August 3, 2018

State of Delaware – Office of the State Treasurer

Proposal for Professional Services (Banking)

Contract Number: TRE18101-BANKINGSVC

Prepared by:

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J.P.Morgan

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J.P. Morgan supports sustainable business practices and adheres to the principles of environmental sustainability wherever possible.

[redacted]

CONTENTS

APPENDICES

Tab A. Transmittal Letter

August 3, 2018

Joshua Berkow
Director of Debt and Cash Management
State of Delaware
Office of the State Treasurer
820 Silver Lake Boulevard, Suite 100
Dover, DE 19904

RE: Request for Proposal for Professional Services (Banking),
Contract Number: TRE18101-BANKINGSVC

Dear Joshua:

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Executive Summary

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Solution Overview

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Tab B: Questionnaire(s)

Provide a detailed set of responses to the questions posed in Attachment 1 (A-E). All Vendors must respond to Attachment 1. Attachments 1A 1E only need responded to if Vendor is proposing for that service. Responses should be both complete and concise.

Attachment 1: Vendor Questionnaire

ALL Firms must complete Attachment 1

A. Vendor Background & General Information

1. **History/Values. Describe in detail the history of your firm, including your founding values and core principles.**

History of Our Firm

JPMorgan Chase's corporate headquarters are in New York City. Our major legacy institutions J.P. Morgan, Chase Manhattan, Chemical, Manufacturers Hanover, Bank One, First National Bank of Chicago and National Bank of Detroit contributed significantly to the development of communities worldwide. Our corporate history is intertwined with innovations in finance and the globalization of the world economy.

The story of JPMorgan Chase and our legacy institutions reaches back more than 200 years with the founding of our earliest predecessor in 1799.

Historical Overview

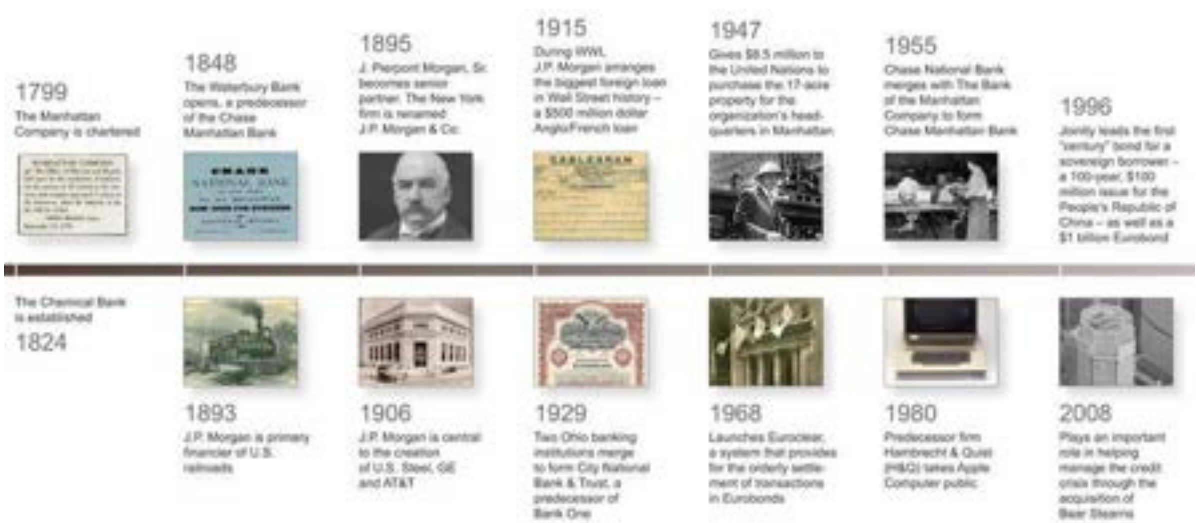

Figure 1

Founding Values

About 70 years ago, one of our firm's leaders, J.P. Morgan, Jr., was called before Congress and asked to explain actions of the firm during the financial crisis of the 1930s. During his testimony, he said:

I should state that at all times the idea of doing only first-class business and that in a first-class way, has been before our minds. We have never been satisfied with simply keeping within the law, but have constantly sought so to act that we might fully observe the professional code, and so maintain the credit and reputation which has been handed down to us from our predecessors in the firm. J.P. Morgan, Jr.

Core Principles

Today, we continue to focus on our core values in how we do business. Our mission focuses on *inclusive growth*, in order to enable more people to share in the rewards of a growing economy:

Fostering collaboration: Forging partnerships among businesses, government and nonprofits to solve complex problems.

Investing philanthropic capital: Making long-term investments to test and scale innovative programs.

Delivering data and analysis: Harnessing the power of data and our firm's insights into the global economy.

Leveraging our core business: Deploying capital, providing credit and applying our expertise to enable local economic development.

Providing skills and expertise: Putting the capabilities of our firm and the knowledge of our people to work for our communities.

Building capacity: Strengthening the nonprofit sector and the underlying systems needed to support sustainable change.

JPMorgan Chase’s Core Principles

Figure 2

Source: JPMorgan Chase & Co.’s April 2018 Corporate Responsibility Report

2. Ownership. Describe your Firm’s current ownership structure. Include any pending agreements or announced plans to merge, sell or significantly change the ownership structure of the Firm or any material portion thereof. Describe any material changes in ownership during the past five years.

As a publicly traded company with approximately four billion shares, JPMorgan Chase & Co. has numerous shareholders whose ownership in the company varies from day to day based upon the purchase and sale of the stock. Exact ownership varies on any day, but even the largest institutional investor in the company owns approximately 5%. Furthermore, due to the large number of shares, business transactions and clients, the Bank does not believe that any shareholder ownership represents a financial interest that would present a conflict of interest in the award of this contract.

3. Experience. Describe your Firm’s experience providing similar services for government entities, specifically states, if possible.

J.P. Morgan ’
government entities with comparable volumes and organizational structure. The individuals who will be working with the State have direct experience working with other States and large

municipal clients, including those we have provided as references, for these banking services. The benefit to you is that we can bring more than just our knowledge of banking products and services, but also an understanding of how other government clients manage banking relationships and interactions with us. We understand the pros and cons of how other clients are organized and how they leverage and use our solutions. We bring this insight and experience to the conversations we will have with the State. We want the State to benefit from what is optimal for you we will tell you if something is not a fit equally to what could be of value and should be considered even if it means change on your side.

Experience with Banking Services for State Governments

Leverage Our Public Sector Expertise to Your Advantage

Figure 3

Committed to Helping State and Local Governments Thrive

The J.P. Morgan Government Banking team is committed to providing innovative financial solutions and personalized client service. We serve government clients in 40 of the 50 states and provide financial solutions to all types of government organizations. We leverage thoughtful strategies and best practices to empower your organization with the practical, workable tools and resources that you need to meet your evolving banking and cash management needs.

Government-first focus

Our first-hand knowledge and understanding of today's challenges comes from having supported government agencies and authorities dealing with issues ranging from planning and development to tax processing, utilities, finance, procurement, public safety and disaster relief.

Dedicated to understanding your needs

We serve 2,281 state and local governments in 40 out of the 50 states, and we help them:

- Manage the burden of over-extended budgets
- Bridge tax-collection gaps
- Find customizable equipment financing solutions
- Manage collection and disbursement of funds and related documentation
- Address resource constraints and improve operational efficiencies
- Gain efficiencies and an added level of fraud protection by transitioning from paper to electronic payment processing

Dedicated Government Banking Experts

We provide financial solutions to all types of state and municipal governments and organizations. Our dedicated team of government bankers structure thoughtful strategies and keep you updated regarding the current best practices so that the State has the practical tools and resources needed to meet today's budgetary, tax collection, financing and liquidity challenges.

Thought Leadership for Government

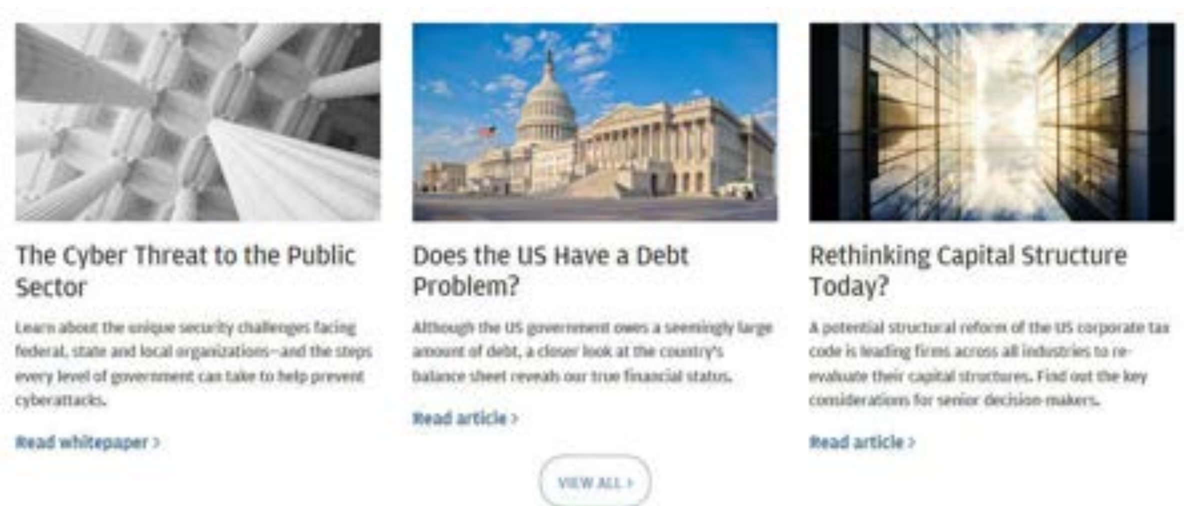

Figure 4

Benefit from our understanding of today's challenges and our firm's firsthand experience helping government agencies and authorities manage issues ranging from planning and development to tax processing, utilities, finance, procurement, public safety and disaster relief. Our bankers are government specialists, and our partners in treasury services, merchant services and commercial card all have government experience as well giving us a unique perspective into your business and industry.

[redacted]

4. Credit Ratings. Complete the following table with current credit ratings by Standard & Poor's Rating Services and Moody's Investor Services. If the Firm is not rated by these organizations, provide other evidence of the Firm's financial strength.

The following ratings are as of June 30, 2018.

	Standard & Poor's Rating	Moody's Investor Services
Firm / Bank		
Short-Term Unsecured Senior Debt	A-2	P-2
Long-Term Unsecured Senior Debt	A-	A3
Bank Holding Company		
Short-Term Unsecured Senior Debt	A-1	P-1
Long-Term Unsecured Senior Debt	A+	Aa3

5. Coverage Ratio. Discuss the Firm's current capital structure, adequacy and coverage. Provide the following statistics for the last reporting period.

a. **Total Risk Based Capital Ratio:** 14.7%

b. **Tier 1 Risk Based Capital Ratio:** 13.8%

c. **Tier 1 Leverage Capital Ratio:** 8.7%

6. FDIC Call Report. Include an *electronic copy* of the most recent Federal Deposit Insurance Corporation (FDIC) call report.

Please find an electronic copy of JPMorgan Chase Bank's FDIC call report in Appendix 1. It can also be found online at https://cdr.ffiec.gov/public/.

7. Community Reinvestment Act. Describe your Firm's participation in the community reinvestment program, including your current national and state Community Reinvestment Act (CRA) rating.

JPMorgan Chase Bank, N.A. is committed to the goals of the Community Reinvestment Act (CRA) and to community service. On its most recent CRA exam conducted by the Comptroller of the Currency, the bank's overall CRA performance was rated Satisfactory.

> **SUPPORTING COMMUNITIES**
>
> On its most recent federal Community Reinvestment Act (CRA) performance examination, JPMorgan Chase Bank earned the CRA rating of Satisfactory.

The major factors that support the most recent CRA rating include:

JPMorgan Chase's over all lending performance was considered good. The volume and responsiveness of community development lending had a significant positive impact. Additionally, the volume of the bank's mortgage loans and CRA-eligible small business loans was generally excellent.

JPMorgan Chase's overall investment performance was considered excellent. The volume of investments was considered excellent. The bank demonstrated leadership through its significant involvement in the Low Income Housing Tax Credit program as well as through its support of Community Development Financial Institutions.

JPMorgan Chase's overall performance under the service test was considered good.

- The branch network provided generally good accessibility to geographies and individuals of different income levels in the bank's assessment areas.
- The bank's record of opening and closing branch offices improved the accessibility of its delivery systems, particularly in low- and moderate-income geographies.
- Branch hours were reasonably consistent across low- and moderate-income geographies.
- Alternative delivery systems (such as ATMs, online and mobile banking) improved accessibility for customers residing in low- and moderate-income geographies.
- The level of CD services provided was generally good overall.

8. State Presence. How many bank branches does your Firm have in the State of Delaware?

JPMorgan Chase Bank, N.A. currently has branches in 23 states and ATMs in 26 states.

Our first branches in Washington, D.C. will open in the fall of 2018. JPMorgan Chase Bank, N.A. will be opening 70 new branches in the Greater Washington region, including northern Virginia, Washington, D.C. and Maryland.

As a business practice, we regularly review branch and ATM activity, which may result in branch openings and closings, ATM placement or removal, or in the change of branch bank or ATM functions. Therefore, branch bank and ATM locations and functions may change from time to time. Branch hours are subject to change and will be posted at each branch location.

9. Community Based Initiatives. Discuss the Firm's existing community oriented activities, specifically:

a. Number of individuals the Firm employs in the State.

b. The investment the Firm has made in the State.

c. Community outreach program(s) for hiring and/or contracting.

d. Existing plans for expanding community based banking and financial services in the State of Delaware.

e. Any public outreach or financial education programs.

f. Support for State businesses, foundations, charities, and residents for the last three years with an explanation of the Firm's level of involvement.

g. Describe how the Firm sees its role in economic development and explain how you can collaborate with the OST in fulfilling its mission of fostering economic development within the State.

With decades of experience working with all levels of government, including entities like the State, our government banking team can guide you in quickly implementing banking services that meet your needs. We will work diligently to provide a solution that exceeds your expectations. Your J.P. Morgan team has developed expertise through working with federal, state and large local government entities. We look forward to addressing your key business issues.

[redacted]

Figure 5

[redacted]

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10. **<u>Sheltered Harbor</u>. Is the Firm a participant in Sheltered Harbor, the new industry initiative to securely store and restore account data?**

J.P. Morgan was one of the leading institutions driving the development and establishment of Sheltered Harbor in 2016. In January 2018, the firm began daily storage of retail banking and brokerage customer data and is working towards the required audit.

B. Key Proposed Personnel

[redacted]

[redacted]

[redacted]

Figure 7

2. **After the initial transition, how often will the primary relationship manager attend on-site meetings with State staff (at minimum quarterly meetings are requested)? Describe a typical meeting agenda for this on-site meeting.**

[redacted]

[redacted]

3. Describe the Firm's policy on changing the primary contact person on an account at your discretion.

While we do not anticipate a change in the State's relationship team at J.P. Morgan, we will notify the State promptly if such a change were to occur. If a change occurs, we will make it a high priority to help smooth the transition and schedule introductions to the State's team.

4. IT Resources: Will Firm provide a dedicated IT liaison to work on set-up, file transfer, testing and troubleshooting / issue resolution? During what hours is technical support available (specify time zones)?

During implementation, a dedicated implementation project manager, David Fleshel, will be your primary point of contact for all aspects of implementation. He will engage additional IT professionals as needed to work on set-up, file transfer, testing and troubleshooting/issue resolution.

One or more technical implementation resources will work with the implementation project manager to coordinate setup activities for your data file transmissions. The technical implementation resource will assemble a team of production and systems experts to work closely with you throughout the process.

A connectivity resource will discuss connectivity options, set up and test the connectivity link, and send test files.

[redacted]

C. Pricing & Incentives

[redacted]

[redacted]

3. **Are there any additional price breaks or incentives if more than one component is awarded to your Firm?**

   [redacted]

D. Electronic Invoicing

1. **Is the Firm able to provide electronic invoicing as opposed to hard copies via mail?**

   The State can view up to 13 months of account analysis statements online or export them in Excel, PDF and CSV format. In addition, the State can download statements in a BAI file via Access Reports or via Host-to-Host Direct Transmission. Account analysis statements are available online starting on the sixth business day after the close of the billing period.

2. **Would it be possible to send an invoice for the Firm's services to a centralized email account or upload to a State vendor portal?**

   In addition to the monthly account analysis statement, J.P. Morgan can provide the State an invoice in an EDI 822 file that can be distributed via secure email to a centralized email account or direct transmission that could be uploaded to the State's systems.

E. Project Management Approach

It will be the responsibility of the Vendor to lead the transition to the new program. The State will collaborate with the Vendor to successfully implement within the negotiated time frame.

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1. Please describe the Vendor's philosophy, methodology, and approach to this implementation project and to project management.

An implementation project manager, [redacted], will be assigned to serve as the State's primary point of contact throughout the process. Your implementation project manager, who has end-to-end ownership and accountability of the implementation, is responsible for communicating regularly with you and coordinates activities across the bank. Regular, often weekly, meetings are held to share information and measure progress.

Your project manager works with you to validate the solutions you have requested, establish timelines for implementation and then coordinates with the necessary teams across your organization and J.P. Morgan to complete the setup.

We view the implementation process as a pivotal phase in our relationship and an opportunity to demonstrate the value of our expertise and consultative capabilities. Our project management methodology is designed to build a strong understanding of your objectives.

The implementation project manager is responsible for:

Forwarding new account and product documentation, file specifications, start-up packet(s) and procedure manuals to the State.

Contacting your designated representative(s) to complete all required documentation and determine specific product instructions.

Reviewing and completing product questionnaires with you, as appropriate.

Opening required accounts.

Ordering depository supplies.

Coordinating with our operations group to make sure products are set up to your specifications.

Coordinating file and transmission testing with the technical implementation resources for both teams, which includes:

- Transmission options review and setup
- File testing
- File security
- Providing test and reports to the State
- Examining all reports and elements of file testing and processing
- Updating all parties on progress

Confirming delivery of PINS and instruction guides.

Providing required training or other assistance, as needed.

Monitoring initial depository activity and confirming depository products are working as expected.

Organizing a post-implementation meeting to review your first bill.

Coordinating the hand-off to your dedicated Client Service Professional, [redacted] for ongoing servicing.

An established project flow and framework is followed when executing the setup of products and services.

Implementation Process Flow

Figure 8

As the State looks to implement a new banking architecture, we have provided a few sample transition plans to help the State proactively assess the potential impact for such a project. Along with a master transition plan, we have created a sample implementation plan for OST and the Division of Unemployment, included in Appendix 2.

The basic implementation process follows:

Relationship team confirms terms of proposal with the State.

You accept the proposal.

Terms of proposal are forwarded to our implementations group.

Sales and implementation discuss the proposal, exceptions and special conditions.

You return the required core DDA documents and product-specific documents to Implementation.

Our implementation team verifies our systems reflect correct State information.

Your Client Service Professional (CSP) [redacted] is notified of product setup completions.

Training requirements are coordinated and scheduled with your designated contact(s).

Training, including product manuals and sample completed order forms, is provided to you at no cost.

Your account is monitored for a period of time (to be determined) to verify proper setup, availability, exceptions, etc.

Our Implementation team confirms with you that products are working properly.

Your account is officially handed to [redacted] your dedicated CSP for ongoing servicing.

2. Describe the methods, tools, and techniques the Vendor intends to use in providing project management services. Does the Firm send Project Status Reports during the course of the implementation? How frequently? Who is responsible for sending these Reports?

The State's dedicated implementation project manager will serve as your primary point of contact and is responsible for coordinating the implementation of your services. Your implementation project manager is also the contact between all levels of the State's staff (e.g., management, users, technical staff and external partners) and J.P. Morgan.

In addition, we may assign additional staff to the implementation team:

One or more technical implementation resources will work with the implementation project manager to coordinate setup activities for your data file transmissions. The technical implementation resource will assemble a team of production and systems experts to work closely with you throughout the process.

A connectivity resource will discuss connectivity options, set up and test the connectivity link, and send test files.

Other experts will be added as required.

Your dedicated implementation manager will schedule a kickoff meeting for large or complex implementations. Key tasks, assignments and time frames are documented and shared with project team members. Your implementation manager will schedule subsequent meetings to track and support the progress of the implementation. The State decides how often these meetings are held. We recommend meeting weekly for complex implementations.

Ongoing support is provided to the State by the Client Service and Technical Support teams. These teams provide training, usage assistance and technical support via telephone.

The support provided by J.P. Morgan does not end once we implement your service(s). We believe continuous support is critical to your overall account relationship. After implementation, [redacted], the State's dedicated CSP will become your ongoing contact to make sure that your expectations are consistently met.

We will supply the State with necessary product guides, procedure manuals and user guides required for the products and services being implemented. Additionally, we will provide training that is required or requested. Our objective is for you to fully understand our products so you can take full advantage of their benefits and features.

3. Please describe IT support that will be provided to help interface the bank's systems with the State's existing First State Financials (FSF / PeopleSoft Financials system version 9.2).

[redacted]

4. What flexibility does the Firm's systems have in accepting different file layouts for inbound files or generating customized file layouts for outbound files that are processed within PeopleSoft, or FSF (the current accounting system)?

[redacted]

5. Please describe the most common reasons for an inefficient or delayed implementation. What strategies should be implemented to increase the likelihood of a smooth transition?

A common lesson learned includes setting expectations for meeting an aggressive target date for implementation. To address this, the State's designated implementation manager will create a detailed timeline at the outset of the project, along with milestone dates. This informs the State and J.P. Morgan of the work that must be completed.

In addition to keeping the core project team focused on the steps needed to meet the goal, this timeline also provides the State with a formal document to gain acceptance from your internal groups, such as Legal, Marketing, Compliance, etc. In many cases, the challenges in meeting timelines are commonly due to the required involvement of these indirectly related departments.

Another common challenge that can arise in an implementation is incomplete requirements identification. Due to the broad impact that customer systems can have within an organization, it is critical that all requirements are identified at the outset of the project.

[redacted]

6. If there is a risk of delay, unforeseen hurdles, or other challenges, who is responsible for identifying these potential problems and communicating them to the working group?

Implementation project managers can help you identify each area that might be affected by a system, and are expert in driving, identifying and documenting application-specific configuration requirements. This step-by-step process helps make sure that no operational requirements are overlooked.

7. Please provide the training materials and resources available for each component being proposed? Are there webinars, on-site training, online resources, or other tools available?

We offer the State a variety of methods for training without any cost to you, such as webinars, phone and short step-by-step prerecorded videos.

The following resources are available:

> **Online Resources**: Available on Access Online's Support via the Education tab. Resources include online help articles, FAQs, guides and a range of live and pre-recorded webinar offerings on how the State can use the Access Online products and services.
>
> **Webinar Training**: Instructor-led sessions are available on many of our products including Receivables Online and Remote Deposit Capture. For Access Online, we have webinars for each of our products in the Access Online family. Each webinar lasts between 15-90 minutes. Webinar registration is available via Access Online's Support/Education page.
>
> **Phone Training**: Customized one-on-one training conducted over the phone is offered to meet the State's unique needs for all Access Online products and services. To schedule a one-on-one session, you may contact [redacted]

The support provided by the bank does not end once we have implemented your account. We believe continued support is critical to our overall account relationship. Ongoing support is provided by the Client Service and Technical Support teams. For example, after account implementation, [redacted], your CSP will become your ongoing contact to address your expectations.

8. During the course of the contract, if the Firm upgrades its banking software or internal processes, how will these changes be communicated to the State?

The bank makes advance notice available in the Important Messages broadcasts and Alerts feature of the Access Online portal, including specific details and benefits.

9. What banking data from the incumbent provider will the Firm be willing to migrate? How does the Firm recommend receiving this information?

[redacted]

10. The State expects to have a long-standing partnership with the chosen Vendor. If the State ever elects to transition services to a different vendor, what end-of-contract transition services is the Firm willing to provide?

J.P. Morgan will work with the State to provide a smooth transition to a new provider at the end of the contract. Upon request, J.P. Morgan will continue to provide current treasury systems as a contingency for the duration of the State's transition, subject to contract terms.

F. Subcontractors

1. The State reserves the right to approve any and all subcontractors utilized in the execution of this event. Please identify all subcontractors for this event, detailing how they will be utilized, your Firm's relationship with the subcontractor, and a description of joint work the Firm has undertaken with this subcontractor.

J.P. Morgan proposes to provide the services offered in Components 1, 2, 3 and 5 directly, without the participation of any subcontractors.

G. Control

1. Describe the Firm's security environment. Specifically cover the physical and digital security and software safeguards that the Firm has put in place to control access to funds transfer systems and client account information.

The firm has developed a full suite of Information Risk and Security Policies, Standards and Procedures that are consistent with industry standard frameworks. In particular, the firm's data security standards are consistent with the Payment Card Industry Data Security Standard 3.2, as the firm's data security control framework incorporates PCI-DSS standards.

Client information is protected by the firm in a variety of ways, including and not limited to:

- Using industry standard firewall technologies to protect data
- Removing vendor supplier defaults for system passwords and other security parameters
- Utilizing industrial-strength encryption methods when the data is in transit outside of the firm network
- Deploying intrusion prevention/intrusion detection systems
- Deploying anti-malware to the computers with regular signature updates
- Regularly patching systems
- Regularly testing security systems and processes
- Tracking and monitoring access to network resources
- Maintaining an information security policy designed to ensure that all employees receive regular training on data privacy and security and that employees are required to certify their completion of such training
- Instituting a corporate-wide policy requiring that all laptops and mobile computing devices have encryption software installed that requires a separate login at boot up.

Lastly, as a card issuer, the Commercial Card division of the firm requires that external service providers who act as the primary processors of cardholder transaction data be PCI-DSS compliant and can confirm that this is the case each year.

Physical Security

Controls provide reasonable assurance that physical access to the computing environment is limited to authorized individuals.

Entrances to computer data centers are restricted through physical access controls. A process is in place to periodically recertify that physical access remains commensurate with job responsibilities, or to periodically revoke all users requiring re-approval of their access.

Visitors (excluding authorized contractors) entering data centers must be monitored by an authorized individual.

Data centers are equipped with alternative power supplies (e.g., uninterruptible power supplies and generators).

Environmental controls are in place at critical data centers including:

- Fire protection systems (alarms and fire suppression)
- Smoke and heat detection (and moisture detection where water based fire suppression exists)
- Temperature and humidity control

[redacted]

[redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

[redacted]

[redacted]

2. **Describe the Firm's security procedures for its information reporting system, both for access and information protection (e.g. RSA tokens, secure certification, etc.).**

As a financial institution, J.P. Morgan has processes and controls in place that are designed to protect the security of our systems as well as the security and privacy of client and customer data; [redacted]

Internal Controls

The Technology Controls Identity and Access Management (TCIAM,) within our Technology Controls organization, administers authorized access to certain firm technology applications. TCIAM oversees the creation, deletion and maintenance of access IDs for most applications through request processing, workflow and approval mechanisms. TCIAM also manages the recertification process at the operating system, application and database layers and ensures appropriate review of personnel as terminations and transfers occurs.

Access to the firm corporate network requires a wireless client to be installed on a user's firm-issued laptop and requires multifactor authentication. All relevant logs are captured and sent to the Cybersecurity Security Event Monitoring. Only firm-issued laptops can gain wireless access to the firm network.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

3. Describe the backup and recovery capabilities in the event the proposed systems are unavailable. Who would the State contact to initiate day-to day transactions if online capabilities and functionality are temporarily unavailable?

J.P. Morgan maintains a comprehensive program for business continuity that includes backup of all systems as well as resources and procedures to provide business continuity, disaster recovery and fail-safe operations in the event of an unforeseen disruption to normal operations.

[redacted]

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[redacted]

[redacted]

[redacted]

4. Discuss the bank's security environment related to cybersecurity. Specifically describe the cyber risks to which the proposed services may be exposed and explain the Firm's approach and response to protection against these risks. What are the Firm's crisis communications plans in the event of a cyber-attack?

Cybersecurity Overview

[redacted]

[redacted]

Periodic risk assessments are performed to identify, assess and quantify cyber risk to the firm in order to prioritize strategic objectives. The Cyber risk framework analyzes identified threats and vulnerabilities by focusing on the potential impact and likelihood of each.

The firm has a fully established Application Risk Assessment (ARA) Process that adheres to the firm's published Policies and Standards. The firm's Information Confidentiality Classification Standard provides the firm-wide definition of confidentiality by assigning information types to one of four classes: Highly Confidential, Confidential, Internal and Public. Technology controls and handling processes are then applied based on the information confidentiality class.

Via the Application Risk Classification (ARC) process, applications, together with underlying technology components, are risk ranked, with the information confidentiality class being a key input to the ranking process. The ARC ranking drives the controls regime for the application, including the required controls and frequency of risk reviews.

The firm performs risk assessments on all externally facing applications that are in scope for the FFIEC Guidance (FFIEC Authentication in an Internet Banking Environment Guidance). The Application Risk Assessment (ARA) ensures that the strength of the authentication mechanism deployed is appropriate for applications that handle sensitive customer information (including personal information) and/or perform money movement. The assessment focuses on appropriate use of multifactor (two-factor) authentication, as well as layered controls (e.g., monitoring) to ensure that all users are appropriately authenticated.

Vulnerability scans are performed as part of the firm's Vulnerability Management Program. Internal and external scans are conducted on a regular schedule in accordance with the firm's IT policies and standards. JPMorgan Chase assets are scanned including externally facing IP addresses across environments.

The firm's vulnerability management plan is developed and implemented via the firm's Vulnerability Management Program. The firm has a dedicated team that manages the Vulnerability Management Program and associated framework. Findings identified and associated recommendations from these activities are formally documented, tracked until completion and validated via follow-on exercises and assessments.

To maintain security and confidentiality, we do not share specific details with clients or other third parties. If you require more information regarding our cybersecurity program, we will be pleased to arrange a meeting for you with members of our Global Cybersecurity & Technology Controls organization.

Incident Response

The firm has controls in place designed to ensure a consistent and effective approach for the management of cyber incidents as per industry standards and best practices. A global security operations center, with the ability to handle issues and pass them between offices in different time zones, responds to any suspected security breach, engages with application and infrastructure incident response teams and performs severity assessment, root cause analysis and implementation of corrective actions as needed.

We notify impacted clients and regulatory agencies as required by applicable laws and regulations. The firm closely collaborates with financial institutions, intelligence organizations and law enforcement to share timely, relevant and actionable physical and cyber security threat and incident information to enhance the ability of the financial services sector to prepare for, respond to and mitigate risks associated with cybersecurity threats.

5. Has the Firm ever had to respond to a data breach? If so, please describe the breach and what the Firm's response was.

In October 2014, JPMorgan Chase disclosed to regulators and customers that it had experienced a data breach. As reported in the firm's 8-K filed at the time, the breach did not affect customers' financial data, but it did compromise customers' names, addresses, email addresses and phone numbers.

Since this experience, the firm has conducted a comprehensive review of our global cybersecurity program and we invest significant resources, including a dedicated team of 2000+ professionals, in identifying and addressing cybersecurity threats. While it is impossible to fully eliminate all cyber threats to our customer data, cybersecurity is one of the most important bedrock commitments of our firm.

6. Describe the encryption capabilities that are supported by the Firm for the transmission of data between the Firm and the State. Describe the file verification capabilities that are supported by the Firm, such as checksum or hash totals to ensure that no data is misfield or substituted.

Authentication Requirements

J.P. Morgan has established minimum requirements for safeguarding the integrity of wholesale financial messages to reduce the risk of financial loss from accidental or deliberate alterations of messages, and the introduction of fraudulent messages as exchanged between

J.P. Morgan financial applications, or between J.P. Morgan financial applications and J.P. Morgan clients.

Message authentication detects any change in data content.

Encryption makes data unreadable but does not confirm data integrity.

Password protection limits access but does not confirm data integrity.

Callbacks can be compromised by call-forwarding technology.

All wholesale financial messages, transmitted through a telecommunications link to or from a J.P. Morgan financial application must be properly authenticated. All message authentication measures and products must conform to approved American National Standards Institute (ANSI) standards. A key management process must be employed and must conform to approved ANSI standards.

To prevent unauthorized or fraudulent transmission of payment instructions, J.P. Morgan requires that authentication be employed on all value bearing transactions, which are electronically transmitted to the bank. Encryption will be implemented based on the client's request.

Please refer to the attached TSS Connectivity User Guide in Appendix 5 for a complete overview of all connectivity and security measures currently available, for the transmission of data between J.P. Morgan and the State.

[redacted]

[redacted]

[redacted]

[redacted]

7. Describe the process and procedures for providing notification of technology changes, such as file content / structure, and new / modified data availability reporting changes to the State.

Any technology changes that J.P. Morgan would mandate would be well-communicated through one of the members of your J.P. Morgan relationship team. Any update to a product or program being utilized at the bank would have a migration contact assigned that is dedicated to that product change. The relationship team would also work carefully with the State during any proposed changes to ensure any negative impacts would be mitigated.

Generally, during an initial implementation, file contents/structures are agreed-upon and do not change unless the State requests a change to the format.

8. List the types and amounts of insurance and bonding carried. Provide copies of the insurance certificates. Insurance requirements can be found in the STCs Section IX of Appendix D.

JPMorgan Chase & Co. (JPMC) maintains reasonable and customary forms of insurance to protect itself and its subsidiary companies against loss. The insurance does not extend to clients, but may protect JPMC and its subsidiary companies if it is liable for loss of client property. JPMC reserves the right to cancel, non-renew or modify all or any part of the insurance policies at any time. For copies of the insurance certificates, please refer to Appendix 6.

Bankers Blanket Bond / Computer Misuse and Telephonic Misuse Insurance

Risks Covered: Loss of Property (e.g. money, securities and other tangible items of personal property) resulting directly from dishonest, fraudulent, malicious or deliberate criminal acts committed by an Employee; robbery, theft, burglary, or mysterious unexplainable disappearance; forged or counterfeit checks and securities; Computer Misuse and/or Telephonic Misuse committed by any person other than an identifiable Employee or Servicing Contractor. Coverage applies to Property (1) owned by JPMC, (2) held by JPMC for any purpose or in any capacity, (3) for which JPMC is legally liable, (4) in which JPMC has a pecuniary or other interest or (5) for which JPMC has instructions to insure.

[redacted]

Excess All Risks of Physical Loss or Damage

Risks Covered: Protects against loss including loss of physical securities, uncertificated securities and electronic securities: (1) owned by JPMC,(2) held by JPMC for any purpose or in any capacity, (3) for which JPMC is legally liable, and (4) property for which JPMC is responsible and/or for which JPMC has instructions to insure. The coverage applies anywhere in the world where property is kept by JPMC at its business locations and/or third party locations where JPMC has insurable interest in physical subject matter covered under this policy.

[redacted]

Mail and Transit

Risks Covered: All risk mail and transit insurance for all types of securities and other valuable property.

[redacted]

[redacted] [redacted]

Policy Period: Continuous until canceled

Bankers Professional Liability

Risks Covered: Bankers Professional Liability coverage indemnifies against loss arising from claims of alleged wrongful acts committed in the performance of professional services.

[redacted] [redacted]

[redacted] [redacted]

[redacted] [redacted]

Cyber Security Liability / Excess Cyber Security Liability

Risks Covered: JPMC currently maintains a Privacy, Media and Network Security Insurance policy covering: a) Network Security & Privacy Liability, b) Event Management, c) Network Business Interruption, d) Crisis Fund, e) Regulatory Defense, Fines, Penalties and Consumer Redress, and f) Payment Card Industry (PCI) Fines.

[redacted] [redacted]

[redacted] [redacted]

[redacted] [redacted]

Workers Compensation & Employer's Liability (U.S.)

Risks Covered: All compensation and other benefits required by state law and all sums the insured is legally obligated to pay because of bodily injury by accident or disease.

[redacted] [redacted]

[redacted]

Commercial General Liability (U.S. and Canada)

Risks Covered: Sums which the insured is legally obligated to pay due to third party bodily injury and property damage claims arising out of the conduct of the insured's business.

[redacted]

Business Automobile Liability (U.S.)

Risks Covered: Sums which the insured is legally obligated to pay due to third party bodily injury and property damage claims arising out of the use of owned, non-owned and hired vehicles.

[redacted]

Umbrella Liability

Risks Covered: Excess liability over underlying liability limits (excess of Employer's Liability, Commercial General Liability and Business Automobile Liability).

[redacted]

International Casualty

Risks Covered: Provides primary and excess liability coverage for international operations in situations where local coverage (i.e., general, automobile and workers' compensation) is limited in application (primary coverage) or insufficient (excess coverage).

[redacted]

9. Does the Firm maintain cyber liability insurance? If so, list the types and amount/limits carried.

Cyber Security Liability / Excess Cyber Security Liability

Risks Covered: JPMC currently maintains a Privacy, Media and Network Security Insurance policy covering: a) Network Security & Privacy Liability, b) Event Management, c) Network Business Interruption, d) Crisis Fund, e) Regulatory Defense, Fines, Penalties and Consumer Redress, and f) Payment Card Industry (PCI) Fines.

[redacted] [redacted]

[redacted] [redacted]

[redacted] [redacted]

10. Describe the bank's procedures for complying with the U.S. Treasury Department's Office of Foreign Assets Control (OFAC) regulations. When was the last time an independent test of the bank's OFAC program was conducted by internal audit, outside auditors, consultants, or other qualified independent party?

JPMorgan Chase & Co. is subject to the regulations administered by the U.S. Treasury Department's Office of Foreign Assets Control (OFAC) and has policies and procedures designed to comply with the prohibitions and restrictions mandated by OFAC and all other sanctions laws and regulations applicable in the jurisdictions in which JPMorgan Chase & Co. operates.

Assessments related to OFAC are performed on an annual basis.

All payment instructions are validated for authenticity and checked for potential duplication and Office of Foreign Assets Control (OFAC) compliance. In addition, they are reviewed for accuracy and correct formatting of account parties and approved for completion. This work is done in an automated, straight-through manner, using the logic and artificial intelligence that has been built into the payment system. Authentication is mandatory regardless of which avenue your company uses to deliver the payment files.

11. Include a copy of the bank's most recent reports issued in accordance with the Statement on Standards for Attestation Engagements (SSAE) No. 16 (formerly known as the Statement of Auditing Standards-70 (SAS70)) for any processes or systems relevant to the services proposed by the Firm under this RFP. *(Note: Failure to provide this information will significantly impair the State's ability to assess the Firm's controls and will negatively affect the evaluation of the proposal.)*

[redacted]

[redacted]

We would be happy to engage our IT Risk Management experts to discuss your questions or concerns in greater detail upon request.

H. Information Technology

1. All services, products and deliverables provided by the Firm must comply with State standards promulgated by DTI, inclusive of Terms and Conditions for Cloud and Offsite Hosting, published at https://dti.delaware.gov.

J.P. Morgan agrees to implement and maintain appropriate levels of data and IT security in accordance with our internal policies and procedures. The bank does not specifically comply with any one particular set of standards or requirements, but broadly complies with numerous standards and requirements in accordance with our many regulatory obligations as part of a highly regulated industry. To comply with such regulations, the bank maintains an IT Risk and Security Management Program (IT Risk Program), which is subject to regular inspection by regulatory authorities, including the U.S. [redacted]

We are more than happy to discuss this topic further with the State to verify that the bank's standards meet or exceed those of the State. However, given the number of bank clients, we are not able to agree to an individual client's security standards or policies.

Attachment 1-A: General Banking Services

A. Key Personnel & Customer Service

1. Provide biographical information on the individuals who will work with the State on a regular basis. Please include the following information:
    a. Proposed role with regard to OST's account;
    b. Biographical information;
    c. Location;
    d. Experience working with other government entities;
    e. Number of years of experience in this field;
    f. Number of years with Firm; and,
    g. Number of accounts the person is responsible for.

[redacted]

[redacted]

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- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

[redacted]

[redacted]

[redacted]

2. **Provide an organizational chart that includes these individuals.**

[redacted]

Figure 9

3. **Customer Service**

a. **For routine day-to-day transactions, will a specific customer service representative or a customer service department be assigned? Provide biographical information for this individual(s) that will be assigned to this account.**

[redacted]

b. **Describe the responsibilities of the customer service personnel, including the chain of command for problem resolution.**

The State's Client Service Professionals (CSP) have the primary responsibility for all day to day aspects of your treasury management relationship such as inquiries, research and maintenance related to accounts and services. They will also have authority to engage all levels of Commercial Banking management and escalate issues as appropriate. Client Service has a detailed matrix of contacts and escalation procedures to expedite resolution for each service provided to you. These procedures also include internal service standards to make sure other J.P. Morgan groups are providing timely responses. Finally, Client Service works closely with your full relationship team to be sure that everyone supporting you is informed of your relationship activity.

c. What are the hours of operation of the customer service unit involved in supporting the State?

[redacted]

d. If a State employee needs assistance after business hours, what support is available?

[redacted]

B. General Banking Services

1. Account Structure

a. Discuss how the Firm would approach setting up a new account structure for the State. (Note: The State would be interested in consolidating the number of accounts and is looking for potential suggestions from the Firm).

J.P. Morgan will work collaboratively with the State leadership team and staff, Agency staff where applicable, along with your consultant to understand the payment and collection needs of each Agency. [redacted]

- [redacted]
- [redacted]
- [redacted]

[redacted]

[redacted]

For the OST accounts, a sample account structure is shown in Appendix 9 for your review. For Agency accounts, we will collaborate with the State[redacted]

b. **For the Firm's other state clients, how many accounts are typically used to facilitate the operations of the Treasurer's office and agencies?**

[redacted]

c. **What resources is the Firm willing to provide to assist the State in re-evaluating their current account structure and making formal recommendations?**

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

- [redacted]
- [redacted]
- [redacted]

d. If the State were to change the existing account structure, how would this affect the time required for implementation?

,

implementation timeline. The first step in the process is account opening and the implementation timeline is governed more by the products and services to be set up,

’

part and the State’

e. In the Firm’s experience, is there a benefit to separating check disbursement activity from other bank activity? *(Note: The State is concerned that accounts with check disbursement activity may be forced to close due to fraud, despite positive pay being used on the account.)*

[redacted]

[redacted]

2. Deposit Reconciliation Services

a. What are the specifications for assigning unique deposit identification numbers (i.e. maximum number of digits, numeric-only, etc.)?

J.P. Morgan offers deposit reporting to assist with deposit reconcilement. This provides the State with a listing of all deposits identified by ULID (Unique Location Identifier), as well as miscellaneous debit/credit deposit adjustments.

The auxiliary on-us field used for ULID reporting is located on the deposit ticket in positions 46 through 55. If you are using less than 10 digits, move the MICR symbol from box 56 and zero-fill. Your number must be at least six digits and no alpha characters.

b. Are daily deposit totals reported by each location separately?

The reporting details are available via Access Online. [redacted]

c. Is the location code available on all standard reports? If not, please identify how this information will be available (i.e. customized reports from the online platform, transmitted files, etc.).

[redacted]

[redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]

3. Remote Deposit Capture (RDC)

a. Describe the Firm's ability to process checks by Remote Deposit Capture (RDC).

Integrated Receivables Collect

Our Integrated Receivables Collect solution includes an efficient and cost-effective electronic alternative to paper deposits. [redacted]

Remote Deposit Capture Workflow

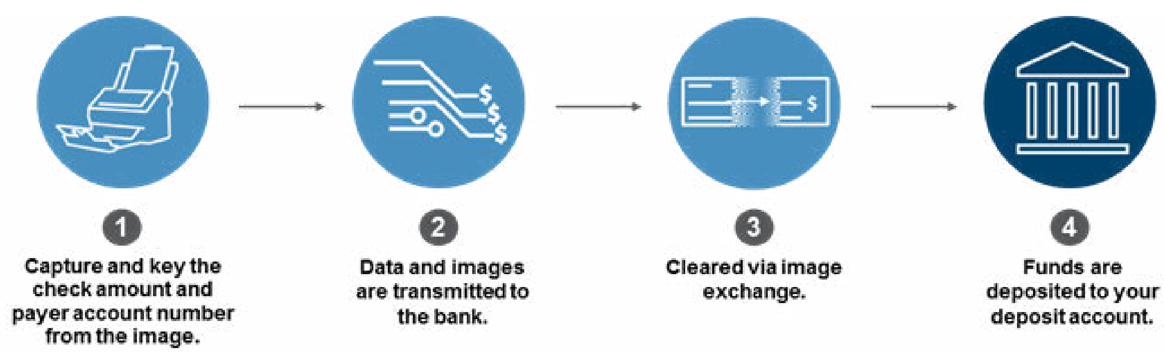

Figure 10

Remote Deposit Capture is an end-to-end hardware, software and processing solution for reducing paper check payments at branch locations, drop boxes and internal retail and consumer lockboxes. To use our remote capture services, the State needs a high-speed Internet connection, a desktop check scanner and a Windows-based PC.

Remote Deposit Capture is:

For U.S, accounts, checks must be:

- Scanned from a U.S. location.
- Drawn on a U.S. financial institution.

- In U.S. dollars.
- Deposited into a J.P. Morgan U.S.-domiciled DDA.

The solution allows the State to deposit business, government and consumer checks, Postal Money Orders, Western Union Money Orders, demand drafts and government warrants.

The State scans images of checks and transmits them electronically to the bank for clearing.

Transmissions are conducted through secure HTTP protocols employing 128-bit encryption.

[redacted]

We provide same-day ledger credit for checks received by the deadline.

An implementation specialist works with the State to set up remote capture services.

[redacted]

[redacted]

Figure 11

OCR: Optical character recognition. MICR: Magnetic ink character recognition.

Remote Deposit Capture/Remote Lockbox Capture with Mobile

Our remote capture service is available on mobile devices extending the reach of a remote deposit service to the point of check receipt. Mobile capabilities provide another efficient and cost-effective electronic alternative to paper deposits. It only requires a compatible smartphone or tablet, connectivity service plan, a wireless signal and a J.P. Morgan demand deposit account.

Remote Deposit Capture via mobile is for use in the U.S. only.

- Checks must be scanned from a U.S. location.
- Drawn on a U.S. financial institution.
- In U.S. funds.
- Deposited into a J.P. Morgan U.S.-domiciled DDA.

Our mobile remote capture service is fully integrated with our desktop solution providing the same features and functionality.

To maximize organizational efficiencies, use desktop scanners and the mobile solution together or stand alone.

The application is intuitive and easy to use, requiring minimal training or support.

Employees in the field can photograph and capture checks for deposit to your J.P. Morgan DDA.

[redacted]

The check image and/or document is uploaded and transmitted to the bank for processing.

Review 14-day deposit history on the mobile device.

No sensitive data is stored on the mobile device once a deposit is completed.

b. Can deposit reconciliation services be used in conjunction with RDC?

Yes, the Operator Summary Report provides a listing of every user who created and submitted batches for deposit. The report will include a captured by field to identify the user.

[redacted]

c. How does a user select which account an RDC deposit will be made into (i.e. drop down menu, key entering account number, other)? If deposit reconciliation is used, is the location id information available in the drop down menu?

A lockbox or account number is selected from a drop down menu at the beginning of the scanning process.

d. Describe how a single RDC terminal can be used to make deposits into multiple bank accounts.

The State can establish multiple depository accounts for each remote deposit site. J.P. Morgan puts no restrictions on the number of accounts that can be used with our remote capture services. The State can set up users to access multiple lockboxes and multiple depository accounts if needed.

e. How are permissions granted for an account with deposit reconciliation services by location id or account?

Unique customer IDs are requested and submitted through the State's Treasury Management Officer or CSP with appropriate substantiating documentation, which is attached in the request if required.

i. **Would this structure allow the bank to directly communicate with the end-user on deposit corrections, returned items, etc.?**

Yes, each end user can see all the items requiring actions based on profile setup.

ii. **Would this structure allow for an individual to view returned items for only their location without having access to other location information?**

Yes, through entitlements, a user can only have access to their location data.

f. **Is there a limit on the number of checks that can be contained in a single deposit? How many checks would the Firm recommend be processed in a single deposit?**

[redacted]

g. **Is there a maximum dollar amount (per check) that can be processed through RDC?**

The maximum check amount is $99,999,999.99.

h. **Does the Firm's service offer the ability to populate data using recognition technology such as Magnetic Ink Character Recognition (MICR), Optical Character Recognition (OCR), or Intelligent Character Recognition (ICR)? If so, does the system recognize both the courtesy amount and the legal amount of the check?**

J.P. Morgan uses scanning technologies, such as magnetic ink character recognition (MICR) and Optical Character Recognition (OCR), to capture and validate check data. We also use Character Amount Recognition (CAR) and Legal Amount Recognition (LAR) to capture and validate the amounts on the check. If the software cannot read the values, it prompts the user to manually enter the data.

i. **When using the Firm's RDC service, can checks be automatically endorsed? Is the endorsement an electronic image or physically printed on the check?**

It is recommended that the State physically endorse all checks before scanning. Our remote capture service electronically endorses each item with a generic endorsement that cannot be customized.

We provide a virtual endorsement on the back of each check (i.e., For Deposit Only RDC). When the captured image is printed or viewed, the endorsement is visible.

Mobile supports the virtual endorsement feature as well, although the endorsement cannot be viewed on the smartphone or tablet.

j. **Describe the process used for balancing and correcting deposits prior to transmitting them to your Firm.**

All balancing for remote deposits is performed by the user before submitting for deposit. If the batch does not balance, the user can correct the item or remove it from the batch prior to submitting for deposit.

Balancing and Correcting Deposits

1. You enter a total for each batch of checks prior to scanning.
2. Our remote deposit capture service uses CAR/LAR technology to capture the dollar value of each scanned check. This allows the scanner to read both the courtesy amount (numbers) and legal amount (letters) to determine the amount of the check.
3. If the amount cannot be systematically captured, remote deposit capture prompts the user to enter the dollar amount.
4. If the captured amount varies from the batch total you entered, remote deposit capture prompts the user to balance the batch.
5. Deposits cannot be submitted if they are not balanced.

Figure 12

k. Does your Firm's service allow for multiple batches to be scanned throughout the day and processed as a single deposit at the end of the day?

[redacted]

l. If batches are processed by different users, are batches consolidated or are they separate deposits?

Batches are consolidated for one deposit. Details per batch can be provided in reporting for reconciliation.

m. For how long are electronic check images deposited by RDC stored and available for viewing?

[redacted]

n. What fields are searchable for researching check deposits?

[redacted]

o. How will the State be notified of deposit corrections and/or adjustments for RDC items?

J.P. Morgan provides a variety of optional services for handling return items, such as posting options, redeposit or notification via Receivables Online. During your account implementation process, we will help the State set up the appropriate solutions to manage your returned checks.

p. If the State needs replacement or additional RDC equipment, what equipment would the Firm recommend? Indicate how many items these machines can handle.

The Epson CaptureOne 60/100 or 90/100 is generally used for check-only scanning and the Epson DS-860 if you plan to scan checks and documents. Please see Appendix 10 for addition Epson 860 information. Epson has indicated that their scanners have an expected lifetime volume of one million documents scanned.

q. What is the document destruction policy for scanned checks? Does the OST have to destroy the documents or can the State contract with a third-party vendor to destroy the documents?

[redacted]

r. What is the ledger cutoff time for deposits for items processed by RDC?

[redacted]

- [redacted]

4. Image Cash Letter (ICL)

a. Describe the Firm's ability to process checks by Image Cash Letter Processing (ICL).

Our image cash letter solution allows the State to image all of your paper items and transmit them to us electronically for clearing.

Image Cash Letter Did you know?

We are one of the first banks to exchange images of items electronically.

We have invested more than $100 million to enhance our image infrastructure.

We consult with the State to create dynamic solutions suited to your current and evolving business requirements.

As a founding member and board representative of The Clearing House, we are one of the first owner banks exchanging images of items electronically.

The illustration below provides an overview of the image cash letter process flow.

Image Cash Letter Overview

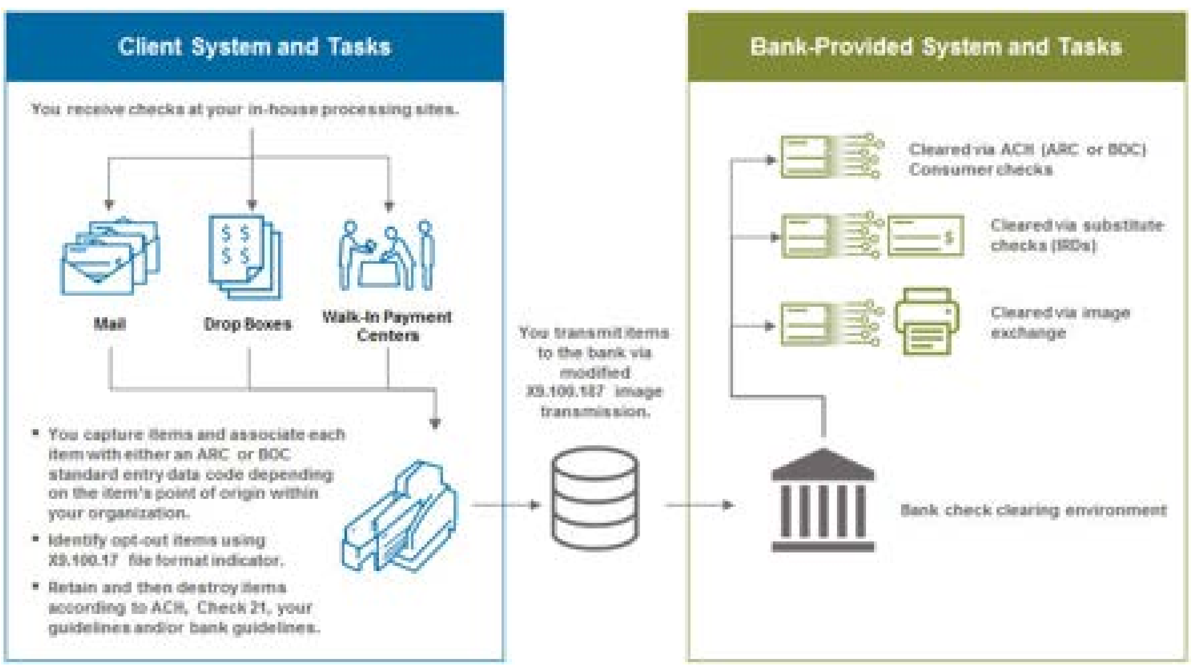

Figure 13

J.P. Morgan employs advanced image quality analysis tools to verify the quality of image deposits and reduce the incidence of items returned by the paying bank for poor quality. We also maintain a duplicate detection database to protect against duplicate files during a 45-day period.

The State will benefit from:

Image-Enabled Routing Transit Numbers: J.P. Morgan currently sends to approximately 22,000 routing transit numbers. The bank updates routing transit numbers on a quarterly basis.

Competitive Availability Schedule: We base availability on the bank on which the deposited check is drawn and the time the deposit is made.

Electronic Notification of ICL Transmission: The State will receive an electronic notification for each ICL file you transmit to us. We send notification, including the number of items and dollar totals, to designated recipients via email or XML transmission.

Advanced Image Quality Analysis Processes: We use a two-pass process to identify suspect items. The process determines whether items may be acceptable for presentment to the paying bank or are nonconforming images (NCIs).

Image Quality Processing: This helps reduce adjustments, potential privacy violations and fraud. Quality checks verify that ICL-deposited items are correctly debited and credited to the proper account(s), for the precise value(s).

Codeline Match Quality Processes: We use, and were one of the first providers to implement, a process to verify that check data associated with an image matches correctly to the item.

- This greatly reduces errors by having the item properly routed to the correct paying bank and debited to the relevant account.
- It also reduces the risk for downstream adjustments and potential privacy violations of a check inserted into another customer's account statement.

Duplicate File Detection: Our transmission management process includes duplicate file review against the database for the previous 45 days of transmission activity. To guard against duplication, J.P. Morgan reviews file headers for volume, value, composition date and time and sender details. Files will not be processed if the header and/or detail records indicate zero dollar value. We provide timely email and telephone notifications to minimize service disruptions.

Enhanced Landing Zone: We assign the State's deposits float and pricing based on the time the file is received and acknowledged, not at another point later in the process.

Seamless Implementation Process: Implementation is driven by the outcome of testing, file certification, connectivity, etc. Our implementation team will work with the State to configure the services we will provide.

[redacted]

b. **Is there a limit on the number of checks that can be contained in a single deposit? How many checks would the Firm recommend be processed in a single deposit?**

There is no limit on the number of files the State can send each day and no time restrictions between file transmissions. Please note that there is a 35,000-item limit on individual ICL files, which should not exceed 2GB. J.P. Morgan has established that as the largest volume level for a file that can be reconciled efficiently.

J.P. Morgan recommends 300 items per bundle. The maximum is 350 items.

c. **Is there a maximum dollar amount (per check) that can be processed through ICL?**

The maximum check amount is $99,999,999.99.

d. **How will the State be notified of deposit corrections and/or adjustments for ICL items?**

Adjustment Advice

The State will receive debit or credit adjustment advices from J.P. Morgan that contain reference identification numbers, the date and the amount of the deposit that was adjusted, identification of the item(s) adjusted and the location number if applicable.

[redacted]

Figure 14

[redacted]

[redacted]

Figure 15

Cash letter advice: This advice lists all return checks processed during the current cycle. Multiple advices may be created during the processing day.

Extended data advice: If extended data is keyed, additional fields appear on the advice.

Single item advice: Each return appears on a single advice.

Adjustment/Image Quality Documents

If image quality does not meet acceptable standards, the State is notified via email. You may then either deposit the original item or rescan and resubmit another image. We can mail the image quality failure document to the same address where statements are sent or to an alternate address.

The standard delivery method for all adjustment advices is the U.S. Postal Service. Adjustment advices are mailed within one business day of verification to the address provided during the implementation process. A copy of the adjustment advice can be sent to a second address and overnight delivery is also available. The location number can be included on the adjustment advice.

The adjustment will post to the State's account and is reported through electronic information reporting. Your bank statement will reflect a debit adjustment that includes the dollar amount and location number.

e. What is the document destruction policy for scanned checks? Does the OST have to destroy the documents or can the State contract with a third-party vendor to destroy the documents?

[redacted]

f. What is the ledger cutoff time for deposits for items processed by RDC?

[redacted]

g. Can the Firm process the State's current ICL X9.100-187 file?

X9.100-187 is J.P. Morgan's standard ICL file format. This is the only format we accept for ICL transmissions.

5. ATM Deposits

a. Would the Firm be willing to install ATMs in State-owned buildings at no cost to the State or respective agencies?

J.P. Morgan is willing and open to further discussions with the State on ATMs.

b. Can OST make deposits into the Firm's ATMs? Please describe the process and any limitations.

[redacted]

Detailed Reporting

Receive up-to-the-minute detailed transaction reporting through Access Online.

[redacted]

c. What other functionality or services are available to the State through the ATMs? What is the associated cost?

To provide the most controlled service for our clients, the Business Deposit ATM card does not allow any other functionality. However, these same ATMs do have the functionality for consumer customers to make deposits and withdrawals, transfer funds between accounts, and obtain balances.

Note that we have expanded the bill capacity in many of our machines to accept up to 200 bills per deposit.

6. Smart Safes

a. Does the Firm offer smart safes? If not, are you able to partner with an armored car courier to offer the technology? If you partner with multiple armored car companies, which companies do you work with in the State's footprint?

J.P. Morgan does not provide Smart Safe equipment services. These services are provided by one of with our approved armored courier providers, Brinks, Garda and Loomis. Working with the armored courier providers, the State will choose a model of Smart Safe and negotiate leasing terms and contracts. This would include maintenance and warranty terms.

The State should discuss the geographic regions covered with the armored courier providers directly.

b. Describe the smart safe options and technology available, including information about the available safe sizes.

[redacted] The efficiencies gained using Smart Safe with Advanced Credit will allow the State to eliminate time-consuming deposit preparation of cash, freeing staff to spend more time on other tasks.

We recommend that the State meet with our approved armored courier providers to understand the Smart Safe solution that is right for your operations. They will review the equipment options, placement, capacity and related pricing with you to help determine a solution that meets your needs.

c. When depositing funds to a smart safe, are currency deposits credited to the State's bank account on a same day basis?

[redacted]

d. Can the smart safe handle deposits of both coin and currency?

If you use the safe to secure coin or check deposits the State will need to follow standard vault deposit guidelines that include a deposit ticket and use of tamper evident deposit bags.

e. Can the smart safe make change ? If so, can both coin and currency be dispensed?

The Smart Safe is designed to accept deposits and does not allow for withdrawals of cash.

f. What fees or costs would be charged by your Firm when using a smart safe for currency deposits? Can these smart safes be leased from the bank or must they be leased from an armored car provider?

[redacted]

7. Returned Item Processing

a. Can returned items be automatically redeposited?

J.P. Morgan can automatically redeposit return items if they have been returned for a reason that is eligible for redeposit, such as non-sufficient funds (NSF). Return items can be redeposited one time.

b. Does the Firm offer Represented Check Entries (RCK) services?

Re-presented Check Entry (RCK) is a special redeposit process that converts eligible paper check returns into an ACH-formatted debit record to be re-presented via ACH. Compared with paper redeposit, RCK rules allow an extra presentment where the State may choose one paper redeposit followed by a final ACH presentment or two ACH presentments. RCK can accelerate the process, and may reduce the costs, of returned check collection.

J.P. Morgan processes deposited checks through normal channels. Eligible checks returned by the paying bank are converted by the Returns Unit to a NACHA-formatted ACH debit record for representment as an ACH. The State may choose the date of the first ACH debit (e.g., on the next business day), a specific number of days in the future (up to 30 days), a specific day of the month (such as the 1st or 15th) or the end of the month.

The ACH processing unit picks up the ACH file and sends out ACH debits on the State's behalf. If there are any items that are not paid through ACH presentments, ACH debits the State's account and notifies the State of those items.

Here is an overview of the process, indicating industry average percentages; actual clearing percentages may vary.

RCK Process Overview

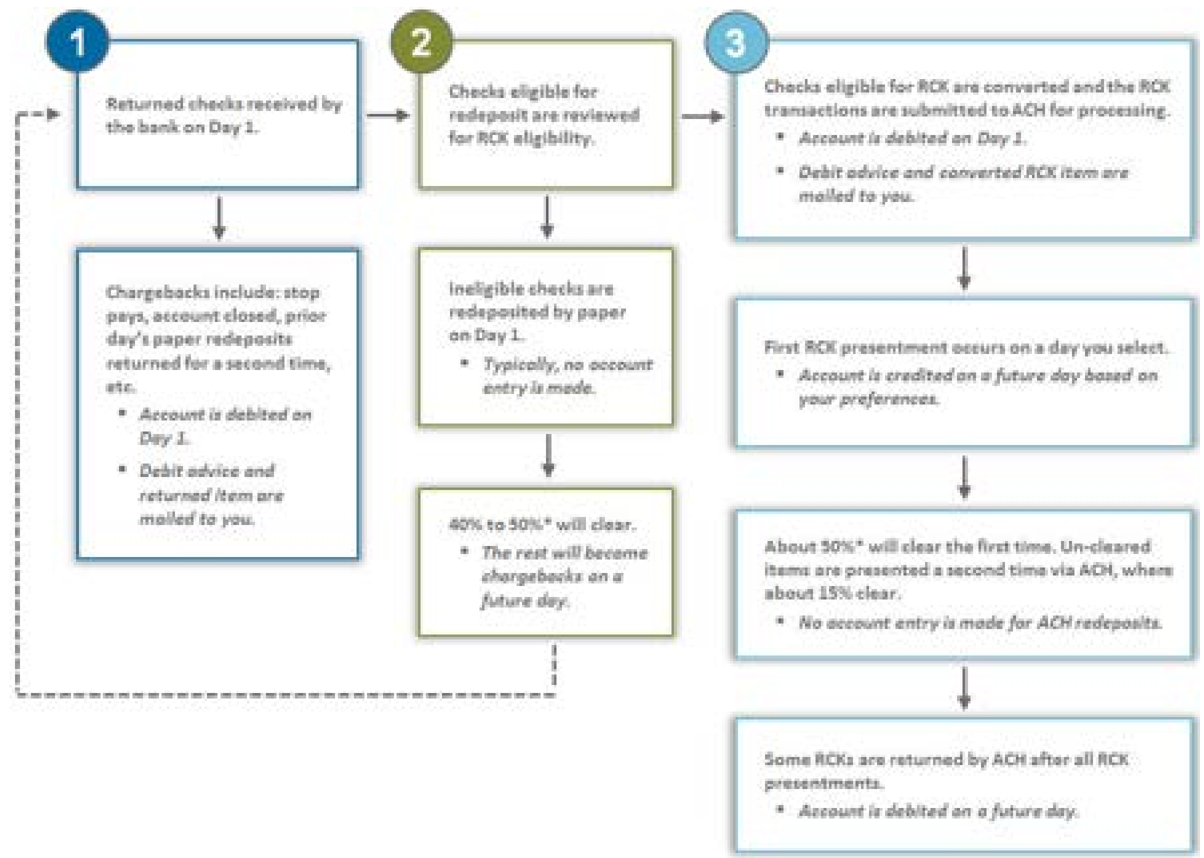

Figure 16

** Percentages are industry averages; actual clearing percentages may differ.*

The State must disclose to check writers that the check may be converted to an electronic debit.

Only checks that meet the following criteria are eligible for RCK:

- Returned for NSF or uncollected funds
- Written for an amount less than $2,500
- Drawn on a consumer bank account
- Not drawn on a Federal Reserve Bank or Federal Home Bank
- Contain a preprinted serial number
- Dated fewer than 180 days prior to ACH debit transaction

c. **Can the Firm provide online access to electronic images (front and back) of returned items to the State? How soon after an item is returned can these images be accessed?**

[redacted]

d. **Can the Firm provide a detailed return item transmission to the State? Can this report identify the payer's name, depositing location, deposit date and type of item being returned?**

[redacted]

[redacted]

8. Availability of Deposits

a. How does the Firm determine and calculate availability of deposited items? Does the Firm calculate availability by item or formula?

The availability schedule determines availability for each item. Availability is based on the deposit method (paper, image or lockbox), the drawee bank routing/transit number, the time the deposit is processed, fractional float assignment and in some instances the dollar amount of the item.

With one of the largest check-clearing networks in the country, the bank offers accelerated funds availability. J.P. Morgan clears more than 99% of all deposited checks as images through approximately 22,000 endpoints.

See the availability schedules in Appendix 11.

b. Does the Firm give immediate availability for on-us items?

Availability for on-us items and on-us controlled disbursement items vary by availability schedule. For specific details, please refer to the availability schedules.

c. Provide a copy of the availability schedules the Firm proposes to use for the State, including branch deposit, vault, and RDC.

[redacted]

9. Check Disbursements / Positive Pay

a. Does the Firm offer payee positive pay?

As part of a complete range of disbursement services, J.P. Morgan offers the State Internet-based positive pay services. Positive pay exception items are presented via Access Online, including images of the item for review. The State then indicates a pay or return decision online.

The State can use J.P. Morgan's stale-date feature to return checks that are presented for payment past a State-determined number of days from the issue date. Your account must be subscribed to positive pay and we must receive the issue record in advance of the check being presented for payment.

For positive pay accounts, these checks appear as exceptions on the daily positive pay exception report, which allows the State to decide whether each item should be paid or returned. The State may also have the Access Online system automatically return all items prior to having them reported for your review.

b. How will OST be notified of exception items? Can an e-mail notification be sent to specific users alerting them that there is an exception item to review?

Using PUSH technology, Access Online provides a daily positive pay email notification to your designated email address that indicates accounts with exception items (or discrepancies) or no items today, providing more complete reporting to the State.

c. At what time will the State receive the information on exception items? How much time will the State have to review discrepancies and notify the Firm to accept or reject?

[redacted]

d. If the State is unable to provide a pay or no pay decision before the deadline, what happens? Does the Firm offer a do not pay default?

[redacted] hile the typical default is setup as return, the State can specify specific default parameters during implementation.

e. What are the options for transmitting check issuance information to the Firm for positive pay services?

The State can manually enter or submit files online via Access Online, or submit files through direct transmission.

f. Does the Firm offer the ability to manually enter one-time check disbursements issued during the day outside of the regular batch file? How quickly will the teller line receive this information?

[redacted]

[redacted]

g. How quickly will transmission files of additional checks and/or recently voided items be available across the Firm's platform (including branch tellers)? Is there a limit to the number of files per day?

[redacted]

h. Does the Firm confirm receipt of transmission files? If so, what options are available for the State to receive confirmation?

For validation, the State may receive an automated acknowledgement of your check issuance file transmission within one hour of file receipt, via the Internet or transmission.

i. **How is payee information captured from the physical checks? What steps does the Firm take to prevent exception items being flagged due to erroneous capture of payee information?**

J.P. Morgan was one of the first banks to offer this technology to detect payee fraud through payee verification. This additional feature of positive pay digitally interrogates up to 100 characters of payee name data after verifying check number and amount against the data on you issue file.

[redacted]

j. **How are stale-dated checks identified? (i.e. are these checks automatically removed from the issue file after a set number of days or does the State need to send a file removing the checks from the issue file?)**

The State can use J.P. Morgan's stale-date feature to return checks that are presented for payment past a State-determined number of days from the issue date. Your account must be subscribed to positive pay and we must receive the issue record in advance of the check being presented for payment.

k. **If a stale-dated check is presented, will it be reported to the State as an (i) exception item because of the date being greater than 180 days, (ii) exception item because of a State initiated a void on file for the issued check, or (iii) automatically returned?**

For positive pay accounts, these checks appear as exceptions on the daily positive pay exception report, which allows the State to decide whether each item should be paid or returned. The State may also have the Access Online system automatically return all items prior to having them reported for your review.

l. **If a disbursement check is deposited by the payee using mobile technology and he/she accidentally attempts to deposit the item a second time, will your Firm's positive pay service identify this item as an exception or will it be automatically returned as a duplicate item? How does this item appear in the State's daily reports?**

[redacted]

m. **Will the Firm cash checks issued by the State presented by a non-account holder at no cost to either the State or the payee?**

[redacted]

[redacted]

10. International Disbursements

a. What recommendation(s) does your Firm have to improve the State's process of issuing checks to individuals now living outside of the U.S.?

This is a challenge for almost all government clients who have international disbursement needs. There are a number of solutions for making international payments. Some of those solutions require the client to maintain in-country international accounts incurring additional costs; or to use more sophisticated banking solutions.

[redacted]

b. Does your Firm offer the ability to initiate International ACH Transactions (IAT)? Describe the differences in the process and procedures for initiating an IAT versus a domestic ACH transaction, if any.

International ACH Transactions (IAT)

Using ACH Direct Send or Access Online, the State can originate USD transactions in NACHA's IAT format. Additionally, the State can originate transactions in local currencies to countries in Asia, Europe and the Western Hemisphere via J.P. Morgan's Global ACH product suite.

c. Are there any restrictions on IATs that the State should be aware of?

International ACH Transactions for USD are supported through J.P. Morgan' to-Host Payment solution only and designed for high volume mixed payment file business needs. When lower volume USD international payment needs exist, we generally recommend utilizing wire payments.

d. Describe the Firm's procedures to comply with the U.S. Treasury Department's Office of Foreign Assets Control (OFAC) regulations.

JPMorgan Chase & Co. is subject to the regulations administered by the U.S. Treasury Department's Office of Foreign Assets Control (OFAC) and has policies and procedures designed to comply with the prohibitions and restrictions mandated by OFAC and all other sanctions laws and regulations applicable in the jurisdictions in which JPMorgan Chase & Co. operates.

JPMorgan Chase & Co. is a publicly traded company that is regulated by various U.S. federal and state banking and securities regulators as well as other regulatory organizations, including self-regulatory organizations and other U.S. and non-U.S. governmental agencies that have supervisory authority over certain legal entities. For more information concerning JPMorgan Chase & Co.'s businesses and the products and services offered, please feel free to visit our website at www.jpmorgan.com.

e. Describe the process of requesting foreign currency denominated paper bank drafts.

Access Online makes it easy to initiate and manage transactions including foreign drafts. With just a few clicks, the State can originate foreign drafts using the same functionality as used for initiating domestic and international wire transfers, ACH and other electronic payments. The platform is fully customizable allowing you to create custom filters and views for ease and accuracy in reviewing, approving and releasing transactions.

Access Online has been designed based on customer feedback, so that all capabilities are in sync with the daily activities of treasury managers. All payment methods (i.e., wire, book transfer, account transfer ACH, and foreign drafts) are accessible from a single-page in a uniform, easy-to-follow work stream.

11. Controlled Disbursement

a. Does the Firm offer controlled disbursement services?

[redacted]

b. At what time will the State be notified of presentment items? Specify 1st and 2nd presentment times.

The first presentment time is 8:30 a.m. ET.

The second presentment time is 10:00 a.m. ET.

c. What is the average percentage of the final presentment available at the 1st presentment time?

The State can expect a reporting average of 99% of dollars at first presentment.

d. Is automatic funding of the controlled disbursement account from a main account possible?

[redacted]

12. Stop Payments

a. What initial term options are available for stop payments?

[redacted]

b. Are stop payment requests effective immediately? If not, how long does it take for a stop payment request to become effective?

[redacted]

c. Will the system automatically verify if a check has been paid before processing the stop payment?

[redacted]

d. Is there a report that lists stop payments that are set to expire?

Access Online provides the following stop payment audit reports:

[redacted]

- [redacted]
- [redacted]

e. **Can stop payments be automatically renewed? If so, for how long?**

[redacted]

f. **If using positive pay, can a cancel be placed on an outstanding check in lieu of a stop payment?**

[redacted]

13. **ACH Processing**

a. **Please provide a comprehensive discussion on the various methods for initiating ACH origination transactions (i.e. direct entry, upload to the online platform, secure file transmission, other etc.) For each method, please discuss:**

Based on the State's operational requirements, J.P. Morgan recommends:

Access Online for lower volume transaction files. Access Online is a fully integrated, browser-based platform that provides easy-to-use applications for all of your information, compliance and portfolio management needs.

The secure file transfer protocol (SFTP) transmission method for large batch origination.

Originating Low Volume Transactions through Access Online

Access Online offers an entirely new way to initiate and manage payments. With just a few clicks, The State can make all key transactions (wire transfers, ACH, liquidity investments and foreign exchange) from a single page. It is fully customizable, meaning the State can create filters or templates with locked fields for added security.

The Access Online platform offers fully integrated functionality. The State will have the ability to use all services without logging out or moving between windows.

Reporting, productivity tools and security administration services are integrated, so you can perform activities across applications using a common workflow that saves time. Access Online is simple and intuitive, making payments easier, with little or no learning curve.

[redacted]

Figure 17

[redacted]

ACH NACHA File Import

The State can elect to use the automated interface to upload a standard NACHA formatted file, after which you can submit them for payment approval and release. NACHA import is available for CCD, CTX, PPD and WEB Standard Entry Class Code transactions. The import functionality also supports the transaction codes for Checking, Savings, General Ledger and Loans. Optionally, a comma-delimited or fixed width file can be uploaded using the template functionality.

[redacted]

Originating Large Volume Transactions through Batch File Transmissions

Using any one of industry standard NACHA file formats (e.g., ARC, CCD or PPD), the State sends the file to J.P. Morgan through a common protocol, such as secure file transfer protocol (SFTP).

The transmission is encrypted and sent to J.P. Morgan for final ACH processing.

[redacted]

J.P. Morgan will maintain an Internet-facing SFTP server and will create a drop box directory on the server for the State. The server will be mirrored for disaster recovery.

The State will be issued a logon and password that gives the State access to the directory.

For inbound data, the State can push files to the directory. The State is responsible for initiating the SFTP session to push and pull data files.

J.P. Morgan offers a file delivery solution that allows the State to send and receive ACH files using SSL session encryption, browser-based file exchange (HTTPS), SFTP with PGP (Pretty Good Privacy) or GNUPG (GNU Privacy Guard) file encryption or AS2 (Applicability Statement 2).

These delivery methods leverage the Internet and readily available software packages to make transferring files simple and secure without the added cost of proprietary software installation.

Additional file transfer solutions, such as VAN (virtual area network) and VPN (virtual private network), are supported.

The bank recommends submitting large batch files containing any consumer credits at least two business days prior to the settlement date. The bank accepts future-dated large batch files containing consumer credits. These should be submitted at least two business days prior to the settlement date. The State can also send same day ACH credits. All ACH credit transactions, except for international transactions

[redacted]

i. **The transmission protocols supported**

[redacted]

ii. **The encryption method that is supported or required**

[redacted]

iii. **If a transmission mailbox is used, what restrictions are in place (can an agency send and receive via the same mailbox, are discrete mailboxes needed to support particular sub-services (e.g. ACH Origination, Returned ACH, and Received ACHs))**

Depending on the connectivity solution chosen by the State, each mailbox within J.P. Morgan'
utilized for specific business processes. One may be designed for dropping off ACH payment files, another may be designed for picking up balance and transaction reporting files, or return-item notifications.

iv. **Can multiple Company IDs use the same mailbox for file transmissions?**

[redacted]

v. **Are control totals required to be submitted for an ACH batch? How are ACH control totals communicated to the bank (i.e. phone, online, email)?**

[redacted]

[redacted]

vi. Does the bank provide automatic file receipt acknowledgements? Is so, how is the acknowledgement transmitted?

[redacted]

vii. What controls (i.e. dual authorization) are available to separate payment initiator and payment approver roles? Are payment initiators and payment approvers required to use a security token to authorize ACH transactions?

Dual authorization is required for payment initiation and payment approval/release. Security tokens are required for all value-bearing transactions.

viii. Are templates used/required for direct entry of transactions?

Access Online provides for a common set of intuitive templates for every payment method. For example, the State can easily create beneficiary templates with lockable and editable fields to set up recurring/repetitive payments. Access Online offers a complete range of funds transfer services supporting U.S. dollar and multicurrency payments, using both predefined (repetitive) templates and free-form formats. Clients with higher volumes can import transactions for easy approval and release, allowing for seamless integration with your existing accounting systems.

For larger volume transactions, we recommend the State use direct transmission. You will create a transaction file in standard NACHA format using industry standard applications. You will then transmit the file to the bank through a common protocol such as FTP. The transmission is encrypted and sent to the bank for final ACH processing.

Lower volume ACH transactions can be performed using Access
,
required ACH payment details in the fields provided. Access Online can also be used for ACH and wire disbursements and concentration.

b. When does the Firm need the file from the State for payments to be made on a same-day, next-day and 2-day settlement? Please complete the following table:

[redacted]

c. Which network does your Firm process ACH transactions through NACHA or the Federal Reserve's Automated Clearing House?

J.P. Morgan processes ACH settlements through the Federal Reserve Bank, which is collectively the largest ACH network operator, as well as the Electronic Payments Network (EPN), which is a private sector ACH Operator that also provides ACH processing and settlement services.

d. How frequently does your Firm send ACH transactions to NACHA or the Federal Reserve's Automated Clearing House? If there is a set-schedule, what times do you transmit?

[redacted]

e. Discuss the Firm's methodology for determining debit and credit exposure limits. Confirm that your Firm is willing to commit to an ACH exposure limit inclusive of all of the State's payment requirements.

ACH service is subject to and contingent upon credit approval according to the bank's current credit policies for credit and debit applications. J.P. Morgan will discuss this with the State during the implementation process to determine what dollar values to expect.

The bank sets credit and debit limits to help facilitate seamless transaction processing, including a cushion over a client's normal file size, and then monitors the client's ACH activity trends to determine if limits are appropriate. Although clients typically are not informed of their limit, it is designed to facilitate uninterrupted service.

f. What would happen to a file if OST exceeded its daily exposure limit?

J.P. Morgan coordinates exposure risk with a client's payment patterns. Exposure is calculated as the net settlement over a cumulative two to three business day period. When a limit is approached or exceeded, a J.P. Morgan credit officer will make a determination to either process the file or notify the State. Please consult with your relationship team to discuss this question in greater detail.

g. Does the Firm accept both debits and credits on the same file? If so, discuss any additional requirements.

[redacted]

h. Can transactions be added online for future processing dates? What is the Firm's maximum retention for future dated transactions?

ACH items, including ACH transactions (IAT) can be future dated.

[redacted]

i. Does your Firm offer Same Day ACH transaction capability? If so, describe the process for initiating transactions and any limitations on the use of Same Day ACHs.

J.P. Morgan ACH originators will automatically be enabled to initiate same-day transactions by using the Effective Entry Date within the batch header record on the ACH File; an opt-out process is available for clients who do not want same-day processing. ACH clients wishing to initiate same-day ACH debit entries must contact their relationship team to enable same-day debit processing.

[redacted]

j. How are returned and rejected ACH transactions handled? What information does the Firm provide to assist in identifying returned and rejected ACH transactions? When is this information available?

Returned funds post at the end of the banking business day. Prior to posting, information concerning these items is available on J.P. Morgan's current-day report. To confirm that a return belongs to the State, J.P. Morgan will perform edits on account number, date, individual ID and trace number.

ADVANTAGE J.P. MORGAN

To minimize the problems exception items can cause, J.P. Morgan carefully designed its return item process to minimize exception items.

Return Item Processing

[redacted]

k. If an individual ACH transaction within a file is rejected, will the entire file be rejected and not processed? How will the individual rejected ACH transactions be communicated?

Access Online

For transactions initiated via the Payments function, the State will have the option to configure the system to reject the entire file if there are errors during the file import stage or allow partial import of only the valid transactions. If there are any errors during the import stage, the entire file or the individual transaction will be rejected with the relevant error message(s).

At this stage, based on your selected configuration, you have the ability to continue with the file import (recognizing only the valid transaction(s) that will be imported) or you may choose to cancel the file import process entirely and fix the erroneous records before proceeding with the import. Once the transaction is fully approved and released, each transaction is acknowledged, e.g. accepted or rejected.

l. Is pricing different if ACH transactions initiated from a standard NACHA file is transmitted via your Firm's online reporting system or through a secure FTP process?

[redacted]

m. For outgoing ACH transmissions, what options are available in transmitting addenda information (i.e. CCD, CCD+ and CTX)? Is there any special processing requirements or can this information be added to the NACHA file? Are there any additional costs associated with sending addenda information?

Transactions are executed on pre-existing templates or with those built by the State. Users can initiate debits and credits using several formats types, including:

PPD (Prearranged Payment and Deposits)

PPD+ (Prearranged Payment and Deposits plus Addenda)

CCD (Corporate Credit or Debit)

CCD+ (Corporate Credit or Debit plus Addenda)

WEB (Internet Initiated Entry) via NACHA Import

CTX (Corporate Trade Exchange) via NACHA Import

[redacted]

Figure 18

There are additional fees for sending addenda information. Please refer to Tab E, Attachment 4 for our Schedule of Fees.

n. Can the Firm accommodate the State's current process for the STRIP program, as found in Appendix A?

J.P. Morgan can accommodate the State's process for the STRIP program.

[redacted]

o. Can the Firm meet all of the pension and payroll direct deposit requirements listed in Appendix G

[redacted]

[redacted]

14. Incoming Electronic Transfers

a. Describe any solutions your Firm offers to help identify and differentiate incoming electronic transfers, similar to Universal Payment Identification Codes (UPICs). If your solution does not rely on UPICs, please explain the features and the benefits of your Firm's solution.

[redacted]

[redacted]

[redacted]

Figure 19

[redacted]

i. **If an alternative solution is recommended above, is your Firm still able to offer UPICs as a solution?**

J.P. Morgan does still offer Universal Payment Identification Code (UPIC). UPIC can help protect the State's sensitive banking information by providing a universally recognized account and routing number that is different than their J.P. Morgan account number for the purposes of receiving ACH credit transactions. Features of UPIC include:

- Masking routing and account numbers while securely facilitating electronic payments
- Receive credit payments only, blocking all debit originations
- Used in conjunction with a universal routing number
- Issued and maintained by banks
- Remains with the State regardless of changes in account numbers or banking relationships

b. How can OST gain access to addenda information (i.e. CCD, CCD+ and CTX) for incoming ACH transactions?

[redacted]

i. Can this information be viewed online with current and previous day reporting, or does the State need to download special EDI reports?

Access Online gives the State access to ACH transaction information.

ii. Are reports available in human readable formats?

ACH addenda is shown in its entirety within Access Balance and Transaction online reports and Access Online EDI reports.

iii. How are the charges assessed for receiving addenda information (by number of characters, number of lines, transaction)?

[redacted]

c. How will the Firm assist the OST in ensuring payers send ACH transactions to the new banking information?

J.P. Morgan will be able to assist the State with the outreach to their payers for communicating updated instructions for incoming ACH payments. While we would not contact your payers directly as a part of this process, we will be able to provide guidance on the aspects of this type of change to help minimize any impacts to the overall payment process.

15. Fraud Protection & Controls

a. What controls are in place to protect against lost files, duplicate transmissions and ACH file edits?

J.P. Morgan has automated tools for encryption, authentication and duplicate file checking to help protect against lost files and duplicate transmissions.

J.P. Morgan requires clients to meet NACHA requirements for encryption in transit. A number of encryption methods are available, including three DES hardware devices, PGP (Pretty Good Privacy), HTTPS secure sessions, and SSL and VPN connections.

J.P. Morgan uses authentication software to authenticate items processed by the State. A message authentication code (MAC) is created for the data in the file with the software and a set of secret keys. The State then transmits the file to ACH. At ACH, the same software and keys are used to calculate the MAC. If the MAC codes do not match, the file is rejected and the transmission desk contacts the State. If the MACs match, the file is allowed to continue processing through the ACH data stream.

[redacted]

b. **Describe the Firm's ability to block unauthorized ACH debits received. If the Firm provides ACH debit filtering, what level of filtering can be applied (originator, originator & dollar amount, etc.)?**

J.P. Morgan can block all ACH debits to the State accounts. J.P. Morgan provides both ACH debit blocking and ACH Transaction Review products.

ACH Debit Block

ACH debit block enables the State to specify which companies are authorized to post ACH debits to its accounts, blocking unauthorized use. The system's block all option prevents all ACH debits from posting. The State may also set dollar limit ceilings.

[redacted]

[redacted]

How it works		
Transaction Types	**ACH Debit Block**	**ACH Transaction Review**
	Debit	***Debit and Credit***
Criteria	Block all: • By Company ID • By maximum dollar amount	Review all or subset transactions by filtering: • DR/CR transactions • Company ID • Dollar amount/dollar range • Transaction type
Returns	Returned automatically	Client return decision required
Timing	Presentment day	Day after presentment
[redacted]		

Debits not Affected by ACH Debit Block/Transaction Review

In accordance with customary practices, as well as applicable law and rules, the following types of ACH-related debits will not be blocked:

- ACH debits to the State's account to offset ACH credit entries originated by the State through J.P. Morgan
- Reversals of previously received ACH credits
- Reclamation entries, as defined in the NACHA operating rules
- Debits to the State's account initiated by J.P. Morgan to correct processing errors, effect back-valuations or make other adjustments
- Returns or reversals of ACH debits originated by the State
- Fees or charges owed for services provide by J.P. Morgan

c. With ACH debit blocking, does the Firm notify the State of attempts to debit funds that have been automatically rejected?

[redacted]

Figure 20

[redacted]

[redacted]

d. **Does the Firm offer ACH positive pay (ability to make pay / no pay decisions on unidentified transactions)?**

ACH Transaction Review

The State can use this fraud mitigation service to review and confirm ACH debit and credit transactions that post to your account on a case-by-case basis. The State's users simply determine if the transaction in question is authorized and return any unauthorized transactions. Clients have until 4:00 p.m. ET, determined by account location, to submit decisions. If a Pay or Return decision is not submitted by the client, the default Pay or Return decision, as established in the related profile, will be applied.

Users can filter transactions to review by any combination of:

- Debits and credits
- Company IDs
- Dollar amount/range
- Transaction types

A self-serve option allows the State to choose either a pay or return decision default on your ACH Filter Profiles. This applies to both credit and debit profiles.

e. **Can accounts be designated post no checks to prevent any check from clearing?**

Post No Checks

If the State has a business account dedicated to electronic payments (ACH or wires) or depository (lockbox), you will benefit from our new Post No Checks service. Post No Checks prevents check debits from posting against a designated account automatically with no monitoring required.

i. **If your Firm does not offer this service, who is liable if a fraudulent check is presented and the account is not set up with positive pay?**

Not Applicable

16. **Wire Processing**

a. **Discuss the process the State must use to set up repetitive wire transfers with the Firm, including communication methods (e.g., written request, fax, PC, Internet).**

J.P. Morgan provides the following options for establishing repetitive transfers:

Internet: The State can input repetitive wire transfer instructions (or standard templates) via Access Online. You also have the option to send your newly created templates to J.P. Morgan for verification prior to their activation (enhanced templates).

Electronic transmission: Host-to-Host Payments clients can establish repetitive lines that will be stored on J.P. Morgan's mainframe.

Mail: Written requests for repetitive line setup are handled on an exception basis.

Other: Clients who initiate wires via telephone can establish repetitive lines that will be stored on J.P. Morgan's mainframe.

b. Please fill in the following table with the cutoff time for an Outgoing Domestic Fedwire by origination method.

	Online	Phone
[redacted]		

c. If wire transfers can be initiated online, describe the system's security features. Can varying degrees of authorization be set (i.e. multiple authorizers, maximum dollar amounts, etc.)?

[redacted]

[redacted]

Figure 21

The elements of an approval rule are:

- Payment Type
- Payment Creation Method
- Accounts/Account Groups
- Templates
- Transaction Amount Limit
- Approval Type (Sequential or Non-Sequential)
- Number, Type and Priority of Approvers
- Approval Rule Elements for Trusted Beneficiary

Categories enable you to classify users, tying approvals to a group or job function rather than a particular individual.

[redacted]

Multilayer Security System

Access Online uses a multilayer security system designed to protect the privacy and authenticity of users' data and transactions.

Authentication is required for users accessing functions involving value-bearing transactions or security activities, for example wires and ACH. We use a two-factor authentication process: Industry standard 128-bit SSL (Secure Socket Layer) and TLS (Transport Layer Security) helps protect the confidentiality of data and transactions.

d. During what hours is the Firm's wire transfer system available? When is the customer service staff supporting the wire transfer system available?

Payment/receipt processing operates from 9:00 p.m. ET each Sunday through 7:00 p.m. ET each Friday, excluding U.S. Federal holidays.

e. Once the Firm is in receipt of instructions, how long does it take the Firm to send the wire?

[redacted]

17. Digital Payments

[redacted]

[redacted]

Figure 22

[redacted]

[redacted]

Figure 23

[redacted]

[redacted]

Figure 24

[redacted]

[redacted]

[redacted]

18. System Administration

a. Please describe your Firm’s system administration capabilities. Can a multilevel hierarchy be established (i.e. Treasury (parent), agency (child), user (grandchild))?

Access Online uses a multi-layer security system designed to protect the privacy and authenticity of users’ data and transactions.

The State’s security environment is maintained by your assigned security administrators (SAs), who create and authorize users for Access Online services. Using online administration tools, SAs can lock down security with precise user entitlements, limits and account settings and generate entitlement reports to meet auditing requirements.

All active security administrators may oversee and entitle user privileges across all of ’ J.P. Morgan Access Online users, created under your J.P. Morgan Access profile. [redacted]

b. Can additional hierarchy levels be added?

[redacted]

c. **Describe the process of granting entitlements and access to individual users. Can agency heads (child) be delegated the responsibility for maintaining end-user (grandchild) entitlements?**

[redacted]

As a standard practice and to help the State maintain audit controls, a minimum of two security administrators are required for user setup and maintenance.

One security administrator establishes users for accounts, services (e.g., ACH initiation, funds transfer initiation or balance reporting) and functions (e.g., reporting, transaction initiation and transaction approval or release).

A second security administrator approves the user entitlements granted by the first security administrator.

For each user created by a State SA, we establish basic authentication user IDs. Digital signature authentication IDs will be established for users authorized for transaction initiation and administrative functions.

SecurID tokens are assigned by the security administrator to those users who need to perform digital signatures.

User IDs are sent electronically to one security administrator, along with the SecurID tokens. The other security administrator electronically receives the user passwords. The State's security administrators are responsible for distributing the IDs and passwords (and a SecurID token if required) to each user.

Users sign on to Access Online to start the new user identification process with the secured information provided by your security administrator. This sign-on procedure, in combination with the acknowledgement and pre-established user entitlements, creates an electronic user profile that will be employed for all Access Online communications with J.P. Morgan. Each user's Access Online desktop will reflect the accounts, services and functions to which that user has been entitled.

Standard Security Administrator Model

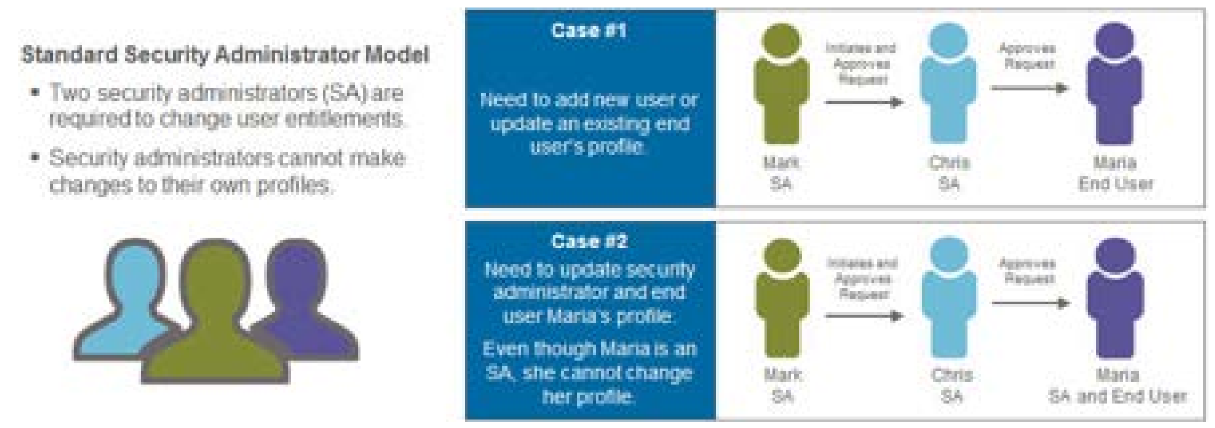

Figure 25

d. Can the State designate administrators?

The State will nominate your own security administrators to establish and approve users for accounts, services and functions using an online entitlement feature.

e. What levels of authorization (i.e. accounts view, transaction capabilities, etc.) can be permitted or turned off for individual users?

Using online administration tools, SAs can lock down security with precise user entitlements, limits and account settings and generate entitlement reports to meet auditing requirements.

Access Online allows complete flexibility for the State] to designate the rights of each user on the platform, and provides comprehensive and configurable user entitlements, limits and approval workflow to provide optimal control. Available services accommodate a wide range of security options, including dual control among users, daily or transaction limits and transaction approval rules.

Each user can be restricted by dollar amount and function, such as creating, approving and releasing transactions or no transaction entitlements at all. Privileges are entitled for specific bank accounts, as well as dollar amounts at either single transaction level, daily aggregate level or both.

By separating duties, accounts and approval workflows, the State can help reduce the risk of fraud or compromised data. The State's security administrators are the only individuals able to assign users with transaction initiation privileges.

f. When setting up a new user, can a current user's profile be copied from one user to another?

There are four setup methods:

Express Setup: This is the simplest and fastest way to set up entitlements, using pre-defined roles to assign product and functions entitlements.

Clone: This setup method enables the State to quickly and easily assign products, functions, accounts and group membership to a new user by cloning (replicating) the entitlements granted in Administration from and existing user.

Profile Only Setup: This setup method enables the State to establish user profile information without assigning entitlements.

Custom Setup: This method allows the greatest amount of customization, enabling the State to choose specific entitlements to products, functions, accounts and group membership.

19. Online Reporting System

a. Are there limits on the number of OST users that can have access to the Firm's online website?

[redacted]

b. **How soon after the cut-off date are the following items ready?**

	Online	By Mail
Bank Statements	Bank statements are available online within two to three business days from the statement cutoff date.	While electronic delivery is standard, bank statements can be mailed 3 business days after the statement cutoff date.
CD-ROMs	**n/a**	CDs are shipped two to three business days after weekly cutoff date, or with monthly reconcilement package.
Partial Reconciliation Information	Reconciliation packages are available online within five business days from the close of a cutoff cycle.	While electronic delivery is standard, reconciliation packages can be mailed 5 business days after the statement cutoff date.
Full Reconciliation Information	Reconciliation packages are available online within five business days from the completion of cutoff cycle and receipt of all incoming issuance/void files for the period.	While electronic delivery is standard, reconciliation packages can be mailed 5 business days after the statement cutoff date.
Account Analysis Statement	Account analysis statements are available online within six business days from the close of the billing period.	While electronic delivery is standard, account analysis statements can be mailed within 6 business days after the close of the billing period.

c. **Describe any recent or upcoming major upgrades to your Firm's online reporting system.**

[redacted]

d. Are there fees associated with user accounts for the Firm's online website?

[redacted]

e. What time is previous day information available?

Prior day reporting will be made available by 7:00 a.m. ET.

f. Can electronic reports be customized by users within the Firm's online platform? Can these customized reports be saved? Can the templates be shared with other users?

The State can create and save customized reports through a set of filter criteria, e.g., date range, accounts, reference numbers, check numbers, transaction types, etc. Users can:

- Run, view and modify all customized reports quickly and easily
- View reports online or export them to Adobe PDF or Microsoft Excel formats. The State can export to Excel from any File List View.
- Most reports can be exported into CSV, BAI2, OFX, ISO camt.052, camt.053, camt.054 or SWIFT MT942/MT940 files.
- Schedule online reports for automatic generation (PDF, XLS).

[redacted]

Output will be delivered to your Report Inbox and available for 24 hours.

g. Complete the following table indicating how long each item is available online? Differentiate between the standard term and the terms available for an additional fee. Please note, this question is asking for how long the items are available, not when they are available.

	Standard Term	Optional Terms Available

[redacted]

	Standard Term	Optional Terms Available
[redacted]		

h. **In what file formats can transaction data be downloaded? Can activity be downloaded into Excel?**

The State can export data from Access Online to Microsoft Excel and other software packages. The State can export to Excel from any File List View.

Access Online can also export information throughout the day to update the State's accounting, ERP and/or treasury workstation systems. For interface to treasury workstation environments, the service provides balance and transaction information in the following formats:

- Microsoft Excel
- BAI2
- Comma-separated Values (CSV)
- SWIFT MT942/MT940
- ISO camt.052/053, camt.054
- Open Financial Exchange (OFX)
- Formatted reports

[redacted]

i. **What protocols are available for transmission of prior data with the State's servers retrieving the file from the bank servers? Are these files transmitted by FTP? How early can these files be retrieved?**

The firm provides transmission solutions that are designed to secure and protect data. File transfer options offer advanced security features to prevent unauthorized access and safeguard data against theft or manipulation. Documented standards require staff to select the appropriate file transfer protocol, encryption, authentication and non-repudiation method that is required per firm and specific line of business requirements.

[redacted]

j. **What technology options would your Firm recommend OST use for archiving historical check images (i.e. CD-ROM, online retention, data transmission)?**

J.P. Morgan recommends our flexible and convenient on-line long-term checks paid image archive solution, though Access Online Checks. The standard archive retention period is seven years online for paid check images (front and back). This retention period is at an account level.

[redacted]

k. For historical images of disbursement checks that are accessible online, does your Firm charge per image stored or per image accessed?

We have billing options to charge either per image stored or per image accessed, but given the low cost for per image stored and the ability to have unlimited access to stored images for the retention period, clients typically find better value with billing per image stored.

l. Can historical images of checks be sent by transmission to the State for archival purposes (i.e. a full fiscal year)? If so, describe.

[redacted]

m. If available, provide access to an interactive demonstration of the Firm's online reporting capabilities.

[redacted]

J.P. Morgan welcomes the opportunity to provide demonstrations of our online products and services.

n. Describe any mobile applications that your Firm offers for smartphones or tablets. What banking services can be completed using these applications? Complete the following table indicating which banking functions can be completed through the mobile applications.

More Than a Trend

Revolutions in technology areas such as social networking and smartphones create more urgency for the State to upgrade the way you collect from consumers. An AFP Electronic Payments Survey found that in 2016, 12% of organizations reported using mobile tools to initiate payments, while another 26% said they plan to do so in the next three years. Similarly, 10% said they currently accept mobile payments from consumers, while 28% indicated they plan to start in the next three years.

Our responses to the questioned banking functions that can be completed through our mobile applications are listed below.

[redacted]

o. What dual authentication protocols are available and does your Firm use (i.e. tokens, etc.)?

Authentication is required for users accessing functions involving value-bearing transactions or security activities, for example wires and ACH. The firm uses a two-factor authentication process: Digital signature authentication is achieved through the firm's patent-pending solution, leveraging SecurID token technology to provide signatures.

Helping the State prevent wire transfer fraud on your accounts is a high priority for J.P. Morgan. In addition to Access Online's security features, the Administration functions and implementation options offer the State the ability to choose settings and features that help prevent fraud.

Access Online uses multi-layered security designed to protect the State's data and transactions.

Access Online automatically prevent a single user from performing all actions (create, approve and release) on a single payment, even if the user is entitled to create, approve and release.

For those functions that demand an extra level of security, Access Online provides two-factor authentication via SecurID token technology.

PSTP or Portable Security Transaction Protocol, a patent pending technology developed by J.P. Morgan, uses SecurID devices to digitally sign transactions and provide a level of security formerly available only using digital certificates.

p. Does the Firm's online reporting system offer the ability to set and send e-mail alerts?

Access Online supports alerts via email or through the Access Online inbox to notify users that payments were entered for approval or have been approved. Access Online offers a wide variety of customizable business critical alert notifications to save the State time and make sure you never miss anything.

[redacted] You can elect to receive Access Online alert notifications via email and/or online via the Alerts Inbox. You can define, manage and view messages from anywhere in the Access Online platform. For example:

[redacted]

The State will receive alerts via email from Access Online Alerts

Note: J.P. Morgan will never send emails that require you to send account or personal information to us via public email or pop-up windows.

q. Can electronic reports be scheduled to be generated automatically and e-mailed to designated users?

The State can create and save customized reports through a set of filter criteria, e.g., date range, accounts, reference numbers, check numbers, transaction types, etc. Users can:

- Run, view and modify all customized reports quickly and easily
- View reports online or export them to Adobe PDF or Microsoft Excel formats. The State can export to Excel from any File List View.
- Most reports can be exported into CSV, BAI2, OFX, ISO camt.052, camt.053, camt.054 or SWIFT MT942/MT940 files.
- Schedule online reports for automatic generation (PDF, XLS).

[redacted]

r. Does your Firm offer any solutions where reports are directly downloaded and accessed from specific workstations?

J.P. Morgan Access entitlements and output reporting are determined at the user ID level only. Account balance and activity data from our web-based reporting cannot be assigned to specific workstation locations or email destinations. Should that become a business need, we can discuss our Host-to-Host reporting with the State.

20. Reconciliation Services

a. Does the Firm offer full Account Reconciliation Program (ARP) services?

Yes, J.P. Morgan offers a complete range of account reconciliation (ARP) services. The full reconciliation service is described in further detail below.

Full Reconciliation

J.P. Morgan offers the State a complete reconciliation of outstanding and paid checks, with the option of reconciling accounts by the week, month, fiscal or calendar year in a format tailored to meet your needs. You provide us with detailed check issue data, including account numbers, check numbers, issue dates, dollar amounts and reference information (up to 15 bytes). The State chooses how you wish to supply this data: In a file transmission or by upload or manual key entry to Access Online, as warranted by the check activity in each account.

With check issued data, J.P. Morgan will perform a full reconciliation of activity in the account, delivering a reconciliation report package online via Access Online. The standard full reconciliation package contains an account statement, balance sheet, paid and outstanding check listing, plus a summary including check number, issue date, amount paid and paid date.

b. What report options are available for full reconciliations? Do these reports include information on check, ACH, and wire transactions? Provide sample reports.

Available partial and full reconciliation reports are listed below.[redacted]

Reconciliation Reports Package		
Report Name	**Full**	**Report Description**
Bank Statement	Yes	Provides a summary of credit, debit and paid check activity for the statement period as well as balances at the start and end of the period. The statement then provides a detailed chronological listing of credit and debit transactions. For each transaction, the entry provides the ledger and value dates, the dollar value of the transaction and detailed transaction description. The report also provides closing ledger balances.
Consolidated Diagnostic Summary Report	Yes	Provides an itemized listing of issued and paid check exception items during the reconciliation period.
Consolidated Reconciliation Report	Yes	Lists both unpaid and paid checks for the reconciliation period. Full and range reconciliation clients may receive this report in addition to or in lieu of the Paid and Unpaid Reports. This report reflects the status of checks written, whether paid, outstanding or assigned a special status, such as cancel or stop payment. The standard report is printed in serial number sequence. Serial numbers are sequenced vertically.
Coversheet	Yes	Summary page.
Current Stop Reconciliation Report	Yes	Lists stops on file for an account as of the reconciliation period date.
DDA Paid File	Yes	Provides an itemized listing of all paid checks during the period.
Daily Paid File	Yes	Provides an itemized listing of paid checks during the previous business day.

Reconciliation Reports Package		
Report Name	**Full**	**Report Description**
Miscellaneous Credit Reconciliation Report	Yes	Lists credit transactions posted during the reconciliation period. Miscellaneous credits include deposits, electronic credits and credit adjustments processed by the bank. Descriptive information relative to the item is provided where applicable.
Miscellaneous Debit Reconciliation Report	Yes	Lists debit transactions, other than checks, posted during the reconciliation period.
Outstanding Settlement Report	Yes	Provides the balances pertaining to the issue information submitted during the reconcilement period.
Paid No Issue Report	Yes	Lists separately the current- and prior-period paid items with no corresponding issue information on file. Items will remain on the report until issue information is submitted. The bank can generate a Paid-No-Issue Report upon request.
Paid Only Diagnostic Summary Report	Yes	Provides an itemized listing of issued and paid checks during the reconciliation period.
Paid Only Reconciliation Report	Yes	Lists checks paid during the reconciliation period. The standard Paid Only Report is printed in serial number sequence. Serial numbers are sequenced vertically. A grand total of paid items is printed at the end of the report.
Recap of Posted Items	Yes	Provides a daily recap of all items posted during the reconciliation period. It also summarizes, per day, the number and amount of issues, stops placed, stops removed and canceled items. The report is printed in sequence vertically by day.
Reconciliation Data File	Yes	Text file containing issues, stops placed, stops removed, canceled items and outstanding checks.
Stop Reconciliation Report	Yes	Lists stops on file for an account as of the reconciliation period date.
Unmatched Report	Yes	Lists unmatched paid and issued items (outstanding checks and paid-no-issues) as of the reconciliation period date in amount sequence.
Unpaid Only Diagnostic Summary Report	Yes	Summary of outstanding check and exception items.
Unpaid Only Reconciliation Report	Yes	Lists outstanding checks and exception items, including stops and cancels, as of the end of the reconciliation period. The total of outstanding items is printed at the end of the report.

c. Describe how reconciliation data would be transmitted to the State? What data elements are available?

J.P. Morgan offers flexible account activity and transaction reconcilement reporting options for all transactions types, not just for checks. They may be delivered in a variety of schedules and industry standard file formats, such as fixed-width, CSV, Excel, BAI2, SWIFT MT 940, ISO2002. They may be delivered via the Access Online

platform of Host-to- ,
preferred ERP interfaces, we will advise on the best approach.

Data elements on the reconciliation file include: record status type, account number, check number, amount, issue date, paid date, additional data field [optional and can contain client-provided data], and payee name.

21. Account Analysis Statements

a. Provide a sample analysis statement. How soon after month-end is the analysis statement available?

The State can retrieve electronic account analysis statements via Access Online [redacted]. All sections of your account analysis statement may be viewed, printed and exported through Access Online. Analysis statements are available in PDF, Excel and CSV formats. In addition, statements can be downloaded in a BAI file via Access Reports or via Host-to-Host Direct Transmission.

[redacted]

Figure 26

[redacted]

Figure 28

b. Can Association for Financial Professionals (AFP) Service Codes be included on the analysis statement? If not, does your Firm offer another report that provides this information?

J.P. Morgan provides AFP service codes* on U.S. account analysis statements.

**A portion of this material related to the AFP Service Codes is copyrighted by the Association for Financial Professionals and has been reprinted with permission.*

c. Are account analysis statements available online? How many prior months are available? Can the account analysis details be downloaded into Microsoft Excel?

The State can retrieve electronic account analysis statements via Access Online.

d. Is the Firm able to send analysis statements in an 822 file?

J.P. Morgan supports EDI 822 version 4010. Delivery is available via:

Direct transmission: Once a secure FTP connection has been established, the monthly file is available by the sixth business day after the close of the billing period for download.

Secure email distribution: An embedded link in a secure email links to the file for download.

22. File Transfers

a. Can the Firm provide all of the file transfers required in Appendix F? If not, please explain any potential issues with meeting these requirements.

J.P. Morgan supports several standard lockbox data transmission formats and can also develop customized formats as required for your accounts receivable system.

J.P. Morgan'

The ANSI X.12 823 and 820 formats

All standard variations of the 80-character-per-record lockbox BAI2 format accepted by major accounts receivable software vendors such as Oracle, SAP (their lockbox BAI1 and BAI2 formats) and PeopleSoft (their 102-character variation)

Sample standard BAI2 formats are provided in the Lockbox BAI2 Data Transmission Guidelines and Formats Description document in Appendix 13. Proprietary formats can be accommodated as well. A one-time programming charge may be assessed when significant format customization is required.

b. What type of confirmation(s) can the State receive that the direct deposit files were received and processed? Are email or mobile alerts available?

An email alert can be established to notify the sender that a transaction has been rejected. This email alert should be used in conjunction with the automated acknowledgement method mentioned below in part c. to ensure there is an adequate notification process in place.

c. How will the State be notified if a file fails to process correctly? What are the notification options? Describe the process of resolution if this happens to a payroll file.

J.P. Morgan will respond to each input file with a level one confirmation. A level one response will include file level validation and control information. It will also include

J.P. Morgan’s front-end transaction validation. Each accepted transaction will be displayed with a confirmation record. Each rejected transaction will be displayed with a confirmation and reject record. A file trailer will also be sent. Additional levels of acknowledgements will be provided where applicable (FX transactions, ASC X12 processing etc.).

If the payment file contains a transaction that fails our transaction-level validation, only transactions that failed validation will be rejected. The rest of the payment file will be processed.

An email alert can also be established to notify the sender that a transaction has been rejected. This email alert should be used in conjunction with the automated acknowledgement method mentioned above to ensure there is an adequate notification process in place.

d. If a direct deposit file is rejected, who can the State contact for resolution?

[redacted]

e. Are there alternative file formats available that would provide more functionality than what the State is using now?

J.P. Morgan offers flexible account activity and transaction reconcilement reporting options for all transactions types, not just for checks. They may be delivered in a variety of schedules and industry standard file formats, such as fixed-width, CSV, Excel, BAI2, SWIFT MT 940, ISO2002. They may be delivered via the on-line J.P. Morgan Access platform or Host-to-Host delivery. Once we understand the ’ ll advise on the best approach.

23. Earnings Credit Rates (ECR)

a. Does the State have the choice of paying the Firm by either hard dollars or soft dollars ? Is the pricing the same for either option? If not, what is the difference?

Yes, J.P. Morgan offers a demand deposit account (DDA) with the option of either paying a hard dollar interest or an earnings credit allowance (soft dollar). Pricing information is available in Tab E: Schedule of Fees.

J.P. Morgan offers an earnings credit a soft dollar value calculation on cash balances in non-interest bearing accounts. This earnings credit can be used to offset certain banking service fees and may enable the State to realize greater value for your cash compared to other alternatives. The account analysis statement automatically applies the earnings credit to offset service fees for an analysis period.

To the extent that earnings credits are not sufficient to offset all service charges, the State will pay hard dollars for the balance. J.P. Morgan will invoice you for this payment. Balances required to offset service charges will vary based on fluctuations in the earnings credit rate and account activity. The earnings credit allowance is automatically credited to your monthly billing statement.

b. How does the Firm determine, adjust, and apply the ECR?

[redacted]

The earnings credit allowance is calculated based on the average daily positive collected balances in the non-interest bearing accounts less the reserve requirement (currently 0%) using the following calculation:

Monthly Earnings Credit Allowance Calculation
(Average Monthly Investable Balance x ECR x Actual Number Of Days in Month) Actual Number of Days in Year

c. Is the Firm willing to link the ECR to a market index? If so, which index is suggested?

[redacted]

d. Does a reserve requirement apply on balances?

In calculating the ECR, J.P. Morgan currently does not deduct the reserve requirement from the available balance.

Since October 1, 2008, the Federal Reserve has paid interest on reserves held at the Federal Reserve by member banks. J.P. Morgan passes this benefit to you by basing the earnings credit on 100% of the eligible balance of non-interest bearing demand deposit accounts.

e. Will the Firm assess any balance-based charges to the State? If so,

i. Provide a list of each charge.

ii. What is the charge for an entire year on a $1,000,000 balance?

iii. How is each charge computed?

iv. Are these charges assessed on ledger or collected balances?

[redacted]

The following formula is used to calculate the BBC:

Balance Based Charge Calculation (monthly)
Average Positive Ledger Balance x Charge Rate x Number of Calendar Days in the Month / Actual Number of Days in the Year

[redacted]

As with other eligible fees, the monthly Balance Based Charge may be offset by earnings credit provided by J.P. Morgan.

f. If the Firm's assessment / surcharge by the FDIC is lowered during the term of the contract with the State, will the proposed balance based charge be lowered as well?

[redacted]

g. Provide the earnings credit rate history for the 5-year period from April 2013 through March 2018. Please indicate the earnings credit rate for each month.

[redacted]

h. What is the Firm's current ECR? What is the ECR you are offering to the State?

[redacted]

i. If the proposed earnings credit rate is higher than bank's standard ECR, does your Firm plan to maintain this spread for the OST over the life of the contract?

J.P. Morgan does not maintain a spread, but we would continue to offer a competitive ECR, above standard, to the State over the term of the contract.

j. Does the Firm have any limits on the amount of deposits that the State could maintain with the Firm?

The bank does not have any limits on the amount of deposits that the State could maintain. We look forward to the opportunity to discuss how our liquidity and investment options could benefit the State to maximize your returns and value realized by the State.

k. Can excess earnings credits be carried forward to cover charges in the following month? Is there a limit on how far forward excess earnings credits can be carried?

Earnings credit is calculated and applied on a monthly basis. Excess credit amounts are not carried forward to the next month. Excess earnings credit would fall off at the end of the invoice settlement period.

24. Overnight Investment Option or Interest Bearing Bank Deposit *(If your Firm is proposing more than one sweep vehicle, please make sure each of the following questions is answered for each option.)*

a. What short-term investment vehicle(s) or interest bearing account(s) does the Firm propose to use for the overnight sweep of the State's main demand deposit accounts?

J.P. Morgan offers a variety of deposit and investment alternatives for your operating and reserve balances including:

- Commercial Checking with Interest
- [redacted]
- Money Market Funds (through a sweep or direct investment)

Commercial Checking with Interest

J.P. Morgan'
suite of products which provides the option of either paying an earned credit rate

The DDA with ECR and the DDA with interest are both fully liquid with no restrictions on withdrawals. J.P. Morgan also offers a Hybrid DDA which offers both a soft dollar interest to be applied against bank fees up to a pre-determined level of balances and hard dollar interest on any balance over that level. Please refer to the Hybrid DDA section for more information.

[redacted]

Figure 29

[redacted]

Money Market Funds

J.P. Morgan Asset Management offers a variety of money market funds (MMF), ranging from diversified credit instruments to government obligations. The average maturities of these MMF investments are short term, generally 45 to 90 days, and the yields are market driven. Select third party (non-J.P. Morgan) MMFs are available.

J.P. Morgan offers the State the convenience of an automated investment sweep and direct investment through J.P. Morgan Access Liquidity Solutions. For direct and automated intraday investments (purchases and redemptions) the funds are subject to specific market cutoff times during the day. [redacted]

MMF yield and share classes are dependent on the investment amount and investment channel. Please see table below for share class minimum balances:

[redacted]

b. Does a reserve requirement apply to the proposed option?

No.

c. Does an FDIC assessment, deposit based fee, or similar fee apply to the proposed option?

[redacted]

i. If so, what is the current charge for an entire year on a $1,000,000 balance? How is this charge computed?

Not applicable.

ii. Is this charge assessed on ledger or collected balances?

Not applicable.

d. **Provide investment return history for the 5-year period from April 2013 through March 2018 for each option proposed. Show the yield for each month.**

[redacted]

[redacted]

e. **With substantial changes in the interest rate and regulatory environments over the last 10 years, what types of changes or recommendations has your Firm made to clients regarding bank deposit balances (i.e. use of compensating balances, sweeps into repurchase agreements, sweep into money market mutual funds, interest bearing checking accounts, other)?**

[redacted]

f. **If a sweep is proposed, what time of day is the sweep deadline? Is it end-of-day or next-day sweep?**

If we determine a sweep is the best option for the State, we would propose an end-of-day sweep to avoid the risk of late day transactions or adjustments that could result in overdrafts.

g. **What fee (if any) is charged to sweep funds into the proposed investment vehicle(s)? Is the charged assessed per account or by the relationship?**

[redacted]

h. **If the Firm is proposing a money market mutual fund, provide a copy of the current prospectus and identify the class of shares by providing the ticker symbol or CUSIP.**

Money market fund (MMF) share classes are dependent on the investment amount and investment channel. [redacted]

[redacted]

i. If the earnings credit rate or overnight investment option is not competitive, the State is considering transferring all funds from the DDA accounts to their custody bank at the end of each day. The State would transfer funds back into the DDA account(s) on a daily basis to meet the disbursements needs each day. Are there any objections or potential issues with this setup?

J.P. Morgan is committed to offering a competitive earnings credit rate and investment rate(s) to the State and we have a number of liquidity products and solutions to help the State optimize your returns. We look forward to discussions with the State on managing your excess cash and options for investing reserve and strategic cash, as well as discussing the benefits to maintaining operating balances with the bank supporting your daily cash management activities.

j. Would the Firm be willing to facilitate these transfers with standing instructions from the OST?

J.P. Morgan recommends that the State use Access Online to initiate wire transactions. Access Online makes it easy to initiate and manage transactions through a customizable platform. Access Online provides for a common set of intuitive templates for every payment method. For example, the State can easily create beneficiary templates with lockable and editable fields to set up recurring/repetitive payments.

k. At what time is the Firm able to provide the State with the total disbursements that will clear that day?

For accounts using our Syracuse controlled disbursement endpoint, the first presentment is made by 8:30 a.m. ET and the second presentment is made by 10:00 a.m. ET. The average reporting time for first notification during the previous quarter was 7:35 a.m. ET. The average reporting time for final notification during the previous quarter was 9:46 a.m. ET.

During the previous quarter, 99.93% of dollars and 99.87% of items were included in the first presentment, with the balance included in the second presentment.

l. Are balances in the sweep product shown and associated with previous day or current day reports?

As we are proposing end of day sweeps, balances shown are associated with previous day reports.

m. If the Firm is proposing a next-day sweep, please explain and diagram the movement of funds in and out of the DDA. If there are more than ample funds in the sweep vehicle, is there any possibility that the DDA account would be overdrawn?

If the State decides to sweep funds to an investment account, J.P. Morgan recommends using an end-of-day sweep.

25. Collateral Requirements

a. Please confirm the Firm's willingness to comply with the Guidelines. If there are any exceptions for the State to consider, identify those, and the impact they can have on the Firm's offering.

J.P. Morgan is willing to comply with the State's Guidelines as indicated in Appendix B: Cash Management Policy Board Guidelines.

J.P. Morgan will collateralize all public deposits as necessary and has no established maximum, to date.

NCMG Process and Procedures

JPMorgan Chase Bank, N.A. (Bank), through its National Collateral Management Group (NCMG), employs a Bank developed Corporate Collateral Management System (Coast), which provides daily monitoring of deposit balances and security value for collateralization purposes.

Coast is reviewed each Federal Reserve banking day by dedicated Collateral Managers for compliance with customer collateral requirements. Collateral requirements are based upon the end-of-day ledger balances (except for Louisiana clients, where collected balances are used) in deposit accounts (demand and time deposits) (plus accrued interest if any), less applicable FDIC coverage, plus applicable margin (gross-up), if any. The end-of-day deposit balances are uploaded into Coast the following Federal Reserve banking day morning from the Bank's deposit system. NCMG monitors the market value of collateral pledged to our customers and compares the market value to the collateral requirements. In the event a market value reduction creates an under-collateralized position, additional collateral will be pledged promptly.

b. Explain how the Firm's approach to collateralization impacts the proposed pricing.

[redacted]

c. What type of collateral does the Firm propose? Explain in detail.

State law will govern acceptable collateral for public fund clients, if applicable. The State may provide further direction as to types of acceptable collateral. The types of collateral pledged are subject to change.

Subject to applicable state law and anticipated deposit levels, the bank may pledge an irrevocable letter of credit issued by a Federal Home Loan Bank and securities in the form of US Treasury (bills, notes, bonds and TIPS) and Agency (Fannie Mae, Freddie Mac) securities as collateral to secure public fund deposits. In circumstances where the amount of deposits exceeds the size of the letter of credit the bank will provide the required collateral using other forms of eligible collateral. Your relationship team or NCMG will be pleased to discuss our approach and provide additional information.

d. Where will the collateral be held? What type of collateral reports will the State receive? Who sends these reports and how frequently?

Custodian for Collateral

The Bank currently employs the Federal Reserve Bank (FRB) as the primary custodian for joint-custody security accounts (collateral account). The Administrative Reserve Bank (ARB) that holds the securities for the Bank is the FRB of New York (determined by Federal Reserve rules). The FRB of Boston is the Federal Reserve System's national collateral account administrator. Pledged securities will be held in a FRB collateral account in the name of the Public Entity (i.e., the State of Delaware).

In order to establish a collateral account, FRB requires a copy of the completed FRB Pledgee Agreement Form (PA) and Fed Mail Form from the Public Entity (the Public Entity must agree to the custodial agreement terms set forth in the FRB's Operating Circular 7, Appendix C, as amended from time to time). The FRB will not review or complete any tri-party custodial agreements that Public Entities or banks present for collateral accounts. (Copies of these FRB forms are available from J.P. Morgan upon request.)

The Public Entity will be assigned a unique, alphanumeric collateral account number by the FRB upon the receipt, review and verification of the completed PA and Fed-mail forms. The Public Entity may retain the original forms for their records.

If a Public Entity has (or had) a FRB collateral account, the Public Entity can provide NCMG the FRB alphanumeric collateral account number, a listing of authorized signer(s) and verification requirements listed on the existing PA or provide a copy of an existing PA, such that NCMG can pledge into their collateral account. If the Public Entity has a PA greater than two (2) years old, it is recommended that the Public Entity submit a new PA.

Until NCMG receives the FRB documents (or information regarding the existing account), NCMG will pledge collateral into a Bank controlled account at the FRB in the name of the Public Entity on Coast.

Reporting

The State will continue to receive collateral reporting as provided by the Federal Reserve Bank.

The FRB provides two (2) types of reporting:

- Joint Custody Daily Activity Statements (AS) reports account activity when conducted within the collateral account
- Monthly Securities Holdings Report (MSHR) reports all securities held in the Public Entity's collateral account at month end.

Both reports are sent within 24 hours either by email or by facsimile. The FRB reports list the original par value of the securities pledged and does not report market value of securities pledged. The FRB does not provide on-line access to collateral account nor hold any irrevocable letter of credit issued by a Federal Home Loan Bank.

The State has requested that the Bank not provide individual collateral reporting, for the State uses the Federal Reserve Bank reporting. The State will continue to receive the average deposit reporting from the Bank.

J.P. Morgan's Firmwide Regulatory Reporting and Analysis group will provide average deposit reporting on a monthly basis.

Should the State desire to change these reporting services, we welcome the opportunity to discuss the available alternatives.

26. End-of-Day Overdrafts

a. Does the Firm return items if an overdraft exists? If yes, how flexible is this policy?

To mitigate the risk of an overdraft, we can explore with the State establishing an overdraft netting arrangement where physical balances remain within their account structures, but we can virtually aggregate balances to mitigate overdrafts.

Any funding resulting in next day funds could lead to an overdraft. If the State should have an overdraft, you will be contacted by the bank to help make sure the account is processed appropriately. We look to resolve overdrafts before 12 noon ET. You can always contact your client service professional, Gus Baltazar, if you have any questions or concerns.

b. What are the fees and interest charges associated with overdrafts? How are these charges calculated?

.P. Morgan charges for the use of end of day (EOD) uncollected funds by applying a daily variable overdraft (OD) rate to individual DDAs for each day an overdraft occurs. Interest and overdraft fees can be offset by an earnings credit allowance and may be assessed on a per-occurrence basis.

The formula for Negative Collected Balance Fee is as follows:

Negative Collected Balance Fee Calculation
(Negative Collected Balance x OD Rate x Number of Days Overdrawn) / 360 days

There is also a per occurrence fee for each individual overdraft when paid or returned.

c. Is there a fee per check or per occurrence when there is an overdraft? If so, what is it?

Yes, there is a fee per check when there is an overdraft. Please refer to the pricing for fees associated with overdrafts.

d. Is there a daily cap on fees? If so, what is it?

No, there is no daily cap on overdraft fees. The negative collected balance amount would be assessed a fee [redacted]. There is no cap on this charge; however, we work closely with clients when overdraft charges would apply.

27. Daylight Overdrafts

a. Describe the Firm's policies concerning daylight balance overdrafts. Indicate whether this is applied to each individual account or across all accounts of a client relationship.

[redacted]

[redacted]

Daylight overdrafts are referenced in the context of either intraday credit line (IDL) or intraday liquidity (Fed daylight overdraft) usage. T[redacted]

b. Is wire transfer processing stopped when the intra-day limit is reached?

Recognizing a client's credit standing, an appropriate intraday credit limit will be made available to make sure your transactions flow smoothly and efficiently through our systems. This limit is electronically verified by our Funds Transfer Balance Control System. Payments within the limit, plus the current cash position in your account, will instantly flow through to the appropriate execution mechanism.

Should a payment take your account balances over the intraday limit, the transfer will be stored electronically and referred to your funds control officer for approval. If covering funds are received while the payment is stored, the transfer will be automatically released without manual intervention.

c. If the Firm incurs a daylight overdraft charge from the Federal Reserve, will it pass this charge on to its customers? If so, how (e.g. intra-day loan, daylight overdraft facility fees)? How is the charge allocated among customers?

[redacted]

C. New Services & Ideas

1. Describe any new services or ideas that will enhance the State's use of banking services.

J.P. Morgan will look to present any new product enhancements or innovative solutions that would benefit the State during our quarterly meetings.

[redacted]

[redacted]

[redacted]

[redacted]

2. Provide any additional information your Firm believes to be pertinent to your ability to provide this service but not specifically requested elsewhere in this RFP.

[redacted]

We will assist the State in implementing the agreed upon recommendations identified during the review that are aligned with the goals and objectives stated in the RFP, highlighted in this proposal, and discussed during the data gathering phase. Our objective is mutual success by providing precise insight into areas where our industry experience can help the State reach its goals.

3. Provide any ideas or suggestions your Firm believes could improve the State's overall banking architecture or services used. Specifically, (a) reducing the number of accounts used by the State and/or State agencies, (b) new services that will benefit the State, (c) services the State could discontinue or replace, and (d) implementing best practices.

J.P. Morgan will work collaboratively with the State leadership team and staff, Agency staff where applicable, along with your consultant to understand the payment and collection needs of each Agency. With an understanding of our bank products and solutions, it is expected there will be opportunities to:

[redacted]

D. Implementation / Conversion

1. Provide a detailed conversion plan for transitioning the State's existing banking services to your Firm. Include the estimated length of time for the transition and the amount of effort required by the State's staff.

We encourage the State to review the sample General Banking Services Implementation Plan [redacted] Note that the time and effort required by certain tasks for the banking services implementation may be reduced or eliminated where we already have completed such tasks to support the lockbox services or other services provided to the State.

2. Based on the State's implementation expectations provided in Section II. Background, how would your Firm work with the 200+ State agencies to transition banking services to your Firm?

We understand the State is interested in supporting an implementation and transition at an Agency level. We can support that choice using a consistent approach which will start by implementing the agreed upon recommendations identified during the Agency review [redacted] These recommendations will be aligned with the goals and objectives stated in the RFP, highlighted in this proposal and discussed during the data gathering phase.

[redacted]

3. Who will be responsible for coordinating the transition? If a conversion team is used, how will the State's account be transitioned to the ongoing client service team?

[redacted]

4. How are implementation managers or implementation teams assigned (i.e. availability, geographically, complexity of the transition)?

The Government Banking implementation team operates out of several locations throughout the U.S. Assignment is generally determined by deal capacity at the time the business is awarded; however, we try to assign someone in close proximity to the client whenever possible. The Senior Implementation Project Manager assigned to this request, regardless of office location, would be able to support a complex onboarding.

5. Indicate the Firm's plans for initial and ongoing education and training of OST and State agency employees in the use of your Firm's systems.

We offer the State a variety of methods for training without any cost to you, such as webinars, phone and short step-by-step prerecorded videos.

The following resources are available:

Online Resources: Available on Access Online's Support via the Education tab. Resources include online help articles, FAQs, guides and a range of live and pre-recorded webinar offerings on how the State can use the Access Online products and services.

Webinar Training: Instructor-led sessions are available on many of our products including Receivables Online and Remote Deposit Capture. For Access Online, we have webinars for each of our products in the Access Online family. Each webinar lasts between 15-90 minutes. Webinar registration is available via Access Online's Support/Education page.

Phone Training: Customized one-on-one training conducted over the phone is offered to meet the State's unique needs for all Access Online products and services.

[redacted]

6. Identify potential issues and risks to the State's implementation of banking services. Identify the appropriate steps to avoid or mitigate these risks.

Communication throughout the team is critical for providing a successful implementation within your time frames. Periodic updates and project meetings are scheduled to measure progress against the plan and to make sure any issues are dealt with swiftly and effectively.

Documenting a stringent timeline from day one will be critical to the success of the implementation. As with any implementation there are potential issues that can arise that can push out and delay an implementation. If deliverable dates are missed, then that can have a negative downstream impact. Any technical issues that arise may require additional rounds of testing which could delay next steps.

In some cases, the availability and knowledge of our client's IT resources can be a potential issue. Resource constraints and/or the client IT capability to support complex file development, integration, connectivity protocols, etc. can cause implementation delays. Having decision makers at the table' during the onboarding process is another key to success.

During the evaluation of proposals, we welcome the opportunity to discuss your capabilities and resources in greater detail so that we can more accurately tailor our approach and recommendations accordingly.

7. Describe the post implementation support that will be provided for the State. Include the philosophy and approach to providing the technical and functional post implementation support requested and identify the resources it would make available to the State to provide this support.

The support provided by the bank does not end once we have implemented your account. We believe continued support is critical to our overall account relationship.

Post-go-live, the Implementations team continues to provide support for approximately 30 days and coordinates the transition to Client Service for day-to-day involvement in issue resolution. Your dedicated client service professional, [redacted] will participate in the , [redacted] and his backup will be prepared to provide ongoing support to address your expectations.

Production support is provided prior to the project's closure, including turnover of documentation and providing proper J.P. Morgan contact information for assistance regarding transmission-related services from our Technical Support teams.

E. Pricing & Fees

1. If the State chooses to use compensating balances, are there any charges that could not be paid in this way?

[redacted]

2. Complete the schedule of fees provided in Attachment 4.

[redacted]

F. Disaster Recovery

1. Are there any disaster recovery plans specific to this component that are not outlined in the Disaster Recovery plan requested in Section V.A. Tab J?

[redacted]

Attachment 1-B: Lockbox Services Questionnaire

A. Key Personnel & Customer Service

1. **Provide biographical information on the individuals who will work with the State on a regular basis. Please include the following information.**
   a. **Proposed role with regard to OST's account;**
   b. **Biographical information;**
   c. **Location;**
   d. **Experience working with other government entities;**
   e. **Number of years of experience in this field;**
   f. **Number of years with Firm; and**
   g. **Number of accounts the person is responsible for.**

[redacted]

2. Provide an organizational chart that includes these individuals.

[redacted]

Figure 30

3. Customer Service

a. For routine day-to-day transactions, will a specific customer service representative or a customer service department be assigned? Provide biographical information for this individual(s) that will be assigned to this account.

[redacted]

b. Describe the responsibilities of the customer service personnel, including the chain of command for problem resolution.

,

day to day aspects of your treasury management relationship such as inquiries, research and maintenance related to accounts and services. They will also have authority to engage all levels of Commercial Banking management and escalate issues as appropriate. Client Service has a detailed matrix of contacts and escalation procedures to expedite resolution for each service provided to you. These procedures also include internal service standards to make sure other J.P. Morgan groups are providing timely responses. Finally, Client Service works closely with your full relationship team to be sure that everyone supporting you is informed of your relationship activity.

c. What are the hours of operation of the customer service unit involved in supporting the State?

[redacted]

d. If a State employee needs assistance after business hours, what support is available?

[redacted]

B. Lockbox Services

1. Describe the Firm's experience providing lockbox services to government entities.

The originator of the lockbox, we have offered wholesale lockbox services since 1947. We have provided lockbox services to public sector entities for the majority of this time, including federal, state and local government entities.

We offer a full range of lockbox services that will allow the State to streamline your remittance processing and accelerate your revenue stream with a fast, cost-efficient, around-the-clock lockbox solution. We own and operate our own nationwide wholesale lockbox network of processing sites to offer the State fully automated wholesale and scannable wholesale lockbox services. We offer optimal availability, funds concentration and full information reporting. The State can receive posting information via a website or delivery of electronic files via transmission. Additionally, you will have a full suite of imaging products available to you for efficient handling of exception cash posting, credit/collection and client service.

As the originator of the lockbox, we have offered lockbox services since 1947 and network lockbox services since 1984. In 1995, we were the first remittance bank to offer secure same-day imaging of checks and remittance documents over the Internet and image browser.

[redacted]

2. Does the Firm operate its own lockbox or does it use the services of a third-party? If a third-party lockbox is used, name the lockbox operator and the length of time the operator has had a relationship with your Firm. Describe how the Firm oversees and monitors the third-party lockbox provider to ensure a high level of service.

[redacted]

3. What type of lockbox solution is the Firm proposing for each of the State's lockboxes (wholesale, retail, wholetail)?

[redacted]

4. Please fill out the table below with the proposed location for each lockbox and the number of employees at each location.

[redacted]

5. Are all of the Firm's locations on the same technology platform?

[redacted]

6. Does the Firm have a unique five-digit zip code assigned exclusively for receipt of lockbox items?

J.P. Morgan maintains unique zip codes in our Binghamton and Brooklyn lockbox sites. The U.S. Postal Service out-sorts all J.P. Morgan lockbox items on the first pass by the unique zip. This use of a unique zip code minimizes mail float by reducing the amount of mail handling at the U.S. post offices.

7. If the State has a preference to use a Delaware P.O. Box, can the Firm accommodate this request? If so:

J.P. Morgan does not support a P.O. Box in Delaware at this time. We recommend the State continue to use the mailing address of our lockbox facility in Binghamton, NY for the most cost-effective and timely processing.

a. How will mail be directed to the Firm's processing facility?

Mail to the Binghamton mailing address would be handled by the U.S. Postal Service. J.P. Morgan picks up mail from the post office multiple times each business day.

b. Will the Firm pick up the items at the Delaware P.O. Box or will your Firm ask the U.S. Postal Service to redirect the mail to your nearest processing facility?

[redacted]

c. Would there be additional mail float time?

Mail sent directly to the Binghamton address would be the most expedient method.

d. Would there be an additional cost to this?

[redacted]

8. What was the average monthly volume for the lockbox operation that would process the State's payments during the last twelve months (items, dollars, number of lockboxes and number of customers)? What percentage of the items processed during the past twelve months were government related?

Listed below are 2017 average statistics for our primary and backup lockbox sites for the State's work. *This information is deemed proprietary and confidential.*

New York Lockbox Volumes	Average Monthly Items	Average Monthly Dollars Processed	Average Monthly Keystrokes	Average Monthly Document Images	# of Active Boxes	Average # of Clients
Binghamton	*This data is considered proprietary and confidential.*					
New York	*This data is considered proprietary and confidential.*					

We do not disclose data regarding the breakdown of volumes by client or industry.

 [redacted]

9. Describe the lockbox department's processing workflow. Include schematics or flow charts of the processing procedures and the equipment used.

While each client's specific instructions may vary, the following outlines the general workflow of lockbox processing.

[redacted]

Figure 31

After scannable items have been separated from wholesale, they are batched and delivered to the scanner workstation. Single and multiple transactions are commingled in a single batch.

Scanning associate enters the lockbox number into the scanner workstation.

Lockbox processing instructions appear on the page.

A unique batch number is applied to the group of work.

OCR scanlines and MICR lines are captured during this first pass.

The system identifies transaction boundaries by looking for sequences of coupon(s) and check(s). For example, an OCR coupon is processed followed by a check. The next OCR scanline following a check acts as the transaction boundary. With this logic, one or more OCR scanlines followed by one or more checks will automatically be separated into transactions.

Low confidence OCR character reads are routed to a scanline fix process for repair.

Courtesy amount(s) and legal amount(s) are compared to scanline amount(s) via data capture through ICR software.

Completed batches are virtually or physically endorsed and encoded.

Upon batch completion, images are available for client delivery.

All outputs are automatically generated (fed to the online browser, direct image transmissions and/or data transmissions).

Unprocessable checks and related materials are forwarded via the client's preferred method.

10. Describe the process of establishing processing procedures for each of the State's lockboxes. Who is involved with these discussions (i.e. relationship manager, implementation coordinator, lockbox specialist)?

Processing instructions are established during the initial implementation of the lockbox in question. Your relationship team, implementation project manager, program manager and lockbox implementations team would be involved in these discussions. The team's approach is to establish consistent procedures that not only serve to quickly and accurately process your remittance items but also to streamline efficiencies among the processing staff performing the day-to-day work.

11. Will your Firm provide a document to the State outlining the processing procedures for each lockbox? If so, please provide a sample of this document for a similar type of lockbox.

J.P. Morgan is always open to providing the State with the current processing procedures in place for lockbox processing. As part of our relationship reviews, we will discuss the current procedures and review aspects of those procedures that may need to be updated. We will always look to review procedures that utilize our technological capabilities to further the timely and accurate processing of your remittance items.

J.P. Morgan provides lockbox instructions to the client as a means of periodic review (i.e., what works, what needs updating). We have conducted reviews in the past with the State of Delaware on this front as it allows us to identify processing efficiencies. Each lockbox would have its own unique set of instructions based on the type of work processed in each. Segregating different work types among multiple lockboxes helps improve efficiencies and reduce the potential for errors.

Below is a sample general instruction for Mail Opening. If you would like the instructions for the other functions for this box (i.e. Data Entry, Mail Room, Imaging) we can provide those upon request.

[redacted]

Figure 32

12. If changes are made to the State's processing instructions, how are these changes communicated? How will the Firm ensure that specifications are adhered to when assigned persons are unavailable?

The State will make all requests for changes to processing instructions to Gus your CSP who will:

Work with you to validate complete understanding of the requested change and, if appropriate, suggest an alternative way of meeting your need that may be more accurate or efficient.

Forward the change to our Production Support staff, which is responsible for making changes to processing and data keying instructions within the lockbox operating system. Each time instructions are changed, the lockbox number will appear on a daily production management report that shows all changes. In addition, when the updated instructions are put into production, a pop-up box on the lockbox operator's screen alerts the operator to the changes.

Lockbox associates review the State's instructions prior to processing your lockbox. This helps verify adherence to your instructions even when the regular associate is absent.

13. Describe the Firm's procedures for the capture and transmission of remittance details such as account number or invoice number.

J.P. Morgan's image-based lockbox system provides optimal processing efficiency and accuracy. Checks and remittance documents are captured as the first step in our automated transaction processing, then electronically routed to operators. The operators perform amount entry and verification as well as capture of supplemental remittance details. Intelligent character recognition (ICR) technologies are used to reduce capture costs and improve accuracy; edit and balance routines can further refine data accuracy, resulting in improved cash application rates. J.P. Morgan supports several standard data transmission formats and can also develop customized formats as required for your accounts receivable system. Files are delivered via various secure transmission protocols; our telecommunication specialists will work with your staff to implement whichever option you prefer.

14. Does the Firm's equipment have mark-sense technology that detects change-of-address information or other exception based information provided?

Our technology can not only lift data based on location of coupon, but be trained over time to know where to look and grab data required.

15. What controls does the Firm have in place to ensure accurate processing per customer specifications?

During our lockbox implementation process:

A dedicated implementation project manager will work closely with the State to document your processing requirements. We create a unique client outline based on our interviews with you, which is used as a set of online processing instructions. We develop a second set of instructions if data capture is required (for example, invoice numbers and amounts are to be keyed from remittance documents).

Our lockbox team also reviews and clarifies the State processing instructions for our associates and prepares for production.

All reported errors can be tracked to the individual responsible so that corrective action can be taken (e.g., clarification of language on the outline, additional training for the associates or modification of procedures).

The State has received high quality processing from J.P. Morgan as a result of the established processing requirements and attention to detail. The performance results that we have shared with the State during relationship reviews have demonstrated this accuracy.

16. Will the Firm process and deposit all of the State's payments on the same ledger day as received? If not, when are these items deposited?

[redacted]

[redacted]

As we establish processing instructions for additional lockboxes, we will determine pickup and processing cutoff times that enable the maximum possible deposit processing with timely reporting that meets the State's operational needs.

17. What specifications for the remittance documents are recommended to minimize errors and reduce lockbox processing costs?

J.P. Morgan suggests utilizing the current processes in place for the Division of Corporations franchise tax payment collection. The value of using your existing lockbox is that no further documentation or setup is required to continue the use of this account and procedures are already established for efficient processing.

We will work with the State and the agencies upon award to evaluate and assess the processes in each of the lockboxes to minimize errors and reduce cost. During implementation, J.P. Morgan will review the remittance coupons for the Division of Unemployment, Pension and Division of Revenue, and provide the scannable specifications. Any recommendations for changes would be made prior to testing.

18. If a payment is received without the remittance document, does the Firm offer any technology that can aid in determining the customer account?

Complex Processing

Our Operations teams use standard processing requirements that have been thoroughly tested and proven highly effective, with excellent quality and efficiency rates. When more complex processing is required (complex sorting, balancing and validation, etc.) we pursue a technical solution based on edits programmed during the implementation and setup phase that accommodate these functions.

During the implementation process, we will discuss how the State would like certain out-of-balance conditions handled. Once implemented, we will follow your processing instructions.

For example, if during implementation the State indicates the check amount must exactly match the amount of the accompanying list bill, we can create a customer program that matches the check amount to the total remittance amount. If the amounts do not match, we can reject those items back to the State as an unprocessable item. We can also create procedures to force-balance unbalanced transactions if desired.

Exception Management

Exception Management is a solution that will allow the State to configure rules that will stop payments from being processed through the lockbox if they meet your defined criteria. [redacted]

- [redacted]
- [redacted]
- [redacted]

[redacted]

[redacted]

[redacted]

19. How are checks processed for deposit (physical deposit vs ICLs)?

[redacted], then a single credit will be posted to the deposit account each banking day that has activity. If a lockbox has multiple contracted deposit times, then separate postings to the deposit account will occur for each scheduled deposit time with activity. For clients contracting for weekend processing and deposit, the weekend deposits post as separate credits on the next banking day.

20. Describe processing options for the following types of exceptions:

a. Stub in envelope with no check

Currently, J.P. Morgan returns these transaction to the State based on processing requirements. If the State would prefer, J.P. Morgan will process these transaction as a No Check' transaction and transmit the data to the State.

b. Check in envelope with no stub

Currently, J.P. Morgan processes these transactions based on the requirements of the State as long as all of the applicable processing information is present on the check.

c. Non-balancing remittances

Currently, J.P. Morgan processes these single coupon/single check unbalanced transactions based on your processing requirements. If multiple coupon/multiple check transactions are received that cannot be matched one for one, we will return those as unbalanced. If the State would prefer these types of transactions be processed, we can review and adjust your processing requirements.

During the implementation process for each additional lockbox, we will discuss how the State would like certain out-of-balance conditions handled. Once implemented, we will follow your processing instructions.

21. Describe the Firm's procedures for processing exception items.

a. Can the State review exception items online?

b. Can business or workflow rules be established for decisioning exception items?

c. How long can items remain in queue awaiting to be decisioned by the State?

d. If items can remain in queue awaiting to be decisioned for only a certain period of time, what happens to the item if the State does not take any action (i.e. the check and remittance document is returned in the mail, the check is processed, but the remittance item is returned, other).

e. Are e-mails sent to authorized users alerting them that an item is awaiting to be decisioned?

Integrated Receivables Reconcile

[redacted]

[redacted]

22. Describe the reporting capabilities of the Firm's web-based lockbox portal.

[redacted]

b. What retention options are available for these images?

J.P. Morgan offers two lockbox imaging services:

Image Transmission: An image file that can be imported into an in-house image system.

Receivables Online: An Internet-based online service.

Clients who have not invested in an in-house image application have elected to use the online service. For those clients with an in-house image system, receiving a daily file of images and an associated index file that is then incorporated into their internal system has made the image transmission method a better alternative.

Receivables Online is an Internet-based service that provides electronic images of checks, remittance documents and, optionally, envelopes to the State. Through this single portal, you can access images and information related to payments received in your J.P. Morgan lockboxes [redacted] your accounts receivable, credit and service staff the ability to make informed business decisions quickly without handling paper documents.

c. For a given day's lockbox activity, at what time of day can your Firm report the total amount that will be credited to the State's account?

[redacted]

d. Does your Firm offer any web-based document search and electronic archiving? If so, does the system allow searches on any data field?

The Transaction Search screen in Receivables Online is the starting point for creating queries to access and display transactions based on a wide variety of criteria. Depending on your company level and user level entitlements, this screen may display up to five sections that include Payment, Bank Identifier, Remitter, Reference Details and Payment Reference Details (optionally configured fields for subscribing customers) and Workflow. In each section, you can define a different category of search criteria.

Within each section, a number of data entry fields and drop-down list options allow you to broadly or very narrowly define the search parameters that will return a large or small number of results. When you execute the search, results may be displayed in any of three subsequent result and detail screens depending on your Personal Options settings and whether your search has returned one or more transactions.

e. In what standard formats does the Firm transmit? Confirm that the Firm can transmit in BAI format. How will this information be transmitted (website, file transfer, etc.)?

J.P. Morgan standard formats include:

The ANSI X.12 823 and 820 formats

All standard variations of the 80-character-per-record lockbox BAI2 format accepted by major accounts receivable software vendors such as Oracle, SAP (their lockbox BAI1 and BAI2 formats) and PeopleSoft (their 102-character variation)

f. If correspondence or other non-payment documents are included in payment envelopes, how will these documents be transmitted to the State and at what time? Does the Firm offer correspondence indexing services for non-financial correspondence? If so, describe the service.

J.P. Morgan utilizes a one-pass scanning environment where the images of checks, remittances documents, correspondence and, optionally, envelopes are captured on lockbox equipment.

When correspondence and other non-financial documents are imaged, each item is indexed based on client-specific criteria such as barcodes, form IDs, etc. Index data is passed with the image via the transmission.

23. If selected as a finalist, can the State tour your Firm's lockbox operation?

J.P. Morgan encourages the State to tour our lockbox operation as part of your evaluation of finalists. The State will be able to see the quality of staff, efficiency of operations and level of security that distinguishes our lockbox operations.

24. Returned items processed in the lockbox

a. Can returned checks be automatically redeposited in the lockbox environment? If so, how many times and at what cost?

J.P. Morgan maintains a comprehensive database that details your return item handling instructions, which may vary by lockbox even if multiple lockboxes share the same depository account. Checks that are returned may automatically be redeposited.

[redacted]

b. Does the Firm offer Represented Check Entries (RCK) where an ACH debit is used to represent a returned check through the lockbox?

Yes. RCK is described in our response to Attachment 1-A: General Banking Services, section B. General Banking Services, question 7.b.

c. How will the State be notified of returned items?

Receivables Online

The Receivables Online check return service provides timely notification of return activity for U.S. lockboxes, allowing the State to follow up promptly with delinquent customers and update your accounting records.

Both redeposited items and final returns are available on the business day following a return item's processing date.

For all final returns, the original item is updated with a status marker to indicate that the item was returned. This information is available for 10 years, with long-term storage.

The Return Item Summary report helps the State analyze patterns and trends of delinquent payers.

An alert can be setup to automatically notify the State of return activity.

- [redacted]

25. Can the Firm's lockbox operation process credit/debit card payments? What merchant card processor would you propose to use for these transactions?

[redacted]

[redacted]

26. What differentiates the Firm's service from that of other providers?

[redacted]

27. What are some of latest services or features added to the Firm's lockbox solution?

[redacted]

28. eLockbox Services

a) Does the Firm offer eLockbox services? If so, describe the Firm's eLockbox service.

J.P. Morgan offers both eLockbox services as well as ACH Direct Debit originations.

ACH eLockbox

ACH eLockbox can streamline the State's receivables posting process by consolidating electronic payments received from multiple sources into a single deposit. On payment receipt, we generally credit your account promptly the morning of the next business day after receipt of payments. Our Transaction Repair service streamlines the exception process by allowing you to review and repair exception items online for faster posting to your back-office system. We provide you with a single accounts receivable file and upload this data into your back-office system to help you save time, improve productivity and reduce costs.

How It Works

1. The State notifies your payment processors to send the payment files directly to your ACH eLockbox. We will work with each processor on your behalf to complete the payment redirection.
2. Your customers send you payments electronically (e.g., online banking, credit cards, bank by phone, government remitters, etc.)
3. After validating the billing account numbers and data match each transaction, we consolidate the payments automatically on receipt.
4. A single credit, along with remittances, posts to your account all in the same business day.

ACH eLockbox: How it Works

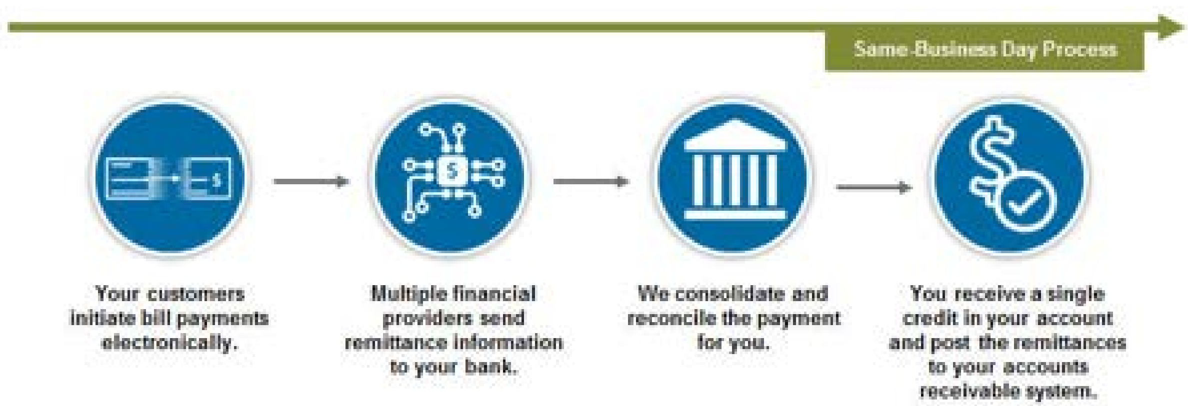

Figure 33

Added Security: To help protect the State's account information, we issue you a unique account number that is used to collect payments into your ACH eLockbox account. This account number is then translated to your actual account number by our back office.

ACH eLockbox provide a range of benefits, including:

- Provides consolidated, straight-through processing of consumer, business or government payments.
- Lowers overall cost associated with payment processing and application.
- Streamlines the receivables process by incorporating electronic remittances and outsourcing the EDI remittance reporting translation function.
- Accelerates funds availability and improve productivity by reducing mail, processing and check clearing float.
- Offers upfront editing and data validation that improves the number of accurate remittances and valid customer account numbers and expedites exception handling.

[redacted]

[redacted]

ACH Direct Debit

In addition to the eLockbox functionality, the State can also originate ACH Debit transactions for electronic collections as a direct transmission to the bank or through a mixed payments file. Where the State has collected the banking information and authorization from payors, we offer extended processing windows to allow the State to submit ACH debit origination files [redacted] ACH debit origination files can also be supported on a same day basis with same day ACH services.

b) Which clearing networks does the Firm work with? Please describe in detail.

[redacted]

c) If multiple State agencies implement eLockbox services, how will constituents be able to differentiate payments between departments? How will the Firm differentiate these payment details to the State (i.e. multiple transmission files, etc.)?

We can provide one file with different values to differentiate between payments or a file per department based on what the State chooses as optimal.

C. New Services & Ideas

1. Describe any new services or ideas that will enhance the State's use of lockbox services.

J.P. Morgan understands that one of the key goals for the State is to improve operational efficiency. By leveraging new technology and innovative solutions, the State can automate the receivables process for a more efficient and cost effective way to collect payments.

[redacted]

These digital and electronic collections can be seamlessly combined with paper check processing through the lockbox and remote capture enabling automated posting of payments without manual involvement ’

[redacted]

[redacted]

Figure 35

[redacted]

2. **Provide any additional information your Firm believes to be pertinent to your ability to provide this service but not specifically requested elsewhere in this RFP.**

[redacted]

[redacted]

[redacted]

3. The Department of Labor's Unemployment Insurance lockbox requires the lockbox processor to hand-key a large amount of data. What recommendations does the Firm have to improve this process? How about for the Training Tax lockbox?

J.P. Morgan will work with the State to implement a coupon with an OCR scanline to decrease the amount of data elements that are keyed.

[redacted]

[redacted]

Once the State selects from this extensive and versatile feature set, and provides information as needed during implementation, J.P. Morgan will quickly provide an application to build,
,
activation and production support. As J.P. Morgan provides industry-leading functionality, service and support, the State is able to achieve your e-payment objectives now and as they evolve in the future.

[redacted]

4. Provide any ideas or suggestions your Firm believes could improve the State's overall use of lockbox services. Specifically, (a) reducing the number of lockboxes used by the State and/or State agencies, (b) new services that will benefit the State, (c) services the State could discontinue or replace, and (d) implementing best practices.

[redacted]

D. Implementation / Conversion

1. Provide a detailed conversion plan for transitioning the State's existing lockbox services to your Firm. Include the estimated length of time for the transition and the amount of effort required by the State's staff.

[redacted]

2. Based on the State's implementation expectations provided in Section II. Background, how would you work with the individual State agencies to transition lockbox services to your Firm?

For each agency implementing our solution for additional lockbox programs such as Pension, Unemployment Insurance, Training, etc., your implementation manager, [redacted], will engage additional J.P. Morgan resources (e.g., your relationship team, our industry solutions experts and others) to collaborate with you and the agency to validate the solutions requested. Once the solution has been scoped, he will establish timelines for implementation and coordinate with the necessary teams across your organization and J.P. Morgan to complete the setup.

[redacted]

3. Who will be responsible for coordinating the transition? If a conversion team is used, how will the State's account be transitioned to the ongoing client service team?

An implementation project manager, [redacted]

In addition, [redacted]

4. **How are implementation managers or implementation teams assigned (i.e. availability, geographically, complexity of the transition)?**

The Government Banking implementation team operates out of several locations throughout the U.S. Assignment is generally determined by deal capacity at the time the business is awarded; however, we try to assign someone in close proximity to the client whenever possible. The Senior Implementation Project Manager assigned to this request, regardless of office location, would be able to support a complex onboarding.

5. **Indicate the Firm's plans for initial and ongoing education and training of OST and State agency employees in the use of the Firm's systems.**

We offer the State a variety of methods for training without any cost to you, such as webinars, phone and short step-by-step prerecorded videos.

The following resources are available:

Online Resources: Available on Access Online's Support via the Education tab. Resources include online help articles, FAQs, guides and a range of live and pre-recorded webinar offerings on how the State can use the Access Online products and services.

Webinar Training: Instructor-led sessions are available on many of our products including Receivables Online and Remote Deposit Capture. For Access Online, we have webinars for each of our products in the Access Online family. Each webinar lasts between 15-90 minutes. Webinar registration is available via Access Online's Support/Education page.

[redacted]

6. **Identify potential issues and risks to the State's implementation of lockbox services. Identify the appropriate steps to avoid or mitigate these risks.**

[redacted]

[redacted]

7. **Describe the post implementation support that will be provided for the State. Include the philosophy and approach to providing the technical and functional post implementation support requested and identify the resources it would make available to the State to provide this support.**

The support provided by the bank does not end once we have implemented your account. We believe continued support is critical to our overall account relationship.

Post-go-live, the Implementations team continues to provide support for approximately 30 days and coordinates the transition to Client Service for day-to-day involvement in issue resolution. Your dedicated client service professional, [redacted], will participate in the [redacted] and his backup will be prepared to provide ongoing support to address your expectations.

The Binghamton team will be actively engaged from an operational perspective if issues arise and/or there are questions pertaining to processing. On an on-going basis, the Binghamton team looks for new, innovative ideas that streamline processing and ultimately reduce costs for the State.

Production support is provided prior to the project's closure, including turnover of documentation and providing proper J.P. Morgan contact information for assistance regarding transmission-related services from our Technical Support teams.

E. Pricing

1. **Complete the schedule of fees provided in Attachment 4**

[redacted]

2. **In addition to the pricing pro forma provided in Attachment 4 provide a sample analysis statement that uses the Firm's actual service names and expected volumes and pricing based upon the information provided in the pro forma. Provide a description for each service included in the analysis statement and when the charge would apply.**

[redacted]

F. Disaster Recovery

1. **Describe the procedures established for disaster recovery for lockbox services.**

Documented business resiliency strategies and plans address the recovery of functions and/or people to one or more viable recovery sites. Many of the firm's production operations, including lockbox, have locations throughout the world. For critical processes, J.P. Morgan employs the strategy of moving work, not people, wherever possible.

When similar processes utilizing like systems are performed at multiple locations, the use of a sister site or distributed operating model is generally the preferred recovery approach. A sister site is defined as a facility that performs like processes, using similar systems and equipment, and where local management possesses expertise on the processes to be recovered at that location.

All recovery sites are in a separate zone from the production location they support. J.P. Morgan's corporate policies use the zone designation to measure and depict local diversification of infrastructure and access. A series of criteria (such as, utility sources, telecommunication feeds, transportation, etc.) is used to determine whether two or more facilities have the potential to be impacted by the same localized incident.

An analysis to determine zone designation is performed by our Global Real Estate, Global Security and Global Technology Infrastructure business units with input from Global Business Resiliency.

Due to the sensitive nature of this information and for the protection of our clients and staff, J.P. Morgan does not release specific details on the location of primary and backup data centers and processing sites, nor further details of our resiliency plans.

2. If a third-party is used for disaster recovery, with whom does your Firm contract?

The backup site for the State's lockbox processing is our lockbox facility in Brooklyn, NY. Not only are staff members of our Brooklyn site cross-trained on processing the State's work, but we can also temporarily relocate certain lockbox staff from Binghamton to Brooklyn. In addition, our trainers are readily available to bring additional employees up to speed in times of need.

If necessary, temporary staff would be engaged to assist with processing under the supervision of J.P. Morgan employees.

3. How often does your Firm test disaster recovery procedures? When was the site last tested?

Critical resiliency plans are tested annually or when there are significant changes in the environment. The level of testing is determined by the recovery time objective of the business function as established by the business impact analysis. Any issues that arise during testing are addressed and resolved, and retested where necessary, prior to the end of the test or within an appropriate timeframe.

4. Have disaster recovery procedures ever been employed for a real disaster? If so, explain.

Plans are partially and wholly implemented as necessary. They are implemented on a regular basis for storm pre-event planning, fires, floods, terror threats, civil unrest and electrical outages.

In recent years, J.P. Morgan has experienced several major events that required activation of our business resiliency plans. During or following these events, J.P. Morgan activated portions of our resiliency plans. With established and documented plans in place, J.P. Morgan and, more importantly, our clients experienced little or no disruption in our services as a result of these events.

Fortunately, we have not had to deploy our resiliency procedures for Binghamton lockbox processing.

In the event of a disaster, we strive to maintain service at the levels established during normal operations. We will work hard to keep our clients informed throughout the entire event.

5. How long does it take to activate the site? How long can your Firm stay at the site?

Each J.P. Morgan business unit performs a formal business impact analysis to assess the client, financial, legal/regulatory and interdependencies impact of a service disruption. The results of the business impact analysis are used to determine the criticality of the function and the corresponding recovery time objective. The recovery strategies developed during the resiliency planning process must enable the business to achieve the recovery time objective as established by the business impact analysis.

Recovery time objectives vary based on criticality of the specific business function as determined by the business impact analysis. For our most critical functions, we apply a two-hour recovery time objective for full resumption of normal operations. For other functions, we apply recovery time objectives ranging from 4-72 hours. For the least critical functions, we apply a recovery time objective of 73+, which results in those business functions deferred and/or suspended until resources are available to restore the function.

Each business impact analysis must be updated, reviewed and approved at least annually or as material changes occur.

For our Binghamton lockbox operations, we will declare a disaster within 24-48 hours, depending on the severity and knowns/unknowns. Within 48-96 hours, J.P. Morgan would be ready to begin recovery methods. We would engage the United States Postal Service in the early stages of the response, and we would determine how long it would take to have mail either rerouted to a different Post Office or would have to courier from Binghamton to Brooklyn on a daily basis.

Because our backup site is our own lockbox, we can stay at this site as long as needed to provide continuity of service.

6. What arrangements are made regarding service level agreements in the event of a disaster?

In the event of a disaster, we strive to maintain service at the levels established during normal operations. We will work hard to keep our clients informed throughout the entire event.

7. What agreements does your Firm have with your equipment manufacturers for additional equipment should a disaster occur? Specify all areas of remittance processing, including mail extraction and image processing.

By using the excess capacity of one of our other existing lockbox sites as the backup location for processing the State's work in the event of a disaster, we do not need additional equipment. Each of our lockbox sites are scaled to accommodate volumes shifted from other sites.

In addition, we have a Hardware Vendor Manager who assists with any equipment issues that may arise in normal or contingency processing scenarios.

8. Are there any additional disaster recovery plans specific to this component that are not outlined above or in the Disaster Recovery plan requested in Section V.A. Tab K?

The firm's business resiliency planning for lockbox services is fully covered in the information provided in Tab K: Business Continuity and Disaster Recovery Plans.

The site has an identified Resiliency Manager that assists with activation, invocation and recovery during a disaster related occurrence. The site maintains a Business Continuity

Playbook that is tested on an annual basis, at a minimum. The playbook covers everything from a recovery strategy overview to contact information to process steps to communication plans.

Attachment 1-C: Purchasing/Virtual Card & ePayables Questionnaire

A. Key Personnel & Customer Service

1. Provide biographical information on the individuals who will work with the State on a regular basis. Please include the following information:
    a. Proposed role with regard to OST's account;
    b. Biographical information;
    c. Location;
    d. Experience working with other government entities;
    e. Number of years of experience in this field;
    f. Number of years with Firm; and,
    g. Number of accounts the person is responsible for.

[redacted]

2. Provide an organizational chart that includes these individuals.

[redacted]

Figure 36

3. Customer Service

a. For routine day-to-day transactions, will a specific customer service representative or a customer service department be assigned? Provide biographical information for this individual(s) that will be assigned to this account.

For routine day-to-day transactions, the State's cardholders will continue to be [redacted] By simply calling the toll-free number on the back of their cards, cardholders are identified by their card number and then routed to the proper service specialist. In areas where toll-free calling is not offered, a collect number is also listed on the back of every card to provide for prompt, efficient service. Importantly, our customer service specialists are solely dedicated to commercial card support and do not handle any other bank products.

Services Tailored to Cardholder Needs

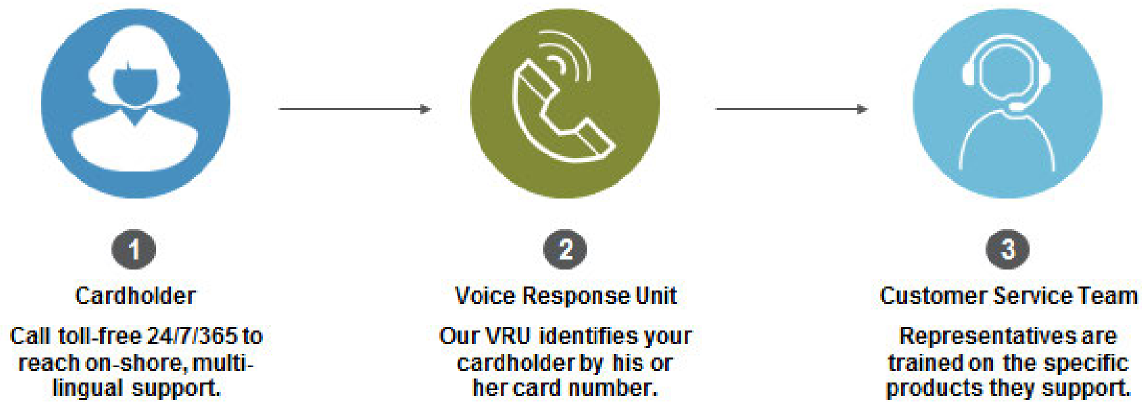

Figure 37

Our specialized service structure enables cardholders to access the support they require 24 hours a day.

Knowledgeable and Experienced Support

We offer support from approximately 100 specialists in two locations. Each customer service specialist is trained and knowledgeable about the specific programs they support. All customer service specialists receive targeted training, enabling them to become experts in their roles.

Services and information our specialists offer for your cardholders include:

- Lost/stolen card reporting
- Answers to statement questions
- Card activation
- General account information
- Balance/credit information
- Billing disputes
- Fraud reporting
- Payment information
- Cardholder transaction information
- Specific charge details (including declines)
- Account closures/card cancellations
- Replacement card requests
- Emergency assistance
- Online password assistance

Our average response time is less than 20 seconds. If issues cannot be resolved immediately, a time commitment will be communicated to the cardholder within 48 hours.

Additional services provided through our call center include an easy-to-use voice response unit (VRU) for commonly asked questions and an interpretation service to assist non-English-speaking cardholders in over 100 languages (e.g., Spanish, German, Italian and French).

b. Describe the responsibilities of the customer service personnel, including the chain of command for problem resolution.

The State's cardholders can continue to contact our Customer Service team 24/7/365 via a toll-free number for assistance with account issues, balance inquiries, lost or stolen cards and other account-related needs.

They can also:

- Investigate and resolve issues.
- Process replacement card requests.
- Adjust account control parameters.
- Reprint archived statement requests.

Issue Resolution and Escalation Process

If a customer service specialist is unable to provide an immediate solution, the specialist will place the cardholder on hold and contact the proper resource (such as a team lead or technical support) for assistance. The specialist will then provide the necessary details and transfer the call to the appropriate resource for immediate resolution.

If additional resources are not available at the time of the call, the specialist will communicate a time commitment for resolution to the caller, end the call and perform any research or escalation necessary to resolve the issue.

[redacted]

Figure 38

Service specialists can resolve issues on their own and have the ability to escalate if necessary.

c. What are the hours of operation of the customer service unit involved in supporting the State?

Our customer service representatives are available 24/7/365.

d. If a State employee needs assistance after business hours, what support is available?

Our customer service representatives are available 24/7/365.

e. In what languages is customer support available?

Our service specialists and voice response unit (VRU) provide support in English and French. Our Service team can connect you to a translation service, which provides support in additional languages through a skilled interpreter.

B. Purchasing Card Services

1. What card platform(s) does your Firm's program employ (e.g., MasterCard and/or Visa)? If more than one is used, which would you recommend for the State and why?

J.P. Morgan employs both Visa and Mastercard for its Purchasing, Travel and One Card programs. We employ Mastercard exclusively for Single Use Accounts. Based on the State's objectives, and as an existing client, we recommend the continued use of Visa for your existing Purchasing Card program and Mastercard for your Single-Use Account program.

Visa

Visa is one of the world's largest electronic payment networks and provider of tailored payment solutions. Visa makes commercial payments convenient for all types of organizations and spending needs. As a leading network brand for cardholders and merchants, Visa's broad coverage enables commercial cards to be the payment channel of choice for more of your transactions.

Visa's processing services provide proven, dependable core payment processing capabilities as well as improve security and enhance convenience. Visa understands that cardholders require integrated, streamlined systems and processes that improve overall efficiency.

Visa delivers insights through benchmarking and market trends that will support your program goals by leveraging the breadth of its network. Your J.P. Morgan relationship manager can work with you to facilitate access to key Visa resources and robust analytical tools.

Mastercard

Currently, our single-use account virtual card program is offered exclusively through Mastercard.

Over the past two decades, Mastercard has become a global leader in providing flexible, end-to-end payment solutions. Mastercard distinguishes itself with broad acceptance levels. Mastercard is accepted at millions of locations and serves cardholder needs in more than 210 countries and territories. In addition, Mastercard has one of the largest ATM network in the world with well over one million terminals.

2. The State requires the awarded Firm to not only support the existing 4,700 cardholders, but also support the expected growth of the program. Explain how the Firm is able to accomplish both of these objectives.

J.P. Morgan has successfully supported the State's existing Purchasing Card program for ten years. Our scale enables us to provide the extensive resources necessary for the expected growth of your program.

Our clients range in size from a few hundred to over 20,000 cards issued. Associated spend can range from a few million dollars to more than one billion dollars per year.

[redacted]

[redacted]

The scalable architecture of PaymentNet, our proprietary online card management platform, is designed to accommodate as many logins as needed without sacrificing speed or consistency.

[redacted]

3. Will the Firm require social security numbers or perform credit checks to approve existing or new cardholders? *(Note: The State will not agree to Firms performing credit checks on employees.)*

No. Neither social security numbers nor personal credit checks are required for programs with corporate liability.

4. Does the Firm have the ability to offer separate Purchase and Travel cards? What benefits are derived by having separate Purchase and Travel card programs? Would you recommend separate programs?

Yes. J.P. Morgan has extensive experience with both one- and two-card programs.

A one-card solution is a good fit for organizations with simple reporting and oversight requirements. This approach allows for both a reduced administrative effort and a significant reduction to the number of cards in the field.

The primary benefit of distinct Purchase and Travel programs is a clear separation between spending types that often have vastly different reporting and oversight requirements. This is the structure the State uses today, and we recommend that you maintain that course as long as your reporting and oversight requirements remain the same.

Should the State prefer to move back to the streamlined one card approach, JP Morgan stands ready to reconfigure your program to meet that need.

5. Provide an overview of software/web based card program management system that supports the Firm's purchasing card program.

The State currently utilizes PaymentNet, our fully hosted online solution that requires no client-side software and is accessible from virtually any secure Internet browser. Designed, developed and supported in house by J.P. Morgan, our easy-to-use system helps the State streamline time-consuming tasks and offers key features, including:

Simplified day-to-day account management: From real-time profile changes and declined transaction viewing for program administrators to streamlined reporting options for cardholders, PaymentNet can help you handle everyday tasks more quickly and efficiently.

Mass update capabilities: PaymentNet allows program administrators to send mass updates of approvals, accounting codes and cardholder applications, reducing the need for repetitive manual updates.

Flexible receipt imaging: the State is given access to PaymentNet's versatile receipt imaging options, including the ability to fax or upload scanned receipts.

PAYMENTNET ADVANTAGES

- Complete online solution, wholly owned by J.P. Morgan
- Real time adjustments of account controls
- Multiple standard reports plus query capabilities
- Full hierarchy support
- Seamless integration with your financial systems
- Simple user interface

Time-saving reporting options: PaymentNet lets users create and save report queries, schedule reports to run automatically and view reports on screen for quick transaction reviews. PaymentNet includes a suite of standard reports to assist the State in monitoring, analyzing and reporting on your program spend.

Custom fields and transaction splitting: the State can use PaymentNet's custom fields to meet their auditing needs, and the ability to easily split transactions simplifies the reconciliation process.

Online disputes: Any cardholder or authorized user can submit a dispute in PaymentNet, which is not possible in many competitors' systems.

PaymentNet Features

Our PaymentNet system enables the State to efficiently manage all aspects of your commercial card program, from policy adherence tracking and spend control to real-time adjustments of credit limits and other account parameters. Unlike other management software, PaymentNet provides a consolidated platform for all card-related needs, creating a uniform and consistent user experience.

[redacted]

The following are the core features of PaymentNet:

[redacted]

6. Is the software/web based card program management system wholly owned by your Firm? If not, specify the owner of the software/web based card program management system.

Yes, PaymentNet is wholly owned by J.P. Morgan. It is designed, developed and maintained in-house.

7. Describe the procedure for enrolling new State organizations into the program, including the following:

a. Required account setup information

The existing State program is fully centralized under the administration of the Division of Accounting. All government branches, State agencies, school systems and higher education organizations are onboarded by the State's program administration team at their discretion. J.P. Morgan requires nothing from these individual entities in order to participate in the State card program.

b. Authorizations

The only authorization required would be internally from the State's card program administration team.

c. Applications

The State utilizes our PaymentNet Account Request Manager (ARM) to process new applications. The State program administration team simply shares a link to its custom application template with any potential new participant. ARM allows for workflow approvals through final approval by a State program administrator.

d. Forms and signatures that are required (samples are encouraged)

No forms or signatures are required to be submitted to J.P. Morgan when onboarding a new State agency school system or higher education organization.

e. Time frames for providing cards once the organization takes the necessary enrollment steps

Individual cards are sent directly to cardholders or your program administrator, at the State's discretion, within four business days after card application processing through standard first-class mail. We also offer overnight bulk card delivery for 10 or more cards sent directly to a central location.

8. The State currently has an online process for adding cardholders that ensures organizational and State internal controls are met. This paperless approach is a requirement of the State and an explanation on how your Firm can meet this requirement should be detailed in question a below.

a. How is the procedure of adding cardholders accomplished through an on-line or electronic system?

The State currently utilizes the Account Request Manager (ARM) online application tool for program administrators within PaymentNet. This tool builds upon the card creation capabilities and offers the ability to move the entire application, validation and approval process associated with commercial cards to a secure online platform.

[redacted]

[redacted]

b. What cardholder information needs to be supplied to issue a new card?

We must collect the following information for each cardholder:

- Full legal first and last name
- Date of birth
- Home address

For security and authentication purposes (mainly for identity validation during the card activation process and when a cardholder contacts our Customer Service team), we also ask cardholders to provide two unique security identifiers: a 4-digit numeric and 4-digit alphanumeric.

c. Does a new cardholder have to input or supply any information or can the State administrator supply all of the necessary information without any involvement by the new cardholder?

Your program administrator can supply all information necessary to request new accounts for your cardholders. However, this approach leaves an organization with the need to handle paper internally or develop some other homegrown mechanism to communicate cardholder details like home address and unique security identifiers to the State program administrators. Continued use of our Account Request Manager (ARM) streamlines the application process by allowing the cardholder to place that information into a secure online application and, upon meeting the State's approval requirements, pushing all of that information to J.P. Morgan without the need for the State program administrator team to re-key any information. This functionality provides the State with greater efficiency, security and visibility in the card application process.

d. Does the Firm offer the ability to have multiple approvers for each new cardholder added?

Yes. ARM integrates several workflow options for the application approval process and provides multiple levels of control, including an electronic signature option using a secure, validated PaymentNet approver role.

e. Are there any paper forms or signatures required to add a new cardholder?

No. ARM is an entirely electronic card application and approval system, eliminating delays and costs associated with distributing, collecting, storing and managing paper applications.

f. What is the time frame for issuing and mailing cards once the organization takes the necessary enrollment steps?

Individual cards are sent directly to cardholders or your program administrator, at the State's discretion, within four business days after card application processing through standard first-class mail. We also offer overnight bulk card delivery for 10 or more cards sent directly to a central location.

9. Describe the card controls and usage restrictions supported by the Firm's program:

a. The ability for the State to occasionally allow cash advances to card holders is essential. Is the State able to block or grant ATM/Institution Cash Advance access on a card-by-card basis to include the issuance of PINs?

Yes. Our cash advance program offers ATM usage by authorized employees through the use of Merchant Category Codes (MCCs) that can either be blocked or allowed, as needed, by the State's program administrators.

b. How quickly can cash advances be permitted when needed by a cardholder? Is it instantaneous?

Yes. Your program administrators can adjust cash advance permissions for your cardholders in real-time through PaymentNet.

c. Is the State able to block card usage by Merchant Category Code (MCC)?

Yes. Limits can be applied to MCCs with a dollar amount, transaction value or the number of transactions allowed per day.

d. Can the State establish card limits on a real-time basis? Card limits include both a per transaction dollar limit, as well as a monthly dollar limit.

Yes. J.P. Morgan's programs offer real-time adjustments of spend controls online.

e. Describe any additional limits, purchase restrictions or any other types of restrictions or fraud controls available.

J.P. Morgan's programs offer numerous card controls and key administrative features such as full hierarchy support, real-time adjustments of spend controls online and denial at the point of sale for transactions that do not meet your requirements. The State's program administrator can establish dollar, transaction, merchant category code (MCC) and cash advance limits at any level of your hierarchy: by individual, department, or for the entire organization.

[redacted]

Standard controls available for our commercial cards include:

Dollar limits: Dollar limit controls include cycle spend, transaction amount, daily spend amount, monthly spend and spend limits by MCC.

Transaction limits: Limits can be placed on the number of transactions allowed per day and per month.

MCC restrictions: Limits can be applied to MCCs with a dollar amount, transaction value or the number of transactions allowed per day.

Cash advance controls: the State has the ability to control monthly cash advance amounts or totally restrict the ability to use the cash advance options.

Guidance Line: Suspends your ability to continue to use the card when the total balance reaches its limit.

10. Card Issuance

a. Can the card design be customized to include the State's logo?

Yes. J.P. Morgan can add the State's logo or seal through a hot stamp process.

b. **Can the card design be customized to include State supplied graphics? Are there any restrictions on the graphics supplied?**

Yes[redacted]

c. **Confirm all cards will include, at minimum:**

i. **EMV Chip**

Yes.

ii. **Phrase: FOR OFFICIAL USE ONLY**

Yes.

iii. **Employee Name**

Yes.

iv. **Toll free 24-hour per day customer service number**

Yes.

d. **What card design features can assist with card acceptance or the prevention of misuse?**

Our cards come with a variety of security features that include validation numbers on the back of each card and chip technology.

Visa developed the card verification value (CVV) system to help prevent alteration or misuse of card data and to enhance verification of the card and cardholder. The CVV comprises three digits encoded in a card's magnetic stripe. The CVV2 is a three-digit numbers printed on the signature panel on the back of the card. For Internet, telephone, and mail orders, cardholders can provide this three-digit number to merchants for verification purposes.

Chip Technology

In addition to enhanced security, chip cards promote broader acceptance with merchants internationally and in the U.S. as chip technology is more widely adopted by merchants.

Embossing

In addition to protection from external misuse, we also offer the ability to provide a card design that will distinguish the State's purchasing cards from a cardholder's personal cards. We are also happy to continue embossing either Purchasing or Travel on the State's plastics to help ensure the cardholder uses the proper card at all times.

e. Is the State able to order cards with no distinctive governmental affiliation for cardholders who should not readily be identified as a State employee?

Yes.

f. For cards issued with an EMV, will a pin number be required for face-to-face transactions? If so, how will the pin number be assigned and communicated to the employee?

Accounts are setup as signature preferring for all chip cards; however, certain terminals may require a PIN. Cardholders can create a PIN for their chip and signature cards at the time of activation.

Our industry-leading voice response unit (VRU) enables callers to activate cards and establish or change PIN numbers in a prompt, user-friendly manner.

g. What is the delivery method and turnaround time for new/replacement cards?

Individual cards are sent directly to cardholders or your program administrator, at the State's discretion, within four business days after card application processing through standard first-class mail. We also offer overnight bulk card delivery for 10 or more cards sent directly to a central location.

Replacement Cards

Card replacement requests can be placed online using the account maintenance feature of PaymentNet. This simple process requires just two clicks from the Account List page. Cards are processed on the same day as long as it is received by their preset processing deadlines. Cards are typically in the mail within five business days of request receipt.

Card delivery tracking information is provided in PaymentNet when a new or replacement card is requested. The State can obtain updated information from the carrier itself and better anticipate when cards will be delivered.

Lost or Stolen Cards

The State should notify us immediately if a card is lost, stolen, misused or if there is fraud. We will promptly cancel the account to prevent further program liability. Our Customer Service team is available 24/7/365 to cancel lost or stolen cards and reissue new plastic, as needed.

Delivery of new cards is made within five to seven business days. If a rush card [redacted]

h. **If the State orders 10 or more new cards on any given day, will the Firm be willing to express ship those cards to the State at no cost?**

Yes. We offer overnight bulk card delivery for 10 or more cards sent directly to a central location at no cost to the State.

i. **Can the Firm send all newly issued cards (including replacement cards) directly to a centralized location? (Note: the State desires to have all cards sent to DOA)**

Yes. Cards can be sent either directly to the cardholder or to a central location, depending on your preference.

j. **What is the time frame for emergency or rush cards, and is there a fee to the State for overnight delivery?**

[redacted]

k. **Can card profiles associated with an employee job title or position be made available to quickly set up new cardholders with a specific transaction/credit limit and specific MCC categories?**

Yes, utilizing the PaymentNet online card application module, Account Request Manager (ARM), a client can leverage application template configuration features to drive card velocity limits and MCC category groupings.

l. **It is State requirement that all cards require activation upon receipt and prior to first use. How will the Firm accommodate this?**

We do not send active cards to our clients as a fraud prevention measure. On receipt, each cardholder must contact our voice response unit to activate his or her card. The State's program administrator may contact your Program Coordinator team for mass activation of cards on delivery, if necessary and applicable to your program.

m. How often do cards expire and are re-issued to cardholders?

Each card will be valid for three-years. The expiration date is defined to be three years from the issuance date.

n. When are reissued cards issued and sent prior to the expiration date of the existing card?

Renewal cards are automatically sent to the State's program administrator or cardholders (depending on preference and bulk ship options) the month prior to expiration. Replacement cards are also active for three years from the issuance date.

o. What are the Firm's procedures for canceling a card and notifying the State? Is the State able to disallow any such cancellation?

The bank must maintain the right to cancel cards associated with individuals on the Federal Government's OFAC sanction screening list.

Delinquency

When an account reaches five cycles past due (beyond 150 days delinquent), the card will be cancelled. At seven cycles past due (typically 181 days past statement date), the cardholder account is charged off.

Suspension is systemically removed when the account is paid in full. It cannot be removed without payment. Reinstatement of a cancelled account can be requested by the Program Administrator of the State if the account is paid in full.

11. Lost, Stolen or Compromised Cards

a. In what ways can the State notify the Firm once they realize a card has been lost, stolen or compromised?

The State should notify us by contacting our Customer Service team or online through PaymentNet immediately if a card is lost, stolen, misused or if there is fraud. We will promptly cancel the account to prevent further program liability.

Our Customer Service team is also available 24/7/365 to cancel lost or stolen cards and reissue new plastic, as needed. Delivery of new cards is made within five to seven business days. If a rush card replacement is requested, a card can be delivered within one to two days.

b. The State requires support for notification. Is support for notification available 24/7?

Yes. When a potentially fraudulent transaction is identified, a fraud analyst will evaluate the account's history and activity. If fraud is still suspected, the analyst will contact the cardholder to confirm card possession, verify the cardholder's two security identifiers on file and validate the transaction(s). Depending on the circumstances, we may continue to monitor the account for suspicious charges or suspend it temporarily to minimize potential fraud losses. If we suspect employee misuse of funds, we will contact the State's program administrator directly.

Enroll to Receive Notifications

Figure 42

Under most circumstances, a call is placed to the cardholder at the telephone number(s) on file, with messages left if contact cannot be made. After the first attempt, we will call the cardholder at both phone numbers and leave messages. If we are unsuccessful in reaching the cardholder after three attempts or if the phone number(s) on file is invalid, we will place a hold on the card and reach out to your program administrator.

As an option, cardholders can enroll to receive fraud alerts via text message or email. Fraud alerts notify cardholders when suspicious transactions are identified on their account and allows them to quickly reply to validate transactions.

c. How long does it take for a card to be cancelled once the Firm has been notified?

Program Administrators can cancel cards online and in real-time through PaymentNet or by contacting our Customer Service team.

d. How quickly can a replacement card be mailed once the Firm has been notified?

Cards are typically in the mail within five business days of request receipt. If a rush card replacement is requested, a card can be delivered within one to two days.

e. How will the Firm handle the replacement of a lost or stolen card in the event the State requires account activation within 48 hours or less?

Emergency rush cards can be sent overnight to cardholders or your program administrator. The Rush Delivery Card report within PaymentNet helps you track online requests for expedited plastic.

[redacted]

A cardholder can contact our Customer Service team for assistance in authorizing charges (e.g., hotel check-in) until the new card arrives. Furthermore, when a program administrator applies for a new card through PaymentNet, a card number is provided for instant use.

12. Program Administration

a. What capabilities and functionalities do administrators have (i.e. adding new cardholders, adjusting credit limits, reviewing activities)? Are these changes made in real-time?

Program administrators can make account changes using PaymentNet's account maintenance feature. With this feature, tasks such as credit limit adjustments, profile updates and termination activities can be accomplished online and in real time, with changes effective immediately. Available functions include:

- Name and address updates
- Current balance verification
- Transaction limit changes
- Monthly/cycle credit limit changes (temporary and permanent)
- MCC Group changes
- New card requests
- Card replacement requests
- Account closures
- Authorization/decline activity access

Cardholders can also use PaymentNet to view their account data, although they will not be able to make changes.

The Account Detail screen displays basic account information to your program administrator, such as credit limits, account status and hierarchy level.

[redacted]

b. If a transaction is declined at the point-of-sale and the cardholder contacts the Program Administrator, can the Program Administrator adjust restrictions, cardholder limits, and controls on individual cards on a real-time basis? If not real-time, identify the length of time required for changes to become effective.

Yes. Online adjustments to card controls in PaymentNet are made in real-time.

Fraud Alert Notifications

When a potentially fraudulent transaction is identified, a fraud analyst will evaluate the account's history and activity. If fraud is still suspected, the analyst will contact the cardholder to confirm card possession, verify the cardholder's two security identifiers on file and validate the transaction(s). Depending on the circumstances, we may continue to monitor the account for suspicious charges or suspend it temporarily to minimize potential fraud losses. If we suspect employee misuse of funds, we will contact the State's program administrator directly.

Enroll to Receive Notifications

Figure 45

Under most circumstances, a call is placed to the cardholder at the telephone number(s) on file, with messages left if contact cannot be made. After the first attempt, we will call the cardholder at both phone numbers and leave messages. If we are unsuccessful in reaching the cardholder after three attempts or if the phone number(s) on file is invalid, we will place a hold on the card and reach out to your program administrator.

As an option, cardholders can enroll to receive fraud alerts via text message or email. Fraud alerts notify cardholders when suspicious transactions are identified on their account and allows them to quickly reply to validate transactions.

c. If the internet is unavailable, can Program Administrators make changes to cardholder limits/restrictions by phone?

Yes.

d. Can Program Administrators make temporary adjustments to a cardholder's profile that automatically reverts back to the original profile on a specified future date?

Yes, program administrators can set beginning and ending dates to make profile adjustments to credit and daily transaction limits. Program administrators can set changes to revert to the original account settings after a predetermined amount of time. However, adjustments to merchant category code (MCC) restrictions will require manual updates from your program administrator. It is important to note that these adjustments occur in real time.

e. Can a report be generated to show dormant accounts that have no activity for a period of time?

Yes, there are several reports that include last transaction date.

An account is considered inactive when it has had no transactions for 18 months, has no outstanding balance and is past its expiration date. An informational message showing the scheduled purge date will be displayed for 30 days before the account is deleted. Program administrators will see this message on the Account Detail screens in PaymentNet if they view an account that has been purged.

f. **Can a report be generated to summarize the amount spent by all cardholders for individual vendors?**

Yes. PaymentNet features three types of vendor spending reports to provide detailed analysis: spending analysis reports, merchant information reports and merchant profile reports.

Spending Analysis Reports

Airline Spending Analysis by Merchant

Car Rental Spending Analysis by Merchant

Lodging Spending Analysis by Merchant

Lodging Spending Analysis by City

Restaurant Spending Analysis

Transportation Spending Analysis by Merchant

If the State requires an analysis of an industry that is not automatically offered in the standard reports, you can change the MCC of any report to match your requirements. You can then save the report for that particular industry and re-run it at any time.

Merchant Information Reports

Merchant Ranking

Quarterly Merchant Analysis by Parent Merchant

Transaction Detail by Parent Merchant

Transaction Summary by Parent Merchant

These reports are excellent in assisting with decision making and rate negotiations. PaymentNet also provides reports that detail spend by MCC. These reports are good tools to determine spend allocation among different merchant classes.

Merchant Reports

Merchant Profile   Excel

Merchants with Default Account Codes

MCC With Default Account Codes

1099 Merchant

Merchant Profile with Custom Fields

These reports track information such as 1099 and socio-economic detail. Vendor data received by PaymentNet is passed by the merchant and verified by the merchant's acquiring bank. If the merchant does not pass this data, PaymentNet gives the State's program administrator the ability to manually add information in the merchant profile section.

[redacted]

[redacted]

13. Customer Support

a. Will State administrators have a dedicated customer service team to handle requests and service needs?

The State will continue to benefit from a designated Card Relationship Manager, Greg Powell and a designated Card Program Coordinator, Phil Snavely. Program coordinator support is further augmented by 24/7/365 customer service assistance, which is available to both program administrators and cardholders.

i. What are the normal business hours of this team?

Our program coordinator servicing team is available Monday through Friday from [redacted] This program coordinator support is further augmented by 24/7/365 customer service assistance, which is available to both program administrators and cardholders.

ii. Will it be available 24/7/365?

Our customer service team, which is available to both program administrators and cardholders, is available 24/7/365.

iii. Where is the call center located?

[redacted]

iv. How many support personnel available?

We offer support from approximately 100 specialists.

v. **What is the average response time?**

Our customer service team's average response time is less than 20 seconds.

b. **Will cardholders have a toll-free assistance line for account inquiries, billing information, reporting fraud and other services the Firm describes?**

Yes.

i. **What are the normal business hours of this team?**

This team is available 24/7/365.

ii. **Will it be available 24/7/365?**

Yes.

iii. **Where is the call center located?**

[redacted]

iv. **How many support personnel available?**

We offer support from approximately 100 specialists.

v. **What is the average response time?**

Our average response time is less than 20 seconds.

14. Disputed and Fraudulent Activity

a. **What is the process for handling disputed and fraudulent items?**

Most erroneous charges can be corrected by calling the merchant avoiding the dispute process entirely.

We have a straightforward dispute initiation process that makes it easy for the State to initiate disputes through us. Throughout the dispute resolution process, our Disputes team will act as advocates on your behalf.

We recommend that the State initiate all disputes via phone, as this enables our specialists to discuss the issue with the cardholder and provide the most comprehensive support. Cardholders can contact our Customer Service department by calling the number on the back of the card. Disputes can also be initiated online in PaymentNet or by email or mail. Dedicated personnel handle the reporting, tracking and resolution of disputes worldwide.

[redacted]

Initiating a Dispute by Phone

Cardholders who are uncertain how to submit a dispute should contact our Customer Service team by calling the number on the back of their card. The customer service specialist will walk the cardholder through the process to initiate a dispute. A dispute analyst will review the case and follow up with the cardholder. They have access to additional tools and information to facilitate the process, such as mediating a conversation between the cardholder and the merchant for immediate resolution which is often the best approach. This gives the analyst an opportunity to more fully understand the concern and better assist the cardholder. We recommend this process for more complicated disputes.

Online Dispute Initiation in PaymentNet

Users authorized by the State to initiate disputes in PaymentNet can do so using a prepopulated form. The user simply selects a dispute reason, follows the prompts to input additional information and clicks submit to transmit the form to our disputes department.

PaymentNet enables employees to track disputes initiated through PaymentNet online. Color-coded indicators on the transaction screen mark steps in the dispute process. After a dispute has been submitted, a yellow indicator appears next to the transaction. When it has been assigned to a dispute specialist and is actively being worked on, the indicator changes to red. After the dispute is resolved, the indicator turns green. Your program administrator can also run the Transaction Disputes by Hierarchy report to see the status of all open disputes.

Dispute Initiation by Email or Mail

We offer a standard form that cardholders can send to us via email or mail in order to initiate a dispute. Cardholders can also initiate a dispute via email without using the form. The dispute will be initiated when we receive the form, and a disputes analyst may contact the cardholder via phone or email for additional information. We will provide the standard form to your program administrator.

Cardholders should include his or her name and account number along with the transaction details of the disputed charge and their reason for disputing the charge. Details of any efforts they have made to resolve the dispute with the merchant on their own should be noted. Cardholders should also provide additional documentation, such as receipts, during the dispute resolution process.

Fraud Screening and Communication Process

Our fraud screening process is designed to protect our clients from fraud losses. Our communication process makes sure that the right person is contacted when we suspect fraud.

We provide fraud screening 24/7/365. As a result, fraud statistics for our commercial card programs are well below the industry average and a far lower rate than the fraud associated with consumer cards. This low fraud rate speaks to the strength of our fraud prevention practices, as well as our relationships with clients in establishing effective card controls.

Fraud Screening

Our team of experienced fraud prevention analysts uses specialized screening tools to constantly monitor transactions for suspicious activity and to aid in detecting fraud and minimizing losses. Our fraud detection systems are flexible and have the ability to target both general and specific fraud trends. Criteria or rules are defined based on analysis of data from current fraud trends:

- Fraud patterns
- Specific or high-risk Merchant Category Codes (MCCs)
- Dollar amounts and cash advances
- Geographic location
- Specific merchants and unusual purchases such as jewelry or electronics

Our screening process uses several indicators (including the trends listed above) to identify possible fraud. The categories we monitor include unusual purchases such as jewelry or electronics, high-risk MCCs and questionable geographic areas. Cash advances are also monitored for high-risk locations and large dollar amounts. Suspicious transactions are further identified based on details that include the authorization type, merchant type, location of recent fraud trends, account history, expiration date entered and decline reason. If authorizations meet these pre-defined criteria, the account is sent to a fraud handling queue or blocked for referral.

If requested, our Fraud team will provide a detailed walkthrough to the State's executives and program administrators explaining fraud performance in depth. This information includes collaboration with your program administrators to identify and implement ongoing improvements.

Fraud Communication

When a potentially fraudulent transaction is identified, a fraud analyst will evaluate the account's history and activity. If fraud is still suspected, the analyst will contact the cardholder to confirm card possession, verify the cardholder's two security identifiers on file and validate the transaction(s). Depending on the circumstances, we may continue to monitor the account for suspicious charges or suspend it temporarily to minimize potential fraud losses. If we suspect employee misuse of funds, we will contact the State's program administrator directly.

Enroll to Receive Notifications

Figure 48

Under most circumstances, a call is placed to the cardholder at the telephone number(s) on file, with messages left if contact cannot be made. After the first attempt, we will call the cardholder at both phone numbers and leave messages. If we are unsuccessful in reaching the cardholder after three attempts or if the phone number(s) on file is invalid, we will place a hold on the card and reach out to your program administrator.

As an option, cardholders can enroll to receive fraud alerts via text message or email. Fraud alerts notify cardholders when suspicious transactions are identified on their account and allows them to quickly reply to validate transactions.

[redacted]

Additional Fraud Protection

We offer clients our third-party fraud waiver and Visa and Mastercard's liability waivers for employee fraud to complement our fraud screening.

Due to the sensitive nature of fraudulent transactions, we require that fraud be reported by phone to an expert in our Fraud department. Reporting fraud by phone makes sure that all fraudulent transactions are identified as soon as possible. The card will be blocked and no further transactions can be processed, immediately stopping fraud attempts. There are also systematic processes to provide for timeliness of opening and resolving a fraud case, as well as requirements put in place by Mastercard. In most cases, we can provide a complete resolution in one call, which avoids multiple call-back attempts and saves time on resolving any open issues.

Cardholders can report fraud by calling the number on the back of their card or the direct fraud line at (888) 307-2990.

b. How will a cardholder dispute an item on his or her statement, or submit notice of an item believed to be fraudulent?

We recommend that the State initiate all disputes or fraud concerns via phone, as this enables our specialists to discuss the issue with the cardholder and provide the most comprehensive support. Cardholders can contact our Customer Service department by calling the number on the back of the card. Disputes can also be initiated online in PaymentNet or by email or mail. Dedicated personnel handle the reporting, tracking and resolution of disputes worldwide.

c. How is the pending dispute or fraudulent item notated on a cardholder's account?

When the State notifies us of a disputed transaction, the disputed item is removed from the balance during the investigation. A temporary dispute credit is issued while the dispute is being researched.

When a fraudulent transaction is reported, we will place a hold on the cardholder's account during the investigation. The card will be blocked and no further transactions can be processed to stop fraud attempts immediately.

d. How is a cardholder's account corrected if dispute is settled in cardholder's favor or transaction is confirmed fraudulent?

We will credit your account if a dispute is resolved in the State's favor. This credit is processed just like a transaction and will appear on your next statement. The suspended charge will leave the dispute status and payment will be due if the dispute is resolved in the merchant's favor.

For suspected fraudulent transactions, if the transaction is valid, we will remove the hold on the cardholder's account. If the transaction is not valid, it will be reported to the association. We will work with the cardholder to close the account and reissue a new number and card.

The merchant chargeback process is initiated after we are notified of fraud on an account. If funds are not recovered, fraud charges are either deducted from the State's rebate or we absorb the loss, contingent on your contract terms.

e. What is the timeframe for crediting the disputed or fraudulent item to the cardholder's account?

Dispute resolution typically occurs within 5 to 60 days of initiation, dependent on the nature of the dispute, and we regularly exceed our goal to resolve 65 percent of disputes within 7 days and 88 percent within 30 days.

In most cases when reporting suspected fraudulent transactions, we can provide a complete resolution in one call, which avoids multiple call-back attempts and saves time on resolving any open issues.

f. Does the Firm offer any program for eliminating/reducing card fraud?

Yes. Our team of experienced fraud prevention analysts uses specialized screening tools to constantly monitor transactions for suspicious activity and to aid in detecting fraud and minimizing losses. Our fraud detection systems are flexible and have the ability to target both general and specific fraud trends.

Criteria or rules are defined based on analysis of data from current fraud trends:

- Fraud patterns
- Specific or high-risk Merchant Category Codes (MCCs)
- Dollar amounts and cash advances
- Geographic location
- Specific merchants and unusual purchases such as jewelry or electronics

Our screening process uses several indicators (including the trends listed above) to identify possible fraud. The categories we monitor include unusual purchases such as jewelry or electronics, high-risk MCCs and questionable geographic areas. Cash advances are also monitored for high-risk locations and large dollar amounts. Suspicious transactions are further identified based on details that include the authorization type, merchant type, location of recent fraud trends, account history, expiration date entered and decline reason. If authorizations meet these pre-defined criteria, the account is sent to a fraud handling queue or blocked for referral.

If requested, our Fraud team will provide a detailed walkthrough to the State's executives and program administrators explaining fraud performance in depth. This information includes collaboration with your program administrators to identify and implement ongoing improvements.

g. What are the liabilities of the State and employees in the event of fraud, abuse, or loss of a card that is committed by a non-employee and not for the benefit of the State?

The State is protected from non-employee fraud if you contact J.P. Morgan immediately when you suspect a card has been lost, stolen, or compromised. Once notified, J.P. Morgan will promptly cancel the account. Subject to the terms and conditions outlined in our attached financial offering in Tab E: Schedule of Fees, the State will not be liable for fraudulent transactions made on that account. Merchants that do not follow transaction authorization procedures can be subject to chargebacks. If there are fraud losses, they are typically netted out of the program rebate opportunity.

i. If the State is not liable but a loss is incurred, would it impact the rebate, if any, paid to the State?

Subject to the terms and conditions outlined in our attached financial offering in Tab E: Schedule of Fees, the State will not be liable for fraudulent transactions made on that account. Fraud losses are not deducted from rebate.

ii. Confirm neither the State nor any State employee will be held responsible for charges incurred from a lost/stolen card if the loss is reported to the awarded Firm within five business days of the known loss.

The State is protected from fraud if you contact J.P. Morgan immediately when you suspect a card has been lost, stolen, or compromised.

h. **Is the Firm able to electronically notify authorized designees of unusual transaction activity at the individual cardholder level?**

Yes, cardholders can enroll to receive fraud alerts via text message, email or phone. Fraud alerts notify cardholders when suspicious transactions are identified on their account and allows them to quickly reply to validate transactions.

15. Reporting

a. **Describe the online reporting provided to cardholders and administrators.**

Through PaymentNet, the State can access a suite of standard reports to help you easily monitor and manage expenditures throughout your organization. These reports have been developed based on best practices and actual client usage, making them effective, practical and convenient. All reports can be run on demand or users can schedule reports to run automatically. Users can elect to receive an email alert when a scheduled report is available. The State can download the report in PDF, Excel or comma-separated values (CSV) format.

In addition to enabling the State to see what your cardholders purchased and from whom, PaymentNet's suite of standard reports addresses the following:

Program administrators Manage employees and accounts, review and approve transactions, assess policy compliance and analyze spend composition

Cardholders Run reports at the end of each billing cycle, review transactions and print data for expense reports

[redacted]

Additionally, PaymentNet enables the State to configure reports to meet your specific requirements. For example, a user can narrow the type of data, date range and hierarchy level of a standard report to show only the information you need for a particular analysis. The user can then save this instance of the report for future use. The system will also store completed reports for up to 35 days for employees who cannot access them right away.

This combination of features and flexibility makes PaymentNet a robust, user-friendly tool for meeting the State's reporting needs.

b. Identify whether the online reporting system provides real time information for transactions. If not, how long does it take for transaction data to become available? (Note: availability of real-time transaction information is a requirement of the State.)

The State's program administrators can view real-time authorization and decline information through PaymentNet.

Transactions are loaded into PaymentNet and available to users within two business days of merchant posting. The State's program administrators, auditors, cardholders and managers can view authorizations and declines immediately.

c. Is the State able to generate reports that are organization (Department or Division level, not across the entire Program) or cardholder specific? (Note: the ability to generate these reports is a requirement of the State.)

Yes. The State can create reporting at any level of your hierarchy from the top of the organization, to the department or division level, or to individual cardholders.

d. Is the State able to schedule on-demand ad-hoc reports?

Yes. PaymentNet's new Reporting module allows users to customize the contents and layout of reports and manage the reports they have created.

Using a redesigned interface, standard and custom reports are available and the State can access by: selecting a report on the Report List screen, running the report and retrieving the output from the Available Downloads screen.

The new Reporting module allows program administrators to:

- Define new reports from templates provided by J.P. Morgan, change the contents and layout of a report as well as specify the output format (PDF, MS Excel, or CSV)
- Customize reports by adding data elements from all reporting categories
- Sort and group report data and include calculations for subtotals, grand totals and counts
- Share customized reports with users across your organization based on their assigned roles; for example, you can customize and share a report only with cardholders
- Schedule reports to run on a regular basis or on behalf of other users
- Find reports using search capabilities and filter options on a redesigned Report List screen

Enable the Quick Run option to allow users to run any report from the Report List screen with a single click

Although only program administrators can build new reports, all users will work with their available reports using the new Reporting interface.

Reporting also offers powerful keyword search and filter capabilities. Cardholders will also be able to create and personalize new versions of their reports, adding filters and sorting the data as needed, and then produce the report in the format of their choice. They can run reports on demand (using the Quick Run button, if enabled) or schedule reports to run on a specific date or a recurring schedule.

[redacted]

Employee access to standard reports in PaymentNet can be modified by the State's program administrator based on the system roles assigned to each user type. Sensitive data in reports is also restricted based on the rights assigned to each user.

e. Confirm that the Firm can provide the reporting requirements provided in the table below.

Requirement	Yes/No
List of cardholders by State, organization, etc.	Yes
Detailed transaction listing by cardholder.	Yes
Detailed transaction listing by organization or unit within the organization.	Yes
Summary listing of activity by merchant type.	Yes

Requirement	Yes/No
Detailed listing of transaction by merchant type, cardholder.	Yes
Monthly listing of all cards reported lost or stolen, including date account was closed.	Yes
Listing of all accounts closed during the month and the date of closing.	Yes
Listing of all disputed transactions submitted by State organizations.	Yes
Daily listing of all declined transactions by organization, cardholder.	Yes
Listing of all authorized card users by account.	Yes

f. **In what formats, can these reports be downloaded? Are these reports downloaded from the web-based application? Are there alternative options for transmitting daily reports (i.e. FTP)?**

All reports can be downloaded from PaymentNet in PDF, Excel or CSV format. Certain types of reports can be set up for a file transmission.

g. **Validate the capacity to meet the file definitions provided in Appendix H for current file transfers.**

Yes. As an existing commercial card client with J.P. Morgan, the State currently receives the DP003 custom card file.

h. **Confirm the Firm's ability to provide cardholder test files to the extent where a testing database is provided to the central P-Card team to execute the triggers provided in Appendix H for creation of testing files for the cardholder data interface file.**

Yes. As an existing commercial card client with J.P. Morgan, the State currently receives the DP003 custom card file.

i. **Does the State have the ability to run reports to show activity for: daily, weekly, monthly, quarterly, yearly, and for a period between any two dates chosen by the central team end user?**

Yes. Reports can be run manually or scheduled to run daily, weekly, monthly, or by cycle. PaymentNet enables users to narrow the date range of a standard report to show only the information you need for a particular analysis. PaymentNet houses a rolling 24 months' worth of transaction data.

j. **Describe the electronic data available online that can be downloaded. In what format is information available?**

PaymentNet receives and displays all levels of transaction detail passed by merchants at the point of sale. All domestic locations are level I capable, and more than 1.4 million Visa and 6 million Mastercard merchants can send level II or level III information. Data typically included at each level is noted in the following table:

FEATURES	LEVEL I	LEVEL II	LEVEL III
Transaction amount	✓	✓	✓
Date	✓	✓	✓
Cardholder information	✓	✓	✓

FEATURES	LEVEL I	LEVEL II	LEVEL III
Exchange rate	✓	✓	✓
Merchant name	✓	✓	✓
Merchant city, state, zip	✓	✓	✓
Merchant category code	✓	✓	✓
Sales tax amount/VAT		✓	✓
Customer code		✓	✓
Street address, phone number		✓	✓
Small business status		✓	✓
MWDOB data		✓	✓
Tax ID/DUNS number		✓	✓
Item description			✓
Item quantity			✓
Cost per unit			✓
Item transaction amount			✓
Ship to/from			✓
Freight, duty			✓
Alternative tax			✓

Data fields available in all commercial card reporting systems (not just J.P. Morgan's offerings) are contingent upon the issuer, the card association, the merchant acquirer, the processor and system parameters. Some fields are standard and required, while others may be generated at the point of sale and fail to make it all the way to the commercial card reporting system. Still, other fields may not be recorded at the point of sale and will never contain information.

Downloading Reports

PaymentNet's user-friendly, intuitive navigation makes it easy for the State's employees to access and configure reports that meet your organizational requirements. Reports can be selected from a master list or by a reporting category (e.g., account, merchant, cardholder or transaction). Users simply specify the report name, output file type and any desired report criteria. After selecting necessary parameters, users can run finished reports and will be given the option of saving the customized criteria for future use.

Fields available for report customization include:

- Date ranges
- Display preference
- Levels of hierarchy

Ascending or descending order

Frequency of report generation

The State's program administrator can control report accessibility based on your established hierarchy, ensuring that sensitive information is limited to approved employees. All employee-specific reports are available only for that employee unless otherwise specified by your program administrator.

Report Formats

Reports can be viewed online at any time and downloaded in PDF, Excel or CSV format. Users can schedule a certain day to run reports or may run them manually on demand. PaymentNet also allows users to request an email notification when a report is ready to be downloaded or viewed.

k. Are workflow reports available to show an audit trail of specific activity, such as card review/approvals (name, date, activity) and temporary credit limit approvals?

Yes. PaymentNet has a full range of on-screen audit trails and features enhanced monitoring controls through extensive audit reporting. Auditing is available for transactions, accounts, employees, hierarchy, chart of accounts and payables. The State can view the last 20 changes made to any of these objects using the History screen. We offer standard reports for each of these objects and provide up to one year of data. Our system and reports show each individual change, including previous and new values, the user ID of the person who made the change and the time that the change was made.

l. Provide a demonstration of your Firm's online capabilities. Access to the demo can be by CD-ROM or online.

As a current client, the State uses and has access to PaymentNet's online capabilities. However, we would welcome the opportunity to provide a walk through to eh State's evaluation committee.

m. How can the State limit the ability to view information on an organization-by-organization basis (scoped viewing)?

The State's program administrator can control report accessibility based on your established hierarchy, ensuring that sensitive information is limited to approved employees. All employee-specific reports are available only for that employee unless otherwise specified by your program administrator.

[redacted]

[redacted]

Additionally, approvers and/or administrators can reassign approval tasks if the approver(s) have been set up previously and have the proper scope and authority to approve the request.

If a user is assigned more than one role, they can select the applicable role for each function and/or task. This allows the user to focus on the functions and tasks specific to the role selected. The user can toggle between different roles easily and quickly.

[redacted]

n. Describe the data that is captured by the online reporting system. Does the reporting system capture Level 3 data?

PaymentNet receives and displays all levels of transaction detail passed by merchants at the point of sale including level III data. All domestic locations are level I capable, and more than 1.4 million Visa merchants can send level II or level III information. Data typically included at each level is noted in the following table:

FEATURES	LEVEL I	LEVEL II	LEVEL III
Transaction amount	✓	✓	✓
Date	✓	✓	✓
Cardholder information	✓	✓	✓
Exchange rate	✓	✓	✓
Merchant name	✓	✓	✓
Merchant city, state, zip	✓	✓	✓
Merchant category code	✓	✓	✓
Sales tax amount/VAT		✓	✓
Customer code		✓	✓
Street address, phone number		✓	✓
Small business status		✓	✓
MWDOB data		✓	✓
Tax ID/DUNS number		✓	✓
Item description			✓
Item quantity			✓
Cost per unit			✓
Item transaction amount			✓
Ship to/from			✓
Freight, duty			✓
Alternative tax			✓

o. Describe the Firm's capabilities regarding interfaces with First State Financials. Elaborate on the ability to extract data in various formats from your system for analysis or to interface with the State's accounting systems.

Today, the State utilizes a Visa VCF transaction file to load transaction data to First State Financials on a daily basis. While we do not anticipate the need for any change to this process, J.P. Morgan does offer a variety of other file options as described below.

J.P. Morgan has extensive experience in mapping commercial card data. Our flexible technical integration capabilities will allow the State to import your transaction information into your ERP system daily, weekly, monthly or by billing cycle.

[redacted]

Standard Transaction File

Our standard transaction file is designed for clients that want to load data into their own systems without additional assistance from J.P. Morgan. This static, tab-delimited file is available within the PaymentNet user interface and contains more than 700 data elements, giving you access to a wide range of details, including transactions, merchants, chart of accounts (when applicable) and reporting hierarchy. If merchants have passed level III or enhanced data with transactions, that information is also included in the file.

This file option is available through the user interface, and may be created and generated through the mapper utility. We also provide technical resources and a developer's guide to help you easily map data elements.

[redacted]

16. Additional Benefits / No Cost Features

a. Discuss any no-cost benefits provided to cardholders (i.e. travelers' checks, emergency check cashing privileges, etc.)

At no cost to the State, J.P. Morgan provides your cardholders with one of the most comprehensive insurance and service offerings in the commercial card industry. Automatic coverage for cardholders using the J.P. Morgan Purchasing Card includes:

- Legal referral assistance
- Medical referral assistance
- Emergency message service
- Prescription and document delivery assistance

b. For employees using the card for travel expenses, what additional benefits (i.e. accident and lost baggage protection) are provided at no additional cost?

When a cardholder uses a purchasing card for travel purposes, the following benefits also apply:

- Primary auto rental insurance

Emergency transportation assistance

Roadside assistance

Pre-trip assistance

Lost luggage locator service

Emergency ticket replacement service

Emergency translation service

C. Electronic Payables (ePayables) Services

Currently, FSF does not have the functionality to handle comprehensive ePayables services. The following questions would allow the State to evaluate the feasibility of implementing a holistic ePayables solution and determine the allocation of resources needed to complete the project.

1. Describe the Firm's capabilities and experience with electronic payables solutions (virtual card and ACH payments).

[redacted]

[redacted]

2. How many customers currently use your Firm's electronic payables service? How many used the service as of December 31, 2017 and as of December 31, 2016?

[redacted]

3. Describe the Firm's involvement with the payment process. Discuss in detail any files that OST would need to prepare or transmit to the bank. Are separate files required for virtual card transactions and ACH transactions or can they be combined in a single file?

For batch payments of invoices from the State's PeopleSoft ERP system, J.P. Morgan is only involved once the invoice is in a ready-to-be paid state.

Single-Use Account Payment Instruction File

The State currently uses J.P. Morgan's stand-alone single-use account solution to disburse SUA payments. Once J.P. Morgan receives a payment request from the State's PeopleSoft ERP system, we will create a payment file and then send the confirmation directly to the supplier via email. Alternately, you can communicate payment and remittance information directly with your suppliers in accordance with your internal communication processes.

In addition to batch payments of approved invoices, individual single-use accounts can be generated in real time either manually through the PaymentNet interface or automatically via a system-to-system interface. Real-time SUA payments can be used for making e-commerce payments at the time of the order, making payments by phone, for airfare or hotel bookings or any other centrally procured and paid card transaction you can think of. In this way, Single-Use Accounts can reduce the State's dependence on purchasing cards, reducing opportunities for fraud and improving the control and reconciliation experience in the process. The State does not currently utilize this SUA real-time functionality.

[redacted]

4. Please provide a timeline or flowchart of the entire payment process, including the deduction of cash from an OST account and receipt of payment by the vendor.

[redacted]

5. What are the options for transmitting vendor payment instructions to the bank? What is the deadline for the transmission of these payment instructions for same-day processing?

The State should send J.P. Morgan its payment files before 4:00 p.m. CT for same day SUA creation.

J.P. Morgan will generate single-use account numbers within four business hours. If the payment file is received toward the end of a business day, it will be processed the next business day. In addition, the time that it takes for the supplier to process the payment may vary.

6. Once the Firm receives a payment instruction file, can the State instruct payments to be delayed and sent on a specific date or will payments be initiated immediate?

Single-use accounts can be assigned with controls over the start and end date.

7. What controls are in place to protect against lost files and duplications of transmissions? If duplicate files are sent, is there a penalty or potential issue?

Batch files are checked against previously processed files to ensure that duplicate files are not processed. This prevents duplicate payables from being generated and issued.

Because single-use accounts leverage a one-to-one match between your payment documents and payments, the State can easily avoid duplicate payments and facilitate automated reconciliation of all of your accounts payable activities.

Batch files are checked against previously processed files to certify that duplicate files are not processed. Files are considered duplicate when the Created Date Time field in the header record matches another file that was successfully processed within the past 35 days for the given organization and user ID.

As a best practice to help you avoid transmitting duplicate payments, after you send J.P. Morgan your payment file, we process it and then return a file showing the status of all payment requests. Your program administrator can then update your system accordingly.

8. How frequently can transmission files be uploaded to the bank for the issuance of additional payments? Is there a limit to the number of files per day?

Multiple files can be processed from a client each day. Multiple files should be sent at least 60 seconds apart to allow adequate time for processing, and each file should be uniquely named.

9. Does the Firm provide automatic file receipt acknowledgements?

Yes. After you send J.P. Morgan your payment file, we process it and then return a file showing the status of all payment requests.

10. Describe the Firm's ability to warehouse payment orders.

All reports available in PaymentNet can be generated with up to 24 months of historical data (audit data is archived after 12 months). We further maintain up to seven years of basic transaction information that can be retrieved by contacting your Relationship Manager, Greg Powell.

11. Describe the Firm's capabilities for delivering remittance detail to the payment recipient for each payment method. Is there an additional fee for this service?

The preferred method of communicating payment is for J.P. Morgan to email the payment information directly to the supplier. However, the State can also communicate the single-use account number directly to your suppliers, if that is your preference. Once the supplier receives the single-use account number and processes it, the transaction flows like an ordinary card transaction, with payment made directly into the supplier's bank account.

[redacted]

Invoices

Our solution has the ability to pass invoice data. You can choose whether to make one payment per invoice or bundle invoices. Our file format accepts up to 30 custom fields. Each one of these fields can be used to house invoice/line item detail.

12. Payments to Vendors by Merchant Card

a. Describe how vendor payments made by card are communicated to vendors. Are ghost cards or one-time use cards used for payment?

Single-use accounts have won out over legacy technologies like ePayables. Traditional ePayables solutions utilize automated ghost cards; a static account number that is assigned to each supplier and typically stored on file by the supplier for reference whenever a payment instruction is received. Automated ghost account solutions present control (the account number never expires), reconciliation (one account number for many payments), and flexibility (no real-time option) challenges for the buyer. Ghost accounts also pose significant reconciliation and PCI challenges for the supplier due to storing the account number on file.

Most often, our clients request that we send payment information directly to their suppliers via email. We encourage suppliers to set up secure email during enrollment. This is a one-time process and allows the supplier to receive remittance information and complete payment information (comprised of full single use account number, expiration date and three-digit security code). As an alternative, the State can communicate payment and remittance information directly to your suppliers following your own internal communication processes.

Single-Use Accounts are used for one-time payments to the State's vendors.

SUA Controls

Single-use accounts enable a high level of program security through the following inherent controls:

- One-to-one relationship of account numbers to payments
- The account credit limit equals the exact payment amount
- Each account is active for a defined time period (e.g., five or 30 days)
- The account authorizes for specific merchant category codes
- No cards are distributed to employees

[redacted]

[redacted]

[redacted]

b. Describe how suppliers receive payments.

Suppliers who are not on our merchant processing network process single-use accounts the same way they would any other credit card payment by keying information in their point-of-sale terminals.

Notification emails to your suppliers include details such as line items, payment amounts, validity dates and remittance information to support reconciliation within your internal system. Emails also include the last nine digits of single-use account numbers. Your suppliers will combine these digits with the seven digits they will be provided during enrollment to create a unique virtual credit card number.

[redacted]

c. Identify how authorization limits are determined or changed.

J.P. Morgan's Single-Use Accounts provide superior control over transactions, as each account is used for a single transaction and is only valid for that specific payment. The following controls can be assigned to each single-use account:

- Single, daily and/or monthly limits
- Credit limit to the penny
- Merchant category code (MCC) restrictions
- Number of authorizations
- Start and end date
- Dollar amount or percentage tolerance
- Estimated freight and tax

Several controls can be set within the State's ERP system. You can choose to have authorization controls remain static within your system or customize controls for each payment.

d. If the supplier reverses a payment, identify the impact on the available balance for the card.

If the single-use account number has been used (i.e., the payment has been processed), your supplier can submit a credit to offset the debit.

As a -use accounts. Single authorization requires suppliers to take the exact amount authorized by the State in a can still be applied to that account, they do not impact available balance.

-use accounts.

sis (as opposed to processing a single payment amount and then allocating it to individual invoices.) If a supplier processes a credit against a multi-authorization single-use account before taking the full payment amount authorized by the State, credits will impact the available balance.

e. Are there any reports that the State can access that identifies initiated, but unprocessed card payments?

Yes. Our user-friendly SUA Payables module offers increased visibility and efficiency. The SUA Overview screen is the new home page for the Payables module. This screen presents information about payables, vendors and the overall SUA Payables program in one centralized place. Benefits include:

- A streamlined experience for full visibility into SUA payables status, bringing relevant information to a single screen
- At-a-glance view of all payables that may require attention along with multiple configurations to view payables list
- Detailed vendor information (spend, updates, etc.) as well as data provided by suppliers via SUA Connection, our supplier portal

[redacted]

Figure 56

f. **If an email is sent to vendors, provide an example of the correspondence sent. Can the body of the email sent to vendors be customized by the State?**

Please refer to Appendix 14 for our Secure Email Fact Sheet. Clients are able to customize the body of the text, as well as the fields provided to the supplier. Notification emails can include up to 30 custom transaction fields. Reminder notifications can also be customized.

g. **If a vendor does not process a credit card payment, after how many days does the card number expire and can no longer be used?**

Your organization can determine the length of time within which a vendor must accept payment. Our recommended standard active account period is 30 days; however, active periods can range from one day to one year (i.e., 365 days).

If the single-use account is not processed within the time frame specified by your organization, the account will automatically close.

h. **Before the card number expires does your Firm's system send an automated reminder notice to the vendor informing them that they have a payment that has not been processed?**

The State can use PaymentNet to extend a payment's active period, as well as to create customized reminder emails for suppliers. These emails can be configured to be sent automatically within a certain number of days before an account's end date. In addition, you can use PaymentNet to track the status of each payment (including changes).

i. **Does your Firm offer a Buyer Initiated Payment (push pay) Program? If so, provide an explanation of how this service would operate. Does a different rebate schedule apply?**

[redacted]

[redacted]

Figure 57

Automated Settlement eliminates steps in the payment process, accelerating the transaction flow.

13. Payments to Suppliers by ACH

a. Does the State need to send a separate file for vendors receiving ACH payments or can these transactions be sent in the same payment instruction file as virtual card payments?

The State can send a single file to vendors receiving ACH payments, [redacted]

[redacted]

Additional benefits of this solution are detailed in the table below.

Benefit	Host-to-Host Payments Feature
Efficiency	Consolidates payment requests and simplifies the payment and e-collections process, reducing costs
Visibility	Manages file delivery and workflow in real time, allowing you to view initiation status and transactions
Compatibility	Integrates with ERP systems and leverages industry-standard formats and standard network protocols
Security	Designed to protect transaction privacy and authenticity to reduce the risk of payment fraud; also reduces human error and improves risk control

Host-to-Host Payments offers a full range of file formats and transmission protocols and supports most payment types offered by J.P. Morgan. Our solution also employs industry standard file formats, advanced communications and data security interfaces.

b. Does the payment instruction file need to include the payee's routing and account number details? If not, how does the Firm process the payment (i.e. a vendor code)?

[redacted]

c. Does your Firm assign a vendor code? Is the vendor code assigned by your Firm or do you use the State's unique vendor identification code?

The vendor ID code is assigned by the State.

d. Is your Firm willing to accommodate the State's preference to process ACH payments through its primary bank by storing and retaining routing and account information in OST's ERP system? If not, discuss why your approach is better for OST.

Yes, it is an acceptable option for the State to store and maintain their own bank account information, for payment instructions. Any third party processors would require special due-diligence review and approval by J.P. Morgan.

14. Vendor Enrollment

a. Discuss your Firm's approach in recruiting vendors on the State's behalf to your Firm's electronic payables platform.

We help you drive adoption and capture more spend, combining our large supplier network, extensive recruitment experience and broad acceptance base. As part of your campaign management service, we help convert targeted suppliers from their current payment type to rebate-generating plastic and/or virtual card payments like Single-Use Accounts (SUA). Further, if suppliers are resistant to commercial card payment options, we can use the recruitment process to also identify suppliers willing to accept ACH payments in lieu of checks.

[redacted]

[redacted]

[redacted]

b. What are the steps for signing up a vendor? Does the Firm have an online self-enrollment internet portal for vendors to register?

Recruitment specialists initiate the acceptance process by sending confirmation email messages to suppliers. To formally accept, each supplier clicks on the acceptance link embedded within the confirmation email. They are directed to the State's landing page where they will then click Submit' to confirm their acceptance to receive single-use account payments from the State. Suppliers only need a standard point-of-sale terminal used to process credit card transactions - to accept single-use account virtual card payments.

[redacted]

Figure 60

To further support the supplier acceptance process. J.P. Morgan provides sample communication materials the State can customize according to your needs.

[redacted]

[redacted]

[redacted]

c. **Identify the number of suppliers your Firm currently has enrolled. Please specify the number of vendors currently receiving card payments vs. ACH payments.**

[redacted]

d. If a supplier is already enrolled with your Firm's payables platform, can these vendors be paid immediately or does your vendor enrollment team have to contact the vendor first? Is the process the same for ACH and card payments? If not, describe the differences.

Suppliers typically only agree to guaranteed acceptance of monetized payments when the timing and cost of payment can be guaranteed. For example, a supplier may only agree to accept payments if they occur within 10 days of invoice approval with a guaranteed fixed cost. This is easier to do with large and strategic suppliers where the cost and method of payment has been contractually agreed upon. The majority of suppliers that participate in spend monetization programs are small to mid-sized and governed by net terms. Acceleration of payment with these smaller suppliers is often challenging due to existing manual and/or decentralized invoice processes.

As a result, like our competitors, we contact all vendors to discuss their willingness to accept SUA payments from a specific client.

Non-monetized ACH payments (straight-ACH) do not have this requirement and once a vendor is ACH payments from the State as well set up on a network to accept ACH from other buyers, they should be able to accept as without additional setup.

e. Who makes outbound phone calls to vendors (i.e. employees of your bank or a third-party)? Will a specific individual or a team of individuals be assigned to the State?

J.P. Morgan's Recruitment Specialists communicate with the suppliers targeted for the State's virtual Single-Use Account (SUA) program. We offer contact via phone and email based on the supplier information you have available. We recommend the State be involved in the communication with your most strategic suppliers.

[redacted]

[redacted]

f. **How many professionals on the vendor outreach teams does your Firm employ? For these individuals, what percentage of their time is dedicated to vendor outreach calls or activities?**

[redacted]

g. **Is the vendor outreach team empowered to sign up the vendor or is it handed off to another department?**

Recruitment specialists are empowered to sign up vendors.

h. **Will your Firm provide vendor payment information (i.e. contact person, e-mail, address, phone number, routing and account number) to the State?**

We do not capture or require routing and account number information for SUA payments as the banking relationship is with the card accepting supplier's merchant processor. During the enrollment process, we do capture the vendor's email address and provide this information back to the State. All supplier information is stored and maintained in the State's ERP or payment system. Relevant details for payment such as supplier name, email address and remittance are passed to J.P. Morgan in the payment instruction file. If you choose to have remittance information emailed to your suppliers by J.P. Morgan on your behalf, a State From email address is used. This helps ensure that any bounce-back email is sent to the appropriate contact in your organization.

i. **How quickly does your Firm anticipate reaching out to the State's vendors? How many vendors do you plan to reach out to in 3 months? In 6 months?**

We can handle campaigns of any size, so depending on the number of suppliers, we have an average campaign completion of 12 weeks. This is also dependent on the data we are provided by the client; the more contact information we have, the more effective our outreach will be. For the vendors we do not have information for, we will enrich the data through several sources to find contact information.

We have partnered with the State on multiple campaigns and stand ready to begin the next at the conclusion of this RFP process. As a best practice, we recommend running a campaign every 12 to 18 months.

j. **Based on the vendor file provided in Appendix I identify the number of vendors, transaction and dollar amount, that your Firm thinks will likely accept the State's electronic payables program within 6 months? Within 12 months? Please specify what you expect to convert to ACH versus card payments.**

[redacted]

k. **What policies or procedures would your Firm recommend the State adopt to maximize vendor acceptance of OST's electronic payment options?**

[redacted]

I. **Provide two specific examples of a successful implementation for a client. What were the organization's issues, solutions, and results of this implementation?**

[redacted]

[redacted]

D. New Services & Ideas

1. What additional ideas or services can your Firm offer that will improve or enhance the State's purchasing card or virtual card program? These can include, but not be limited to:

   a. Alternative payment programs

[redacted]

[redacted]

Figure 62

Card Security Features

Our cards comes with a variety of security features that include validation numbers on the back of each card and chip technology.

Visa developed the card verification value (CVV) system to help prevent alteration or misuse of card data and to enhance verification of the card and cardholder. The CVV comprises three digits encoded in a card's magnetic stripe. The CVV2 is a three-digit numbers printed on the signature panel on the back of the card. For Internet, telephone and mail orders, cardholders can provide this three-digit number to merchants for verification purposes.

Chip Technology

In addition to enhanced security, chip cards promote broader acceptance with merchants internationally and in the U.S. as chip technology is more widely adopted by merchants.

Embossing

In addition to protection from external misuse, we also offer the ability to provide a card design that will distinguish the State's purchasing cards from a cardholder's personal cards. We are also happy to continue embossing either Purchasing or Travel on the State's plastics to help ensure the cardholder uses the proper card at all times.

c. Advances in fraud detection

We have recently launched our new cardholder fraud alert notification process. Cardholder enrollment is voluntary, but strongly encouraged as a further protection against fraudulent activity. Through this process, cardholders can enroll online to receive fraud alert notifications via email, text or phone. The alerts will go out to enrolled cardholders when suspicious activity is detected on a cardholder's account. The cardholder can respond immediately to indicate whether the activity is valid, minimizing the disruption of card usage due to suspicious activity.

d. Specialized customer services

In addition to the direct support we provide to Program Administrators and cardholders, the State will benefit from our dedicated Supplier Support Team, which is available to provide your vendors with extensive pre and post enrollment support. The Supplier Support team will guide vendors through details of what to expect and how to accept SUA payments.

[redacted]

Figure 63

e. Timesaving items on billing statement

Cardholders can use PaymentNet's online statement functionality to view electronic versions of their statements. Statements are available for viewing within two business days after the billing cycle ends, which means there is no need to wait for hardcopy statements in order to make payments. The State has the opportunity to earn higher rebates associated with faster payment by receiving billing statements earlier.

Cardholder access to the online statement feature is granted by the State's program administrators.

f. Specially created and informative management reports

[redacted]

Figure 64

Program Administrator Dashboard

Each time you log in to PaymentNet, the Program Administrator (PA) Dashboard displays on the Welcome screen to give you a quick snapshot of information about accounts, cardholder transactions and users.

The following figure shows an example of the PA Dashboard on the PaymentNet Welcome screen.

[redacted]

Figure 65

You can set the default hierarchy, tab and corporate accounts for the PA Dashboard by editing your user profile. Refer to the PaymentNet Online Help for detailed information about the PA Dashboard.

g. Vendor relations and marketing

SUA Connection, available for PaymentNet programs, makes it easy for your suppliers to process and track SUA payments. A user-friendly online resource, SUA Connection empowers suppliers via:

- Full visibility into SUA payment status
- Intuitive user interface to simplify payment processing and tracking
- Self-serve options to minimize missed/expired payments and improve days sales outstanding (DSO)
- Easy access to aggregate remittance data to streamline reconciliation
- Supplier-defined profile, preferences and user access control to help ensure tailored support

SUA Connection is easy to navigate and offered to suppliers at no additional cost.

[redacted]

[redacted]

[redacted]

Figure 67

[redacted]

Figure 68

2. Does the Firm currently have or will offer in the near future, mobile banking services (i.e., via cell phone, tablet, laptop, etc.) to view transactions or perform administrative functions? If so, is there a cost associated with this service?

Yes. Cardholders can access PaymentNet whether in the office or on the road to manage and monitor their transactions. J.P. Morgan's Commercial Card Mobile site enables cardholders to easily view balances, filter and sort transactions, access real-time authorizations and declines, as well as make a payment through their mobile device. Support is provided for the most widely used smartphones and mobile devices (i.e., Apple, Android, or Blackberry devices), with stability and security as a top priority.

[redacted]

Figure 69

Users can also Access Online help while logged in or call our Customer Service department with any questions.

3. Provide any additional information that your Firm believes to be pertinent but not specifically requested elsewhere in the RFP.

As part of our ongoing commitment to innovation, our product development teams are continually improving and expanding our product capabilities to meet both client and market needs. Our current single-use account roadmap is focused on enhancing the client and supplier experience. We are in the process of developing features such as simplified supplier management tools and an enhanced online experience in PaymentNet.

J.P. Morgan is committed to maintaining our position as an industry leader in this space, and our experience and expertise in providing electronic payables solutions for more than 11 years enable us to offer optimal options for our clients and their suppliers.

[redacted]

Figure 70

4. **Provide any additional ideas or suggestions your Firm feels could improve the State's purchasing/virtual card program. Specifically, (a) growing the State's vendor acceptance of both programs, (b) new services that will benefit the State, (c) services the State could discontinue or replace, and (d) implementing best practices.**

(a) Growing the State's vendor acceptance of both programs

[redacted]

[redacted]

[redacted]

[redacted]

E. Implementation / Conversion

1. Provide a detailed conversion plan for transitioning the State's existing purchasing and virtual card programs to your Firm. Include the estimated length of time for the transition and the amount of effort required by the DOA's staff.

Because the State is a current J.P. Morgan commercial card client, you will not need to go through an implementation process for your purchasing card and single-use account programs.

As you move forward in evaluating our competitors' proposals, it is important to consider the very significant expense that the State could incur by implementing an entirely new program. Remember that no new implementation will be required for your existing purchasing card and SUA programs. Additionally, our financial benefits will not need to be earmarked to cover implementation expenses and other costs of change. Furthermore, by continuing to collaborate with J.P. Morgan for your card program, the State will be able to focus on realizing added value through growth opportunities and expert consultation services.

[redacted]

2. What are the general steps in implementing an ePayables program for the State? What resources will be needed from the State? (Note: ePayables in this RFP is defined as the ability for the State to create and send a single file with vendor payments to be made by either virtual card or ACH.)

The State has already implemented the Single-Use Account services with J.P. Morgan. Implementing the additional ability to send a mixed payment file (including ACH, check, wire, SUA and other payment types) via Host-to-Host Payments would follow the same high-level implementation process as for other general banking services.

For Host-to-Host Payments, an implementation project manager, [redacted], will be [redacted] have end-to-end ownership and accountability of the implementation. He will be responsible for communicating regularly with you and coordinating activities across the bank. He will lead regular, often weekly, meetings to share information and measure progress.

[redacted] will engage additional J.P. Morgan resources such as your relationship team, our industry solutions experts and others, to collaborate with you to validate the solutions you have requested. Once the solution has been scoped, he will establish timelines for implementation and coordinate with the necessary teams across your organization and J.P. Morgan to complete the setup.

[redacted]

3. If the State implements an ePayables program as mentioned above, does the State have the ability to add check payments to this same file in the future, and have the bank print and mail physical check payments?

Yes. [redacted]

[redacted]

4. Based on the State's implementation expectations provided in Section II. Background, how would your Firm work with the individual State agencies to transition this service to your Firm?

Because the State is a current J.P. Morgan commercial card client, you will not need to go through an implementation process for your purchasing card and single-use account programs.

For each agency implementing our Host-to-Host Payments solution for ePayables, your implementation manager, David Fleshel, will engage additional J.P. Morgan resources such as your relationship team, our industry solutions experts and others, to collaborate with you and the agency to validate the solutions requested. Once the solution has been scoped, he will establish timelines for implementation and coordinate with the necessary teams across your organization and J.P. Morgan to complete the setup.

[redacted]

5. Who will be responsible for coordinating the transition? If a conversion team is used, how will the State's account be transitioned to the ongoing client service team?

Because the State is a current J.P. Morgan commercial card client, you will not need to go through an implementation process for your purchasing card and single-use account programs.

For implementation of our Host-to-Host Payments solution, [redacted] will manage the transition process. Further information regarding [redacted] role, responsibilities and background are included in our response to Component 1: General Banking Services.

6. How are implementation managers or implementation teams assigned (i.e. availability, geographically, complexity of the transition)?

Because the State is a current J.P. Morgan commercial card client, you will not need to go through an implementation process for your purchasing card and single-use account programs. If any implementation for card services is ever needed, the State can be confident that we will provide your organization with the most appropriate personnel to staff your account team based on their experience and industry knowledge, location and availability. J.P. Morgan's goal is to ensure that we provide our clients with the full support you require to establish best-in-class programs.

Should the State adopt our Host-to-Host Payments solution, a Treasury Services implementation manager, [redacted], will lead the transition. The Government Banking implementation team operates out of several locations throughout the U.S. Assignment is generally determined by deal capacity at the time the business is awarded; however, we try to assign someone in close proximity to the client whenever possible. The Senior Implementation Project Manager assigned to this request, regardless of office location, would be able to support a complex onboarding

7. Indicate the Firm's plans for initial and ongoing education and training of DOA and State agency employees in the use of your Firm's systems.

To meet the State's training needs, J.P. Morgan offers tailored introductory sessions and ongoing supplementary webinars as well as a variety of educational materials to support all program users.

[redacted]

J.P. Morgan supports one of the only dedicated training teams in the industry. Our curriculum includes live, instructor-led sessions tailored to your needs and conducted onsite at your location or via webinar.

Delivering our training courses through customized webinars allows for a virtually unlimited number of participants and makes it easy to accommodate scheduling preferences without requiring attendees to travel, obtain special equipment or arrange for large meeting spaces.

For your initial training on any new programs added to your existing program, one of our expert trainers will consult with the State's program administrator, in collaboration with the J.P. Morgan implementation team, to perform a needs assessment and create a webinar based on your goals and existing processes.

For ongoing training, our training team members will continue to provide assistance throughout the life of your program through the following:

Supplemental Tailored Training Sessions

J.P. Morgan does not limit individualized training to one initial session. The State can request additional tailored webinar training sessions for your organization by simply contacting your relationship manager or a program coordinator. Our experienced training team will assess your specific requirements (for example, adding a new location or training new program administrators) and will then create a session that meets your needs.

Monthly Topical Webinars

The State is welcome to participate in our monthly training sessions, which are designed to enhance your knowledge of commercial card programs and the card industry. These sessions cover a range of topics, including:

- Updated information on PaymentNet features
- New details on our programs and services
- Industry trends
- Best practices

Session invitations will be conveniently posted on your PaymentNet Welcome screen, and we offer morning and afternoon sessions for flexible scheduling. Each session lasts about an hour. Attendees are polled at the end of the session regarding desired topics for upcoming sessions, enabling you to help drive the direction of future calls.

8. Identify potential issues and risks to the State's implementation of a new purchasing/virtual card and ePayables program. Identify the appropriate steps to avoid or mitigate these risks.

Because the State is a current J.P. Morgan client, you will have the advantage of avoiding common implementation risks associated with converting to a new Purchasing Card or SUA program.

9. Describe the recommended process for data conversion and migration of the existing 4,700 cardholders that the State expects to convert to the new card administration system. Where and when does this task/subtask fit into the overall project workplan? Identify State and Vendor responsibilities for these activities.

Because the State is a current J.P. Morgan client, you will not need to go through any implementation process

10. Describe the post implementation support that will be provided for the Delaware Procurement Card Program. Include the philosophy and approach to providing the technical and functional post implementation support requested and identify the resources it would make available to the State to provide this support.

Our service structure is composed of experienced commercial card experts and is designed to make sure we provide the customized support and central points of contact our clients require at all organizational levels, from senior management to program administration to cardholders.

J.P. Morgan Service Model

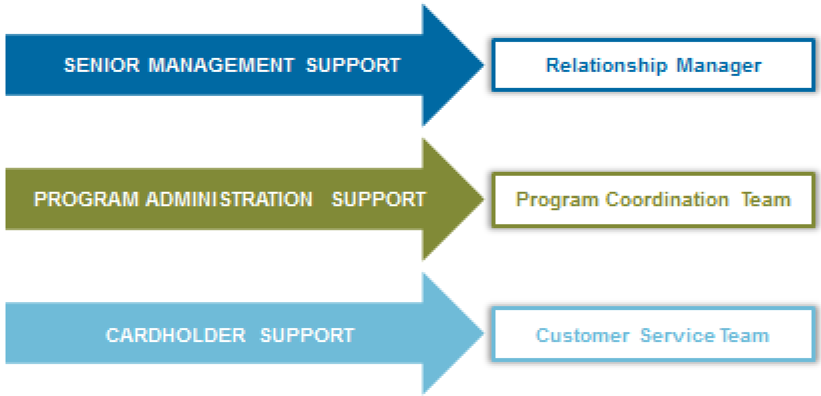

Figure 72

Our service model is designed to give each area of the State's organization the specialized support you need.

Management Team Support

To maintain a successful card program, the State needs access to industry best practices, as well as a variety of customized financial services and solutions. Your management team can continue to turn to your designated commercial card relationship manager, Greg Powell, for strategic advice, assistance with key features and tools and help with any program-wide issues that may arise. You will also have ongoing access to your local treasury and banking representatives Michael Pressman and Bill Zuk to leverage resources throughout J.P. Morgan.

In addition, on contract award, the State will be assigned an implementation project manager to help you roll out your program. This individual leads an experienced team that will leverage our proven methodology to make your program deployment as smooth and seamless as possible by working closely with you to design and implement your commercial card program using a comprehensive approach that is specifically tailored to your objectives.

Program Administration Support

Supporting your program administrator and Commercial Card relationship manager, Phil Snavely is your designated program coordinator (DPC). Phil will continue to assist with account management inquiries, operations requests and technical issues. He maintains access to your organization's program files and program-specific information to help deliver prompt, efficient service.

The State will also continue to benefit from dedicated support teams that are aligned with each relationship manager and serve as backup to your DPC.

These smaller support teams are designed to promote more efficient interactions in the event that your DPC is unavailable. Rather than being directed to a randomly selected service specialist according to capacity, your calls will be handled by a reduced pool of experts familiar with your business. By serving clients as a unit, extended members of the Program Coordinator team are able to become service experts for an entire client set.

This program coordinator support is further augmented by 24/7/365 customer service assistance, which is available to both program administrators and cardholders.

Cardholder Support

The State's cardholders receive 24/7/365 support from our commercial card call centers. Our customer service specialists are available to answer questions, resolve issues and make sure your employees have access to the support resources they need whenever and wherever they do business. Our service personnel are held to some of the highest standards in the industry and our service organization is entirely dedicated to commercial card support Customer Service team members do not handle consumer cards or other bank products. All customer service is conducted domestically we do not offshore support. We have two call centers with 100 customer service specialists dedicated to servicing our Commercial Card clients.

11. What type of training is available for all current and potential purchasing card users? Include the availability of training in the following formats: webinars, on-site and job aids. Also, describe any training resources that will be available for the State to use to train new end users on an ongoing basis after initial implementation.

J.P. Morgan supports one of the only dedicated training teams in the industry. Our curriculum includes live, instructor-led sessions tailored to your needs and conducted onsite at your location or via webinar.

Delivering our training courses through customized webinars allows for a virtually unlimited number of participants and makes it easy to accommodate scheduling preferences without requiring attendees to travel, obtain special equipment or arrange for large meeting spaces.

Trainings are designed for program administrators; however, as part of these sessions, a trainer will also address cardholder functionalities and make sure program administrators are prepared to educate cardholders on our user-friendly systems. In addition, we provide resources for cardholder training and advice on best practices.

New Program Administrator Training

Invitations will be sent via email to new program administrators for existing clients. These specialized training sessions lasts 90 minutes and focus on common administrator topics, such as PaymentNet hierarchy setup, reporting and managing cardholder limits. This training is an invaluable resource for new program administrators, giving them the extra instruction they need to feel confident in their roles.

Training Resources

J.P. Morgan posts a variety of educational materials in PaymentNet to help ensure that all program participants have quick, easy access to information about the tools they are using and the tasks they must complete. Available resources include the following:

- **PaymentNet user guide**: The guide walks users through PaymentNet functions step-by-step and contains comprehensive details about the more than 100 reports offered in the system.

Quick reference cards: Our quick reference cards contain instructions for frequently used PaymentNet processes in a user-friendly format; versions for program administrators and cardholders are provided.

Help files: Context-sensitive help files address common questions and technical features and can be viewed at any time and from any page in PaymentNet.

Import file templates: Your program administrator can leverage several Excel templates to assist you in importing data such as your chart of accounts or hierarchy changes.

Product release notes: When we update or enhance our products, we keep you informed about these modifications through detailed release notes.

J.P. Morgan can also offer marketing sheets and product brochures to help the State promote and manage your program. Our wide range of reference materials can significantly reduce your program administrator's workload by providing immediate answers to questions posed by infrequent PaymentNet users and serving as a starting point for self-directed refresher training for any user or group.

Making certain that our clients have the education, information and support necessary to maximize your commercial card programs is a primary focus for J.P. Morgan, and we look forward to consulting with the State to implement a training plan that will achieve your unique objectives.

12. The awarded Firm will be responsible for providing help desk operations to support the new Delaware Procurement Card Program. The implementation will have an impact on the demand for and delivery of help desk services. The Firm will be responsible for providing help desk operations to support the State. Describe the following:

a. Coordination of the State help desk with training activities;

Because the State is a current J.P. Morgan client, it is unlikely that your help desk will require any further training on PaymentNet. However, the State can request webinar training sessions for your organization by simply contacting your relationship manager or a program coordinator.

b. Recommended help desk software tools;

PaymentNet is a fully hosted online solution that requires no client-side software and is accessible from virtually any secure Internet browser; therefore, there are no software tools required to access our solution.

c. Training to be provided to the State help desk agents;

The State can request webinar training sessions for your organization by simply contacting your relationship manager or a program coordinator. Our experienced training team will assess your specific requirements and will then create a session that meets your needs.

d. Suggested escalation procedures;

Please refer to Appendix 16 for our Escalation Process.

e. **Interim staffing for peak help desk demand periods and transition to a permanent arrangement; and**

Because the State has an existing commercial card program with J.P. Morgan, it is unlikely that your help desk would require any additional training. It is important to note that our customer service representatives are available to the State 24 hours a day, 7 days a week and 365 days a year to answer questions and resolve issues. Our specialists are dedicated solely to commercial card and do not handle any other bank products.

f. **Development of a help desk knowledge base.**

The State can request webinar training sessions for your organization by simply contacting your relationship manager or a program coordinator. Our experienced training team will assess your specific requirements and will then create a session that meets your needs.

F. Pricing

1. Settlement and Billing System

a. **Describe the Firm's basic system for billing. Examples and samples are encouraged.**

J.P. Morgan offers central billing and payment for purchasing card and single-use account programs. Under this structure, the State's accounting department will receive a central invoice and make one payment to J.P. Morgan. Individual cardholders can receive online statements that contain transaction details but show a zero payment due on the individual account.

[redacted]

b. **Discuss the Firm's adaptability of its system to organization requests for changes, such as additional data elements, characters, or control numbers.**

Responsiveness to client requirements is of paramount importance to J.P. Morgan. We analyze each client request, including an assessment of implementation requirements and timeframes. Although prioritization and deployment may be dependent on various factors, we are committed to finding solutions for clients in the most expedient manner possible.

Because PaymentNet was developed and is maintained in house, we have full control over the enhancement process.

c. **Provide an example of a cardholder billing statement format and displayed information.**

[redacted].

d. **Who has the ability to view and download cardholder billing statements?**

Cardholders and Program Administrators can view and download statements online through PaymentNet. Cardholder access to the online statement and payment feature is granted by the State's program administrators.

e. **What are the available options to add other recipients/parent organizations?**

Cardholder access to the online statement and payment feature is granted by the State's program administrators. Other users, such as Agency Coordinators or

Program Administrators, can also be granted access to see cardholder statements that would be within their area of responsibility.

f. What billing cycles are available?

The State utilizes a 30/14 billing and settlement period today. That said, J.P. Morgan offers a wide range of billing cycle closing dates, allowing the State to select the date that is most appropriate for your calendar. This date can vary for each subsidiary that has its own accounting system. Billing runs on a 30-day cycle with payment due 14 days after the end of the cycle. There are several flexible payment options, with shorter payment cycles tied to reduced credit exposure and improved rebates.

g. How will the State receive billing statements? Are they available electronically? (Note: electronic billing is desired by the State).

Yes. Users can use PaymentNet to review statements and remit payment online. This payment vehicle also debits directly from approved checking or savings accounts.

Reissuing Statements

If users need statements reissued, they can access PaymentNet (for a rolling 24-month period), where they will remain until purged by the State. There are no fees associated with this service. J.P. Morgan's customer service team can also assist with statement requests.

Statement Reports

PaymentNet can also generate several standard reports that contain all transactions made during a billing cycle:

Statement of Account: This report provides a listing of previous cycle transaction information as well as accounting code allocations, transaction notes, custom fields and transaction addendum detail when available.

Transaction Summary by Hierarchy: This report provides summary information on spend by hierarchy and cardholders within a defined cycle/period. It includes the dollar amount and the total number of debits and credits and the aggregate total of all debit and credit transactions and dollars.

Reports can be scheduled to run on a recurring basis or on demand. Note that transaction reports are not official bank billing statements and cannot be used for remittance purpose

h. What are the payment terms from statement date ?

Standard purchasing card and SUA payment is due 14 days from the statement date. Early payment may result in a higher rebate.

Please refer to the financial proposal for the payment options that are available to the State.

i. How soon after the billing cycle ends are statements available? Can statements be available electronically the morning following the billing cycle end date?

Statements are available online in PaymentNet within two days after your billing cycle closes.

j. Is the Firm able to provide a monthly invoice for all statewide charges and credits transacted in the statement period? If so, in what format is this information available?

Yes. Statement information is collected and stored by the processor during each billing cycle. On each billing date, as chosen by the State, an account statement is generated by the processor. The statement, or data reflected on the statement, is then available to the State either online in PaymentNet. The statement information provides the user with a record of specific, detailed information regarding the account, as well as activity posted to the account during the billing period.

Information provided on the statement includes data pertaining to credit limit, previous and new balances as well as a listing of charges, payments, and other debit or credit adjustments.

k. Is the Firm able to provide a detailed electronic report of all statewide transactions to support the summary invoice, available the first morning following the end of the billing period? If so, in what format is this information available?

Yes. PaymentNet can generate several standard reports that contain all transactions made during a billing cycle:

Statement of Account: This report provides a listing of previous cycle transaction information as well as accounting code allocations, transaction notes, custom fields and transaction addendum detail when available.

Transaction Summary by Hierarchy: This report provides summary information on spend by hierarchy and cardholders within a defined cycle/period. It includes the dollar amount and the total number of debits and credits and the aggregate total of all debit and credit transactions and dollars.

Statements are available online in PaymentNet within two days after your billing cycle closes though other reporting is available the morning after a cycle ends.

Users can schedule a certain day to run reports or may run them manually on demand. Reports can be viewed online at any time and downloaded in PDF, Excel or CSV format. PaymentNet also allows users to request an email notification when a report is ready to be downloaded or viewed.

l. By what payment methods (ACH/Wire/Check) will the Firm accept monthly payments by the State?

[redacted]

Payment options are driven by the billing and payment setup rather than program type. Please note that ACH payments must be formatted according to Commercial Card's specifications to provide for timely and accurate processing.

Programs that are setup to consolidate billing on one or more central bill accounts can also take advantage of the following payment options:

Central Bill/Central Pay

ACH CCD: The Cash Concentration and Disbursement (CCD) payment type is used when initiating payments from a corporate or business deposit account. This option is for a single ACH payment made to a single account typically a central bill account.

ACH CCD+: CCD+ signifies that a CCD has a single addendum record. This option is for a single ACH payment made to a single account, typically a central bill account.

ACH-CTX: A Corporate Trade Exchange (CTX) payment is typically used when a company makes payments to programs with multiple accounts. CTX is the ACH payment type and it contains an EDI 820 transaction set in the addenda records. It is commonly referred to as a CTX 820, or a Financial EDI payment. ACH CTX sends one lump sum payment to be allocated to one or more centrally billed accounts with funds and remittance detail provided together.

Online: Users with authority granted by their program administrator may use PaymentNet to make payments on their account. Payments can be scheduled on a recurring basis or can be created as-needed. You can also setup a payment instruction for an individually billed or central bill account. The payment generates an ACH transaction to withdraw funds from the designated DDA account.

2. Rebate Schedule

a. Provide a rebate schedule for card activity at various usage levels up to $500 million.

[redacted]

[redacted]

[redacted]

b. Describe any other factors, such as average transaction size, file turn, etc., that affect the rebate amount.

Please refer to question 2.a. above.

While not a direct factor in rebate calculation, we do monitor Spend per Card as an important measure of the expenses associated with your card programs. To illustrate, imagine a card program that spends $1 million annually using only one card vs. a program that spends $1 million dollars annually using 10,000 cards. The latter would be vastly more expensive to the bank while generating the same revenue as the more efficient program.

To that end, we have crafted our financial proposal with the expectation that the State will not materially reduce the efficiency of its card programs and have included the bullet below to our Terms & Conditions:

[redacted]

c. Describe how speed of payment is calculated.

File Turn is calculated as the Average Balance divided by Total Charge Volume multiplied by the number of days in the period.

d. Identify any exceptions to the rebate schedule (i.e. large dollar items, etc.) Specifically define what constitutes a large dollar item.

Please see our response to item 2.a. above for a discussion of Large Ticket.

Categories that do not qualify as spend for rebate purposes include the following:

- Annual fees, finance charges and other fees or charges posted to accounts (e.g., late fees, returned check fees, cash advance fees, collection costs and administrative fees)
- Convenience checks, cash advance transactions and fees
- Fraudulent charges reported to a lost or stolen card or unauthorized charges posted to accounts

Large-ticket interchange (LTI) is a discount (preferential pricing) given to suppliers for processing certain transactions. These discounts are given only for larger transactions, if the supplier passes level III enhanced detail. Discounted fees for large-ticket transactions encourage suppliers to accept credit cards for larger purchases. This gives the State the ability to expand your purchasing card and single-use account programs and to streamline your purchasing processes.

A merchant benefits from LTI pricing if the transaction exceeds a break-even' point (dollar amount). A merchant's acquiring bank determines whether to submit a transaction for LTI rates. The only accurate way to determine if your vendors are receiving a discounted LTI rate is to contact them directly.

Visa

Visa's LTI program has the following specifications:

- Merchants are required to pass level II and level III (line-item detail) enhanced data.
- The program applies to U.S. large-ticket purchases only.
- The break-even point is roughly $7,755. At this point, the marginal cost of interchange under LTI lowers as the transaction size increases (relative to standard Level III rates).

Mastercard

Mastercard's LTI requirements vary slightly based on merchant location.

Merchants within the United States

The transaction can be conducted within any Mastercard commercial card program.

The transaction must be submitted with a merchant category code (MCC) other than airline, vehicle rental, passenger railway or restaurant.

Commercial large-ticket addendum data requirements (level III) must be satisfied.

Each transaction amount must be more than $7,255.01.

Merchants Outside the United States

The transaction must be conducted on a Mastercard purchasing card or fleet card.

The transaction must be submitted with an MCC other than airline, lodging, vehicle rental, passenger railway or restaurant.

Inter-regional commercial purchasing large-ticket addendum data requirements must be satisfied.

Please also refer to Tab E, Attachment 4 to evaluate our schedule of fees for other integrated payables services.

e. Address additional proposed incentives to include signing bonuses.

[redacted]

f. Will the same rebate schedule apply for purchasing card and virtual card payments?

Yes.

3. Fees to the State

a. Identify all fees/charges that would apply to international transactions.

International transactions incur [redacted] that originates at Visa/MasterCard and is passed through by J.P. Morgan.

b. Are there any fees associated with cash advances?

[redacted]

c. Is there a cost to send monthly paper statements to individual cardholders?

No. However, it is a best practice to utilize online statements via PaymentNet.

d. Identify all fees and charges for the ePayables solution including payment by purchasing card, check and ACH, that the State would be responsible for paying in an ePayables environment.

[redacted]

e. Is your Firm willing to offer any upfront or one-time transition or retention incentives?

[redacted]

f. For how long will the Firm guarantee the proposed fees/rebate?

[redacted]

g. Provide all purchase, licensing, and maintenance costs. If software must be licensed per workstation, show each workstation license cost. Note if any site license/master license program is available. Please provide a copy of this proposed license agreement. If there is a software maintenance agreement, please provide a copy of this proposed agreement. Indicate support capabilities and availability; indicate whether upgrades and to what degree (i.e., full vs. incremental) are included in the maintenance agreement.

PaymentNet is a proprietary J.P. Morgan system, and does not require any licensing or maintenance costs. PaymentNet is designed, developed and supported in-house by J.P. Morgan.

Technical Support

The Client Application Support (CAS) team is your first level of help desk technical support. Available from 7:00 a.m. to 6:00 p.m. CT Monday through Friday with on-call emergency support available 24 hours per day, seven days per week, this knowledgeable team can resolve most concerns within the first call. The CAS team will assist the State in addressing program-specific software functionality issues, including:

- System error messages
- System outages
- System slowness
- Inability to access modules
- Actual results that are different than expected results

- Defect and incident updates
- Association (Mastercard/Visa) issues

Our approximately 30 CAS employees are located in Elgin, IL and Columbus, OH. They can be reached directly by the State or through one of our internal business partners such as your J.P. Morgan relationship manager. Regardless of who initiated the request, the CAS team will speak directly with the State and will inform your relationship manager of issue resolution.

System Upgrades

Because PaymentNet is housed online and wholly owned by J.P. Morgan, updates and enhancements are taken care of behind the scenes, saving your organization the time and money associated with software maintenance.

System updates are made simultaneously to our clients. Approximately 60 days prior to updates, the State will receive a notice regarding upcoming enhancements. A message will also be posted directly on the PaymentNet Welcome page. Importantly, because PaymentNet is Internet based, there is no need to deal with time-consuming software upgrades are made on our server, so users receive updates simultaneously, with minimal or no additional effort on your part.

G. Disaster Recovery

1. Are there any disaster recovery plans specific to this component that are not outlined in the Disaster Recovery plan requested in Section V.A. Tab K?

The firm's business resiliency planning for general banking services is fully covered in the information provided [redacted]

Attachment 1-D: Stored Value Card Questionnaire

J.P. Morgan respectfully declines to submit a proposal for stored value card services.

Attachment 1-E: Check Printing Questionnaire

A. Key Personnel & Customer Service

1. **Provide biographical information on the individuals who will work with the State on a regular basis. Please include the following information:**
    a. **Proposed role with regard to OST's account;**
    b. **Biographical information;**
    c. **Location;**
    d. **Experience working with other government entities;**
    e. **Number of years of experience in this field;**
    f. **Number of years with Firm; and**
    g. **Number of accounts the person is responsible for.**

[redacted]

2. Provide an organizational chart that includes these individuals.

[redacted]

Figure 73

3. Customer Service

a. For routine day-to-day transactions, will a specific customer service representative or a customer service department be assigned? Provide biographical information for this individual(s) that will be assigned to this account.

The State has been assigned a dedicated Client Service Professional, [redacted], to handle your day-to-day inquiries. [redacted]

b. Describe the responsibilities of the customer service personnel, including the chain of command for problem resolution.

, y responsibility for all day to day aspects of your treasury management relationship such as inquiries, research and maintenance related to accounts and services. They will also have authority to engage all levels of Commercial Banking management and escalate issues as appropriate. Client Service has a detailed matrix of contacts and escalation procedures to expedite resolution for each service provided to you. These procedures also include internal service standards to make sure other J.P. Morgan groups are providing timely responses. Finally, Client Service works closely with your full relationship team to be sure that everyone supporting you is informed of your relationship activity.

c. What are the hours of operation of the customer service unit involved in supporting the State?

Our CSPs are available during standard business hours within each time zone. In addition, our Commercial Banking Service Center offers extended hours of operation from 8:00 a.m. to 8:00 p.m. ET, Monday through Friday.

d. If a State employee needs assistance after business hours, what support is available?

The Commercial Banking Service Center is staffed with CSPs who can help with routine requests after normal business hours until 8:00 p.m. ET Monday through Friday. Our Transmissions team provides support for clients initiating file transfer or receiving reporting via Direct Transmissions to J.P. Morgan. Staff is available to assist Transmissions clients from 8:00 a.m. to 3:00 a.m. ET Monday through Friday. Weekend on call hours are between 12:00 p.m. ET Saturday and 8:00 p.m. ET Sunday.

B. Check Printing Services

1. Describe the Firm’s experience in providing check-printing services.

J.P. Morgan’s Check Print service provides the State with a comprehensive print-to-mail solution for processing large volumes of checks. We have offered check print and dispatch services for more than 20 years. Designed to help you lower operating costs, our service removes the State’s need to maintain printing equipment and unnecessary overhead associated with printing checks or remittances advices.

J.P. Morgan offers two check print services with similar functionality, but differences that may
’
volumes and requirements. Rather than a one-size-fits-all approach, we will work with the State and each Agency during implementation to determine which service would be best for the specific check print purpose.

[redacted]

Figure 74

2. **How will the State transmit check payment information to the bank?**

The State can submit check print instruction files via:

- Direct transmission
- Web file upload or check direct entry through Access Online

3. **Are there any file size limits for check printing files? If so, what is are they?**

[redacted]

4. **What is your Firm's cut-off time for receiving files for vendor checks to be printed on the next business day?**

[redacted]

5. What is the cut-off date and time for receiving files for payroll checks and statements for mailing of checks/paystubs on Friday?

We recommend next-day print for payroll checks. The cutoff date and time depends on the check print service selected, as noted above in question 4.

6. Where will checks be printed?

J.P. Morgan has two redundant regional check printing facilities, and will consult with the State during the implementation process to determine which facility would best match your mail distribution requirements. [redacted]

7. Can a printed check be returned? How long does it take?

Checks can be mailed to the State for distribution. Checks can be delivered to the State via Federal Express or UPS. Checks will be forwarded to the State the same day they are printed.

[redacted]

8. What controls does your Firm employ to assure safety of customer data transmitted, check stock, and safeguarding of the checks before they are mailed?

Transmission controls described in Attachment 1: Vendor Questionnaire, section G. Control and in the TSS Connectivity Services guide in Appendix 5.

Checks are printed onto blank stock, so there can be no tampering or loss of pre-printed stock. J.P. [redacted]

J.P. Morgan maintains secured, monitored physical access to facilities and processing areas. Access and dual control is in place for all negotiable checks.

9. Describe the process that your Firm would use to verify that all records have been received and processed.

Through our automated Check Print file transmission process, a control record is provided at the end of file tallying the total number of records within the file, including control records. The total number of records is required on the file trailer to ensure that our Check Print Operations has received the entire file successfully via the file transfer process. Within our check print operations, they use an Automated Document factory to track and account for each item received and processed.

[redacted]

10. Describe in detail the type of printers and the technology that would be used to print the payroll statements and checks? What security features does the equipment have?

[redacted]

[redacted]

11. What quality controls are in place to prevent errors in printing?

Upon processing of each file, check print outsourcing clients receive both an acknowledgement (confirmation) report and an error report indicating items that may have rejected due to failing the edit. J.P. Morgan can also provide check register information for each file delivered to the bank.

If an error is detected in a sent transaction, J.P. Morgan will reject the transaction, notifying the State via acknowledgment.

Control Total verification will include the total amount of the file and the total number of transactions. If the Control Totals do not match the File Totals, or Control Totals are not

Discrepancies must be resolved before the bank will process the file.

In addition, each check print file will be validated for the following: file name, creation date is greater than last transmission, sequence is one greater than the last cycle, batch and file totals in proof and validated division number. Additional validation for duplicate check numbers and valid address is performed when the check print file is processed.

Errors are listed in four categories, and the State is emailed an error report with the following information. The State will receive a document that identifies each category in detail. This report can also be sent via transmission.

W: Warning error, but check is processed.

E: Check is rejected, but batch is processed.

B: Entire batch is rejected.

F: Fatal errors halt processing and must be resolved before process can continue.

12. What are the hours of your Firm's printing operation?

[redacted]

13. Describe in detail any quality improvement program that your Firm has in place. Provide statistics or other regularly available performance data related to the level of service quality and any other data that demonstrates your commitment to quality improvement.

[redacted]

[redacted]

C. New Services & Ideas

1. Describe any new services or ideas that will enhance the State's use of a check printing services.

[redacted]

[redacted]

2. Provide any additional information your Firm believes to be pertinent to your ability to provide this service but not specifically requested elsewhere in this RFP.

J.P. Morgan offers two varieties of Check Print Services, and we recommend the State and each of its agencies use whichever of these solutions best meets your specific needs.

[redacted]

D. Implementation / Conversion

1. Provide a detailed conversion plan for transitioning the State's current process of check printing to your Firm. Include the estimated length of time for the transition and the amount of effort required by the OST's staff.

[redacted] Note that the time and effort required by certain tasks for the check print implementation may be reduced or eliminated where we already have completed such tasks to support the lockbox services or other services provided to the State.

2. Based on the State's implementation expectations provided in Section II. Background, how would your Firm work with the individual State agencies to transition this service to your Firm?

For each agency implementing our solution for Check Print Services, your implementation manager, [redacted], will engage additional J.P. Morgan resources such as your relationship team, our industry solutions experts and others, to collaborate with you and the agency to validate the solutions requested. Once the solution has been scoped, he will establish timelines for implementation and coordinate with the necessary teams across your organization and J.P. Morgan to complete the setup.

[redacted]

3. Who will be responsible for coordinating the transition? If a conversion team is used, how will the State's account be transitioned to the ongoing client service team?

An implementation project manager, [redacted], has been assigned to serve as the 's primary point of contact throughout the process. [redacted] is responsible to coordinate the hand-off to your dedicated CSP.

4. How are implementation managers or implementation teams assigned (i.e. availability, geographically, complexity of the transition)?

The Government Banking implementation team operates out of several locations throughout the U.S. Assignment is generally determined by deal capacity at the time the business is awarded; however, we try to assign someone in close proximity to the client whenever possible. The Senior Implementation Project Manager assigned to this request, regardless of office location, would be able to support a complex onboarding.

5. Indicate the Firm's plans for initial and ongoing education and training of OST and State agency employees in the use of your Firm's systems.

We offer the State a variety of methods for training without any cost to you, such as webinars, phone and short step-by-step prerecorded videos.

The following resources are available:

Online Resources: Available ,
Resources include online help articles, FAQs, guides and a range of live and pre-recorded webinar offerings on how the State can use the Access Online products and services.

Webinar Training: Instructor-led sessions are available on many of our products including Receivables Online and Remote Deposit Capture. For Access Online, we have webinars for each of our products in the Access Online family. Each webinar lasts between 15-90 minutes. ,
Support/Education page.

[redacted]

6. Identify potential issues and risks to the State's implementation of check printing services. Identify the appropriate steps to avoid or mitigate these risks.

[redacted]

7. Describe the post implementation support that will be provided for the State. Include the philosophy and approach to providing the technical and functional post implementation support requested and identify the resources it would make available to the State to provide this support.

The support provided by the bank does not end once we have implemented your account. We believe continued support is critical to our overall account relationship.

Post-go-live, the Implementations team continues to provide support for approximately 30 days and coordinates the transition to Client Service for day-to-day involvement in issue resolution. Your dedicated client service professional, [redacted], will participate in the implem [redacted] and his backup will be prepared to provide ongoing support to address your expectations.

Production support is provided prior to the project's closure, including turnover of documentation and providing proper J.P. Morgan contact information for assistance regarding transmission-related services from our Technical Support teams.

E. Pricing

1. What are the estimated costs associated with the State outsourcing their check printing? Be sure to include any one-time setup fees.

[redacted]

2. Complete the pro forma provided in Attachment 4.

[redacted]

F. Disaster Recovery

1. Are there any disaster recovery plans specific to this component that are not outlined in the Disaster Recovery plan requested in Section V.A. Tab K?

The firm’s business resiliency planning for check printing services is fully covered in the information provided [redacted]

2. How quickly can check printing resume in a disaster recovery situation?

J.P. ’s exercises commercially reasonable efforts to ensure that the firm meets our obligations to you and to all of our clients. The firm’s resiliency program provides comprehensive business impact analysis, risk assessment, resiliency planning and testing to ensure we can manage our risk and our clients’ risk within a reasonable time period.

J.P. Morgan has two redundant regional check printing facilities, minimizing downtime in the event of a disaster situation.

Tab C: Requirements Matrix

Complete and return the attached Requirements Matrix in Attachment 2.

Attachment 2: Requirements Matrix

Contract Number: TRE18101-BANKINGSRVC

Section	Requirement	Can Firm meet this requirement?		Notes
		Y	N	
1	1. Provide technical solutions that meet or exceed all listed DTI requirements.		No	Please refer to Tab H for our exceptions to the State's DTI requirements.
	2. Support file transfer formats and requirements as outlined.		No	[redacted].
	3. Complete contracting process per the steps outlined in the RFP.	Yes		
	4. Adhere to Standard Terms and Conditions ("STCs") or otherwise provide preferred language.	Yes		Please review the proposed language in Tab H: Redlined Version of STCs.

Attachment 2: Requirements Matrix

Contract Number: TRE18101-BANKINGSRVC

Appendix A: Scope of Services: General Banking

Section	Requirement	Can Firm meet this requirement? Y	N	Notes
A.1.	1. Establish demand deposit accounts to meet the State's banking requirements and maintain accurate records of activity in those accounts.	Yes		
	2. Offer ZBA services.	Yes		
A.2.	1. Provide a relationship management team with government experience.	Yes		The State will be supported by an experienced team – relationship, client service, implementation and program management – who are dedicated only to government clients.
	2. Quarterly (at minimum) meetings with the State to review the items listed above.	Yes		Meetings will be in person, at least quarterly and could include joint or separate meetings with OST and individual departments and agencies.
A.3.	1. Process the deposit of approximately 29,000 checks per month via RDC or ICL.	Yes		J.P. Morgan will work with the different departments and agencies on driving further adoption of electronic deposit solutions.
	2. Image deposited RDC items.	Yes		[redacted]
	3. Provide deposit reconciliation services.	Yes		The State will have robust options for using Receivables Online as part of J.P. Morgan Access for customized reporting and deposit reconciliation services. The State can also additionally use BAI2 reporting tools (online and via transmission to support reconciliation needs).
	4. Provide online access of deposited item images.	Yes		[redacted]
A.4.	1. Provide controlled disbursement services.	Yes		
	2. Provide positive pay services with online transmission of check details.	Yes		
	3. Provide positive pay exception item review and correction online.	Yes		[redacted]
	4. Provide payee positive pay services.	Yes		
	5. Provide stale date service.	Yes		
	6. Provide online stop payment services.	Yes		The State can place stop payments online as late as 7:30 p.m. ET for same day effectiveness.
A.5.	1. Send ACH transactions.	Yes		
	2. Provide a secure electronic method for wiring funds and initiating intra-bank transfers.	Yes		
	3. Meet all processing deadlines in order for payroll and pension direct deposit payments to process as needed.	Yes		[redacted]
	4. Provide ACH debit blocking, positive pay and fraud filter services.	Yes		We offer a mix of check and ACH fraud protection solutions that can be tailored at an account level to meet the varying needs of the State.
A.6.	1. Accept ACH transactions.	Yes		We can accept all ACH standard entry codes including IAT.
	2. Accept incoming wire transfers.	Yes		[redacted]
	3. Provide UPIC services or an alternative solution.	Yes		
	1. Provide online balance reporting services.	Yes		
	2. Allow OST employees with different levels of authorization to access the bank's online reporting system.	Yes		

Attachment 2: Requirements Matrix

Contract Number: TRE18101-BANKINGSRVC

Appendix A: Scope of Services: General Banking

Section	Requirement	Can Firm meet this requirement? Y	N	Notes
A.9.	3. If needed, provide multi-hierarchy administration.		No	[redacted]
	4. Provide current day and prior day reporting.	Yes		
	5. Provide full account reconciliation services for disbursements and deposits.	Yes		
	6. Provide online monthly activity statements and reports for all accounts by the third business day of the following month.	Yes		For monthly activity reporting, reports are available as soon as the first business day of the following month.
	7. Provide a detailed monthly account analysis statement for each individual account and a consolidated statement showing charges for all account services by the tenth business day of the month.	Yes		
	8. Provide electronic archival of cleared checks (images of front and back).	Yes		Front and back images of paid checks issued by the State are available online for 7 years for viewing, downloading or printing.
	9. Provide online access to cashed check images.	Yes		
	10. Transfer, at no cost to the OST, all records and information relating to Component 1, electronically and by hard copy as requested, to a successor bank upon termination or completion of contract.	Yes		Should the State choose another provider upon termination or completion of the contract, J.P. Morgan will work with the provider to share records and information, as authorized by the State, relating to Component 1 electronically and by hard copy (within reasonable limits).
A.10.	1. Provide a competitive earnings credit rate for uninvested balances.	Yes		
	2. Provide an overnight investment service (sweep) and/or interest bearing account for excess cash balances in the demand deposit accounts.	Yes		
	3. Collateralize all collected balances, in excess of balances insured by the FDIC, as per the collateral requirements of the State of Delaware.	Yes		
	4. Meet all requirements for the investment of State funds as described above and in the Statement of Objectives and Guidelines for the Investment of State of Delaware Funds, Chapter 8 (found in Appendix C).	Yes		

Attachment 2: Requirements Matrix

Contract Number: TRE18101-BANKINGSRVC

Appendix A: Scope of Services: Lockbox Services

Section	Requirement	Can Firm meet this requirement?		Notes
		Y	N	
B	1. Provide a lockbox solution for the State's payment and document collection needs.	Yes		
	2. Process, including imaging, checks, remittance documents, and other forms/documents received.	Yes		
	3. Provide online access to images of processed items, remittance documents and other forms/documents.	Yes		
	4. Capture details from the remittance document and other forms/documents either electronically or manually.	Yes		
	5. Provide online reporting and download of transaction detail and summary including account numbers and payment amounts.	Yes		
	6. Split exception items from general processing to allow for review and correction by the Treasurer's Office.	Yes		
	7. Provide online exception item review and correction.	Yes		
	8. Provide an "eLockbox" solution.	Yes		

Attachment 2: Requirements Matrix

Contract Number: TRE18101-BANKINGSRVC

Appendix A: Scope of Services: Purchasing/Virtual Card & ePayables

Section	Requirement	Can Firm meet this requirement?		Notes
		Y	N	
C	1. Work with the State to convert vendors that currently receive checks to payment by virtual card or ACH.	Yes		
	2. Pay a rebate to the State on purchasing card and virtual card payments.	Yes		
	3. Work with the State to expand the use of its electronic payables program to increase the rebate earned.	Yes		
	4. Provide a VISA or MasterCard solution.	Yes		
	5. Include a plan for business continuation and/or recovery as a result of disaster.	Yes		
	6. Issue cards to State employees without a prior individual credit approval or credit check.	Yes		
	7. Provide issued cards within seven to ten business days.	Yes		
	8. Support the State's current transaction volume and allow for continued growth.	Yes		
	9. Provide an online platform that allows real-time changes to cardholder accounts, such as names, addresses, card cancellations and organizational transfers.	Yes		
	10. Respond to technical testing requirements within 48 hours, and process the request within 7 business days.	n/a		Because the State's card program has already been established with J.P. Morgan, we do not anticipate that you will require any additional technical testing. Due to the various client requirements of technical requests, the onboarding team would communicate the timeline and milestones (including testing) for project delivery once program requirements have been finalized. There is a direct line of communication between the onboarding team at all times during the process.
	11. Transfer, at no cost to the State, all records and information relating to Component 3, electronically and by hard copy as requested, to a successor bank upon termination or completion of contract.		No	J.P. Morgan has the capabilities to transfer the data requested but would need to ensure it does not breach any banking regulations.

Attachment 2: Requirements Matrix

Contract Number: TRE18101-BANKINGSRVC

Appendix A: Scope of Services: Stored Value Card

Section	Requirement	Can Firm meet this requirement?		Notes
		Y	N	
D	1. Accept 100% of the State's program recipients.	n/a		J.P. Morgan respectfully declines to submit a proposal for stored value card services.
	2. Allow 100% withdrawal off funds.	n/a		
	3. Provide written instructional materials to cardholders once issued.	n/a		
	4. Offer a system linked to a wide ATM network (e.g. STAR, Cirrus, Plus, Maestro).	n/a		
	5. Provide domestic 24/7 telephone customer service center.	n/a		
	6. Allow unlimited daily withdrawals.	n/a		
	7. Provide cardholders with a detailed monthly statement.	n/a		
	8. Prohibit overdrawn accounts.	n/a		
	9. Provide program and administration at no cost to the State.	n/a		
	10. Provide no- or low- fee options for card recipients to access funds.	n/a		
	11. Accept demographic changes on cards regardless of ready or active status.	n/a		
	12. Provide reporting on returned cards and daily load values.	n/a		
	13. Provide 24 hour turnaround on issues raised at help desk.	n/a		
	14. Transfer, at no cost to the OST, all records and information relating to Component 4, electronically and by hard copy as requested, to a successor bank upon termination or completion of contract.	n/a		

Attachment 2: Requirements Matrix

Contract Number: TRE18101-BANKINGSRVC

Appendix A: Scope of Services: Check Printing Services

Section	Requirement	Can Firm meet this requirement? Y	N	Notes
E	1. Accept electronic transmittal of payment details and remittance information from PeopleSoft.	Yes		
	2. Print checks in the format prescribed by the State's banking partners and in conformance with industry standards.	Yes		[redacted]
	3. Send a daily electronic file of the checks printed to be used for positive pay and full reconciliation services.	Yes		[redacted]
	4. Send an electronic print reconciliation report with counts, amounts and statistics pertinent to the processed data after the completion of each production run.	Yes		J.P. Morgan provides acknowledgement files with record counts and dollar amounts for each submitted check print file. Additionally we provide a check register file and error reports for any items which have rejected and need attention.
	5. Provide management reports for reconciliation, control and information purposes, as required.	Yes		
	6. Process and prepare (fold, insert and meter) all mailings with correct postage rates for all outgoing USPS mail in accordance with USPS requirements for mailings.	Yes		[redacted]
	7. Regularly sample checks for MICR line testing to ensure conformity with ANSI standards.	Yes		
	8. Transfer, at no cost to the OST, all records and information relating to Component 1, electronically and by hard copy as requested, to a successor bank upon termination or completion of contract.	Yes		Should the State choose another provider upon termination or completion of the contract, J.P. Morgan will work with the provider to share records and information, as authorized by the State, relating to Component 1 electronically and by hard copy (within reasonable limits).

Tab D: Confidential Information Form

Vendors should identify any material information that is considered confidential using the form of Attachment 3. Any information not within this form is automatically subject to FOIA.

Attachment 3: Confidential or Proprietary Information Form

CONTRACT NUMBER: TRE18101-BANKINGSVC

☐ By checking this box, the Vendor acknowledges that its proposal does not contain any information it declares to be confidential or proprietary for the purpose of production under 29 Delaware Code, Chapter 100, Delaware Freedom of Information Act.

Confidentiality or Proprietary Information
[redacted]
[redacted]
[redacted]
[redacted]

Note: Use additional pages as necessary.

Tab E: Schedule of Fees

Provide a schedule of fees using the Pro Formas provided in Attachment 4 (attached excel file) for the Vendor's proposed service(s). Vendors may also provide alternative fee structures (including, but not limited to, any fixed fee arrangements), however, these alternative fee structures must be in addition to the Pro Formas provided. Paper copies of proposal shall have this information in print, however, electronic copies MUST contain the completed excel file.

[redacted] 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 1: General Banking

INSTRUCTIONS: FILL IN COLUMNS WITH BLUE HEADINGS ONLY. COLUMNS C - G PROVIDE VOLUME INFORMATION FOR THE OST AND STATE AGENCIES. L - O WILL AUTO CALCULATE TOTAL MONTHLY COST BASED ON PROPOSED COST YOU PROVIDE. IT IS THVENDOR'S RESPONSIBILITY TO ENSURE ALL CALCULATIONS ARE CORRECT AND THAT THE TOTALS IN ROW 374 ACCURATELY REFLECT THE EXPECTED MONTHLY COST. SPACE IS AVAILABLE STARTING ON ROW 369 TO ADD ANY ADDITIONAL SERVICES/LINE ITEMS THAT WILL BEREQUIRED BY YOUR FIRM. YOU MAY INSERT ADDITIONAL ROWS AS NEEDED. ANY OPTIONAL OR RECOMMENDED SERVICES CAN BE ADDED IN ROW 395 AND BELOW.

The State has provided services and volumes related to the OST accounts (column C), various Agency accounts (column D) and DelDOT accounts (column F). In order for the State to best evaluate their options, please provide pricing in columns H - J if the State were to only award these services/volumes to your Firm. Please provide pricing in Column K if the State were to award all of the State's activity to your Firm.

AFP Code*	Service Description	Average Monthly Volume OST ACCOUNTS	Average Monthly Volume AGENCY ACCOUNTS	TOTAL Average Monthly Volume STATE ACCOUNTS	Average Monthly Volume DELDOT ACCOUNTS	TOTAL Average Monthly Volume STATE + DELDOT (ALL) ACCOUNTS	Proposed Unit Cost OST ACCOUNTS	Proposed Unit Cost AGENCY ACCOUNTS	Proposed Unit Cost DELDOT ACCOUNTS	Proposed Unit Cost ALL ACCOUNTS	Proposed Monthly Cost OST ACCOUNTS	Proposed Monthly Cost AGENCY ACCOUNTS	Proposed Monthly Cost DELDOT ACCOUNTS	Proposed Monthly Cost ALL ACCOUNTS
*AFP Codes provided where available				Columns C + D		Columns E + F	VENDORS: ENTER PROPOSED UNIT COST IN THESE COLUMNS				[redacted]			
	ACCOUNT SERVICES													
01 00 00	ACCOUNT MAINTENANCE	21	259	280	8	288	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 1: General Banking

INSTRUCTIONS: FILL IN COLUMNS WITH BLUE HEADINGS ONLY. COLUMNS C - G PROVIDE VOLUME INFORMATION FOR THE OST AND STATE AGENCIES. L - O WILL AUTO CALCULATE TOTAL MONTHLY COST BASED ON PROPOSED COST YOU PROVIDE. IT IS THVENDOR'S RESPONSIBILITY TO ENSURE ALL CALCULATIONS ARE CORRECT AND THAT THE TOTALS IN ROW 374 ACCURATELY REFLECT THE EXPECTED MONTHLY COST. SPACE IS AVAILABLE STARTING ON ROW 369 TO ADD ANY ADDITIONAL SERVICES/LINE ITEMS THAT WILL BEREQUIRED BY YOUR FIRM. YOU MAY INSERT ADDITIONAL ROWS AS NEEDED. ANY OPTIONAL OR RECOMMENDED SERVICES CAN BE ADDED IN ROW 395 AND BELOW.

The State has provided services and volumes related to the OST accounts (column C), various Agency accounts (column D) and DelDOT accounts (column F). In order for the State to best evaluate their options, please provide pricing in columns H - J if the State were to only award these services/volumes to your Firm. Please provide pricing in Column K if the State were to award all of the State's activity to your Firm.

AFP Code*	Service Description	Average Monthly Volume OST ACCOUNTS	Average Monthly Volume AGENCY ACCOUNTS	TOTAL Average Monthly Volume STATE ACCOUNTS	Average Monthly Volume DELDOT ACCOUNTS	TOTAL Average Monthly Volume STATE + DELDOT (ALL) ACCOUNTS	Proposed Unit Cost OST ACCOUNTS	Proposed Unit Cost AGENCY ACCOUNTS	Proposed Unit Cost DELDOT ACCOUNTS	Proposed Unit Cost ALL ACCOUNTS	Proposed Monthly Cost OST ACCOUNTS	Proposed Monthly Cost AGENCY ACCOUNTS	Proposed Monthly Cost DELDOT ACCOUNTS	Proposed Monthly Cost ALL ACCOUNTS
20 99 99	ONLINE IMAGE VIEWED-ARCHIVE	7	2	9		9	N/A	N/A	N/A	N/A				
99 99 99	ONLINE POSITIVE PAY EXCEPTIONS LOADED	113	-	113		113								
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 1: General Banking

INSTRUCTIONS: FILL IN COLUMNS WITH BLUE HEADINGS ONLY. COLUMNS C - G PROVIDE VOLUME INFORMATION FOR THE OST AND STATE AGENCIES. L - O WILL AUTO CALCULATE TOTAL MONTHLY COST BASED ON PROPOSED COST YOU PROVIDE. IT IS THVENDOR'S RESPONSIBILITY TO ENSURE ALL CALCULATIONS ARE CORRECT AND THAT THE TOTALS IN ROW 374 ACCURATELY REFLECT THE EXPECTED MONTHLY COST. SPACE IS AVAILABLE STARTING ON ROW 369 TO ADD ANY ADDITIONAL SERVICES/LINE ITEMS THAT WILL BEREQUIRED BY YOUR FIRM. YOU MAY INSERT ADDITIONAL ROWS AS NEEDED. ANY OPTIONAL OR RECOMMENDED SERVICES CAN BE ADDED IN ROW 395 AND BELOW.

The State has provided services and volumes related to the OST accounts (column C), various Agency accounts (column D) and DelDOT accounts (column F). In order for the State to best evaluate their options, please provide pricing in columns H - J if the State were to only award these services/volumes to your Firm. Please provide pricing in Column K if the State were to award all of the State's activity to your Firm.

AFP Code*	Service Description	Average Monthly Volume OST ACCOUNTS	Average Monthly Volume AGENCY ACCOUNTS	TOTAL Average Monthly Volume STATE ACCOUNTS	Average Monthly Volume DELDOT ACCOUNTS	TOTAL Average Monthly Volume STATE + DELDOT (ALL) ACCOUNTS	Proposed Unit Cost OST ACCOUNTS	Proposed Unit Cost AGENCY ACCOUNTS	Proposed Unit Cost DELDOT ACCOUNTS	Proposed Unit Cost ALL ACCOUNTS	Proposed Monthly Cost OST ACCOUNTS	Proposed Monthly Cost AGENCY ACCOUNTS	Proposed Monthly Cost DELDOT ACCOUNTS	Proposed Monthly Cost ALL ACCOUNTS
	ORIGINATED HISTORY REPORTING - 60 DAYS (15)	12,701	-	12,701		12,701	N/A [redacted]	N/A [redacted]	N/A [redacted]	N/A [redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	COST PER UPIC (OR SIMILAR SERVICE) (16)	125	125	250		250								
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Attachment 4: Schedule of Fees
Contract Number: TRE18101-BANKINGSRVC

Component 1: General Banking

INSTRUCTIONS: FILL IN COLUMNS WITH BLUE HEADINGS ONLY. COLUMNS C - G PROVIDE VOLUME INFORMATION FOR THE OST AND STATE AGENCIES. L - O WILL AUTO CALCULATE TOTAL MONTHLY COST BASED ON PROPOSED COST YOU PROVIDE. IT IS THVENDOR'S RESPONSIBILITY TO ENSURE ALL CALCULATIONS ARE CORRECT AND THAT THE TOTALS IN ROW 374 ACCURATELY REFLECT THE EXPECTED MONTHLY COST. SPACE IS AVAILABLE STARTING ON ROW 369 TO ADD ANY ADDITIONAL SERVICES/LINE ITEMS THAT WILL BEREQUIRED BY YOUR FIRM. YOU MAY INSERT ADDITIONAL ROWS AS NEEDED. ANY OPTIONAL OR RECOMMENDED SERVICES CAN BE ADDED IN ROW 395 AND BELOW.

The State has provided services and volumes related to the OST accounts (column C), various Agency accounts (column D) and DelDOT accounts (column F). In order for the State to best evaluate their options, please provide pricing in columns H - J if the State were to only award these services/volumes to your Firm. Please provide pricing in Column K if the State were to award all of the State's activity to your Firm.

AFP Code*	Service Description	Average Monthly Volume OST ACCOUNTS	Average Monthly Volume AGENCY ACCOUNTS	TOTAL Average Monthly Volume STATE ACCOUNTS	Average Monthly Volume DELDOT ACCOUNTS	TOTAL Average Monthly Volume STATE + DELDOT (ALL) ACCOUNTS	Proposed Unit Cost OST ACCOUNTS	Proposed Unit Cost AGENCY ACCOUNTS	Proposed Unit Cost DELDOT ACCOUNTS	Proposed Unit Cost ALL ACCOUNTS	Proposed Monthly Cost OST ACCOUNTS	Proposed Monthly Cost AGENCY ACCOUNTS	Proposed Monthly Cost DELDOT ACCOUNTS	Proposed Monthly Cost ALL ACCOUNTS
	ELECTRONIC BANK SERVICES													
	CUSTOMER ID MAINTENANCE	5	-	5		5	DUP ROW 265	DUP ROW 265	DUP ROW 265	DUP ROW 265				
	ELECTRONIC BANKING ACCOUNT MAINTENANCE	55	-	55		55								
[redacted]														

Attachment 4: Schedule of Fees
Contract Number: TRE18101-BANKINGSRVC

Component 1: General Banking

INSTRUCTIONS: FILL IN COLUMNS WITH BLUE HEADINGS ONLY. COLUMNS C - G PROVIDE VOLUME INFORMATION FOR THE OST AND STATE AGENCIES. L - O WILL AUTO CALCULATE TOTAL MONTHLY COST BASED ON PROPOSED COST YOU PROVIDE. IT IS THVENDOR'S RESPONSIBILITY TO ENSURE ALL CALCULATIONS ARE CORRECT AND THAT THE TOTALS IN ROW 374 ACCURATELY REFLECT THE EXPECTED MONTHLY COST. SPACE IS AVAILABLE STARTING ON ROW 369 TO ADD ANY ADDITIONAL SERVICES/LINE ITEMS THAT WILL BEREQUIRED BY YOUR FIRM. YOU MAY INSERT ADDITIONAL ROWS AS NEEDED. ANY OPTIONAL OR RECOMMENDED SERVICES CAN BE ADDED IN ROW 395 AND BELOW.

The State has provided services and volumes related to the OST accounts (column C), various Agency accounts (column D) and DelDOT accounts (column F). In order for the State to best evaluate their options, please provide pricing in columns H - J if the State were to only award these services/volumes to your Firm. Please provide pricing in Column K if the State were to award all of the State's activity to your Firm.

AFP Code*	Service Description	Average Monthly Volume OST ACCOUNTS	Average Monthly Volume AGENCY ACCOUNTS	TOTAL Average Monthly Volume STATE ACCOUNTS	Average Monthly Volume DELDOT ACCOUNTS	TOTAL Average Monthly Volume STATE + DELDOT (ALL) ACCOUNTS	Proposed Unit Cost OST ACCOUNTS	Proposed Unit Cost AGENCY ACCOUNTS	Proposed Unit Cost DELDOT ACCOUNTS	Proposed Unit Cost ALL ACCOUNTS	Proposed Monthly Cost OST ACCOUNTS	Proposed Monthly Cost AGENCY ACCOUNTS	Proposed Monthly Cost DELDOT ACCOUNTS	Proposed Monthly Cost ALL ACCOUNTS
	RECONCILIATION SERVICES													
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL ESTIMATED MONTHLY COST											$22,284.24	$14,990.45	$27,871.37	$65,117.50
PROPOSED ECR											[redacted]	[redacted]	[redacted]	[redacted]
BALANCE BASED (I.E. FDIC FEES) (as a %)														

	SWEEP SERVICES	Average Monthly Volume OST ACCOUNTS	Average Monthly Volume AGENCY ACCOUNTS	TOTAL Average Monthly Volume STATE ACCOUNTS	Average Monthly Volume DELDOT ACCOUNTS	TOTAL Average Monthly Volume STATE + DELDOT (ALL) ACCOUNTS	Proposed Unit Cost OST ACCOUNTS	Proposed Unit Cost AGENCY ACCOUNTS	Proposed Unit Cost DELDOT ACCOUNTS	Proposed Unit Cost ALL ACCOUNTS	Proposed Monthly Cost OST ACCOUNTS	Proposed Monthly Cost AGENCY ACCOUNTS	Proposed Monthly Cost DELDOT ACCOUNTS	Proposed Monthly Cost ALL ACCOUNTS
	Monthly Sweep Fee [redacted]	-	-	-	-	-	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	RECOMMENDED SERVICES	Average Monthly Volume OST ACCOUNTS	Average Monthly Volume AGENCY ACCOUNTS	TOTAL Average Monthly Volume STATE ACCOUNTS	Average Monthly Volume DELDOT ACCOUNTS	TOTAL Average Monthly Volume STATE + DELDOT (ALL) ACCOUNTS	Proposed Unit Cost OST ACCOUNTS	Proposed Unit Cost AGENCY ACCOUNTS	Proposed Unit Cost DELDOT ACCOUNTS	Proposed Unit Cost ALL ACCOUNTS	Proposed Monthly Cost OST ACCOUNTS	Proposed Monthly Cost AGENCY ACCOUNTS	Proposed Monthly Cost DELDOT ACCOUNTS	Proposed Monthly Cost ALL ACCOUNTS
	ACCOUNT SERVICES													
010010	ACCT MAINT-INT	-	-	-	-	-	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Attachment 4: Schedule of Fees
Contract Number: TRE18101-BANKINGSRVC

Component 1: General Banking

INSTRUCTIONS: FILL IN COLUMNS WITH BLUE HEADINGS ONLY. COLUMNS C - G PROVIDE VOLUME INFORMATION FOR THE OST AND STATE AGENCIES. L - O WILL AUTO CALCULATE TOTAL MONTHLY COST BASED ON PROPOSED COST YOU PROVIDE. IT IS THVENDOR'S RESPONSIBILITY TO ENSURE ALL CALCULATIONS ARE CORRECT AND THAT THE TOTALS IN ROW 374 ACCURATELY REFLECT THE EXPECTED MONTHLY COST. SPACE IS AVAILABLE STARTING ON ROW 369 TO ADD ANY ADDITIONAL SERVICES/LINE ITEMS THAT WILL BEREQUIRED BY YOUR FIRM. YOU MAY INSERT ADDITIONAL ROWS AS NEEDED. ANY OPTIONAL OR RECOMMENDED SERVICES CAN BE ADDED IN ROW 395 AND BELOW.

The State has provided services and volumes related to the OST accounts (column C), various Agency accounts (column D) and DelDOT accounts (column F). In order for the State to best evaluate their options, please provide pricing in columns H - J if the State were to only award these services/volumes to your Firm. Please provide pricing in Column K if the State were to award all of the State's activity to your Firm.

AFP Code*	Service Description	Average Monthly Volume OST ACCOUNTS	Average Monthly Volume AGENCY ACCOUNTS	TOTAL Average Monthly Volume STATE ACCOUNTS	Average Monthly Volume DELDOT ACCOUNTS	TOTAL Average Monthly Volume STATE + DELDOT (ALL) ACCOUNTS	Proposed Unit Cost OST ACCOUNTS	Proposed Unit Cost AGENCY ACCOUNTS	Proposed Unit Cost DELDOT ACCOUNTS	Proposed Unit Cost ALL ACCOUNTS	Proposed Monthly Cost OST ACCOUNTS	Proposed Monthly Cost AGENCY ACCOUNTS	Proposed Monthly Cost DELDOT ACCOUNTS	Proposed Monthly Cost ALL ACCOUNTS
250000	SERVICE BUREAU MAINTENANCE													
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

[redacted]

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 2: Lockbox Services

AFP Code	Service Description	Average Monthly Volume	Proposed Unit Cost	Proposed Monthly Cost
	LOCKBOX 1 - DIVISION OF CORPORATIONS			
	ACCOUNT SERVICES		Enter proposed unit cost in this column	This column will automatically calculate
01 00 00	ACCOUNT MAINTENANCE	1	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 2: Lockbox Services

AFP Code	Service Description	Average Monthly Volume	Proposed Unit Cost	Proposed Monthly Cost
	CONSOLIDATED RECEIVABLES PLATFORM			
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL ESTIMATED MONTHLY COST FOR CORPORATIONS LOCKBOX				[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				$0.00

J.P.Morgan

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 2: Lockbox Services

AFP Code	Service Description	Average Monthly Volume	Proposed Unit Cost	Proposed Monthly Cost
LOCKBOX 2 - DIVISION OF UNEMPLOYMENT / UNEMPLOYMENT INSURANCE				
	ACCOUNT SERVICES		Enter proposed unit cost in this column	This column will automatically calculate
[redacted]		[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]		[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]		[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]		[redacted]	[redacted]	[redacted]
LOCKBOX 3 - DIVISION OF UNEMPLOYMENT / TRAINING TAX				
	[redacted]			
[redacted]		[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]		[redacted]	[redacted]	[redacted]

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 2: Lockbox Services

AFP Code	Service Description	Average Monthly Volume	Proposed Unit Cost	Proposed Monthly Cost
[redacted]		[redacted]	[redacted]	
	[redacted]			
[redacted]		[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]		[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL ESTIMATED MONTHLY COST FOR UNEMPLOYMENT LOCKBOXES				[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				$0.00

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 2: Lockbox Services

AFP Code	Service Description	Average Monthly Volume	Proposed Unit Cost	Proposed Monthly Cost
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	$0.00

J.P.Morgan

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 2: Lockbox Services

AFP Code	Service Description	Average Monthly Volume	Proposed Unit Cost	Proposed Monthly Cost
	LOCKBOX 4 - PENSION			
			Enter proposed unit cost in this column	This column will automatically calculate
	[redacted]			
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]	[redacted]
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	[redacted]	[redacted]	[redacted]	
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	[redacted]			
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[redacted]	[redacted]	[redacted]	[redacted]	
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL ESTIMATED MONTHLY COST FOR PENSION LOCKBOX				[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 2: Lockbox Services

AFP Code	Service Description	Average Monthly Volume	Proposed Unit Cost	Proposed Monthly Cost
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 2: Lockbox Services

AFP Code	Service Description	Average Monthly Volume	Proposed Unit Cost	Proposed Monthly Cost
	LOCKBOX 5 - DIVISION OF REVENUE ELOCKBOX			
	ACCOUNT SERVICES		Enter proposed unit cost in this column	This column will automatically calculate
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]		
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL ESTIMATED MONTHLY COST FOR REVENUE eLOCKBOX				[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Attachment 4: Schedule of Fees
Contract Number: TRE18101-BANKINGSRVC

Component 2: Lockbox Services

AFP Code	Service Description	Average Monthly Volume	Proposed Unit Cost	Proposed Monthly Cost
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	$0.00

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 3: Purchasing/Virtual Card & ePayables

PURCHASING/VIRTUAL CARDS			
Tiers	Minimum Tier Spend	Maximum Tier Spend	Proposed Rebate
			[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]		[redacted]
	[redacted]		[redacted]
	[redacted]	[redacted]	
	[redacted]	[redacted]	
[redacted]			

J.P.Morgan

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 3: Purchasing/Virtual Card & ePayables

EPAYABLES		
AFP Code	Service Description	Proposed Unit Cost
		[redacted]
[redacted]	[redacted]	

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 4: Stored Value Card - J.P. Morgan is not bidding on this module

AFP Code	Service Description	Average Monthly Volume	Proposed Unit Cost
	STATE RELATED FEES		
	INSTANT ISSUE CARD	TBD	N/A
	ISSUANCE OF MAILED CARD	TBD	N/A
	INSTANT FUND OR RELOAD A CARD	TBD	N/A
	REPLACEMENT CARD	TBD	N/A
	EXPEDITED DELIVERY OF REPLACEMENT	TBD	N/A
	STANDARD REPORTS	TBD	N/A
	PER APPLICATION PROCESSED	TBD	N/A
	IMPLEMENTATION FEE(S)		N/A
	TRAINING FEE(S)		N/A
	CARDHOLDER FEES		
	IN-NETWORK ATM FEE	TBD	N/A
	OUT-OF-NETWORK ATM FEE	TBD	N/A
	ATM DECLINE FEE	TBD	N/A
	POS FEE - PIN-BASED TRANSACTION	TBD	N/A
	POS FEE - SIGNATURE-BASED TRANSACTION	TBD	N/A
	POS PIN DECLINE FEE	TBD	N/A
	POS SIGNATURE DECLINE FEE	TBD	N/A
	MONTHLY ACCOUNT FEE	TBD	N/A
	ONLINE STATEMENT FEE	TBD	N/A
	MONTHLY PAPER STATEMENT FEE	TBD	N/A
	BALANCE INQUIRY FEE	TBD	N/A
	CALL TO CUSTOMER SERVICE	TBD	N/A
	INTERNATIONAL TRANSACTION SURCHARGE	TBD	N/A
	SECONDARY CARD	TBD	N/A
	REPLACEMENT CARD	TBD	N/A
	EXPRESS DELIVERY FOR REPLACEMENT CARD	TBD	N/A
	INACTIVITY FEE	TBD	N/A
	CHECK REQUEST FEE	TBD	N/A
	OVERDRAFT PROTECTION FEE	TBD	N/A
	WITHDRAWAL AT BANK BRANCH DISPLAYING VISA/MC LOGO	TBD	N/A

		Estimate Monthly Volume	Proposed Unit Cost
	ADDITIONAL REQUIRED FEES/SERVICES NOT LISTED ABOVE		

		Estimate Monthly Volume	Proposed Unit Cost
	RECOMMENDED/OPTIONAL FEES & SERVICES		

Attachment 4: Schedule of Fees

Contract Number: TRE18101-BANKINGSRVC

Component 5: Check Printing

AFP Code	Service Description	Average Monthly Volume	Proposed Unit Cost
C[redacted]			
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Tab F: Implementation Plan

Provide a detailed implementation plan (in weekly increments and highlighting milestones) for each of the components being proposed. Ensure to take into consideration the information provided below.

[redacted]

[redacted]

Implementation Approach:

The State is eliciting feedback from industry experts to determine the best approach to implement the new banking architecture. In order to complete this statewide project successfully, the State favors the development of a master transition plan encompassing all components with all selected providers engaging and assisting the creation of such plan. The main objective of the plan is to reduce the risk of implementation failure by proactively assessing the impact to the State. It is the State's intent to work with selected Vendors to create a centralized reference document that organizes relevant information needed (i.e., tasks, deadlines, milestones, responsible parties) for a successful implementation.

Traditionally, the State has selected Vendors and performed implementations by banking services or products rather than clients (i.e., state agencies or organizations). The State prefers an implementation plan constructed to deploy services and products by client. During the evaluation process, the State will finalize the banking services and products menu that will be available to agencies and organizations going forward. The options on the menu will be based on best practices and allow for some level of consistency across the State. At the outset of the implementation project, the State and selected Vendors would identify the sequence to use when deploying the menu to clients.

[redacted]

Tab G: Exception Form

Provide a detailed listing of any exceptions to the RFP, including all attachments and appendices but not including the STCs and its exhibits, using the form included as Attachment 5. Successful Vendors who do not take exceptions as required are deemed to have consented and irrevocably agreed to the terms of the RFP.

Tab H: Redlined Version of STCs

Include the Redline or similar comparative version of the STCs, a copy of which is affixed hereto as Appendix D, reflecting all proposed changes to the STCs and Exhibit 4, Exhibit 5 and Exhibit 6 thereto, which changes may be accepted or rejected in OST's discretion. Successful Vendors who do not propose changes are deemed to have consented and irrevocably agreed to the STCs.

J.P. Morgan has identified below the terms or conditions that we respectfully request be modified in accordance with our recommended revisions. We are willing to discuss mutually agreeable modifications to the contract terms. The proposed changes are indicated on Attachment D, Exhibit 4, Exhibit 5 and Exhibit 6 by additions *in italic*, underlined, text and deletions by ~~strikethrough~~, red text.

Tab I: Financial Statements

Provide electronic copies (no paper copies) of the last three years of audited financial statements. These statements shall be submitted on the electronic version of the proposal only. If, and only if, audited financial statements are not available, Vendors may submit unaudited financial statements (in which case, Vendors shall explain in detail why audited financial statements are not available).

Audited financial statements for JPMorgan Chase & Co. for 2017, 2016 and 2015 are available online at https://www.jpmorganchase.com/corporate/investor-relations/annual-report-proxy.htm. The 2017 annual report (which contains data for all three years) has been included on the electronic copies of this proposal.

ANNUAL REPORT

2017

JPMorgan Chase & Co.

Financial Highlights

As of or for the year ended December 31, (in millions, except per share, ratio data and headcount)	2017	2016	2015
Reported basis[(a)]			
Total net revenue	**$ 99,624**	$ 95,668	$ 93,543
Total noninterest expense	**58,434**	55,771	59,014
Pre-provision profit	**41,190**	39,897	34,529
Provision for credit losses	**5,290**	5,361	3,827
Net income	**$ 24,441**	$ 24,733	$ 24,442
Per common share data			
Net income per share:			
Basic	**$ 6.35**	$ 6.24	$ 6.05
Diluted	**6.31**	6.19	6.00
Cash dividends declared	**2.12**	1.88	1.72
Book value	**67.04**	64.06	60.46
Tangible book value (TBVPS)[(b)]	**53.56**	51.44	48.13
Selected ratios			
Return on common equity	**10%**	10%	11%
Return on tangible common equity (ROTCE)[(b)]	**12**	13	13
Common equity Tier 1 capital ratio[(c)]	**12.1**	12.2	11.6
Tier 1 capital ratio[(c)]	**13.8**	13.9[(d)]	13.3
Total capital ratio[(c)]	**15.7**	15.2	14.7
Selected balance sheet data (period-end)			
Loans	**$ 930,697**	$ 894,765	$ 837,299
Total assets	**2,533,600**	2,490,972	2,351,698
Deposits	**1,443,982**	1,375,176	1,279,715
Common stockholders' equity	**229,625**	228,122	221,505
Total stockholders' equity	**255,693**	254,190	247,573
Market data			
Closing share price	**$ 106.94**	$ 86.29	$ 66.03
Market capitalization	**366,301**	307,295	241,899
Common shares at period-end	**3,425.3**	3,561.2	3,663.5
Headcount	**252,539**	243,355	234,598

(a) Results are presented in accordance with accounting principles generally accepted in the United States of America, except where otherwise noted.
(b) TBVPS and ROTCE are each non-GAAP financial measures. For further discussion of these measures, see Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures and Key Financial Performance Measures on pages 52–54.
(c) The ratios presented are calculated under the Basel III Advanced Fully Phased-In Approach, and they are key regulatory capital measures. For further discussion, see "Capital Risk Management" on pages 82-91.
(d) The prior period ratio has been revised to conform with the current period presentation.

JPMorgan Chase & Co. (NYSE: JPM) is a leading global financial services firm with assets of $2.5 trillion and operations worldwide. The firm is a leader in investment banking, financial services for consumers and small businesses, commercial banking, financial transaction processing, and asset management. A component of the Dow Jones Industrial Average, JPMorgan Chase & Co. serves millions of customers in the United States and many of the world's most prominent corporate, institutional and government clients under its J.P. Morgan and Chase brands.

Information about J.P. Morgan's capabilities can be found at jpmorgan.com and about Chase's capabilities at chase.com. Information about JPMorgan Chase & Co. is available at jpmorganchase.com.

46.7
MILLION DIGITAL CUSTOMERS

46.7 million digital customers make us the #1 most visited bank website with the most mobile banking customers

$900+
BILLION

$900+ billion in debit and credit card sales volume

$1.75
BILLION

$1.75 billion in philanthropic investments over the next five years

$200
BILLION

$200 billion in clean energy financing by 2025

TOP EMPLOYER

Named a top company by LinkedIn for where people want to work

#1

#1 on *Fortune*'s Change the World list

400

Opening 400 new branches in 15-20 markets over the next five years

100%

Renewable energy for 100% of the firm's global power by 2020

$5
TRILLION

$5 trillion daily value of wholesale payments across 120 currencies

$1.3
TRILLION

$1.3 trillion in assets under management shifted to J.P. Morgan by BlackRock as part of the largest custody mandate in history

TOP 50

Top 50 metro areas covered by Commercial Banking following expansion into new locations

86%

86% of long-term mutual fund assets under management ranked in top two quartiles over 10-year period

Dear Fellow Shareholders,

Jamie Dimon,
Chairman and
Chief Executive Officer

Once again, I begin this letter with a sense of pride about JPMorgan Chase. As I look back on last year — in fact, the last decade — it is remarkable how well our company has performed. And I'm not only talking about our strong financial performance — but also about how much we have accomplished to help our clients, customers and communities all around the world. Ours is an exceptional company with an extraordinary heritage and a promising future.

We continue to make excellent progress around technology, risk and controls, innovation, diversity and reduced bureaucracy. We've helped communities large and small — by doing what we do best (lending, investing and serving our clients); by creatively expanding certain flagship Corporate Responsibility programs, including the Entrepreneurs of Color Fund, The Fellowship Initiative and our Service Corps; and by applying our successful Detroit investment model to neighborhood revitalization efforts in the Bronx in New York City, Chicago and Washington, D.C.

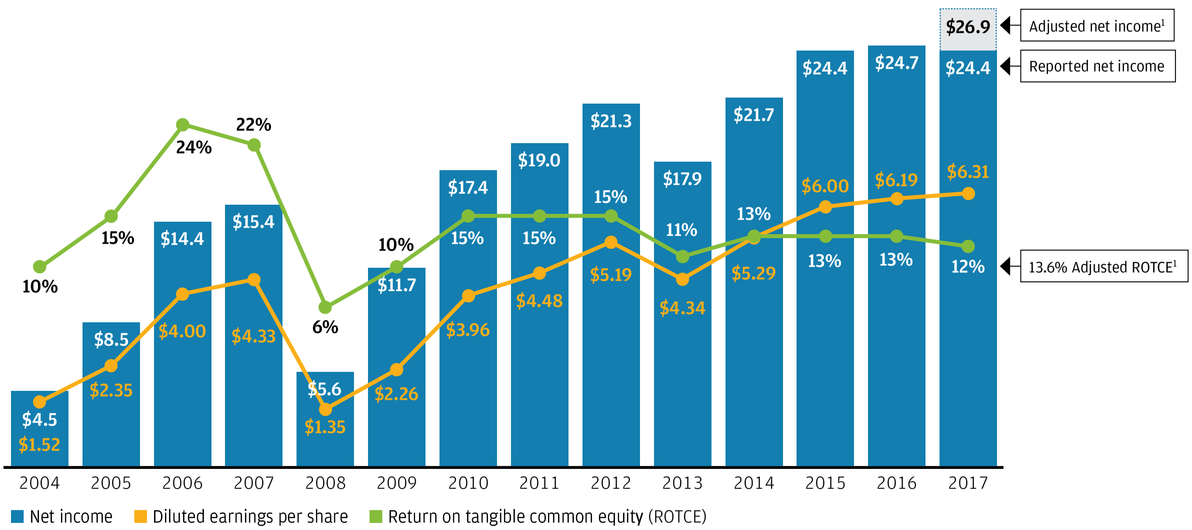
Throughout a period of profound political and economic change around the world, our company has been steadfast in our dedication to the clients, communities and countries we serve while earning a fair return for our shareholders.

2017 was another record year across many measures for our company as we added clients and customers and delivered record earnings per share. We earned $24.4 billion in net income on revenue[1] of $103.6 billion (if we exclude the tax charge at year-end, 2017 net income would have been a record $26.9 billion), reflecting strong underlying performance across our businesses. We now have delivered record results in seven of the last eight years, and we have confidence that we will continue to deliver in the future.

[1] Represents managed revenue

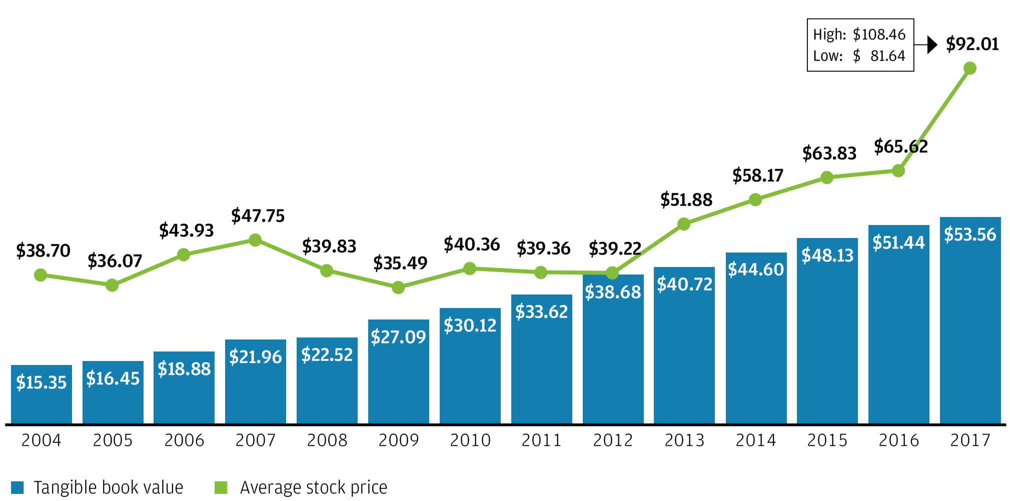
Earnings, Diluted Earnings per Share and Return on Tangible Common Equity 2004–2017

($ in billions, except per share and ratio data)



[1] Adjusted results exclude a $2.4 billion decrease to net income as a result of the enactment of the Tax Cuts and Jobs Act (TCJA)

Tangible Book Value and Average Stock Price per Share 2004–2017



As you know, we believe tangible book value per share is a good measure of the value we have created for our shareholders. If our asset and liability values are appropriate – and we believe they are – and if we can continue to deploy this capital profitably, we now think that it can earn approximately 17% return on tangible equity for the foreseeable future. Then, in our view, our company should ultimately be worth considerably more than tangible book value. The chart on the bottom of page 3 shows that tangible book value "anchors" the stock price.

Bank One/JPMorgan Chase & Co. tangible book value per share performance vs. S&P 500

	Bank One (A)	S&P 500 (B)	Relative Results (A) – (B)
Performance since becoming CEO of Bank One (3/27/2000–12/31/2017)[1]			
Compounded annual gain	11.8%	5.2%	6.6%
Overall gain	566.3%	147.3%	419.0%

	JPMorgan Chase & Co. (A)	S&P 500 (B)	Relative Results (A) – (B)
Performance since the Bank One and JPMorgan Chase & Co. merger (7/1/2004–12/31/2017)			
Compounded annual gain	12.7%	8.8%	3.9%
Overall gain	403.5%	210.4%	193.1%

Tangible book value over time captures the company's use of capital, balance sheet and profitability. In this chart, we are looking at heritage Bank One shareholders and JPMorgan Chase & Co. shareholders. The chart shows the increase in tangible book value per share; it is an after-tax number assuming all dividends were retained vs. the Standard & Poor's 500 Index (S&P 500), which is a pre-tax number with dividends reinvested.

[1] On March 27, 2000, Jamie Dimon was hired as CEO of Bank One.

In the last five years, we have bought back nearly $40 billion in stock. In prior years, I explained why buying back our stock at tangible book value per share was a no-brainer. Six years ago, we offered an example of this, with earnings per share and tangible book value per share being substantially higher than they otherwise would have been just four years later. While we prefer buying back our stock at tangible book value, we think it makes sense to do so even at or above two times tangible book value for reasons similar to those we've expressed in the past. If we buy back a big block of stock this year, we would expect (using analyst earnings estimates for the next five years) earnings per share in five years to be 2%–3% higher and tangible book value to be virtually unchanged.

We want to remind our shareholders that we ***much*** prefer to use our capital to grow than to buy back stock. Buying back stock should only be considered when we either cannot invest (sometimes that's a function of regulatory policies) or when we are generating excess, unusable capital. We currently have excess capital, but due to recent tax reform and a more constructive regulatory environment, we hope, in the future, to use more of our excess capital to grow our businesses, expand into new markets and support our employees.

Stock total return analysis

	Bank One	S&P 500	S&P Financials Index
Performance since becoming CEO of Bank One (3/27/2000–12/31/2017)[1]			
Compounded annual gain	12.4%	5.2%	4.1%
Overall gain	691.5%	147.3%	102.8%

	JPMorgan Chase & Co.	S&P 500	S&P Financials Index
Performance since the Bank One and JPMorgan Chase & Co. merger (7/1/2004–12/31/2017)			
Compounded annual gain	10.7%	8.8%	3.6%
Overall gain	294.2%	210.4%	61.6%
Performance for the period ended December 31, 2017			
Compounded annual gain			
One year	26.7%	21.8%	22.1%
Five years	22.7%	15.8%	18.2%
Ten years	12.0%	8.5%	3.7%

These charts show actual returns of the stock, with dividends reinvested, for heritage shareholders of Bank One and JPMorgan Chase & Co. vs. the Standard & Poor's 500 Index (S&P 500) and the Standard & Poor's Financials Index (S&P Financials Index).

[1] On March 27, 2000, Jamie Dimon was hired as CEO of Bank One.

Our stock price is a measure of the progress we have made over the years. This progress is a function of continually making important investments, in good times and not-so-good times, to build our capabilities — people, systems and products. These investments drive the future prospects of our company and position it to grow and prosper for decades. Whether looking back over five years, 10 years or since the Bank One/JPMorgan Chase merger (approximately 13 years ago), our stock has significantly outperformed the Standard & Poor's 500 Index (S&P 500) and the S&P Financials Index. And this growth came during a time of unprecedented challenges for banks — both the Great Recession and the extraordinarily difficult legal, regulatory and political environment that followed. We have long contended that these factors explained why bank stock price/earnings ratios were appropriately depressed. And we believe the anticipated reversal of many negatives and an increasingly more favorable business environment, coupled with our sustained, strong business results, are among the reasons our stock price has done so well this past year.

We do not worry about the stock price in the short run, and we do not worry about quarterly earnings. Our mindset is that we consistently build the company — if you do the right things, the stock price will take care of itself. In the next section, I discuss in more detail how we think about building shareholder value for the long run while also taking care of customers, employees and communities.

JPMorgan Chase stock is owned by large institutions, pension plans, mutual funds and directly by individual investors. However, it is important to remember that in almost all cases, the ultimate owner is an individual. Well over 100 million people in the United States own stocks, and a large percentage of them, in one way or another, own JPMorgan Chase stock. Many of these people are veterans, teachers, police officers, firefighters, retirees, or those saving for a home, school or retirement. Your management team goes to work every day recognizing the enormous responsibility that we have to perform for our shareholders.

In this letter, I discuss the issues highlighted below — which describe many of our successes and opportunities, as well as our challenges and responses.

I. JPMORGAN CHASE BUSINESS STRATEGIES

Since our business leaders describe their businesses later in this report, I am not going to be repetitive within this section. I encourage you to read their letters following this Letter to Shareholders. Instead, in this section, I deal with some critical themes around how we run this company – in good times and in bad times – and how we are continuing to build for what we think will be a bright future.

1. How has the company grown?

Below is a powerful representation of how we have grown and built client franchises over time.

You can see from the numbers circled within the chart below that we have grown our market share fairly substantially in most of our businesses. In some cases, these market

Client Franchises Built Over the Long Term

		2006	2016	2017	
Consumer & Community Banking	Deposits market share[1]	3.6%	8.3%	8.7%	■ Relationships with ~50% of U.S. households ■ Industry-leading deposit growth[12] ■ #1 U.S. credit card issuer[13] ■ #1 U.S. co-brand credit card issuer[14] ■ #1 U.S. credit and debit payments volume[15] ■ #2 merchant acquirer[16]
	# of top 50 Chase markets where we are #1 (top 3)	11 (25)	14 (38)	16 (40)	
	Average deposits growth rate	8%	10%	9%	
	Active mobile customers growth rate	NM	16%	13%	
	Credit card sales market share[2]	15.9%	21.5%	22.4%	
	Merchant processing volume[3] ($B)	$661	$1,063	$1,192	
	# of branches	3,079	5,258	5,130	
	Client investment assets ($B)	~$80	$235	$273	
	Business Banking primary market share[24]	5.1%	8.5%	8.7%	
Corporate & Investment Bank	Global Investment Banking fees[4]	#2	#1	#1	■ >80% of Fortune 500 companies do business with us ■ #1 in both N.A. and EMEA Investment Banking fees[17] ■ #1 in Global Long-Term Debt and Loan Syndications[17] ■ #1 in FICC productivity[18] ■ Top 3 Custodian globally with AUC of $23.5T[19] ■ #1 in USD payment volumes with 20% share in 2017[20] ■ In Total Markets, J.P. Morgan has ranked #1 in each year since 2012[25] ■ Equities and Prime are now ranked co-#1[25] ■ J.P. Morgan Research ranked as the #1 Global Research Firm[26]
	Market share[4]	8.7%	7.9%	8.1%	
	Total Markets revenue[5]	#8	#1	#1	
	Market share[5]	6.3%	11.2%	11.0%	
	FICC[5]	#7	#1	#1	
	Market share[5]	7.0%	11.7%	11.4%	
	Equities[5]	#8	#2	co-#1	
	Market share[5]	5.0%	10.1%	10.3%	
	Assets under custody (AUC)($T)	$13.9	$20.5	$23.5	
Commercial Banking	# of top 50 MSAs with dedicated teams	26	47	50	■ Top 3 in overall Middle Market, large Middle Market and Asset Based Lending Bookrunner[21] ■ Industry-leading credit performance – 6th straight year of net recoveries or single digit NCO rate
	Bankers	1,203	1,642	1,766	
	New relationships (gross)	NA	911	1,062	
	Gross Investment Banking revenue ($B)	$0.7	$2.3	$2.3	
	Average loans ($B)	$53.6	$179.4	$198.1	
	Average deposits ($B)	$73.6	$174.4	$177.0	
	Multifamily lending[7]	#28	#1	#1	
Asset & Wealth Management	Mutual funds with a 4/5 star rating[8]	119	220	235	■ 86% of 10-year long-term mutual fund assets under management (AUM) in top 2 quartiles[22] ■ #2 in 5-year cumulative long-term client asset flows among publicly traded peers ■ #1 Private Bank in N.A. and LatAm[23] ■ Revenue and long-term AUM growth >90% since 2006
	Ranking of long-term client asset flows[9]	NA	#2	#2	
	Active AUM market share[10]	1.8%	2.5%	2.4%	
	North America Private Bank (*Euromoney*)	#1	#1	#1	
	Client assets ($T)	$1.3	$2.5	$2.8	
	Client assets market share[11]	3%	4%	4%	
	Average loans ($B)	$26.5	$112.9	$123.5	
	# of Wealth Management client advisors	1,506	2,504	2,605	

For information on footnotes 1-23, refer to slides 105-106 in the 2018 JPMorgan Chase Strategic Update presentation, which is available on JPMorgan Chase & Co.'s website (https://www.jpmorganchase.com/corporate/investor-relations/document/3cea4108_strategic_update.pdf), under the heading Investor Relations, Events & Presentations, JPMorgan Chase 2018 Investor Day, and on Form 8-K as furnished to the U.S. Securities and Exchange Commission (SEC) on February 27, 2018, which is available on the SEC's website (www.sec.gov).

[24] Source: Barlow Research Associates, Primary Bank Market Share Database as of 4Q17. Rolling eight quarter average of small businesses with revenues of $100,000 - <$25 million

[25] Source: Preliminary Coalition Global Industry Revenue Pool based on internal business structure, 2017

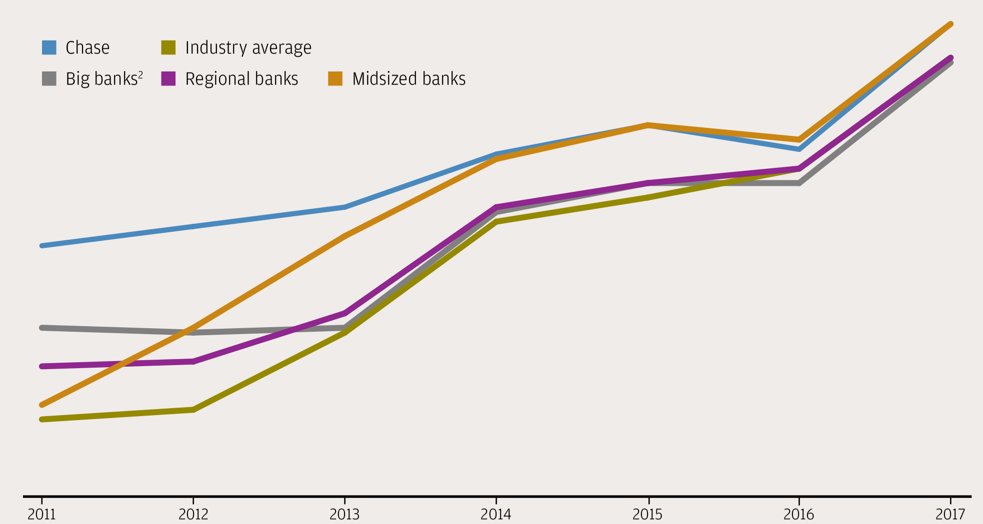
[26] Source: *Institutional Investor* magazine survey of large investors, 2017

NM = Not meaningful
NA = Not available
FICC = Fixed Income, Currencies and Commodities
N.A. = North America
EMEA = Europe/Middle East/Africa
MSAs = Metropolitan Statistical Areas
LatAm = Latin America/Caribbean
B = Billions
T = Trillions

share increases were due to our acquisitions of Bear Stearns and Washington Mutual. But in all cases, this growth is driven by consistent and disciplined investment in our businesses. The chart below shows how we try to measure customer satisfaction in multiple ways. For the most part, we have seen a rise in these scores as well. It is a given that you will not grow your share – unless you are satisfying your customers – and we know they can always walk across the street to be served by another bank.

Increasing Customer Satisfaction

U.S. retail banking satisfaction[1]



[1] Source: J.D. Power U.S. Retail Banking Satisfaction Study, 2017
[2] Big banks defined as top six U.S. banks

Other important metrics

Increasing market share is a sign of increasing customer satisfaction

Consumer & Community Banking
- Chase continues to lead the big banks and the industry average in U.S. Consumer Bank Customer Satisfaction studies including being ranked #1 in retail banking advice in the U.S. and ranked #2 in the first ever National Bank study[1]
- Customer satisfaction, measured by Net Promoter Scores ("NPS"), has continued to increase across most of our businesses since we brought CCB together five years ago. NPS increased year over year in Merchant Services, Business Banking, Home Lending, and Auto
- Digitally-engaged customers who bank with Chase are more satisfied than all other households, with higher NPS (+19%), higher retention rates (+10 percentage points), and higher card spend (+118%)
- Digitally-engaged established customers who use Chase as their primary bank also have 40% more deposits and investments with us

Corporate & Investment Bank
- Highest ever client satisfaction and retention levels for Custody & Fund Services

Commercial Banking
- NPS for Commercial Banking Middle Market clients increased from 35 to 45 from 2011 to 2017[2]
- #1 in overall satisfaction, perceived satisfaction, customer relationships and transactions/payments processing[3]

Asset & Wealth Management
- J.P. Morgan has ranked as the #1 private bank in the U.S. for nine consecutive years and #1 in Latin America for five consecutive years[4]
- J.P. Morgan has ranked as the Leading Pan-European Fund Management Firm for eight consecutive years[5]

[1] Source: J.D. Power 2018 U.S. Retail Banking Advice Study & 2017 National Bank Satisfaction Study
[2] Source: Greenwich Associates Commercial Banking Study, 2017
[3] Source: CFO magazine's Commercial Banking Survey, 2017
[4] Source: *Euromoney*, 2018
[5] Source: Thomson Reuters, 2017

2. How will the company continue to grow? What are the organic growth opportunities?

We have good market share in most businesses, but we see organic growth opportunities almost everywhere – some large and some small. Following are a few examples:

Consumer & Community Banking

- We recently announced that we will start to expand the consumer branch business into cities like Boston, Philadelphia and Washington, D.C. Over the next five years, we hope to expand to another 15-20 new markets. We know the competition is tough, but we have much to offer. When JPMorgan Chase comes to town, we come not just with our consumer branches but also with mortgages, investments, credit cards, private banking, small and midsized business banking, government business and corporate responsibility initiatives to support our communities.
- In addition, this year we are rolling out many new exciting products and have made several improvements around the customer's experience, including a fully mobile bank pilot (Finn), digital account openings, facial recognition in our app, the Amazon Prime Rewards Visa card and a simpler online application for Business Banking customers.
- We also are adding many tools that will help our customers manage their financial affairs. For example, in the credit card business, we will be allowing our customers to review and decide how and where they want their cards and credit lines to be used. In Consumer Banking, we are adding financial planning tools and insights that help customers make the most of their money – and there's more coming.

Corporate & Investment Bank

- We see growth opportunities even in Fixed Income, Currencies and Commodities, where we already have the #1 market share at 11.4%. There may be some underlying growth as the capital markets of the world grow, even though this is partially offset by declining margins like we have experienced over the last 30 years. However, we see opportunities to gain share in various products and in certain regions where we have low share.
- This opportunity would be true for Investment Banking, too. Country by country and industry by industry, there are still plenty of opportunities to increase our low market share. For example, we have 10% share in the United States but less than 5% share in Asia.
- In Treasury Services and Custody, where our market shares are 4.7% and 8.0%, respectively, we believe we can grow significantly by adding bankers, building better technology, entering new countries, building better products and continuing to do a great job for clients. In this business, while you make large initial investments in order to grow, when you gain clients, they usually stick with you for a long time.
- Over time, we do expect to expand our Corporate & Investment Bank into new countries, which will benefit all the businesses within this franchise.

Commercial Banking

- This past year, Commercial Banking has completed its expansion into the top 50 markets in the United States – this will drive growth for decades. And remember, when Commercial Banking opens its doors, it also helps drive the growth of our Private Bank and the Corporate & Investment Bank businesses.
- Commercial Banking has added many specialized industry bankers to better serve those specific segments.

Asset & Wealth Management

- In the United States, our share of the ultra-high-net-worth market ($10 million or greater) is 8%. We believe we have a superior business and that we can grow our share by essentially adding bankers, branches and better products.
- In the high-net-worth business ($3 million to $10 million) and the Chase affluent business ($500,000 to $5 million), our market shares are only 1% and 4%, respectively. We have no doubt that we can grow by adding bankers and locations, particularly because we have some exciting new products coming soon. There is no reason we can't more than double our share over the next 10 years.
- We are also adding new products, like index funds and exchange-traded funds (ETF), that we believe will help drive growth.

Across the company

In addition, we are undertaking many initiatives across the company that will help grow our businesses and better serve our customers.

- On the payments front, we have developed multiple products to make wholesale payments better, easier and faster. We are rolling out these products across our platforms, and they should help us solidify and grow our position.
- On the consumer side, we have introduced Chase Pay, the digital equivalent to using a debit or credit card, which allows customers to pay online or in-store with their mobile phone. We also introduced Zelle, a real-time consumer-to-consumer payments system, which allows customers to easily, safely and immediately send money to their friends and family. We expect these products to drive lots of customer interactions and make our payments offerings compelling, even as some very smart fintech competitors emerge.
- Across the company – not just in technology – we have thousands of employees who are data scientists or have advanced degrees in science, technology, engineering and math. Of the nearly 50,000 people in technology at the company, more than 31,000 are in development and engineering jobs, and more than 2,500 are in digital technology. Think of these talented individuals as driving change across the company.
- Artificial intelligence, big data and machine learning are helping us reduce risk and fraud, upgrade service, improve underwriting and enhance marketing across the firm. And this is just the beginning.
- Our shared technology infrastructure – our networks, data centers, and the public and private cloud – decreases costs, enhances efficiency and makes all our businesses more productive. In addition, this allows us to embrace the fact that every business and merchant has its own software and also wants easy, integrated access to our products and services. We are delivering on that through the creation of a common JPMorgan Chase API (application programming interface) store that allows customers to add simple, secure payments to their software. And we are building everything digital – both for individual customers and large corporations – from onboarding to idea generation.
- Increasingly, the management teams of Consumer & Community Banking, Corporate & Investment Bank, Commercial Banking and Asset & Wealth Management share ideas, share platforms and serve each other's customers. The success of any one business almost always helps the other three.

- ***Privacy and safety – we spend an enormous amount of resources to protect all of our clients and customers from fraud, cybersecurity risk and invasion of their privacy.*** These capabilities are extraordinary, and we will continue to relentlessly build them. As part of this, we have consistently warned our customers about privacy issues, which will become increasingly critical for all industries as consumers realize the severity of the problem. Last year, we wrote about a new arrangement with Intuit that bears repeating – it briefly described the problem and presented a solution, which we hope might set a standard for protecting customers while giving them control of their data.

  For years, we have been describing the risks – to banks and customers – that arise when customers freely give away their bank passcodes to third-party services, allowing virtually unlimited access to their data. Customers often do not know the liability this may create for them if their passcode is misused, and, in many cases, they do not realize how their data are being used. For example, access to the data may continue for years after customers have stopped using the third-party services.

  We recently completed a new arrangement with Intuit, which we think represents an important step forward. In addition to protecting the bank, the customers and even the third party (in this case, Intuit), it allows customers to share data – how and when they want. Under this arrangement, customers can choose whatever they would like to share and opt to turn these selections on or off as they see fit. The data will be "pushed" to Intuit, eliminating the need for sharing bank passcodes, which protects the bank and our customers and reduces potential liabilities on Intuit's part as well. We are hoping this sets a new standard for data-sharing relationships.

Events from the past year underscore the importance of efforts like this. As questions are raised about how consumers' information is shared and protected, I strongly believe that data privacy and security should be a way in which we and other businesses compete to serve customers.

3. Why is organic growth a better way to grow — and why is it sometimes difficult?

Organic growth is all about hiring and training bankers, opening branches, improving or innovating new products and building new technology. It is ***hard*** work. In fact, institutionally, there is often a lot of resistance to it. It's easier ***not*** to add expenses, even when they are good for the business. And growing any sales force is usually met by some opposition from – guess who? – the existing sales force. Sometimes people are afraid the change will take away from their compensation pool or their client base. And it's hard work to properly recruit and train salespeople. Building new products and services is sometimes in conflict with existing products and services. All of these efforts require huge team coordination. So it's no surprise that it's sometimes easier not to push organic growth. However, if you build the right culture, where management teams are intensely analytical and critical of their own business' strengths, weaknesses and opportunities, you can create great clarity about what those opportunities are. If you have strong leaders, they have the discipline and fortitude to develop and execute a forward-looking growth plan.

4. Is there a conflict between building shareholder value vs. serving customers, taking care of employees and lifting up communities?

Keeping JPMorgan Chase a healthy and vibrant company is the ***best*** thing we can do for our shareholders, our customers, our employees and our communities. Building shareholder value is the ***primary*** goal of a business, but it is simply not possible to do well if a company is not properly treating and serving its customers, training and motivating its employees, and being a good citizen in the community. If they are all done well, it enhances shareholder value. Let me explain.

We cannot be a healthy and vibrant company if we are not both delivering financial success and investing for the future.

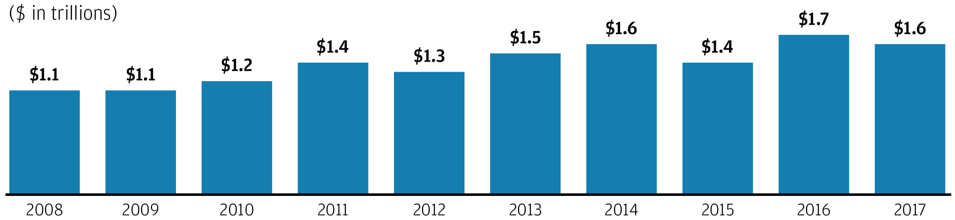
Show me a company that is not financially successful (in the long run), and I will show you an unsuccessful company. This is particularly true for a bank, where confidence in its stability is critical. I should caution, however, that financial success is a little more complex than short-term profits – and many investors are completely aware of this.

Do not confuse financial success with profits in a quarter or even in a year. All businesses have a different customer and investment life cycle, which can be anywhere from one year to 30 years – think of building new restaurants to developing new airplanes or building electrical grids. Generally, anything our business does to grow will cost money in the short term (whether it's opening branches or conducting research and development (R&D) or launching products), but it does not mean that it is not the right financial decision. A company could be losing money on its way to bankruptcy ***or*** on its way to a very high return on invested capital. Diligent management teams understand the difference between the two scenarios and invest in a way that will make the company financially successful over time. You need to invest continually for better products and services so you can serve your customers in the future.

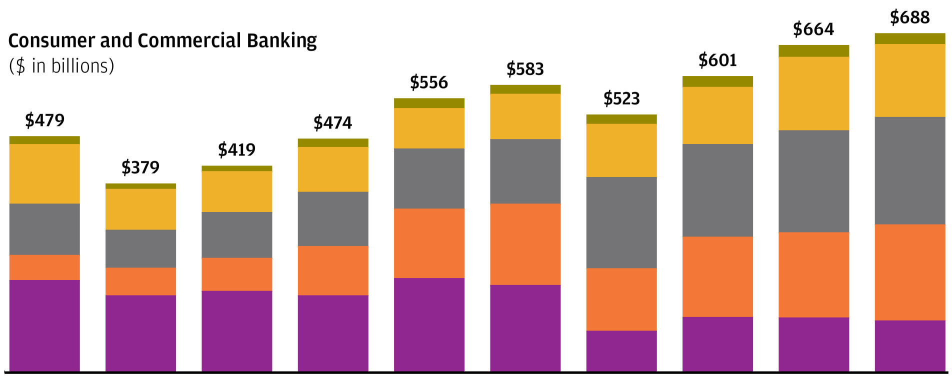
A bank cannot simply stop serving its clients or halt investing because of quarterly or annual earnings pressures. It does not work when long-term investing is changed because of short-term pressures – you cannot stop-start training programs and the development of new products, among other investments. You need to serve your clients and make investments while explaining to shareholders why certain decisions are appropriate at that time. Earnings results for any one quarter or even the next few years are fundamentally the result of decisions that were made years and even decades earlier.

New and Renewed Credit and Capital for Our Clients
at December 31,

Corporate clients
($ in trillions)



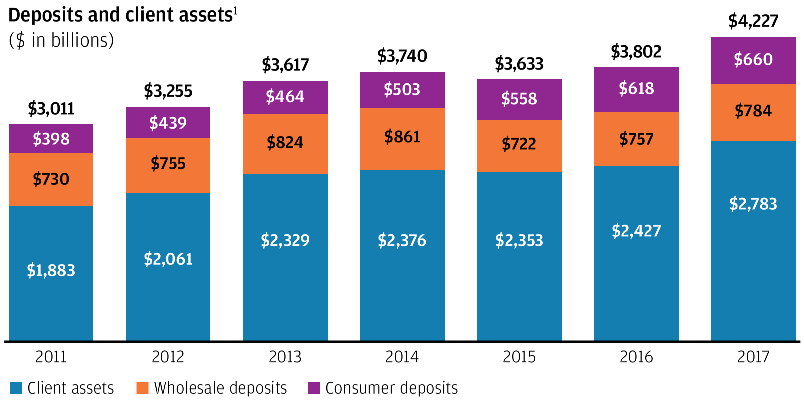
Consumer and Commercial Banking
($ in billions)



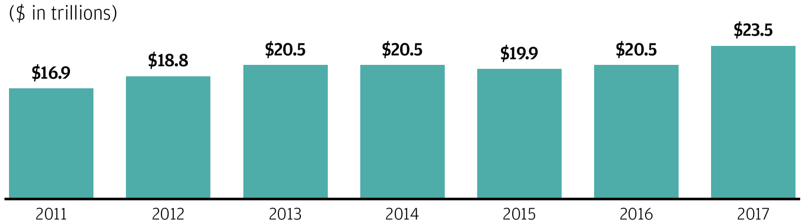
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Small business	$ 16	$ 7	$ 11	$ 17	$ 20	$ 18	$ 19	$ 22	$ 24	$ 22
Card & Auto	121	83	83	91	82	92	108	116	149	148
Commercial/Middle market	104	77	93	110	122	131	185	188	207	218
Asset & Wealth management	51	56	67	100	141	165	127	163	173	195
Mortgage/Home equity	187	156	165	156	191	177	84	112	111	105

Assets Entrusted to Us by Our Clients
at December 31,

Deposits and client assets[1]
($ in billions)



Assets under custody[2]
($ in trillions)



[1] Represents assets under management, as well as custody, brokerage, administration and deposit accounts
[2] Represents activities associated with the safekeeping and servicing of assets

We have to be there for our clients in good times and bad. And we have to continuously improve the products and services we provide to them.

If you are a bank, your clients rely on you to always be there, regardless of the environment – banks are the lender of last resort. Contrary to public opinion, most banks consistently extended credit to their clients (without dramatically raising lending rates) throughout the Great Recession. The charts on page 14 show how we have consistently been there for our clients and that they trust us to hold their assets.

We simply cannot deliver to our shareholders what they deserve if we do not have high-quality, motivated, committed employees.

Talented, diverse employees deliver lifelong – and satisfied – customers. They also deliver innovative products, excellent training and outstanding ideas. Basically, everything we do emanates from our employees. And all of this creates shareholder value. We do not try to get the last dollar of profit off of our employees' or customers' backs. We want long-tenured employees and satisfied customers who stay with us year after year. We would rather earn a fair return and grow our businesses long term than try to maximize our profit over any one time period.

Great employees are the result of a healthy, open and respectful environment and continual investment in training. And great employees are the result of management teams that are humble enough to recognize that they don't know everything their employees do and, therefore, are always seeking out constructive feedback.

While keeping JPMorgan Chase a healthy and vibrant company is the best thing we can do for our communities, there's a lot more we can do.

It is important to explain both what we do and why it is so important for our communities.

As the primary engine of economic growth, the private sector has an important role to play in making sure the benefits are widely shared. The future of business and the health of our communities are ***inextricably linked***. We believe that making the economy work for more people is not simply a moral obligation – it's a business imperative.

Using our unique capabilities, we can do even more for our communities to help lift them up. We have broad and unique knowledge around how communities can develop, how work skills can be successfully implemented, how businesses can be started, how inequality can be addressed, how financial health can be secured, and how more families can find jobs and affordable housing.

We continue to step up our efforts to help communities. In 2017, we were honored to be ranked by *Fortune* magazine as the #1 company changing the world in recognition of our work in Detroit and other communities.

We do extensive investing to help our communities, such as providing affordable housing, lending to lower income households and helping advise governments in economic development. Our philanthropic efforts are only a part of what we do – but a very important part. This year, we announced we will increase our philanthropic investments by 40%. Over the next five years, we will spend $1.75 billion to help drive inclusive growth in communities around the world. Our head of Corporate Responsibility talks about our significant progress and specific measures in more detail in his letter, but I would like to highlight a few initiatives:

- **We are helping communities realize their potential as engines of growth and shared prosperity.** In 2014, we launched our most comprehensive corporate responsibility initiative to date to try to help Detroit, an iconic city that was long engulfed in economic turmoil and then bankruptcy. We view our initiative in Detroit as validation of our firm's model for driving inclusive growth. Three years in, we exceeded our initial $100 million commitment, and we now expect to invest $150 million in the city by 2019. We see the results on the ground – people are moving back into the city, small businesses are being created and expanded, and for the first time in 17 years, property values are on the rise. Our work in Detroit has taught us many important lessons, and this past year, we extended our model for impact to communities in need in Chicago and Washington, D.C.

- **Helping people develop the skills they need to compete for today's jobs can transform lives and strengthen economies**. JPMorgan Chase is investing more than $350 million to support demand-driven skills training around the world. Through New Skills for Youth, we launched additional innovation sites to expand high-quality, career-focused education programs in cities across the United States and around the world.
- **The path to opportunity begins at an early age, but too many young people, particularly from disadvantaged backgrounds, do not get a fair shot at economic opportunity.** High school graduation rates for young men of color are dangerously low, and many who do graduate lack the skills they need to be successful in college or their careers. Through programs like The Fellowship Initiative (TFI), we are working to address barriers to opportunity. TFI engages young men of color in a comprehensive program that includes academic support, leadership development and mentoring during their critical high school years. This past year, we expanded this program to Dallas and recruited new classes of Fellows in Chicago, Los Angeles and New York. One hundred percent of these students are graduating from high school, and, combined, they have been accepted into more than 200 colleges and universities across the country.
- **Supporting re-entry programs is an important part of our effort to create opportunity that strengthens communities and results in a stronger economy.** The overwhelming majority of Americans who are incarcerated return to their communities after they are released. Reducing recidivism is not only important to returning citizens and their families – it can also have profound implications for public safety. New research from The Brookings Institution shows that, not surprisingly, joblessness and incarceration are related. Barriers to hiring returning citizens come in different forms, and some are imposed from the outside. This year, we welcomed the Federal Deposit Insurance Corporation's proposed changes to allow banks more flexibility in hiring returning citizens. Our responsibility to recruit, hire, retain and train talented workers extends to this population. Earlier this year, I visited one of our partnering organizations, the North Lawndale Employment Network in Chicago, which gives formerly incarcerated Americans a path to well-paying jobs. The network also builds a pipeline of trained mechanics for Chicago's growing transportation sector. This is a win-win for workers, employers and the economy as a whole.
- **We are expanding innovative models that enable more people to share in the rewards of a growing economy.** Small businesses are growing fastest among people of color, yet, despite their critical role in boosting economic growth, these businesses receive only a fraction of traditional loans compared with non-minority entrepreneurs. In Detroit, a city with the fourth-largest number of minority-owned small businesses, we quickly saw the need to address the challenges facing minority entrepreneurs. Therefore, in 2015, we helped launch the ***Entrepreneurs of Color Fund in Detroit*** to provide underserved entrepreneurs with greater access to the capital and assistance they needed. Seeing the tremendous success this program has had in Detroit, we decided to scale this model to the South Bronx in New York City, as well as San Francisco – cities that are experiencing similar challenges.

Our Diverse Workforce

I believe the door to diversity opens when you run a great company where everyone feels they are treated fairly and with respect – this is what we strive to create at JPMorgan Chase. We are devoted to diversity for three reasons, and each reason stands on its own – combined, they are powerful. First, it is the right thing to do from a moral perspective. Second, it is better for business to include a group of people who represent the various communities where we operate. And third, if I can pick my team from among all diverse people, I will have the best team.

We have more than 252,000 employees globally, with over 170,000 in the United States. Women represent 50% of our employees. Recently, Oliver Wyman, a leading global management consulting firm, issued a report stating that it would be 30 years before women reach 30% executive committee representation within global financial services companies. So you might be surprised to learn that, today, 50% of the Operating Committee members reporting to me are women as are approximately 30% of our firm's senior leadership globally. They run major businesses – several units on their own would be among Fortune 1000 companies. In addition to having five women on our Operating Committee – who run Asset & Wealth Management, Finance, Global Technology, Legal and Human Resources – some of our other businesses and functions headed by women include Consumer Banking, Credit Card, U.S. Private Bank, U.S. Mergers & Acquisitions, Global Equity Capital Markets, Global Research, Global Custody, Regulatory Affairs, Global Philanthropy, our U.S. branch network, our Controller and firmwide Marketing. I believe we have some of the best women leaders in the corporate world globally. In addition to gender diversity, 48% of our firm's population is ethnically diverse in the United States.

We are proud of JPMorgan Chase's industry recognition for its diversity and inclusion efforts. In 2017, we received more than 50 awards that recognize the firm and represent the diversity of our employees.

Advancing Black Leaders

In 2016, we introduced Advancing Black Leaders (ABL), an expanded diversity strategy focused on increased hiring, retention and development of talent from within the black community. This specifically recognized that — with this population — we should and could do more. We set up a separate group whose sole purpose is to help do this better. From training to retention to recruiting and hiring new employees, our intensified efforts are starting to pay off.

Two years into this initiative, we are seeing encouraging results. At executive levels, we closed 2017 with a noticeable increase in headcount (97 black managing directors globally, up from 83 a year earlier), driven by recruiting new talent and promoting existing talent. In addition, we are seeing positive headcount gains in our pipeline for mid-level managers over the last two years, with executive director representation up 30%, emerging talent with vice president representation up 17% and student talent up 7%. To encourage dialogue and engage our people, more than 85,000 employees were invited to participate in ABL Dialogues — a series of interactive panel discussions facilitated by local leaders in 10 U.S. strategic hubs.

We recently developed a few additional plans and goals for this effort, which we believe will improve these results dramatically.

5. Transparency, financial discipline and a fortress balance sheet. Why is this discipline so important?

Our bank operates in a complex and sometimes volatile world. We must maintain a fortress balance sheet if we want to continually invest and support our clients through thick and thin. A fortress balance sheet also means clear, comprehensive, accurate financial and operational reporting so we can properly manage the company, particularly through difficult times.

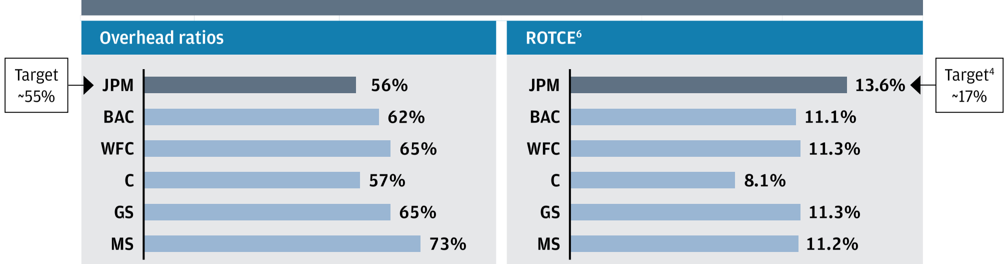
We are fanatical about measuring our results – financial and operational. We set targets for ourselves, and we always compare ourselves with our competitors.

These targets are what we hope to achieve over the medium term and after making proper investments for the future, such as adding bankers and enhancing technology. The chart below shows that we generally compare well with our best-in-class peers (we never expect to be best-in-class every year

JPMorgan Chase Is in Line with Best-in-Class Peers in Both Efficiency and Returns

	Efficiency			Returns			
	JPM 2017 overhead ratios	Best-in-class peer overhead ratios[1]	JPM medium-term target overhead ratio	JPM 2017 ROTCE	Best-in-class peer ROTCE[2, 3]	JPM medium-term target ROTCE Year-ago	JPM medium-term target ROTCE Current[4]
Consumer & Community Banking	**56%**	**52%** BAC-CB	**50%+/-**	**17%**	**22%** BAC-CB	**20%+/-**	**25%+**
Corporate & Investment Bank	**56%**	**53%** BAC-GB & GM	**54%+/-**	**14%**	**14%** BAC-GB & GM	**14%+/-**	**~17%**
Commercial Banking	**39%**	**42%** PNC	**35%+/-**	**17%**	**16%** FITB	**15%+/-**	**~18%**
Asset & Wealth Management	**72%**	**63%** CS-PB & TROW	**70%+/-**	**25%**	**24%** BAC-GWIM & TROW	**25%+/-**	**~35%**

JPMorgan Chase compared with peers[5]



[1] Best-in-class overhead ratio represents comparable JPMorgan Chase (JPM) peer business segments: Bank of America Consumer Banking (BAC-CB), Bank of America Global Banking and Global Markets (BAC-GB & GM), PNC Corporate and Institutional Banking (PNC), Credit Suisse Private Banking (CS-PB) and T. Rowe Price (TROW)

[2] Best-in-class ROTCE represents implied net income minus preferred stock dividends of comparable JPM peers and peer business segments when available: BAC-CB, BAC-GB & GM, Fifth Third Bank (FITB), Bank of America Global Wealth and Investment Management (BAC-GWIM), and TROW

[3] Given comparisons are at the business segment level, where available, allocation methodologies across peers may be inconsistent with JPM's

[4] Each of our businesses has revised its medium-term return targets up, reflecting the benefit of tax reform and growth. We also increased our Firmwide ROTCE target to 17%, up from 15% last year. While competitive dynamics will impact our ultimate results, we believe this target is achievable in the medium-term, reflecting higher revenue in a normalized rate environment and our disciplined investment agenda

[5] Bank of America Corporation (BAC), Wells Fargo & Company (WFC), Citigroup Inc. (C), Goldman Sachs Group, Inc. (GS), Morgan Stanley (MS)

[6] ROTCE is a non-GAAP financial measure and has been adjusted for the impact of the enactment of the TCJA

in every business). You should assume we do this internally at a far more detailed level than what is presented here.

We need a fortress balance sheet so we can continue to do our job – regardless of the environment.

The chart below and the one on page 20 show the extraordinary strength of our balance sheet. We have always believed that maintaining a strong balance sheet (including liquidity and conservative accounting) is an absolute necessity.

We have said this before, and it remains true: JPMorgan Chase has to be prepared to handle multiple, complex, global and interrelated types of risk. We do this in many ways – let me share a few:

The Federal Reserve's Comprehensive Capital Analysis and Review (CCAR) stress test estimated what our losses would be through a severely adverse event lasting over nine quarters – an event that is worse than what actually happened during the Great Recession; e.g., high unemployment and

Our Fortress Balance Sheet

at December 31,

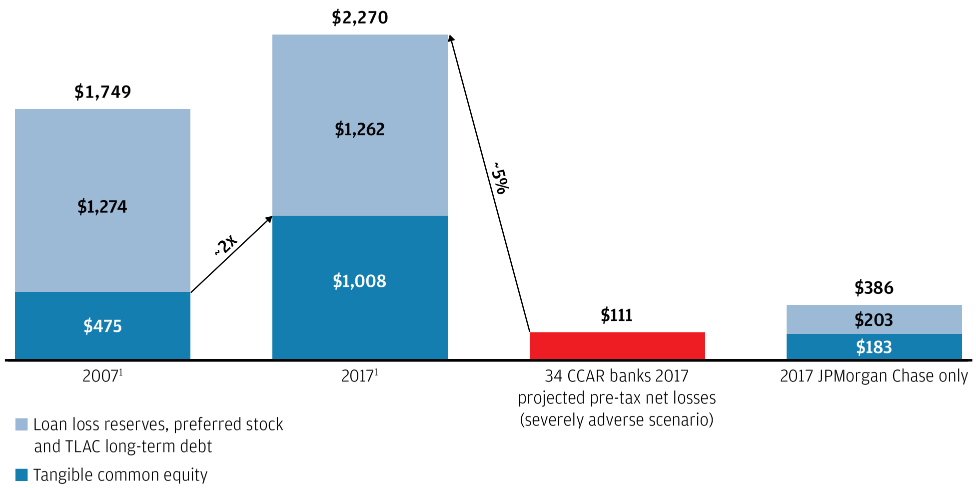
	2008		2017	
CET1	7.0%[3]	+570 bps	12.7%[4]	17.5% excluding operational risk RWA
TCE/ Total assets[1]	4.0%	+340 bps	7.4%	
Tangible common equity	$84B	+$99B	$183B	
Total assets	$2.2T	+$300B	$2.5T	
RWA	$1.2T[3]	+$200B	$1.4T[4]	
Operational risk RWA	$0	+$400B	$400B[5]	
Liquidity	~$300B	+~$256B	$556B[6]	
Fed funds purchased and securities loaned or sold under repurchase agreements	$193B	-$34B	$159B	
Long-term debt and preferred stock[2]	$303B	+$7B	$310B	$186B eligible for TLAC

[1] Excludes goodwill and intangible assets.
[2] Includes trust preferred securities.
[3] Reflects Basel I measure; CET1 reflects Tier 1 common.
[4] Reflects Basel III Advanced Fully Phased-in measure.
[5] Operational risk RWA is a component of RWA.
[6] Represents the amount of high quality liquid assets (HQLA) included in the liquidity coverage ratio. For additional information, see LCR and HQLA on page 93.

B = Billions
T = Trillions
bps = basis points

CET1 = Common equity Tier 1 ratio
TCE = Tangible common equity
RWA = Risk-weighted assets
HQLA = High quality liquid assets predominantly includes cash on deposit at central banks, U.S. agency mortgage-backed securities, U.S. Treasuries and sovereign bonds
Liquidity = HQLA plus unencumbered marketable securities, which includes excess liquidity at JPMorgan Chase Bank, N.A.
TLAC = Total loss absorbing capacity

Loss Absorbing Resources of U.S. SIFI Banks Combined
($ in billions)



[1] Includes only the 18 banks participating in CCAR in 2013, as well as Bear Stearns, Countrywide, Merrill Lynch, National City, Wachovia and Washington Mutual
Source: SNL Financial; Federal Reserve Bank, February 2018
SIFI = Systemically important financial institution
CCAR = Comprehensive Capital Analysis and Review
TLAC = Total loss absorbing capacity

counterparty failures. The Fed estimated that in such a scenario, we would lose $18 billion over the ensuing nine quarters, which is easily manageable by JPMorgan Chase's capital base. My view is that we would make money in almost every quarter in that scenario, and this is supported by our having earned approximately $30 billion pre-tax over the course of the nine quarters during the ***actual*** financial crisis of 2009.

We are believers in the CCAR stress testing process, although our view is that it could be simplified and improved. Our shareholders should know that the CCAR stress test is only an annual test. To explain how serious we are about stress testing, you should know that we run several hundred tests a week – including a number of complicated, potentially disastrous scenarios – to prepare our company for almost every type of event. While we never know exactly how and when the next major crisis will unfold, these rigorous exercises keep us constantly prepared.

The chart above shows just how much capital is retained by the CCAR banks. To remind you, CCAR forecasts the losses of each bank over the next nine quarters as if all of them went through a crisis worse than the crisis in 2009 and that each bank performed as poorly as the worst bank throughout that crisis. The chart above also shows that even in the extremely unlikely event that it could happen this way (i.e., that each bank is the worst bank), there is plenty of capital in the system to absorb these events. This does not include the fact that the new regulatory requirements would appropriately force any bank to take corrective action long before it gets into serious trouble.

6. What risks worry us the most? And what could go wrong?

The global economy across Asia and Japan, Latin America and Europe, and the United States has been doing well – better than most would have expected a year ago. The United States in particular may be strengthening as we speak. The competitive tax system, a more constructive regulatory environment, and very high consumer and business confidence are increasing indications that the economy will likely expand. Unemployment may very well drop to 3.5% this year, and there are more and more signals that business will improve capital expenditures and raise payrolls. Credit is readily available (though still not enough in some mortgage markets). Wages, jobs and household formation are increasing. Housing is in short supply. Underlying consumer and corporate credit have been relatively strong. All these signs lead to a positive outlook for the economy for the next year or so.

I will not spend time dwelling on geopolitics here, which can – but rarely does – upset the global economy. In the next section, I talk about serious policy issues that could harm economic growth, including America's relationship with China and potential disruptions to global trade. In this section, I focus on some of the risks in the financial system and how we go about managing them.

We will be prepared for Brexit.

So far, it has turned out pretty much like we expected: It's complex and hard to figure out, and the long-term impact to the United Kingdom is still uncertain. Last year, we spoke about whether Brexit would cause the European Union to unravel or pull together – and it appears, particularly with the new leadership in France and the steady hand in Germany, that the countries might pull together. As for JPMorgan Chase, fortunately, we have the resources to be prepared for a hard Brexit, as we must be. It essentially means moving 300-400 jobs around Europe in the short term and modifying some of our legal entities to be able to conduct business the day after Brexit. What we do not know – and will not know until the negotiations are complete – is what the end state will look like. Although unlikely, there is the possibility that we could stay exactly as we are today. Unfortunately, the worst outcome would be much of London's financial center moving to the Continent over time. We hope for all involved that this outcome will not be the case.

We cannot do enough as a country when it comes to cybersecurity.

I cannot overemphasize the importance of cybersecurity in America. This is a critical issue, not just for financial companies but also for utilities, technology companies, electrical grids and others. It is an arms race, and we need to do whatever we can to protect the United States of America.

Our bank is extremely good at cybersecurity and client protection. However, cyber law in the United States is inadequate regarding banks and government entities. We need to be allowed to work even closer with our government in real time to properly protect the financial system. In addition, we need to have better international cyber laws (and include them in trade agreements) like we do in maritime and aviation laws. Countries should know what they are responsible for – and what redress companies or countries have – when either a bad state actor or criminals in a state cause extreme problems.

In the financial markets, we must be prepared for the full range of possibilities and probabilities.

We strive to try to understand the ***possibilities and probabilities*** of potential outcomes so as to be prepared for any outcome. We analyze multiple scenarios (in addition to the stress testing I wrote about earlier in this section). So regardless of what you think about the probabilities, we need to be prepared for the possibilities, including the worst case. In essence, we try to manage the company such that all possibilities, including the "fat tails" (the worst-case scenarios), cannot hurt the company.

We try to intelligently, thoughtfully and analytically make decisions and manage risk (and not overly rely on models).

When I hear people talk about banks taking risks, it often sounds as if we are taking big bets like you would at a casino or a racetrack. This is the complete opposite of reality. Every loan we extend is a proprietary risk. Every new facility we build is a risk. Whether we are adding branches or bankers – or making markets or expanding operations – we perform extensive analytics and stress testing to challenge our assumptions. In short, we look at the best- and worst-case scenarios before we "take risk." Much of what we do as a bank is to mitigate or manage the risk being taken. I think you would be impressed by the thoroughness and risk-mitigating approach demonstrated at our risk committee meetings. At these meetings, we have lawyers, compliance, risk management, bankers and technologists – folks with decades of experience who challenge each other and ensure we have thought about every possible angle. And since we know we will be wrong sometimes, we almost always look at the worst possible case – to ensure JPMorgan Chase can survive any situation. This is not risk taking on the order of taking a guess – it is intelligent, thoughtful, analytical decision making.

We rely heavily on detailed and constantly improving models as a foundational element of that analysis. But we are cognizant of the fact that models by their nature are backward looking and have a difficult time adjusting to material items, including the following:

- The character and integrity of those with whom you are doing business
- Changing technology as it impacts industries (including the banking industry)
- Future changes in the law or even how the law might be interpreted differently 10 years from now
- Deteriorating international competiveness (as what happened to our tax code)
- Emerging competitive threats
- Changes in industrial structure; e.g., new sources of competition
- Political influence and unexpected litigation
- Public sector fiscal challenges, demographic changes and challenges managing the nation's healthcare resources

There are other items – but you get the point. Judgment (which will never be perfect all of the time) cannot be removed from the process.

Volatility and rapidly moving markets should surprise no one.

We are always prepared for volatility and rapidly moving markets – they should surprise no one. I am a little perplexed when people are surprised by large market moves. Oftentimes, it takes only an unexpected supply/demand imbalance of a few percent and changing sentiment to dramatically move markets. We have seen that condition occur recently in oil, but I have also seen it multiple times in my career in cotton, corn, aluminum, soybeans, chicken, beef, copper, iron – you get the point. Each industry or commodity has continually changing supply and demand, different investment horizons to add or subtract supply, varying marginal and fixed costs, and different inventory and supply lines. In all cases, extreme volatility can be created by slightly changing factors.

It is fundamentally the same for stocks, bonds, and interest rates and currencies. Changing expectations, whether around inflation, growth or recession (yes, there will be another recession – we just don't know when), supply and demand, sentiment and other factors, can cause drastic volatility.

One scenario that we must be prepared for is the possibility that the reversal of quantitative easing (QE) by the world's central banks – in a new regulatory environment – will be different from what people expect.

The United States has had subpar economic growth over the last eight years (I believe this is due to a lot of poor policy decisions that I discuss in the next section), as well as new demographic realities. Our growth cumulatively in this expansion has been about 20%, while a more normal recovery would have seen growth of over 40% by now. However, with recent reforms, the situation may be improving. As inflation, wages and growth seem to be modestly increasing, the Federal Reserve has started to raise interest rates and reverse QE. ***Importantly***, as long as rates are rising ***because*** the economy is strengthening and inflation is contained, it is reasonable to expect that the reversal of QE will not be painful. The benefits of a strong economy are more important than the negative impact from modest increases in interest rates.

Since QE has ***never been done*** on this scale and we don't completely know the myriad effects it has had on asset prices, confidence, capital expenditures and other factors, we cannot possibly know all of the effects of its reversal. We have to deal with the ***possibility*** that at one point, the Federal Reserve and other central banks may have to take more drastic action than they currently anticipate – reacting to the markets, not guiding the markets. A simple scenario under which this could happen is if inflation and wages grow more than people expect. I believe that many people underestimate the possibility of higher inflation and wages, which means they might be underestimating the chance that the Federal Reserve may have to raise rates faster than we all think. While in the past, interest rates have been lower and for longer than people expected, they may go higher and faster than people expect. If this happens, it is useful to look at how the table is set – what are all the things that are different or better or worse than during prior crises, particularly the last one – and try to think through the possible effects.

There are many pluses (things that are better than during the last crisis in 2009):

- Far more capital and less leverage in the banking system
- Far more liquidity in the banking system
- More collateral in the markets
- Less total short-term secured financing, which is also more properly collateralized
- Less leveraged lending
- Money market funds that are far safer due to regulatory requirements around credit standards and liquidation
- Healthier consumers in terms of both employment and disposable income (and their debt burden is still modest relative to their disposable income, while debt service burdens are historically low)
- The absence of massive losses in the mortgage markets. Mortgage underwriting since 2009 has been rather pristine. And while losses will go up in a recession, it will be nothing like what happened in the Great Recession. In the 2009 crisis, losses totaled more than $1 trillion. The marketplace realization that financial institutions and investors were going to experience massive losses is a primary reason why there was a devastating loss of confidence in the financial system.

And there are some modest negatives or potentially important differences (than during the last crisis):

- Far more money than before (about $9 trillion of assets, which represents about 30% of total mutual fund long-term assets) is managed passively in index funds or ETFs (both of which are very easy to get out of). Some of these funds provide far more liquidity to the customer than the underlying assets in the fund, and it is reasonable to worry about what would happen if these funds went into large liquidation.

- Even more procyclicality has been built into the system. Risk-weighted assets will go up as will collateral requirements – and this is on top of the procyclicality of loan loss reserving.
- Market making is dramatically smaller than in the past (e.g., aggregate primary dealer positions of bonds – including Treasury and agency securities, mortgage-backed securities and corporates – averaged $530 billion in 2007 vs. an average of $179 billion today). While in the past that total may have been too high, virtually every asset manager says today it is much harder to buy and sell securities, particularly the less liquid securities.
- Liquidity requirements, while much higher, now have an element of rigidity built in that did not exist before. Banks will be unable to use that liquidity when they most need to do so – to make loans or intermediate markets. They have a "red line" they cannot cross (they are required to maintain hard and fast liquidity requirements). As clients demand more liquidity from their banks, the banks essentially will be unable to provide it.
- There has been an excessive reliance on models (which I spoke about earlier in this section).
- The continuous politicization of complex policy is an issue. No one can believe that very detailed and complex global liquidity or capital requirements should be set by politicians.
- No banks to the rescue this time – banks got punished for helping in the last go-round.

It would be a ***reasonable*** expectation that with normal growth and inflation approaching 2%, the 10-year bond could or should be trading at around 4%. And the short end should be trading at around 2½% (these would be fairly normal historical experiences). And this is still a little lower than the Fed is forecasting under these conditions. It is also a reasonable explanation (and one that many economists believe) that today's rates of the 10-year bond trading below 3% are due to the large purchases of U.S. debt by the Federal Reserve (and others).

This situation is completely reversing. Sometime in the next year or so, many of the major buyers of U.S. debt, including the Federal Reserve, will either stop their buying or reverse their purchases (think foreign exchange managers or central banks in Japan or China and Europe). So far, only one central bank, the Federal Reserve, has started to reverse QE – and even that in a minor way. However, by the end of this year, the Fed has indicated it might reduce its holding of Treasuries by up to $150 billion a quarter. And finally, the U.S. government will need to sell more than $250 billion a quarter to fund its deficit.

There are two offsetting factors to the large sales of Treasuries. One is that as the Federal Reserve sells, it reduces excess reserves, which requires banks to buy Treasuries to meet liquidity requirements. But we do not fully know the extent of this scenario, and it certainly won't be dollar for dollar. The second factor, as some argue, is that the U.S. trade deficit effectively forces foreign countries to use their dollars to buy Treasuries, although this is not completely true – they can buy other U.S. securities or assets or sell their dollars.

So we could be going into a situation where the Fed will have to raise rates faster and/or sell more securities, which certainly could lead to more uncertainty and market volatility. Whether this would lead to a recession or not, we don't know – but even that is not the worst case. If growth in America is accelerating, which it seems to be, and any remaining slack in the labor markets is disappearing – and wages start going up, as do commodity prices – then it is not an unreasonable ***possibility*** that inflation could go higher than people might expect. As a result, the Federal Reserve will also need to raise rates faster and higher than people might expect. In this case, markets will get more volatile as all asset prices adjust to a new and maybe not-so-positive environment. Remember that former Chairman of the Federal Reserve Paul Volcker increased the discount rate by 100 basis points on a Saturday night back in 1979 in response to a serious double-digit inflation problem. And when markets opened the next business day, the Fed funds rate went up by over 200 basis points. Also remember that the Federal Reserve is operating with extremely different monetary transmission mechanisms than in the past. The old "money multiplier" has been superseded by the new capital and liquidity requirements. Today's "excess reserves" (reserves once considered in excess of what banks were required to post in cash at the Federal Reserve – fundamentally reserves that could be lent out) are not lendable, although we still don't completely understand the effect of this.

There is a risk that volatile and declining markets can lead to market panic.

Financial markets have a life of their own and are sometimes barely connected to the real economy (most people don't pay much attention to the financial markets nor do the markets affect them very much). Volatile markets and/or declining markets generally have been a reaction to the economic environment. Most of the major downturns in the market since the Great Depression reflect negative future expectations due to a potential or real recession. In almost all of these cases, stock markets fell, credit losses increased and credit spreads rose, among other disruptions. The biggest negative effect of volatile markets is that it ***can*** create market panic, which could start to slow the growth of the ***real*** economy. The years 1929 and 2009 are the only real examples in the United States in the past 100 years when panic in the markets caused large reductions in investments and hiring. I wouldn't give this scenario very high odds – in fact, I would give it low odds. Most people think of those events as one-in-a-thousand-year floods. But because the experience of 2009 is so recent, there is always a chance that people may overreact.

If truly negative events started to unfold, we could expect the Federal Reserve, with its enormous authority and power, to take strong action, including changing regulations, if the Fed thought it necessary. In any event, our shareholders should rest assured that we will weather it all. There are a couple of things we all could do to be more prepared for this situation and other disruptions, which I will discuss in the next few paragraphs.

Banks and regulators need to be more forward looking and less backward looking – particularly when examining risks across the system.

One day there will be another crisis, and financial institutions and central banks will need to respond. The financial system is far more safe and sound than in the past. But in spite of all the regulations put in place, I worry about whether we have properly prepared for the next crisis. The Financial Stability Oversight Council was created to oversee the whole system (as appropriate), but we have not yet really worked collaboratively to prepare tabletop exercises about what would happen ***across*** the system under difficult situations.

When the next crisis begins, regardless of where or how it starts, multiple actors in the system will take actions – either out of necessity (i.e., they need cash) or sentiment (i.e., they want to reduce risk). This will happen across passive, index and ETF funds, insurance companies, banks and nonbanks. As individual actors stop providing credit and liquidity in the marketplace, we need to do a better job of understanding how this might unfold. And all this will be happening under a different regulatory regime from before.

We also need to be more forward looking in many other areas. Doing so will create a better and stronger system – not doing so will actually create additional risk. Following are a few examples:

Almost all risk and control functions (think Anti-Money Laundering, Know Your Customer (KYC) and Compliance) could be better performed if we worked with the regulators to streamline what we do and use advanced techniques, like artificial intelligence and machine learning, to improve the outcomes. The same is true for fraud prevention and customer service. We must also be far more aggressive in protecting ourselves from cybersecurity risks, both within the banking system and across the financial system (think of nonbanks, money managers, clearinghouses, exchanges, etc.)

Modest regulatory reform can strengthen the financial system, improve the functioning of our markets and enhance economic growth for all Americans.

While the regulatory environment is appropriately much stricter than it once was, we can simplify it and even strengthen it by ensuring that it is globally fair and transparent and includes continuous, regular review and appropriate modification.

Regulators now have begun to simplify, coordinate and reduce overlapping regulations. I won't repeat the details that I've discussed in prior letters – many of them were also discussed in Treasury reports issued by the government. But suffice it to say, modest regulatory reform could allow banks to expand carefully, improve access to credit (e.g., mortgages and small business loans) and improve market making and the functioning of the money markets.

7. How is the company dealing with bureaucracy and complacency that often infect large companies?

I was recently at a senior leadership offsite meeting talking about bureaucracy. We heard bureaucracy described as "a necessary outcome of complex businesses operating in complex international and regulatory environments." This is hogwash. Bureaucracy is a disease. Bureaucracy drives out good people, slows down decision making, kills innovation and is often the petri dish of bad politics. Large organizations, in fact all organizations, should be thought of as always slowing down and getting more bureaucratic. Therefore, leaders must continually drive for speed and accuracy to eliminate waste and kill bureaucracy. When you get in great shape, you don't stop exercising.

After years of increasing regulations, there has been a temptation to blame some of our bureaucracy and ridiculous processes on regulations. That, too, is (mostly) hogwash. It is easy to find excuses not to attempt to reimagine how things could be done better and more efficiently.

Below are five examples of how we've set out to combat this condition:

Meetings. Internal meetings can be a giant waste of time and money. I am a vocal proponent of having fewer of them. If a meeting is absolutely necessary, the organizer needs to have a well-planned, focused agenda with pre-read materials sent in advance. The right people have to be in the room, and follow-up actions must be well-documented. Just as important, each meeting should only run for as long as it needs to and lead to real decisions. In addition, there should be clarity around who chairs the meeting. The chair is responsible for making sure all issues are properly raised, facilitating effective and productive discussions and driving to decisions.

War rooms. Just as important, we need to simplify our processes while accelerating the pace of change and driving new innovations. Last year, the Operating Committee created a number of "war rooms" – spanning lines of business, geographies, functions and levels – to make our firm more agile and to put a laser focus on several hot-button issues, like client onboarding and vendor and third-party management. Each war room is staffed with a dedicated group of employees tasked with solving specific problems within a set number of weeks or months. You would be amazed at how quickly our employees can come up with new solutions when they are galvanized around solving a problem in a concentrated time period. These teams have been so successful in driving bureaucracy out of the decision-making process that we plan to deploy more war rooms when critical needs arise. These war rooms are very similar to how we operated when we made complex acquisitions. Essentially, they cause better and faster dissemination of information to those who need to know – and faster and more productive decision making because everyone involved is in the room.

Reimagining. You can take any part of your business and reimagine it. You can get all the right people in the room to think about a certain process and reimagine how it could be done from the ground up. Our Know Your Customer problem-solving team is a good example of the results our reimagining and war rooms can drive. Comprising all lines of business, the group was given eight weeks to reimagine our KYC processes to improve the customer experience without sacrificing controls. By applying a sharp, firmwide focus to the KYC protocols, the team identified several KYC questions and protocols that had become outdated or been made redundant by recent controls. One customer could be subjected to multiple KYC processes depending on the line of business and channel used. As a result, the team streamlined KYC questions substantially and identified a number of processes that could be eliminated, which will allow for a better customer experience while still maintaining a strong control environment. This war room team's results not only helped disparate lines of business identify duplicative processes but also enabled the team to update the firm's priorities.

Fighting complacency by being self-critical. Complacency is another disease. It is usually borne out of arrogance or success, but it is a guarantee of future failure. Our competitors are not resting on their laurels – nor can we. The only way to fight complacency is to always analyze our own actions and point out our own weaknesses. It's great to openly celebrate our successes, but when the door is closed, management should emphasize the negatives.

Using agile management to create speed. Agile technology generally means using new forms of technology – think cloud computing, for example – to enable small teams of programmers to build and properly execute new programs and products rapidly and effectively. The concept of ***agile management*** goes hand in hand with this approach. Small teams of people responsible for products and services work with technologists to improve the customer experience. To do this, they must be given the necessary authority and resources. It is also important they understand that they can make mistakes without punishment.

8. What are the firm's views on succession?

Having a first-rate management team in place is probably the Board's highest priority. Therefore, management succession planning is a key focus of our Board. The Board knows the firm's senior leaders well, through unfettered access and significant interaction.

While the Board and I have agreed that I will continue in my current role for approximately five more years, we both believe that, under all timing scenarios, the firm has in place several highly capable successors.

Early in the year, we announced that Daniel Pinto, CEO of our Corporate & Investment Bank, and Gordon Smith, CEO of Consumer & Community Banking, have been appointed Co-Presidents and Chief Operating Officers of the company. In addition to their current roles, Daniel and Gordon will work closely with me to help drive critical firmwide functions. Our other outstanding CEOs, Mary Erdoes, Asset & Wealth Management, and Doug Petno, Commercial Banking, along with our CFO, Marianne Lake, took on expanded responsibilities last year and have played progressively more significant roles partnering across the firm in helping to manage the company. I also want to say how grateful I am to our Operating Committee and to all of the leaders of our organization for the extraordinary job they do.

II. PUBLIC POLICY

The following messages are worth repeating from last year's letter: The United States needs to ensure that we maintain a healthy and vibrant economy. This is what fuels job creation, raises the standard of living and creates opportunity for those who are hurting, while positioning us to invest in education, technology and infrastructure – in a programmatic and sustainable way – to build a better and safer future for our country and its people. And in a world with so many security threats and challenges, we need to maintain the best military. America's military will be the best in the world only as long as we have the best economy in the world.

Business plays a critical role as an engine of economic growth – particularly our largest, globally competitive American businesses. As an example, the 1,000 largest companies in America (out of approximately 29 million) employ nearly 30 million people in the United States, and nearly all of their full-time employees receive full medical and retirement benefits, as well as extensive training. In addition, these companies account for more than 30% of the roughly $2.3 trillion spent annually on capital expenditures. These expenditures and research and development spending drive productivity and innovation, which, ultimately, drive job creation across the entire economy.

Of the approximately 150 million people who work in the United States, 130 million work in private enterprise. We hold in high regard the 20 million people employed by the government or in the public sector – teachers, police officers, firefighters and others. But we could not pay for those jobs if the other 130 million workers were not actively producing America's gross domestic product (GDP).

Small businesses are a critical engine of economic growth. Small and large businesses are symbiotic – they are each other's customers, and they help drive each other's growth. They are integral to our large business ecosystem. At JPMorgan Chase, for example, we support more than 4 million small business clients, including hundreds of small banks, 15,000 middle market companies, and approximately 7,000 corporations and investor clients. Additionally, we rely on services from nearly 30,000 vendors, many of which are small and midsized companies.

Business, taken as a whole, is the source of almost all job creation. And we need to maintain trust and confidence in our businesses as in all of our institutions. Confidence is a "secret sauce" that costs nothing, but it helps the economy grow. A strong and vibrant private sector (including big companies) is good for the average American. Entrepreneurship and free enterprise, with strong ethics and high standards, are something to root for – not attack.

To support this, we need a pro-growth policy environment from the government that provides a degree of certainty around longstanding issues that have proved frustratingly elusive to solve. The most pressing areas where government, business and other stakeholders can find common ground should include tax reform, infrastructure investment, education reform, more favorable trade agreements and a sensible immigration policy.

Let's take another look at what is holding us back and some solutions that could make life better for all Americans.

1. What has gone wrong in public policy?

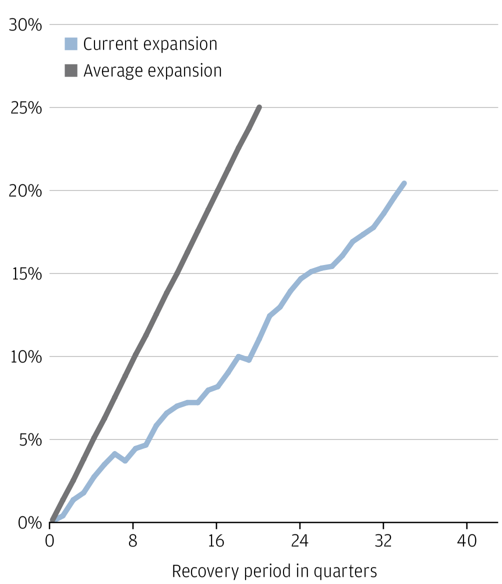
In the last several years, I have spent a good amount of time – in both these letters and elsewhere – talking about public policy. Some of the policies directly relate to JPMorgan Chase, while others are more indirect but have a large effect on the future of the United States of America, on the global economy and, therefore, on our company. With all of America's exceptional strengths, it seems clear to me that something is holding us back. As we have already pointed out, our economic growth has been anemic. Our economy has grown approximately 20% in the last eight years, but this stands in contrast with prior average recoveries where growth would have been more than 40% over an eight-year period. The chart below on the left shows this.

Last year, I laid out in detail an extensive list of things I thought were holding us back, and it bears repeating here because, just as it took many years for these obstacles to develop, it is going to take sustained effort over many years to right the course. When you look at this list in totality, it is significant and fairly shocking. Most of these areas have become consistently worse over the last 10 to 20 years, and it is hard to argue that they did not meaningfully damage the country's economic growth. It is also important to point out that I have never seen an economic model that accounts for the extremely damaging aspects of these items. (These items don't include the trillions of dollars we have spent on war-related expenditures. And whether you were for or against these wars, they certainly did not add to American productivity.) This is not secular stagnation – this represents senseless and misguided policies.

GDP[1] Growth

The present expansion relative to average

Cumulative growth since prior trough, percent

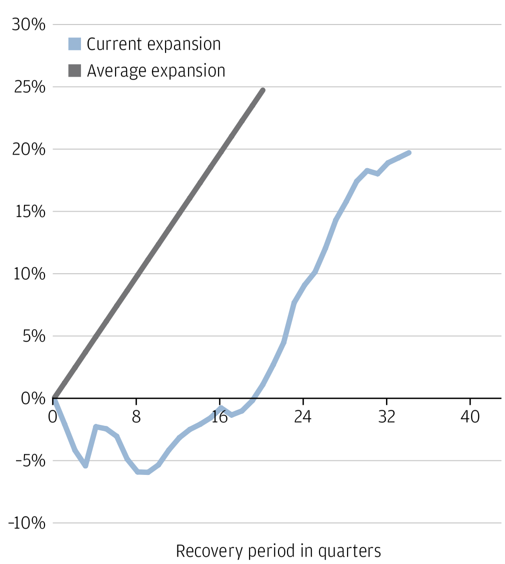


[1] Adjusted for inflation
Source: Bureau of Economic Analysis (BEA); National Bureau of Economic Resource (NBER), March 2018

Bank Credit[1] Growth

The present expansion relative to average

Cumulative growth since prior trough, percent



[1] Adjusted for inflation
Source: Haver; Federal Reserve Board, March 2018

- We had a hugely and increasingly uncompetitive tax system driving companies' capital and brainpower overseas.
- Excessive regulations for both large and small companies reduced growth and business formation. The ease of starting a business in the United States worsened, with small business formation dropping to the lowest rate in 30 years.
- The chart on the bottom right of page 30 shows how tepid bank credit growth was in general during this recovery. Remember, bank credit growth directly relates to economic growth, although it's often difficult to figure out the cause and effect. But there is no question that the things that reduce credit availability, in turn, reduce growth. One area where we know this happened was in the mortgage market. Household formation has been slow because many young adults have had a difficult time finding work and, with the help of their families, have gone back for more schooling. That is slowly reversing. But the inability to reform mortgage markets has dramatically reduced mortgage availability. In fact, our analysis shows that, conservatively, more than $1 trillion in mortgage loans might have been made over a five-year period.
- Labor force participation – particularly among men aged 25-54 – dropped dramatically. An estimated 2 million Americans are currently addicted to opioids (in 2016, a staggering 42,000 Americans died because of opioid overdoses), and some studies show this is one of the major reasons why men aged 25-54 are permanently out of work. Even worse, 70% of today's youth (ages 17-24) are not eligible for military service, essentially due to a lack of proper education (basic reading and writing skills) or health issues (often obesity or diabetes).
- Our schools are leaving too many behind. In some inner city schools, fewer than 60% of students graduate, and of those who do, a significant number are not prepared for employment. Additionally, many of our high schools, vocational schools and community colleges do not properly prepare today's younger generation for the available professional-level jobs, many of which pay a multiple of the minimum wage.
- Infrastructure is a disaster. It took eight years to get a man to the moon (from idea inception to completion), yet it now can sometimes take a decade to simply get the permits to build a bridge or a new solar field. The country that used to have the best infrastructure on the planet by most measures is now not even ranked among the top 20 developed nations according to the Basic Requirement Index.
- Our immigration policies fail us in numerous ways. Forty percent of foreign students who receive advanced degrees in science, technology and math (300,000 students annually) have no legal way of staying here, although many would choose to do so. Most students from countries outside the United States pay full freight to attend our universities but many are forced to take the training back home. From my vantage point, that means one of our largest exports is brainpower.
- Our nation's healthcare costs are twice the amount per person compared with most developed nations.
- Our litigation system is increasingly arbitrary, capricious, wasteful and slow.

Economic analysis provides a sense of the costs associated with misguided policies. The Congressional Budget Office estimates the cost of failing to pass immigration reform earlier this decade at 0.3% of GDP a year. An International Monetary Fund study suggests that a 1% of GDP rise in infrastructure investment in 2013 would have delivered a similar boost to advanced economy GDP over the subsequent decade. J.P. Morgan analysis indicates that the cost of not reforming the mortgage markets could be as high as 0.2% of GDP a year. Taken together with the costs of excessive regulation and a depressed prime age labor participation rate, it is easy to conclude that corrections in policy could add more than 1% of GDP annually. And this does not account for many of the items I mentioned in the prior list.

The end result is that our economy is still leaving many behind. Much of this is probably self-inflicted. While a job used to provide a ticket to the middle class, today more people are getting stuck in low-wage work. Historically, we've thought of these jobs as providing the first rung on a career ladder – a chance for workers to prove themselves and develop skills before moving on to other, better paying jobs. But a growing number of Americans are left hanging on this first rung: During the mid-1990s, only one in five minimum-wage workers was still at minimum wage a year later. Today, that number is nearly one in three.

So while the economy has not performed badly and has done amazingly well for a handful – low-skilled and even middle-skilled wages have gone down, leaving large swaths of Americans behind.

It is surprising that many younger people in the United States, who are effectively going to inherit the wealthiest nation on the planet, seem to be pessimistic about our future and capitalism. But falling expectations, the failure of our economy to lift up everyone, and the continual deprecation of society and its leaders have led to huge amounts of discontent and unrest.

All these issues are fixable, but we should ask ourselves how we got it wrong in the first place.

2. Poor public policy — how has this happened?

America has been an amazingly resilient country. And we hope it will reset and get back on track. But it is hard to look at the last 20 years and not think that it has been getting increasingly worse (and we should not assume that it will get better on its own). Before we try to address what we can do to fix it, it is important to look at why it has gotten worse. Here are my theories:

- The world is getting faster and more complex, making speed and analytics all the more important. But the structure of our political parties and institutions has barely changed in 100 years. They may not be set up for success – organized in a way to enable them to deal with today's challenges.
- Critical thinking, analysis of facts and proper policy formation have become extremely difficult in a politicized and media-saturated environment. Often, politics misuses facts to justify a position.
- We are effectively crippled when it comes to fixing our problems ***even when they are totally predictable***. Puerto Rico's bankruptcy, Detroit's bankruptcy, unfunded pension plans, the job skills gap, and crumbling bridges and tunnels are prime examples.
- We focus too much on the short term. For example, President Bill Clinton (and I don't mean to pick him out specifically) usually gets credit for driving a strong economy. But the excessive mortgage lending, incented and promulgated by the federal government (I am in no way saying that banks and investors didn't play a part, too), is part of the reason the economy at that time did well. It blew up

late in President George W. Bush's term. There are many examples of presidents getting credit or blame for scenarios that had nothing to do with their governing. We simply learned the wrong lessons. And in the short run, we tend to simplistically look for scapegoats instead of solutions.

- Rogoff and Reinhart wrote in their book, *This Time Is Different*, that it takes a long time to recover from a financial crisis. But this was often due to poor policy or overreaction to the financial crisis, and while history teaches us that maybe we should expect this reaction in the next crisis, it does not have to be true over and over. We have a difficult time learning from the past.
- A famous politician once said, "Don't let a good crisis go to waste." I think he really meant, "Let's use the crisis to get some good, important things done." It appears that politicians sometimes use a crisis to justify implementing their own agenda.
- Here's another example: We all know that the U.S. healthcare system needs to be reformed. Many have advocated getting on the path to universal healthcare for all Americans. The creation of Obamacare, while a step in the right moral direction, was not well done. America has 290 million people who have insurance – 180 million through private enterprise and 110 million through Medicare and Medicaid. Obamacare slightly expanded both and created exchanges that insure 10 million people. But it did very little to fix our broken healthcare system and has, in fact, torn up the body politic over 10 years – and this tumult may go on for another 10 years.

3. We can fix this problem through intelligent, thoughtful, analytical and comprehensive policy.

First off, we should find it rather easy to recognize that bad thinking often leads to bad policymaking. Let me list a few of the culprits:

- Binary arguments. When people argue as if there are binary solutions, the argument is almost always wrong. When people say you should not do something because it is like going down a "slippery slope," it generally is not a good argument. In the modern world, there are reasons to calibrate various parts of policy instead of just denying the argument altogether.
- "They complain too much" arguments. When a point has been made and someone calls it a complaint, the point is diminished right away. When someone complains about something, a better response is to think about where or how the person might be right or partially right.
- Not listening to one another. I tell my liberal friends to read columnists like Arthur Brooks and George Will. And I tell my conservative friends to read writers like Tom Friedman.
- Not asking what outcomes you really want to achieve.
- Not working with experts who know the most about a subject.
- Trying to create too many zero-tolerance environments when they are often not merited. Examples include situations where people need to be able to communicate with each other and work through miscommunications and mistakes of judgment rather than criminal and unethical behavior, where a zero-tolerance standard should be applied equally to all.
- This way of thinking also applies to institutions. We should not destroy the credibility or the effectiveness of institutions – public or private – for the mistakes or misdeeds of a few. This may feel good in the short term but will not serve us well over the long term.

We all generally know what a good decision-making process looks like – and we applaud it – whether in business or in Congress.

4. The need for solutions through collaborative, competent government.

People don't think about the challenges in their everyday lives as being Democratic or Republican issues – and our political leaders need to stop thinking that way. We need a well-performing, competent government to thrive as a nation. Clearly, there are things that only the government can do – and must do well – such as having a strong military and ensuring an efficient and properly functioning justice system. The federal government maintains most of our nation's transportation systems, and we need state and local governments to do a good job in terms of education, policing and other important functions. Some argue that the government should be doing more. But when many Americans think of the government delivering services, they think of the endless bureaucracy and paperwork associated with the Internal Revenue Service, the U.S. Postal Service and the Department of Veterans Affairs – none of which would consistently get high marks.

We all can agree that the lack of true collaboration and an unwillingness to address our most pressing policy issues have contributed to the divisive and polarized environment we have today. Certainly there is plenty of blame to go around on this front. However, rather than looking back, it now is more important than ever for the business community and government to come together to find meaningful solutions. This cannot be done by government or business alone.

By collaborating and applying some good old American can-do ingenuity, there is nothing we can't accomplish. By working together, business, government and the nonprofit sector can ensure and maintain a healthy and vibrant economy into the future – creating jobs, fostering economic mobility and maintaining sustainable economic growth. Ultimately, this translates to an improved quality of life and greater financial security for those in the United States struggling to make ends meet. It also represents a significant step in restoring public faith in two of our greatest democratic institutions in the United States: business and government. Working together will allow us to move toward a prosperous future for all Americans.

Many examples of business and government working together already have produced positive outcomes. Businesses have played a large role in trying to help Detroit recover. Businesses started the Veteran Jobs Mission. With a goal of 1 million jobs, the coalition of businesses has already helped 400,000 U.S. veterans get work, and the number is still growing. Many businesses have worked closely with the education system (mostly locally) to support charter schools, vocational schools and community colleges to provide skills training that prepares students for productive employment. We believe that collaboration can create even better outcomes in education, healthcare and job creation while shoring up pension plans and rebuilding our cities and communities across the nation.

Our Founding Fathers studied and worked hard to design a strong and permanent democracy. They perfected a Constitution to protect our basic liberties, building in protections to temper some of our worst attributes and incent our best ones. If they were here with us today, I believe they would recognize that our government institutions are stuck in the mud – too slow and inadequate for the job at hand. Therefore, they would study and work hard within the Constitution to redesign and reformulate how government should function so that it works properly. We will eventually need to do the same.

5. A competitive business tax system is a key pillar of a growth strategy.

It isn't easy to stay competitive in an increasingly global marketplace, and national tax policy was one critical area where we were falling behind. Over the last 20 years, as the world reduced its tax rates, America did not. Our previous tax code was increasingly uncompetitive, overly complex, and loaded with special interest provisions that created winners and losers. This was driving down capital investment, reducing productivity and causing wages to remain stagnant. The good news is that the recent changes in the U.S. tax system have many of the key ingredients to fuel economic expansion: a business tax rate that will make the U.S. competitive around the world; provisions to free U.S. companies to bring back profits earned overseas; and, importantly, tax relief for the middle class.

The passage of tax reform is critical because strong businesses create jobs and higher wages. Before tax reform was passed, 76% of the CEOs of leading U.S. companies said they would increase hiring if tax reform were enacted, and 82% would increase capital spending – and we already are seeing these effects. Hundreds of companies like ours are stepping up by investing in their employees and in initiatives to address challenges facing communities.

I must confess I don't understand how anyone could believe an uncompetitive tax system would be good for the United States – whether the current economic environment was good or bad. The damage has been cumulative. Here is one example: A recent study by the accounting firm Ernst & Young found that under a 20% corporate income tax rate, U.S. companies would have acquired $1.2 trillion in cross-border assets during 2004-2016 instead of losing $510 billion in such assets to foreign buyers. Simply put, this means the United States would have kept 4,700 companies under U.S. ownership during the past 13 years if they had paid taxes at a rate competitive with other countries that have modernized their corporate tax codes. Today's competitive U.S. corporate tax rate will reduce incentives for U.S. companies to relocate abroad or be purchased by foreign companies.

There is a reason why it has taken 30 years for comprehensive tax reform to take place in this country: It is complicated work, and navigating competing interests is hard. I am pleased that we did the right thing – not the easy thing. Congress took a historic step in 2017 to reform America's broken and outdated tax code. Coming together to get that work done shows that we can take on tough issues that have been holding us back.

I believe tax reform will have both short- and long-term benefits. In the short term, we already are seeing some companies increasing capital expenditures, hiring and raising wages. Of course, that will not be enough to offset all the immediate benefits associated with tax reform. Some argue that the added cash flow going to dividends and buybacks is a negative – it is not. It simply represents capital finding a higher and better use than the current owner has with it. And that higher and better use will be reinvestment in companies, innovation, R&D or consumption. Thinking this is a bad thing is just wrong. Tax reform's real benefit will be the ***long-term cumulative*** effect of retained and reinvested capital in the United States, which means more companies, innovation and employment will stay in this country. The United States should always aim to have a competitive business tax system. It should not be traded off against other objectives.

Here is some news we announced on how JPMorgan Chase is immediately putting some of the benefits of tax reform to good work.

Along with a more constructive regulatory and business environment and our strong business performance, this reform has led our company to recently announce a $20 billion, five-year comprehensive investment to help its employees while supporting job and local economic growth in the United States.

JPMorgan Chase plans to build up to 400 Chase branches in 15-20 new markets and hire up to 4,000 additional employees over the next five years. These employees will support our branch growth and more lending to small businesses and homeowners. Today, Chase has roughly 5,100 branches across 23 U.S. states, and, for a long time, we have wanted to expand beyond our current footprint. The heart of our company is our branches. We serve 61 million U.S. households — one out of every two U.S. families is a Chase customer. Nearly every line of business operates out of our branches in some way. We are not in some major markets, including Boston, Philadelphia and Washington, D.C., but Consumer Banking has started the formal application process for national expansion.

As I previously said, when Chase enters a community, it enters with the full force of JPMorgan Chase behind it. We hire people. We lend to and support local businesses. We help customers with banking, lending and saving. And our philanthropic programs help make these communities stronger.

Our company has made a significant economic impact in all the communities in which we operate, and we're excited to become an even more relevant part of many others.

We're also investing in our employees. We want to have the best people, period. We know happy customers start with happy employees, and we want to be the best place to work ***everywhere*** we do business. For the second time in two years, we're raising wages for 22,000 employees. For employees making between $12 and $16.50 an hour, we will raise hourly wages to between $15 and $18, depending on the local cost of living.

This is the right thing to do, and we believe it puts us well above the average hourly wage for most markets. These increases are on top of the value of the firm's full benefits package, which averages $12,000 for employees in this pay range. But the improvements won't stop there. We're reducing medical plan deductibles by $750 per year for employees making less than $60,000 — this essentially makes the deductible $0 for those employees who take care of themselves by meeting minimal wellness and preventative program requirements.

Credit is essential to a healthy economy and growth, and our new investments include sizable increases in lending to small businesses and homeowners. Through Commercial Banking and Business Banking, we will hire 500 new bankers and help expand small business lending by 20% — or $4 billion — over three years while entering new markets. We're also doubling the investment in our Small Business Forward initiative to $150 million over five years to help provide small businesses run by women, minorities and veterans get both the capital and technical assistance they need to grow.

We will also help more families live their dream of owning a home by increasing home lending in low- and moderate-income communities by 25% — to $50 billion — over the next five years. To do so, we will hire up to 500 new Home Lending advisors across our current markets and in some new ones. In addition, we will increase lending to finance affordable rental housing to $7 billion over five years.

Today, our company is strong and growing, and when we grow, so do the communities where we do business. We're excited to welcome new employees, new customers and new communities to JPMorgan Chase and to look forward to a bright future.

The need for rational, thoughtful, consistent tax policy.

The best long-term tax policy should have the following attributes:

- The business tax system should be competitive – always – and not be traded off against anything else. I would consider this table stakes for having a healthy economy in the long run.
- We should build the infrastructure we need. (We should consider this table stakes, too.) There are many reports that highlight how less expensive it is in the long run to have better infrastructure. In fact, some studies show it is even more expensive to have bad infrastructure.
- We should have a progressive tax system (helping people on the lower end) that progressively taxes higher incomes, like mine. And, of course, no one wants to think about their money being misspent. Therefore, it is critical for Washington to show the American public that their money will be used wisely – and that includes canceling or modifying programs that don't work and not using money to pay off special interest groups. If we need to raise taxes on the more well-off, I would hope the more affluent would recognize that they will do better if the country does better.
- The tax policy should be consistent in the long term for businesses to maximize their productivity and growth.

This is the best way to permanently drive growth and become a far wealthier and fairer society. There are two things I would do immediately to improve income inequality and create a much healthier society as explained below.

6. We should reform and expand the Earned Income Tax Credit and invest in the workforce of the future.

The Earned Income Tax Credit (EITC) supplements low- to moderate-income working individuals and couples, particularly with children. For example, a single mother with two children earning $9 an hour (approximately $20,000 a year) could get a tax credit of more than $5,000 at year's end. A single male without children (also making approximately $20,000 a year) does not get any money for a tax credit under this program. Last year, the EITC program cost the United States about $65 billion, and 27 million individuals received the credit. This program has lifted an estimated 9 million people above the poverty line. (The federal poverty guideline is determined by household size. For a four-person household, the poverty level is $25,100 or approximately $11 an hour.)

There are some problems with the EITC. Paid as a tax credit at the end of the year, 21% of the people who are entitled to it don't file for it – mostly because they don't know about it. Additionally, there is some fraud involved.

We should convert the EITC into more of a negative income payroll tax, which would spread the benefit, reduce fraud and get it into more people's hands. (Both Democrats and Republicans favor a move like this.) We should also dramatically expand the tax credit and even make it more available to workers without children.

Of the 150 million Americans working today, approximately 21 million earn between $7.25 an hour (the prevailing federal minimum wage) and $10.10 an hour. Approximately 42% of American workers make less than $15 an hour. It is hard to argue that you can live on $7-$10 an hour, particularly for families (even if two are working in that household). Decades ago, workers with very limited skills could earn a living wage to support themselves and their family. In this new highly technical world – where work skills are so greatly valued – the "natural" wage for unskilled workers may no longer lead to a living wage. This is an area that deserves more study.

Jobs are a wonderful thing. Jobs bring dignity. That first job is often the first rung on the ladder. People like working, and studies show that once people start working, they continue working. Jobs and living wages lead to better social outcomes – more household formation, more marriages and children, and less crime, as well as better health and overall well-being. As society creates an enormous amount of wealth, expanding the EITC would be a very productive way to share it. If a large portion of the American population cannot earn a living wage, then we will create a situation of permanent social turmoil.

We need to improve work skills and training that lead to better jobs – this will help both low- and middle-income workers. It is also the cure for rapid technological change.

Many high schools and vocational schools do not provide the education our students need – the ability to graduate and get a decent job. We should be ringing the alarm bell, signaling that inner city schools are failing our children – often minorities and mostly lower income students. In many inner city schools, fewer than 60% of students graduate, and many of those who do are not prepared for employment. We are creating generations of citizens who never had a chance in this land of dreams and equal opportunity. Unfortunately, it's self-perpetuating.

And we all pay the price. According to an assessment of math and science scores that the Organisation for Economic Co-operation and Development (OECD) conducted in 35 advanced industrialized countries, the United States ranks, on average, #24. Making the investment to improve our performance to the level of the OECD average would increase the U.S. gross domestic product by 1.7% over the next 35 years.

America used to be one of the best at training our workforce for good jobs. ***We know what to do*** to regain that mantle. We need to ensure that our high schools, vocational schools, technical schools and community colleges work together with local businesses to properly train these students so they can get well-paying jobs upon graduation; then we need to make sure proper apprenticeships and certifications (including college credits) are widely available. These students can continue to work or have the opportunity to go back to college, if they so choose. Doing this well will help the lower skilled and middle-income workers in the new world. The best way to offset any negatives associated with trade or technology is through continued education and training so that well-paying jobs are replaced with other well-paying jobs.

We know that technological advancements are displacing certain industries. Driverless cars, for example, are getting closer to mainstream use every day. Technology will bring innovation, but it will also change the employment opportunities available to hundreds of thousands – perhaps even millions – of people. We have the opportunity, now, to start preparing for and addressing potential future job losses. Anticipating problems that may arise from new technologies – and developing plans to responsibly minimize them – should be considered the final phase of our R&D process.

We, as a country, must also change the way we think about education. In less mutable times, a degree meant that formal learning was complete. You had acquired what you needed for a successful career in your field. A degree in today's world cannot mean the end of your studies. New discoveries, new advancements, new technologies and new terminology all mean that a degree will not carry you as far into the future as it once did. We must place a higher premium on lifelong learning. Corporations can do a lot to encourage and foster such a shift.

We should celebrate the benefits of technology, and we should also prepare for its challenges.

Overall, technology is the greatest thing that has ever happened to mankind. It is the reason why we enjoy our high living standard. It is staggering how our lives have changed when compared with 100 years ago. We live longer and work less; we are healthier and safer; and during that time period, billions of people have been pulled out of poverty. People legitimately worry that technology will eliminate jobs as artificial intelligence replaces drivers, call center operators, etc. And this is no doubt true. But this has actually been happening for a long time. For instance, back in 1900, 41% of the U.S. workforce made their living in agriculture. Today, it is under 2%. This is only one example, but our vibrant economy has always found a way to adjust to job loss by creating new jobs and sometimes changing the way we work by reducing work days and work hours.

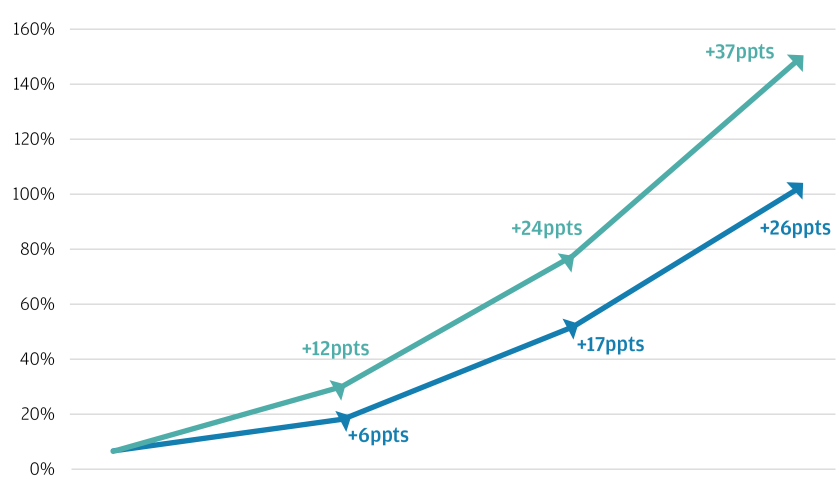
We know technology has been a great force, and for the benefit of mankind, that force should be left unleashed. In the event that it creates change faster in the future than it has in the past – and the economy is unable to adjust jobs fast enough – the best protection is continual workforce training, education and re-education, supplemented by income assistance and relocation.

7. America's growing fiscal deficit and fixing our entitlement programs.

America's net debt currently stands at 77% of GDP (this is already historically high but not unprecedented). You can see in the chart below that the debt level continues to get worse, but at an accelerated pace over the ensuing decades. We have time to fix it, so I am not immediately concerned. But this problem will not age well, and the sooner we start to fix it, the better. If we don't fix the growing deficit situation, it will adjust itself and in a way we won't like.

The chart below also shows the Congressional Budget Office's estimate of the total U.S. debt to GDP, assuming a 2% real GDP growth rate. Hopefully, with the right policies we can grow faster than 2%. We estimate if we got the growth rate even a little bit higher (i.e., 2½%), then the debt burden gets a little lighter but does not disappear.

U.S. Government Public[1] Debt as a Percentage of GDP



	2017	2027	2037	2047
Debt held by public (% of GDP growth at 2.0%)	77%	89%	113%	150%
Debt held by public (% of GDP growth at 2.5%)	77%	83%	100%	126%

[1] Debt issued in the financial markets, but not held by any U.S. government agency or fund
Source: Congressional Budget Office, March 2017
ppts = percentage points

The real problem with our deficit is the uncontrolled growth of our entitlement programs.

We cannot fix problems if we don't acknowledge them. The extraordinary growth of Medicare, Medicaid and Social Security is jeopardizing our fiscal situation. We have to attack these issues. I am not going to spend a lot of time talking about Social Security. I think fixing it is within our grasp – for example, by changing the qualification age and means testing, among other things. When President Franklin Delano Roosevelt astutely put Social Security in place in 1935, American citizens would work and pay into Social Security until they were 65 years old. At that time, when someone retired at age 65, the average life span after retirement was 13 years. Today, the average person retires at age 62, and the average life span after retiring is just under 25 years.

The core issue underpinning the entitlements problem is healthcare in the United States. Here are just a few places where we know we can do better:

- The United States has some of the best healthcare in the world, including our doctors, nurses, hospitals and clinical research. However, we also have some of the worst – in terms of some outcomes and costs.
- Administrative and fraud costs are estimated to be 25% to 40% of total healthcare spend.
- Chronic disease accounts for 75% of spend concentrated on six conditions, which, in many cases, are preventable or reversible.

While we don't know the exact fix to this problem, we do know the process that will help us fix it. We need to form a bipartisan group of experts whose direct charge is to fix our healthcare system. I am convinced that this can be done, and if done properly, it will actually improve the outcomes and satisfaction of all American citizens.

JPMorgan Chase, along with our partners Amazon and Berkshire Hathaway, recently formed a joint venture that we hope will help improve the satisfaction of our healthcare services for our employees (that could be in terms of costs and outcomes) and possibly help inform public policy for the country. The effort will start very small, but there is much to do, and we are optimistic. We will be hiring a strong management team to start working on some of these critical problems and issues:

- Aligning incentives systemwide – the United States has the highest costs associated with the worst outcomes because we're getting what we incentivize.
- Studying the extraordinary amount of money spent on waste, administration and fraud costs.
- Empowering employees to make better choices and have the best options available by owning their own healthcare data with access to excellent telemedicine options, where more consumer-driven health initiatives can help.
- Developing better wellness programs, particularly around obesity and smoking – they account for approximately 25% of chronic diseases (e.g., cancer, stroke, heart disease and depression).
- Determining why costly and specialized medicine and pharmaceuticals are frequently over- and under-utilized.
- Examining the extraordinary amount of money spent on end-of-life care, often unwanted.

To attack these issues, we will be using top management, big data, virtual technology, better customer engagement and the improved creation of customer choice (high deductibles have barely worked). This effort is just beginning, and we intend to start small. We will report on our progress in the coming years.

8. Why is smart regulation vs. just more regulation so important?

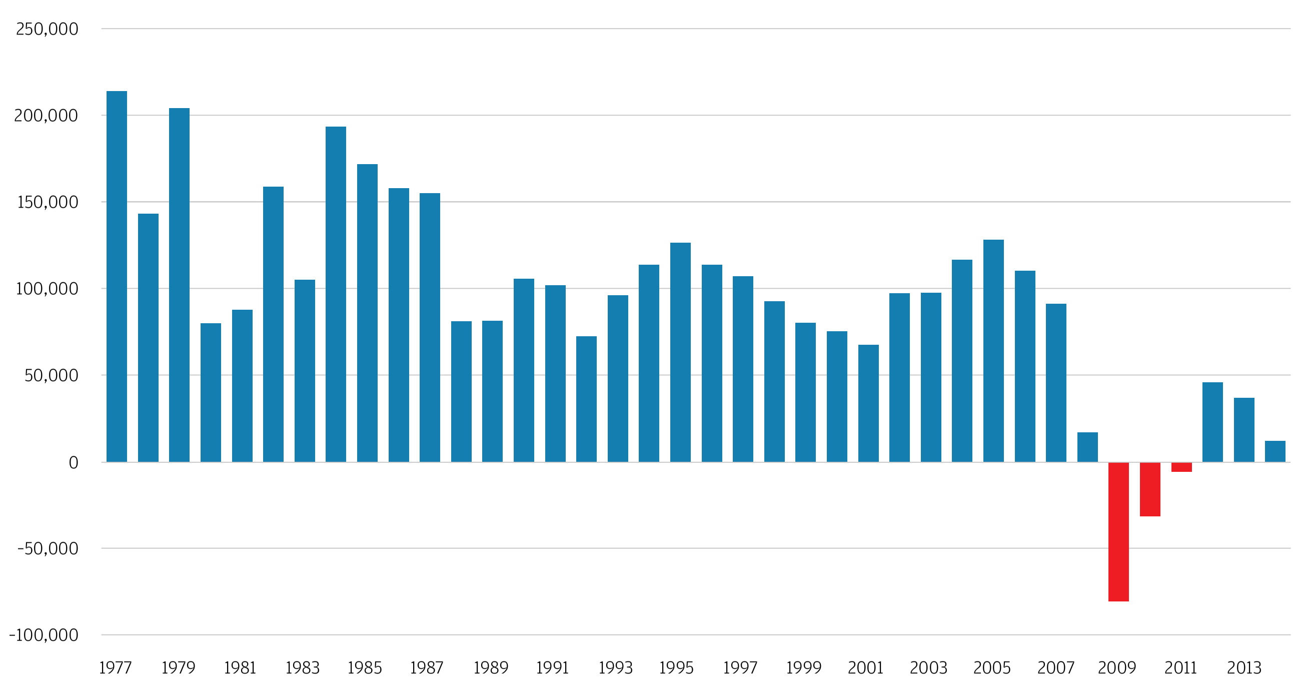
It is absolutely necessary to have proper regulation. Often, though, we confuse ***more*** regulation with ***good*** regulation. What is really needed is ***smart*** regulation. If you speak with businesses, large or small, they will give a long list of the time, effort and documentation it takes to run their business. They will show you books of red tape, inefficient, outdated systems and extraordinary delays. To start a small business today, you need multiple licenses. We have given an example of this with infrastructure in terms of needing up to 10 years to get a permit to build a bridge. Please read the article on page 42 written by a very liberal Democratic former U.S. senator and presidential candidate about what it was like to run a small business. The article provides excellent advice for all of our legislators and regulators. Unfortunately, he learned these lessons only after leaving his career in government.

The current administration is taking steps to reduce unnecessary regulation by insisting that congressional rules around cost-benefit analysis be properly applied. It is also actively trying to put regulators in the right roles with the proper authority to use commonsense principles to make appropriate changes.

By some estimates, approximately $2 trillion is spent on regulations annually, which is about $15,000 per household. While we believe much of this money is well spent (leading to cleaner water and air, and safer highways and hospitals, for example), it is hard to imagine that all of it is well spent. Decades of continuously expanding and overlapping regulation certainly can be streamlined and improved. There is little doubt that excessive regulation has adversely impacted innovation, growth and the formation of small businesses. The chart below shows the dramatic reduction in the net formation of small businesses. It is hard to know exactly

Annual Net Small Business Formations

Number of businesses



Source: U.S. Census Bureau, Business Dynamic Statistics, March 2018

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Manager's Journal:
A Politician's Dream Is a Businessman's Nightmare

By George McGovern

Wisdom too often never comes, and so one ought not to reject it merely because it comes late.

-- Justice Felix Frankfurter

It's been 11 years since I left the U.S. Senate, after serving 24 years in high public office. After leaving a career in politics, I devoted much of my time to public lectures that took me into every state in the union and much of Europe, Asia, the Middle East and Latin America.

In 1988, I invested most of the earnings from this lecture circuit acquiring the leasehold on Connecticut's Stratford Inn. Hotels, inns and restaurants have always held a special fascination for me. The Stratford Inn promised the realization of a longtime dream to own a combination hotel, restaurant and public conference facility -- complete with an experienced manager and staff.

In retrospect, I wish I had known more about the hazards and difficulties of such a business, especially during a recession of the kind that hit New England just as I was acquiring the inn's 43-year leasehold. I also wish that during the years I was in public office, I had had this firsthand experience about the difficulties business people face every day. That knowledge would have made me a better U.S. senator and a more understanding presidential contender.

Today we are much closer to a general acknowledgment that government must encourage business to expand and grow. Bill Clinton, Paul Tsongas, Bob Kerrey and others have, I believe, changed the debate of our party. We intuitively know that to create job opportunities we need entrepreneurs who will risk their capital against an expected payoff. Too often, however, public policy does not consider whether we are choking off those opportunities.

My own business perspective has been limited to that small hotel and restaurant in Stratford, Conn., with an especially difficult lease and a severe recession. But my business associates and I also lived with federal, state and local rules that were all passed with the objective of helping employees, protecting the environment, raising tax dollars for schools, protecting our customers from fire hazards, etc. While I never have doubted the worthiness of any of these goals, the concept that most often eludes legislators is: "Can we make consumers pay the higher prices for the increased operating costs that accompany public regulation and government reporting requirements with reams of red tape." It is a simple concern that is nonetheless often ignored by legislators.

For example, the papers today are filled with stories about businesses dropping health coverage for employees. We provided a substantial package for our staff at the Stratford Inn. However, were we operating today, those costs would exceed $150,000 a year for health care on top of salaries and other benefits. There would have been no reasonable way for us to absorb or pass on these costs.

Some of the escalation in the cost of health care is attributed to patients suing doctors. While one cannot assess the merit of all these claims, I've also witnessed firsthand the explosion in blame-shifting and scapegoating for every negative experience in life.

Today, despite bankruptcy, we are still dealing with litigation from individuals who fell in or near our restaurant. Despite these injuries, not every misstep is the fault of someone else. Not every such incident should be viewed as a lawsuit instead of an unfortunate accident. And while the business owner may prevail in the end, the endless exposure to frivolous claims and high legal fees is frightening.

Our Connecticut hotel, along with many others, went bankrupt for a variety of reasons, the general economy in the Northeast being a significant cause. But that reason masks the variety of other challenges we faced that drive operating costs and financing charges beyond what a small business can handle.

It is clear that some businesses have products that can be priced at almost any level. The price of raw materials (e.g., steel and glass) and life-saving drugs and medical care are not easily substituted by consumers. It is only competition or antitrust that tempers price increases. Consumers may delay purchases, but they have little choice when faced with higher prices.

In services, however, consumers do have a choice when faced with higher prices. You may have to stay in a hotel while on vacation, but you can stay fewer days. You can eat in restaurants fewer times per month, or forgo a number of services from car washes to shoeshines. Every such decision eventually results in job losses for someone. And often these are the people without the skills to help themselves -- the people I've spent a lifetime trying to help.

In short, "one-size-fits-all" rules for business ignore the reality of the marketplace. And setting thresholds for regulatory guidelines at artificial levels -- e.g., 50 employees or more, $500,000 in sales -- takes no account of other realities, such as profit margins, labor intensive vs. capital intensive businesses, and local market economics.

The problem we face as legislators is: Where do we set the bar so that it is not too high to clear? I don't have the answer. I do know that we need to start raising these questions more often.

Mr. McGovern, the 1972 Democratic presidential candidate, is president of the Middle-Eastern Policy Council in Washington.

(See related letters: "Letters to the Editor: A Politician's Dream Is a Businessman's Nightmare" -- WSJ July 2, 1992)

why this is happening, but the main culprits are probably the cost and difficulties that unnecessary regulations cause, coupled with the lack of access to credit for ***new*** businesses.

Another study examines the effect poor infrastructure has on efficiency (for example, poorly constructed highways, congested airports with antiquated air traffic control systems, aging electrical grids and old water pipes). This could all be costing us more than $200 billion a year. Philip Howard, who does some of the best academic work on America's infrastructure, estimates it would cost $4 trillion to fix our aging infrastructure – and this is ***less*** than it would cost ***not*** to fix it.

9. Public company corporate governance — how would you change it? And the case against earnings guidance.

Last year, I wrote about the decline in the number of public companies in the United States. Unfortunately, that trend has continued unabated. Indeed, if anything, it's accelerated. According to one study, the number of U.S. public companies has fallen by approximately 50% over two decades (from 8,090 in 1996 to 4,331 in 2016). And that decline, it pains me to say, is a uniquely American phenomenon. Public company listings in other developed markets have increased over the same period.

Fortunately, policymakers are sitting up and taking notice. In a report issued in October 2017, the U.S. Treasury Department decried the decline in the number of U.S. public companies and recommended several measures to stem the tide. Eliminating duplicative regulations, liberalizing restrictions on pre-initial public offering communications and removing non-material disclosure requirements were some of these measures. Jay Clayton, Chairman of the U.S. Securities and Exchange Commission, also has been quite vocal about the decline: He says it potentially deprives "Mr. and Ms. 401(k)" of the opportunity to participate in much of our country's wealthy creation. I share Chairman Clayton's concern.

Too many private company owners look at the burdens tied to public company status – among them, frivolous shareholder litigation, burdensome disclosures that don't get to the core of investor concerns, an unhealthy focus on short-term results and shareholder meetings that often focus on the trivial. Because of such factors, many private companies make a rational decision to stay private, particularly given rules that increasingly allow individuals to invest in private companies. Ultimately, that's not good for America because public companies are a powerful economic engine for job and wealth creation. They are also responsible for one-third of all private sector employment, with millions of American families depending on public companies for retirement, savings for college and home purchases, and investment.

So what can public companies do about these issues? For one, they can continue to engage policymakers. Second, they can continue to resist pressures to focus on the short term at the expense of long-term strategy, growth and sustainable performance. ***And in my mind, quarterly and annual earnings per share guidance is a major contributor to that short-term focus. It can cause companies to hold back on technology spending, marketing expenditures and other investments in their future in order to meet a prognostication affected by factors outside the company's control, such as fluctuations in commodity prices, stock market volatility and even the weather.*** That's why during my time as JPMorgan Chase's CEO we've never provided quarterly or annual net earnings guidance and why we would support any company that considers dropping such guidance in the future. We totally support being open and transparent about our financial and operational numbers with our shareholders – this includes providing guidance or expectations around number of branches, likely expense levels, "what ifs" and other specific items.

With their own sizable investment portfolios, most public companies could use their power as shareholders to urge public companies and asset managers to take a relentlessly long-term focus.

Of course, shareholders of all stripes – and particularly institutional shareholders (asset managers, as well as asset owners) – have a critical role to play in public company corporate governance. Among other things, they should exercise their proxy voting rights thoughtfully, using independent judgment even where they use proxy advisors to inform their judgment. They should actively engage with company boards and management, as appropriate, to understand the company's point of view and to convey their own. And they should evaluate and compensate their portfolio managers in a manner that reflects the investment time horizon applicable to the portfolio they are managing. That may mean using performance benchmarks over three-, five- and even 10-year periods, in addition to shorter period benchmarks.

10. Global engagement, trade and immigration — America's role in the world is critical.

Today's world is as complex and dynamic as ever. Things like trade, immigration, technology and social media, as well as our ability to move capital and purchase goods with the click of a button, all are changing how we live and how we do business. A natural reaction to this disruption might be to turn inward, to build walls. Such an impulse reflects real and justifiable concerns about whether our rush to change has outpaced our ability to successfully adapt. At this moment of uncertainty, however, U.S. global engagement is needed more than ever.

Following the devastation brought on by two world wars, the United States and other like-minded nations resolved to shape a new international order that would ensure a future unlike the past. In the succeeding years, America led the creation of a system defined by the rule of law and supported international institutions like the United Nations, the World Health Organization and the World Trade Organization (WTO). These institutions offered states a way to work out their differences around a conference table and address pressing economic and social challenges. Organizations like the North Atlantic Treaty Organization (NATO) were formed to enable collective action, promote peace and deter aggression. Treaties and coalitions were forged to limit the spread of nuclear weapons and to address threats such as terrorism, disease and climate change. America undertook efforts to promote and spread democratic values such as free speech and equality while standing firm against dictators and strongmen who would otherwise insist that "might makes right." There should be no doubt that these efforts have made us all more prosperous, secure and free.

The world has made incredible strides since most of us were born. We have overcome challenges once thought insurmountable. More than a billion people have been lifted out of extreme poverty in the last two decades. Food security is dramatically improving – a major driver of improving human health – and the number of undernourished people around the world is continuing to fall. Vaccines have almost entirely eliminated most infectious diseases around the globe – polio, smallpox, measles, mumps, diphtheria, rubella. Malaria has been eradicated in many parts of the world, and deaths have declined significantly in Africa and Southeast Asia over the last decade. These achievements and numerous others reinforce the overall positive trend line of human history.

Reversing the interconnectedness built by our post-World War II institutions is neither desirable nor feasible. As a nation, we cannot isolate ourselves any more than we can stem the ocean's tide. The international system provides agreed-upon rules of the road – and mechanisms for enforcing them. It serves as the basis upon which we can insist on fairer trade practices from competitors and adequate burden-sharing from allies. It is the means by which we can continue to improve people's lives and livelihoods. The system, built at great sacrifice, continues to serve our interests. It should be preserved and defended – ideally under strong U.S. leadership.

Any system created by humans, however, is ultimately fallible. Sustaining the current order and ensuring its longevity mean acknowledging its flaws. We must have an honest conversation about its strengths and, more important, its weaknesses. Global GDP has more than doubled since 2000, yet too many people are being left behind – shut out of a growing economy's rewards. Nations with a proud history of welcoming immigrants – including the United States, a nation of immigrants – are engaged in hotly contested debates over whether immigration is good for one's country or not. Recognizing our extraordinary accomplishments is one thing, but we should acknowledge what has gotten worse. NATO has become less effective, serious issues surround trade and the WTO is unprepared to deal with today's issues – and too bureaucratic and slow to fix them. The associated loss of faith in governments and institutions has manifested itself in a wave of political disruptions, none more surprising than in the United States itself. We are increasingly divided and unable to work out our disagreements.

Retreating from the world is not the solution, nor is burning down the current system and starting anew. At the same time, we cannot and should not turn a blind eye to the real pressures millions of families face at the hands of globalization, technological advances and other factors. Ultimately, governments are charged with addressing the types of issues and popular grievances that led us to this moment of division and distrust. But increasingly, the private sector must also play a role.

Business in total has a huge amount of capabilities and knowledge. Business needs to work with the government to drive good, long-term solutions. But if it is to play a helpful role, business must be less parochial about what is good for one's particular company and more helpful about what is good for the people of our countries.

Proper resolution of serious trade issues is good for the United States and for the rest of the world.

We have entered a time of uncertainty over global trade. President Trump has rejected the Trans-Pacific Partnership (TPP) as not being in the best interests of the United States and is renegotiating the North American Free Trade Agreement (NAFTA). He has begun to demand material changes in our trade agreements with many nations and has begun to demand that nations reduce their trade surpluses with the United States, probably most importantly between the United States and China, the world's two largest economies.

We should acknowledge many of the legitimate complaints around trade. Tariffs and non-tariff barriers to trade are often not fair; intellectual property is frequently stolen; and the rights to invest in and own companies in some countries, in many cases, are not equal. Countries commonly subsidize state-owned enterprises. When the U.S. administration talks about "free" and "fair," it essentially means the same on all counts. This is not what has existed. It is not unreasonable for the United States to press ahead for more equivalency.

In last year's letter, I spoke about NAFTA and said that while there are some clear problems, an updated agreement should be worked out in a way that is fair and beneficial for all parties. The logic to do so is completely compelling.

China is far more complex – and the complaints are more legitimate. China has realized significant economic and employment gains since joining the WTO in 2001. China was expected to continue on an aggressive path of opening up its economy, but this has happened at a much slower pace than most nations expected. Now, more than 16 years later, it has the second-largest economy in the world and is home to 20% of the Fortune 500 companies, yet it still considers itself a "developing" nation that should not be subject to the same WTO standards as the United States and other "developed" countries. The Chinese government is competent and capable, and it has done an extraordinarily good job of managing its emergence as the world's second-largest economy. I believe that China understands most of these issues and wants to properly resolve them. Recently, the United States threatened unilateral action against China. Of course, anything that starts to resemble a trade war creates risk and uncertainty to the global economic system. One of the administration's best arguments is that negotiation alone has not worked. But regardless of the process, here is my view on what the best outcomes would look like:

- The United States should define very clearly, and in detail, what it wants from China.
- The United States should lay out a distinct timeline – and determine what the reaction would be if it is not met.
- The United States should listen closely to China about any legitimate complaints it may have.
- This should be done in partnership with our largest allies, particularly Japan and Europe.
- The United States should revisit the Trans-Pacific Partnership and fix the parts considered unfair. The TPP could be an excellent economic and strategic agreement between America and its allies, particularly Asia. This is not against China: The country could at some point be offered the opportunity to enter the TPP if it demonstrates a willingness to meet its standards, which would improve upon the rules-based global trading system under American leadership.

While the chance of having an improved trade deal with both Mexico and Canada, as well as a more mutually beneficial relationship with China, is possible and preferable, there is always a chance that miscalculations on the part of the various actors could lead to negative outcomes. This obviously creates higher risk and more uncertainty until resolved.

We need to resolve immigration – it is tearing apart our body politic and damaging our economy.

Immigration reform is important both morally and economically. Immigration has been a critical part of America's economic and cultural vitality. And there are some basic and key principles that most Americans seem to agree with:

- We need to have – and ***believe*** that we have – proper border control. American citizens have the right to complain that we have not successfully protected our borders since the last immigration reform in 1986. In the 1986 amnesty, 3 million undocumented immigrants came forward, and now we estimate there are another 11 million undocumented people domiciled in our country. If the American public does not believe we have proper border control, nothing else can be accomplished.
- The "Dreamers" who came to America as undocumented children (there are approximately 2 million of them) should get a path to legal status and citizenship.
- We need improved merit-based immigration. Those who get an advanced degree in the United States should receive a green card along with their diploma. We need these skilled individuals in America. We could also improve on other merit-based immigration practices.
- Law-abiding, hardworking undocumented immigrants should have a path to legal status or citizenship. The American public should know this is no easy path. Back taxes should be paid, and citizenship could take up to 15 years.
- Finally, it is unlikely the American public will feel comfortable with immigration if we don't revert to some core principles. Immigrants should be coming here because they want to be part of our country and who we are as a people. America was an idea borne of freedom, with freedom of speech, freedom of religion, freedom of enterprise, and equality and opportunity. People immigrating to this country should be taught American history, our language and our principles. The American public will not be pro-immigration if we don't address these issues.

Closing policy thoughts.

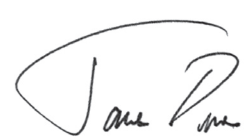
It is an absolute necessity that America maintain a world-class economy, with world-class companies and a world-class military. We need to do a significantly better job of managing our economy if we want it to be world class.

And, finally, ceding America's leadership role on the world stage is a bad idea for everyone – inside and outside our great land. We must all collaborate and respect each other to make the world a better place.

IN CLOSING

We are devoted to earning the trust and respect of
our shareholders, customers, employees
and the communities we serve every single day.
We will never lose sight of this.
And we have an outstanding management team
leading this mission – a group of dedicated executives
with exceptional capabilities, character,
experience and wisdom.

I am humbled and honored to work at this
company and with its great people. It is an
extraordinary privilege and responsibility.
On behalf of JPMorgan Chase and our management
team, I want to express my deepest gratitude
to all of our people – I am proud to be their partner.



Jamie Dimon
Chairman and Chief Executive Officer

April 5, 2018

Consumer & Community Banking

2017 financial results

JPMorgan Chase had a strong year in 2017. For Consumer & Community Banking (CCB), we delivered 17% return on equity (ROE) on net income of $9.4 billion and $46.5 billion in revenue. We grew our customer base to 61 million U.S. households – nearly half of all U.S. households do business with Chase – including 4 million small businesses. Our customers have 97 million debit and credit card accounts and spent over $900 billion on their cards in 2017. Our active digital customers grew to 47 million, and 30 million of them are active on mobile, the largest in our industry.

We've made progress since we brought the Chase businesses together five years ago, and we have seen remarkable growth in our business drivers over that time. In Consumer and Business Banking, our average deposits of $626 billion are up 60%, and our client investment assets are up 72%, hitting a record $273 billion. Annual credit card sales rose to $622 billion in 2017, up 63% since five years ago. Merchant processing volume reached $1.2 trillion, up 82%. Home Lending average loans have grown 16%, and our Auto loans and leases have grown 53%.

We delivered these results with a steady focus on the same four areas: customers, profitability, controls and people. There is no substitute for a consistent strategy well-executed.

Here are some of the highlights from 2017 for each.

Customers

Customer satisfaction is at record highs across most of our businesses. We will always have plenty of work to do, but we are extremely pleased with how far we've come.

2017 Performance Highlights

Key business drivers	($ in billions, except ratios and where otherwise noted)	2017	2012	%∆
Consumer & Community Banking	Households (millions)[1]	61.0	55.9	9%
	Active digital customers (millions)[2]	46.7	31.1	50%
	Active mobile customers (millions)[3]	30.1	12.4	143%
Consumer and Business Banking	Average deposits	$626	$392	60%
	Client investment assets (end of period)	$273	$159	72%
	Average Business Banking loans	$23	$18	28%
	Business Banking net charge-off rate	0.57%	1.65%	(108) bps
Home Lending	Total mortgage origination volume	$98	$181	(46)%
	Foreclosure units (thousands, end of period)	35	312	(89)%
	Average loans	$237	$205	16%
	Net charge-off rate[4]	0.02%	2.37%	(235) bps
Credit Card	New accounts opened (millions)[5]	8.4	6.7	25%
	Sales volume[5]	$622	$381	63%
	Average loans	$140	$125	12%
	Net charge-off rate	2.95%	3.95%	(100) bps
Merchant Services	Merchant processing volume	$1,192	$655	82%
Auto	Loan and lease originations	$33	$23	43%
	Average loan and leased assets	$81	$53	53%
	Net charge-off rate	0.51%	0.39%	12 bps

[1] Reflects data as of November 2017
[2] Users of all web and/or mobile platforms who have logged in within the past 90 days
[3] Users of all mobile platforms who have logged in within the past 90 days
[4] Excludes the impact of purchased credit-impaired loans
[5] Excludes Commercial Card

bps = basis points

The bar for what customers expect in every industry has grown much higher. We live in an on-demand world. Customers can get the service, content or experience they want when they want it on nearly any device. They expect speed and simplicity.

Customer service in banking and payments has improved greatly in recent years but lags compared with certain other industries such as travel or segments of retail. We are seeing fintechs have success simply by removing customer pain points that banks haven't. Customers are showing us where we need to get better, and we are paying attention. Getting this right is important because we are a part of our customers' everyday lives. On average, our digitally active customers log in more than 15 times a month. Our active debit card customers average 32 purchases a month, and those who use our ATMs have an average of five monthly ATM transactions. Our active credit card customers average 21 transactions each month.

In 2017, we made several improvements around the customer experience, including facial recognition in our app, a fully mobile bank pilot (Finn), real-time payments using Chase QuickPay℠ with Zelle and a simpler online application for Business Banking customers. For those who need our business products – deposits, credit cards and merchant processing – we collapsed the three applications into one so customers provide their information once instead of multiple times. We didn't change the products – we just made it easier for customers to get the ones they want. The simpler application reduces the time it takes to apply for all three products by 45 minutes, and we saw engagement with new Business Banking households with both deposit and credit card accounts increase 25% with this change.

We also reached many new customers through important partnerships. In the Card business, many consumers want rewards for items they buy. In 2017, we completed co-brand renewals for partner cards with Disney, Hyatt and Marriott. We also launched the popular Amazon Prime Rewards Visa card and helped drive double-digit year-over-year sales growth for the Amazon portfolio. In addition to signing new, strategic Chase Pay® partnerships with PayPal and The Kroger Co., we launched acceptance of Chase Pay® across merchants such as Cinemark, Wakefern Food Corporation and Walmart. And in Auto, we renewed our contract with Subaru of America, extending our partnership.

Profitability

We always have said short-term growth is not our goal, but profitable growth over the long term is. We never make decisions to drive short-term earnings and always focus on investing for long-term results. We are proud of the work we have done to bring down our structural expense, allowing us to invest more in our core businesses. The CCB overhead ratio has gone from 61% in 2011 to 56% in 2017, with a medium-term target of 50%+/-. Delivering on that will allow us to further increase our investments in technology and digital, as well as to move with greater speed to market. These investments matter: Digital is a more efficient way to serve our customers, and our digitally engaged customers are happier with us and are more likely to stay with Chase. Our goal is to be the easiest bank for customers to do business with.

Controls

Controls are the checks, balances and safeguards we rely on to do our work effectively. Controls help us avoid errors and adhere to all requirements and regulations. Controls are an ongoing discipline for us, but we believe the worst is behind us. In 2017, three of our consent orders were lifted. Early in 2018, the Federal Reserve lifted our Home Lending consent order, recognizing the improvements we have made since the financial crisis; the Office of the Comptroller of the Currency lifted its own foreclosure consent order in 2016.

People

We think we have the greatest team on the field with our 134,000 Chase employees. Our steady focus on creating a great employee experience and investing in our people has made us a stronger business. We promoted more than 15,000 people in 2017 and filled over 16,000 roles with internal candidates. During the year, the firm invested in excess of $300 million on employee training to keep everyone's skills current in a changing economy. Our team reflects the customer base we serve: More than 58% of our employees are female, and over 53% are minorities. Although we are proud of our progress in increasing diversity among our senior leadership, we still have work to do.

We have also made several changes to help support our people. For the second time in two years, we raised wages for 22,000 employees to $15 to $18 an hour, depending on the local cost of living. These increases are on top of our full benefits package, which averages $12,000 for employees in this pay range and a lower medical deductible to protect families from sudden medical expense.

Perhaps the proudest moment of 2017 came when this firm and our people stepped up to help communities in need, as hurricanes, fires and mudslides devastated several communities in the U.S.

This is when our company is at its best. We made more loans, extended loan payments, waived late fees and made investments to support the long-term recovery in these communities. We also reached out to help the hundreds of our employees who were affected directly. Our employee-to-employee giving fund showed the tremendous generosity of employees looking out for each other in times of need. And from Houston to South Florida to the Bay Area, you could see the blue shirts of our Good Works volunteers helping out distributing food and water, clearing debris and helping however they could. Business has a broader social role to play, particularly now, and it's possible that no company can do as much as ours.

Looking ahead

If this organization has proved one thing, it's that we can move and adapt quickly for a company of our size. We are experiencing another period of extraordinary change. The pace of technology is accelerating faster than most businesses can absorb. Industry after industry is being disrupted as emerging players develop better customer experiences, faster than incumbents can innovate. API-based platforms allow software developers to build onto experiences, and we see services converging.

We know we have an extraordinary leadership position, and we do not take it for granted for a second. Across industries, the mighty have fallen – and we do not think we are immune. The key for us now is to invest, innovate and speed up to serve customers. As we look ahead, we will be laser focused on

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Intelligence is the ability to adapt to change.

— STEPHEN HAWKING

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becoming the easiest bank to do business with. We will do that by being excellent in six core areas we deliver for customers: becoming a customer, paying with Chase, owning a home, owning a car, growing wealth and growing businesses.

Becoming a customer – No matter how customers find us – in a branch, on our app, on chase.com or through a friend – we want to make it easy for them to become a customer and stay with us throughout their lives. We will continue to invest in having a simple, fast way to develop this relationship across Chase. Early in 2018, we started using a simpler digital application for our Consumer checking and savings products. Similar to the Business Banking application I mentioned earlier, we just streamlined the process to make it fast and easy. Early results have been beyond our expectations, requiring only a few minutes for existing customers to add checking or savings accounts and only a few minutes longer for customers who are new to Chase to join us. During one day in February, we opened two accounts every minute.

Paying with Chase – Helping our customers pay for things is at the center of everything we do. Whether a customer pays an individual, purchases a product or settles a bill, it should be simple, quick and safe. Forty percent of Chase customers already move money with us. We have 48 million active credit and debit card customers, and more than 70% of our active credit card customers use those cards in mobile wallets or for recurring bills and merchant payments. Zelle has been adding nearly 100,000 users every day, and Chase QuickPay℠ makes up more than 50% of Zelle's volume. We want our customers to decide who to pay and when, and we make sure it's simple, safe and seamless.

Owning a home – Buying a home is one of the most emotional purchases a family ever makes. But the process of buying one is anything but joyful. We want to help the hundreds of thousands of customers who will buy a home with Chase in 2018 to do so with ease and speed. Our partnership with Roostify has made our digital mortgage process simpler and has reduced the time it takes to refinance by 15%.

Owning a car – Over 1 million customers will buy or lease a car with Chase in 2018, yet many people still don't think to call us first if they're buying one. Like getting a home loan, the experience of buying a car can be long and daunting. We think we can reinvent it – making it easier, less expensive and a pleasant experience. Chase Auto Direct, in partnership with TrueCar, is a step in the right direction.

Growing wealth – Our brand promise is to help customers make the most of their money. Our team of bankers and wealth advisors has worked with customers for decades. In 2018, we will introduce new digital tools to help customers invest and trade from their phones, as well as connect them with an advisor when they need one. Unlike other investment apps, ours will have the team of J.P. Morgan advisors and bankers behind it.

Growing businesses – Few banks can help businesses as much as JPMorgan Chase can, from startups to multinationals. From the beginning, we can offer banking, credit and merchant services along with a business banker. We have developed new products and services that make it easier for our customers to manage and grow their business. Chase Business Quick Capital®, powered by our partnership with OnDeck, is a great example, offering same-day access to short-term loans. The next step is to expand into new markets and use the power of Chase to help our business customers grow and thrive.

Looking ahead at our ambitions for the year, we are grateful for our leadership position and are ready to do more. As large as we are and as much as we have grown, we know the best days are still to come. We raised our medium-term ROE target to 25%+ from 20%+/-, in part due to the impact of tax reform. With the strength of our products, distribution and brand, we know we can get there.

The first step will be expanding our already sizable technology investment. As a firm, we invest in excess of $10 billion annually in technology. We have more than 31,000 technologists at the firm in development and engineering jobs; that number has grown over time, and we expect to hire more people in 2018. We have moved a number of our technology teams to an agile structure, allowing them to be closer to the product owners and speeding up time to market. This change has enabled our teams to be 100% focused on their products and on delivering for our customers.

To maintain speed and adaptability, we have to fight the institutional drag that slows big companies down. Bureaucracy is like a virus. As soon as one strain is inoculated, another appears. In most cases, bureaucracy is driven by good people thinking they're doing the right thing. But when we try to torture a product to perfection, we sacrifice time to market and risk losing customers to someone who can do it better. Jamie has asked Daniel and me to take this on, and we have accepted with pleasure. We are working at cutting unnecessary committees, making meetings more efficient and putting accountability on business owners.

And last, we will expand our retail branches into new communities. This is perhaps the most exciting development for 2018. The heart of our company is our retail branches – more than 1 million customers visit our branches each day. For years, we have been constrained to our current 23-state footprint and unable to expand into major markets such as Washington, D.C., Boston, Philadelphia, Baltimore and the Carolinas. In January 2018, we announced that we plan to open up to 400 branches in 15-20 new markets over the next five years. These markets represent a $1 trillion deposit opportunity. Our new branches in these markets will lead to nearly 3,000 new jobs and drive economic opportunity for small businesses in those communities.

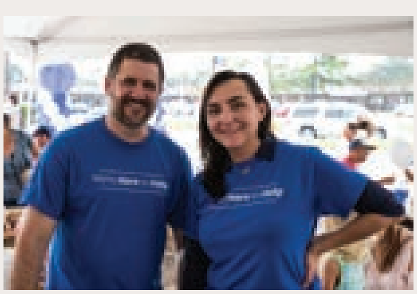
When we enter these markets, we will do so with the full force of JPMorgan Chase. We will hire. We will lend. And we will help customers achieve milestones, like buying a home or sending a child to college. Our JPMorgan Chase Foundation will support the nonprofits within that area to drive economic growth. We have seen the significant impact we have made in the communities we are in, and we're excited to become an even more relevant part of many more.

I'm always an optimist, but I can honestly say I've never been more optimistic to be a part of this company. We are the largest bank in America, and I don't think we've ever been stronger, more disciplined and more focused on how we can serve our customers. Thank you for your support of this great company, and I look forward to our best days ahead.

Gordon Smith
Co-President and Chief Operating Officer,
JPMorgan Chase & Co., and
CEO, Consumer & Community Banking

2017 HIGHLIGHTS AND ACCOMPLISHMENTS

- Consumer relationships with nearly half of U.S. households
- #1 in primary bank relationships within our Chase footprint
- Consumer deposit volume has grown at a rate more than twice the industry average since 2012
- #1 most visited banking portal in the U.S. – chase.com
- #1 in Retail Banking for five years in a row (Kantar TNS)
- #1 ATM network in the U.S.
- #1 credit card issuer in the U.S.
- #1 U.S. co-brand credit card issuer
- #1 in total U.S. credit and debit payments volume
- #1 wholly-owned merchant acquirer
- #2 jumbo mortgage originator
- #3 bank auto lender
- 2017 Bank Brand of the Year (The Harris Poll)



Helping Customers in Times of Need

After Hurricane Harvey in Houston, a city where we have served people and businesses for 151 years, we provided more than $30 million in immediate relief, worked with customers on over $1.2 billion in loans and mortgages, and waived certain fees. After the storm, we hosted 1,400 Houston area neighbors at community branch events where our employees helped our customers and members of the community.

Corporate & Investment Bank

During 2017, the Corporate & Investment Bank (CIB) maintained its position as the most successful and profitable institution of its kind.

But the seeds of our current strength were planted years ago. As other banks retrenched, cutting back on products and geographies, we chose a different path. We believed that growth would come from being global, having scale and maintaining a complete product offering for clients. Those elements anchored the profitability that enabled us to invest consistently and to sustain our growth, all while improving the client experience.

Staying true to our character and reputation, we also knew we had to be open for business under all market conditions, not just when markets were strong. Whether in Europe, Latin America, Asia or North America, our teams have worked hard, built trust and gained share in recent years.

In 2017, the CIB generated earnings of $10.8 billion on $34.5 billion of revenue, resulting in a return on equity (ROE) of 14% that allowed us to continue our pace of investment in our people and technology.

Our CIB franchise also benefits from being part of JPMorgan Chase and collaborating with our firmwide partners: Commercial Banking (CB), Asset & Wealth Management (AWM) and Consumer & Community Banking (CCB).

To cite some examples, CB's universe of more than 20,000 clients has access to the CIB's treasury services and foreign exchange products as a result of the close working relationship they share. On the strength of that relationship, nearly 40% of North America Investment Banking fees were derived from CB clients – a record. Family office clients served by AWM are often interested in investing in the types of transactions the CIB brings to market, and the CCB's relationships with major merchants and businesses generate opportunities as these businesses need to raise capital, seek advisory expertise or require payments services.

Maintaining share, and even growing it, in recent years hasn't been easy. Having scale and expertise across a set of businesses enabled us to sustain profitability under various market conditions. And while we take pride in our standings, we aren't complacent about them. Each day, our employees know that J.P. Morgan has to earn client business with innovative solutions that tap the appropriate mix of our products. More than ever, that means delivering best-in-class ideas and service through cutting-edge technology.

Providing easy-to-use technology in order to deliver a great client experience will continue to be a major differentiator in the coming years. That's why we are always exploring ways to offer our clients faster, better and simpler ways to do business with us. The banks that don't invest will lose ground and will have a long, difficult catchup process.

Looking ahead, we are implementing a set of simultaneous priorities – a blueprint for investing that runs in parallel tracks across three time horizons. In the immediate period, we are focused on maintaining day-to-day discipline to support organic growth while holding firm on costs and integrating efficiencies.

At the same time, we are planning and preparing for the changing industry conditions that will affect the business over the medium term,

Sustaining Our Lead Across Three Horizons

Maintaining day-to-day discipline
Running a best-in-class business across all dimensions

Optimizing our current model
Improving the way we serve our clients

Transforming for the future
Investing in next-generation capabilities and expanding our global footprint

a period defined as the next two to three years, and the longer term, extending 10 years out. The medium-term investments we're making are already enhancing our ability to serve clients and hold the promise of transforming our business.

Looking five to 10 years out, the pace of technological innovation will only quicken as artificial intelligence, robotics, machine learning, distributed ledgers and big data will all shape our future.

We will continue the prudent expansion of our global footprint. J.P. Morgan has been doing business in China, India, Brazil and countries in Africa for decades. And as global economies grow, we are making judicious decisions that will reaffirm our unique position as the leading global financial institution.

Our efforts to expand our coverage of global clients over the last eight years are paying dividends today. Now, with economic growth taking hold across the globe, these clients have turned to us for services, such as cash management, electronic payments and fraud detection.

On the following pages, I will discuss the CIB's 2017 performance in greater detail, outlining how we intend to prepare for the industry changes that are certain to affect our business over the foreseeable future.

By the numbers: Working for clients

The CIB's revenue was more than $6 billion higher than its closest competitor, according to industry data provider Coalition.

That financial success is directly tied to how well the CIB delivers for our clients across our businesses. Their success is our success. With the increasingly competitive environment we inhabit today, we take pride in every client assignment and the number of times they choose us for repeat business.

We kicked off 2017 announcing that J.P. Morgan's Custody & Fund Services business won the largest custody mandate in history. BlackRock is in the process of shifting $1.3 trillion in assets under management over to our platform, validating the investments we've made and the resources we've added to that business. As the only global custodian with a top Markets franchise, we're confident that scale, technology and seamless execution will continue to draw clients.

Custody & Fund Services built on its momentum, as evidenced by the $3.9 billion revenue in Securities Services, which was up 9% for the year. Our business has record assets under custody of $23.5 trillion, which increased by 14% compared with 2016.

Treasury Services, a business that supports clients in their cash management needs and is rolling out its real-time payments capability, also continued to perform well through the year, with revenue rising to $4.2 billion, an increase of 15% over 2016. As it serves the needs of increasingly global commerce, Treasury Services' state-of-the-art technology is reducing to seconds what once took days.

Turning to investment banking, J.P. Morgan set a record in global Investment Banking fees, $7.2 billion, including debt underwriting of $3.6 billion. Measured by market share, in Mergers & Acquisitions (M&A), Equity Capital Markets (ECM) and Debt Capital Markets (DCM), the firm has scored gains since 2015: M&A share rose to 8.6% from 8.4%; ECM was up to 7.1% from 6.9%; and DCM moved to 8.3% from 7.9%.

Our debt underwriting team closed on the largest number of deals in its history, up about 16% over last year. While we witnessed an overall decline in the number of deals over $1 billion, J.P. Morgan still played a key role in the year's biggest transactions. We served as joint active bookrunner on AT&T's $22.5 billion bond offering, the third largest of all time, and also served as joint active bookrunner on Amazon's $16 billion offering to support its acquisition of Whole Foods Market.

J.P. Morgan was also #1 in U.S. initial public offering (IPO) volume and managed the largest number of deals during 2017. Our equity team served as global coordinator or helped to lead more than 40% of the IPOs over $1 billion in size, including Pirelli at $2.8 billion, Altice at $2.1 billion and Netmarble at $2.3 billion.

Our Global M&A team completed the most M&A deals during the year, 354, and had record post-crisis fees for its advisory work. The firm advised on six of the top M&A announced transactions in North America. One of our more visible roles is our work serving as advisor to The Walt Disney Company on its acquisition of portions of 21st Century Fox, including its film and television studio.

Looking at the Markets business, after an exceptionally strong 2016, J.P. Morgan's 2017 share in Fixed Income, Currencies and Commodities (FICC) decreased marginally to 11.4% from 11.7%. However, offsetting that slight drop, the market share in Equities and Prime rose to 10.3% from the previous year's 10.1% and shared the top ranking for the category.

We are particularly proud of progress in Prime Services. We have a competitive and complete platform, and we grew global prime balances by 28% last year while increasing market share to 13.8% from 11.3% since 2015.

The CIB's Global Research team also continued to rank #1 worldwide and across a broad range of equity and debt market categories, providing clients with actionable insights on the markets. The regularity with which our analysts top the rankings is a remarkable achievement. As Markets in Financial Instruments Directive regulations take on a greater impact, quality research will continue to set us apart.

Our fintech future

The CIB is an investment bank, but financial technology forms the bank's backbone. As part of JPMorgan Chase, the CIB benefits from being part of a firm that draws on the expertise of nearly 50,000 technologists and a 2017 technology budget that amounted to $9.5 billion. But to underscore the firm's overall commitment, this year's technology budget totals $10.8 billion, with more than $5 billion earmarked for new investments.

Over the last several years, I have mentioned in my annual letter J.P. Morgan's commitment to embracing technology. Being creative requires a willingness to take risks. As part of our technology culture, experimentation and failure are okay – it is encouraged, in fact, in order to achieve breakthroughs.

It was only a few years ago that programmers and technology graduates seemed reluctant to build their careers in banks; that's not the case at J.P. Morgan. Nearly 30% of our recent senior hires in technology came from non-financial services firms, and they're working on finding solutions to some of the most complex issues in the field.

The divide between the front office and the back office is no more. Our technologists and our product people work side by side, in the same rooms and at the same tables. They're fully assimilated. That way, the teams are able to work in tandem to build the next-generation systems best targeted to meet the needs of our clients and the business.

In the age of smartphones, when people only need an app in order to trade, our mission is to make it possible for clients to trade and interact with us easily and in whatever way they choose. If they want to access our top-rated research or conduct business with us, we want them to have the freedom to choose the option they prefer – whether it's in person or by telephone, website, mobile app, online trading platform or third party.

On the strength of its scale and technology, J.P. Morgan processes $5 trillion in payments and trades billions of dollars electronically every day. In equities, nearly 100% of the tickets are handled electronically, representing 89% of notional volume. The macro desk, primarily foreign exchange, handles 97% of its tickets electronically, corresponding to 46% of its volume.

We have assembled talented teams to drive innovation in artificial intelligence, blockchain technology, big data, machine learning and bots, with the objectives of improving our efficiency and enabling us to serve more clients with greater effectiveness, depth and sophistication. As a result, many of our initiatives are already showing promise in terms of charting their future expansion and application.

We're piloting several ventures to test the viability of technology in real-world situations. Late in 2017, J.P. Morgan's Treasury Services and its Blockchain Center of Excellence launched a payment network powered by distributed ledger technology in partnership with the Royal Bank of Canada and the Australia and New Zealand Banking Group. Called the Interbank Information Network, the pilot's objective is to use blockchain technology to process bank-to-bank transactions faster, alleviating situations where payments get held up due to mismatched information.

Because our people are our greatest strength, we value technology as a tool to enhance their ability to provide the best-in-class ideas and solutions that our clients expect from us.

Sustainability

Before I close, I want to highlight what the CIB, along with the overall JPMorgan Chase organization, is doing to further a sustainable environment. On behalf of the entire organization, I have been asked to champion our sustainability efforts. It's an issue that is important to me and is one that our employees care about deeply as well. Employees want to work for an organization they can be proud of and that shares their values. Through our sustainability initiatives, the firm is demonstrating its commitment to those shared concerns and is taking action.

In 2017, the Operating Committee ramped up our firmwide sustainability efforts in a big way. Over the next three years, JPMorgan Chase intends to become 100% reliant on renewable power. In our own workspace, we are executing several strategies to increase our energy efficiency. We are installing building management systems and are in the process of retrofitting 4,500 Chase branches with LED lighting as part of the world's largest LED lighting installation. We will also produce power for some of our own buildings by developing on-site solar power generation. We expect that these measures will reduce total power consumption by 15%.

Using the firm's expertise in the renewable power sector also enables us to support the development of renewable projects – and advances our goal of 100% reliance on renewable power – in other substantive ways. One example is the Buckthorn wind farm, a 100-megawatt project in Texas that came online last December. More than half of the wind farm's output will be purchased by our Global Real Estate team and the remainder by our Commodities team. This is good for the environment and good for business.

In our effort to finance green initiatives, we've raised the stakes, committing $200 billion for such projects by 2025. From 2016 to year-end 2017, we reached $60.6 billion cumulatively toward that goal. The company plans to increase its recycling efforts and to pioneer the use of greener materials in its products and processes.

We've also continued our leading role as an underwriter of green bonds. In 2017, Apple Inc. raised $1 billion using green bonds – the second green bond Apple has issued with J.P. Morgan as an active bookrunner.

In addition, J.P. Morgan led some of the largest clean energy transactions, such as serving as financial advisor to Enbridge on its C$2.1 billion partnership with EnBW on the Hohe See and Albatros offshore wind farms in the North Sea. J.P. Morgan also was a bookrunner for energy company Iberdrola's first issue of green hybrid bonds on the euromarket, valued at €1 billion. The proceeds will be used to refinance investments in various renewable projects in the United Kingdom.

Closing

The CIB has had another successful year, gaining share and generating healthy profits by remaining intently focused on serving our clients and benefiting from our scale, breadth and global reach.

J.P. Morgan is known for being a place where people want to work, where we can attract and retain the best talent, where their work is recognized and where the culture is collaborative. That is critical to our ongoing success. I, along with the entire CIB management team, appreciate the dedication, enthusiasm and intelligence our employees bring with them every day.

Finally, on a personal note, I'd like to express my gratitude to my partners on the Operating Committee. The collaboration that exists throughout the firm is the foundation that supports our strength year after year.

Daniel Pinto
Co-President and Chief Operating Officer, JPMorgan Chase & Co., and CEO, Corporate & Investment Bank

2017 HIGHLIGHTS AND ACCOMPLISHMENTS

- The CIB had earnings of $10.8 billion on $34.5 billion of revenue, producing a best-in-class ROE of 14%.
- We retained our #1 ranking in global Investment Banking fees with an 8.1% market share, according to Dealogic.
- Debt Capital Markets was #1 in closing deals, setting a record for the highest number of deals bookrun in the firm's history.
- Equity Capital Markets was #1 in U.S. IPO volume and in the number of deals.
- M&A was #1 in the number of deals completed: 354.
- The CIB continued investing in technology to offer clients a broader array of trading platforms while making it easier and faster to trade with us.
- *Institutional Investor* magazine's survey of large investors ranked J.P. Morgan as the #1 Global Research Firm. Across individual categories, J.P. Morgan ranked #1 in All-America Fixed Income Research and All-Europe Fixed Income Research. It also ranked #1 in All-America Equity Research and ranked #2 in Emerging Markets.
- Treasury Services revenue rose to $4.2 billion, an increase of 15% over 2016, and continued momentum in Custody & Fund Services drove 9% growth in Securities Services revenue for the year.
- Custody & Fund Services had a record $23.5 trillion in assets under custody while also achieving the highest ever client satisfaction and retention levels.

Commercial Banking

Commercial Banking (CB) is the nexus of everything we do at JPMorgan Chase. The hard work of our dedicated team, along with the unmatched capabilities across our firm, allows us to build deep, lasting relationships with so many great companies. We are incredibly proud of the role we play in the success of our clients, and we are grateful every day for the confidence they place in us.

One such success story is siggi's yogurt (siggi's), celebrated as the fastest-growing national yogurt brand in 2017. What started as selling his unique recipe out of coolers at local outdoor markets in New York, founder Siggi Hilmarsson quickly turned his humble operation into a thriving business. Up until 2016, Siggi and his team had fully funded the company on their own, but when their growth accelerated, we worked with them to deliver their first bank credit facility. As Siggi shaped the company's plans for the future, we provided differentiated industry advice, and in 2017, we were selected to advise siggi's on the sale of the company – the capstone transaction for an incredible brand and business. At every step, we were delighted to support Siggi's passion to share his native Icelandic recipe with households around the country.

Our dedication to clients, like siggi's, continues to drive our strategy and how we do business in CB. I'm excited to share highlights of our 2017 performance, the investments we are making to deliver more value to our clients and the steps we are taking to reach our full potential.

2017 performance

With strong momentum across all of our businesses and continued focus on executing our strategic priorities, CB delivered record financial results for 2017, earning $3.5 billion of net income on revenue of $8.6 billion. We achieved a notable return on equity of 17% and an industry-leading overhead ratio of 39%, even while making significant investments across the business.

Higher interest rates, disciplined loan growth and outstanding credit quality all contributed to our record performance. We ended the year with record loan balances across our Commercial & Industrial and Commercial Real Estate (CRE) businesses, up $15 billion or 8% from the prior year. Staying true to our proven underwriting standards, we have remained highly selective in growing our loan portfolio – 2017 marked the sixth straight year of net charge-offs of less than 10 basis points. This ongoing discipline is especially important given the late stages of the current economic cycle and competitive pressures in the market.

These record results reflect our sustained investment, the incredible effort of the CB team and their continued focus on our clients. We are committed to building upon these great milestones and see tremendous potential across our franchise.

Executing our long-term, organic growth strategy

Our strategy to grow CB remains consistent year after year: Add great clients and work hard to deepen those relationships over time by delivering valuable solutions to help them succeed. We have been steadily investing in the business, taking a long-term disciplined approach. Since 2010, we have expanded into 33 new cities and added more than 800 bankers, helping us achieve sustained organic growth across our business.

Expanding into new markets

Being able to deliver the broad-based capabilities of JPMorgan Chase at a very local level is a key competitive advantage. In 2017, we added client coverage in six new high-potential markets and now have dedicated teams in all of the top 50 metropolitan statistical areas. We look forward to growing our business in these terrific locations and expanding into additional communities in the future.

Investing in our team

Our success depends 100% on our people. As such, we are making significant investments in our training and development capabilities, all focused on providing our bankers with the deep expertise they need to best serve our clients. In 2017, we hired more than 100 bankers to support the growth and expansion of our business, and we expect to add more great bankers in the coming year.

Delivering value to our clients

Expansion is only one part of our growth strategy – deepening our relationships with our clients is equally important. Given the breadth of our capabilities, we can support the needs of businesses of all sizes – fast-growing companies, like siggi's, as well as large, multinational corporations.

With the quality of our team, differentiated advice, and ability to deliver a full range of solutions locally, not many other banks can serve clients the way we can. In 2017, our clients had more than $135 billion in assets managed by our leading Asset & Wealth Management business, generated nearly 40% of all North America Investment Banking (IB) fees for the Corporate & Investment Bank (CIB), and made over 13 million transactions in our branches.

Smart growth in our CRE business

We have been building a CRE business that will stand the test of time. Although we are in the late stages of the real estate cycle, market conditions for our targeted asset classes remain strong, and we were able to grow our CRE loan portfolio by $12 billion in 2017. Importantly, maintaining our strict underwriting standards and conservative approach, we are focusing only on the loans and markets we know best. If we can stay true to these fundamentals, we believe we can continue to selectively grow our real estate loan balances.

Innovating across CB

Complementing our investments to drive growth in our business, we are working to bring new technologies and innovation to transform how we interact with our clients. Our approach to innovation is anchored on having a full understanding of the identified, as well as unidentified, needs of our clients. Over 99% of companies in the U.S. are small to midsized businesses. We know they have unique behaviors and concerns. They tell us they don't feel in control. Small business owners and their teams can be stretched, and they struggle with forecasting, collecting receivables and managing vendors. To help, this past year we increased our payments, technology and digital investments and put more capital and resources into delivering real solutions to these challenges.

Digital

In 2017, we partnered with Consumer & Community Banking to launch a new digital platform, Chase Connect, that is tailored to meet the needs of small and midsized companies. This platform provides our clients with a simple and convenient experience, integrating account information, payables and receivables. Chase Connect allows clients to see all of their accounts in one place, stay organized when paying bills, view payment history, approve transactions quickly and easily from one location, and receive customized account alerts. We are focused on having the best integrated, digital capabilities for clients and will continue to invest in enhancing the functionality of this robust platform.

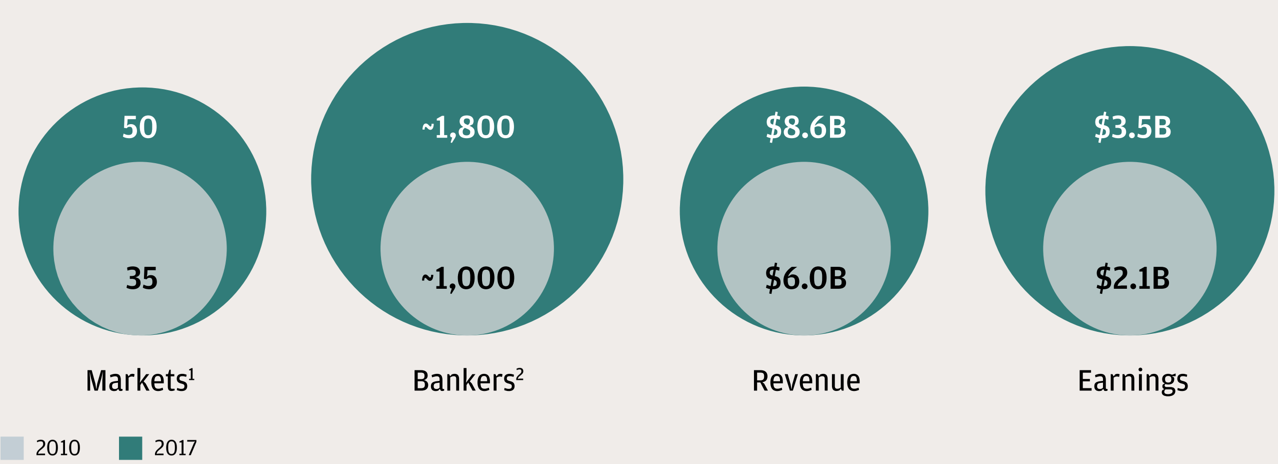
Payments

Recognizing that managing payments is a major pain point for our clients, we completed a comprehensive analysis to determine a digital solution. In 2017, we announced our investment in and partnership with Bill.com, the largest digital business-to-business payments network in the U.S. Seamlessly integrated into Chase Connect, this new automated payments capability will enable our clients to easily send and receive electronic invoices and payments, saving them substantial time and effort. We are very excited about this innovative solution and look forward to bringing this functionality to our clients in 2018.

Client experience

In addition to offering new capabilities, we are making great progress in re-engineering our core processes to

Sustained Growth Across Commercial Banking



[1] Number of Metropolitan Statistical Areas (MSAs) with Middle Market Banking presence out of top 50 MSAs

[2] Based on total count of client-facing employees

B = Billion

make it easier for clients to do business with us. For example, we are working to streamline and digitize the onboarding process to ensure that our clients' first experience with JPMorgan Chase is simple and transparent. Through these efforts, clients will be able to provide information electronically, e-sign and upload documents digitally, and receive real-time support via online chat capabilities. Clients are at the center of everything we do, and our work to deliver more value and an exceptional experience has no finish line.

Looking forward

While we celebrate CB's record 2017, we do not take our performance for granted. We understand that complacency and standing still in any way will threaten the future success of our business. As such, we remain focused on building upon our franchise to provide even more support to our clients. By combining the core strength of our business with new technologies and innovation, we believe we can further extend our competitive advantages.

I want to thank all of our great clients, like siggi's, for the trust and confidence they place in JPMorgan Chase. I also want to thank the entire CB team for their continued dedication to our clients and their communities. I am excited about the direction of the business for 2018 and beyond.

Douglas Petno
CEO, Commercial Banking

2017 HIGHLIGHTS AND ACCOMPLISHMENTS

Performance highlights

- Delivered record revenue of $8.6 billion
- Grew end-of-period loans 8%; 30 consecutive quarters of loan growth
- Generated return on equity of 17% on $20 billion of allocated capital
- Continued superior credit quality – net charge-off ratio of 0.02%

Leadership positions

- #1 U.S. multifamily lender[1]
- #1 in overall satisfaction, perceived satisfaction, customer relationships and transactions/payments processing – *CFO* magazine's Commercial Banking Survey, 2017
- Top 3 in Overall Middle Market, Large Middle Market and Asset Based Lending Bookrunner[2]
- Winner of 2017 Greenwich Best Brand Awards in Middle Market Banking – overall, loans/lines of credit, cash management, international products/services and investment banking
- Winner of 2017 Greenwich Excellence Awards in Middle Market Banking: international capabilities, cash management online banking functionality, cash management mobile banking functionality

Business segment highlights

- Middle Market Banking – Record gross Investment Banking revenue[3]; added eight new offices
- Corporate Client Banking – Record revenue, with average loans up 10% from prior year
- Commercial Term Lending – Record average loans; completed rollout of Commercial Real Estate Origination System for MFL business
- Real Estate Banking – Record revenue, with average loans up 27% from the prior year
- Community Development Banking – Record New Market Tax Credit equity investment production of $1.2 billion – Financed more than 9,000 units of affordable housing in 70+ cities through construction lending commitments of over $1 billion

Firmwide contribution

- Commercial Banking clients accounted for 38% of total North America Investment Banking fees[4]
- Over $135 billion in assets under management from Commercial Banking clients, generating more than $475 million in investment management revenue
- $479 million in Card Services revenue[3]
- $3.4 billion in Treasury Services revenue

Progress in key growth areas

- Middle Market expansion – Record revenue of $519 million; 18% CAGR since 2012
- Investment Banking – Record gross revenue of $2.3 billion[3]; 8% CAGR since 2012
- International Banking – Revenue[5] of $323 million; 8% CAGR since 2012

[1] Rank based on S&P Global Market Intelligence as of 12/31/17
[2] Thomson Reuters LPC, FY17
[3] Investment Banking and Card Services revenue represents gross revenue generated by CB clients
[4] Represents the percentage of CIB's North America IB fees generated by CB clients, excluding fees from fixed income and equity markets, which is included in CB gross IB revenue
[5] Non-U.S. revenue from U.S. multinational clients

CAGR = Compound annual growth rate
MFL = Multifamily lending

Asset & Wealth Management

J.P. Morgan Asset & Wealth Management (AWM) has been a fiduciary of client assets for nearly two centuries, with our roots dating back to the earliest cross-border fund managers in the industry. Over these many decades, we have managed the assets of institutions, central banks, sovereign wealth funds and individuals, helping them navigate their assets from the beginning stages of cash management all the way through complex multigenerational portfolios.

Our breadth of experience, through economic and geopolitical cycles, gives us the insights to help clients make smart, long-term investment decisions. It also gives our portfolio managers and advisors the perspective and fortitude to remain disciplined risk managers and opportunistic risk takers in today's ever-evolving market environment.

Today, while the fundamentals of managing money still require having the best investment minds, they must be coupled with major investments in technology. This enables more comprehensive analysis of enormous data sets, faster and more optimal execution in portfolios, and seamless delivery of all that we do in both human and digital form. The global size and scale of AWM, as well as its connectivity with JPMorgan Chase's broader technology expertise, continue to be competitive advantages for our teams, our clients and our shareholders.

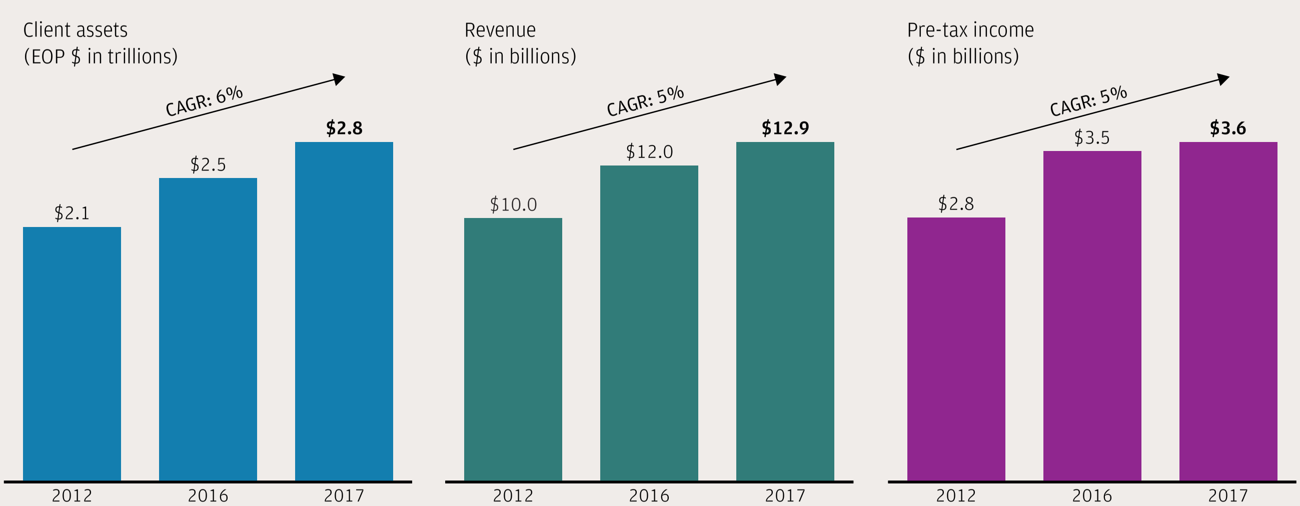
A record year for AWM

For investors in JPMorgan Chase, AWM continues to be a consistent revenue and earnings growth contributor to the company, with a very strong return on shareholder capital.

AWM's total client assets in 2017 grew to a record $2.8 trillion, with revenue of $12.9 billion and pre-tax income of $3.6 billion also hitting their highest levels ever. However, the consistent growth trajectory those numbers represent is just as important. From 2012 to 2017, we achieved a 6% compound annual growth rate (CAGR) for client assets and a 5% CAGR for both revenue and pre-tax income.

Rising client assets is a critical indicator because it tells us that clients continue to entrust even more of their capital with us every year. In 2017, clients entrusted us with an additional $84 billion of long-term assets – or $1 billion to $2 billion of incoming money every week. We have increased net new assets every year since 2004, with $388 billion coming over the past five years.

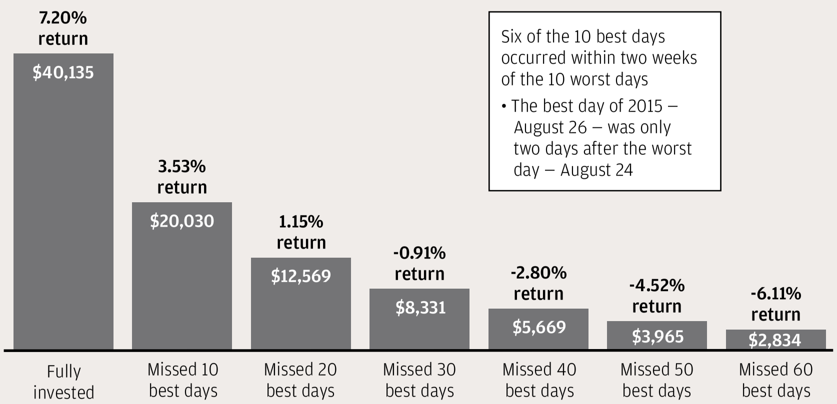
Continued Strong Financial Performance in 2017



CAGR = Compound annual growth rate
EOP = End of period

Returns of S&P 500

Performance of a $10,000 investment between January 2, 1998 and December 29, 2017



Source: Prepared by J.P. Morgan Asset Management using data from Bloomberg. Returns based on the S&P 500 Total Return Index. For illustrative purposes only. Past performance is not indicative of future returns

The primary reason clients turn to J.P. Morgan to manage their assets is because of our strong and consistent investment performance. In 2017, 86% of our long-term mutual fund assets under management outperformed the peer median in the 10-year period, including 87% for equity, 81% for fixed income, and 90% for multi-asset solutions and alternatives.

Covering the full spectrum of clients

AWM delivers investment advisory expertise to clients across the firm, ranging from Chase customers investing their first $100 to the world's wealthiest individuals and families. We also manage the portfolios of many of the largest sovereign wealth funds, pension funds and central banks in the world.

Across the Wealth Management business, in addition to investments, we help clients with their banking needs. This ranges from cash deposits to loans across many areas from real estate to investment capital for a new business. The deposit base of these private clients has grown consistently over the past five years, achieving a 10% CAGR and reaching nearly $300 billion. On the lending side, year-end spot balances of $134 billion represent a 9% CAGR over the past five years. This was accomplished with a well-managed risk profile, resulting in strong and consistent credit performance, and low charge-offs of less than 10 basis points over a cycle.

In addition to traditional investing and banking, AWM has developed a full suite of solutions to meet the complexity of our clients' needs – from alternative investments to trust and estate planning to philanthropic advice. Our platform is among the most comprehensive in the industry, enabling us to serve clients across both sides of their balance sheet and to offer insights and expertise into virtually every area of their financial life.

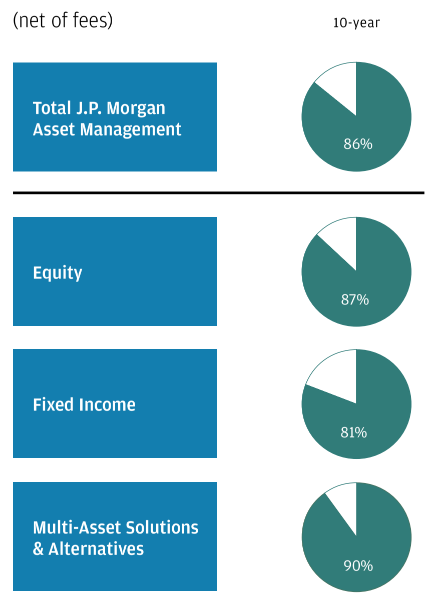
As wealth grows around the world, we continue to hire advisors to deliver J.P. Morgan's capabilities to more clients. We expect to hire in excess of 1,000 advisors over the coming years to expand in both new and existing markets. Our extensive experience in hiring and training has led our advisor productivity to rank among the top in the industry.

An increasingly digital world

Our clients' needs and behaviors are changing – and we are changing along with them.

% of J.P. Morgan Asset Management Long-Term Mutual Fund AUM Over the Peer Median[1]

(net of fees)



[1] For footnoted information, refer to slide 98 in the 2018 JPMorgan Chase Strategic Update presentation, which is available on JPMorgan Chase & Co.'s website (https://www.jpmorganchase.com/corporate/investor-relations/document/3cea4108_strategic_update.pdf), under the heading Investor Relations, Events & Presentations, JPMorgan Chase 2018 Investor Day, and on Form 8-K as furnished to the SEC on February 27, 2018, which is available on the SEC's website (www.sec.gov)

Last year, we formed a new business, Intelligent Digital Solutions (IDS), to help drive our efforts around digital transformation and big data. This group is unifying and optimizing our use of data analytics to transform how we apply these added insights efficiently and effectively in managing portfolios. IDS also is helping us digitize everything we do to make it easier for clients to gain 24/7 access to our investment ideas, insights and execution.

Additionally, we are building a digital wealth offering that provides clients access to proprietary tools that can complement their personal relationship with an advisor or be used when they want to interact with us entirely online. Ultimately, we want to be at the intersection of human and digitally enhanced advice.

Simplify for growth

Our goal is not to be the biggest asset manager but rather to be the best at what we do. Knowing that what has made us successful in the past will not necessarily be sustainable or sufficient for the future, we relentlessly challenge ourselves to focus on the products and services that are most important to clients and in which we have a competitive advantage.

We bring equal parts innovation and introspection in evaluating where to place our extra investment dollars and resources to ensure we have a differentiated offering. Last year, we launched more than 70 new fund strategies to our platform, a third of which are in our Beta Strategies lineup.

At the same time, if we aren't convinced we have a long-lasting advantage, we realign those resources to areas in which we do. In 2017, we liquidated or merged more than 70 funds and implemented significant fee reductions on 58 different funds across 235 share classes.

Above all, first-class business in a first-class way

I am proud of what we have delivered for our shareholders and clients and am even more excited about the investments we are making to position ourselves for the future. We have been working for two centuries as stewards of our clients' wealth to continuously refine what we do and how we do it. We remain committed to delivering first-class business and that in a first-class way.

Mary Callahan Erdoes
CEO, Asset & Wealth Management

2017 HIGHLIGHTS AND ACCOMPLISHMENTS

Business highlights

- Fiduciary mindset ingrained since mid-1800s
- Positive client asset flows every year since 2004
- Record revenue of $12.9 billion
- Record pre-tax income of $3.6 billion
- Record $2.8 trillion in client assets
- Record average loan balances of $123 billion
- Record average mortgage balances of $37 billion
- Retention rate of 98% for top senior portfolio management talent

Leadership positions

- #1 Private Bank Overall in North America (*Euromoney*, February 2018)
- #1 Private Bank Overall in Latin America (*Euromoney*, February 2018)
- Best Private Bank in Asia for Ultra-High-Net-Worth (*The Asset*, July 2017)
- Best Asset Management Company in Asia (*The Asset*, May 2017)
- Top Pan-European Fund Management Firm (Thomson Reuters Extel, June 2017)
- Best New Alternatives ETF and Best New Active ETF (ETF.com, March 2017)
- IT Team of the Year (*Banking Technology* magazine, December 2017)
- Social Media Leader of the Year (Fund Intelligence, March 2017)

Corporate Responsibility

One reason for JPMorgan Chase's enduring success is that we have always recognized that businesses operate within the context of their communities – and when our communities thrive, our business thrives.

Despite so much progress and so many economic gains, we know that many are still struggling. Millions in our communities and throughout the world live daily with economic uncertainty, just one unexpected expense from the financial edge.

> "At JPMorgan Chase, we view it as a firmwide objective to be a positive force in society and to help solve today's biggest challenges."

Young people entering the labor market are finding themselves stuck in low-skill, low-wage jobs or worse, entirely disconnected from employment, education or training. When so many are left behind, we all feel the consequences: It sows division, erodes trust in our institutions and undermines confidence in our systems. We all have a stake in creating more widely shared prosperity.

Economic growth fuels economic opportunity, so the momentum we are seeing in economies around the world should be unequivocally heralded as good news. Yet it is not preordained that an expanding economy automatically translates into greater opportunity for all. Rather, it requires deliberate action and meaningful collaboration. Government and the nonprofit sector will continue to play vital roles, but the private sector must step up and do more to ensure that everyone shares in the rewards of a growing economy.

That is precisely what JPMorgan Chase is doing. Through our model for driving inclusive growth, we are undertaking significant, long-term initiatives and are making strategic investments focused in areas where we can draw on our firm's resources and capabilities to have the greatest impact: building skills for today's high-quality jobs, expanding small businesses, revitalizing neighborhoods and promoting financial health.

Our firm's model is yielding real results – so we are scaling it with a 40% increase in our annual community investments. Whether times are good or tough, our firm has always supported our communities, but the strong and sustained performance of our company, recent changes to the U.S. corporate tax system, and a more constructive regulatory and business environment are enabling us to do even more. The net result is that JPMorgan Chase will invest a total of $1.75 billion over the next five years to help drive inclusive economic growth in local communities.

In 2017, for example, we announced comprehensive, multi-year initiatives to expand opportunity for the residents of Chicago's South and West sides and Washington, D.C.'s underserved neighborhoods. Our commitments to these cities are based on the successful approach we developed and refined through our firm's $150 million investment in Detroit's economic recovery, which *Fortune* magazine cited in naming us #1 on its list of companies that are changing the world.

At JPMorgan Chase, we view it as a firmwide objective to be a positive force in society and to help solve today's biggest challenges. We are deeply proud of the ways we are making a real difference in people's lives through our strategic philanthropic investments, but this is just one example of how we are stepping up. Across our firm, we are leveraging our resources, capabilities and core business to, in short, invest in opportunity – something we know will pay dividends not only for our communities but for our firm as well.

Peter L. Scher
Head of Corporate Responsibility and
Chairman of the Mid-Atlantic Region

Investing in opportunity

JPMorgan Chase believes there is a pressing need to expand access to opportunity and help more people move up the economic ladder. Through our proven model for driving inclusive growth, we are taking a strategic, data-driven approach to doing just that.

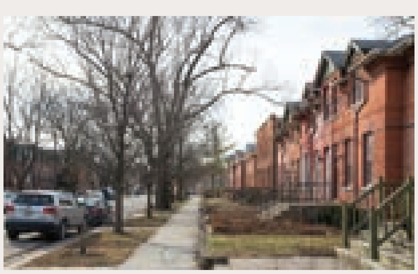
Our efforts are focused on what our experience has shown are universal pillars of opportunity, and we are undertaking significant, long-term global initiatives that directly leverage our firm's worldwide presence, expertise and resources.

Extending our model for impact

We refined this model through our work in Detroit, where, in 2014, we launched our most comprehensive initiative to date. Combining philanthropic investments and our core business expertise, we have been working to address some of Detroit's biggest economic challenges, from catalyzing commercial development and boosting small business growth to revitalizing neighborhoods and equipping Detroiters with the skills to secure well-paying jobs.

Meaningful collaboration among the city's leaders, business community and nonprofit sector has been the fundamental driver of the progress we are seeing to date and has allowed us to accelerate our initial investment. In just three years, and two years ahead of schedule, we exceeded our initial $100 million commitment and now expect to invest $150 million in the city by 2019.

Our comprehensive efforts in Detroit have yielded important insights, which we are turning into action in other communities that are facing similar challenges. In 2017, we extended our model for impact to Chicago and Washington, D.C. Our comprehensive, multimillion-dollar commitment to each city will focus on driving inclusive growth in underserved neighborhoods, where economic opportunity is increasingly out of reach.



Advancing sustainability for our clients and within our operations

As a company with clients and operations around the world, JPMorgan Chase is in a unique position to leverage our expertise to promote sustainable business practices and help clients capitalize on opportunities arising from the transition to a more sustainable global economy.

While JPMorgan Chase has a long-standing commitment to protect the environment and advance sustainability for our clients and within our own operations, we recognize that today's challenges call for an even greater commitment.

In 2017, we pledged to source renewable energy for 100% of our global power needs by 2020. JPMorgan Chase has offices and operations in over 60 countries across more than 5,500 properties, covering nearly 75 million square feet. To increase energy efficiency, we are retrofitting our branches with the world's largest LED lighting installation — a total of 1.4 million new lightbulbs. This move is likely to cut our lighting energy consumption in half, which is the equivalent of taking 27,000 cars off the road.

We are also developing an on-site solar installation at the firm's largest single-tenant office. This will comprise up to 20 megawatts of capacity, which is enough to power the equivalent of 3,280 homes. Additionally, we are supporting the development of new renewable assets by contracting for long-term power off-take from wind and solar projects on the grids from which JPMorgan Chase purchases power. As a first step, we are purchasing power from the Buckthorn wind farm, a 100-megawatt project in Erath County, Texas.

Finally, as one of the largest financiers of energy in the world, we pledged to facilitate $200 billion in clean financing through 2025. Through this commitment, JPMorgan Chase will help scale the impact of sustainability efforts among more than 20,000 corporate and investor clients in the U.S. and across the world.

The size, scope and global reach of our firm allow us to take on big challenges and to drive progress that few can match.

Harnessing the power of data

Delivering data and analyses is central to our model for impact. The JPMorgan Chase Institute is harnessing the scale and scope of one of the world's leading financial firms to better understand the economy. Its mission is to help policymakers, businesses and nonprofit leaders use better facts, timely data and thoughtful analysis to make smarter decisions to advance prosperity. Drawing on JPMorgan Chase's unique proprietary data, expertise and market access, the Institute frames and provides analysis of the most critical economic challenges of our time.

In 2017, the Institute shared important insights and thoughtful analyses on:

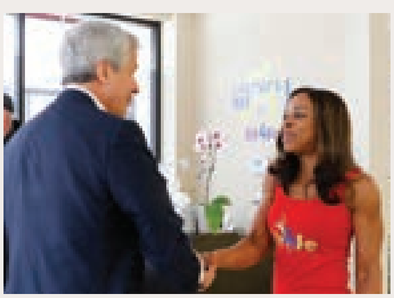
- U.S. household expense volatility, particularly in the wake of extraordinary medical payments;
- A first-of-its-kind look into out-of-pocket healthcare spending by U.S. consumers with a high frequency view at the state, metro and county level;
- The gender gap in financial outcomes and lasting impacts of major medical payments;
- The burden and dynamics of health insurance premium payments for small business owners;
- The challenges that U.S. small businesses face in managing payroll growth and volatility;
- Resident access to everyday goods and services in Detroit and New York City;
- A full year of the Local Consumer Commerce Index, measuring consumer spending growth within and across 14 U.S. cities each month;
- How an anticipated drop in mortgage payments, resulting from lower interest rates, impacted household consumption; and
- The impact of payment and principal reduction on default and consumption provided by mortgage modifications.

FORTUNE RANKS JPMORGAN CHASE #1 ON "CHANGE THE WORLD" LIST

"Thanks to Detroit, the bank is confident that this full-court-press approach is a blueprint that could work across the country – and in the next few months, they'll be taking components of the Motown model nationwide."

Excerpted from "How JPMorgan Chase Is Fueling Detroit's Revival," *Fortune* (September 15, 2017)

- JPMorgan Chase's investment in Detroit is yielding real results. To date, we have deployed $117 million in loans and grants to accelerate the city's economic recovery. This investment is allowing more than 15,000 adults and young people to receive skills training for in-demand jobs; supporting development projects that have created or preserved over 900 jobs, more than 1,300 housing units and over 177,000 square feet of commercial space; and providing more than 2,200 entrepreneurs with technical assistance and access to capital, creating or maintaining more than 1,100 jobs.
- Scaling innovative, high-impact models to create opportunity for more people:
  - – Expanded the Entrepreneurs of Color (EOC) Fund to the South Bronx in New York City and San Francisco. We first launched the EOC Fund in Detroit in 2015 to provide underserved entrepreneurs with greater access to capital and assistance needed to grow and thrive. To date, the fund has lent or approved nearly $4.7 million to more than 45 minority-owned small businesses, resulting in over 600 new or preserved jobs.



  - – Expanded The Fellowship Initiative (TFI) to Dallas and recruited new classes of Fellows in Chicago, Los Angeles and New York City. This program seeks to address barriers to opportunity for young men of color and to position them for success by engaging them in comprehensive training that includes academic support, mentoring and leadership development at a critical juncture in their lives. One hundred percent of TFI Fellows are graduating from high school, and, collectively, they have been accepted into more than 200 colleges and universities across the country.

  - – Expanded innovative apprenticeship models and career-focused programs that equip high school students with the skills and education they need to pursue well-paying, long-term careers through the launch of New Skills for Youth innovation sites in New York City's South Bronx and across three provinces in South Africa and four provinces in China.
- In the United Kingdom, we received the Queen's Award for Enterprise for Promoting Opportunity for the firm's Aspiring Professionals Program, which exposes young people from low-income backgrounds in London to new career opportunities.
- Engaged more than 1,800 young people in summer jobs and other work-related experiences in 19 cities across the U.S.
- Invested more than $43 million in 164 job training and career education initiatives in 35 countries around the world – including in Mexico, the Philippines and the United Kingdom – to prepare people with the skills they need to be successful in growing industries.
- Increased labor market transparency and efficiency through the development and launch of innovative workforce and career pathway tools such as the Good Jobs Index, BankingOnMyCareer.com and Credential Engine.
- Underwrote $13.5 billion in green bonds and bonds with a sustainable use of proceeds.
- In 2017, provided $1.2 billion for wind and solar projects in the U.S. Since 2003, JPMorgan Chase has committed or arranged over $18 billion in financing for wind, solar and geothermal energy projects in the U.S.
- Announced eight financial services innovators as winners of the third competition of the Financial Solutions Lab (FinLab), which is focused on improving the financial health of overlooked populations. To date, FinLab has supported 26 fintech companies offering innovative financial products to help more than 2.5 million Americans improve their financial health. Collectively, these companies have raised over $250 million in capital since joining the program. More than 100 JPMorgan Chase employees have provided mentorship to the companies as part of the Lab.

- Engaging our employees:
  - – We are putting the knowledge and expertise of our people to work for our communities. In 2017, 56,000 of our employees volunteered more than 383,000 hours of their time. And through the JPMorgan Chase Service Corps, a program that leverages the energy and skills of top talent to assist nonprofit partners, nearly 80 employee volunteers from offices in more than a dozen countries have contributed over 11,500 hours to help 20 organizations address critical needs.
  - – We are committed to supporting the communities where we work and live in their time of greatest need. In 2017, in the wake of an unprecedented number of natural disasters, our firm and employees donated $7.8 million to assist disaster relief efforts around the world.

Table of contents

Financial:

Management's discussion and analysis:

Audited financial statements:

Supplementary information:

FIVE-YEAR SUMMARY OF CONSOLIDATED FINANCIAL HIGHLIGHTS

(unaudited) As of or for the year ended December 31, (in millions, except per share, ratio, headcount data and where otherwise noted)	2017	2016	2015	2014	2013
Selected income statement data					
Total net revenue	**$ 99,624**	$ 95,668	$ 93,543	$ 95,112	$ 97,367
Total noninterest expense	**58,434**	55,771	59,014	61,274	70,467
Pre-provision profit	**41,190**	39,897	34,529	33,838	26,900
Provision for credit losses	**5,290**	5,361	3,827	3,139	225
Income before income tax expense	**35,900**	34,536	30,702	30,699	26,675
Income tax expense	**11,459**	9,803	6,260	8,954	8,789
Net income[(a)]	**$ 24,441**	$ 24,733	$ 24,442	$ 21,745	$ 17,886
Earnings per share data					
Net income: Basic	**$ 6.35**	$ 6.24	$ 6.05	$ 5.33	$ 4.38
Diluted	**6.31**	6.19	6.00	5.29	4.34
Average shares: Basic	**3,551.6**	3,658.8	3,741.2	3,808.3	3,832.4
Diluted	**3,576.8**	3,690.0	3,773.6	3,842.3	3,864.9
Market and per common share data					
Market capitalization	**$ 366,301**	$ 307,295	$ 241,899	$ 232,472	$ 219,657
Common shares at period-end	**3,425.3**	3,561.2	3,663.5	3,714.8	3,756.1
Share price:[(b)]					
High	**$ 108.46**	$ 87.39	$ 70.61	$ 63.49	$ 58.55
Low	**81.64**	52.50	50.07	52.97	44.20
Close	**106.94**	86.29	66.03	62.58	58.48
Book value per share	**67.04**	64.06	60.46	56.98	53.17
Tangible book value per share ("TBVPS")[(c)]	**53.56**	51.44	48.13	44.60	40.72
Cash dividends declared per share	**2.12**	1.88	1.72	1.58	1.44
Selected ratios and metrics					
Return on common equity ("ROE")	**10%**	10%	11%	10%	9%
Return on tangible common equity ("ROTCE")[(c)]	**12**	13	13	13	11
Return on assets ("ROA")	**0.96**	1.00	0.99	0.89	0.75
Overhead ratio	**59**	58	63	64	72
Loans-to-deposits ratio	**64**	65	65	56	57
High quality liquid assets ("HQLA") (in billions)[(d)]	**$ 556**	$ 524	$ 496	$ 600	$ 522
Common equity tier 1 ("CET1") capital ratio[(e)]	**12.2%**	12.3% [(i)]	11.8%	10.2%	10.7%
Tier 1 capital ratio[(e)]	**13.9**	14.0 [(i)]	13.5	11.6	11.9
Total capital ratio[(e)]	**15.9**	15.5	15.1	13.1	14.3
Tier 1 leverage ratio[(e)]	**8.3**	8.4	8.5	7.6	7.1
Selected balance sheet data (period-end)					
Trading assets	**$ 381,844**	$ 372,130	$ 343,839	$ 398,988	$ 374,664
Securities	**249,958**	289,059	290,827	348,004	354,003
Loans	**930,697**	894,765	837,299	757,336	738,418
Core Loans	**863,683**	806,152	732,093	628,785	583,751
Average core loans	**829,558**	769,385	670,757	596,823	563,809
Total assets	**2,533,600**	2,490,972	2,351,698	2,572,274	2,414,879
Deposits	**1,443,982**	1,375,179	1,279,715	1,363,427	1,287,765
Long-term debt[(f)]	**284,080**	295,245	288,651	276,379	267,446
Common stockholders' equity	**229,625**	228,122	221,505	211,664	199,699
Total stockholders' equity	**255,693**	254,190	247,573	231,727	210,857
Headcount	**252,539**	243,355	234,598	241,359	251,196
Credit quality metrics					
Allowance for credit losses	**$ 14,672**	$ 14,854	$ 14,341	$ 14,807	$ 16,969
Allowance for loan losses to total retained loans	**1.47%**	1.55%	1.63%	1.90%	2.25%
Allowance for loan losses to retained loans excluding purchased credit-impaired loans[(g)]	**1.27**	1.34	1.37	1.55	1.80
Nonperforming assets	**$ 6,426**	$ 7,535	$ 7,034	$ 7,967	$ 9,706
Net charge-offs[(h)]	**5,387**	4,692	4,086	4,759	5,802
Net charge-off rate[(h)]	**0.60%**	0.54%	0.52%	0.65%	0.81%

(a) On December 22, 2017, the Tax Cuts and Jobs Act ("TCJA") was signed into law. The Firm's results included a $2.4 billion decrease to net income as a result of the enactment of the TCJA. For additional information related to the impact of the TCJA, see Note 24.
(b) Based on daily prices reported by the New York Stock Exchange.
(c) TBVPS and ROTCE are non-GAAP financial measures. For further discussion of these measures, see Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures and Key Financial Performance Measures on pages 52–54.
(d) HQLA represents the amount of assets that qualify for inclusion in the liquidity coverage ratio. For December 31, 2017, the balance represents the average of quarterly reported results per the U.S. LCR public disclosure requirements effective April 1, 2017. Prior periods represent period-end balances under the final U.S. rule ("U.S. LCR") for December 31, 2016 and 2015, and the Firm's estimated amount for December 31, 2014 prior to the effective date of the final rule, and under the Basel III liquidity coverage ratio ("Basel III LCR") for December 31, 2013. For additional information, see LCR and HQLA on page 93.
(e) Ratios presented are calculated under the Basel III Transitional rules, which became effective on January 1, 2014, and for the capital ratios, represent the Collins Floor. Prior to 2014, the ratios were calculated under the Basel I rules. See Capital Risk Management on pages 82–91 for additional information on Basel III.
(f) Included unsecured long-term debt of $218.8 billion, $212.6 billion, $211.8 billion, $207.0 billion and $198.9 billion respectively, as of December 31, of each year presented.
(g) Excluded the impact of residential real estate purchased credit-impaired ("PCI") loans, a non-GAAP financial measure. For further discussion of these measures, see Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures and Key Performance Measures on pages 52–54, and the Allowance for credit losses on pages 117–119.
(h) Excluding net charge-offs of $467 million related to the student loan portfolio sale, the net charge-off rate for the year ended December 31, 2017 would have been 0.55%.
(i) The prior period ratios have been revised to conform with the current period presentation.

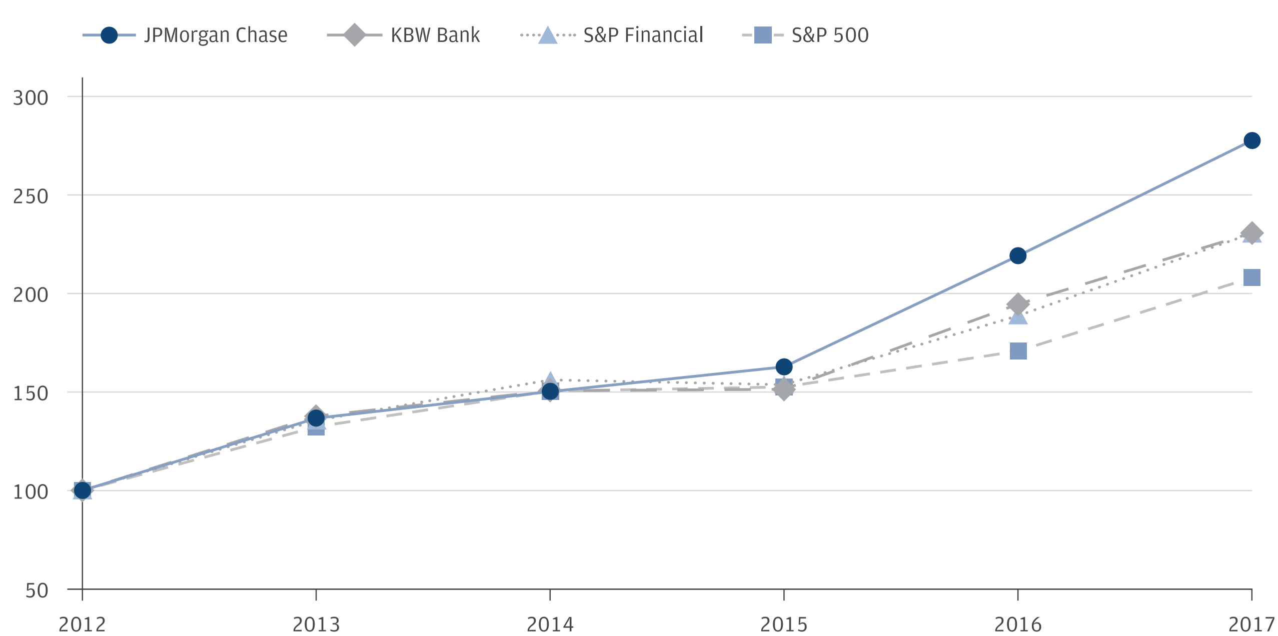
FIVE-YEAR STOCK PERFORMANCE

The following table and graph compare the five-year cumulative total return for JPMorgan Chase & Co. (“JPMorgan Chase” or the “Firm”) common stock with the cumulative return of the S&P 500 Index, the KBW Bank Index and the S&P Financial Index. The S&P 500 Index is a commonly referenced equity benchmark in the United States of America (“U.S.”), consisting of leading companies from different economic sectors. The KBW Bank Index seeks to reflect the performance of banks and thrifts that are publicly traded in the U.S. and is composed of leading national money center and regional banks and thrifts. The S&P Financial Index is an index of financial companies, all of which are components of the S&P 500. The Firm is a component of all three industry indices.

The following table and graph assume simultaneous investments of $100 on December 31, 2012, in JPMorgan Chase common stock and in each of the above indices. The comparison assumes that all dividends are reinvested.

December 31, (in dollars)	2012	2013	2014	2015	2016	**2017**
JPMorgan Chase	$ 100.00	$ 136.71	$ 150.22	$ 162.79	$ 219.06	**$ 277.62**
KBW Bank Index	100.00	137.76	150.66	151.39	194.55	**230.72**
S&P Financial Index	100.00	135.59	156.17	153.72	188.69	**230.47**
S&P 500 Index	100.00	132.37	150.48	152.55	170.78	**208.05**

December 31,
(in dollars)



This section of JPMorgan Chase's Annual Report for the year ended December 31, 2017 ("Annual Report"), provides Management's discussion and analysis of financial condition and results of operations ("MD&A") of JPMorgan Chase. See the Glossary of Terms and Acronyms on pages 283-289 for definitions of terms used throughout this Annual Report. The MD&A included in this Annual Report contains statements that are forward-looking within the meaning of the Private Securities Litigation Reform Act of 1995. Such statements are based on the current beliefs and expectations of JPMorgan Chase's management and are subject to significant risks and uncertainties. These risks and uncertainties could cause the Firm's actual results to differ materially from those set forth in such forward-looking statements. Certain of such risks and uncertainties are described herein (see Forward-looking Statements on page 145) and in JPMorgan Chase's Annual Report on Form 10-K for the year ended December 31, 2017 ("2017 Form 10-K"), in Part I, Item 1A: Risk factors; reference is hereby made to both.

INTRODUCTION

JPMorgan Chase & Co., a financial holding company incorporated under Delaware law in 1968, is a leading global financial services firm and one of the largest banking institutions in the United States of America ("U.S."), with operations worldwide; the Firm had $2.5 trillion in assets and $255.7 billion in stockholders' equity as of December 31, 2017. The Firm is a leader in investment banking, financial services for consumers and small businesses, commercial banking, financial transaction processing and asset management. Under the J.P. Morgan and Chase brands, the Firm serves millions of customers in the U.S. and many of the world's most prominent corporate, institutional and government clients.

JPMorgan Chase's principal bank subsidiaries are JPMorgan Chase Bank, National Association ("JPMorgan Chase Bank, N.A."), a national banking association with U.S. branches in 23 states, and Chase Bank USA, National Association ("Chase Bank USA, N.A."), a national banking association that is the Firm's principal credit card-issuing bank. JPMorgan Chase's principal nonbank subsidiary is J.P. Morgan Securities LLC ("JPMorgan Securities"), a U.S. broker-dealer. The bank and non-bank subsidiaries of JPMorgan Chase operate nationally as well as through overseas branches and subsidiaries, representative offices and subsidiary foreign banks. The Firm's principal operating subsidiary in the U.K. is J.P. Morgan Securities plc, a subsidiary of JPMorgan Chase Bank, N.A.

For management reporting purposes, the Firm's activities are organized into four major reportable business segments, as well as a Corporate segment. The Firm's consumer business is the Consumer & Community Banking ("CCB") segment. The Firm's wholesale business segments are Corporate & Investment Bank ("CIB"), Commercial Banking ("CB"), and Asset & Wealth Management ("AWM"). For a description of the Firm's business segments, and the products and services they provide to their respective client bases, refer to Business Segment Results on pages 55–74, and Note 31.

This executive overview of the MD&A highlights selected information and may not contain all of the information that is important to readers of this Annual Report. For a complete description of the trends and uncertainties, as well as the risks and critical accounting estimates affecting the Firm and its various lines of business, this Annual Report should be read in its entirety.

Financial performance of JPMorgan Chase

Year ended December 31, (in millions, except per share data and ratios)	2017	2016	Change
Selected income statement data			
Total net revenue	**$ 99,624**	$ 95,668	4%
Total noninterest expense	**58,434**	55,771	5
Pre-provision profit	**41,190**	39,897	3
Provision for credit losses	**5,290**	5,361	(1)
Net income	**24,441**	24,733	(1)
Diluted earnings per share	**6.31**	6.19	2
Selected ratios and metrics			
Return on common equity	**10%**	10%	
Return on tangible common equity	**12**	13	
Book value per share	**$ 67.04**	$ 64.06	5
Tangible book value per share	**53.56**	51.44	4
Capital ratios[(a)]			
CET1	**12.2%**	12.3% [(b)]	
Tier 1 capital	**13.9**	14.0 [(b)]	
Total capital	**15.9**	15.5	

(a) Ratios presented are calculated under the Basel III Transitional rules and represent the Collins Floor. See Capital Risk Management on pages 82-91 for additional information on Basel III.
(b) The prior period ratios have been revised to conform with the current period presentation.

Comparisons noted in the sections below are calculated for the full year of 2017 versus the full year of 2016, unless otherwise specified.

Summary of 2017 results

JPMorgan Chase reported strong results for full year 2017 with net income of $24.4 billion, or $6.31 per share, on net revenue of $99.6 billion. The Firm reported ROE of 10% and ROTCE of 12%. The Firm's results included a $2.4 billion decrease to net income as a result of the enactment of the Tax Cuts and Jobs Act ("TCJA"), driven by a deemed repatriation charge and adjustments to the value of the Firm's tax-oriented investments, partially offset by a benefit from the revaluation of the Firm's net deferred tax liability. For additional information related to the impact of the TCJA, refer to Note 24.

- Net income decreased 1% driven by higher noninterest expense and income tax expense, predominantly offset by higher net interest income.
- Total net revenue increased by 4% driven by higher net interest income and investment banking fees, partially offset by lower Fixed Income Markets and Home Lending noninterest revenue.
- Noninterest expense was $58.4 billion, up 5%, driven by higher compensation expense, auto lease depreciation expense and continued investments across the businesses.
- The provision for credit losses was $5.3 billion, relatively flat compared with the prior year, reflecting a decrease in the wholesale provision driven by credit quality improvements in the Oil & Gas, Natural Gas Pipelines and Metals & Mining portfolios, offset by an increase in the consumer provision. The increase in the consumer provision was driven by higher net charge-offs and a higher addition to the allowance for loan losses in the credit card portfolio, and the impact of the sale of the student loan portfolio.
- The total allowance for credit losses was $14.7 billion at December 31, 2017, and the Firm had a loan loss coverage ratio, excluding the PCI portfolio, of 1.27%, compared with 1.34% in the prior year. The Firm's nonperforming assets totaled $6.4 billion, a decrease from the prior-year level of $7.5 billion.
- Firmwide average core loans increased 8%.

Selected capital-related metrics

- The Firm's Basel III Fully Phased-In CET1 capital was $183 billion, and the Standardized and Advanced CET1 ratios were 12.1% and 12.7%, respectively.
- The Firm's Fully Phased-In supplementary leverage ratio ("SLR") was 6.5%.
- The Firm continued to grow tangible book value per share ("TBVPS"), ending 2017 at $53.56, up 4%.

ROTCE and TBVPS are non-GAAP financial measures. Core loans and each of the Fully Phased-In capital and leverage measures are considered key performance measures. For a further discussion of each of these measures, see Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures and Key Performance Measures on pages 52–54, and Capital Risk Management on pages 82–91.

Lines of business highlights

Selected business metrics for each of the Firm's four lines of business are presented below for the full year of 2017.

CCB ROE 17%	• Average core loans up 9%; average deposits of $640 billion, up 9% • Client investment assets of $273 billion, up 17% • Credit card sales volume up 14% and merchant processing volume up 12%
CIB ROE 14%	• Maintained #1 ranking for Global Investment Banking fees with 8.1% wallet share • Investment Banking revenue up 12%; Treasury Services revenue up 15%; and Securities Services revenue up 9%
CB ROE 17%	• Record revenue of $8.6 billion, up 15%; record net income of $3.5 billion, up 33% • Average loan balances of $198 billion, up 10%
AWM ROE 25%	• Record revenue of $12.9 billion, up 7%; record net income of $2.3 billion, up 4% • Average loan balances of $123 billion, up 9% • Record assets under management ("AUM") of $2.0 trillion, up 15%

For a detailed discussion of results by line of business, refer to the Business Segment Results on pages 55–56.

Credit provided and capital raised

JPMorgan Chase continues to support consumers, businesses and communities around the globe. The Firm provided credit and raised capital of $2.3 trillion for wholesale and consumer clients during 2017:

- $258 billion of credit for consumers
- $22 billion of credit for U.S. small businesses
- $817 billion of credit for corporations
- $1.1 trillion of capital raised for corporate clients and non-U.S. government entities
- $92 billion of credit and capital raised for U.S. government and nonprofit entities, including states, municipalities, hospitals and universities.

Recent events

- On February 21, 2018, the Firm announced its intent to pursue building a new 2.5 million square foot headquarters at its 270 Park Avenue location in New York City. The project will be subject to various approvals, and the Firm will work closely with the New York City Council and State officials to complete the project in a manner that benefits all constituencies. Once the project's approvals are granted, redevelopment and construction are expected to begin in 2019 and take approximately five years to complete. The project is not expected to have a material impact on the company's financial results.
- On January 30, 2018, Amazon, Berkshire Hathaway, and JPMorgan Chase announced that they are partnering on ways to address healthcare for their U.S. employees, with the aim of improving employee satisfaction and reducing costs. Through a new independent company, the initial focus will be on technology solutions that will provide U.S. employees and their families with simplified, high-quality and transparent healthcare at a reasonable cost.
- On January 29, 2018, JPMorgan Chase announced that Daniel Pinto, Chief Executive Officer ("CEO") of CIB, and Gordon Smith, CEO of CCB, have been appointed Co-Presidents and Co-Chief Operating Officers ("COO") of the Firm, effective January 30, 2018, and will continue to report to Jamie Dimon, Chairman and CEO. In addition to their current roles, Mr. Pinto and Mr. Smith will work closely with Mr. Dimon to help drive critical Firmwide opportunities. Responsibilities for the rest of the Firm's Operating Committee will remain unchanged, with its members continuing to report to Mr. Dimon.
- On January 23, 2018, the Firm announced a $20 billion, five-year comprehensive investment to help its employees and support job and economic growth in the U.S. Through these new investments, the Firm plans to develop hundreds of new branches in several new U.S. markets, increase wages and benefits for hourly U.S. employees, make increased small business and mortgage lending commitments, add approximately 4,000 jobs throughout the country, and increase philanthropic investments.
- On December 22, 2017, the TCJA was signed into law. The Firm's results included a $2.4 billion decrease to net income as a result of the enactment of the TCJA. For additional information related to the impact of the TCJA, see Note 24.
- During the second half of 2017, natural disasters caused significant disruptions to individuals and businesses, and damage to homes and communities in several regions where the Firm conducts business. The Firm continues to provide assistance to customers, clients, communities and employees who have been affected by these disasters. These events did not have a material impact on the Firm's 2017 financial results.

2018 outlook

These current expectations are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Such forward-looking statements are based on the current beliefs and expectations of JPMorgan Chase's management and are subject to significant risks and uncertainties. These risks and uncertainties could cause the Firm's actual results to differ materially from those set forth in such forward-looking statements. See Forward-Looking Statements on page 145 *and the Risk Factors section on* pages 8–26. *There is no assurance that actual results for the full year of 2018 will be in line with the outlook set forth below, and the Firm does not undertake to update any forward-looking statements.*

JPMorgan Chase's outlook for 2018 should be viewed against the backdrop of the global and U.S. economies, financial markets activity, the geopolitical environment, the competitive environment, client and customer activity levels, and regulatory and legislative developments in the U.S. and other countries where the Firm does business. Each of these interrelated factors will affect the performance of the Firm and its lines of business. The Firm expects that it will continue to make appropriate adjustments to its businesses and operations in response to ongoing developments in the legal, regulatory, business and economic environments in which it operates.

Firmwide

- As a result of the change in tax rate due to the TCJA, management expects a reduction in tax-equivalent adjustments, decreasing both revenue and income tax expense, on a managed basis, by approximately $1.2 billion on an annual run-rate basis.
- Management expects the new revenue recognition accounting standard to increase both noninterest revenue and expense for full-year 2018 by approximately $1.2 billion, with most of the impact in the AWM business. For additional information on the new accounting standard, see Accounting and Reporting Developments on page 141.
- Management expects first-quarter 2018 net interest income, on a managed basis, to be down modestly compared with the fourth quarter of 2017, driven by the impact of the TCJA and a lower day count. For full-year 2018, management expects net interest income, on a managed basis, to be in the $54 to $55 billion range, market dependent, and assuming expected core loan growth. Management expects Firmwide average core loan growth to be in the 6% to 7% range in 2018, excluding CIB loans.
- Excluding the impact of the new revenue recognition accounting standard, management expects Firmwide noninterest revenue for full-year 2018, on a managed basis, to be up approximately 7%, depending on market conditions.
- The Firm continues to take a disciplined approach to managing its expenses, while investing for growth and innovation. As a result, management expects Firmwide adjusted expense for full-year 2018 to be less than $62 billion, excluding the impact of the new revenue recognition accounting standard.
- Management estimates the full-year 2018 effective income tax rate to be in the 19% to 20% range, depending upon several factors, including the geographic mix of taxable income and refinements to estimates of the impacts of the TCJA.
- Management expects net charge-off rates to remain relatively flat across the wholesale and consumer portfolios, with the exception of Card.

CCB

- Management expects the full-year 2018 Card Services net revenue rate to be approximately 11.25%.
- In Card, management expects the net charge-off rate to increase to approximately 3.25% in 2018.

CIB

- Markets revenue in the first-quarter 2018 is expected to be up by mid to high single digit percentage points when compared with the prior-year quarter; actual Markets revenue results will continue to be affected by market conditions, which can be volatile.

CONSOLIDATED RESULTS OF OPERATIONS

This section provides a comparative discussion of JPMorgan Chase's Consolidated Results of Operations on a reported basis for the three-year period ended December 31, 2017, unless otherwise specified. Factors that relate primarily to a single business segment are discussed in more detail within that business segment. For a discussion of the Critical Accounting Estimates Used by the Firm that affect the Consolidated Results of Operations, see pages 138–140.

Revenue

Year ended December 31, (in millions)	2017	2016	2015
Investment banking fees	**$ 7,248**	$ 6,448	$ 6,751
Principal transactions	**11,347**	11,566	10,408
Lending- and deposit-related fees	**5,933**	5,774	5,694
Asset management, administration and commissions	**15,377**	14,591	15,509
Securities gains/(losses)	**(66)**	141	202
Mortgage fees and related income	**1,616**	2,491	2,513
Card income	**4,433**	4,779	5,924
Other income[(a)]	**3,639**	3,795	3,032
Noninterest revenue	**49,527**	49,585	50,033
Net interest income	**50,097**	46,083	43,510
Total net revenue	**$ 99,624**	$ 95,668	$ 93,543

(a) Included operating lease income of $3.6 billion, $2.7 billion and $2.1 billion for the years ended December 31, 2017, 2016 and 2015, respectively.

2017 compared with 2016

Investment banking fees increased reflecting higher debt and equity underwriting fees in CIB. The increase in debt underwriting fees was driven by a higher share of fees and an overall increase in industry-wide fees; and the increase in equity underwriting fees was driven by growth in industry-wide issuance, including a strong initial public offering ("IPO") market. For additional information, see CIB segment results on pages 62–66 and Note 6.

Principal transactions revenue decreased compared with a strong prior year in CIB, primarily reflecting:

- lower Fixed Income-related revenue driven by sustained low volatility and tighter credit spreads

partially offset by

- higher Equity-related revenue primarily in Prime Services, and
- higher Lending-related revenue reflecting lower fair value losses on hedges of accrual loans.

For additional information, see CIB and Corporate segment results on pages 62–66 and pages 73–74, respectively, and Note 6.

Asset management, administration and commissions revenue increased as a result of higher asset management fees in AWM and CCB, and higher asset-based fees in CIB, both driven by higher market levels. For additional information, see AWM, CCB and CIB segment results on pages 70–72, pages 57-61 and pages 62–66, respectively, and Note 6.

For information on lending- and deposit-related fees, see the segment results for CCB on pages 57-61, CIB on pages 62–66, and CB on pages 67–69 and Note 6; on securities gains, see the Corporate segment discussion on pages 73–74.

Mortgage fees and related income decreased driven by lower MSR risk management results, lower net production revenue on lower margins and volumes, and lower servicing revenue on lower average third-party loans serviced. For further information, see CCB segment results on pages 57-61, Note 6 and 15.

Card income decreased predominantly driven by higher credit card new account origination costs, largely offset by higher card-related fees, primarily annual fees. For further information, see CCB segment results on pages 57-61 .

Other income decreased primarily due to:

- lower other income in CIB largely driven by a $520 million impact related to the enactment of the TCJA, which reduced the value of certain of CIB's tax-oriented investments, and
- the absence in the current year of gains from
  - the sale of Visa Europe interests in CCB,
  - the redemption of guaranteed capital debt securities ("trust preferred securities"), and
  - the disposal of an asset in AWM

partially offset by

- higher operating lease income reflecting growth in auto operating lease volume in CCB, and
- a legal benefit of $645 million recorded in the second quarter of 2017 in Corporate related to a settlement with the FDIC receivership for Washington Mutual and with Deutsche Bank as trustee of certain Washington Mutual trusts.

For further information, see Note 6.

Net interest income increased primarily driven by the net impact of higher rates and loan growth across the businesses, partially offset by declines in Markets net interest income in CIB. The Firm's average interest-earning assets were $2.2 trillion, up $79 billion from the prior year, and the net interest yield on these assets, on a fully taxable equivalent ("FTE") basis, was 2.36%, an increase of 11 basis points from the prior year.

2016 compared with 2015

Investment banking fees decreased predominantly due to lower equity underwriting fees driven by declines in industry-wide fee levels.

Principal transactions revenue increased reflecting broad-based strength across products in CIB's Fixed Income Markets business. Rates performance was strong, with increased client activity driven by high issuance-based flows, global political developments, and central bank actions. Credit revenue improved driven by higher market-making revenue from the secondary market as clients' appetite for risk recovered.

Asset management, administration and commissions revenue decreased reflecting lower asset management fees in AWM driven by a reduction in revenue related to the disposal of assets at the beginning of 2016, the impact of lower average equity market levels and lower performance fees, as well as due to lower brokerage commissions and other fees in CIB and AWM.

Mortgage fees and related income were relatively flat, as lower mortgage servicing revenue related to lower average third-party loans serviced was predominantly offset by higher MSR risk management results.

Card income decreased predominantly driven by higher new account origination costs and the impact of renegotiated co-brand partnership agreements, partially offset by higher card sales volume and other card-related fees.

Other income increased primarily reflecting:

- higher operating lease income from growth in auto operating lease assets in CCB
- a gain on the sale of Visa Europe interests in CCB
- a gain related to the redemption of guaranteed capital debt securities
- the absence of losses recognized in 2015 related to the accelerated amortization of cash flow hedges associated with the exit of certain non-operating deposits
- a gain on disposal of an asset in AWM

partially offset by

- a $514 million benefit recorded in the prior year from a legal settlement in Corporate.

Net interest income increased primarily driven by loan growth across the businesses and the net impact of higher rates, partially offset by lower investment securities balances and higher interest expense on long-term debt. The Firm's average interest-earning assets were $2.1 trillion in 2016, up $13 billion from the prior year, and the net interest yield on these assets, on a FTE basis, was 2.25%, an increase of 11 basis points from the prior year.

Provision for credit losses

Year ended December 31, (in millions)	2017	2016	2015
Consumer, excluding credit card	$ 620	$ 467	$ (81)
Credit card	4,973	4,042	3,122
Total consumer	5,593	4,509	3,041
Wholesale	(303)	852	786
Total provision for credit losses	$ 5,290	$ 5,361	$ 3,827

2017 compared with 2016

The **provision for credit losses** decreased as a result of:

- a net $422 million reduction in the wholesale allowance for credit losses, reflecting credit quality improvements in the Oil & Gas, Natural Gas Pipelines, and Metals & Mining portfolios, compared with an addition of $511 million in the prior year driven by downgrades in the same portfolios

predominantly offset by

- a higher consumer provision driven by
  - $450 million of higher net charge-offs, primarily in the credit card portfolio due to growth in newer vintages which, as anticipated, have higher loss rates than the more seasoned portion of the portfolio, partially offset by a decrease in net charge-offs in the residential real estate portfolio reflecting continued improvement in home prices and delinquencies,
  - a $416 million higher addition to the allowance for credit losses related to the credit card portfolio driven by higher loss rates and loan growth, and a lower reduction in the allowance for the residential real estate portfolio predominantly driven by continued improvement in home prices and delinquencies, and
  - a $218 million impact in connection with the sale of the student loan portfolio.

For a more detailed discussion of the credit portfolio, the student loan sale and the allowance for credit losses, see the segment discussions of CCB on pages 57-61, CIB on pages 62–66, CB on pages 67–69, the Allowance for Credit Losses on pages 117–119 and Note 13.

2016 compared with 2015

The **provision for credit losses** reflected an increase in the consumer provision and, to a lesser extent, the wholesale provision. The increase in the consumer provision was predominantly driven by:

- a $920 million increase related to the credit card portfolio, due to a $600 million addition in the allowance for loan losses, as well as $320 million of higher net charge-offs, driven by loan growth (including growth in newer vintages which, as anticipated, have higher loss rates compared to the overall portfolio), and

- a $470 million lower benefit related to the residential real estate portfolio, as the reduction in the allowance for loan losses in 2016 was lower than the prior year. The reduction in both periods reflected continued improvements in home prices and lower delinquencies.

The increase in the wholesale provision was largely driven by the impact of downgrades in the Oil & Gas and Natural Gas Pipelines portfolios.

Noninterest expense

Year ended December 31, (in millions)	**2017**	2016	2015
Compensation expense	**$31,009**	$29,979	$29,750
Noncompensation expense:			
Occupancy	**3,723**	3,638	3,768
Technology, communications and equipment	**7,706**	6,846	6,193
Professional and outside services	**6,840**	6,655	7,002
Marketing	**2,900**	2,897	2,708
Other[(a)(b)]	**6,256**	5,756	9,593
Total noncompensation expense	**27,425**	25,792	29,264
Total noninterest expense	**$58,434**	$55,771	$59,014

(a) Included Firmwide legal expense/(benefit) of $(35) million, $(317) million and $3.0 billion for the years ended December 31, 2017, 2016 and 2015, respectively.
(b) Included FDIC-related expense of $1.5 billion, $1.3 billion and $1.2 billion for the years ended December 31, 2017, 2016 and 2015, respectively.

2017 compared with 2016

Compensation expense increased predominantly driven by investments in headcount in most businesses, including bankers and business-related support staff, and higher performance-based compensation expense, predominantly in AWM.

Noncompensation expense increased as a result of:

- higher depreciation expense from growth in auto operating lease volume in CCB
- contributions to the Firm's Foundation
- a lower legal net benefit compared to the prior year
- higher FDIC-related expense, and
- an impairment in CB on certain leased equipment, the majority of which was sold subsequent to year-end

partially offset by

- the absence in the current year of two items totaling $175 million in CCB related to liabilities from a merchant in bankruptcy and mortgage servicing reserves.

For a discussion of legal expense, see Note 29.

2016 compared with 2015

Compensation expense was relatively flat predominantly driven by higher performance-based compensation expense and investments in several businesses, offset by the impact of continued expense reduction initiatives, including lower headcount in certain businesses.

Noncompensation expense decreased as a result of lower legal expense (including lower legal professional services expense), the impact of efficiencies, and reduced non-U.S. tax surcharges. These factors were partially offset by higher depreciation expense from growth in auto operating lease assets and higher investments in marketing.

Income tax expense

Year ended December 31, (in millions, except rate)	**2017**	2016	2015
Income before income tax expense	**$35,900**	$ 34,536	$ 30,702
Income tax expense	**11,459**	9,803	6,260
Effective tax rate	**31.9%**	28.4%	20.4%

2017 compared with 2016

The **effective tax rate** increased in 2017 driven by:

- a $1.9 billion increase to income tax expense representing the impact of the enactment of the TCJA. The increase was driven by the deemed repatriation of the Firm's unremitted non-U.S. earnings and adjustments to the value of certain tax-oriented investments, partially offset by a benefit from the revaluation of the Firm's net deferred tax liability. The incremental expense resulted in a 5.4 percentage point increase to the Firm's effective tax rate

partially offset by

- benefits resulting from the vesting of employee share-based awards related to the appreciation of the Firm's stock price upon vesting above their original grant price, and the release of a valuation allowance.

For further information, see Note 24.

2016 compared with 2015

The **effective tax rate** in 2016 was affected by changes in the mix of income and expense subject to U.S. federal and state and local taxes, tax benefits related to the utilization of certain deferred tax assets, as well as the adoption of new accounting guidance related to employee share-based incentive payments. These tax benefits were partially offset by higher income tax expense from tax audits. The lower effective tax rate in 2015 was predominantly driven by $2.9 billion of tax benefits, which reduced the Firm's effective tax rate by 9.4 percentage points. The recognition of tax benefits in 2015 resulted from the resolution of various tax audits, as well as the release of U.S. deferred taxes associated with the restructuring of certain non-U.S. entities.

Consolidated Balance Sheets Analysis

The following is a discussion of the significant changes between December 31, 2017 and 2016.

Selected Consolidated balance sheets data

December 31, (in millions)	2017	2016	Change
Assets			
Cash and due from banks	$ **25,827**	$ 23,873	8%
Deposits with banks	**404,294**	365,762	11
Federal funds sold and securities purchased under resale agreements	**198,422**	229,967	(14)
Securities borrowed	**105,112**	96,409	9
Trading assets:			
Debt and equity instruments	**325,321**	308,052	6
Derivative receivables	**56,523**	64,078	(12)
Securities	**249,958**	289,059	(14)
Loans	**930,697**	894,765	4
Allowance for loan losses	**(13,604)**	(13,776)	(1)
Loans, net of allowance for loan losses	**917,093**	880,989	4
Accrued interest and accounts receivable	**67,729**	52,330	29
Premises and equipment	**14,159**	14,131	–
Goodwill, MSRs and other intangible assets	**54,392**	54,246	–
Other assets	**114,770**	112,076	2
Total assets	$ **2,533,600**	$ 2,490,972	2%

Cash and due from banks and deposits with banks increased primarily driven by deposit growth and a shift in the deployment of excess cash from securities purchased under resale agreements and investment securities into deposits with banks. The Firm's excess cash is placed with various central banks, predominantly Federal Reserve Banks.

Federal funds sold and securities purchased under resale agreements decreased primarily due to the shift in the deployment of excess cash to deposits with banks and lower client activity in CIB. For additional information on the Firm's Liquidity Risk Management, see pages 92–97.

Securities borrowed increased driven by higher demand for securities to cover short positions related to client-driven market-making activities in CIB.

Trading assets–debt and equity instruments increased predominantly as a result of client-driven market-making activities in CIB, primarily in Fixed Income Markets and Prime Services, partially offset by lower equity instruments in Equity Markets. For additional information, refer to Note 2.

Trading assets and trading liabilities–derivative receivables and payables decreased predominantly as a result of client-driven market-making activities in CIB Markets, which reduced foreign exchange and interest rate derivative receivables and payables, and increased equity derivative receivables, driven by market movements. For additional information, refer to Derivative contracts on pages 114–115, and Notes 2 and 5.

Securities decreased primarily reflecting net sales, maturities and paydowns of U.S. Treasuries, non-U.S. government securities and collateralized loan obligations. For additional information, see Notes 2 and 10.

Loans increased reflecting:

- higher wholesale loans driven by new originations in CB and higher loans to Private Banking clients in AWM
- higher consumer loans driven by higher retention of originated high-quality prime mortgages in CCB and AWM, and higher credit card loans, largely offset by the sale of the student loan portfolio, lower home equity loans and the run-off of PCI loans.

The **allowance for loan losses** decreased driven by:

- a net reduction in the wholesale allowance, reflecting credit quality improvements in the Oil & Gas, Natural Gas Pipelines and Metals & Mining portfolios (compared with additions to the allowance in the prior year driven by downgrades in the same portfolios)

largely offset by

- a net increase in the consumer allowance, reflecting additions to the allowance for the credit card and business banking portfolios, driven by loan growth in both of these portfolios and higher loss rates in the credit card portfolio, largely offset by a reduction in the allowance for the residential real estate portfolio, predominantly driven by continued improvement in home prices and delinquencies, and the utilization of the allowance in connection with the sale of the student loan portfolio.

For a more detailed discussion of loans and the allowance for loan losses, refer to Credit and Investment Risk Management on pages 99–120, and Notes 2, 3, 12 and 13.

Accrued interest and accounts receivable increased primarily reflecting higher held-for-investment margin loans related to client-driven financing activities in Prime Services.

Other assets increased slightly as a result of higher auto operating lease assets from growth in business volume in CCB.

For information on Goodwill and MSRs, see Note 15.

Selected Consolidated balance sheets data

December 31, (in millions)	2017	2016	Change
Liabilities			
Deposits	$ **1,443,982**	$ 1,375,179	5
Federal funds purchased and securities loaned or sold under repurchase agreements	**158,916**	165,666	(4)
Short-term borrowings	**51,802**	34,443	50
Trading liabilities:			
Debt and equity instruments	**85,886**	87,428	(2)
Derivative payables	**37,777**	49,231	(23)
Accounts payable and other liabilities	**189,383**	190,543	(1)
Beneficial interests issued by consolidated variable interest entities ("VIEs")	**26,081**	39,047	(33)
Long-term debt	**284,080**	295,245	(4)
Total liabilities	**2,277,907**	2,236,782	2
Stockholders' equity	**255,693**	254,190	1
Total liabilities and stockholders' equity	$ **2,533,600**	$ 2,490,972	2%

Deposits increased due to:

- higher consumer deposits reflecting the continuation of strong growth from new and existing customers, and low attrition rates
- higher wholesale deposits largely driven by growth in client cash management activity in CIB's Securities Services business, partially offset by lower balances in AWM reflecting balance migration predominantly into the Firm's investment-related products.

For more information, refer to the Liquidity Risk Management discussion on pages 92–97; and Notes 2 and 17.

Short-term borrowings increased primarily due to higher issuance of commercial paper reflecting in part a change in the mix of funding from securities sold under repurchase agreements for CIB Markets activities. For additional information, see Liquidity Risk Management on pages 92–97.

Beneficial interests issued by consolidated VIEs decreased due to net maturities of credit card securitizations and the deconsolidation of the student loan securitization entities in connection with the portfolio's sale. For further information on Firm-sponsored VIEs and loan securitization trusts, see Off-Balance Sheet Arrangements on pages 50–51 and Note 14 and 27; and for the sale of the student loan portfolio, see CCB segment results on pages 57-61.

Long-term debt decreased reflecting lower Federal Home Loan Bank ("FHLB") advances, partially offset by the net issuance of senior debt and the net issuance of structured notes in CIB driven by client demand. For additional information on the Firm's long-term debt activities, see Liquidity Risk Management on pages 92–97 and Note 19.

For information on changes in stockholders' equity, see page 151, and on the Firm's capital actions, see Capital actions on pages 89-90.

Consolidated Cash Flows Analysis

(in millions)	Year ended December 31, 2017	2016	2015
Net cash provided by/(used in)			
Operating activities	**$ (2,501)**	$ 20,196	$ 73,466
Investing activities	**(10,283)**	(114,949)	106,980
Financing activities	**14,642**	98,271	(187,511)
Effect of exchange rate changes on cash	**96**	(135)	(276)
Net increase/(decrease) in cash and due from banks	**$ 1,954**	$ 3,383	$ (7,341)

Operating activities
JPMorgan Chase's operating assets and liabilities support the Firm's lending and capital markets activities. These assets and liabilities can vary significantly in the normal course of business due to the amount and timing of cash flows, which are affected by client-driven and risk management activities and market conditions. The Firm believes cash flows from operations, available cash and other liquidity sources, and its capacity to generate cash through secured and unsecured sources are sufficient to meet operating liquidity needs.

- In 2017, cash used reflected an increase in held-for-investment margin loans in accrued interest and accounts receivable and a decrease in trading liabilities.
- In 2016, cash provided reflected increases in accounts payable and trading liabilities, partially offset by cash used reflecting an increase in trading assets, an increase in accounts receivable from merchants and higher client receivables.
- In 2015, cash provided reflected decreases in trading assets and in accounts receivable, partially offset by cash used due to a decrease in accounts payable and other liabilities.

Investing activities
The Firm's investing activities predominantly include originating held-for-investment loans and investing in the securities portfolio and other short-term interest-earning assets.

- In 2017, cash used primarily reflected net originations of loans and a net increase in short-term interest-earning assets, partially offset by net proceeds from paydowns, maturities, sales and purchases of investment securities.
- In 2016, cash used reflected net originations of loans, an increase in short-term interest-earning assets, an increase in securities purchased under resale agreements, and the deployment of excess cash.
- In 2015, cash provided predominantly reflected lower short-term interest-earning assets, and net proceeds from lower investment securities, partially offset by cash used for net originations of loans.

Financing activities
The Firm's financing activities include acquiring customer deposits and issuing long-term debt, as well as preferred and common stock.

- In 2017, cash provided reflected higher deposits and short-term borrowings, partially offset by a decrease in long-term borrowings.
- In 2016, cash provided reflected higher deposits, and an increase in securities loaned or sold under repurchase agreements, and net proceeds from long term borrowings.
- In 2015, cash used reflected lower deposits and short-term borrowings, partially offset by net proceeds from long-term borrowings. Additionally, in 2015 cash outflows reflected a decrease in securities loaned or sold under repurchase agreements.
- For all periods, cash was used for repurchases of common stock and cash dividends on common and preferred stock.

* * *

For a further discussion of the activities affecting the Firm's cash flows, see Consolidated Balance Sheets Analysis on pages 47-48 , Capital Risk Management on pages 82–91, and Liquidity Risk Management on pages 92–97.

OFF-BALANCE SHEET ARRANGEMENTS AND CONTRACTUAL CASH OBLIGATIONS

In the normal course of business, the Firm enters into various contractual obligations that may require future cash payments. Certain obligations are recognized on-balance sheet, while others are off-balance sheet under accounting principles generally accepted in the U.S. ("U.S. GAAP").

The Firm is involved with several types of off–balance sheet arrangements, including through nonconsolidated SPEs, which are a type of VIE, and through lending-related financial instruments (e.g., commitments and guarantees).

The Firm holds capital, as deemed appropriate, against all SPE-related transactions and related exposures, such as derivative transactions and lending-related commitments and guarantees.

The Firm has no commitments to issue its own stock to support any SPE transaction, and its policies require that transactions with SPEs be conducted at arm's length and reflect market pricing. Consistent with this policy, no JPMorgan Chase employee is permitted to invest in SPEs with which the Firm is involved where such investment would violate the Firm's Code of Conduct.

The table below provides an index of where in this Annual Report a discussion of the Firm's various off-balance sheet arrangements can be found. In addition, see Note 1 for information about the Firm's consolidation policies.

Type of off-balance sheet arrangement	Location of disclosure	Page references
Special-purpose entities: variable interests and other obligations, including contingent obligations, arising from variable interests in nonconsolidated VIEs	See Note 14	236–243
Off-balance sheet lending-related financial instruments, guarantees, and other commitments	See Note 27	261–266

Contractual cash obligations

The accompanying table summarizes, by remaining maturity, JPMorgan Chase's significant contractual cash obligations at December 31, 2017. The contractual cash obligations included in the table below reflect the minimum contractual obligation under legally enforceable contracts with terms that are both fixed and determinable. Excluded from the below table are certain liabilities with variable cash flows and/or no obligation to return a stated amount of principal at maturity.

The carrying amount of on-balance sheet obligations on the Consolidated balance sheets may differ from the minimum contractual amount of the obligations reported below. For a discussion of mortgage repurchase liabilities and other obligations, see Note 27.

Contractual cash obligations

By remaining maturity at December 31, (in millions)	2017					2016
	2018	2019-2020	2021-2022	After 2022	**Total**	Total
On-balance sheet obligations						
Deposits[a]	**$ 1,421,174**	**$ 5,276**	**$ 4,810**	**$ 6,204**	**$ 1,437,464**	$ 1,368,866
Federal funds purchased and securities loaned or sold under repurchase agreements	**133,779**	**4,198**	**4,958**	**15,981**	**158,916**	165,666
Short-term borrowings[a]	**42,664**	**—**	**—**	**—**	**42,664**	26,497
Beneficial interests issued by consolidated VIEs	**13,636**	**9,542**	**2,544**	**314**	**26,036**	38,927
Long-term debt[a]	**37,211**	**63,685**	**43,180**	**116,819**	**260,895**	288,315
Other[b]	**4,726**	**2,146**	**2,080**	**4,573**	**13,525**	8,980
Total on-balance sheet obligations	**1,653,190**	**84,847**	**57,572**	**143,891**	**1,939,500**	1,897,251
Off-balance sheet obligations						
Unsettled reverse repurchase and securities borrowing agreements[c]	**76,859**	**—**	**—**	**—**	**76,859**	50,722
Contractual interest payments[d]	**9,248**	**11,046**	**7,471**	**26,338**	**54,103**	48,862
Operating leases[e]	**1,526**	**2,750**	**1,844**	**3,757**	**9,877**	10,115
Equity investment commitments[f]	**174**	**46**	**19**	**515**	**754**	1,068
Contractual purchases and capital expenditures	**1,923**	**937**	**439**	**204**	**3,503**	2,566
Obligations under co-brand programs	**249**	**500**	**478**	**207**	**1,434**	868
Total off-balance sheet obligations	**89,979**	**15,279**	**10,251**	**31,021**	**146,530**	114,201
Total contractual cash obligations	**$ 1,743,169**	**$ 100,126**	**$ 67,823**	**$ 174,912**	**$ 2,086,030**	$ 2,011,452

(a) Excludes structured notes on which the Firm is not obligated to return a stated amount of principal at the maturity of the notes, but is obligated to return an amount based on the performance of the structured notes.
(b) Primarily includes dividends declared on preferred and common stock, deferred annuity contracts, pension and other postretirement employee benefit obligations, insurance liabilities and income taxes payable associated with the deemed repatriation under the TCJA.
(c) For further information, refer to unsettled reverse repurchase and securities borrowing agreements in Note 27.
(d) Includes accrued interest and future contractual interest obligations. Excludes interest related to structured notes for which the Firm's payment obligation is based on the performance of certain benchmarks.
(e) Includes noncancelable operating leases for premises and equipment used primarily for banking purposes. Excludes the benefit of noncancelable sublease rentals of $1.0 billion and $1.4 billion at December 31, 2017 and 2016, respectively. See Note 28 for more information on lease commitments.
(f) At December 31, 2017 and 2016, included unfunded commitments of $40 million and $48 million, respectively, to third-party private equity funds, and $714 million and $1.0 billion of unfunded commitments, respectively, to other equity investments.

EXPLANATION AND RECONCILIATION OF THE FIRM'S USE OF NON-GAAP FINANCIAL MEASURES AND KEY PERFORMANCE MEASURES

Non-GAAP financial measures

The Firm prepares its Consolidated Financial Statements using U.S. GAAP; these financial statements appear on pages 148–152. That presentation, which is referred to as "reported" basis, provides the reader with an understanding of the Firm's results that can be tracked consistently from year-to-year and enables a comparison of the Firm's performance with other companies' U.S. GAAP financial statements.

In addition to analyzing the Firm's results on a reported basis, management reviews Firmwide results, including the overhead ratio, on a "managed" basis; these Firmwide managed basis results are non-GAAP financial measures. The Firm also reviews the results of the lines of business on a managed basis. The Firm's definition of managed basis starts, in each case, with the reported U.S. GAAP results and includes certain reclassifications to present total net revenue for the Firm (and each of the reportable business segments) on a FTE basis. Accordingly, revenue from investments that receive tax credits and tax-exempt securities is presented in the managed results on a basis comparable to taxable investments and securities. These financial measures allow management to assess the comparability of revenue from year-to-year arising from both taxable and tax-exempt sources. The corresponding income tax impact related to tax-exempt items is recorded within income tax expense. These adjustments have no impact on net income as reported by the Firm as a whole or by the lines of business.

Management also uses certain non-GAAP financial measures at the Firm and business-segment level, because these other non-GAAP financial measures provide information to investors about the underlying operational performance and trends of the Firm or of the particular business segment, as the case may be, and, therefore, facilitate a comparison of the Firm or the business segment with the performance of its relevant competitors. For additional information on these non-GAAP measures, see Business Segment Results on pages 55–74.

Additionally, certain credit metrics and ratios disclosed by the Firm exclude PCI loans, and are therefore non-GAAP measures. For additional information on these non-GAAP measures, see Credit and Investment Risk Management on pages 99–120.

Non-GAAP financial measures used by the Firm may not be comparable to similarly named non-GAAP financial measures used by other companies.

The following summary table provides a reconciliation from the Firm's reported U.S. GAAP results to managed basis.

	2017			2016			2015		
Year ended December 31, (in millions, except ratios)	Reported Results	Fully taxable-equivalent adjustments[(a)]	Managed basis	Reported Results	Fully taxable-equivalent adjustments[(a)]	Managed basis	Reported Results	Fully taxable-equivalent adjustments[(a)]	Managed basis
Other income	**$ 3,639**	**$ 2,704** [(b)]	**$ 6,343**	$ 3,795	$ 2,265	$ 6,060	$ 3,032	$ 1,980	$ 5,012
Total noninterest revenue	**49,527**	**2,704**	**52,231**	49,585	2,265	51,850	50,033	1,980	52,013
Net interest income	**50,097**	**1,313**	**51,410**	46,083	1,209	47,292	43,510	1,110	44,620
Total net revenue	**99,624**	**4,017**	**103,641**	95,668	3,474	99,142	93,543	3,090	96,633
Pre-provision profit	**41,190**	**4,017**	**45,207**	39,897	3,474	43,371	34,529	3,090	37,619
Income before income tax expense	**35,900**	**4,017**	**39,917**	34,536	3,474	38,010	30,702	3,090	33,792
Income tax expense	**11,459**	**4,017** [(b)]	**15,476**	9,803	3,474	13,277	6,260	3,090	9,350
Overhead ratio	**59%**	**NM**	**56%**	58%	NM	56%	63%	NM	61%

(a) Predominantly recognized in CIB and CB business segments and Corporate.
(b) Included $375 million related to tax-oriented investments as a result of the enactment of the TCJA.

Net interest income excluding CIB's Markets businesses

In addition to reviewing net interest income on a managed basis, management also reviews net interest income excluding net interest income arising from CIB's Markets businesses to assess the performance of the Firm's lending, investing (including asset-liability management) and deposit-raising activities. This net interest income is referred to as non-markets related net interest income. CIB's Markets businesses are Fixed Income Markets and Equity Markets. Management believes that disclosure of non-markets related net interest income provides investors and analysts with another measure by which to analyze the non-markets-related business trends of the Firm and provides a comparable measure to other financial institutions that are primarily focused on lending, investing and deposit-raising activities.

The data presented below are non-GAAP financial measures due to the exclusion of markets related net interest income arising from CIB.

Year ended December 31, (in millions, except rates)	2017	2016	2015
Net interest income – managed basis[(a)(b)]	**$ 51,410**	$ 47,292	$ 44,620
Less: CIB Markets net interest income[(c)]	**4,630**	6,334	5,298
Net interest income excluding CIB Markets[(a)]	**$ 46,780**	$ 40,958	$ 39,322
Average interest-earning assets	**$2,180,592**	$2,101,604	$ 2,088,242
Less: Average CIB Markets interest-earning assets[(c)]	**540,835**	520,307	510,292
Average interest-earning assets excluding CIB Markets	**$1,639,757**	$1,581,297	$ 1,577,950
Net interest yield on average interest-earning assets – managed basis	2.36%	2.25%	2.14%
Net interest yield on average CIB Markets interest-earning assets[(c)]	0.86	1.22	1.04
Net interest yield on average interest-earning assets excluding CIB Markets	2.85%	2.59%	2.49%

(a) Interest includes the effect of related hedges. Taxable-equivalent amounts are used where applicable.

(b) For a reconciliation of net interest income on a reported and managed basis, see reconciliation from the Firm's reported U.S. GAAP results to managed basis on page 52.

(c) The amounts in this table differ from the prior-period presentation to align with CIB's Markets businesses. For further information on CIB's Markets businesses, see page 65.

Calculation of certain U.S. GAAP and non-GAAP financial measures

Certain U.S. GAAP and non-GAAP financial measures are calculated as follows:

Book value per share ("BVPS")
Common stockholders' equity at period-end / Common shares at period-end

Overhead ratio
Total noninterest expense / Total net revenue

Return on assets ("ROA")
Reported net income / Total average assets

Return on common equity ("ROE")
Net income* / Average common stockholders' equity

Return on tangible common equity ("ROTCE")
Net income* / Average tangible common equity

Tangible book value per share ("TBVPS")
Tangible common equity at period-end / Common shares at period-end

* Represents net income applicable to common equity

Tangible common equity, ROTCE and TBVPS

Tangible common equity ("TCE"), ROTCE and TBVPS are each non-GAAP financial measures. TCE represents the Firm's common stockholders' equity (i.e., total stockholders' equity less preferred stock) less goodwill and identifiable intangible assets (other than MSRs), net of related deferred tax liabilities. ROTCE measures the Firm's net income applicable to common equity as a percentage of average TCE. TBVPS represents the Firm's TCE at period-end divided by common shares at period-end. TCE, ROTCE and TBVPS are utilized by the Firm, as well as investors and analysts, in assessing the Firm's use of equity.

The following summary table provides a reconciliation from the Firm's common stockholders' equity to TCE.

	Period-end		Average		
			Year ended December 31,		
(in millions, except per share and ratio data)	**Dec 31, 2017**	Dec 31, 2016	**2017**	2016	2015
Common stockholders' equity	**$ 229,625**	$ 228,122	**$ 230,350**	$ 224,631	$ 215,690
Less: Goodwill	**47,507**	47,288	**47,317**	47,310	47,445
Less: Other intangible assets	**855**	862	**832**	922	1,092
Add: Certain Deferred tax liabilities[(a)(b)]	**2,204**	3,230	**3,116**	3,212	2,964
Tangible common equity	**$ 183,467**	$ 183,202	**$ 185,317**	$ 179,611	$ 170,117
Return on tangible common equity	**NA**	NA	**12%**	13%	13%
Tangible book value per share	**$ 53.56**	$ 51.44	**NA**	NA	NA

(a) Represents deferred tax liabilities related to tax-deductible goodwill and to identifiable intangibles created in nontaxable transactions, which are netted against goodwill and other intangibles when calculating TCE.
(b) Includes the effect from the revaluation of the Firm's net deferred tax liability as a result of the enactment of the TCJA.

Key performance measures

The Firm considers the following to be key regulatory capital measures:

- Capital, risk-weighted assets ("RWA"), and capital and leverage ratios presented under Basel III Standardized and Advanced Fully Phased-In rules, and
- SLR calculated under Basel III Advanced Fully Phased-In rules.

The Firm, as well as banking regulators, investors and analysts, use these measures to assess the Firm's regulatory capital position and to compare the Firm's regulatory capital to that of other financial services companies.

For additional information on these measures, see Capital Risk Management on pages 82–91.

Core loans are also considered a key performance measure. Core loans represent loans considered central to the Firm's ongoing businesses; and exclude loans classified as trading assets, runoff portfolios, discontinued portfolios and portfolios the Firm has an intent to exit. Core loans is a measure utilized by the Firm and its investors and analysts in assessing actual growth in the loan portfolio.

The Firm is managed on a line of business basis. There are four major reportable business segments – Consumer & Community Banking, Corporate & Investment Bank, Commercial Banking and Asset & Wealth Management. In addition, there is a Corporate segment.

The business segments are determined based on the products and services provided, or the type of customer served, and they reflect the manner in which financial information is currently evaluated by management. Results of these lines of business are presented on a managed basis. For a definition of managed basis, see Explanation and Reconciliation of the Firm's use of Non-GAAP Financial Measures, on pages 52–54.

JPMorgan Chase						
Consumer Businesses			Wholesale Businesses			
Consumer & Community Banking			Corporate & Investment Bank		Commercial Banking	Asset & Wealth Management
Consumer & Business Banking	Home Lending[(a)]	Card, Merchant Services & Auto[(b)]	Banking	Markets & Investor Services	• Middle Market Banking • Corporate Client Banking • Commercial Term Lending • Real Estate Banking	• Asset Management • Wealth Management
• Consumer Banking/ Chase Wealth Management • Business Banking	• Home Lending Production • Home Lending Servicing • Real Estate Portfolios	• Card Services – Credit Card – Merchant Services • Auto	• Investment Banking • Treasury Services • Lending	• Fixed Income Markets • Equity Markets • Securities Services • Credit Adjustments & Other		

(a) Formerly Mortgage Banking
(b) Formerly Card, Commerce Solutions & Auto

Description of business segment reporting methodology

Results of the business segments are intended to reflect each segment as if it were essentially a stand-alone business. The management reporting process that derives business segment results includes the allocation of certain income and expense items described in more detail below. The Firm also assesses the level of capital required for each line of business on at least an annual basis.

The Firm periodically assesses the assumptions, methodologies and reporting classifications used for segment reporting, and further refinements may be implemented in future periods.

Revenue sharing

When business segments join efforts to sell products and services to the Firm's clients, the participating business segments agree to share revenue from those transactions. The segment results reflect these revenue-sharing agreements.

Funds transfer pricing

Funds transfer pricing is used to assign interest income and expense to each business segment and to transfer the primary interest rate risk and liquidity risk exposures to Treasury and CIO within Corporate. The funds transfer pricing process considers the interest rate risk, liquidity risk and regulatory requirements of a business segment as if it were operating independently. This process is overseen by senior management and reviewed by the Firm's Asset-Liability Committee ("ALCO").

Debt expense and preferred stock dividend allocation
As part of the funds transfer pricing process, almost all of the cost of the credit spread component of outstanding unsecured long-term debt and preferred stock dividends is allocated to the reportable business segments, while the balance of the cost is retained in Corporate. The methodology to allocate the cost of unsecured long-term debt and preferred stock dividends to the business segments is aligned with the Firm's process to allocate capital. The allocated cost of unsecured long-term debt is included in a business segment's net interest income, and net income is reduced by preferred stock dividends to arrive at a business segment's net income applicable to common equity.

Business segment capital allocation
The amount of capital assigned to each business is referred to as equity. On at least an annual basis, the Firm assesses the level of capital required for each line of business as well as the assumptions and methodologies used to allocate capital. For additional information on business segment capital allocation, see Line of business equity on page 89.

Expense allocation
Where business segments use services provided by corporate support units, or another business segment, the costs of those services are allocated to the respective business segments. The expense is generally allocated based on the actual cost and use of services provided. In contrast, certain other costs related to corporate support units, or to certain technology and operations, are not allocated to the business segments and are retained in Corporate. Expense retained in Corporate generally includes parent company costs that would not be incurred if the segments were stand-alone businesses; adjustments to align corporate support units; and other items not aligned with a particular business segment.

Segment Results – Managed Basis

The following tables summarize the business segment results for the periods indicated.

Year ended December 31,	Total net revenue			Total noninterest expense			Pre-provision profit/(loss)		
(in millions)	**2017**	2016	2015	**2017**	2016	2015	**2017**	2016	2015
Consumer & Community Banking	**$ 46,485**	$ 44,915	$ 43,820	**$ 26,062**	$ 24,905	$ 24,909	**$ 20,423**	$ 20,010	$ 18,911
Corporate & Investment Bank	**34,493**	35,216	33,542	**19,243**	18,992	21,361	**15,250**	16,224	12,181
Commercial Banking	**8,605**	7,453	6,885	**3,327**	2,934	2,881	**5,278**	4,519	4,004
Asset & Wealth Management	**12,918**	12,045	12,119	**9,301**	8,478	8,886	**3,617**	3,567	3,233
Corporate	**1,140**	(487)	267	**501**	462	977	**639**	(949)	(710)
Total	**$103,641**	$ 99,142	$ 96,633	**$ 58,434**	$ 55,771	$ 59,014	**$ 45,207**	$ 43,371	$ 37,619

Year ended December 31,	Provision for credit losses			Net income/(loss)			Return on equity		
(in millions, except ratios)	**2017**	2016	2015	**2017**	2016	2015	**2017**	2016	2015
Consumer & Community Banking	**$ 5,572**	$ 4,494	$ 3,059	**$ 9,395**	$ 9,714	$ 9,789	**17%**	18%	18%
Corporate & Investment Bank	**(45)**	563	332	**10,813**	10,815	8,090	**14**	16	12
Commercial Banking	**(276)**	282	442	**3,539**	2,657	2,191	**17**	16	15
Asset & Wealth Management	**39**	26	4	**2,337**	2,251	1,935	**25**	24	21
Corporate	**–**	(4)	(10)	**(1,643)**	(704)	2,437	**NM**	NM	NM
Total	**$ 5,290**	$ 5,361	$ 3,827	**$ 24,441**	$ 24,733	$ 24,442	**10%**	10%	11%

The following sections provide a comparative discussion of business segment results as of or for the years ended December 31, 2017, 2016 and 2015.

Consumer & Community Banking offers services to consumers and businesses through bank branches, ATMs, online, mobile and telephone banking. CCB is organized into Consumer & Business Banking (including Consumer Banking/Chase Wealth Management and Business Banking), Home Lending (including Home Lending Production, Home Lending Servicing and Real Estate Portfolios) and Card, Merchant Services & Auto. Consumer & Business Banking offers deposit and investment products and services to consumers, and lending, deposit, and cash management and payment solutions to small businesses. Home Lending includes mortgage origination and servicing activities, as well as portfolios consisting of residential mortgages and home equity loans. Card, Merchant Services & Auto issues credit cards to consumers and small businesses, offers payment processing services to merchants, and originates and services auto loans and leases.

Selected income statement data

Year ended December 31, (in millions, except ratios)	2017	2016	2015
Revenue			
Lending- and deposit-related fees	**$ 3,431**	$ 3,231	$ 3,137
Asset management, administration and commissions	**2,212**	2,093	2,172
Mortgage fees and related income	**1,613**	2,490	2,511
Card income	**4,024**	4,364	5,491
All other income	**3,430**	3,077	2,281
Noninterest revenue	**14,710**	15,255	15,592
Net interest income	**31,775**	29,660	28,228
Total net revenue	**46,485**	44,915	43,820
Provision for credit losses	**5,572**	4,494	3,059
Noninterest expense			
Compensation expense	**10,159**	9,723	9,770
Noncompensation expense[(a)]	**15,903**	15,182	15,139
Total noninterest expense	**26,062**	24,905	24,909
Income before income tax expense	**14,851**	15,516	15,852
Income tax expense	**5,456**	5,802	6,063
Net income	**$ 9,395**	$ 9,714	$ 9,789
Revenue by line of business			
Consumer & Business Banking	**$ 21,104**	$ 18,659	$ 17,983
Home Lending	**5,955**	7,361	6,817
Card, Merchant Services & Auto	**19,426**	18,895	19,020
Mortgage fees and related income details:			
Net production revenue	**636**	853	769
Net mortgage servicing revenue[(b)]	**977**	1,637	1,742
Mortgage fees and related income	**$ 1,613**	$ 2,490	$ 2,511
Financial ratios			
Return on equity	**17%**	18%	18%
Overhead ratio	**56**	55	57

Note: In the discussion and the tables which follow, CCB presents certain financial measures which exclude the impact of PCI loans; these are non-GAAP financial measures.

(a) Included operating lease depreciation expense of $2.7 billion, $1.9 billion and $1.4 billion for the years ended December 31, 2017, 2016 and 2015, respectively.

(b) Included MSR risk management results of $(242) million, $217 million and $(117) million for the years ended December 31, 2017, 2016 and 2015, respectively.

2017 compared with 2016

Net income was $9.4 billion, a decrease of 3%, driven by higher noninterest expense and provision for credit losses, largely offset by higher net revenue.

Net revenue was $46.5 billion, an increase of 3%.

Net interest income was $31.8 billion, up 7%, driven by higher deposit balances, deposit margin expansion, and higher loan balances in Card, partially offset by loan spread compression from higher rates, including the impact of higher funding costs in Home Lending and Auto and the impact of the sale of the student loan portfolio.

Noninterest revenue was $14.7 billion, down 4%, driven by:

- higher new account origination costs in Card,
- lower MSR risk management results,
- the absence in the current year of a gain on the sale of Visa Europe interests,
- lower net production revenue reflecting lower mortgage production margins and volumes, and
- lower mortgage servicing revenue as a result of a lower level of third-party loans serviced

largely offset by

- higher auto lease volume and
- higher card- and deposit-related fees.

See Note 15 for further information regarding changes in value of the MSR asset and related hedges, and mortgage fees and related income.

Noninterest expense was $26.1 billion, an increase of 5%, driven by:

- higher auto lease depreciation, and
- continued business growth

partially offset by

- two items totaling $175 million included in the prior year related to liabilities from a merchant bankruptcy and mortgage servicing reserves.

The provision for credit losses was $5.6 billion, an increase of 24%, reflecting:

- $445 million of higher net charge-offs, primarily in the credit card portfolio due to growth in newer vintages which, as anticipated, have higher loss rates than the more seasoned portion of the portfolio, partially offset by a decrease in net charge-offs in the residential real estate portfolio reflecting continued improvement in home prices and delinquencies,
- a $415 million higher addition to the allowance for credit losses related to the credit card portfolio driven by higher loss rates and loan growth, and a lower reduction in the allowance for the residential real estate portfolio predominantly driven by continued improvement in home prices and delinquencies, and
- a $218 million impact in connection with the sale of the student loan portfolio.

The sale of the student loan portfolio during 2017 did not have a material impact on the Firm's Consolidated Financial Statements.

2016 compared with 2015

Net income was $9.7 billion, a decrease of 1%, driven by higher provision for credit losses, predominantly offset by higher net revenue.

Net revenue was $44.9 billion, an increase of 2%.

Net interest income was $29.7 billion, up 5%, driven by higher deposit balances and higher loan balances, partially offset by deposit spread compression and an increase in the reserve for uncollectible interest and fees in Card.

Noninterest revenue was $15.3 billion, down 2%, driven by higher new account origination costs and the impact of renegotiated co-brand partnership agreements in Card and lower mortgage servicing revenue predominantly as a result of a lower level of third-party loans serviced; these factors were predominantly offset by higher auto lease and card sales volume, higher card- and deposit-related fees, higher MSR risk management results and a gain on the sale of Visa Europe interests. See Note 15 for further information regarding changes in value of the MSR asset and related hedges, and mortgage fees and related income.

Noninterest expense of $24.9 billion was flat, driven by:

- lower legal expense and branch efficiencies

offset by

- higher auto lease depreciation, and
- higher investment in marketing.

The provision for credit losses was $4.5 billion, an increase of 47%, reflecting:

- a $920 million increase related to the credit card portfolio, due to a $600 million addition in the allowance for loan losses, as well as $320 million of higher net charge-offs, driven by loan growth, including growth in newer vintages which, as anticipated, have higher loss rates compared to the overall portfolio,
- a $450 million lower benefit related to the residential real estate portfolio, as the current year reduction in the allowance for loan losses was lower than the prior year. The reduction in both periods reflected continued improvements in home prices and lower delinquencies, and
- a $150 million increase related to the auto and business banking portfolio, due to additions to the allowance for loan losses and higher net charge-offs, reflecting loan growth in the portfolios.

Selected metrics

As of or for the year ended December 31, (in millions, except headcount)	2017	2016	2015
Selected balance sheet data (period-end)			
Total assets	**$552,601**	$535,310	$502,652
Loans:			
Consumer & Business Banking	**25,789**	24,307	22,730
Home equity	**42,751**	50,296	58,734
Residential mortgage	**197,339**	181,196	164,500
Home Lending	**240,090**	231,492	223,234
Card	**149,511**	141,816	131,463
Auto	**66,242**	65,814	60,255
Student	**–**	7,057	8,176
Total loans	**481,632**	470,486	445,858
Core loans	**415,167**	382,608	341,881
Deposits	**659,885**	618,337	557,645
Equity	**51,000**	51,000	51,000
Selected balance sheet data (average)			
Total assets	**$532,756**	$516,354	$472,972
Loans:			
Consumer & Business Banking	**24,875**	23,431	21,894
Home equity	**46,398**	54,545	63,261
Residential mortgage	**190,242**	177,010	140,294
Home Lending	**236,640**	231,555	203,555
Card	**140,024**	131,165	125,881
Auto	**65,395**	63,573	56,487
Student	**2,880**	7,623	8,763
Total loans	**469,814**	457,347	416,580
Core loans	**393,598**	361,316	301,700
Deposits	**640,219**	586,637	530,938
Equity	**51,000**	51,000	51,000
Headcount	**134,117**	132,802	127,094

Selected metrics

As of or for the year ended December 31, (in millions, except ratio data)	2017	2016	2015
Credit data and quality statistics			
Nonaccrual loans[a][b]	**$ 4,084**	$ 4,708	$ 5,313
Net charge-offs/(recoveries)[c]			
Consumer & Business Banking	**257**	257	253
Home equity	**63**	184	283
Residential mortgage	**(16)**	14	2
Home Lending	**47**	198	285
Card	**4,123**	3,442	3,122
Auto	**331**	285	214
Student	**498**	162	210
Total net charge-offs/ (recoveries)	**$ 5,256**	$ 4,344	$ 4,084
Net charge-off/(recovery) rate[c]			
Consumer & Business Banking	**1.03%**	1.10%	1.16%
Home equity[d]	**0.18**	0.45	0.60
Residential mortgage[d]	**(0.01)**	0.01	–
Home Lending[d]	**0.02**	0.10	0.18
Card	**2.95**	2.63	2.51
Auto	**0.51**	0.45	0.38
Student	**NM**	2.13	2.40
Total net charge-offs/(recovery) rate[d]	**1.21**	1.04	1.10
30+ day delinquency rate			
Home Lending[e][f]	**1.19%**	1.23%	1.57%
Card	**1.80**	1.61	1.43
Auto	**0.89**	1.19	1.35
Student[g]	**–**	1.60	1.81
90+ day delinquency rate - Card	**0.92**	0.81	0.72
Allowance for loan losses			
Consumer & Business Banking	**$ 796**	$ 753	$ 703
Home Lending, excluding PCI loans	**1,003**	1,328	1,588
Home Lending – PCI loans[c]	**2,225**	2,311	2,742
Card	**4,884**	4,034	3,434
Auto	**464**	474	399
Student	**–**	249	299
Total allowance for loan losses[c]	**$ 9,372**	$ 9,149	$ 9,165

(a) Excludes PCI loans. The Firm is recognizing interest income on each pool of PCI loans as each of the pools is performing.

(b) At December 31, 2017, 2016 and 2015, nonaccrual loans excluded loans 90 or more days past due as follows: (1) mortgage loans insured by U.S. government agencies of $4.3 billion, $5.0 billion and $6.3 billion, respectively; and (2) student loans insured by U.S. government agencies under the Federal Family Education Loan Program ("FFELP") of zero, $263 million and $290 million, respectively. These amounts have been excluded based upon the government guarantee.

(c) Net charge-offs and the net charge-off rates for the years ended December 31, 2017, 2016 and 2015, excluded $86 million, $156 million and $208 million, respectively, of write-offs in the PCI portfolio. These write-offs decreased the allowance for loan losses for PCI loans. For further information on PCI write-offs, see summary of changes in the allowance on page 118.

(d) Excludes the impact of PCI loans. For the years ended December 31, 2017, 2016 and 2015, the net charge-off rates including the impact of PCI loans were as follows: (1) home equity of 0.14%, 0.34% and 0.45%, respectively; (2) residential mortgage of (0.01)%, 0.01% and –%, respectively; (3) Home Lending of 0.02%, 0.09% and 0.14%, respectively; and (4) total CCB of 1.12%, 0.95% and 0.99%, respectively.

(e) At December 31, 2017, 2016 and 2015, excluded mortgage loans insured by U.S. government agencies of $6.2 billion, $7.0 billion and $8.4 billion, respectively, that are 30 or more days past due. These amounts have been excluded based upon the government guarantee.
(f) Excludes PCI loans. The 30+ day delinquency rate for PCI loans was 10.13%, 9.82% and 11.21% at December 31, 2017, 2016 and 2015, respectively.
(g) Excluded student loans insured by U.S. government agencies under FFELP of $468 million and $526 million at December 31, 2016 and 2015, respectively, that are 30 or more days past due. These amounts have been excluded based upon the government guarantee.

Selected metrics

As of or for the year ended December 31, (in billions, except ratios and where otherwise noted)	**2017**	2016	2015
Business Metrics			
CCB households (in millions)[a]	**61.0**	60.4	58.1
Number of branches	**5,130**	5,258	5,413
Active digital customers (in thousands)[b]	**46,694**	43,836	39,242
Active mobile customers (in thousands)[c]	**30,056**	26,536	22,810
Debit and credit card sales volume[a]	**$ 916.9**	$ 821.6	$ 754.1
Consumer & Business Banking			
Average deposits	**$ 625.6**	$ 570.8	$ 515.2
Deposit margin	**1.98%**	1.81%	1.90%
Business banking origination volume	**$ 7.3**	$ 7.3	$ 6.8
Client investment assets	**273.3**	234.5	218.6
Home Lending			
Mortgage origination volume by channel			
Retail	**$ 40.3**	$ 44.3	$ 36.1
Correspondent	**57.3**	59.3	70.3
Total mortgage origination volume[d]	**$ 97.6**	$ 103.6	$ 106.4
Total loans serviced (period-end)	**$ 816.1**	$ 846.6	$ 910.1
Third-party mortgage loans serviced (period-end)	**553.5**	591.5	674.0
MSR carrying value (period-end)	**6.0**	6.1	6.6
Ratio of MSR carrying value (period-end) to third-party mortgage loans serviced (period-end)	**1.08%**	1.03%	0.98%
MSR revenue multiple[e]	**3.09x**	2.94x	2.80x
Card, excluding Commercial Card			
Credit card sales volume	**$ 622.2**	$ 545.4	$ 495.9
New accounts opened (in millions)	**8.4**	10.4	8.7
Card Services			
Net revenue rate	**10.57%**	11.29%	12.33%
Merchant Services			
Merchant processing volume	**$1,191.7**	$1,063.4	$ 949.3
Auto			
Loan and lease origination volume	**$ 33.3**	$ 35.4	$ 32.4
Average Auto operating lease assets	**15.2**	11.0	7.8

(a) The prior period amounts have been revised to conform with the current period presentation.
(b) Users of all web and/or mobile platforms who have logged in within the past 90 days.
(c) Users of all mobile platforms who have logged in within the past 90 days.
(d) Firmwide mortgage origination volume was $107.6 billion, $117.4 billion and $115.2 billion for the years ended December 31, 2017, 2016 and 2015, respectively.
(e) Represents the ratio of MSR carrying value (period-end) to third-party mortgage loans serviced (period-end) divided by the ratio of loan servicing-related revenue to third-party mortgage loans serviced (average).

Mortgage servicing-related matters

The Firm has resolved the majority of the consent orders and settlements into which it entered with federal and state governmental agencies and private parties related to mortgage servicing, origination, and residential mortgage-backed securities activities. On January 12, 2018, the Board of Governors of the Federal Reserve System terminated its mortgage servicing-related Consent Order with the Firm, which had been outstanding since April 2011.

Some of the remaining obligations are overseen by an independent reviewer, who publishes periodic reports detailing the Firm's compliance with the obligations.

CORPORATE & INVESTMENT BANK

The Corporate & Investment Bank, which consists of Banking and Markets & Investor Services, offers a broad suite of investment banking, market-making, prime brokerage, and treasury and securities products and services to a global client base of corporations, investors, financial institutions, government and municipal entities. Banking offers a full range of investment banking products and services in all major capital markets, including advising on corporate strategy and structure, capital-raising in equity and debt markets, as well as loan origination and syndication. Banking also includes Treasury Services, which provides transaction services, consisting of cash management and liquidity solutions. Markets & Investor Services is a global market-maker in cash securities and derivative instruments, and also offers sophisticated risk management solutions, prime brokerage, and research. Markets & Investor Services also includes Securities Services, a leading global custodian which provides custody, fund accounting and administration, and securities lending products principally for asset managers, insurance companies and public and private investment funds.

Selected income statement data

Year ended December 31, (in millions)	2017	2016	2015
Revenue			
Investment banking fees	**$ 7,192**	$ 6,424	$ 6,736
Principal transactions	**10,873**	11,089	9,905
Lending- and deposit-related fees	**1,531**	1,581	1,573
Asset management, administration and commissions	**4,207**	4,062	4,467
All other income	**572**	1,169	1,012
Noninterest revenue	**24,375**	24,325	23,693
Net interest income	**10,118**	10,891	9,849
Total net revenue[(a)(b)]	**34,493**	35,216	33,542
Provision for credit losses	**(45)**	563	332
Noninterest expense			
Compensation expense	**9,535**	9,546	9,973
Noncompensation expense	**9,708**	9,446	11,388
Total noninterest expense	**19,243**	18,992	21,361
Income before income tax expense	**15,295**	15,661	11,849
Income tax expense	**4,482**	4,846	3,759
Net income[(a)]	**$ 10,813**	$ 10,815	$ 8,090

(a) The full year 2017 results reflect the impact of the enactment of the TCJA including a decrease to net revenue of $259 million and a benefit to net income of $141 million. For additional information related to the impact of the TCJA, see Note 24.

(b) Included tax-equivalent adjustments, predominantly due to income tax credits related to alternative energy investments; income tax credits and amortization of the cost of investments in affordable housing projects; and tax-exempt income from municipal bonds of $2.4 billion, $2.0 billion and $1.7 billion for the years ended December 31, 2017, 2016 and 2015, respectively.

Selected income statement data

Year ended December 31, (in millions, except ratios)	2017	2016	2015
Financial ratios			
Return on equity	**14%**	16%	12%
Overhead ratio	**56**	54	64
Compensation expense as percentage of total net revenue	**28**	27	30
Revenue by business			
Investment Banking	**$ 6,688**	$ 5,950	$ 6,376
Treasury Services	**4,172**	3,643	3,631
Lending	**1,429**	1,208	1,461
Total Banking	**12,289**	10,801	11,468
Fixed Income Markets	**12,812**	15,259	12,592
Equity Markets	**5,703**	5,740	5,694
Securities Services	**3,917**	3,591	3,777
Credit Adjustments & Other[(a)]	**(228)**	(175)	11
Total Markets & Investor Services	**22,204**	24,415	22,074
Total net revenue	**$34,493**	$35,216	$33,542

(a) Consists primarily of credit valuation adjustments ("CVA") managed centrally within CIB, funding valuation adjustments ("FVA") and debit valuation adjustments ("DVA") on derivatives. Results are primarily reported in principal transactions revenue. Results are presented net of associated hedging activities and net of CVA and FVA amounts allocated to Fixed Income Markets and Equity Markets. For additional information, see Accounting and Reporting Developments on pages 141–144 and Notes 2, 3 and 23.

2017 compared with 2016

Net income was $10.8 billion, flat compared with the prior year, reflecting lower net revenue and higher noninterest expense, offset by a lower provision for credit losses, and a tax benefit resulting from the vesting of employee share-based awards. The current year included a $141 million benefit to net income as a result of the enactment of the TCJA.

Net revenue was $34.5 billion, down 2%.

Banking revenue was $12.3 billion, up 14% compared with the prior year. Investment banking revenue was $6.7 billion, up 12% from the prior year, driven by higher debt and equity underwriting fees. The Firm maintained its #1 ranking for Global Investment Banking fees, according to Dealogic. Debt underwriting fees were $3.6 billion, up 16% driven by a higher share of fees and an overall increase in industry-wide fees; the Firm maintained its #1 ranking globally in fees across high-grade, high-yield, and loan products. Equity underwriting fees were $1.4 billion, up 20% driven by growth in industry-wide issuance including a strong IPO market; the Firm ranked #2 in equity underwriting fees globally. Advisory fees were $2.2 billion, up 2%; the Firm maintained its #2 ranking for M&A. Treasury Services revenue was $4.2 billion, up 15%, driven by the impact of higher interest rates and growth in operating deposits. Lending revenue was $1.4 billion, up

18% from the prior year, reflecting lower fair value losses on hedges of accrual loans.

Markets & Investor Services revenue was $22.2 billion, down 9% from the prior year. Fixed Income Markets revenue was $12.8 billion, down 16%, as lower revenue across products was driven by sustained low volatility, tighter credit spreads, and the impact from the TCJA on tax-oriented investments of $259 million, against a strong prior year. Equity Markets revenue was $5.7 billion, down 1% from the prior year, and included a fair value loss of $143 million on a margin loan to a single client. Excluding the fair value loss, Equity Markets revenue was higher driven by higher revenue in Prime Services and Cash Equities, partially offset by lower revenue in derivatives. Securities Services revenue was $3.9 billion, up 9%, driven by the impact of higher interest rates and deposit growth, as well as higher asset-based fees driven by higher market levels. Credit Adjustments & Other was a loss of $228 million, driven by valuation adjustments.

The provision for credit losses was a benefit of $45 million, which included a net reduction in the allowance for credit losses driven by the Oil & Gas and Metals & Mining portfolios partially offset by a net increase in the allowance for credit losses for a single client. The prior year was an expense of $563 million, which included an addition to the allowance for credit losses driven by the Oil & Gas and Metals & Mining portfolios.

Noninterest expense was $19.2 billion, up 1% compared with the prior year.

2016 compared with 2015

Net income was $10.8 billion, up 34% compared with the prior year, driven by lower noninterest expense and higher net revenue, partially offset by a higher provision for credit losses.

Banking revenue was $10.8 billion, down 6% compared with the prior year. Investment banking revenue was $6.0 billion, down 7% from the prior year, largely driven by lower equity underwriting fees. The Firm maintained its #1 ranking for Global Investment Banking fees, according to Dealogic. Equity underwriting fees were $1.2 billion, down 19% driven by lower industry-wide fee levels; however, the Firm improved its market share and maintained its #1 ranking in equity underwriting fees globally as well as in both North America and Europe and its #1 ranking by volumes across all products, according to Dealogic. Advisory fees were $2.1 billion, down 1%; the Firm maintained its #2 ranking for M&A, according to Dealogic. Debt underwriting fees were $3.2 billion; the Firm maintained its #1 ranking globally in fees across high grade, high yield, and loan products, according to Dealogic. Treasury Services revenue was $3.6 billion. Lending revenue was $1.2 billion, down 17% from the prior year, reflecting fair value losses on hedges of accrual loans.

Markets & Investor Services revenue was $24.4 billion, up 11% from the prior year. Fixed Income Markets revenue was $15.3 billion, up 21% from the prior year, driven by broad strength across products. Rates performance was strong, with increased client activity driven by high issuance-based flows, global political developments, and central bank actions. Credit and Securitized Products revenue improved driven by higher market-making revenue from the secondary market as clients' risk appetite recovered, and due to increased financing activity. Equity Markets revenue was $5.7 billion, up 1%, compared to a strong prior-year. Securities Services revenue was $3.6 billion, down 5% from the prior year, largely driven by lower fees and commissions. Credit Adjustments and Other was a loss of $175 million driven by valuation adjustments, compared with an $11 million gain in the prior-year, which included funding spread gains on fair value option elected liabilities.

The provision for credit losses was $563 million, compared to $332 million in the prior year, reflecting a higher allowance for credit losses, including the impact of select downgrades within the Oil & Gas portfolio.

Noninterest expense was $19.0 billion, down 11% compared with the prior year, driven by lower legal and compensation expenses.

Selected metrics

As of or for the year ended December 31, (in millions, except headcount)	2017	2016	2015
Selected balance sheet data (period-end)			
Assets	**$ 826,384**	$ 803,511	$ 748,691
Loans:			
Loans retained[(a)]	**108,765**	111,872	106,908
Loans held-for-sale and loans at fair value	**4,321**	3,781	3,698
Total loans	**113,086**	115,653	110,606
Core loans	**112,754**	115,243	110,084
Equity	**70,000**	64,000	62,000
Selected balance sheet data (average)			
Assets	**$ 857,060**	$ 815,321	$ 824,208
Trading assets-debt and equity instruments	**342,124**	300,606	302,514
Trading assets-derivative receivables	**56,466**	63,387	67,263
Loans:			
Loans retained[(a)]	**108,368**	111,082	98,331
Loans held-for-sale and loans at fair value	**4,995**	3,812	4,572
Total loans	**113,363**	114,894	102,903
Core loans	**113,006**	114,455	102,142
Equity	**70,000**	64,000	62,000
Headcount	**51,181**	48,748	49,067

(a) Loans retained includes credit portfolio loans, loans held by consolidated Firm-administered multi-seller conduits, trade finance loans, other held-for-investment loans and overdrafts.

Selected metrics

As of or for the year ended December 31, (in millions, except ratios)	2017	2016	2015
Credit data and quality statistics			
Net charge-offs/(recoveries)	**$ 71**	$ 168	$ (19)
Nonperforming assets:			
Nonaccrual loans:			
Nonaccrual loans retained[(a)]	**812**	467	428
Nonaccrual loans held-for-sale and loans at fair value	**–**	109	10
Total nonaccrual loans	**812**	576	438
Derivative receivables	**130**	223	204
Assets acquired in loan satisfactions	**85**	79	62
Total nonperforming assets	**1,027**	878	704
Allowance for credit losses:			
Allowance for loan losses	**1,379**	1,420	1,258
Allowance for lending-related commitments	**727**	801	569
Total allowance for credit losses	**2,106**	2,221	1,827
Net charge-off/(recovery) rate[(b)]	**0.07%**	0.15%	(0.02)%
Allowance for loan losses to period-end loans retained	**1.27**	1.27	1.18
Allowance for loan losses to period-end loans retained, excluding trade finance and conduits[(c)]	**1.92**	1.86	1.88
Allowance for loan losses to nonaccrual loans retained[(a)]	**170**	304	294
Nonaccrual loans to total period-end loans	**0.72**	0.50	0.40

(a) Allowance for loan losses of $316 million, $113 million and $177 million were held against these nonaccrual loans at December 31, 2017, 2016 and 2015, respectively.
(b) Loans held-for-sale and loans at fair value were excluded when calculating the net charge-off/(recovery) rate.
(c) Management uses allowance for loan losses to period-end loans retained, excluding trade finance and conduits, a non-GAAP financial measure, to provide a more meaningful assessment of CIB's allowance coverage ratio.

Investment banking fees

	Year ended December 31,		
(in millions)	2017	2016	2015
Advisory	**$ 2,150**	$ 2,110	$ 2,133
Equity underwriting	**1,396**	1,159	1,434
Debt underwriting[(a)]	**3,646**	3,155	3,169
Total investment banking fees	**$ 7,192**	$ 6,424	$ 6,736

(a) Includes loans syndication.

League table results – wallet share

Year ended December 31,	2017 Rank	2017 Share	2016 Rank	2016 Share	2015 Rank	2015 Share
Based on fees[(a)]						
Debt, equity and equity-related						
Global	**#1**	**7.4%**	#1	7.0%	#1	7.6%
U.S.	**1**	**11.2**	1	11.9	1	11.5
Long-term debt[(b)]						
Global	**1**	**7.6**	1	6.7	1	8.1
U.S.	**2**	**10.9**	2	11.1	1	11.7
Equity and equity-related						
Global[(c)]	**2**	**7.1**	1	7.4	2	6.9
U.S.	**1**	**11.7**	1	13.3	1	11.3
M&A[(d)]						
Global	**2**	**8.6**	2	8.3	2	8.4
U.S.	**2**	**9.2**	2	9.8	2	9.9
Loan syndications						
Global	**1**	**9.5**	1	9.3	1	7.5
U.S.	**1**	**11.3**	2	11.9	2	10.8
Global investment banking fees[(e)]	**#1**	**8.1%**	#1	7.9%	#1	7.8%

(a) Source: Dealogic as of January 1, 2018. Reflects the ranking of revenue wallet and market share.
(b) Long-term debt rankings include investment-grade, high-yield, supranationals, sovereigns, agencies, covered bonds, asset-backed securities ("ABS") and mortgage-backed securities ("MBS"); and exclude money market, short-term debt, and U.S. municipal securities.
(c) Global equity and equity-related ranking includes rights offerings and Chinese A-Shares.
(d) Global M&A reflect the removal of any withdrawn transactions. U.S. M&A revenue wallet represents wallet from client parents based in the U.S.
(e) Global investment banking fees exclude money market, short-term debt and shelf deals.

Markets revenue

The following table summarizes select income statement data for the Markets businesses. Markets includes both Fixed Income Markets and Equity Markets. Markets revenue consists of principal transactions, fees, commissions and other income, as well as net interest income. The Firm assesses its Markets business performance on a total revenue basis, as offsets may occur across revenue line items. For example, securities that generate net interest income may be risk-managed by derivatives that are recorded in principal transactions. For a description of the composition of these income statement line items, see Notes 6 and 7.

Principal transactions reflects revenue on financial instruments and commodities transactions that arise from client-driven market making activity. Principal transactions revenue includes amounts recognized upon executing new transactions with market participants, as well as "inventory-related revenue", which is revenue recognized from gains and losses on derivatives and other instruments that the Firm has been holding in anticipation of, or in response to, client demand, and changes in the fair value of instruments used by the Firm to actively manage the risk exposure arising from such inventory. Principal transactions revenue recognized upon executing new transactions with market participants is driven by many factors including the level of client activity, the bid-offer spread (which is the difference between the price at which a market participant is willing to sell an instrument to the Firm and the price at which another market participant is willing to buy it from the Firm, and vice versa), market liquidity and volatility. These factors are interrelated and sensitive to the same factors that drive inventory-related revenue, which include general market conditions, such as interest rates, foreign exchange rates, credit spreads, and equity and commodity prices, as well as other macroeconomic conditions.

For the periods presented below, the predominant source of principal transactions revenue was the amount recognized upon executing new transactions.

Year ended December 31, (in millions, except where otherwise noted)	2017 Fixed Income Markets	2017 Equity Markets	2017 Total Markets	2016 Fixed Income Markets	2016 Equity Markets	2016 Total Markets	2015 Fixed Income Markets	2015 Equity Markets	2015 Total Markets
Principal transactions	**$ 7,393**	**$ 3,855**	**$ 11,248**	$ 8,347	$ 3,130	$ 11,477	$ 6,899	$ 3,038	$ 9,937
Lending- and deposit-related fees	**191**	**6**	**197**	220	2	222	194	–	194
Asset management, administration and commissions	**390**	**1,635**	**2,025**	388	1,551	1,939	383	1,704	2,087
All other income	**436**	**(21)**	**415**	1,014	13	1,027	854	(84)	770
Noninterest revenue	**8,410**	**5,475**	**13,885**	9,969	4,696	14,665	8,330	4,658	12,988
Net interest income[(a)]	**4,402**	**228**	**4,630**	5,290	1,044	6,334	4,262	1,036	5,298
Total net revenue	**$ 12,812**	**$ 5,703**	**$ 18,515**	$ 15,259	$ 5,740	$ 20,999	$ 12,592	$ 5,694	$ 18,286
Loss days[(b)]			4			0			2

(a) Declines in Markets net interest income in 2017 were driven by higher funding costs.
(b) Loss days represent the number of days for which Markets posted losses. The loss days determined under this measure differ from the disclosure of daily market risk-related gains and losses for the Firm in the value-at-risk ("VaR") back-testing discussion on pages 123–125.

Selected metrics

As of or for the year ended December 31, (in millions, except where otherwise noted)	2017	2016	2015
Assets under custody ("AUC") by asset class (period-end) (in billions):			
Fixed Income	**$ 13,043**	$ 12,166	$ 12,042
Equity	**7,863**	6,428	6,194
Other[(a)]	**2,563**	1,926	1,707
Total AUC	**$ 23,469**	$ 20,520	$ 19,943
Client deposits and other third party liabilities (average)[(b)]	**$ 408,911**	$ 376,287	$ 395,297
Trade finance loans (period-end)	**17,947**	15,923	19,255

(a) Consists of mutual funds, unit investment trusts, currencies, annuities, insurance contracts, options and other contracts.
(b) Client deposits and other third party liabilities pertain to the Treasury Services and Securities Services businesses.

International metrics

Year ended December 31, (in millions, except where otherwise noted)	2017	2016	2015
Total net revenue[(a)]			
Europe/Middle East/Africa	**$ 11,328**	$ 10,786	$ 10,894
Asia/Pacific	**4,525**	4,915	4,901
Latin America/Caribbean	**1,125**	1,225	1,096
Total international net revenue	**16,978**	16,926	16,891
North America	**17,515**	18,290	16,651
Total net revenue	**$ 34,493**	$ 35,216	$ 33,542
Loans retained (period-end)[(a)]			
Europe/Middle East/Africa	**$ 25,931**	$ 26,696	$ 24,622
Asia/Pacific	**15,248**	14,508	17,108
Latin America/Caribbean	**6,546**	7,607	8,609
Total international loans	**47,725**	48,811	50,339
North America	**61,040**	63,061	56,569
Total loans retained	**$ 108,765**	$ 111,872	$ 106,908
Client deposits and other third-party liabilities (average)[(a)(b)]			
Europe/Middle East/Africa	**$ 154,582**	$ 135,979	$ 141,062
Asia/Pacific	**76,744**	68,110	67,111
Latin America/Caribbean	**25,419**	22,914	23,070
Total international	**$ 256,745**	$ 227,003	$ 231,243
North America	**152,166**	149,284	164,054
Total client deposits and other third-party liabilities	**$ 408,911**	$ 376,287	$ 395,297
AUC (period-end) (in billions)[(a)]			
North America	**$ 13,971**	$ 12,290	$ 12,034
All other regions	**9,498**	8,230	7,909
Total AUC	**$ 23,469**	$ 20,520	$ 19,943

(a) Total net revenue is based predominantly on the domicile of the client or location of the trading desk, as applicable. Loans outstanding (excluding loans held-for-sale and loans at fair value), client deposits and other third-party liabilities, and AUC are based predominantly on the domicile of the client.
(b) Client deposits and other third party liabilities pertain to the Treasury Services and Securities Services businesses.

Commercial Banking delivers extensive industry knowledge, local expertise and dedicated service to U.S. and U.S. multinational clients, including corporations, municipalities, financial institutions and nonprofit entities with annual revenue generally ranging from $20 million to $2 billion. In addition, CB provides financing to real estate investors and owners. Partnering with the Firm's other businesses, CB provides comprehensive financial solutions, including lending, treasury services, investment banking and asset management to meet its clients' domestic and international financial needs.

Selected income statement data

Year ended December 31, (in millions)	2017	2016	2015
Revenue			
Lending- and deposit-related fees	**$ 919**	$ 917	$ 944
Asset management, administration and commissions	**68**	69	88
All other income[(a)]	**1,535**	1,334	1,333
Noninterest revenue	**2,522**	2,320	2,365
Net interest income	**6,083**	5,133	4,520
Total net revenue[(b)]	**8,605**	7,453	6,885
Provision for credit losses	**(276)**	282	442
Noninterest expense			
Compensation expense	**1,470**	1,332	1,238
Noncompensation expense	**1,857**	1,602	1,643
Total noninterest expense	**3,327**	2,934	2,881
Income before income tax expense	**5,554**	4,237	3,562
Income tax expense	**2,015**	1,580	1,371
Net income	**$ 3,539**	$ 2,657	$ 2,191

(a) Includes revenue from investment banking products and commercial card transactions.

(b) Total net revenue included tax-equivalent adjustments from income tax credits related to equity investments in designated community development entities that provide loans to qualified businesses in low-income communities, as well as tax-exempt income related to municipal financing activities of $699 million, $505 million and $493 million for the years ended December 31, 2017, 2016 and 2015, respectively. The 2017 results reflect the impact of the enactment of the TCJA including a benefit to all other income of $115 million on certain investments in the Community Development Banking business. For additional information related to the impact of the TCJA, see Note 24.

2017 compared with 2016

Net income was $3.5 billion, an increase of 33% compared with the prior year, driven by higher net revenue and a lower provision for credit losses, partially offset by higher noninterest expense.

Net revenue was $8.6 billion, an increase of 15% compared with the prior year. Net interest income was $6.1 billion, an increase of 19% compared with the prior year, driven by higher deposit spreads and loan growth. Noninterest revenue was $2.5 billion, an increase of 9% compared with the prior year, predominantly driven by higher Community Development Banking revenue, including a $115 million benefit for the impact of the TCJA on certain investments, and higher investment banking revenue.

Noninterest expense was $3.3 billion, an increase of 13% driven by hiring of bankers and business-related support staff, investments in technology, and an impairment of approximately $130 million on certain leased equipment, the majority of which was sold subsequent to year-end.

The provision for credit losses was a benefit of $276 million, driven by net reductions in the allowance for credit losses, including in the Oil & Gas, Natural Gas Pipelines and Metals & Mining portfolios. The prior year provision for credit losses was $282 million driven by downgrades in the Oil & Gas portfolio and select client downgrades in other industries.

2016 compared with 2015

Net income was $2.7 billion, an increase of 21% compared with the prior year, driven by higher net revenue and a lower provision for credit losses, partially offset by higher noninterest expense.

Net revenue was $7.5 billion, an increase of 8% compared with the prior year. Net interest income was $5.1 billion, an increase of 14% compared with the prior year, driven by higher loan balances and deposit spreads. Noninterest revenue was $2.3 billion, a decrease of 2% compared with the prior year, largely driven by lower lending-and-deposit-related fees and other revenue, partially offset by higher investment banking revenue.

Noninterest expense was $2.9 billion, an increase of 2% compared with the prior year, reflecting increased hiring of bankers and business-related support staff and investments in technology.

The provision for credit losses was $282 million and $442 million for 2016 and 2015, respectively, with both periods driven by downgrades in the Oil & Gas portfolio and select client downgrades in other industries.

CB product revenue consists of the following:

Lending includes a variety of financing alternatives, which are primarily provided on a secured basis; collateral includes receivables, inventory, equipment, real estate or other assets. Products include term loans, revolving lines of credit, bridge financing, asset-based structures, leases, and standby letters of credit.

Treasury services includes revenue from a broad range of products and services that enable CB clients to manage payments and receipts, as well as invest and manage funds.

Investment banking includes revenue from a range of products providing CB clients with sophisticated capital-raising alternatives, as well as balance sheet and risk management tools through advisory, equity underwriting, and loan syndications. Revenue from Fixed Income and Equity Markets products used by CB clients is also included.

Other product revenue primarily includes tax-equivalent adjustments generated from Community Development Banking activities and certain income derived from principal transactions.

CB is divided into four primary client segments: Middle Market Banking, Corporate Client Banking, Commercial Term Lending, and Real Estate Banking.

Middle Market Banking covers corporate, municipal and nonprofit clients, with annual revenue generally ranging between $20 million and $500 million.

Corporate Client Banking covers clients with annual revenue generally ranging between $500 million and $2 billion and focuses on clients that have broader investment banking needs.

Commercial Term Lending primarily provides term financing to real estate investors/owners for multifamily properties as well as office, retail and industrial properties.

Real Estate Banking provides full-service banking to investors and developers of institutional-grade real estate investment properties.

Other primarily includes lending and investment-related activities within the Community Development Banking business.

Selected income statement data (continued)

Year ended December 31, (in millions, except ratios)	2017	2016	2015
Revenue by product			
Lending	**$ 4,094**	$ 3,795	$ 3,429
Treasury services	**3,444**	2,797	2,581
Investment banking[(a)]	**805**	785	730
Other[(b)]	**262**	76	145
Total Commercial Banking net revenue	**$ 8,605**	$ 7,453	$ 6,885
Investment banking revenue, gross[(c)]	**$ 2,327**	$ 2,286	$ 2,179
Revenue by client segment			
Middle Market Banking[(d)]	**$ 3,341**	$ 2,848	$ 2,685
Corporate Client Banking[(d)]	**2,727**	2,429	2,205
Commercial Term Lending	**1,454**	1,408	1,275
Real Estate Banking	**604**	456	358
Other[(b)]	**479**	312	362
Total Commercial Banking net revenue	**$ 8,605**	$ 7,453	$ 6,885
Financial ratios			
Return on equity	**17%**	16%	15%
Overhead ratio	**39**	39	42

(a) Includes total Firm revenue from investment banking products sold to CB clients, net of revenue sharing with the CIB.
(b) The 2017 results reflect the impact of the enactment of the TCJA including a benefit of $115 million on certain investments in the Community Development Banking business. For additional information related to the impact of the TCJA, see Note 24.
(c) Represents total Firm revenue from investment banking products sold to CB clients.
(d) Certain clients were transferred from Middle Market Banking to Corporate Client Banking in the second quarter of 2017. The prior period amounts have been revised to conform with the current period presentation.

Selected metrics

As of or for the year ended December 31, (in millions, except headcount)	2017	2016	2015
Selected balance sheet data (period-end)			
Total assets	**$ 221,228**	$ 214,341	$ 200,700
Loans:			
Loans retained	**202,400**	188,261	167,374
Loans held-for-sale and loans at fair value	**1,286**	734	267
Total loans	**$ 203,686**	$ 188,995	$ 167,641
Core loans	**203,469**	188,673	166,939
Equity	**20,000**	16,000	14,000
Period-end loans by client segment			
Middle Market Banking[(a)]	**$ 56,965**	$ 53,929	$ 50,501
Corporate Client Banking[(a)]	**46,963**	43,027	37,709
Commercial Term Lending	**74,901**	71,249	62,860
Real Estate Banking	**17,796**	14,722	11,234
Other	**7,061**	6,068	5,337
Total Commercial Banking loans	**$ 203,686**	$ 188,995	$ 167,641
Selected balance sheet data (average)			
Total assets	**$ 217,047**	$ 207,532	$ 198,076
Loans:			
Loans retained	**197,203**	178,670	157,389
Loans held-for-sale and loans at fair value	**909**	723	492
Total loans	**$ 198,112**	$ 179,393	$ 157,881
Core loans	**197,846**	178,875	156,975
Client deposits and other third-party liabilities	**177,018**	174,396	191,529
Equity	**20,000**	16,000	14,000
Average loans by client segment			
Middle Market Banking[(a)]	**$ 55,474**	$ 52,242	$ 50,334
Corporate Client Banking[(a)]	**46,037**	41,756	34,497
Commercial Term Lending	**73,428**	66,700	58,138
Real Estate Banking	**16,525**	13,063	9,917
Other	**6,648**	5,632	4,995
Total Commercial Banking loans	**$ 198,112**	$ 179,393	$ 157,881
Headcount	**9,005**	8,365	7,845

(a) Certain clients were transferred from Middle Market Banking to Corporate Client Banking in the second quarter of 2017. The prior period amounts have been revised to conform with the current period presentation.

Selected metrics

As of or for the year ended December 31, (in millions, except ratios)	2017	2016	2015
Credit data and quality statistics			
Net charge-offs/(recoveries)	**$ 39**	$ 163	$ 21
Nonperforming assets			
Nonaccrual loans:			
Nonaccrual loans retained[(a)]	**617**	1,149	375
Nonaccrual loans held-for-sale and loans at fair value	**—**	—	18
Total nonaccrual loans	**617**	1,149	393
Assets acquired in loan satisfactions	**3**	1	8
Total nonperforming assets	**620**	1,150	401
Allowance for credit losses:			
Allowance for loan losses	**2,558**	2,925	2,855
Allowance for lending-related commitments	**300**	248	198
Total allowance for credit losses	**2,858**	3,173	3,053
Net charge-off/(recovery) rate[(b)]	**0.02%**	0.09%	0.01%
Allowance for loan losses to period-end loans retained	**1.26**	1.55	1.71
Allowance for loan losses to nonaccrual loans retained[(a)]	**415**	255	761
Nonaccrual loans to period-end total loans	**0.30**	0.61	0.23

(a) Allowance for loan losses of $92 million, $155 million and $64 million was held against nonaccrual loans retained at December 31, 2017, 2016 and 2015, respectively.
(b) Loans held-for-sale and loans at fair value were excluded when calculating the net charge-off/(recovery) rate.

ASSET & WEALTH MANAGEMENT

Asset & Wealth Management, with client assets of $2.8 trillion, is a global leader in investment and wealth management. AWM clients include institutions, high-net-worth individuals and retail investors in many major markets throughout the world. AWM offers investment management across most major asset classes including equities, fixed income, alternatives and money market funds. AWM also offers multi-asset investment management, providing solutions for a broad range of clients' investment needs. For Wealth Management clients, AWM also provides retirement products and services, brokerage and banking services including trusts and estates, loans, mortgages and deposits. The majority of AWM's client assets are in actively managed portfolios.

Selected income statement data

Year ended December 31, (in millions, except ratios and headcount)	2017	2016	2015
Revenue			
Asset management, administration and commissions	**$ 8,946**	$ 8,414	$ 9,175
All other income	**593**	598	388
Noninterest revenue	**9,539**	9,012	9,563
Net interest income	**3,379**	3,033	2,556
Total net revenue	**12,918**	12,045	12,119
Provision for credit losses	**39**	26	4
Noninterest expense			
Compensation expense	**5,318**	5,065	5,113
Noncompensation expense	**3,983**	3,413	3,773
Total noninterest expense	**9,301**	8,478	8,886
Income before income tax expense	**3,578**	3,541	3,229
Income tax expense	**1,241**	1,290	1,294
Net income	**$ 2,337**	$ 2,251	$ 1,935
Revenue by line of business			
Asset Management	**$ 6,340**	$ 5,970	$ 6,301
Wealth Management	**6,578**	6,075	5,818
Total net revenue	**$12,918**	$12,045	$12,119
Financial ratios			
Return on common equity	**25%**	24%	21%
Overhead ratio	**72**	70	73
Pre-tax margin ratio:			
Asset Management	**25**	31	31
Wealth Management	**30**	28	22
Asset & Wealth Management	**28**	29	27
Headcount	**22,975**	21,082	20,975
Number of Wealth Management client advisors	**2,605**	2,504	2,778

2017 compared with 2016

Net income was $2.3 billion, an increase of 4% compared with the prior year, reflecting higher revenue and a tax benefit resulting from the vesting of employee share-based awards, offset by higher noninterest expense.

Net revenue was $12.9 billion, an increase of 7%. Net interest income was $3.4 billion, up 11%, driven by higher deposit spreads. Noninterest revenue was $9.5 billion, up 6%, driven by higher market levels, partially offset by the absence of a gain in the prior year on the disposal of an asset.

Revenue from Asset Management was $6.3 billion, up 6% from the prior year, driven by higher market levels, partially offset by the absence of a gain in prior year on the disposal of an asset. Revenue from Wealth Management was $6.6 billion, up 8% from the prior year, reflecting higher net interest income from higher deposit spreads.

Noninterest expense was $9.3 billion, an increase of 10%, predominantly driven by higher legal expense and compensation expense on higher revenue and headcount.

2016 compared with 2015

Net income was $2.3 billion, a decrease of 16% compared with the prior year, reflecting lower noninterest expense, predominantly offset by lower net revenue.

Net revenue was $12.0 billion, a decrease of 1%. Net interest income was $3.0 billion, up 19%, driven by higher loan balances and spreads. Noninterest revenue was $9.0 billion, a decrease of 6%, reflecting the impact of lower average equity market levels, a reduction in revenue related to the disposal of assets at the beginning of 2016, and lower performance fees and placement fees.

Revenue from Asset Management was $6.0 billion, down 5% from the prior year, driven by a reduction in revenue related to the disposal of assets at the beginning of 2016, the impact of lower average equity market levels and lower performance fees. Revenue from Wealth Management was $6.1 billion, up 4% from the prior year, reflecting higher net interest income from higher deposit and loan spreads and continued loan growth, partially offset by the impact of lower average equity market levels and lower placement fees.

Noninterest expense was $8.5 billion, a decrease of 5%, predominantly due to a reduction in expense related to the disposal of assets at the beginning of 2016 and lower legal expense.

AWM's lines of business consist of the following:

Asset Management provides comprehensive global investment services, including asset management, pension analytics, asset-liability management and active risk-budgeting strategies.

Wealth Management offers investment advice and wealth management, including investment management, capital markets and risk management, tax and estate planning, banking, lending and specialty-wealth advisory services.

AWM's client segments consist of the following:

Private Banking clients include high- and ultra-high-net-worth individuals, families, money managers, business owners and small corporations worldwide.

Institutional clients include both corporate and public institutions, endowments, foundations, nonprofit organizations and governments worldwide.

Retail clients include financial intermediaries and individual investors.

Asset Management has two high-level measures of its overall fund performance.

- **Percentage of mutual fund assets under management in funds rated 4- or 5-star:** Mutual fund rating services rank funds based on their risk-adjusted performance over various periods. A 5-star rating is the best rating and represents the top 10% of industry-wide ranked funds. A 4-star rating represents the next 22.5% of industry-wide ranked funds. A 3-star rating represents the next 35% of industry-wide ranked funds. A 2-star rating represents the next 22.5% of industry-wide ranked funds. A 1-star rating is the worst rating and represents the bottom 10% of industry-wide ranked funds. The "overall Morningstar rating" is derived from a weighted average of the performance associated with a fund's three-, five- and ten-year (if applicable) Morningstar Rating metrics. For U.S. domiciled funds, separate star ratings are given at the individual share class level. The Nomura "star rating" is based on three-year risk-adjusted performance only. Funds with fewer than three years of history are not rated and hence excluded from this analysis. All ratings, the assigned peer categories and the asset values used to derive this analysis are sourced from these fund rating providers mentioned in footnote (a). The data providers re-denominate the asset values into U.S. dollars. This % of AUM is based on star ratings at the share class level for U.S. domiciled funds, and at a "primary share class" level to represent the star rating of all other funds except for Japan where Nomura provides ratings at the fund level. The "primary share class", as defined by Morningstar, denotes the share class recommended as being the best proxy for the portfolio and in most cases will be the most retail version (based upon annual management charge, minimum investment, currency and other factors). The performance data could have been different if all funds/accounts would have been included. Past performance is not indicative of future results.
- **Percentage of mutual fund assets under management in funds ranked in the 1st or 2nd quartile (one, three and five years):** All quartile rankings, the assigned peer categories and the asset values used to derive this analysis are sourced from the fund ranking providers mentioned in footnote (c). Quartile rankings are done on the net-of-fee absolute return of each fund. The data providers re-denominate the asset values into U.S. dollars. This % of AUM is based on fund performance and associated peer rankings at the share class level for U.S. domiciled funds, at a "primary share class" level to represent the quartile ranking of the U.K., Luxembourg and Hong Kong funds and at the fund level for all other funds. The "primary share class", as defined by Morningstar, denotes the share class recommended as being the best proxy for the portfolio and in most cases will be the most retail version (based upon annual management charge, minimum investment, currency and other factors). Where peer group rankings given for a fund are in more than one "primary share class" territory both rankings are included to reflect local market competitiveness (applies to "Offshore Territories" and "HK SFC Authorized" funds only). The performance data could have been different if all funds/accounts would have been included. Past performance is not indicative of future results.

Selected metrics

As of or for the year ended December 31, (in millions, except ranking data and ratios)	2017	2016	2015
% of JPM mutual fund assets rated as 4- or 5-star[(a)(b)]	**60%**	63%	52%
% of JPM mutual fund assets ranked in 1st or 2nd quartile:[(c)]			
1 year	**64**	54	62
3 years	**75**	72	78
5 years[(b)]	**83**	79	79
Selected balance sheet data (period-end)			
Total assets	**$ 151,909**	$ 138,384	$ 131,451
Loans	**130,640**	118,039	111,007
Core loans	**130,640**	118,039	111,007
Deposits	**146,407**	161,577	146,766
Equity	**9,000**	9,000	9,000
Selected balance sheet data (average)			
Total assets	**$ 144,206**	$ 132,875	$ 129,743
Loans	**123,464**	112,876	107,418
Core loans	**123,464**	112,876	107,418
Deposits	**148,982**	153,334	149,525
Equity	**9,000**	9,000	9,000
Credit data and quality statistics			
Net charge-offs	**$ 14**	$ 16	$ 12
Nonaccrual loans	**375**	390	218
Allowance for credit losses:			
Allowance for loan losses	**290**	274	266
Allowance for lending-related commitments	**10**	4	5
Total allowance for credit losses	**300**	278	271
Net charge-off rate	**0.01%**	0.01%	0.01%
Allowance for loan losses to period-end loans	**0.22**	0.23	0.24
Allowance for loan losses to nonaccrual loans	**77**	70	122
Nonaccrual loans to period-end loans	**0.29**	0.33	0.20

(a) Represents the "overall star rating" derived from Morningstar for the U.S., the U.K., Luxembourg, Hong Kong and Taiwan domiciled funds; and Nomura "star rating" for Japan domiciled funds. Includes only Asset Management retail open-ended mutual funds that have a rating. Excludes money market funds, Undiscovered Managers Fund, and Brazil domiciled funds.

(b) The prior period amounts have been revised to conform with the current period presentation.

(c) Quartile ranking sourced from: Lipper for the U.S. and Taiwan domiciled funds; Morningstar for the U.K., Luxembourg and Hong Kong domiciled funds; Nomura for Japan domiciled funds and Fund Doctor for South Korea domiciled funds. Includes only Asset Management retail open-ended mutual funds that are ranked by the aforementioned sources. Excludes money market funds, Undiscovered Managers Fund, and Brazil domiciled funds.

Client assets

2017 compared with 2016

Client assets were $2.8 trillion, an increase of 14% compared with the prior year. Assets under management were $2.0 trillion, an increase of 15% from the prior year reflecting higher market levels, and net inflows into long-term and liquidity products.

2016 compared with 2015

Client assets were $2.5 trillion, an increase of 4% compared with the prior year. Assets under management were $1.8 trillion, an increase of 3% from the prior year reflecting inflows into both liquidity and long-term products and the effect of higher market levels, partially offset by asset sales at the beginning of 2016.

Client assets

December 31, (in billions)	2017	2016	2015
Assets by asset class			
Liquidity[(a)]	**$ 459**	$ 436	$ 430
Fixed income[(a)]	**474**	420	376
Equity	**428**	351	353
Multi-asset and alternatives	**673**	564	564
Total assets under management	**2,034**	1,771	1,723
Custody/brokerage/ administration/deposits	**755**	682	627
Total client assets	**$ 2,789**	$ 2,453	$ 2,350
Memo:			
Alternatives client assets[(b)]	**$ 166**	$ 154	$ 172
Assets by client segment			
Private Banking	**$ 526**	$ 435	$ 437
Institutional	**968**	869	816
Retail	**540**	467	470
Total assets under management	**$ 2,034**	$ 1,771	$ 1,723
Private Banking	**$ 1,256**	$ 1,098	$ 1,050
Institutional	**990**	886	824
Retail	**543**	469	476
Total client assets	**$ 2,789**	$ 2,453	$ 2,350

(a) The prior period amounts have been revised to conform with the current period presentation.
(b) Represents assets under management, as well as client balances in brokerage accounts.

Client assets (continued)

Year ended December 31, (in billions)	2017	2016	2015
Assets under management rollforward			
Beginning balance	**$ 1,771**	$ 1,723	$ 1,744
Net asset flows:			
Liquidity	**9**	24	–
Fixed income	**36**	30	(8)
Equity	**(11)**	(29)	1
Multi-asset and alternatives	**43**	22	22
Market/performance/other impacts	**186**	1	(36)
Ending balance, December 31	**$ 2,034**	$ 1,771	$ 1,723
Client assets rollforward			
Beginning balance	**$ 2,453**	$ 2,350	$ 2,387
Net asset flows	**93**	63	27
Market/performance/other impacts	**243**	40	(64)
Ending balance, December 31	**$ 2,789**	$ 2,453	$ 2,350

International metrics

Year ended December 31, (in billions, except where otherwise noted)	2017	2016	2015
Total net revenue (in millions)[(a)]			
Europe/Middle East/Africa	**$ 2,021**	$ 1,849	$ 1,946
Asia/Pacific	**1,162**	1,077	1,130
Latin America/Caribbean	**844**	726	795
Total international net revenue	**4,027**	3,652	3,871
North America	**8,891**	8,393	8,248
Total net revenue	**$ 12,918**	$ 12,045	$ 12,119
Assets under management			
Europe/Middle East/Africa	**$ 384**	$ 309	$ 302
Asia/Pacific	**160**	123	123
Latin America/Caribbean	**61**	45	45
Total international assets under management	**605**	477	470
North America	**1,429**	1,294	1,253
Total assets under management	**$ 2,034**	$ 1,771	$ 1,723
Client assets			
Europe/Middle East/Africa	**$ 441**	$ 359	$ 351
Asia/Pacific	**225**	177	173
Latin America/Caribbean	**154**	114	110
Total international client assets	**820**	650	634
North America	**1,969**	1,803	1,716
Total client assets	**$ 2,789**	$ 2,453	$ 2,350

(a) Regional revenue is based on the domicile of the client.

The Corporate segment consists of Treasury and Chief Investment Office and Other Corporate, which includes corporate staff units and expense that is centrally managed. Treasury and CIO is predominantly responsible for measuring, monitoring, reporting and managing the Firm's liquidity, funding and structural interest rate and foreign exchange risks, as well as executing the Firm's capital plan. The major Other Corporate units include Real Estate, Enterprise Technology, Legal, Finance, Human Resources, Internal Audit, Risk Management, Compliance, Oversight & Controls, Corporate Responsibility and various Other Corporate groups.

Selected income statement data

Year ended December 31, (in millions, except headcount)	2017	2016	2015
Revenue			
Principal transactions	**$ 284**	$ 210	$ 41
Securities gains/(losses)	**(66)**	140	190
All other income/(loss)[a]	**867**	588	569
Noninterest revenue	**1,085**	938	800
Net interest income	**55**	(1,425)	(533)
Total net revenue[b]	**1,140**	(487)	267
Provision for credit losses	**–**	(4)	(10)
Noninterest expense[c]	**501**	462	977
Income/(loss) before income tax benefit	**639**	(945)	(700)
Income tax expense/(benefit)	**2,282**	(241)	(3,137)
Net income/(loss)	**$ (1,643)**	$ (704)	$ 2,437
Total net revenue			
Treasury and CIO	**566**	(787)	(493)
Other Corporate	**574**	300	760
Total net revenue	**$ 1,140**	$ (487)	$ 267
Net income/(loss)			
Treasury and CIO	**60**	(715)	(235)
Other Corporate	**(1,703)**	11	2,672
Total net income/(loss)	**$ (1,643)**	$ (704)	$ 2,437
Total assets (period-end)	**$ 781,478**	$ 799,426	$ 768,204
Loans (period-end)	**1,653**	1,592	2,187
Core loans[d]	**1,653**	1,589	2,182
Headcount	**35,261**	32,358	29,617

(a) Included revenue related to a legal settlement of $645 million for the year ended December 31, 2017.

(b) Included tax-equivalent adjustments, predominantly due to tax-exempt income from municipal bond investments of $905 million, $885 million and $839 million for the years ended December 31, 2017, 2016 and 2015, respectively.

(c) Included legal expense/(benefit) of $(593) million, $(385) million and $832 million for the years ended December 31, 2017, 2016 and 2015, respectively.

(d) Average core loans were $1.6 billion, $1.9 billion and $2.5 billion for the years ended December 31, 2017, 2016 and 2015, respectively.

2017 compared with 2016

Net loss was $1.6 billion, compared with a net loss of $704 million in the prior year. The current year net loss included a $2.7 billion increase to income tax expense related to the impact of the TCJA.

Net revenue was $1.1 billion, compared with a loss of $487 million in the prior year. The increase in current year net revenue was driven by a $645 million benefit from a legal settlement with the FDIC receivership for Washington Mutual and with Deutsche Bank as trustee of certain Washington Mutual trusts and by the net impact of higher interest rates.

Net interest income was $55 million, compared with a loss of $1.4 billion in the prior year. The gain in the current year was primarily driven by higher interest income on deposits with banks due to higher interest rates and balances, partially offset by higher interest expense on long-term debt primarily driven by higher interest rates.

2016 compared with 2015

Net loss was $704 million, compared with net income of $2.4 billion in the prior year.

Net revenue was a loss of $487 million, compared with a gain of $267 million in the prior year. The prior year included a $514 million benefit from a legal settlement.

Net interest income was a loss of $1.4 billion, compared with a loss of $533 million in the prior year. The loss in the current year was primarily driven by higher interest expense on long-term debt and lower investment securities balances during the year, partially offset by higher interest income on deposits with banks and securities purchased under resale agreements as a result of higher interest rates.

Noninterest expense was $462 million, a decrease of $515 million from the prior year driven by lower legal expense, partially offset by higher compensation expense.

The prior year reflected tax benefits of $2.6 billion predominantly from the resolution of various tax audits.

Treasury and CIO overview

Treasury and CIO is predominantly responsible for measuring, monitoring, reporting and managing the Firm's liquidity, funding and structural interest rate and foreign exchange risks, as well as executing the Firm's capital plan. The risks managed by Treasury and CIO arise from the activities undertaken by the Firm's four major reportable business segments to serve their respective client bases, which generate both on- and off-balance sheet assets and liabilities.

Treasury and CIO seek to achieve the Firm's asset-liability management objectives generally by investing in high-quality securities that are managed for the longer-term as part of the Firm's investment securities portfolio. Treasury and CIO also use derivatives to meet the Firm's asset-liability management objectives. For further information on derivatives, see Note 5. The investment securities portfolio primarily consists of agency and nonagency mortgage-backed securities, U.S. and non-U.S. government securities, obligations of U.S. states and municipalities, other ABS and corporate debt securities. At December 31, 2017, the investment securities portfolio was $248.0 billion, and the average credit rating of the securities comprising the portfolio was AA+ (based upon external ratings where available and where not available, based primarily upon internal ratings that correspond to ratings as defined by S&P and Moody's). See Note 10 for further information on the details of the Firm's investment securities portfolio. For further information on liquidity and funding risk, see Liquidity Risk Management on pages 92–97. For information on interest rate, foreign exchange and other risks, see Market Risk Management on pages 121-128.

Selected income statement and balance sheet data

As of or for the year ended December 31, (in millions)	2017	2016	2015
Securities gains/(losses)	**$ (78)**	$ 132	$ 190
AFS investment securities (average)	**219,345**	226,892	264,758
HTM investment securities (average)	**47,927**	51,358	50,044
Investment securities portfolio (average)	**267,272**	278,250	314,802
AFS investment securities (period-end)	**200,247**	236,670	238,704
HTM investment securities (period-end)	**47,733**	50,168	49,073
Investment securities portfolio (period–end)	**247,980**	286,838	287,777

ENTERPRISE-WIDE RISK MANAGEMENT

Risk is an inherent part of JPMorgan Chase's business activities. When the Firm extends a consumer or wholesale loan, advises customers on their investment decisions, makes markets in securities, or offers other products or services, the Firm takes on some degree of risk. The Firm's overall objective is to manage its businesses, and the associated risks, in a manner that balances serving the interests of its clients, customers and investors and protects the safety and soundness of the Firm.

The Firm believes that effective risk management requires:

- Acceptance of responsibility, including identification and escalation of risk issues, by all individuals within the Firm;
- Ownership of risk identification, assessment, data and management within each of the lines of business and corporate functions; and
- Firmwide structures for risk governance.

The Firm strives for continual improvement through efforts to enhance controls, ongoing employee training and development, talent retention, and other measures. The Firm follows a disciplined and balanced compensation framework with strong internal governance and independent Board oversight. The impact of risk and control issues are carefully considered in the Firm's performance evaluation and incentive compensation processes.

Firmwide Risk Management is overseen and managed on an enterprise-wide basis. The Firm's approach to risk management involves understanding drivers of risks, risk types, and impacts of risks.

Drivers of risk include, but are not limited to, the economic environment, regulatory or government policy, competitor or market evolution, business decisions, process or judgment error, deliberate wrongdoing, dysfunctional markets, and natural disasters.

The Firm's risks are generally categorized in the following four risk types:

- Strategic risk is the risk associated with the Firm's current and future business plans and objectives, including capital risk, liquidity risk, and the impact to the Firm's reputation.
- Credit and investment risk is the risk associated with the default or change in credit profile of a client, counterparty or customer; or loss of principal or a reduction in expected returns on investments, including consumer credit risk, wholesale credit risk, and investment portfolio risk.
- Market risk is the risk associated with the effect of changes in market factors, such as interest and foreign exchange rates, equity and commodity prices, credit spreads or implied volatilities, on the value of assets and liabilities held for both the short and long term.
- Operational risk is the risk associated with inadequate or failed internal processes, people and systems, or from external events and includes compliance risk, conduct risk, legal risk, and estimations and model risk.

There may be many consequences of risks manifesting, including quantitative impacts such as reduction in earnings and capital, liquidity outflows, and fines or penalties, or qualitative impacts, such as reputation damage, loss of clients, and regulatory and enforcement actions.

The Firm has established Firmwide risk management functions to manage different risk types. The scope of a particular risk management function may include multiple risk types. For example, the Firm's Country Risk Management function oversees country risk which may be a driver of risk or an aggregation of exposures that could give rise to multiple risk types such as credit or market risk. The following sections discuss how the Firm manages the key risks that are inherent in its business activities.

Risk Oversight	Definition	Page references
Strategic risk	The risk associated with the Firm's current and future business plans and objectives.	81
Capital risk	The risk that the Firm has an insufficient level and composition of capital to support the Firm's business activities and associated risks during normal economic environments and under stressed conditions.	82–91
Liquidity risk	The risk that the Firm will be unable to meet its contractual and contingent financial obligations as they arise or that it does not have the appropriate amount, composition and tenor of funding and liquidity to support its assets and liabilities.	92–97
Reputation risk	The potential that an action, inaction, transaction, investment or event will reduce trust in the Firm's integrity or competence by its various constituents, including clients, counterparties, investors, regulators, employees and the broader public.	98
Consumer credit risk	The risk associated with the default or change in credit profile of a customer.	102–107
Wholesale credit risk	The risk associated with the default or change in credit profile of a client or counterparty.	108–116
Investment portfolio risk	The risk associated with the loss of principal or a reduction in expected returns on investments arising from the investment securities portfolio held by Treasury and CIO in connection with the Firm's balance sheet or asset-liability management objectives or from principal investments managed in various lines of business in predominantly privately-held financial assets and instruments.	120
Market risk	The risk associated with the effect of changes in market factors, such as interest and foreign exchange rates, equity and commodity prices, credit spreads or implied volatilities, on the value of assets and liabilities held for both the short and long term.	121–128
Country risk	The framework for monitoring and assessing how financial, economic, political or other significant developments adversely affect the value of the Firm's exposures related to a particular country or set of countries.	129–130
Operational risk	The risk associated with inadequate or failed internal processes, people and systems, or from external events.	131–133
Compliance risk	The risk of failure to comply with applicable laws, rules, and regulations.	134
Conduct risk	The risk that any action or inaction by an employee of the Firm could lead to unfair client/customer outcomes, compromise the Firm's reputation, impact the integrity of the markets in which the Firm operates, or reflect poorly on the Firm's culture.	135
Legal risk	The risk of loss primarily caused by the actual or alleged failure to meet legal obligations that arise from the rule of law in jurisdictions in which the Firm operates, agreements with clients and customers, and products and services offered by the Firm.	136
Estimations and Model risk	The risk of the potential for adverse consequences from decisions based on incorrect or misused estimation outputs.	137

Governance and oversight

The Firm's overall appetite for risk is governed by a "Risk Appetite" framework. The framework and the Firm's risk appetite are set and approved by the Firm's Chief Executive Officer ("CEO"), Chief Financial Officer ("CFO") and Chief Risk Officer ("CRO"). LOB-level risk appetite is set by the respective LOB CEO, CFO and CRO and is approved by the Firm's CEO, CFO and CRO. Quantitative parameters and qualitative factors are used to monitor and measure the Firm's capacity to take risk consistent with its stated risk appetite. Quantitative parameters have been established to assess select strategic risks, credit risks and market risks. Qualitative factors have been established for select operational risks, and for reputation risks. Risk Appetite results are reported quarterly to the Board of Directors' Risk Policy Committee ("DRPC").

The Firm has an Independent Risk Management ("IRM") function, which consists of the Risk Management and Compliance organizations. The CEO appoints, subject to DRPC approval, the Firm's CRO to lead the IRM organization and manage the risk governance framework of the Firm. The framework is subject to approval by the DRPC in the form of the primary risk management policies. The Chief Compliance Officer ("CCO"), who reports to the CRO, is also responsible for reporting to the Audit Committee for the Global Compliance Program. The Firm's Global Compliance Program focuses on overseeing compliance with laws, rules and regulations applicable to the Firm's products and services to clients and counterparties.

The Firm places reliance on each of its LOBs and other functional areas giving rise to risk. Each LOB and other functional area giving rise to risk is expected to operate within the parameters identified by the IRM function, and within its own management-identified risk and control standards. The LOBs, inclusive of LOB aligned Operations, Technology and Oversight & Controls, are the "first line of defense" in identifying and managing the risk in their activities, including but not limited to applicable laws, rules and regulations.

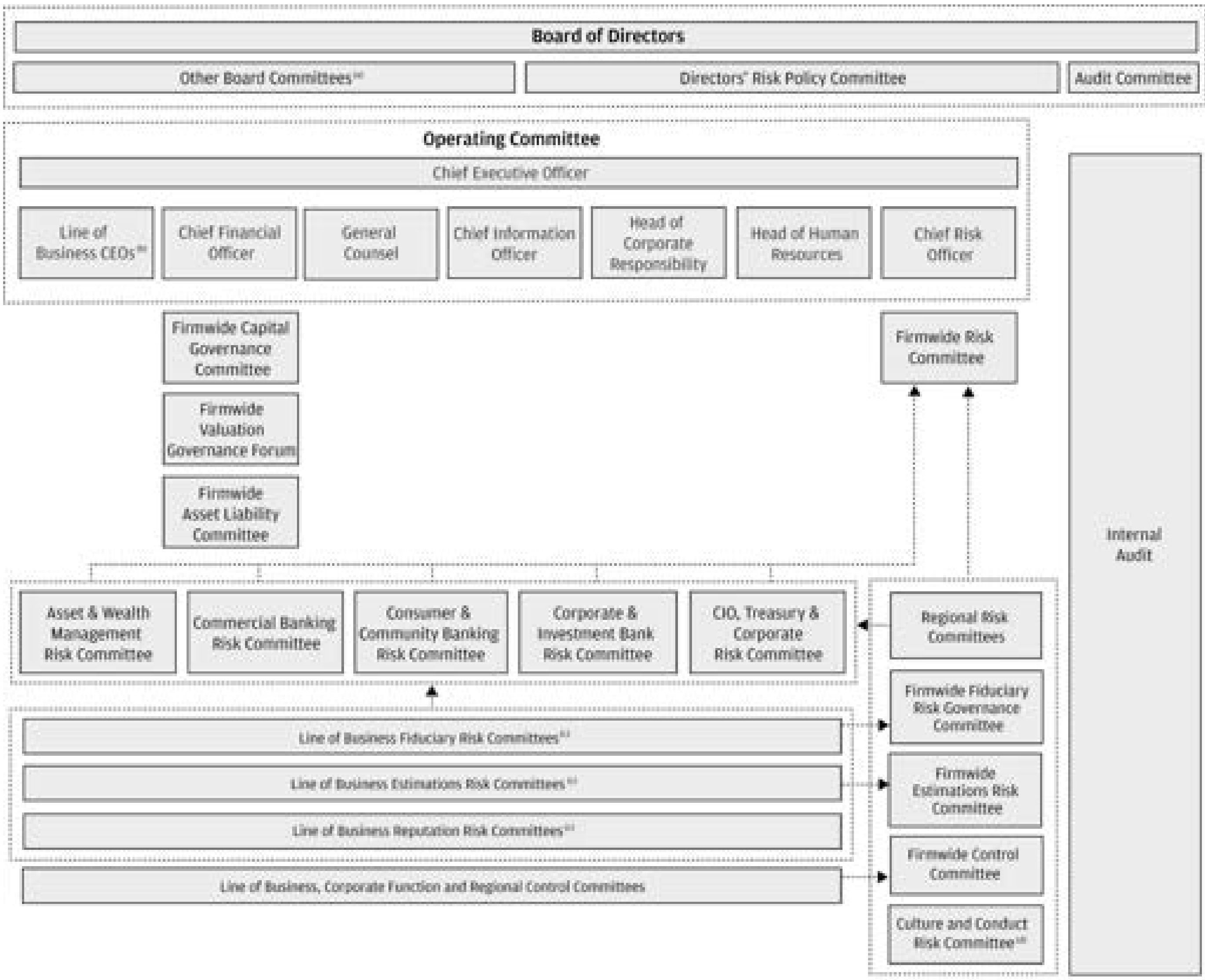
The IRM function is independent of the businesses and forms "the second line of defense". The IRM function sets and oversees various standards for the risk governance framework, including risk policy, identification, measurement, assessment, testing, limit setting, monitoring and reporting, and conducts independent challenge of adherence to such standards.

The Internal Audit function operates independently from other parts of the Firm and performs independent testing and evaluation of firmwide processes and controls across the entire enterprise as the Firm's "third line of defense" in managing risk. The Internal Audit Function is headed by the General Auditor, who reports to the Audit Committee.

In addition, there are other functions that contribute to the firmwide control environment including Finance, Human Resources, Legal, and Corporate Oversight & Control.

The independent status of the IRM function is supported by a governance structure that provides for escalation of risk issues to senior management, the Firmwide Risk Committee, and the Board of Directors, as appropriate.

The chart below illustrates the Board of Directors and key senior management level committees in the Firm's risk governance structure. In addition, there are other committees, forums and paths of escalation that support the oversight of risk, not shown in the chart below.



(a) Other Board Committees include the Compensation & Management Development Committee, Corporate Governance & Nominating Committee and Public Responsibility Committee.
(b) The Line of Business CEOs for CIB and CCB are also the Firm's Co-Presidents and Co-Chief Operating Officers.
(c) As applicable.
(d) Each Board committee oversees conduct risk within the scope of its responsibilities.

The Firm's Operating Committee, which consists of the Firm's CEO, CRO, CFO and other senior executives, is the ultimate management escalation point in the Firm and may refer matters to the Firm's Board of Directors. The Operating Committee is accountable to the Firm's Board of Directors.

The Board of Directors provides oversight of risk principally through the DRPC, the Audit Committee and, with respect to compensation and other management-related matters, the Compensation & Management Development Committee. Each committee of the Board oversees reputation risk and conduct risk issues within its scope of responsibility.

The Directors' Risk Policy Committee of the Board oversees the Firm's global risk management framework and approves the primary risk management policies of the Firm. The Committee's responsibilities include oversight of management's exercise of its responsibility to assess and manage the Firm's risks, and its capital and liquidity planning and analysis. Breaches in risk appetite, liquidity issues that may have a material adverse impact on the Firm and other significant risk-related matters are escalated to the DRPC.

The Audit Committee of the Board assists the Board in its oversight of management's responsibilities to assure that there is an effective system of controls reasonably designed to safeguard the assets and income of the Firm, assure the integrity of the Firm's financial statements and maintain compliance with the Firm's ethical standards, policies, plans and procedures, and with laws and regulations. In addition, the Audit Committee assists the Board in its oversight of the Firm's independent registered public accounting firm's qualifications, independence and performance, and of the performance of the Firm's Internal Audit function.

The Compensation & Management Development Committee ("CMDC") assists the Board in its oversight of the Firm's compensation programs and reviews and approves the Firm's overall compensation philosophy, incentive compensation pools, and compensation practices consistent with key business objectives and safety and soundness. The CMDC reviews Operating Committee members' performance against their goals, and approves their compensation awards. The CMDC also periodically reviews the Firm's diversity programs and management development and succession planning, and provides oversight of the Firm's culture and conduct programs.

Among the Firm's senior management-level committees that are primarily responsible for key risk-related functions are:

The Firmwide Risk Committee ("FRC") is the Firm's highest management-level risk committee. It provides oversight of the risks inherent in the Firm's businesses. The FRC is co-chaired by the Firm's CEO and CRO. The FRC serves as an escalation point for risk topics and issues raised by its members, the Line of Business Risk Committees, Firmwide Control Committee, Firmwide Fiduciary Risk Governance Committee, Firmwide Estimations Risk Committee, Culture and Conduct Risk Committee and regional Risk Committees, as appropriate. The FRC escalates significant issues to the DRPC, as appropriate.

The Firmwide Control Committee ("FCC") provides a forum for senior management to review and discuss firmwide operational risks, including existing and emerging issues and operational risk metrics, and to review operational risk management execution in the context of the Operational Risk Management Framework ("ORMF"). The ORMF provides the framework for the governance, risk identification and assessment, measurement, monitoring and reporting of operational risk. The FCC is co-chaired by the Chief Control Officer and the Firmwide Risk Executive for Operational Risk Governance. The FCC relies on the prompt escalation of operational risk and control issues from businesses and functions as the primary owners of the operational risk. Operational risk and control issues may be escalated by business or function control committees to the FCC, which in turn, may escalate to the FRC, as appropriate.

The Firmwide Fiduciary Risk Governance Committee ("FFRGC") is a forum for risk matters related to the Firm's fiduciary activities. The FFRGC oversees the firmwide fiduciary risk governance framework, which supports the consistent identification and escalation of fiduciary risk issues by the relevant lines of business; approves risk or compliance policy exceptions requiring FFRGC approval; approves the scope and/or expansion of the Firm's fiduciary framework; and reviews metrics to track fiduciary activity and issue resolution Firmwide. The FFRGC is co-chaired by the Asset Management CEO and the Asset & Wealth Management CRO. The FFRGC escalates significant fiduciary issues to the FRC, the DRPC and the Audit Committee, as appropriate.

The Firmwide Estimations Risk Committee ("FERC") reviews and oversees governance and execution activities related to models and certain analytical and judgment based estimations, such as those used in risk management, budget forecasting and capital planning and analysis. The FERC is chaired by the Firmwide Risk Executive for Model Risk Governance and Review. The FERC serves as an escalation channel for relevant topics and issues raised by its members and the Line of Business Estimation Risk Committees. The FERC escalates significant issues to the FRC, as appropriate.

The Culture and Conduct Risk Committee ("CCRC") provides oversight of culture and conduct initiatives to develop a more holistic view of conduct risks and to connect key programs across the Firm to identify opportunities and emerging areas for focus. The CCRC is co-chaired by the Chief Culture & Conduct Officer and the Conduct Risk Compliance Executive. The CCRC escalates significant issues to the FRC, as appropriate.

Line of Business and Regional Risk Committees review the ways in which the particular line of business or the business operating in a particular region could be exposed to adverse outcomes with a focus on identifying, accepting, escalating and/or requiring remediation of matters brought to these committees. These committees may escalate to the FRC, as appropriate. LOB risk committees are co-chaired by the LOB CEO and the LOB CRO. Each LOB risk committee may create sub-committees with requirements for escalation. The regional committees are established similarly, as appropriate, for the region.

In addition, each line of business and function is required to have a Control Committee. These control committees oversee the control environment of their respective business or function. As part of that mandate, they are responsible for reviewing data which indicates the quality and stability of the processes in a business or function, reviewing key operational risk issues and focusing on processes with shortcomings and overseeing process remediation. These committees escalate issues to the FCC, as appropriate.

The Firmwide Asset Liability Committee ("ALCO"), chaired by the Firm's Treasurer and Chief Investment Officer under the direction of the CFO, monitors the Firm's balance sheet, liquidity risk and structural interest rate risk. ALCO reviews the Firm's overall structural interest rate risk position, and the Firm's funding requirements and strategy. ALCO is responsible for reviewing and approving the Firm's Funds Transfer Pricing Policy (through which lines of business "transfer" interest rate risk and liquidity risk to Treasury and CIO), the Firm's Intercompany Funding and Liquidity Policy and the Firm's Contingency Funding Plan.

The Firmwide Capital Governance Committee, chaired by the Head of the Regulatory Capital Management Office, is responsible for reviewing the Firm's Capital Management Policy and the principles underlying capital issuance and distribution alternatives and decisions. The Committee oversees the capital adequacy assessment process, including the overall design, scenario development and macro assumptions, and ensures that capital stress test programs are designed to adequately capture the risks specific to the Firm's businesses.

The Firmwide Valuation Governance Forum ("VGF") is composed of senior finance and risk executives and is responsible for overseeing the management of risks arising from valuation activities conducted across the Firm. The VGF is chaired by the Firmwide head of the Valuation Control Group ("VCG") under the direction of the Firm's Controller, and includes sub-forums covering the Corporate & Investment Bank, Consumer & Community Banking, Commercial Banking, Asset & Wealth Management and certain corporate functions, including Treasury and CIO.

In addition, the JPMorgan Chase Bank, N.A. Board of Directors is responsible for the oversight of management of the Bank. The JPMorgan Chase Bank, N.A. Board accomplishes this function acting directly and through the principal standing committees of the Firm's Board of Directors. Risk and control oversight on behalf of JPMorgan Chase Bank N.A. is primarily the responsibility of the DRPC and the Audit Committee of the Firm's Board of Directors, respectively, and, with respect to compensation and other management-related matters, the Compensation & Management Development Committee of the Firm's Board of Directors.

Risk Identification

The Firm has a Risk Identification process in which the first line of defense identifies material risks inherent to the Firm, catalogs them in a central repository and reviews the most material risks on a regular basis. The second line of defense, at a firmwide level, establishes the risk identification framework, coordinates the process, maintains the central repository and reviews and challenges the first line's identification of risks.

STRATEGIC RISK MANAGEMENT

Strategic risk is the risk associated with the Firm's current and future business plans and objectives. Strategic risk includes the risk to current or anticipated earnings, capital, liquidity, enterprise value, or the Firm's reputation arising from adverse business decisions, poor implementation of business decisions, or lack of responsiveness to changes in the industry or external environment.

Overview

The Operating Committee and the senior leadership of each LOB are responsible for managing the Firm's most significant strategic risks. Strategic risks are overseen by IRM through participation in business reviews, LOB senior management committees, ongoing management of the Firm's risk appetite and limit framework, and other relevant governance forums. The Board of Directors oversees management's strategic decisions, and the DRPC oversees IRM and the Firm's risk management framework.

The Firm's strategic planning process, which includes the development and execution of strategic priorities and initiatives by the Operating Committee and the management teams of the lines of business, is an important process for managing the Firm's strategic risk. Guided by the Firm's How We Do Business ("HWDB") principles, the strategic priorities and initiatives are updated annually and include evaluating performance against prior year initiatives, assessment of the operating environment, refinement of existing strategies and development of new strategies.

These strategic priorities and initiatives are then incorporated in the Firm's budget, and are reviewed by the Board of Directors.

In the process of developing the strategic initiatives, line of business leadership identify the strategic risks associated with their strategic initiatives and those risks are incorporated into the Firmwide Risk Identification process and monitored and assessed as part of the Firmwide Risk Appetite framework. For further information on Risk Identification, see Enterprise-Wide Risk Management on page 75. For further information on the Risk Appetite framework see, Enterprise-Wide Risk Management on page 77.

The Firm's balance sheet strategy, which focuses on risk-adjusted returns, strong capital and robust liquidity, is key to management of strategic risk. For further information on capital risk, see Capital Risk Management on pages 82–91. For further information on liquidity risk see, Liquidity Risk Management on pages 92–97

For further information on reputation risk, see Reputation Risk Management on page 98.

Governance and oversight

The Firm's Operating Committee defines the most significant strategic priorities and initiatives, including those of the Firm, the LOBs and the Corporate functions, for the coming year and evaluates performance against the prior year. As part of the strategic planning process, IRM conducts a qualitative assessment of those significant initiatives to determine the impact on the risk profile of the Firm. The Firm's priorities, initiatives and IRM's assessment are provided to the Board for its review.

As part of its ongoing oversight and management of risk across the Firm, IRM is regularly engaged in significant discussions and decision-making across the Firm, including decisions to pursue new business opportunities or modify or exit existing businesses.

CAPITAL RISK MANAGEMENT

Capital risk is the risk the Firm has an insufficient level and composition of capital to support the Firm's business activities and associated risks during normal economic environments and under stressed conditions.

A strong capital position is essential to the Firm's business strategy and competitive position. Maintaining a strong balance sheet to manage through economic volatility is considered a strategic imperative of the Firm's Board of Directors, CEO and Operating Committee. The Firm's fortress balance sheet philosophy focuses on risk-adjusted returns, strong capital and robust liquidity. The Firm's capital risk management strategy focuses on maintaining long-term stability to enable it to build and invest in market-leading businesses, even in a highly stressed environment. Senior management considers the implications on the Firm's capital prior to making decisions that could impact future business activities. In addition to considering the Firm's earnings outlook, senior management evaluates all sources and uses of capital with a view to preserving the Firm's capital strength.

The Firm's capital risk management objectives are to hold capital sufficient to:

- Maintain "well-capitalized" status for the Firm and its insured depository institution ("IDI") subsidiaries;
- Support risks underlying business activities;
- Maintain sufficient capital in order to continue to build and invest in its businesses through the cycle and in stressed environments;
- Retain flexibility to take advantage of future investment opportunities;
- Serve as a source of strength to its subsidiaries;
- Meet capital distribution objectives; and
- Maintain sufficient capital resources to operate throughout a resolution period in accordance with the Firm's preferred resolution strategy.

These objectives are achieved through the establishment of minimum capital targets and a strong capital governance framework. Capital risk management is intended to be flexible in order to react to a range of potential events. The Firm's minimum capital targets are based on the most binding of three pillars: an internal assessment of the Firm's capital needs; an estimate of required capital under the CCAR and Dodd-Frank Act stress testing requirements; and Basel III Fully Phased-In regulatory minimums. Where necessary, each pillar may include a management-established buffer. The capital governance framework requires regular monitoring of the Firm's capital positions, stress testing and defining escalation protocols, both at the Firm and material legal entity levels.

The following tables present the Firm’s Transitional and Fully Phased-In risk-based and leverage-based capital metrics under both the Basel III Standardized and Advanced Approaches. The Firm’s Basel III ratios exceed both the Transitional and Fully Phased-In regulatory minimums as of December 31, 2017 and 2016. For further discussion of these capital metrics, including regulatory minimums, and the Standardized and Advanced Approaches, refer to Strategy and Governance on pages 84–88.

December 31, 2017 (in millions, except ratios)	Transitional			Fully Phased-In		
	Standardized	Advanced	Minimum capital ratios	Standardized	Advanced	Minimum capital ratios
Risk-based capital metrics:						
CET1 capital	**$ 183,300**	**$ 183,300**		**$ 183,244**	**$ 183,244**	
Tier 1 capital	**208,644**	**208,644**		**208,564**	**208,564**	
Total capital	**238,395**	**227,933**		**237,960**	**227,498**	
Risk-weighted assets	**1,499,506**	**1,435,825**		**1,509,762**	**1,446,696**	
CET1 capital ratio	**12.2%**	**12.8%**	7.5%	**12.1%**	**12.7%**	10.5%
Tier 1 capital ratio	**13.9**	**14.5**	9.0	**13.8**	**14.4**	12.0
Total capital ratio	**15.9**	**15.9**	11.0	**15.8**	**15.7**	14.0
Leverage-based capital metrics:						
Adjusted average assets[(a)]	**$ 2,514,270**	**$ 2,514,270**		**$ 2,514,822**	**$ 2,514,822**	
Tier 1 leverage ratio[(b)]	**8.3%**	**8.3%**	4.0%	**8.3%**	**8.3%**	4.0%
Total leverage exposure	**NA**	**$ 3,204,463**		**NA**	**$ 3,205,015**	
SLR[(c)]	**NA**	**6.5%**	NA	**NA**	**6.5%**	5.0% [(e)]

December 31, 2016 (in millions, except ratios)	Transitional			Fully Phased-In		
	Standardized	Advanced	Minimum capital ratios	Standardized	Advanced	Minimum capital ratios
Risk-based capital metrics:						
CET1 capital	$ 182,967	$ 182,967		$ 181,734	$ 181,734	
Tier 1 capital	208,112	208,112		207,474	207,474	
Total capital	239,553	228,592		237,487	226,526	
Risk-weighted assets	1,483,132 [(d)]	1,476,915		1,492,816 [(d)]	1,487,180	
CET1 capital ratio	12.3% [(d)]	12.4%	6.25%	12.2% [(d)]	12.2%	10.5%
Tier 1 capital ratio	14.0 [(d)]	14.1	7.75	13.9 [(d)]	14.0	12.0
Total capital ratio	16.2 [(d)]	15.5	9.75	15.9 [(d)]	15.2	14.0
Leverage-based capital metrics:						
Adjusted average assets[(a)]	$ 2,484,631	$ 2,484,631		$ 2,485,480	$ 2,485,480	
Tier 1 leverage ratio[(b)]	8.4%	8.4%	4.0%	8.3%	8.3%	4.0%
Total leverage exposure	NA	$ 3,191,990		NA	$ 3,192,839	
SLR[(c)]	NA	6.5%	NA	NA	6.5%	5.0% [(e)]

Note: As of December 31, 2017 and 2016, the lower of the Standardized or Advanced capital ratios under each of the Transitional and Fully Phased-In Approaches in the table above represents the Firm’s Collins Floor, as discussed in Risk-based capital regulatory minimums on page 85.

(a) Adjusted average assets, for purposes of calculating the Tier 1 leverage ratio, includes total quarterly average assets adjusted for unrealized gains/(losses) on available-for-sale (“AFS”) securities, less deductions for goodwill and other intangible assets, defined benefit pension plan assets, and deferred tax assets related to tax attributes, including net operating losses (“NOLs”).

(b) The Tier 1 leverage ratio is calculated by dividing Tier 1 capital by adjusted total average assets.

(c) The SLR leverage ratio is calculated by dividing Tier 1 capital by total leverage exposure. For additional information on total leverage exposure, see SLR on page 88.

(d) The prior period amounts have been revised to conform with the current period presentation.

(e) In the case of the SLR, the Fully Phased-In minimum ratio is effective January 1, 2018.

Strategy and governance

The Firm's CEO, together with the Board of Directors and the Operating Committee, establishes principles and guidelines for capital planning, issuance, usage and distributions, and minimum capital targets for the level and composition of capital in business-as-usual and highly stressed environments. The DRPC reviews and approves the capital management and governance policy of the Firm. The Firm's Audit Committee is responsible for reviewing and approving the capital stress testing control framework.

The Capital Governance Committee and the Regulatory Capital Management Office ("RCMO") support the Firm's strategic capital decision-making. The Capital Governance Committee oversees the capital adequacy assessment process, including the overall design, scenario development and macro assumptions, and ensures that capital stress test programs are designed to adequately capture the risks specific to the Firm's businesses. RCMO, which reports to the Firm's CFO, is responsible for designing and monitoring the Firm's execution of its capital policies and strategies once approved by the Board, as well as reviewing and monitoring the execution of its capital adequacy assessment process. The Basel Independent Review function ("BIR"), which reports to the RCMO, conducts independent assessments of the Firm's regulatory capital framework to ensure compliance with the applicable U.S. Basel rules in support of senior management's responsibility for assessing and managing capital and for the DRPC's oversight of management in executing that responsibility. For additional discussion on the DRPC, see Enterprise-wide Risk Management on pages 75–137.

Monitoring and management of capital

In its monitoring and management of capital, the Firm takes into consideration an assessment of economic risk and all regulatory capital requirements to determine the level of capital needed to meet and maintain the objectives discussed above, as well as to support the framework for allocating capital to its business segments. While economic risk is considered prior to making decisions on future business activities, in most cases the Firm considers risk-based regulatory capital to be a proxy for economic risk capital.

Regulatory capital

The Federal Reserve establishes capital requirements, including well-capitalized standards, for the consolidated financial holding company. The OCC establishes similar minimum capital requirements for the Firm's national banks, including JPMorgan Chase Bank, N.A. and Chase Bank USA, N.A. The U.S. capital requirements generally follow the Capital Accord of the Basel Committee, as amended from time to time.

Basel III overview

Capital rules under Basel III establish minimum capital ratios and overall capital adequacy standards for large and internationally active U.S. bank holding companies ("BHC") and banks, including the Firm and its IDI subsidiaries. Basel III sets forth two comprehensive approaches for calculating RWA: a standardized approach ("Basel III Standardized"), and an advanced approach ("Basel III Advanced"). Certain of the requirements of Basel III are subject to phase-in periods that began on January 1, 2014 and continue through the end of 2018 ("transitional period").

Basel III establishes capital requirements for calculating credit risk RWA and market risk RWA, and in the case of Basel III Advanced, operational risk RWA. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent basis between Basel III Standardized and Basel III Advanced. In addition to the RWA calculated under these methodologies, the Firm may supplement such amounts to incorporate management judgment and feedback from its regulators.

Basel III also includes a requirement for Advanced Approach banking organizations, including the Firm, to calculate the SLR. For additional information on the SLR, see page 88.

On December 7, 2017, the Basel Committee issued the Basel III Reforms. Potential changes to the requirements for U.S. financial institutions are being considered by the U.S. banking regulators. For additional information on Basel III reforms, refer to Supervision & Regulation on pages 1–8.

Basel III Fully Phased-In

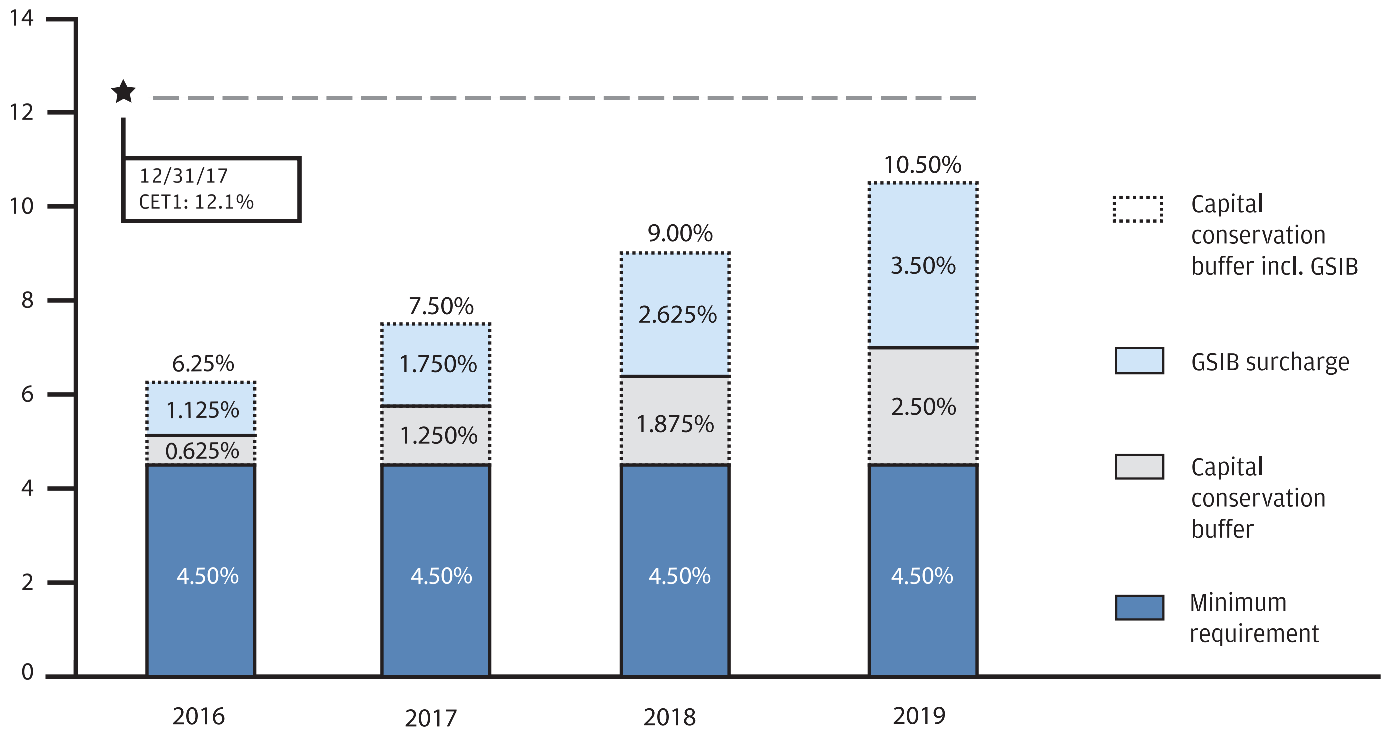
The Basel III transitional period will end on December 31, 2018, at which point the Firm will calculate its capital ratios under both the Basel III Standardized and Advanced Approaches on a Fully Phased-In basis. In the case of the SLR, the Fully Phased-In well-capitalized ratio is effective January 1, 2018. The Firm manages each of its lines of business, as well as the corporate functions, primarily on a Basel III Fully Phased-In basis.

For additional information on the Firm, JPMorgan Chase Bank, N.A. and Chase Bank USA, N.A.'s capital, RWA and capital ratios under Basel III Standardized and Advanced Fully Phased-In rules and the SLR calculated under the Basel III Advanced Fully Phased-In rules, all of which are considered key regulatory capital measures, see Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures and Key Performance Measures on pages 52–54.

The Basel III Standardized and Advanced Fully Phased-In capital, RWA and capital ratios, and SLRs for the Firm, JPMorgan Chase Bank, N.A. and Chase Bank USA, N.A. are based on the current published U.S. Basel III rules.

Risk-based capital regulatory minimums

The following chart presents the Basel III minimum CET1 capital ratio during the transitional periods and on a fully phased-in basis under the Basel III rules currently in effect.



The Basel III rules include minimum capital ratio requirements that are subject to phase-in periods through the end of 2018. The capital adequacy of the Firm and its IDI subsidiaries, both during the transitional period and upon full phase-in, is evaluated against the Basel III approach (Standardized or Advanced) which, for each quarter, results in the lower ratio as required by the Collins Amendment of the Dodd-Frank Act (the "Collins Floor"). The Basel III Standardized Fully Phased-In CET1 ratio is the Firm's current binding constraint, and the Firm expects that this will remain its binding constraint for the foreseeable future.

Additional information regarding the Firm's capital ratios, as well as the U.S. federal regulatory capital standards to which the Firm is subject, is presented in Note 26. For further information on the Firm's Basel III measures, see the Firm's Pillar 3 Regulatory Capital Disclosures reports, which are available on the Firm's website (http://investor.shareholder.com/jpmorganchase/basel.cfm).

All banking institutions are currently required to have a minimum capital ratio of 4.5% of risk weighted assets. Certain banking organizations, including the Firm, are required to hold additional amounts of capital to serve as a "capital conservation buffer". The capital conservation buffer is intended to be used to absorb potential losses in times of financial or economic stress. If not maintained, the Firm could be limited in the amount of capital that may be distributed, including dividends and common equity repurchases. The capital conservation buffer is subject to a phase-in period that began January 1, 2016 and continues through the end of 2018.

As an expansion of the capital conservation buffer, the Firm is also required to hold additional levels of capital in the form of a GSIB surcharge and a countercyclical capital buffer.

Under the Federal Reserve's final rule, the Firm is required to calculate its GSIB surcharge on an annual basis under two separately prescribed methods, and is subject to the higher of the two. The first ("Method 1"), reflects the GSIB surcharge as prescribed by the Basel Committee's assessment methodology, and is calculated across five criteria: size, cross-jurisdictional activity, interconnectedness, complexity and substitutability. The second ("Method 2"), modifies the Method 1 requirements to include a measure of short-term wholesale funding in place of substitutability, and introduces a GSIB score "multiplication factor". The following table represents the Firm's GSIB surcharge.

	2017	2016
Fully Phased-In:		
Method 1	2.50%	2.50%
Method 2	3.50%	4.50%
Transitional[(a)]	1.75%	1.125%

(a) The GSIB surcharge is subject to transition provisions (in 25% increments) through the end of 2018.

The Firm's effective GSIB surcharge for 2018 is anticipated to be 3.5%.

The countercyclical capital buffer takes into account the macro financial environment in which large, internationally active banks function. On September 8, 2016 the Federal Reserve published the framework that will apply to the setting of the countercyclical capital buffer. As of December 1, 2017, the Federal Reserve reaffirmed setting the U.S. countercyclical capital buffer at 0%, and stated that it will review the amount at least annually. The countercyclical capital buffer can be increased if the Federal Reserve, FDIC and OCC determine that credit growth in the economy has become excessive and can be set at up to an additional 2.5% of RWA subject to a 12-month implementation period.

The Firm believes that it will operate with a Basel III CET1 capital ratio between 11% and 12% over the medium term. It is the Firm's intention that its capital ratios will continue to meet regulatory minimums as they are fully phased in 2019 and thereafter.

In addition to meeting the capital ratio requirements of Basel III, the Firm also must maintain minimum capital and leverage ratios in order to be "well-capitalized." The following table represents the ratios that the Firm and its IDI subsidiaries must maintain in order to meet the definition of "well-capitalized" under the regulations issued by the Federal Reserve and the Prompt Corrective Action ("PCA") requirements of the FDIC Improvement Act ("FDICIA"), respectively.

	Well-capitalized ratios	
	BHC	IDI
Capital ratios		
CET1	–%	6.5%
Tier 1 capital	6.0	8.0
Total capital	10.0	10.0
Tier 1 leverage	–	5.0
SLR[(a)]	5.0	6.0

(a) In the case of the SLR, the Fully Phased-In well-capitalized ratio is effective January 1, 2018.

Capital

The following table presents reconciliations of total stockholders' equity to Basel III Fully Phased-In CET1 capital, Tier 1 capital and Basel III Advanced and Standardized Fully Phased-In Total capital as of December 31, 2017 and 2016. For additional information on the components of regulatory capital, see Note 26.

Capital components

(in millions)	December 31, 2017	December 31, 2016
Total stockholders' equity	**$ 255,693**	**$ 254,190**
Less: Preferred stock	26,068	26,068
Common stockholders' equity	**229,625**	**228,122**
Less:		
Goodwill	47,507	47,288
Other intangible assets	855	862
Add:		
Certain Deferred tax liabilities[(a)(b)]	2,204	3,230
Less: Other CET1 capital adjustments[(b)]	223	1,468
Standardized/Advanced Fully Phased-In CET1 capital	**183,244**	**181,734**
Preferred stock	26,068	26,068
Less:		
Other Tier 1 adjustments[(c)]	748	328
Standardized/Advanced Fully Phased-In Tier 1 capital	**$ 208,564**	**$ 207,474**
Long-term debt and other instruments qualifying as Tier 2 capital	$ 14,827	$ 15,253
Qualifying allowance for credit losses	14,672	14,854
Other	(103)	(94)
Standardized Fully Phased-In Tier 2 capital	**$ 29,396**	**$ 30,013**
Standardized Fully Phased-in Total capital	**$ 237,960**	**$ 237,487**
Adjustment in qualifying allowance for credit losses for Advanced Tier 2 capital	(10,462)	(10,961)
Advanced Fully Phased-In Tier 2 capital	**$ 18,934**	**$ 19,052**
Advanced Fully Phased-In Total capital	**$ 227,498**	**$ 226,526**

(a) Represents deferred tax liabilities related to tax-deductible goodwill and identifiable intangibles created in nontaxable transactions, which are netted against goodwill and other intangibles when calculating TCE.

(b) Includes the effect from the revaluation of the Firm's net deferred tax liability as a result of the enactment of the TCJA.

(c) Includes the deduction associated with the permissible holdings of covered funds (as defined by the Volcker Rule). The deduction was not material as of December 31, 2017 and 2016.

The following table presents reconciliations of the Firm's Basel III Transitional CET1 capital to the Firm's Basel III Fully Phased-In CET1 capital as of December 31, 2017 and 2016.

(in millions)	December 31, 2017	December 31, 2016
Transitional CET1 capital	**$ 183,300**	**$ 182,967**
AOCI phase-in[a]	128	(156)
CET1 capital deduction phase-in[b]	(20)	(695)
Intangible assets deduction phase-in[c]	(160)	(312)
Other adjustments to CET1 capital[d]	(4)	(70)
Fully Phased-In CET1 capital	**$ 183,244**	**$ 181,734**

(a) Includes the remaining balance of accumulated other comprehensive income ("AOCI") related to AFS debt securities and defined benefit pension and other postretirement employee benefit ("OPEB") plans that will qualify as Basel III CET1 capital upon full phase-in.
(b) Predominantly includes regulatory adjustments related to changes in DVA, as well as CET1 deductions for defined benefit pension plan assets and deferred tax assets related to tax attributes, including NOLs.
(c) Relates to intangible assets, other than goodwill and MSRs, that are required to be deducted from CET1 capital upon full phase-in.
(d) Includes minority interest and the Firm's investments in its own CET1 capital instruments.

Capital rollforward

The following table presents the changes in Basel III Fully Phased-In CET1 capital, Tier 1 capital and Tier 2 capital for the year ended December 31, 2017.

Year Ended December 31, (in millions)	2017
Standardized/Advanced CET1 capital at December 31, 2016	$ 181,734
Net income applicable to common equity[a]	22,778
Dividends declared on common stock	(7,542)
Net purchase of treasury stock	(13,741)
Changes in additional paid-in capital	(1,048)
Changes related to AOCI	536
Adjustment related to DVA[b]	468
Changes related to other CET1 capital adjustments[c]	59
Increase in Standardized/Advanced CET1 capital	1,510
Standardized/Advanced CET1 capital at December 31, 2017	**$ 183,244**
Standardized/Advanced Tier 1 capital at December 31, 2016	$ 207,474
Change in CET1 capital	1,510
Net issuance of noncumulative perpetual preferred stock	–
Other	(420)
Increase in Standardized/Advanced Tier 1 capital	1,090
Standardized/Advanced Tier 1 capital at December 31, 2017	**$ 208,564**
Standardized Tier 2 capital at December 31, 2016	$ 30,013
Change in long-term debt and other instruments qualifying as Tier 2	(426)
Change in qualifying allowance for credit losses	(182)
Other	(9)
Decrease in Standardized Tier 2 capital	(617)
Standardized Tier 2 capital at December 31, 2017	**$ 29,396**
Standardized Total capital at December 31, 2017	**$ 237,960**
Advanced Tier 2 capital at December 31, 2016	$ 19,052
Change in long-term debt and other instruments qualifying as Tier 2	(426)
Change in qualifying allowance for credit losses	317
Other	(9)
Decrease in Advanced Tier 2 capital	(118)
Advanced Tier 2 capital at December 31, 2017	**$ 18,934**
Advanced Total capital at December 31, 2017	**$ 227,498**

(a) Includes a $2.4 billion decrease to net income as a result of the enactment of the TCJA. For additional information related to the impact of the TCJA, see Note 24.
(b) Includes DVA related to structured notes recorded in AOCI.
(c) Includes the effect from the revaluation of the Firm's net deferred tax liability as a result of the enactment of the TCJA.

RWA rollforward

The following table presents changes in the components of RWA under Basel III Standardized and Advanced Fully Phased-In for the year ended December 31, 2017. The amounts in the rollforward categories are estimates, based on the predominant driver of the change.

Year ended December 31, 2017 (in millions)	Standardized			Advanced			
	Credit risk RWA	Market risk RWA	Total RWA	Credit risk RWA	Market risk RWA	Operational risk	Total RWA
December 31, 2016	$ 1,365,137 [d]	$ 127,679	**$ 1,492,816** [d]	$ 959,523	$ 127,657	$ 400,000	**$ 1,487,180**
Model & data changes[a]	(8,214)	1,739	**(6,475)**	(14,189)	1,739	–	**(12,450)**
Portfolio runoff[b]	(13,600)	–	**(13,600)**	(16,100)	–	–	**(16,100)**
Movement in portfolio levels[c]	42,737	(5,716)	**37,021**	(6,329)	(5,605)	–	**(11,934)**
Changes in RWA	20,923	(3,977)	**16,946**	(36,618)	(3,866)	–	**(40,484)**
December 31, 2017	**$ 1,386,060**	**$ 123,702**	**$ 1,509,762**	**$ 922,905**	**$ 123,791**	**$ 400,000**	**$ 1,446,696**

(a) Model & data changes refer to material movements in levels of RWA as a result of revised methodologies and/or treatment per regulatory guidance (exclusive of rule changes).
(b) Portfolio runoff for credit risk RWA primarily reflects (under both the Standardized and Advanced approaches) reduced risk from position rolloffs in legacy portfolios in Home Lending, the sale of the student loan portfolio during the second quarter of 2017, and the sale of reverse mortgages in CIB during the third quarter of 2017.
(c) Movement in portfolio levels for credit risk RWA refers to changes primarily in book size, composition, credit quality, and market movements; and for market risk RWA refers to changes in position and market movements.
(d) The prior period amounts have been revised to conform with the current period presentation.

Supplementary leverage ratio

The SLR is defined as Tier 1 capital under Basel III divided by the Firm's total leverage exposure. Total leverage exposure is calculated by taking the Firm's total average on-balance sheet assets, less amounts permitted to be deducted for Tier 1 capital, and adding certain off-balance sheet exposures, such as undrawn commitments and derivatives potential future exposure.

The following table presents the components of the Firm's Fully Phased-In SLR as of December 31, 2017 and 2016.

(in millions, except ratio)	**December 31, 2017**	December 31, 2016
Tier 1 capital	**$ 208,564**	$ 207,474
Total average assets	2,562,155	2,532,457
Less: Adjustments for deductions from Tier 1 capital	47,333	46,977
Total adjusted average assets[a]	2,514,822	2,485,480
Off-balance sheet exposures[b]	690,193	707,359
Total leverage exposure	**$ 3,205,015**	$ 3,192,839
SLR	**6.5%**	6.5%

(a) Adjusted average assets, for purposes of calculating the SLR, includes total quarterly average assets adjusted for on-balance sheet assets that are subject to deduction from Tier 1 capital, predominantly goodwill and other intangible assets.
(b) Off-balance sheet exposures are calculated as the average of the three month-end spot balances during the reporting quarter.

As of December 31, 2017, JPMorgan Chase Bank, N.A.'s and Chase Bank USA, N.A.'s Fully Phased-In SLRs are approximately 6.7% and 11.8%, respectively.

Line of business equity

Each business segment is allocated capital by taking into consideration stand-alone peer comparisons and regulatory capital requirements. For 2016, capital was allocated to each business segment for, among other things, goodwill and other intangibles associated with acquisitions effected by the line of business. ROE is measured and internal targets for expected returns are established as key measures of a business segment's performance.

On at least an annual basis, the Firm assesses the level of capital required for each line of business as well as the assumptions and methodologies used to allocate capital. Through the end of 2016, capital was allocated to the lines of business based on a single measure, Basel III Advanced Fully Phased-In RWA. Effective January 1, 2017, the Firm's methodology used to allocate capital to the Firm's business segments was updated. The new methodology incorporates Basel III Standardized Fully Phased-In RWA (as well as Basel III Advanced Fully Phased-In RWA), leverage, the GSIB surcharge, and a simulation of capital in a severe stress environment. The methodology will continue to be weighted towards Basel III Advanced Fully Phased-In RWA because the Firm believes it to be the best proxy for economic risk. The Firm will consider further changes to its capital allocation methodology as the regulatory framework evolves. In addition, under the new methodology, capital is no longer allocated to each line of business for goodwill and other intangibles associated with acquisitions effected by the line of business. The Firm will continue to establish internal ROE targets for its business segments, against which they will be measured, as a key performance indicator.

The table below reflects the Firm's assessed level of capital allocated to each line of business as of the dates indicated.

Line of business equity (Allocated capital)

(in billions)	January 1, 2018	December 31, 2017	December 31, 2016
Consumer & Community Banking	**$ 51.0**	$ 51.0	$ 51.0
Corporate & Investment Bank	**70.0**	70.0	64.0
Commercial Banking	**20.0**	20.0	16.0
Asset & Wealth Management	**9.0**	9.0	9.0
Corporate	**79.6**	79.6	88.1
Total common stockholders' equity	**$ 229.6**	$ 229.6	$ 228.1

Planning and stress testing

Comprehensive Capital Analysis and Review
The Federal Reserve requires large bank holding companies, including the Firm, to submit a capital plan on an annual basis. The Federal Reserve uses the CCAR and Dodd-Frank Act stress test processes to ensure that large BHCs have sufficient capital during periods of economic and financial stress, and have robust, forward-looking capital assessment and planning processes in place that address each BHC's unique risks to enable it to absorb losses under certain stress scenarios. Through the CCAR, the Federal Reserve evaluates each BHC's capital adequacy and internal capital adequacy assessment processes ("ICAAP"), as well as its plans to make capital distributions, such as dividend payments or stock repurchases.

On June 28, 2017, the Federal Reserve informed the Firm that it did not object, on either a quantitative or qualitative basis, to the Firm's 2017 capital plan. For information on actions taken by the Firm's Board of Directors following the 2017 CCAR results, see Capital actions on pages 89-90.

The Firm's CCAR process is integrated into and employs the same methodologies utilized in the Firm's ICAAP process, as discussed below.

Internal Capital Adequacy Assessment Process
Semiannually, the Firm completes the ICAAP, which provides management with a view of the impact of severe and unexpected events on earnings, balance sheet positions, reserves and capital. The Firm's ICAAP integrates stress testing protocols with capital planning.

The process assesses the potential impact of alternative economic and business scenarios on the Firm's earnings and capital. Economic scenarios, and the parameters underlying those scenarios, are defined centrally and applied uniformly across the businesses. These scenarios are articulated in terms of macroeconomic factors, which are key drivers of business results; global market shocks, which generate short-term but severe trading losses; and idiosyncratic operational risk events. The scenarios are intended to capture and stress key vulnerabilities and idiosyncratic risks facing the Firm. However, when defining a broad range of scenarios, actual events can always be worse. Accordingly, management considers additional stresses outside these scenarios, as necessary. ICAAP results are reviewed by management and the Audit Committee.

Capital actions

Preferred stock
Preferred stock dividends declared were $1.7 billion for the year ended December 31, 2017.

On October 20, 2017, the Firm issued $1.3 billion of fixed-to-floating rate non-cumulative preferred stock, Series CC, with an initial dividend rate of 4.625%. On December 1, 2017, the Firm redeemed all $1.3 billion of its outstanding 5.50% non-cumulative preferred stock, Series O.

For additional information on the Firm's preferred stock, see Note 20.

Trust preferred securities
On December 18, 2017, the Delaware trusts that issued seven series of outstanding trust preferred securities were liquidated, $1.6 billion of trust preferred and $56 million of common securities originally issued by those trusts were cancelled, and the junior subordinated debentures previously held by each trust issuer were distributed pro rata to the holders of the corresponding series of trust preferred and common securities.

The Firm redeemed $1.6 billion of trust preferred securities in the year ended December 31, 2016.

Common stock dividends
The Firm's common stock dividend policy reflects JPMorgan Chase's earnings outlook, desired dividend payout ratio, capital objectives, and alternative investment opportunities.

On September 19, 2017, the Firm announced that its Board of Directors increased the quarterly common stock dividend to $0.56 per share, effective with the dividend paid on October 31, 2017. The Firm's dividends are subject to the Board of Directors' approval on a quarterly basis.

For information regarding dividend restrictions, see Note 20 and Note 25.

The following table shows the common dividend payout ratio based on net income applicable to common equity.

Year ended December 31,	2017	2016	2015
Common dividend payout ratio	**33%**	30%	28%

Common equity
During the year ended December 31, 2017, warrant holders exercised their right to purchase 9.9 million shares of the Firm's common stock. The Firm issued from treasury stock 5.4 million shares of its common stock as a result of these exercises. As of December 31, 2017, 15.0 million warrants remained outstanding, compared with 24.9 million outstanding as of December 31, 2016.

Effective June 28, 2017, the Firm's Board of Directors authorized the repurchase of up to $19.4 billion of common equity (common stock and warrants) between July 1, 2017 and June 30, 2018, as part of its annual capital plan.

As of December 31, 2017, $9.8 billion of authorized repurchase capacity remained under the common equity repurchase program.

The following table sets forth the Firm's repurchases of common equity for the years ended December 31, 2017, 2016 and 2015. There were no repurchases of warrants during the years ended December 31, 2017, 2016 and 2015.

Year ended December 31, (in millions)	2017	2016	2015
Total number of shares of common stock repurchased	**166.6**	140.4	89.8
Aggregate purchase price of common stock repurchases	**$15,410**	$ 9,082	$ 5,616

The Firm may, from time to time, enter into written trading plans under Rule 10b5-1 of the Securities Exchange Act of 1934 to facilitate repurchases in accordance with the common equity repurchase program. A Rule 10b5-1 repurchase plan allows the Firm to repurchase its equity during periods when it would not otherwise be repurchasing common equity – for example, during internal trading blackout periods. All purchases under Rule 10b5-1 plans must be made according to predefined schedules established when the Firm is not aware of material nonpublic information.

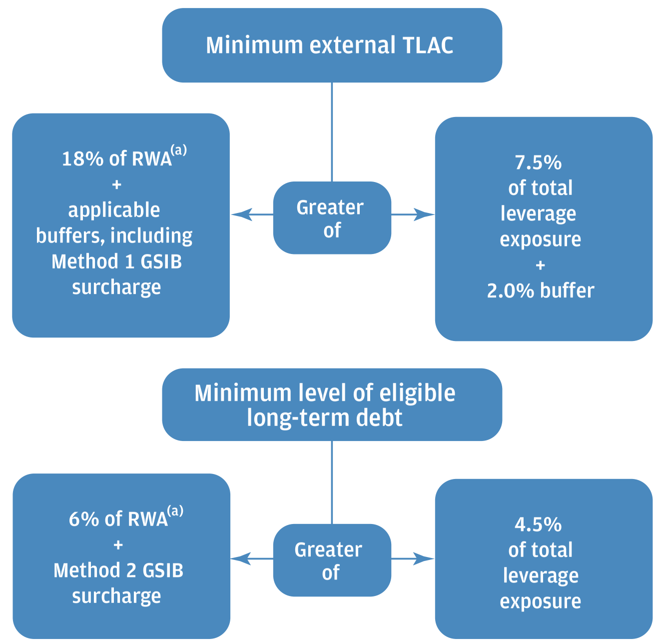
The authorization to repurchase common equity will be utilized at management's discretion, and the timing of purchases and the exact amount of common equity that may be repurchased is subject to various factors, including market conditions; legal and regulatory considerations affecting the amount and timing of repurchase activity; the Firm's capital position (taking into account goodwill and intangibles); internal capital generation; and alternative investment opportunities. The repurchase program does not include specific price targets or timetables; may be executed through open market purchases or privately negotiated transactions, or utilizing Rule 10b5-1 plans; and may be suspended by management at any time.

For additional information regarding repurchases of the Firm's equity securities, see Part II, Item 5: Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities on page 28.

Other capital requirements

TLAC
On December 15, 2016, the Federal Reserve issued its final TLAC rule which requires the top-tier holding companies of eight U.S. GSIB holding companies, including the Firm, to maintain minimum levels of external TLAC and external long-term debt that satisfies certain eligibility criteria ("eligible LTD"), effective January 1, 2019.

The minimum external TLAC and the minimum level of eligible long-term debt requirements are shown below:



(a) RWA is the greater of Standardized and Advanced.

The final TLAC rule permanently grandfathered all long-term debt issued before December 31, 2016, to the extent these securities would be ineligible because they contained impermissible acceleration rights or were governed by non-U.S. law. As of December 31, 2017, the Firm was compliant with the requirements under the current rule to which it will be subject on January 1, 2019.

Broker-dealer regulatory capital

JPMorgan Securities

JPMorgan Chase's principal U.S. broker-dealer subsidiary is JPMorgan Securities. JPMorgan Securities is subject to Rule 15c3-1 under the Securities Exchange Act of 1934 (the "Net Capital Rule"). JPMorgan Securities is also registered as a futures commission merchant and subject to Rule 1.17 of the CFTC.

JPMorgan Securities has elected to compute its minimum net capital requirements in accordance with the "Alternative Net Capital Requirements" of the Net Capital Rule.

In accordance with the market and credit risk standards of Appendix E of the Net Capital Rule, JPMorgan Securities is eligible to use the alternative method of computing net capital if, in addition to meeting its minimum net capital requirements, it maintains tentative net capital of at least $1.0 billion and is also required to notify the SEC in the event that tentative net capital is less than $5.0 billion. As of December 31, 2017, JPMorgan Securities had tentative net capital in excess of the minimum and notification requirements. The following table presents JPMorgan Securities' net capital information:

December 31, 2017	Net capital	
(in billions)	Actual	Minimum
JPMorgan Securities	**$ 13.6**	**$ 2.8**

J.P. Morgan Securities plc

J.P. Morgan Securities plc is a wholly owned subsidiary of JPMorgan Chase Bank, N.A. and is the Firm's principal operating subsidiary in the U.K. It has authority to engage in banking, investment banking and broker-dealer activities.

J.P. Morgan Securities plc is jointly regulated by the U.K. PRA and the FCA. J.P. Morgan Securities plc is subject to the European Union Capital Requirements Regulation and the U.K. PRA capital rules, each of which implemented Basel III and thereby subject J.P. Morgan Securities plc to its requirements.

The following table presents J.P. Morgan Securities plc's capital information:

December 31, 2017	Total capital	CET1 ratio		Total capital ratio	
(in billions, except ratios)	Estimated	Estimated	Minimum	Estimated	Minimum
J.P. Morgan Securities plc	**$ 39.6**	**15.9%**	**4.5%**	**15.9%**	**8.0%**

LIQUIDITY RISK MANAGEMENT

Liquidity risk is the risk that the Firm will be unable to meet its contractual and contingent financial obligations as they arise or that it does not have the appropriate amount, composition and tenor of funding and liquidity to support its assets and liabilities.

Liquidity risk oversight

The Firm has a liquidity risk oversight function whose primary objective is to provide assessment, measurement, monitoring, and control of liquidity risk across the Firm. Liquidity risk oversight is managed through a dedicated firmwide Liquidity Risk Oversight group. The CIO, Treasury and Corporate ("CTC") CRO, who reports to the Firm's CRO, as part of the IRM function, is responsible for firmwide Liquidity Risk Oversight. Liquidity Risk Oversight's responsibilities include:

- Establishing and monitoring limits, indicators, and thresholds, including liquidity risk appetite tolerances;
- Monitoring internal firmwide and material legal entity liquidity stress tests, and monitoring and reporting regulatory defined liquidity stress testing;
- Approving or escalating for review liquidity stress assumptions;
- Monitoring liquidity positions, balance sheet variances and funding activities, and
- Conducting ad hoc analysis to identify potential emerging liquidity risks.

Liquidity management

Treasury and CIO is responsible for liquidity management. The primary objectives of effective liquidity management are to:

- Ensure that the Firm's core businesses and material legal entities are able to operate in support of client needs and meet contractual and contingent financial obligations through normal economic cycles as well as during stress events, and
- Manage an optimal funding mix and availability of liquidity sources.

The Firm manages liquidity and funding using a centralized, global approach across its entities, taking into consideration both their current liquidity profile and any potential changes over time, in order to optimize liquidity sources and uses.

In the context of the Firm's liquidity management, Treasury and CIO is responsible for:

- Analyzing and understanding the liquidity characteristics of the assets and liabilities of the Firm, lines of business and legal entities, taking into account legal, regulatory, and operational restrictions;
- Developing internal liquidity stress testing assumptions;
- Defining and monitoring firmwide and legal entity-specific liquidity strategies, policies, guidelines, reporting and contingency funding plans;
- Managing liquidity within the Firm's approved liquidity risk appetite tolerances and limits;
- Managing compliance with regulatory requirements related to funding and liquidity risk, and
- Setting transfer pricing in accordance with underlying liquidity characteristics of balance sheet assets and liabilities as well as certain off-balance sheet items.

Risk governance and measurement

Specific committees responsible for liquidity governance include the firmwide ALCO as well as line of business and regional ALCOs, and the CTC Risk Committee. In addition, the DRPC reviews and recommends to the Board of Directors, for formal approval, the Firm's liquidity risk tolerances, liquidity strategy, and liquidity policy at least annually. For further discussion of ALCO and other risk-related committees, see Enterprise-wide Risk Management on pages 75–137.

Internal stress testing

Liquidity stress tests are intended to ensure that the Firm has sufficient liquidity under a variety of adverse scenarios, including scenarios analyzed as part of the Firm's resolution and recovery planning. Stress scenarios are produced for JPMorgan Chase & Co. ("Parent Company") and the Firm's material legal entities on a regular basis, and ad hoc stress tests are performed, as needed, in response to specific market events or concerns. Liquidity stress tests assume all of the Firm's contractual financial obligations are met and take into consideration:

- Varying levels of access to unsecured and secured funding markets,
- Estimated non-contractual and contingent cash outflows, and
- Potential impediments to the availability and transferability of liquidity between jurisdictions and material legal entities such as regulatory, legal or other restrictions.

Liquidity outflow assumptions are modeled across a range of time horizons and currency dimensions and contemplate both market and idiosyncratic stresses.

Results of stress tests are considered in the formulation of the Firm's funding plan and assessment of its liquidity position. The Parent Company acts as a source of funding for the Firm through equity and long-term debt issuances, and the IHC provides funding support to the ongoing operations of the Parent Company and its subsidiaries, as necessary. The Firm maintains liquidity at the Parent Company and the IHC, in addition to liquidity held at the operating subsidiaries, at levels sufficient to comply with liquidity risk tolerances and minimum liquidity requirements, and to manage through periods of stress where access to normal funding sources is disrupted.

Contingency funding plan

The Firm's contingency funding plan ("CFP"), which is approved by the firmwide ALCO and the DRPC, is a compilation of procedures and action plans for managing liquidity through stress events. The CFP incorporates the limits and indicators set by the Liquidity Risk Oversight group. These limits and indicators are reviewed regularly to identify the emergence of risks or vulnerabilities in the Firm's liquidity position. The CFP identifies the alternative contingent funding and liquidity resources available to the Firm and its legal entities in a period of stress.

LCR and HQLA

The LCR rule requires the Firm to maintain an amount of unencumbered HQLA that is sufficient to meet its estimated total net cash outflows over a prospective 30 calendar-day period of significant stress. HQLA is the amount of liquid assets that qualify for inclusion in the LCR. HQLA primarily consist of unencumbered cash and certain high quality liquid securities as defined in the LCR rule.

Under the LCR rule, the amount of HQLA held by JPMorgan Chase Bank N.A. and Chase Bank USA, N.A that are in excess of each entity's standalone 100% minimum LCR requirement, and that are not transferable to non-bank affiliates, must be excluded from the Firm's reported HQLA. Effective January 1, 2017, the LCR is required to be a minimum of 100%.

On December 19, 2016, the Federal Reserve published final LCR public disclosure requirements for certain BHCs and non-bank financial companies. Beginning with the second quarter of 2017, the Firm disclosed its average LCR for the quarter and the key quantitative components of the average LCR, along with a qualitative discussion of material drivers of the ratio, changes over time, and causes of such changes. The Firm will continue to make available its U.S. LCR Disclosure report on a quarterly basis on the Firm's website at: (https://investor.shareholder.com/jpmorganchase/basel.cfm)

The following table summarizes the Firm's average LCR for the three months ended December 31, 2017 based on the Firm's current interpretation of the finalized LCR framework.

Average amount (in millions)		Three months ended December 31, 2017
HQLA		
Eligible cash[(a)]	$	370,126
Eligible securities[(b)(c)]		189,955
Total HQLA[(d)]	$	560,081
Net cash outflows	$	472,078
LCR		119%
Net excess HQLA[(d)]	$	88,003

(a) Represents cash on deposit at central banks, primarily Federal Reserve Banks.
(b) Predominantly U.S. Agency MBS, U.S. Treasuries, and sovereign bonds net of applicable haircuts under the LCR rules
(c) HQLA eligible securities may be reported in securities borrowed or purchased under resale agreements, trading assets, or securities on the Firm's Consolidated balance sheets.
(d) Excludes average excess HQLA at JPMorgan Chase Bank, N.A. and Chase Bank USA, N.A. that are not transferable to non-bank affiliates.

For the three months ended December 31, 2017, the Firm's average LCR was 119%, compared with an average of 120% for the three months ended September 30, 2017. The decrease in the ratio was largely attributable to a decrease in average HQLA, driven primarily by long-term debt maturities. The Firm's average LCR may fluctuate from period to period, due to changes in its HQLA and estimated net cash outflows under the LCR as a result of ongoing business activity. The Firm's HQLA are expected to be available to meet its liquidity needs in a time of stress.

Other liquidity sources

As of December 31, 2017, in addition to assets reported in the Firm's HQLA under the LCR rule, the Firm had approximately $208 billion of unencumbered marketable securities, such as equity securities and fixed income debt securities, available to raise liquidity, if required. This includes HQLA-eligible securities included as part of the excess liquidity at JPMorgan Chase Bank, N.A. that are not transferable to non-bank affiliates.

As of December 31, 2017, the Firm also had approximately $277 billion of available borrowing capacity at various Federal Home Loan Banks ("FHLBs"), discount windows at Federal Reserve Banks and various other central banks as a result of collateral pledged by the Firm to such banks. This borrowing capacity excludes the benefit of securities reported in the Firm's HQLA or other unencumbered securities that are currently pledged at Federal Reserve Bank discount windows. Although available, the Firm does not view the borrowing capacity at Federal Reserve Bank discount windows and the various other central banks as a primary source of liquidity.

NSFR

The net stable funding ratio ("NSFR") is intended to measure the adequacy of "available" and "required" amounts of stable funding over a one-year horizon. On April 26, 2016, the U.S. NSFR proposal was released for large banks and BHCs and was largely consistent with the Basel Committee's final standard.

While the final U.S. NSFR rule has yet to be released, as of December 31, 2017 the Firm estimates that it was compliant with the proposed 100% minimum NSFR based on its current understanding of the proposed rule.

Funding

Sources of funds

Management believes that the Firm's unsecured and secured funding capacity is sufficient to meet its on- and off-balance sheet obligations.

The Firm funds its global balance sheet through diverse sources of funding including a stable deposit franchise as well as secured and unsecured funding in the capital markets. The Firm's loan portfolio is funded with a portion of the Firm's deposits, through securitizations and, with respect to a portion of the Firm's real estate-related loans, with secured borrowings from the FHLBs. Deposits in excess of the amount utilized to fund loans are primarily invested in the Firm's investment securities portfolio or deployed in cash or other short-term liquid investments based on their interest rate and liquidity risk characteristics. Securities borrowed or purchased under resale agreements and trading assets-debt and equity instruments are primarily funded by the Firm's securities loaned or sold under agreements to repurchase, trading liabilities–debt and equity instruments, and a portion of the Firm's long-term debt and stockholders' equity. In addition to funding securities borrowed or purchased under resale agreements and trading assets-debt and equity instruments, proceeds from the Firm's debt and equity issuances are used to fund certain loans and other financial and non-financial assets, or may be invested in the Firm's investment securities portfolio. See the discussion below for additional information relating to Deposits, Short-term funding, and Long-term funding and issuance.

Deposits

The table below summarizes, by line of business, the period-end and average deposit balances as of and for the years ended December 31, 2017 and 2016.

Deposits			Year ended December 31,	
As of or for the year ended December 31,			Average	
(in millions)	2017	2016	2017	2016
Consumer & Community Banking	$ 659,885	$ 618,337	$ 640,219	$ 586,637
Corporate & Investment Bank	455,883	412,434	447,697	409,680
Commercial Banking	181,512	179,532	176,884	172,835
Asset & Wealth Management	146,407	161,577	148,982	153,334
Corporate	295	3,299	3,604	5,482
Total Firm	$ 1,443,982	$ 1,375,179	$ 1,417,386	$ 1,327,968

A key strength of the Firm is its diversified deposit franchise, through each of its lines of business, which provides a stable source of funding and limits reliance on the wholesale funding markets. A significant portion of the Firm's deposits are consumer and wholesale operating deposits, which are both considered to be stable sources of liquidity. Wholesale operating deposits are considered to be stable sources of liquidity because they are generated from customers that maintain operating service relationships with the Firm.

The table below shows the loan and deposit balances, the loans-to-deposits ratios, and deposits as a percentage of total liabilities, as of December 31, 2017 and 2016.

As of December 31, (in billions except ratios)	2017	2016
Deposits	$ 1,444.0	$ 1,375.2
Deposits as a % of total liabilities	63%	61%
Loans	930.7	894.8
Loans-to-deposits ratio	64%	65%

Deposits increased due to both higher consumer and wholesale deposits. The higher consumer deposits reflect the continuation of strong growth from new and existing customers, and low attrition rates. The higher wholesale deposits largely were driven by growth in client cash management activity in CIB's Securities Services business, partially offset by lower balances in AWM reflecting balance migration predominantly into the Firm's investment-related products.

The Firm believes average deposit balances are generally more representative of deposit trends than period-end deposit balances. The increase in average deposits for the year ended December 31, 2017 compared with the year ended December 31, 2016, was driven by an increase in both consumer and wholesale deposits. For further discussions of deposit and liability balance trends, see the discussion of the Firm's business segments results and the Consolidated Balance Sheet Analysis on pages 55–74 and pages 47-48, respectively.

The following table summarizes short-term and long-term funding, excluding deposits, as of December 31, 2017 and 2016, and average balances for the years ended December 31, 2017 and 2016. For additional information, see the Consolidated Balance Sheets Analysis on pages 47-48 and Note 19.

Sources of funds (excluding deposits)

As of or for the year ended December 31,			Average	
(in millions)	**2017**	2016	**2017**	2016
Commercial paper	**$ 24,186**	$ 11,738	**$ 19,920**	$ 15,001
Other borrowed funds	**27,616**	22,705	**26,612**	21,139
Total short-term borrowings	**$ 51,802**	$ 34,443	**$ 46,532**	$ 36,140
Obligations of Firm-administered multi-seller conduits[(a)]	**$ 3,045**	$ 2,719	**$ 3,206**	$ 5,153
Securities loaned or sold under agreements to repurchase:				
Securities sold under agreements to repurchase[(b)]	**$ 146,432**	$ 149,826	**$ 171,973**	$ 160,458
Securities loaned[(c)]	**7,910**	12,137	**11,526**	13,195
Total securities loaned or sold under agreements to repurchase[(d)]	**$ 154,342**	$ 161,963	**$ 183,499**	$ 173,653
Senior notes	**$ 155,852**	$ 151,042	**$ 154,352**	$ 153,768
Trust preferred securities[(e)]	**690**	2,345	**2,276**	3,724
Subordinated debt[(e)]	**16,553**	21,940	**18,832**	24,224
Structured notes	**45,727**	37,292	**42,918**	35,978
Total long-term unsecured funding	**$ 218,822**	$ 212,619	**$ 218,378**	$ 217,694
Credit card securitization[(a)]	**$ 21,278**	$ 31,181	**$ 25,933**	$ 29,428
Other securitizations[(a)(f)]	**—**	1,527	**626**	1,669
FHLB advances	**60,617**	79,519	**69,916**	73,260
Other long-term secured funding[(g)]	**4,641**	3,107	**3,195**	4,619
Total long-term secured funding	**$ 86,536**	$ 115,334	**$ 99,670**	$ 108,976
Preferred stock[(h)]	**$ 26,068**	$ 26,068	**26,212**	$ 26,068
Common stockholders' equity[(h)]	**$ 229,625**	$ 228,122	**230,350**	$ 224,631

(a) Included in beneficial interest issued by consolidated variable interest entities on the Firm's Consolidated balance sheets.
(b) Excludes long-term structured repurchase agreements of $1.3 billion and $1.8 billion as of December 31, 2017 and 2016, respectively, and average balances of $1.5 billion and $2.9 billion for the years ended December 31, 2017 and 2016, respectively.
(c) Excludes long-term securities loaned of $1.3 billion and $1.2 billion as of December 31, 2017 and 2016, respectively, and average balances of $1.3 billion for both the years ended December 31, 2017 and 2016.
(d) Excludes federal funds purchased.
(e) Subordinated debt includes $1.6 billion of junior subordinated debentures distributed pro rata to the holders of the $1.6 billion of trust preferred securities which were cancelled on December 18, 2017. For further information see Note 19 .
(f) Other securitizations includes securitizations of student loans. The Firm deconsolidated the student loan securitization entities in the second quarter of 2017 as it no longer had a controlling financial interest in these entities as a result of the sale of the student loan portfolio. The Firm's wholesale businesses also securitize loans for client-driven transactions, which are not considered to be a source of funding for the Firm and are not included in the table.
(g) Includes long-term structured notes which are secured.
(h) For additional information on preferred stock and common stockholders' equity see Capital Risk Management on pages 82–91, Consolidated statements of changes in stockholders' equity, Note 20 and Note 21.

Short-term funding

The Firm's sources of short-term secured funding primarily consist of securities loaned or sold under agreements to repurchase. These instruments are secured predominantly by high-quality securities collateral, including government-issued debt and agency MBS, and constitute a significant portion of the federal funds purchased and securities loaned or sold under repurchase agreements on the Consolidated balance sheets. The increase in the average balance of securities loaned or sold under agreements to repurchase for the year ended December 31, 2017, compared to December 31, 2016, was largely due to client activities in CIB. The balances associated with securities loaned or sold under agreements to repurchase fluctuate over time due to customers' investment and financing activities; the Firm's demand for financing; the ongoing management of the mix of the Firm's liabilities, including its secured and unsecured financing (for both the investment securities and market-making portfolios); and other market and portfolio factors.

The Firm's sources of short-term unsecured funding primarily consist of issuances of wholesale commercial paper. The increase in short-term unsecured funding was primarily due to higher issuance of commercial paper reflecting in part a change in the mix of funding from securities sold under repurchase agreements for CIB Markets activities.

Long-term funding and issuance

Long-term funding provides additional sources of stable funding and liquidity for the Firm. The Firm's long-term funding plan is driven primarily by expected client activity, liquidity considerations, and regulatory requirements, including TLAC. Long-term funding objectives include maintaining diversification, maximizing market access and optimizing funding costs. The Firm evaluates various funding markets, tenors and currencies in creating its optimal long-term funding plan.

The significant majority of the Firm's long-term unsecured funding is issued by the Parent Company to provide maximum flexibility in support of both bank and non-bank subsidiary funding needs. The Parent Company advances substantially all net funding proceeds to its subsidiary, the IHC. The IHC does not issue debt to external counterparties. The following table summarizes long-term unsecured issuance and maturities or redemptions for the years ended December 31, 2017 and 2016. For additional information, see Note 19.

Long-term unsecured funding

Year ended December 31, (in millions)	2017	2016
Issuance		
Senior notes issued in the U.S. market	$ 21,192	$ 25,639
Senior notes issued in non-U.S. markets	2,210	7,063
Total senior notes	23,402	32,702
Subordinated debt	–	1,093
Structured notes	29,040	22,865
Total long-term unsecured funding – issuance	$ 52,442	$ 56,660
Maturities/redemptions		
Senior notes	$ 22,337	$ 29,989
Trust preferred securities	–	1,630
Subordinated debt	6,901	3,596
Structured notes	22,581	15,925
Total long-term unsecured funding – maturities/redemptions	$ 51,819	$ 51,140

The Firm raises secured long-term funding through securitization of consumer credit card loans and advances from the FHLBs.

The following table summarizes the securitization issuance and FHLB advances and their respective maturities or redemption for the years ended December 31, 2017 and 2016.

Long-term secured funding

Year ended December 31,	Issuance		Maturities/Redemptions	
(in millions)	2017	2016	2017	2016
Credit card securitization	$ 1,545	$ 8,277	$ 11,470	$ 5,025
Other securitizations[(a)]		–	55	233
FHLB advances	–	17,150	18,900	9,209
Other long-term secured funding[(b)]	2,354	455	731	2,645
Total long-term secured funding	$ 3,899	$ 25,882	$ 31,156	$ 17,112

(a) Other securitizations includes securitizations of student loans. The Firm deconsolidated the student loan securitization entities in the second quarter of 2017 as it no longer had a controlling financial interest in these entities as a result of the sale of the student loan portfolio.

(b) Includes long-term structured notes which are secured.

The Firm's wholesale businesses also securitize loans for client-driven transactions; those client-driven loan securitizations are not considered to be a source of funding for the Firm and are not included in the table above. For further description of the client-driven loan securitizations, see Note 14.

Credit ratings

The cost and availability of financing are influenced by credit ratings. Reductions in these ratings could have an adverse effect on the Firm's access to liquidity sources, increase the cost of funds, trigger additional collateral or funding requirements and decrease the number of investors and counterparties willing to lend to the Firm. Additionally, the Firm's funding requirements for VIEs and other third-party commitments may be adversely affected by a decline in credit ratings. For additional information on the impact of a credit ratings downgrade on the funding requirements for VIEs, and on derivatives and collateral agreements, see SPEs on page 50, and credit risk, liquidity risk and credit-related contingent features in Note 5 on page 186.

The credit ratings of the Parent Company and the Firm's principal bank and non-bank subsidiaries as of December 31, 2017, were as follows.

	JPMorgan Chase & Co.			JPMorgan Chase Bank, N.A. Chase Bank USA, N.A.			J.P. Morgan Securities LLC J.P. Morgan Securities plc		
December 31, 2017	Long-term issuer	Short-term issuer	Outlook	Long-term issuer	Short-term issuer	Outlook	Long-term issuer	Short-term issuer	Outlook
Moody's Investors Service	A3	P-2	Stable	Aa3	P-1	Stable	A1	P-1	Stable
Standard & Poor's	A-	A-2	Stable	A+	A-1	Stable	A+	A-1	Stable
Fitch Ratings	A+	F1	Stable	AA-	F1+	Stable	AA-	F1+	Stable

On February 22, 2017, Moody's published its updated rating methodologies for securities firms. As a result of this methodology change, J.P. Morgan Securities LLC's long-term issuer rating was downgraded by one notch from Aa3 to A1; the short-term issuer rating was unchanged and the outlook remained stable.

On June 1, 2017, JPMorgan Chase Bank, N.A. terminated its guarantee of the payment of all obligations of J.P. Morgan Securities plc arising after such termination. J.P. Morgan Securities plc, whose credit ratings previously reflected the benefit of this guarantee, is now rated on a stand-alone, non-guaranteed basis.

Downgrades of the Firm's long-term ratings by one or two notches could result in an increase in its cost of funds, and access to certain funding markets could be reduced as noted above. The nature and magnitude of the impact of ratings downgrades depends on numerous contractual and behavioral factors which the Firm believes are incorporated in its liquidity risk and stress testing metrics. The Firm believes that it maintains sufficient liquidity to withstand a potential decrease in funding capacity due to ratings downgrades.

JPMorgan Chase's unsecured debt does not contain requirements that would call for an acceleration of payments, maturities or changes in the structure of the existing debt, provide any limitations on future borrowings or require additional collateral, based on unfavorable changes in the Firm's credit ratings, financial ratios, earnings, or stock price.

Critical factors in maintaining high credit ratings include a stable and diverse earnings stream, strong capital ratios, strong credit quality and risk management controls, diverse funding sources, and disciplined liquidity monitoring procedures. Rating agencies continue to evaluate economic and geopolitical trends, regulatory developments, future profitability, risk management practices, and litigation matters, as well as their broader ratings methodologies. Changes in any of these factors could lead to changes in the Firm's credit ratings.

REPUTATION RISK MANAGEMENT

Reputation risk is the potential that an action, inaction, transaction, investment or event will reduce trust in the Firm's integrity or competence by its various constituents, including clients, counterparties, investors, regulators, employees and the broader public. Maintaining the Firm's reputation is the responsibility of each individual employee of the Firm. The Firm's Reputation Risk Governance policy explicitly vests each employee with the responsibility to consider the reputation of the Firm when engaging in any activity. Because the types of events that could harm the Firm's reputation are so varied across the Firm's lines of business, each line of business has a separate reputation risk governance infrastructure in place, which consists of three key elements: clear, documented escalation criteria appropriate to the business; a designated primary discussion forum – in most cases, one or more dedicated reputation risk committees; and a list of designated contacts to whom questions relating to reputation risk should be referred. Any matter giving rise to reputation risk that originates in a corporate function is required to be escalated directly to Firmwide Reputation Risk Governance ("FRRG") or to the relevant Risk Committee. Reputation risk governance is overseen by FRRG, which provides oversight of the governance infrastructure and process to support the consistent identification, escalation, management and monitoring of reputation risk issues firmwide.

CREDIT AND INVESTMENT RISK MANAGEMENT

Credit and investment risk is the risk associated with the default or change in credit profile of a client, counterparty or customer; or loss of principal or a reduction in expected returns on investments.

Credit risk management

Credit risk is the risk associated with the default or change in credit profile of a client, counterparty or customer. The Firm provides credit to a variety of customers, ranging from large corporate and institutional clients to individual consumers and small businesses. In its consumer businesses, the Firm is exposed to credit risk primarily through its home lending, credit card, auto, and business banking businesses. In its wholesale businesses, the Firm is exposed to credit risk through its underwriting, lending, market-making, and hedging activities with and for clients and counterparties, as well as through its operating services activities (such as cash management and clearing activities), securities financing activities, investment securities portfolio, and cash placed with banks.

Credit risk management is an independent risk management function that monitors, measures and manages credit risk throughout the Firm and defines credit risk policies and procedures. The credit risk function reports to the Firm's CRO. The Firm's credit risk management governance includes the following activities:

- Establishing a comprehensive credit risk policy framework
- Monitoring, measuring and managing credit risk across all portfolio segments, including transaction and exposure approval
- Setting industry concentration limits and establishing underwriting guidelines
- Assigning and managing credit authorities in connection with the approval of all credit exposure
- Managing criticized exposures and delinquent loans
- Estimating credit losses and ensuring appropriate credit risk-based capital management

Risk identification and measurement

The Credit Risk Management function monitors, measures, manages and limits credit risk across the Firm's businesses. To measure credit risk, the Firm employs several methodologies for estimating the likelihood of obligor or counterparty default. Methodologies for measuring credit risk vary depending on several factors, including type of asset (e.g., consumer versus wholesale), risk measurement parameters (e.g., delinquency status and borrower's credit score versus wholesale risk-rating) and risk management and collection processes (e.g., retail collection center versus centrally managed workout groups). Credit risk measurement is based on the probability of default of an obligor or counterparty, the loss severity given a default event and the exposure at default.

Based on these factors and related market-based inputs, the Firm estimates credit losses for its exposures. Probable credit losses inherent in the consumer and wholesale held-for-investment loan portfolios are reflected in the allowance for loan losses, and probable credit losses inherent in lending-related commitments are reflected in the allowance for lending-related commitments. These losses are estimated using statistical analyses and other factors as described in Note 13. In addition, potential and unexpected credit losses are reflected in the allocation of credit risk capital and represent the potential volatility of actual losses relative to the established allowances for loan losses and lending-related commitments. The analyses for these losses include stress testing that considers alternative economic scenarios as described in the Stress testing section below. For further information, see Critical Accounting Estimates used by the Firm on pages 138–140.

The methodologies used to estimate credit losses depend on the characteristics of the credit exposure, as described below.

Scored exposure

The scored portfolio is generally held in CCB and predominantly includes residential real estate loans, credit card loans, and certain auto and business banking loans. For the scored portfolio, credit loss estimates are based on statistical analysis of credit losses over discrete periods of time. The statistical analysis uses portfolio modeling, credit scoring, and decision-support tools, which consider loan-level factors such as delinquency status, credit scores, collateral values, and other risk factors. Credit loss analyses also consider, as appropriate, uncertainties and other factors, including those related to current macroeconomic and political conditions, the quality of underwriting standards, and other internal and external factors. The factors and analysis are updated on a quarterly basis or more frequently as market conditions dictate.

Risk-rated exposure

Risk-rated portfolios are generally held in CIB, CB and AWM, but also include certain business banking and auto dealer loans held in CCB that are risk-rated because they have characteristics similar to commercial loans. For the risk-rated portfolio, credit loss estimates are based on estimates of the probability of default ("PD") and loss severity given a default. The probability of default is the likelihood that a borrower will default on its obligation; the loss given default ("LGD") is the estimated loss on the loan that would be realized upon the default and takes into consideration collateral and structural support for each credit facility. The estimation process includes assigning risk ratings to each borrower and credit facility to differentiate risk within the portfolio. These risk ratings are reviewed regularly by Credit Risk Management and revised as needed to reflect the borrower's current financial position, risk profile and related collateral. The calculations and assumptions are based on both internal and external historical experience and management judgment and are reviewed regularly.

Stress testing

Stress testing is important in measuring and managing credit risk in the Firm's credit portfolio. The process assesses the potential impact of alternative economic and business scenarios on estimated credit losses for the Firm. Economic scenarios and the underlying parameters are defined centrally, articulated in terms of macroeconomic factors and applied across the businesses. The stress test results may indicate credit migration, changes in delinquency trends and potential losses in the credit portfolio. In addition to the periodic stress testing processes, management also considers additional stresses outside these scenarios, including industry and country-specific stress scenarios, as necessary. The Firm uses stress testing to inform decisions on setting risk appetite both at a Firm and LOB level, as well as to assess the impact of stress on individual counterparties.

Risk monitoring and management

The Firm has developed policies and practices that are designed to preserve the independence and integrity of the approval and decision-making process of extending credit to ensure credit risks are assessed accurately, approved properly, monitored regularly and managed actively at both the transaction and portfolio levels. The policy framework establishes credit approval authorities, concentration limits, risk-rating methodologies, portfolio review parameters and guidelines for management of distressed exposures. In addition, certain models, assumptions and inputs used in evaluating and monitoring credit risk are independently validated by groups that are separate from the line of businesses.

Consumer credit risk is monitored for delinquency and other trends, including any concentrations at the portfolio level, as certain of these trends can be modified through changes in underwriting policies and portfolio guidelines. Consumer Risk Management evaluates delinquency and other trends against business expectations, current and forecasted economic conditions, and industry benchmarks. Historical and forecasted economic performance and trends are incorporated into the modeling of estimated consumer credit losses and are part of the monitoring of the credit risk profile of the portfolio.

Wholesale credit risk is monitored regularly at an aggregate portfolio, industry, and individual client and counterparty level with established concentration limits that are reviewed and revised as deemed appropriate by management, typically on an annual basis. Industry and counterparty limits, as measured in terms of exposure and economic risk appetite, are subject to stress-based loss constraints. In addition, wrong-way risk – the risk that exposure to a counterparty is positively correlated with the impact of a default by the same counterparty, which could cause exposure to increase at the same time as the counterparty's capacity to meet its obligations is decreasing – is actively monitored as this risk could result in greater exposure at default compared with a transaction with another counterparty that does not have this risk.

Management of the Firm's wholesale credit risk exposure is accomplished through a number of means, including:

- Loan underwriting and credit approval process
- Loan syndications and participations
- Loan sales and securitizations
- Credit derivatives
- Master netting agreements
- Collateral and other risk-reduction techniques

In addition to Credit Risk Management, an independent Credit Review function is responsible for:

- Independently validating or changing the risk grades assigned to exposures in the Firm's wholesale and commercial-oriented retail credit portfolios, and assessing the timeliness of risk grade changes initiated by responsible business units; and
- Evaluating the effectiveness of business units' credit management processes, including the adequacy of credit analyses and risk grading/LGD rationales, proper monitoring and management of credit exposures, and compliance with applicable grading policies and underwriting guidelines.

For further discussion of consumer and wholesale loans, see Note 12.

Risk reporting

To enable monitoring of credit risk and effective decision-making, aggregate credit exposure, credit quality forecasts, concentration levels and risk profile changes are reported regularly to senior members of Credit Risk Management. Detailed portfolio reporting of industry; clients, counterparties and customers; product and geographic concentrations occurs monthly, and the appropriateness of the allowance for credit losses is reviewed by senior management at least on a quarterly basis. Through the risk reporting and governance structure, credit risk trends and limit exceptions are provided regularly to, and discussed with, risk committees, senior management and the Board of Directors as appropriate.

In the following tables, reported loans include loans retained (i.e., held-for-investment); loans held-for-sale; and certain loans accounted for at fair value. The following tables do not include certain loans the Firm accounts for at fair value and classifies as trading assets. For further information regarding these loans, see Note 2 and Note 3. For additional information on the Firm's loans, lending-related commitments, and derivative receivables, including the Firm's accounting policies, see Note 12, Note 27, and Note 5, respectively.

For further information regarding the credit risk inherent in the Firm's cash placed with banks, investment securities portfolio, and securities financing portfolio, see Note 4, Note 10, and Note 11, respectively.

For discussion of the consumer credit environment and consumer loans, see Consumer Credit Portfolio on pages 102-107 and Note 12. For discussion of the wholesale credit environment and wholesale loans, see Wholesale Credit Portfolio on pages 108–116 and Note 12.

Total credit portfolio

December 31, (in millions)	Credit exposure		Nonperforming[e][f]	
	2017	2016	**2017**	2016
Loans retained	**$ 924,838**	$ 889,907	**$ 5,943**	$ 6,721
Loans held-for-sale	**3,351**	2,628	**–**	162
Loans at fair value	**2,508**	2,230	**–**	–
Total loans – reported	**930,697**	894,765	**5,943**	6,883
Derivative receivables	**56,523**	64,078	**130**	223
Receivables from customers and other [a]	**26,272**	17,560	**–**	–
Total credit-related assets	**1,013,492**	976,403	**6,073**	7,106
Assets acquired in loan satisfactions				
Real estate owned	**NA**	NA	**311**	370
Other	**NA**	NA	**42**	59
Total assets acquired in loan satisfactions	**NA**	NA	**353**	429
Lending-related commitments	**991,482**	975,152 [d]	**731**	506
Total credit portfolio	**$2,004,974**	$1,951,555 [d]	**$ 7,157**	$ 8,041
Credit derivatives used in credit portfolio management activities[b]	**$ (17,609)**	$ (22,114)	**$ –**	$ –
Liquid securities and other cash collateral held against derivatives[c]	**(16,108)**	(22,705)	**NA**	NA

Year ended December 31, (in millions, except ratios)	2017	2016
Net charge-offs[g]	**$ 5,387**	$ 4,692
Average retained loans		
Loans	**898,979**	861,345
Loans – reported, excluding residential real estate PCI loans	**865,887**	822,973
Net charge-off rates[g]		
Loans	**0.60%**	0.54%
Loans – excluding PCI	**0.62**	0.57

(a) Receivables from customers and other primarily represents held-for-investment margin loans to brokerage customers.
(b) Represents the net notional amount of protection purchased and sold through credit derivatives used to manage both performing and nonperforming wholesale credit exposures; these derivatives do not qualify for hedge accounting under U.S. GAAP. For additional information, see Credit derivatives on pages 115–116 and Note 5.
(c) Includes collateral related to derivative instruments where an appropriate legal opinion has not been either sought or obtained.
(d) The prior period amounts have been revised to conform with the current period presentation.
(e) Excludes PCI loans. The Firm is recognizing interest income on each pool of PCI loans as each of the pools is performing.
(f) At December 31, 2017 and 2016, nonperforming assets excluded: (1) mortgage loans insured by U.S. government agencies of $4.3 billion and $5.0 billion, respectively, that are 90 or more days past due; (2) student loans insured by U.S. government agencies under the FFELP of zero and $263 million, respectively, that are 90 or more days past due; and (3) Real estate owned ("REO") insured by U.S. government agencies of $95 million and $142 million, respectively. These amounts have been excluded based upon the government guarantee. In addition, the Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status as permitted by regulatory guidance issued by the Federal Financial Institutions Examination Council ("FFIEC").
(g) For the year ended December 31, 2017, excluding net charge-offs of $467 million related to the student loan portfolio sale, the net charge-off rate for loans would have been 0.55% and for loans - excluding PCI would have been 0.57%.

CONSUMER CREDIT PORTFOLIO

The Firm’s retained consumer portfolio consists primarily of residential real estate loans, credit card loans, auto loans, and business banking loans, as well as associated lending-related commitments. The Firm’s focus is on serving primarily the prime segment of the consumer credit market. Originated mortgage loans are retained in the mortgage portfolio, securitized or sold to U.S. government agencies and U.S. government-sponsored enterprises; other types of consumer loans are typically retained on the balance sheet. The credit performance of the consumer portfolio continues to benefit from discipline in credit underwriting as well as improvement in the economy driven by increasing home prices and low unemployment. The total amount of residential real estate loans delinquent 30+ days, excluding government guaranteed and purchased credit impaired loans, increased from December 31, 2016 due to the impact of recent hurricanes; however, the 30+ day delinquency rate decreased due to growth in the portfolio. The Credit Card 30+ day delinquency rate and the net charge-off rate increased from the prior year, in line with expectations. For further information on consumer loans, see Note 12. For further information on lending-related commitments, see Note 27.

The following table presents consumer credit-related information with respect to the credit portfolio held by CCB, prime mortgage and home equity loans held by AWM, and prime mortgage loans held by Corporate. For further information about the Firm's nonaccrual and charge-off accounting policies, see Note 12.

Consumer credit portfolio

As of or for the year ended December 31, (in millions, except ratios)	Credit exposure		Nonaccrual loans[k][l]		Net charge-offs/ (recoveries)[e][m][n]		Average annual net charge-off rate[e][m][n]	
	2017	2016	**2017**	2016	**2017**	2016	**2017**	2016
Consumer, excluding credit card								
Loans, excluding PCI loans and loans held-for-sale								
Residential mortgage[a]	**$ 216,496**	$ 192,486	**$ 2,175**	$ 2,256	**$ (10)**	$ 16	**—%**	0.01%
Home equity	**33,450**	39,063	**1,610**	1,845	**69**	189	**0.19**	0.45
Auto[b][c]	**66,242**	65,814	**141**	214	**331**	285	**0.51**	0.45
Consumer & Business Banking[a][c][d]	**25,789**	24,307	**283**	287	**257**	257	**1.03**	1.10
Student[a][e]	**—**	7,057	**—**	165	**498**	162	**NM**	2.13
Total loans, excluding PCI loans and loans held-for-sale	**341,977**	328,727	**4,209**	4,767	**1,145**	909	**0.34**	0.28
Loans – PCI								
Home equity	**10,799**	12,902	**NA**	NA	**NA**	NA	**NA**	NA
Prime mortgage	**6,479**	7,602	**NA**	NA	**NA**	NA	**NA**	NA
Subprime mortgage	**2,609**	2,941	**NA**	NA	**NA**	NA	**NA**	NA
Option ARMs[f]	**10,689**	12,234	**NA**	NA	**NA**	NA	**NA**	NA
Total loans – PCI	**30,576**	35,679	**NA**	NA	**NA**	NA	**NA**	NA
Total loans – retained	**372,553**	364,406	**4,209**	4,767	**1,145**	909	**0.31**	0.25
Loans held-for-sale	**128**	238	**—**	53	**—**	—	**—**	—
Total consumer, excluding credit card loans	**372,681**	364,644	**4,209**	4,820	**1,145**	909	**0.31**	0.25
Lending-related commitments[g]	**48,553**	53,247 [j]						
Receivables from customers[h]	**133**	120						
Total consumer exposure, excluding credit card	**421,367**	418,011 [j]						
Credit Card								
Loans retained[i]	**149,387**	141,711	**—**	—	**4,123**	3,442	**2.95**	2.63
Loans held-for-sale	**124**	105	**—**	—	**—**	—	**—**	—
Total credit card loans	**149,511**	141,816	**—**	—	**4,123**	3,442	**2.95**	2.63
Lending-related commitments[g]	**572,831**	553,891						
Total credit card exposure	**722,342**	695,707						
Total consumer credit portfolio	**$ 1,143,709**	$ 1,113,718 [j]	**$ 4,209**	$ 4,820	**$ 5,268**	$ 4,351	**1.04%**	0.89%
Memo: Total consumer credit portfolio, excluding PCI	**$ 1,113,133**	$ 1,078,039 [j]	**$ 4,209**	$ 4,820	**$ 5,268**	$ 4,351	**1.11%**	0.96%

(a) Certain loan portfolios have been reclassified. The prior period amounts have been revised to conform with the current period presentation.
(b) At December 31, 2017 and 2016, excluded operating lease assets of $17.1 billion and $13.2 billion, respectively. These operating lease assets are included in other assets on the Firm's Consolidated balance sheets. The risk of loss on these assets relates to the residual value of the leased vehicles, which is managed through projection of the lease residual value at lease origination, periodic review of residual values, and through arrangements with certain auto manufacturers that mitigates this risk.
(c) Includes certain business banking and auto dealer risk-rated loans that apply the wholesale methodology for determining the allowance for loan losses; these loans are managed by CCB, and therefore, for consistency in presentation, are included within the consumer portfolio.
(d) Predominantly includes Business Banking loans.
(e) For the year ended December 31, 2017, excluding net charge-offs of $467 million related to the student loan portfolio sale, the net charge-off rate for Total consumer, excluding credit card and PCI loans and loans held-for-sale would have been 0.20%; Total consumer - retained excluding credit card loans would have been 0.18%; Total consumer credit portfolio would have been 0.95%; and Total consumer credit portfolio, excluding PCI loans would have been 1.01%.
(f) At December 31, 2017 and 2016, approximately 68% and 66%, respectively, of the PCI option adjustable rate mortgages ("ARMs") portfolio has been modified into fixed-rate, fully amortizing loans.
(g) Credit card and home equity lending-related commitments represent the total available lines of credit for these products. The Firm has not experienced, and does not anticipate, that all available lines of credit would be used at the same time. For credit card and home equity commitments (if certain conditions are met), the Firm can reduce or cancel these lines of credit by providing the borrower notice or, in some cases as permitted by law, without notice. For further information, see Note 27.
(h) Receivables from customers represent held-for-investment margin loans to brokerage customers that are collateralized through assets maintained in the clients' brokerage accounts. These receivables are reported within accrued interest and accounts receivable on the Firm's Consolidated balance sheets.
(i) Includes billed interest and fees net of an allowance for uncollectible interest and fees.
(j) The prior period amounts have been revised to conform with the current period presentation.
(k) At December 31, 2017 and 2016, nonaccrual loans excluded loans 90 or more days past due as follows: (1) mortgage loans insured by U.S. government agencies of $4.3 billion and $5.0 billion, respectively; and (2) student loans insured by U.S. government agencies under the FFELP of zero and $263 million, respectively. These amounts have been excluded from nonaccrual loans based upon the government guarantee. In addition, the Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status, as permitted by regulatory guidance issued by the FFIEC.
(l) Excludes PCI loans. The Firm is recognizing interest income on each pool of PCI loans as each of the pools is performing.
(m) Net charge-offs and net charge-off rates excluded write-offs in the PCI portfolio of $86 million and $156 million for the years ended December 31, 2017 and 2016. These write-offs decreased the allowance for loan losses for PCI loans. See Allowance for Credit Losses on pages 117–119 for further details.
(n) Average consumer loans held-for-sale were $1.5 billion and $496 million for the years ended December 31, 2017 and 2016, respectively. These amounts were excluded when calculating net charge-off rates.

Consumer, excluding credit card

Portfolio analysis

Consumer loan balances increased from December 31, 2016 predominantly due to originations of high-quality prime mortgage loans that have been retained on the balance sheet, partially offset by the sale of the student loan portfolio as well as paydowns and the charge-off or liquidation of delinquent loans.

PCI loans are excluded from the following discussions of individual loan products and are addressed separately below. For further information about the Firm's consumer portfolio, including information about delinquencies, loan modifications and other credit quality indicators, see Note 12.

Residential mortgage: The residential mortgage portfolio predominantly consists of high-quality prime mortgage loans with a small component (approximately 1%) of subprime mortgage loans. These subprime mortgage loans continue to run-off and are performing in line with expectations. The residential mortgage portfolio, including loans held-for-sale, increased from December 31, 2016 due to retained originations of primarily high-quality fixed rate prime mortgage loans partially offset by paydowns. Residential mortgage 30+ day delinquencies increased from December 31, 2016 due to the impact of recent hurricanes. Nonaccrual loans decreased from the prior year primarily as a result of loss mitigation activities. There was a net recovery for the year ended December 31, 2017 compared to a net charge-off for the year ended December 31, 2016, reflecting continued improvement in home prices and delinquencies.

At December 31, 2017 and 2016, the Firm's residential mortgage portfolio, including loans held-for-sale, included $8.6 billion and $9.5 billion, respectively, of mortgage loans insured and/or guaranteed by U.S. government agencies, of which $6.2 billion and $7.0 billion, respectively, were 30 days or more past due (of these past due loans, $4.3 billion and $5.0 billion, respectively, were 90 days or more past due). The Firm monitors its exposure to certain potential unrecoverable claim payments related to government insured loans and considers this exposure in estimating the allowance for loan losses.

At December 31, 2017 and 2016, the Firm's residential mortgage portfolio included $20.2 billion and $19.1 billion, respectively, of interest-only loans. These loans have an interest-only payment period generally followed by an adjustable-rate or fixed-rate fully amortizing payment period to maturity and are typically originated as higher-balance loans to higher-income borrowers. To date, losses on this portfolio generally have been consistent with the broader residential mortgage portfolio. The Firm continues to monitor the risks associated with these loans.

Home equity: The home equity portfolio declined from December 31, 2016 primarily reflecting loan paydowns. The amount of 30+ day delinquencies decreased from December 31, 2016 but was impacted by recent hurricanes. Nonaccrual loans decreased from December 31, 2016 primarily as a result of loss mitigation activities. Net charge-offs for the year ended December 31, 2017 declined when compared with the prior year, partially as a result of lower loan balances.

At December 31, 2017, approximately 90% of the Firm's home equity portfolio consists of home equity lines of credit ("HELOCs") and the remainder consists of home equity loans ("HELOANs"). HELOANs are generally fixed-rate, closed-end, amortizing loans, with terms ranging from 3–30 years. In general, HELOCs originated by the Firm are revolving loans for a 10-year period, after which time the HELOC recasts into a loan with a 20-year amortization period.

The carrying value of HELOCs outstanding was $30 billion at December 31, 2017. Of such amounts, $14 billion have recast from interest-only to fully amortizing payments or have been modified and $5 billion are interest-only balloon HELOCs, which primarily mature after 2030. The Firm manages the risk of HELOCs during their revolving period by closing or reducing the undrawn line to the extent permitted by law when borrowers are exhibiting a material deterioration in their credit risk profile.

The Firm monitors risks associated with junior lien loans where the borrower has a senior lien loan that is more than 90 days delinquent or has been modified. These loans are considered "high-risk seconds" and are classified as nonaccrual as they are considered to pose a higher risk of default than other junior lien loans. At December 31, 2017, the Firm estimated that the carrying value of its home equity portfolio contained approximately $725 million of current junior lien loans that were considered high-risk seconds, compared with $1.1 billion at December 31, 2016. For further information, see Note 12.

Auto: The auto loan portfolio, which predominantly consists of prime-quality loans, was relatively flat compared with December 31, 2016, as new originations were largely offset by paydowns and the charge-off or liquidation of delinquent loans. Nonaccrual loans decreased compared with December 31, 2016. Net charge-offs for the year ended December 31, 2017 increased compared with the prior year, primarily as a result of an incremental adjustment recorded in accordance with regulatory guidance regarding the timing of loss recognition for certain loans in bankruptcy and loans where assets were acquired in loan satisfaction.

Consumer & Business banking: Consumer & Business Banking loans increased compared with December 31, 2016 as growth due to loan originations was partially offset by paydowns and the charge-off or liquidation of delinquent loans. Nonaccrual loans and net charge-offs were relatively flat compared with prior year.

Student: The Firm wrote down and subsequently sold the student loan portfolio during 2017. Net charge-offs for the year ended December 31, 2017 increased as a result of the write-down.

Purchased credit-impaired loans: PCI loans decreased as the portfolio continues to run off. As of December 31, 2017, approximately 11% of the option ARM PCI loans were delinquent and approximately 68% of the portfolio had been modified into fixed-rate, fully amortizing loans. The borrowers for substantially all of the remaining loans are making amortizing payments, although such payments are not necessarily fully amortizing. This latter group of loans is subject to the risk of payment shock due to future payment recast. Default rates generally increase on option ARM loans when payment recast results in a payment increase. The expected increase in default rates is considered in the Firm's quarterly impairment assessment.

The following table provides a summary of lifetime principal loss estimates included in either the nonaccretable difference or the allowance for loan losses.

Summary of PCI loans lifetime principal loss estimates

	Lifetime loss estimates[(a)]		Life-to-date liquidation losses[(b)]	
December 31, (in billions)	**2017**	2016	**2017**	2016
Home equity	**$ 14.2**	$ 14.4	**$ 12.9**	$ 12.8
Prime mortgage	**4.0**	4.0	**3.8**	3.7
Subprime mortgage	**3.3**	3.2	**3.1**	3.1
Option ARMs	**10.0**	10.0	**9.7**	9.7
Total	**$ 31.5**	$ 31.6	**$ 29.5**	$ 29.3

(a) Includes the original nonaccretable difference established in purchase accounting of $30.5 billion for principal losses plus additional principal losses recognized subsequent to acquisition through the provision and allowance for loan losses. The remaining nonaccretable difference for principal losses was $842 million and $1.1 billion at December 31, 2017 and 2016, respectively.

(b) Represents both realization of loss upon loan resolution and any principal forgiven upon modification.

For further information on the Firm's PCI loans, including write-offs, see Note 12.

Geographic composition of residential real estate loans

At December 31, 2017, $152.8 billion, or 63% of the total retained residential real estate loan portfolio, excluding mortgage loans insured by U.S. government agencies and PCI loans, were concentrated in California, New York, Illinois, Texas and Florida, compared with $139.9 billion, or 63%, at December 31, 2016. For additional information on the geographic composition of the Firm's residential real estate loans, see Note 12.

Current estimated loan-to-values of residential real estate loans

Average current estimated loan-to-value ("LTV") ratios have declined consistent with improvements in home prices, customer pay downs, and charge-offs or liquidations of higher LTV loans. For further information on current estimated LTVs of residential real estate loans, see Note 12.

Loan modification activities for residential real estate loans

The performance of modified loans generally differs by product type due to differences in both the credit quality and the types of modifications provided. Performance metrics for modifications to the residential real estate portfolio, excluding PCI loans, that have been seasoned more than six months show weighted-average redefault rates of 24% for residential mortgages and 21% for home equity. The cumulative performance metrics for modifications to the PCI residential real estate portfolio that have been seasoned more than six months show weighted average redefault rates of 20% for home equity, 19% for prime mortgages, 16% for option ARMs and 34% for subprime mortgages. The cumulative redefault rates reflect the performance of modifications completed under both the U.S. Government's Home Affordable Modification Program ("HAMP") and the Firm's proprietary modification programs (primarily the Firm's modification program that was modeled after HAMP) from October 1, 2009, through December 31, 2017.

Certain loans that were modified under HAMP and the Firm's proprietary modification programs have interest rate reset provisions ("step-rate modifications"). Interest rates on these loans generally began to increase commencing in 2014 by 1% per year, and will continue to do so until the rate reaches a specified cap. The cap on these loans is typically at a prevailing market interest rate for a fixed-rate mortgage loan as of the modification date. At December 31, 2017, the carrying value of non-PCI loans and the unpaid principal balance of PCI loans modified in step-rate modifications, which have not yet met their specified caps, were $3 billion and $7 billion, respectively. The Firm continues to monitor this risk exposure and the impact of these potential interest rate increases is considered in the Firm's allowance for loan losses.

The following table presents information as of December 31, 2017 and 2016, relating to modified retained residential real estate loans for which concessions have been granted to borrowers experiencing financial difficulty. For further information on modifications for the years ended December 31, 2017 and 2016, see Note 12.

Modified residential real estate loans

December 31, (in millions)	2017 Retained loans	2017 Nonaccrual retained loans[d]	2016 Retained loans	2016 Nonaccrual retained loans[d]
Modified residential real estate loans, excluding PCI loans[a][b]				
Residential mortgage	**5,620**	**1,743**	6,032	1,755
Home equity	**$ 2,118**	**$ 1,032**	$ 2,264	$ 1,116
Total modified residential real estate loans, excluding PCI loans	**$ 7,738**	**$ 2,775**	$ 8,296	$ 2,871
Modified PCI loans[c]				
Home equity	**$ 2,277**	**NA**	$ 2,447	NA
Prime mortgage	**4,490**	**NA**	5,052	NA
Subprime mortgage	**2,678**	**NA**	2,951	NA
Option ARMs	**8,276**	**NA**	9,295	NA
Total modified PCI loans	**$17,721**	**NA**	$19,745	NA

(a) Amounts represent the carrying value of modified residential real estate loans.
(b) At December 31, 2017 and 2016, $3.8 billion and $3.4 billion, respectively, of loans modified subsequent to repurchase from Ginnie Mae in accordance with the standards of the appropriate government agency (i.e., Federal Housing Administration ("FHA"), U.S. Department of Veterans Affairs ("VA"), Rural Housing Service of the U.S. Department of Agriculture ("RHS")) are not included in the table above. When such loans perform subsequent to modification in accordance with Ginnie Mae guidelines, they are generally sold back into Ginnie Mae loan pools. Modified loans that do not re-perform become subject to foreclosure. For additional information about sales of loans in securitization transactions with Ginnie Mae, see Note 14.
(c) Amounts represent the unpaid principal balance of modified PCI loans.
(d) As of December 31, 2017 and 2016, nonaccrual loans included $2.2 billion and $2.3 billion, respectively, of troubled debt restructuring ("TDRs") for which the borrowers were less than 90 days past due. For additional information about loans modified in a TDR that are on nonaccrual status, see Note 12.

Nonperforming assets

The following table presents information as of December 31, 2017 and 2016, about consumer, excluding credit card, nonperforming assets.

Nonperforming assets[a]

December 31, (in millions)	2017	2016
Nonaccrual loans[b]		
Residential real estate[c]	**$ 3,785**	$ 4,154
Other consumer[c]	**424**	666
Total nonaccrual loans	**4,209**	4,820
Assets acquired in loan satisfactions		
Real estate owned	**225**	292
Other	**40**	57
Total assets acquired in loan satisfactions	**265**	349
Total nonperforming assets	**$ 4,474**	$ 5,169

(a) At December 31, 2017 and 2016, nonperforming assets excluded: (1) mortgage loans insured by U.S. government agencies of $4.3 billion and $5.0 billion, respectively, that are 90 or more days past due; (2) student loans insured by U.S. government agencies under the FFELP of zero and $263 million, respectively, that are 90 or more days past due; and (3) real estate owned insured by U.S. government agencies of $95 million and $142 million, respectively. These amounts have been excluded based upon the government guarantee.
(b) Excludes PCI loans which are accounted for on a pool basis. Since each pool is accounted for as a single asset with a single composite interest rate and an aggregate expectation of cash flows, the past-due status of the pools, or that of individual loans within the pools, is not meaningful. The Firm is recognizing interest income on each pool of loans as each of the pools is performing.
(c) Certain loan portfolios have been reclassified. The prior period amounts have been revised to conform with the current period presentation.

Nonaccrual loans in the residential real estate portfolio at December 31, 2017 decreased to $3.8 billion from $4.2 billion at December 31, 2016, of which 26% and 29% were greater than 150 days past due, respectively. In the aggregate, the unpaid principal balance of residential real estate loans greater than 150 days past due was charged down by approximately 40% and 43% to the estimated net realizable value of the collateral at December 31, 2017 and 2016, respectively.

Active and suspended foreclosure: For information on loans that were in the process of active or suspended foreclosure, see Note 12.

Nonaccrual loans: The following table presents changes in the consumer, excluding credit card, nonaccrual loans for the years ended December 31, 2017 and 2016.

Nonaccrual loan activity

Year ended December 31, (in millions)	2017	2016
Beginning balance	**$ 4,820**	$ 5,413
Additions	**3,525**	3,858
Reductions:		
Principal payments and other[a]	**1,577**	1,437
Charge-offs	**699**	843
Returned to performing status	**1,509**	1,589
Foreclosures and other liquidations	**351**	582
Total reductions	**4,136**	4,451
Net changes	**(611)**	(593)
Ending balance	**$ 4,209**	$ 4,820

(a) Other reductions includes loan sales.

Credit card

Total credit card loans increased from December 31, 2016 due to strong new account growth and higher sales volume. The December 31, 2017 30+ day delinquency rate increased to 1.80% from 1.61% at December 31, 2016, while the December 31, 2017 90+ day delinquency rate increased to 0.92% from 0.81% at December 31, 2016, in line with expectations. Net charge-offs increased for the year ended December 31, 2017 primarily due to growth in newer vintages which, as anticipated, have higher loss rates than the more seasoned portion of the portfolio. The credit card portfolio continues to reflect a largely well-seasoned portfolio that has strong U.S. geographic diversification.

Loans outstanding in the top five states of California, Texas, New York, Florida and Illinois consisted of $67.2 billion in receivables, or 45% of the retained loan portfolio, at December 31, 2017, compared with $62.8 billion, or 44%, at December 31, 2016. For more information on the geographic and FICO composition of the Firm's credit card loans, see Note 12.

Modifications of credit card loans

At both December 31, 2017 and 2016, the Firm had $1.2 billion of credit card loans outstanding that have been modified in TDRs. These balances included both credit card loans with modified payment terms and credit card loans that reverted back to their pre-modification payment terms because the cardholder did not comply with the modified payment terms.

Consistent with the Firm's policy, all credit card loans typically remain on accrual status until charged off. However, the Firm establishes an allowance, which is offset against loans and charged to interest income, for the estimated uncollectible portion of accrued and billed interest and fee income.

For additional information about loan modification programs to borrowers, see Note 12.

WHOLESALE CREDIT PORTFOLIO

In its wholesale businesses, the Firm is exposed to credit risk through its underwriting, lending, market-making, and hedging activities with and for clients and counterparties, as well as through its operating services activities (such as cash management and clearing activities), securities financing activities, investment securities portfolio, and cash placed with banks. A portion of the loans originated or acquired by the Firm's wholesale businesses is generally retained on the balance sheet. The Firm distributes a significant percentage of the loans it originates into the market as part of its syndicated loan business and to manage portfolio concentrations and credit risk.

The wholesale credit portfolio was stable for the year ended December 31, 2017, characterized by low levels of criticized exposure, nonaccrual loans and charge-offs. See industry discussion on pages 109–112 for further information. The increase in retained loans was driven by new originations in CB and higher loans to Private Banking clients in AWM, which was partially offset by paydowns in CIB. Discipline in underwriting across all areas of lending continues to be a key point of focus. The wholesale portfolio is actively managed, in part by conducting ongoing, in-depth reviews of client credit quality and transaction structure inclusive of collateral where applicable, and of industry, product and client concentrations.

In the following tables, the Firm's wholesale credit portfolio includes exposure held in CIB, CB, AWM and Corporate, and excludes all exposure managed by CCB.

Wholesale credit portfolio

December 31, (in millions)	Credit exposure		Nonperforming[c]	
	2017	2016	**2017**	2016
Loans retained	**$ 402,898**	$ 383,790	**$ 1,734**	$ 1,954
Loans held-for-sale	**3,099**	2,285	**–**	109
Loans at fair value	**2,508**	2,230	**–**	–
Loans – reported	**408,505**	388,305	**1,734**	2,063
Derivative receivables	**56,523**	64,078	**130**	223
Receivables from customers and other[a]	**26,139**	17,440	**–**	–
Total wholesale credit-related assets	**491,167**	469,823	**1,864**	2,286
Lending-related commitments	**370,098**	368,014	**731**	506
Total wholesale credit exposure	**$ 861,265**	$ 837,837	**$ 2,595**	$ 2,792
Credit derivatives used in credit portfolio management activities[b]	**$ (17,609)**	$ (22,114)	**$ –**	$ –
Liquid securities and other cash collateral held against derivatives	**(16,108)**	(22,705)	**NA**	NA

(a) Receivables from customers and other include $26.0 billion and $17.3 billion of held-for-investment margin loans at December 31, 2017 and 2016, respectively, to brokerage customers in CIB Prime Services and in AWM; these are classified in accrued interest and accounts receivable on the Consolidated balance sheets.
(b) Represents the net notional amount of protection purchased and sold through credit derivatives used to manage both performing and nonperforming wholesale credit exposures; these derivatives do not qualify for hedge accounting under U.S. GAAP. For additional information, see Credit derivatives on pages 115-116, and Note 5.
(c) Excludes assets acquired in loan satisfactions.

The following tables present the maturity and ratings profiles of the wholesale credit portfolio as of December 31, 2017 and 2016. The ratings scale is based on the Firm's internal risk ratings, which generally correspond to the ratings assigned by S&P and Moody's. For additional information on wholesale loan portfolio risk ratings, see Note 12.

Wholesale credit exposure – maturity and ratings profile

	Maturity profile[d]				Ratings profile			
					Investment-grade	Noninvestment-grade		
December 31, 2017 (in millions, except ratios)	Due in 1 year or less	Due after 1 year through 5 years	Due after 5 years	**Total**	AAA/Aaa to BBB-/Baa3	BB+/Ba1 & below	**Total**	Total % of IG
Loans retained	**$ 121,643**	**$ 177,033**	**$ 104,222**	**$ 402,898**	**$ 311,681**	**$ 91,217**	**$ 402,898**	**77%**
Derivative receivables				**56,523**			**56,523**	
Less: Liquid securities and other cash collateral held against derivatives				**(16,108)**			**(16,108)**	
Total derivative receivables, net of all collateral	**9,882**	**10,463**	**20,070**	**40,415**	**32,373**	**8,042**	**40,415**	**80**
Lending-related commitments	**80,273**	**275,317**	**14,508**	**370,098**	**274,127**	**95,971**	**370,098**	**74**
Subtotal	**211,798**	**462,813**	**138,800**	**813,411**	**618,181**	**195,230**	**813,411**	**76**
Loans held-for-sale and loans at fair value[a]				**5,607**			**5,607**	
Receivables from customers and other				**26,139**			**26,139**	
Total exposure – net of liquid securities and other cash collateral held against derivatives				**$ 845,157**			**$ 845,157**	
Credit derivatives used in credit portfolio management activities[b][c]	**$ (1,807)**	**$ (11,011)**	**$ (4,791)**	**$ (17,609)**	**$ (14,984)**	**$ (2,625)**	**$ (17,609)**	**85%**

	Maturity profile[d]				Ratings profile			
					Investment-grade	Noninvestment-grade		
December 31, 2016 (in millions, except ratios)	Due in 1 year or less	Due after 1 year through 5 years	Due after 5 years	Total	AAA/Aaa to BBB-/Baa3	BB+/Ba1 & below	Total	Total % of IG
Loans retained	$ 117,238	$ 167,235	$ 99,317	$ 383,790	$ 289,923	$ 93,867	$ 383,790	76%
Derivative receivables				64,078			64,078	
Less: Liquid securities and other cash collateral held against derivatives				(22,705)			(22,705)	
Total derivative receivables, net of all collateral	14,019	8,510	18,844	41,373	33,081	8,292	41,373	80
Lending-related commitments	88,399	271,825	7,790	368,014	269,820	98,194	368,014	73
Subtotal	219,656	447,570	125,951	793,177	592,824	200,353	793,177	75
Loans held-for-sale and loans at fair value[a]				4,515			4,515	
Receivables from customers and other				17,440			17,440	
Total exposure – net of liquid securities and other cash collateral held against derivatives				$ 815,132			$ 815,132	
Credit derivatives used in credit portfolio management activities [b][c]	$ (1,354)	$ (16,537)	$ (4,223)	$ (22,114)	$ (18,710)	$ (3,404)	$ (22,114)	85%

(a) Represents loans held-for-sale, primarily related to syndicated loans and loans transferred from the retained portfolio, and loans at fair value.
(b) These derivatives do not qualify for hedge accounting under U.S. GAAP.
(c) The notional amounts are presented on a net basis by underlying reference entity and the ratings profile shown is based on the ratings of the reference entity on which protection has been purchased. Predominantly all of the credit derivatives entered into by the Firm where it has purchased protection used in credit portfolio management activities, are executed with investment-grade counterparties.
(d) The maturity profile of retained loans, lending-related commitments and derivative receivables is based on remaining contractual maturity. Derivative contracts that are in a receivable position at December 31, 2017, may become payable prior to maturity based on their cash flow profile or changes in market conditions.

Wholesale credit exposure – industry exposures

The Firm focuses on the management and diversification of its industry exposures, and pays particular attention to industries with actual or potential credit concerns. Exposures deemed criticized align with the U.S. banking regulators' definition of criticized exposures, which consist of the special mention, substandard and doubtful categories. The total criticized component of the portfolio, excluding loans held-for-sale and loans at fair value, was $15.6 billion at December 31, 2017, compared with $19.8 billion at December 31, 2016, driven by a 47% decrease in the Oil & Gas portfolio.

In 2017, the Firm revised its methodology for the assignment of industry classifications, to better monitor and manage concentrations. This largely resulted in the re-assignment of holding companies from All other to the industry of risk category based on the primary business activity of the holding company's underlying entities. In the tables and industry discussions below, the prior period amounts have been revised to conform with the current period presentation.

Below are summaries of the Firm's exposures as of December 31, 2017 and 2016. For additional information on industry concentrations, see Note 4.

Wholesale credit exposure – industries[(a)]

			Noninvestment-grade			Selected metrics			
As of or for the year ended **December 31, 2017** (in millions)	Credit exposure[(e)]	Investment-grade	Noncriticized	Criticized performing	Criticized nonperforming	30 days or more past due and accruing loans	Net charge-offs/ (recoveries)	Credit derivative hedges[(f)]	Liquid securities and other cash collateral held against derivative receivables
Real Estate	$ 139,409	$ 115,401	$ 23,012	$ 859	$ 137	$ 254	$ (4)	$ –	$ (2)
Consumer & Retail	87,679	55,737	29,619	1,791	532	30	34	(275)	(9)
Technology, Media & Telecommunications	59,274	36,510	20,453	2,258	53	14	(12)	(910)	(19)
Healthcare	55,997	42,643	12,731	585	38	82	(1)	–	(207)
Industrials	55,272	37,198	16,770	1,159	145	150	(1)	(196)	(21)
Banks & Finance Cos	49,037	34,654	13,767	612	4	1	6	(1,216)	(3,174)
Oil & Gas	41,317	21,430	14,854	4,046	987	22	71	(747)	(1)
Asset Managers	32,531	28,029	4,484	4	14	27	–	–	(5,290)
Utilities	29,317	24,486	4,383	227	221	–	11	(160)	(56)
State & Municipal Govt[(b)]	28,633	27,977	656	–	–	12	5	(130)	(524)
Central Govt	19,182	18,741	376	65	–	4	–	(10,095)	(2,520)
Chemicals & Plastics	15,945	11,107	4,764	74	–	4	–	–	–
Transportation	15,797	9,870	5,302	527	98	9	14	(32)	(131)
Automotive	14,820	9,321	5,278	221	–	10	1	(284)	–
Metals & Mining	14,171	6,989	6,822	321	39	3	(13)	(316)	(1)
Insurance	14,089	11,028	2,981	–	80	1	–	(157)	(2,195)
Financial Markets Infrastructure	5,036	4,775	261	–	–	–	–	–	(23)
Securities Firms	4,113	2,559	1,553	1	–	–	–	(274)	(335)
All other[(c)]	147,900	134,110	13,283	260	247	901	8	(2,817)	(1,600)
Subtotal	$ 829,519	$ 632,565	$ 181,349	$ 13,010	$ 2,595	$ 1,524	$ 119	$ (17,609)	$ (16,108)
Loans held-for-sale and loans at fair value	5,607								
Receivables from customers and other	26,139								
Total[(d)]	$ 861,265								

As of or for the year ended December 31, 2016 (in millions)	Credit exposure[e]	Investment-grade	Noninvestment-grade: Noncriticized	Noninvestment-grade: Criticized performing	Noninvestment-grade: Criticized nonperforming	Selected metrics: 30 days or more past due and accruing loans	Selected metrics: Net charge-offs/ (recoveries)	Selected metrics: Credit derivative hedges[f]	Selected metrics: Liquid securities and other cash collateral held against derivative receivables[g]
Real Estate	$ 134,287	$ 104,869	$ 28,281	$ 937	$ 200	$ 206	$ (7)	$ (54)	$ (11)
Consumer & Retail	84,804	54,730	28,255	1,571	248	75	24	(424)	(69)
Technology, Media & Telecommunications	63,324	39,998	21,751	1,559	16	9	2	(589)	(30)
Healthcare	49,445	39,244	9,279	882	40	86	37	(286)	(246)
Industrials	55,733	36,710	17,854	1,033	136	128	3	(434)	(40)
Banks & Finance Cos	48,393	35,385	12,560	438	10	21	(2)	(1,336)	(7,337)
Oil & Gas	40,367	18,629	12,274	8,069	1,395	31	233	(1,532)	(18)
Asset Managers	33,201	29,194	4,006	1	–	17	–	–	(5,737)
Utilities	29,672	24,203	4,959	424	86	8	–	(306)	–
State & Municipal Govt[b]	28,263	27,603	624	6	30	107	(1)	(130)	–
Central Govt	20,408	20,123	276	9	–	4	–	(11,691)	(4,183)
Chemicals & Plastics	15,043	10,405	4,452	156	30	3	–	(35)	(3)
Transportation	19,096	12,178	6,421	444	53	9	10	(93)	(188)
Automotive	16,736	9,235	7,299	201	1	7	–	(401)	(14)
Metals & Mining	13,419	5,523	6,744	1,133	19	–	36	(621)	(62)
Insurance	13,510	10,918	2,459	–	133	9	–	(275)	(2,538)
Financial Markets Infrastructure	8,732	7,980	752	–	–	–	–	–	(390)
Securities Firms	4,211	1,812	2,399	–	–	–	–	(273)	(491)
All other[c]	137,238	124,661	11,988	303	286	598	6	(3,634)	(1,348)
Subtotal	$ 815,882	$ 613,400	$ 182,633	$ 17,166	$ 2,683	$ 1,318	$ 341	$ (22,114)	$ (22,705)
Loans held-for-sale and loans at fair value	4,515								
Receivables from customers and other	17,440								
Total[d]	$ 837,837								

(a) The industry rankings presented in the table as of December 31, 2016, are based on the industry rankings of the corresponding exposures at December 31, 2017, not actual rankings of such exposures at December 31, 2016.

(b) In addition to the credit risk exposure to states and municipal governments (both U.S. and non-U.S.) at December 31, 2017 and 2016, noted above, the Firm held: $9.8 billion and $9.1 billion, respectively, of trading securities; $32.3 billion and $31.6 billion, respectively, of AFS securities; and $14.4 billion and $14.5 billion, respectively, of HTM securities, issued by U.S. state and municipal governments. For further information, see Note 2 and Note 10.

(c) All other includes: individuals; SPEs; and private education and civic organizations, representing approximately 59%, 37% and 4%, respectively, at both December 31, 2017 and December 31, 2016.

(d) Excludes cash placed with banks of $421.0 billion and $380.2 billion, at December 31, 2017 and 2016, respectively, which is predominantly placed with various central banks, primarily Federal Reserve Banks.

(e) Credit exposure is net of risk participations and excludes the benefit of credit derivatives used in credit portfolio management activities held against derivative receivables or loans and liquid securities and other cash collateral held against derivative receivables.

(f) Represents the net notional amounts of protection purchased and sold through credit derivatives used to manage the credit exposures; these derivatives do not qualify for hedge accounting under U.S. GAAP. The All other category includes purchased credit protection on certain credit indices.

(g) Prior period amounts have been revised to conform with the current period presentation.

Presented below is additional detail on certain industries to which the Firm has exposure.

Real Estate

Exposure to the Real Estate industry increased $5.1 billion during the year ended December 31, 2017, to $139.4 billion predominantly driven by multifamily lending within CB. For the year ended December 31, 2017, the investment-grade percentage of the portfolio was 83%, up from 78% for the year ended December 31, 2016. For further information on Real Estate loans, see Note 12.

	December 31, 2017				
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[(c)]
Multifamily[(a)]	$ 84,635	$ 34	$ 84,669	89%	92%
Other	54,620	120	54,740	74	66
Total Real Estate Exposure[(b)]	139,255	154	139,409	83	82

	December 31, 2016				
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[(c)]
Multifamily[(a)]	$ 80,280	$ 34	$ 80,314	82%	90%
Other	53,801	172	53,973	72	62
Total Real Estate Exposure[(b)]	134,081	207	134,287	78	79

(a) Multifamily exposure is largely in California.
(b) Real Estate exposure is predominantly secured; unsecured exposure is largely investment-grade.
(c) Represents drawn exposure as a percentage of credit exposure.

Oil & Gas and Natural Gas Pipelines

Exposure to the Oil & Gas and Natural Gas Pipeline portfolios increased by $1.1 billion during the year ended December 31, 2017 to $45.9 billion. During the year ended December 31, 2017, the credit quality of this exposure continued to improve, with the investment-grade percentage increasing from 48% to 53% and criticized exposure decreasing by $4.5 billion.

	December 31, 2017				
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[(d)]
Exploration & Production ("E&P") and Oilfield Services	$ 20,558	$ 1,175	$ 21,733	34%	33%
Other Oil & Gas[(a)]	19,032	552	19,584	72	28
Total Oil & Gas	**39,590**	**1,727**	**41,317**	**52**	**31**
Natural Gas Pipelines[(b)]	4,507	38	4,545	66	14
Total Oil & Gas and Natural Gas Pipelines[(c)]	**$ 44,097**	**$ 1,765**	**$ 45,862**	**53**	**29**

	December 31, 2016				
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[(d)]
E&P and Oilfield Services	$ 20,971	$ 1,256	$ 22,227	27%	35%
Other Oil & Gas[(a)]	17,518	622	18,140	70	31
Total Oil & Gas	38,489	1,878	40,367	46	33
Natural Gas Pipelines[(b)]	4,253	106	4,359	66	30
Total Oil & Gas and Natural Gas Pipelines[(c)]	$ 42,742	$ 1,984	$ 44,726	48	33

(a) Other Oil & Gas includes Integrated Oil & Gas companies, Midstream/Oil Pipeline companies and refineries.
(b) Natural Gas Pipelines is reported within the Utilities Industry.
(c) Secured lending is $14.0 billion and $14.3 billion at December 31, 2017 and December 31, 2016, respectively, approximately half of which is reserve-based lending to the Exploration & Production sub-sector; unsecured exposure is largely investment-grade.
(d) Represents drawn exposure as a percentage of credit exposure.

Loans

In the normal course of its wholesale business, the Firm provides loans to a variety of clients, ranging from large corporate and institutional clients to high-net-worth individuals. For further discussion on loans, including information on credit quality indicators and sales of loans, see Note 12.

The following table presents the change in the nonaccrual loan portfolio for the years ended December 31, 2017 and 2016.

Wholesale nonaccrual loan activity[(a)]

Year ended December 31, (in millions)	2017	2016
Beginning balance	**$ 2,063**	$ 1,016
Additions	**1,482**	2,981
Reductions:		
Paydowns and other	**1,137**	1,148
Gross charge-offs	**200**	385
Returned to performing status	**189**	242
Sales	**285**	159
Total reductions	**1,811**	1,934
Net changes	**(329)**	1,047
Ending balance	**$ 1,734**	$ 2,063

(a) Loans are placed on nonaccrual status when management believes full payment of principal or interest is not expected, regardless of delinquency status, or when principal or interest have been in default for a period of 90 days or more unless the loan is both well-secured and in the process of collection.

The following table presents net charge-offs/recoveries, which are defined as gross charge-offs less recoveries, for the years ended December 31, 2017 and 2016. The amounts in the table below do not include gains or losses from sales of nonaccrual loans.

Wholesale net charge-offs/(recoveries)

Year ended December 31, (in millions, except ratios)	2017	2016
Loans – reported		
Average loans retained	**$ 392,263**	$ 371,778
Gross charge-offs	**212**	398
Gross recoveries	**(93)**	(57)
Net charge-offs	**119**	341
Net charge-off rate	**0.03%**	0.09%

Lending-related commitments

The Firm uses lending-related financial instruments, such as commitments (including revolving credit facilities) and guarantees, to meet the financing needs of its clients. The contractual amounts of these financial instruments represent the maximum possible credit risk should the counterparties draw down on these commitments or the Firm fulfill its obligations under these guarantees, and the counterparties subsequently fail to perform according to the terms of these contracts. Most of these commitments and guarantees are refinanced, extended, cancelled, or expire without being drawn upon or a default occurring. In the Firm's view, the total contractual amount of these wholesale lending-related commitments is not representative of the Firm's expected future credit exposure or funding requirements. For further information on wholesale lending-related commitments, see Note 27.

Clearing services

The Firm provides clearing services for clients entering into securities and derivative transactions. Through the provision of these services the Firm is exposed to the risk of non-performance by its clients and may be required to share in losses incurred by central counterparties. Where possible, the Firm seeks to mitigate its credit risk to its clients through the collection of adequate margin at inception and throughout the life of the transactions and can also cease provision of clearing services if clients do not adhere to their obligations under the clearing agreement. For further discussion of clearing services, see Note 27.

Derivative contracts

In the normal course of business, the Firm uses derivative instruments predominantly for market-making activities. Derivatives enable counterparties to manage exposures to fluctuations in interest rates, currencies and other markets. The Firm also uses derivative instruments to manage its own credit and other market risk exposure. The nature of the counterparty and the settlement mechanism of the derivative affect the credit risk to which the Firm is exposed. For OTC derivatives the Firm is exposed to the credit risk of the derivative counterparty. For exchange-traded derivatives ("ETD"), such as futures and options, and "cleared" over-the-counter ("OTC-cleared") derivatives, the Firm is generally exposed to the credit risk of the relevant CCP. Where possible, the Firm seeks to mitigate its credit risk exposures arising from derivative transactions through the use of legally enforceable master netting arrangements and collateral agreements. For further discussion of derivative contracts, counterparties and settlement types, see Note 5.

The following table summarizes the net derivative receivables for the periods presented.

Derivative receivables

December 31, (in millions)	2017	2016
Interest rate	**$ 24,673**	$ 28,302
Credit derivatives	**869**	1,294
Foreign exchange	**16,151**	23,271
Equity	**7,882**	4,939
Commodity	**6,948**	6,272
Total, net of cash collateral	**56,523**	64,078
Liquid securities and other cash collateral held against derivative receivables[(a)]	**(16,108)**	(22,705)
Total, net of all collateral	**$ 40,415**	$ 41,373

(a) Includes collateral related to derivative instruments where an appropriate legal opinion has not been either sought or obtained.

Derivative receivables reported on the Consolidated balance sheets were $56.5 billion and $64.1 billion at December 31, 2017 and 2016, respectively. Derivative receivables decreased predominantly as a result of client-driven market-making activities in CIB Markets, which reduced foreign exchange and interest rate derivative receivables, and increased equity derivative receivables, driven by market movements.

Derivative receivables amounts represent the fair value of the derivative contracts after giving effect to legally enforceable master netting agreements and cash collateral held by the Firm. However, in management's view, the appropriate measure of current credit risk should also take into consideration additional liquid securities (primarily U.S. government and agency securities and other group of seven nations ("G7") government bonds) and other cash collateral held by the Firm aggregating $16.1 billion and $22.7 billion at December 31, 2017 and 2016, respectively, that may be used as security when the fair value of the client's exposure is in the Firm's favor.

In addition to the collateral described in the preceding paragraph, the Firm also holds additional collateral (primarily cash, G7 government securities, other liquid government-agency and guaranteed securities, and corporate debt and equity securities) delivered by clients at the initiation of transactions, as well as collateral related to contracts that have a non-daily call frequency and collateral that the Firm has agreed to return but has not yet settled as of the reporting date. Although this collateral does not reduce the balances and is not included in the table above, it is available as security against potential exposure that could arise should the fair value of the client's derivative transactions move in the Firm's favor. The derivative receivables fair value, net of all collateral, also does not include other credit enhancements, such as letters of credit. For additional information on the Firm's use of collateral agreements, see Note 5.

While useful as a current view of credit exposure, the net fair value of the derivative receivables does not capture the potential future variability of that credit exposure. To capture the potential future variability of credit exposure, the Firm calculates, on a client-by-client basis, three measures of potential derivatives-related credit loss: Peak, Derivative Risk Equivalent ("DRE"), and Average exposure ("AVG"). These measures all incorporate netting and collateral benefits, where applicable.

Peak represents a conservative measure of potential exposure to a counterparty calculated in a manner that is broadly equivalent to a 97.5% confidence level over the life of the transaction. Peak is the primary measure used by the Firm for setting of credit limits for derivative transactions, senior management reporting and derivatives exposure management. DRE exposure is a measure that expresses the risk of derivative exposure on a basis intended to be equivalent to the risk of loan exposures. DRE is a less extreme measure of potential credit loss than Peak and is used for aggregating derivative credit risk exposures with loans and other credit risk.

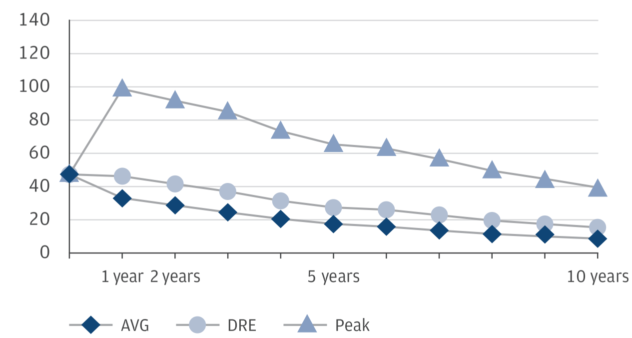
Finally, AVG is a measure of the expected fair value of the Firm's derivative receivables at future time periods, including the benefit of collateral. AVG exposure over the total life of the derivative contract is used as the primary metric for pricing purposes and is used to calculate credit risk capital and the CVA, as further described below. The three year AVG exposure was $29.0 billion and $31.1 billion at December 31, 2017 and 2016, respectively, compared with derivative receivables, net of all collateral, of $40.4 billion and $41.4 billion at December 31, 2017 and 2016, respectively.

The fair value of the Firm's derivative receivables incorporates CVA to reflect the credit quality of counterparties. CVA is based on the Firm's AVG to a counterparty and the counterparty's credit spread in the credit derivatives market. The Firm believes that active risk management is essential to controlling the dynamic credit risk in the derivatives portfolio. In addition, the Firm's risk management process takes into consideration the potential impact of wrong-way risk, which is broadly defined as the potential for increased correlation between the Firm's exposure to a counterparty (AVG) and the counterparty's credit quality. Many factors may influence the nature and magnitude of these correlations over time. To the extent that these correlations are identified, the Firm may adjust the CVA associated with that counterparty's AVG. The Firm risk manages exposure to changes in CVA by entering into credit derivative transactions, as well as interest rate, foreign exchange, equity and commodity derivative transactions.

The accompanying graph shows exposure profiles to the Firm's current derivatives portfolio over the next 10 years as calculated by the Peak, DRE and AVG metrics. The three measures generally show that exposure will decline after the first year, if no new trades are added to the portfolio.

Exposure profile of derivatives measures

December 31, 2017
(in billions)



The following table summarizes the ratings profile by derivative counterparty of the Firm's derivative receivables, including credit derivatives, net of all collateral, at the dates indicated. The ratings scale is based on the Firm's internal ratings, which generally correspond to the ratings as assigned by S&P and Moody's.

Ratings profile of derivative receivables

Rating equivalent	2017		2016	
December 31, (in millions, except ratios)	Exposure net of all collateral	% of exposure net of all collateral	Exposure net of all collateral	% of exposure net of all collateral
AAA/Aaa to AA-/Aa3	**$ 11,529**	**29%**	$ 11,449	28%
A+/A1 to A-/A3	**6,919**	**17**	8,505	20
BBB+/Baa1 to BBB-/Baa3	**13,925**	**34**	13,127	32
BB+/Ba1 to B-/B3	**7,397**	**18**	7,308	18
CCC+/Caa1 and below	**645**	**2**	984	2
Total	**$ 40,415**	**100%**	$ 41,373	100%

As previously noted, the Firm uses collateral agreements to mitigate counterparty credit risk. The percentage of the Firm's over-the-counter derivatives transactions subject to collateral agreements – excluding foreign exchange spot trades, which are not typically covered by collateral agreements due to their short maturity and centrally cleared trades that are settled daily – was approximately 90% as of December 31, 2017, largely unchanged compared with December 31, 2016.

Credit derivatives

The Firm uses credit derivatives for two primary purposes: first, in its capacity as a market-maker, and second, as an end-user to manage the Firm's own credit risk associated with various exposures. For a detailed description of credit derivatives, see Credit derivatives in Note 5.

Credit portfolio management activities

Included in the Firm's end-user activities are credit derivatives used to mitigate the credit risk associated with traditional lending activities (loans and unfunded commitments) and derivatives counterparty exposure in the Firm's wholesale businesses (collectively, "credit portfolio management" activities). Information on credit portfolio management activities is provided in the table below. For further information on derivatives used in credit portfolio management activities, see Credit derivatives in Note 5.

The Firm also uses credit derivatives as an end-user to manage other exposures, including credit risk arising from certain securities held in the Firm's market-making businesses. These credit derivatives are not included in credit portfolio management activities; for further information on these credit derivatives as well as credit derivatives used in the Firm's capacity as a market-maker in credit derivatives, see Credit derivatives in Note 5.

Credit derivatives used in credit portfolio management activities

	Notional amount of protection purchased [a]	
December 31, (in millions)	**2017**	2016
Credit derivatives used to manage:		
Loans and lending-related commitments	**$ 1,867**	$ 2,430
Derivative receivables	**15,742**	19,684
Credit derivatives used in credit portfolio management activities	**$ 17,609**	$ 22,114

(a) Amounts are presented net, considering the Firm's net protection purchased or sold with respect to each underlying reference entity or index.

The credit derivatives used in credit portfolio management activities do not qualify for hedge accounting under U.S. GAAP; these derivatives are reported at fair value, with gains and losses recognized in principal transactions revenue. In contrast, the loans and lending-related commitments being risk-managed are accounted for on an accrual basis. This asymmetry in accounting treatment, between loans and lending-related commitments and the credit derivatives used in credit portfolio management activities, causes earnings volatility that is not representative, in the Firm's view, of the true changes in value of the Firm's overall credit exposure.

The effectiveness of credit default swaps ("CDS") as a hedge against the Firm's exposures may vary depending on a number of factors, including the named reference entity (i.e., the Firm may experience losses on specific exposures that are different than the named reference entities in the purchased CDS); the contractual terms of the CDS (which may have a defined credit event that does not align with an actual loss realized by the Firm); and the maturity of the Firm's CDS protection (which in some cases may be shorter than the Firm's exposures). However, the Firm generally seeks to purchase credit protection with a maturity date that is the same or similar to the maturity date of the exposure for which the protection was purchased, and remaining differences in maturity are actively monitored and managed by the Firm.

ALLOWANCE FOR CREDIT LOSSES

JPMorgan Chase's allowance for credit losses covers the retained consumer and wholesale loan portfolios, as well as the Firm's wholesale and certain consumer lending-related commitments.

For a further discussion of the components of the allowance for credit losses and related management judgments, see Critical Accounting Estimates Used by the Firm on pages 138–140 and Note 13.

At least quarterly, the allowance for credit losses is reviewed by the CRO, the CFO and the Controller of the Firm, and discussed with the Board of Directors' Risk Policy Committee ("DRPC") and the Audit Committee. As of December 31, 2017, JPMorgan Chase deemed the allowance for credit losses to be appropriate and sufficient to absorb probable credit losses inherent in the portfolio.

The allowance for credit losses decreased as of December 31, 2017, driven by:

- a net reduction in the wholesale allowance, reflecting credit quality improvements in the Oil & Gas, Natural Gas Pipelines, and Metals & Mining portfolios (compared with additions to the allowance in the prior year driven by downgrades in the same portfolios)

largely offset by

- a net increase in the consumer allowance, reflecting
  - additions to the allowance for the credit card and business banking portfolios, driven by loan growth in both of these portfolios and higher loss rates in the credit card portfolio,

  largely offset by

  - a reduction in the allowance for the residential real estate portfolio, predominantly driven by continued improvement in home prices and delinquencies, and
  - the utilization of the allowance in connection with the sale of the student loan portfolio.

For additional information on the consumer and wholesale credit portfolios, see Consumer Credit Portfolio on pages 102-107, Wholesale Credit Portfolio on pages 108–116 and Note 12.

Summary of changes in the allowance for credit losses

Year ended December 31, (in millions, except ratios)	2017 Consumer, excluding credit card	2017 Credit card	2017 Wholesale	2017 Total	2016 Consumer, excluding credit card	2016 Credit card	2016 Wholesale	2016 Total
Allowance for loan losses								
Beginning balance at January 1,	$ 5,198	$ 4,034	$ 4,544	$ 13,776	$ 5,806	$ 3,434	$ 4,315	$ 13,555
Gross charge-offs	1,779	4,521	212	6,512	1,500	3,799	398	5,697
Gross recoveries	(634)	(398)	(93)	(1,125)	(591)	(357)	(57)	(1,005)
Net charge-offs[(a)]	1,145	4,123	119	5,387	909	3,442	341	4,692
Write-offs of PCI loans[(b)]	86	–	–	86	156	–	–	156
Provision for loan losses	613	4,973	(286)	5,300	467	4,042	571	5,080
Other	(1)	–	2	1	(10)	–	(1)	(11)
Ending balance at December 31,	$ 4,579	$ 4,884	$ 4,141	$ 13,604	$ 5,198	$ 4,034	$ 4,544	$ 13,776
Impairment methodology								
Asset-specific[(c)]	$ 246	$ 383	$ 461	$ 1,090	$ 308	$ 358	$ 342	$ 1,008
Formula-based	2,108	4,501	3,680	10,289	2,579	3,676	4,202	10,457
PCI	2,225	–	–	2,225	2,311	–	–	2,311
Total allowance for loan losses	$ 4,579	$ 4,884	$ 4,141	$ 13,604	$ 5,198	$ 4,034	$ 4,544	$ 13,776
Allowance for lending-related commitments								
Beginning balance at January 1,	$ 26	$ –	$ 1,052	$ 1,078	$ 14	$ –	$ 772	$ 786
Provision for lending-related commitments	7	–	(17)	(10)	–	–	281	281
Other	–	–	–	–	12	–	(1)	11
Ending balance at December 31,	$ 33	$ –	$ 1,035	$ 1,068	$ 26	$ –	$ 1,052	$ 1,078
Impairment methodology								
Asset-specific	$ –	$ –	$ 187	$ 187	$ –	$ –	$ 169	$ 169
Formula-based	33	–	848	881	26	–	883	909
Total allowance for lending-related commitments[(d)]	$ 33	$ –	$ 1,035	$ 1,068	$ 26	$ –	$ 1,052	$ 1,078
Total allowance for credit losses	$ 4,612	$ 4,884	$ 5,176	$ 14,672	$ 5,224	$ 4,034	$ 5,596	$ 14,854
Memo:								
Retained loans, end of period	$ 372,553	$ 149,387	$ 402,898	$ 924,838	$ 364,406	$ 141,711	$ 383,790	$ 889,907
Retained loans, average	366,798	139,918	392,263	898,979	358,486	131,081	371,778	861,345
PCI loans, end of period	30,576	–	3	30,579	35,679	–	3	35,682
Credit ratios								
Allowance for loan losses to retained loans	1.23%	3.27%	1.03%	1.47%	1.43%	2.85%	1.18%	1.55%
Allowance for loan losses to retained nonaccrual loans[(e)]	109	NM	239	229	109	NM	233	205
Allowance for loan losses to retained nonaccrual loans excluding credit card	109	NM	239	147	109	NM	233	145
Net charge-off rate[(a)]	0.31	2.95	0.03	0.60	0.25	2.63	0.09	0.54
Credit ratios, excluding residential real estate PCI loans								
Allowance for loan losses to retained loans	0.69	3.27	1.03	1.27	0.88	2.85	1.18	1.34
Allowance for loan losses to retained nonaccrual loans[(e)]	56	NM	239	191	61	NM	233	171
Allowance for loan losses to retained nonaccrual loans excluding credit card	56	NM	239	109	61	NM	233	111
Net charge-off rate[(a)]	0.34%	2.95%	0.03%	0.62%	0.28%	2.63%	0.09%	0.57%

Note: In the table above, the financial measures which exclude the impact of PCI loans are non-GAAP financial measures.

(a) For the year ended December 31, 2017, excluding net charge-offs of $467 million related to the student loan portfolio sale, the net charge-off rate for Consumer, excluding credit card would have been 0.18%; total Firm would have been 0.55%; Consumer, excluding credit card and PCI loans would have been 0.20%; and total Firm, excluding PCI would have been 0.57%.

(b) Write-offs of PCI loans are recorded against the allowance for loan losses when actual losses for a pool exceed estimated losses that were recorded as purchase accounting adjustments at the time of acquisition. A write-off of a PCI loan is recognized when the underlying loan is removed from a pool (e.g., upon liquidation).

(c) Includes risk-rated loans that have been placed on nonaccrual status and loans that have been modified in a TDR. The asset-specific credit card allowance for loan losses modified in a TDR is calculated based on the loans' original contractual interest rates and does not consider any incremental penalty rates.

(d) The allowance for lending-related commitments is reported in accounts payable and other liabilities on the Consolidated balance sheets.

(e) The Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status as permitted by regulatory guidance.

Provision for credit losses

The following table presents the components of the Firm's provision for credit losses:

Year ended December 31, (in millions)	Provision for loan losses			Provision for lending-related commitments			Total provision for credit losses		
	2017	2016	2015	**2017**	2016	2015	**2017**	2016	2015
Consumer, excluding credit card	**$ 613**	$ 467	$ (82)	**$ 7**	$ –	$ 1	**$ 620**	$ 467	$ (81)
Credit card	**4,973**	4,042	3,122	**–**	–	–	**4,973**	4,042	3,122
Total consumer	**5,586**	4,509	3,040	**7**	–	1	**5,593**	4,509	3,041
Wholesale	**(286)**	571	623	**(17)**	281	163	**(303)**	852	786
Total	**$ 5,300**	$ 5,080	$ 3,663	**$ (10)**	$ 281	$ 164	**$ 5,290**	$ 5,361	$ 3,827

Provision for credit losses

The provision for credit losses decreased as of December 31, 2017 as a result of:

- a net $422 million reduction in the wholesale allowance for credit losses, reflecting credit quality improvements in the Oil & Gas, Natural Gas Pipelines, and Metals & Mining portfolios, compared with an addition of $511 million in the prior year driven by downgrades in the same portfolios.

The decrease was predominantly offset by

- a higher consumer provision driven by
  - $450 million of higher net charge-offs, primarily in the credit card portfolio due to growth in newer vintages which, as anticipated, have higher loss rates than the more seasoned portion of the portfolio, partially offset by a decrease in net charge-offs in the residential real estate portfolio reflecting continued improvement in home prices and delinquencies,
  - a $218 million impact in connection with the sale of the student loan portfolio, and
  - a $416 million higher addition to the allowance for credit losses.

    Current year additions to the consumer allowance included:

    - an $850 million addition to the allowance for credit losses in the credit card portfolio, compared to a $600 million addition in the prior year, due to higher loss rates and loan growth in both years, and
    - a $50 million addition to the allowance for credit losses in the business banking portfolio, driven by loan growth

    the additions were partially offset by

    - a $316 million net reduction in the allowance for credit losses in the residential real estate portfolio, compared to a $517 million net reduction in the prior year, reflecting continued improvement in home prices and delinquencies in both years.

INVESTMENT PORTFOLIO RISK MANAGEMENT

Investment portfolio risk is the risk associated with the loss of principal or a reduction in expected returns on investments arising from the investment securities portfolio held by Treasury and CIO in connection with the Firm's balance sheet or asset-liability management objectives or from principal investments managed in various LOBs in predominantly privately-held financial assets and instruments. Investments are typically intended to be held over extended periods and, accordingly, the Firm has no expectation for short-term realized gains with respect to these investments.

Investment securities risk

Investment securities risk includes the exposure associated with the default of principal plus coupon payments. This risk is minimized given that Treasury and CIO generally invest in high-quality securities. At December 31, 2017, the investment securities portfolio was $248.0 billion, and the average credit rating of the securities comprising the portfolio was AA+ (based upon external ratings where available and where not available, based primarily upon internal ratings that correspond to ratings as defined by S&P and Moody's). For further information on the investment securities portfolio, see Note 10 on pages 203-208. For further information on the market risk inherent in the portfolio, see Market Risk Management on pages 121-128. For further information on related liquidity risk, see Liquidity Risk on pages 92–97.

Governance and oversight

Investment securities risks are governed by the Firm's Risk Appetite framework, and discussed at the CIO, Treasury and Corporate (CTC) Risk Committee with regular updates to the DRPC.

The Firm's independent control functions are responsible for reviewing the appropriateness of the carrying value of investment securities in accordance with relevant policies. Approved levels for investment securities are established for each risk category, including capital and credit risks.

Principal investment risk

Principal investments are typically private non-traded financial instruments representing ownership or other forms of junior capital. Principal investments cover multiple asset classes and are made either in stand-alone investing businesses or as part of a broader business platform. As of December 31, 2017, the carrying value of the principal investment portfolios included tax-oriented investments (e.g., affordable housing and alternative energy investments) of $14.0 billion and private equity and various debt and equity instruments of $5.5 billion. Increasingly, new principal investment activity seeks to enhance or accelerate LOB strategic business initiatives. The Firm's principal investments are managed under various LOBs and are reflected within the respective LOB financial results.

Governance and oversight

The Firm's approach to managing principal risk is consistent with the Firm's general risk governance structure. A Firmwide risk policy framework exists for all principal investing activities. All investments are approved by investment committees that include executives who are independent from the investing businesses.

The Firm's independent control functions are responsible for reviewing the appropriateness of the carrying value of investments in accordance with relevant policies. Approved levels for investments are established for each relevant business in order to manage the overall size of the portfolios.

Industry, geographic and position level concentration limits have been set and are intended to ensure diversification of the portfolios. The Firm also conducts stress testing on these portfolios using specific scenarios that estimate losses based on significant market moves and/or other risk events.

MARKET RISK MANAGEMENT

Market risk is the risk associated with the effect of changes in market factors, such as interest and foreign exchange rates, equity and commodity prices, credit spreads or implied volatilities, on the value of assets and liabilities held for both the short and long term.

Market Risk Management

Market Risk Management monitors market risks throughout the Firm and defines market risk policies and procedures. The Market Risk Management function reports to the Firm's CRO.

Market Risk Management seeks to manage risk, facilitate efficient risk/return decisions, reduce volatility in operating performance and provide transparency into the Firm's market risk profile for senior management, the Board of Directors and regulators. Market Risk Management is responsible for the following functions:

- Establishment of a market risk policy framework
- Independent measurement, monitoring and control of line of business and firmwide market risk
- Definition, approval and monitoring of limits
- Performance of stress testing and qualitative risk assessments

Risk measurement

Tools used to measure risk

There is no single measure to capture market risk and therefore the Firm uses various metrics, both statistical and nonstatistical, to assess risk including:

- VaR
- Economic-value stress testing
- Nonstatistical risk measures
- Loss advisories
- Profit and loss drawdowns
- Earnings-at-risk
- Other sensitivities

Risk monitoring and control

Market risk exposure is managed primarily through a series of limits set in the context of the market environment and business strategy. In setting limits, the Firm takes into consideration factors such as market volatility, product liquidity and accommodation of client business, and management experience. The Firm maintains different levels of limits. Corporate level limits include VaR and stress limits. Similarly, line of business limits include VaR and stress limits and may be supplemented by loss advisories, nonstatistical measurements and profit and loss drawdowns. Limits may also be set within the lines of business, as well at the portfolio or legal entity level.

Market Risk Management sets limits and regularly reviews and updates them as appropriate, with any changes approved by line of business management and Market Risk Management. Senior management, including the Firm's CEO and CRO, are responsible for reviewing and approving certain of these risk limits on an ongoing basis. All limits that have not been reviewed within specified time periods by Market Risk Management are escalated to senior management. The lines of business are responsible for adhering to established limits against which exposures are monitored and reported.

Limit breaches are required to be reported in a timely manner to limit approvers, Market Risk Management and senior management. In the event of a breach, Market Risk Management consults with senior management of the Firm and the line of business senior management to determine the appropriate course of action required to return the applicable positions to compliance, which may include a reduction in risk in order to remedy the breach. Certain Firm or line of business-level limits that have been breached for three business days or longer, or by more than 30%, are escalated to senior management and the Firmwide Risk Committee.

The following table summarizes by line of business the predominant business activities that give rise to market risk, and certain market risk tools used to measure those risks.

Risk identification and classification by line of business

Line of Business	Predominant business activities and related market risks	Positions included in Risk Management VaR	Positions included in earnings-at-risk	Positions included in other sensitivity-based measures

CCB	• Services mortgage loans which give rise to complex, non-linear interest rate and basis risk
	  • Non-linear risk arises primarily from prepayment options embedded in mortgages and changes in the probability of newly originated mortgage commitments actually closing
	  • Basis risk results from differences in the relative movements of the rate indices underlying mortgage exposure and other interest rates
	• Originates loans and takes deposits
		• Mortgage pipeline loans, classified as derivatives
		• Warehouse loans, classified as trading assets – debt instruments
		• MSRs
		• Hedges of pipeline loans, warehouse loans and MSRs, classified as derivatives
		• Interest-only securities, classified as trading assets - debt instruments, and related hedges, classified as derivatives
			• Retained loan portfolio
			• Deposits	

CIB	• Makes markets and services clients across fixed income, foreign exchange, equities and commodities • Market risk arises from changes in market prices (e.g., rates and credit spreads) resulting in a potential decline in net income • Originates loans and takes deposits	• Trading assets/liabilities – debt and marketable equity instruments, and derivatives, including hedges of the retained loan portfolio • Certain securities purchased, loaned or sold under resale agreements and securities borrowed • Fair value option elected liabilities • Derivative CVA and associated hedges	• Retained loan portfolio • Deposits	• Private equity investments measured at fair value • Derivatives FVA and fair value option elected liabilities DVA
CB	• Engages in traditional wholesale banking activities which include extensions of loans and credit facilities and taking deposits • Risk arises from changes in interest rates and prepayment risk with potential for adverse impact on net interest income and interest-rate sensitive fees		• Retained loan portfolio • Deposits	
AWM	• Provides initial capital investments in products such as mutual funds, which give rise to market risk arising from changes in market prices in such products • Originates loans and takes deposits	• Debt securities held in advance of distribution to clients, classified as trading assets - debt instruments	• Retained loan portfolio • Deposits	• Initial seed capital investments and related hedges, classified as derivatives • Capital invested alongside third-party investors, typically in privately distributed collective vehicles managed by AWM (i.e., co-investments)
Corporate	• Manages the Firm's liquidity, funding, structural interest rate and foreign exchange risks arising from activities undertaken by the Firm's four major reportable business segments	• Derivative positions measured at fair value through noninterest revenue in earnings • Marketable equity investments measured at fair value through noninterest revenue in earnings	• Deposits with banks • Investment securities portfolio and related interest rate hedges • Long-term debt and related interest rate hedges	• Private equity investments measured at fair value • Foreign exchange exposure related to Firm-issued non-USD long-term debt ("LTD") and related hedges

Value-at-risk

JPMorgan Chase utilizes VaR, a statistical risk measure, to estimate the potential loss from adverse market moves in a normal market environment. The Firm has a single VaR framework used as a basis for calculating Risk Management VaR and Regulatory VaR.

The framework is employed across the Firm using historical simulation based on data for the previous 12 months. The framework's approach assumes that historical changes in market values are representative of the distribution of potential outcomes in the immediate future. The Firm believes the use of Risk Management VaR provides a stable measure of VaR that is closely aligned to the day-to-day risk management decisions made by the lines of business, and provides the appropriate information needed to respond to risk events on a daily basis.

The Firm's Risk Management VaR is calculated assuming a one-day holding period and an expected tail-loss methodology which approximates a 95% confidence level. Risk Management VaR provides a consistent framework to measure risk profiles and levels of diversification across product types and is used for aggregating risks and monitoring limits across businesses. VaR results are reported to senior management, the Board of Directors and regulators.

Under the Firm's Risk Management VaR methodology, assuming current changes in market values are consistent with the historical changes used in the simulation, the Firm would expect to incur VaR "back-testing exceptions," defined as losses greater than that predicted by VaR estimates, an average of five times every 100 trading days. The number of VaR back-testing exceptions observed can differ from the statistically expected number of back-testing exceptions if the current level of market volatility is materially different from the level of market volatility during the 12 months of historical data used in the VaR calculation.

Underlying the overall VaR model framework are individual VaR models that simulate historical market returns for individual products and/or risk factors. To capture material market risks as part of the Firm's risk management framework, comprehensive VaR model calculations are performed daily for businesses whose activities give rise to market risk. These VaR models are granular and incorporate numerous risk factors and inputs to simulate daily changes in market values over the historical period; inputs are selected based on the risk profile of each portfolio, as sensitivities and historical time series used to generate daily market values may be different across product types or risk management systems. The VaR model results across all portfolios are aggregated at the Firm level.

As VaR is based on historical data, it is an imperfect measure of market risk exposure and potential losses, and it is not used to estimate the impact of stressed market conditions or to manage any impact from potential stress events. In addition, based on their reliance on available historical data, limited time horizons, and other factors, VaR measures are inherently limited in their ability to measure certain risks and to predict losses, particularly those associated with market illiquidity and sudden or severe shifts in market conditions.

For certain products, specific risk parameters are not captured in VaR due to the lack of inherent liquidity and availability of appropriate historical data. The Firm uses proxies to estimate the VaR for these and other products when daily time series are not available. It is likely that using an actual price-based time series for these products, if available, would affect the VaR results presented. The Firm therefore considers other measures such as stress testing and nonstatistical measures, in addition to VaR, to capture and manage its market risk positions.

The daily market data used in VaR models may be different than the independent third-party data collected for VCG price testing in its monthly valuation process. For example, in cases where market prices are not observable, or where proxies are used in VaR historical time series, the data sources may differ (see Valuation process in Note 2 for further information on the Firm's valuation process). Because VaR model calculations require daily data and a consistent source for valuation, it may not be practical to use the data collected in the VCG monthly valuation process for VaR model calculations.

The Firm's VaR model calculations are periodically evaluated and enhanced in response to changes in the composition of the Firm's portfolios, changes in market conditions, improvements in the Firm's modeling techniques and measurements, and other factors. Such changes may affect historical comparisons of VaR results. For information regarding model reviews and approvals, see Model Risk Management on page 137.

The Firm calculates separately a daily aggregated VaR in accordance with regulatory rules ("Regulatory VaR"), which is used to derive the Firm's regulatory VaR-based capital requirements under Basel III. This Regulatory VaR model framework currently assumes a ten business-day holding period and an expected tail loss methodology which approximates a 99% confidence level. Regulatory VaR is applied to "covered" positions as defined by Basel III, which may be different than the positions included in the Firm's Risk Management VaR. For example, credit derivative hedges of accrual loans are included in the Firm's Risk Management VaR, while Regulatory VaR excludes these credit derivative hedges. In addition, in contrast to the Firm's Risk Management VaR, Regulatory VaR currently excludes the diversification benefit for certain VaR models.

For additional information on Regulatory VaR and the other components of market risk regulatory capital for the Firm (e.g., VaR-based measure, stressed VaR-based measure and the respective backtesting), see JPMorgan Chase's Basel III Pillar 3 Regulatory Capital Disclosures reports, which are available on the Firm's website at: (http://investor.shareholder.com/jpmorganchase/basel.cfm).

The table below shows the results of the Firm's Risk Management VaR measure using a 95% confidence level.

Total VaR

As of or for the year ended December 31,	2017			2016		
(in millions)	Avg.	Min	Max	Avg.	Min	Max
CIB trading VaR by risk type						
Fixed income	**$ 28**	**$ 20**	**$ 40**	$ 45	$ 33	$ 65
Foreign exchange	**10**	**4**	**20**	12	7	27
Equities	**12**	**8**	**19**	13	5	32
Commodities and other	**7**	**4**	**10**	9	7	11
Diversification benefit to CIB trading VaR	**(30)** (a)	**NM** (b)	**NM** (b)	(36) (a)	NM (b)	NM (b)
CIB trading VaR	**27**	**14** (b)	**38** (b)	43	28 (b)	79 (b)
Credit portfolio VaR	**7**	**3**	**12**	12	10	16
Diversification benefit to CIB VaR	**(6)** (a)	**NM** (b)	**NM** (b)	(10) (a)	NM (b)	NM (b)
CIB VaR	**28**	**17** (b)	**39** (b)	45	32 (b)	81 (b)
CCB VaR	**2**	**1**	**4**	3	1	6
Corporate VaR	**4**	**1**	**16** (c)	6	3	13 (c)
AWM VaR	**—**	**—**	**—**	2	—	4
Diversification benefit to other VaR	**(1)** (a)	**NM** (b)	**NM** (b)	(3) (a)	NM (b)	NM (b)
Other VaR	**5**	**2** (b)	**16** (b)	8	4 (b)	16 (b)
Diversification benefit to CIB and other VaR	**(4)** (a)	**NM** (b)	**NM** (b)	(8) (a)	NM (b)	NM (b)
Total VaR	**$ 29**	**$ 17** (b)	**$ 42** (b)	$ 45	$ 33 (b)	$ 78 (b)

(a) Average portfolio VaR is less than the sum of the VaR of the components described above, which is due to portfolio diversification. The diversification effect reflects that the risks are not perfectly correlated.
(b) Diversification benefit represents the difference between the total VaR and each reported level and the sum of its individual components. Diversification benefit reflects the non-additive nature of VaR due to imperfect correlation across lines of business and risk types. The maximum and minimum VaR for each portfolio may have occurred on different trading days than the components and consequently diversification benefit is not meaningful.
(c) Maximum Corporate VaR was higher than the prior year, due to a Private Equity position that became publicly traded in the fourth quarter of 2017. Previously, this position was included in other sensitivity-based measures.

Average Total VaR decreased $16 million for the year-ended December 31, 2017 as compared with the prior year. The reduction is a result of refinements made to VaR models for certain asset-backed products, changes made to the scope of positions included in VaR in the third quarter of 2016, and lower volatility in the one-year historical look-back period.

In addition, Credit Portfolio VaR declined by $5 million reflecting the sale of select positions and lower volatility in the one-year historical look-back period.

In the first quarter of 2017, the Firm refined the historical proxy time series inputs to certain VaR models. These refinements are intended to more appropriately reflect the risk exposure from certain asset-backed products. In the absence of this refinement, the average Total VaR, CIB fixed income VaR, CIB trading VaR and CIB VaR would have each been higher by $4 million for the year ended December 31, 2017.

VaR can vary significantly as positions change, market volatility fluctuates, and diversification benefits change.

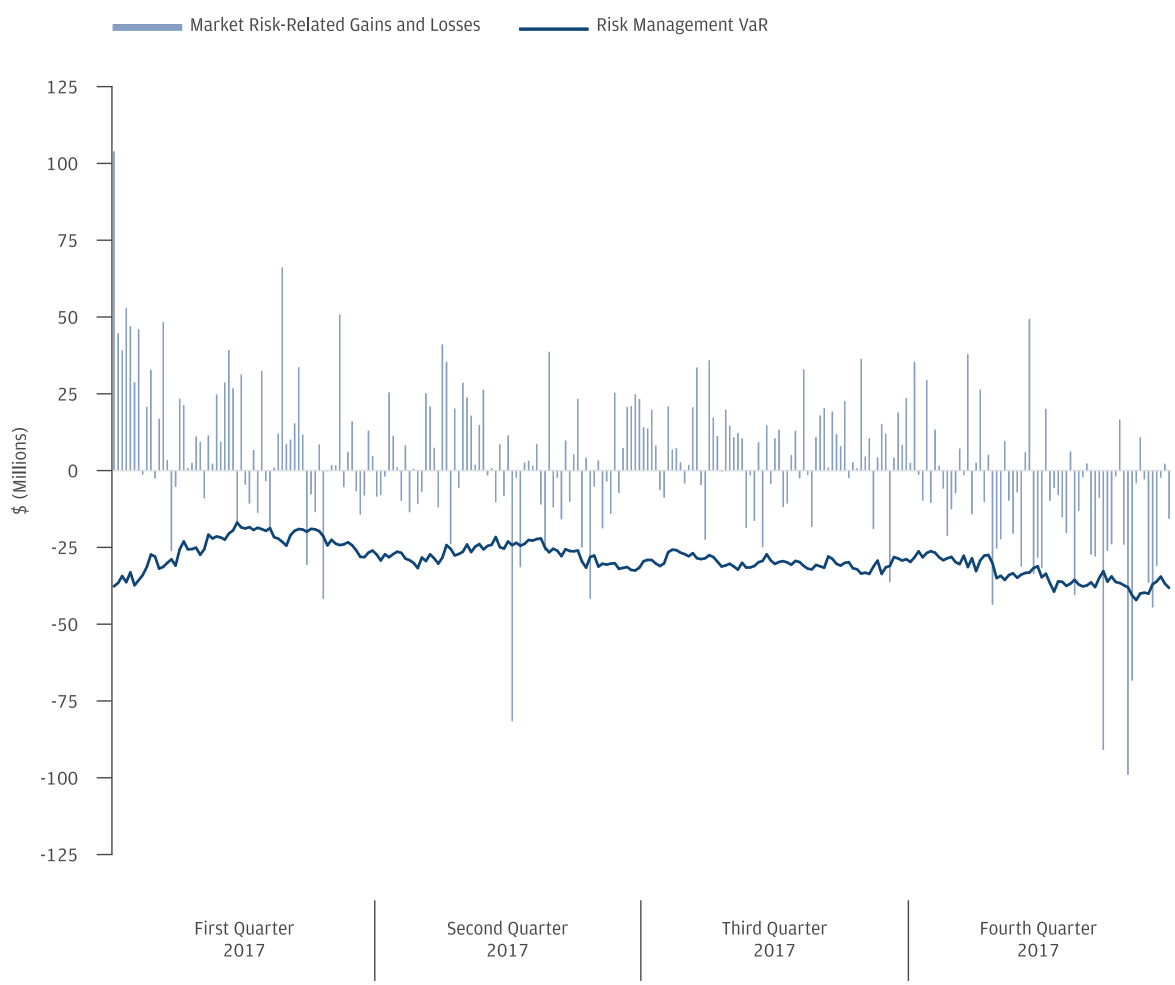
VaR back-testing

The Firm evaluates the effectiveness of its VaR methodology by back-testing, which compares the daily Risk Management VaR results with the daily gains and losses actually recognized on market-risk related revenue.

The Firm's definition of market risk-related gains and losses is consistent with the definition used by the banking regulators under Basel III. Under this definition market risk-related gains and losses are defined as: gains and losses on the positions included in the Firm's Risk Management VaR, excluding fees, commissions, certain valuation adjustments (e.g., liquidity and FVA), net interest income, and gains and losses arising from intraday trading.

The following chart compares actual daily market risk-related gains and losses with the Firm's Risk Management VaR for the year ended December 31, 2017. As the chart presents market risk-related gains and losses related to those positions included in the Firm's Risk Management VaR, the results in the table below differ from the results of back-testing disclosed in the Market Risk section of the Firm's Basel III Pillar 3 Regulatory Capital Disclosures reports, which are based on Regulatory VaR applied to covered positions. The chart shows that for the year ended December 31, 2017 the Firm observed 15 VaR back-testing exceptions and posted gains on 145 of the 258 days.

Daily Market Risk-Related Gains and Losses
vs. Risk Management VaR (1-day, 95% Confidence level)
Year ended December 31, 2017



Other risk measures

Economic-value stress testing

Along with VaR, stress testing is an important tool in measuring and controlling risk. While VaR reflects the risk of loss due to adverse changes in markets using recent historical market behavior as an indicator of losses, stress testing is intended to capture the Firm's exposure to unlikely but plausible events in abnormal markets. The Firm runs weekly stress tests on market-related risks across the lines of business using multiple scenarios that assume significant changes in risk factors such as credit spreads, equity prices, interest rates, currency rates and commodity prices.

The Firm uses a number of standard scenarios that capture different risk factors across asset classes including geographical factors, specific idiosyncratic factors and extreme tail events. The stress framework calculates multiple magnitudes of potential stress for both market rallies and market sell-offs for each risk factor and combines them in multiple ways to capture different market scenarios. For example, certain scenarios assess the potential loss arising from current exposures held by the Firm due to a broad sell-off in bond markets or an extreme widening in corporate credit spreads. The flexibility of the stress testing framework allows risk managers to construct new, specific scenarios that can be used to form decisions about future possible stress events.

Stress testing complements VaR by allowing risk managers to shock current market prices to more extreme levels relative to those historically realized, and to stress test the relationships between market prices under extreme scenarios. Stress scenarios are defined and reviewed by Market Risk Management, and significant changes are reviewed by the relevant LOB Risk Committees and may be redefined on a periodic basis to reflect current market conditions.

Stress-test results, trends and qualitative explanations based on current market risk positions are reported to the respective LOBs and the Firm's senior management to allow them to better understand the sensitivity of positions to certain defined events and to enable them to manage their risks with more transparency. Results are also reported to the Board of Directors.

The Firm's stress testing framework is utilized in calculating results for the Firm's CCAR and ICAAP processes. In addition, the results are incorporated into the quarterly assessment of the Firm's Risk Appetite Framework and are also presented to the DRPC.

Nonstatistical risk measures

Nonstatistical risk measures include sensitivities to variables used to value positions, such as credit spread sensitivities, interest rate basis point values and market values. These measures provide granular information on the Firm's market risk exposure. They are aggregated by line of business and by risk type, and are also used for monitoring internal market risk limits.

Loss advisories and profit and loss drawdowns

Loss advisories and profit and loss drawdowns are tools used to highlight trading losses above certain levels of risk tolerance. Profit and loss drawdowns are defined as the decline in net profit and loss since the year-to-date peak revenue level.

Earnings-at-risk

The VaR and sensitivity measures illustrate the economic sensitivity of the Firm's Consolidated balance sheets to changes in market variables.

The effect of interest rate exposure on the Firm's reported net income is also important as interest rate risk represents one of the Firm's significant market risks. Interest rate risk arises not only from trading activities but also from the Firm's traditional banking activities, which include extension of loans and credit facilities, taking deposits and issuing debt. The Firm evaluates its structural interest rate risk exposure through earnings-at-risk, which measures the extent to which changes in interest rates will affect the Firm's net interest income and interest rate-sensitive fees. For a summary by line of business, identifying positions included in earnings-at-risk, see the table on page 122.

The CTC Risk Committee establishes the Firm's structural interest rate risk policies and market risk limits, which are subject to approval by the DRPC. Treasury and CIO, working in partnership with the lines of business, calculates the Firm's structural interest rate risk profile and reviews it with senior management including the CTC Risk Committee and the Firm's ALCO. In addition, oversight of structural interest rate risk is managed through a dedicated risk function reporting to the CTC CRO. This risk function is responsible for providing independent oversight and governance around assumptions and establishing and monitoring limits for structural interest rate risk. The Firm manages structural interest rate risk generally through its investment securities portfolio and interest rate derivatives.

Structural interest rate risk can occur due to a variety of factors, including:

- Differences in the timing among the maturity or repricing of assets, liabilities and off-balance sheet instruments
- Differences in the amounts of assets, liabilities and off-balance sheet instruments that are repricing at the same time
- Differences in the amounts by which short-term and long-term market interest rates change (for example, changes in the slope of the yield curve)
- The impact of changes in the maturity of various assets, liabilities or off-balance sheet instruments as interest rates change

The Firm manages interest rate exposure related to its assets and liabilities on a consolidated, firmwide basis. Business units transfer their interest rate risk to Treasury and CIO through funds transfer pricing, which takes into account the elements of interest rate exposure that can be risk-managed in financial markets. These elements include asset and liability balances and contractual rates of interest, contractual principal payment schedules, expected prepayment experience, interest rate reset dates and maturities, rate indices used for repricing, and any interest rate ceilings or floors for adjustable rate products. All transfer-pricing assumptions are dynamically reviewed.

The Firm generates a baseline for net interest income and certain interest rate-sensitive fees, and then conducts simulations of changes for interest rate-sensitive assets and liabilities denominated in U.S. dollars and other currencies ("non-U.S. dollar" currencies). This simulation primarily includes, retained loans, deposits, deposits with banks, investment securities, long term debt and any related interest rate hedges, and excludes other positions in risk management VaR and other sensitivity-based measures as described on page 122.

Earnings-at-risk scenarios estimate the potential change in this baseline, over the following 12 months utilizing multiple assumptions. These scenarios consider the impact on exposures as a result of changes in interest rates from baseline rates, as well as pricing sensitivities of deposits, optionality and changes in product mix. The scenarios include forecasted balance sheet changes, as well as modeled prepayment and reinvestment behavior, but do not include assumptions about actions that could be taken by the Firm in response to any such instantaneous rate changes. Mortgage prepayment assumptions are based on scenario interest rates compared with underlying contractual rates, the time since origination, and other factors which are updated periodically based on historical experience. The pricing sensitivity of deposits in the baseline and scenarios use assumed rates paid which may differ from actual rates paid due to timing lags and other factors. The Firm's earnings-at-risk scenarios are periodically evaluated and enhanced in response to changes in the composition of the Firm's balance sheet, changes in market conditions, improvements in the Firm's simulation and other factors.

The Firm's U.S. dollar sensitivities are presented in the table below.

JPMorgan Chase's 12-month earnings-at-risk sensitivity profiles

U.S. dollar	Instantaneous change in rates			
(in billions)	+200 bps	+100 bps	-100 bps	-200 bps
December 31, 2017	**$ 2.4**	**$ 1.7**	**(3.6)** (a)	**NM** (b)
December 31, 2016	$ 4.0	$ 2.4	NM (b)	NM (b)

(a) As a result of the 2017 increase in the Fed Funds target rate to between 1.25% and 1.50%, the -100 bps sensitivity has been included.
(b) Given the level of market interest rates, these downward parallel earnings-at-risk scenarios are not considered to be meaningful.

The non-U.S. dollar sensitivities for an instantaneous increase in rates by 200 and 100 basis points results in a 12-month benefit to net interest income of approximately $800 million and $500 million, respectively, at December 31, 2017 and were not material at December 31, 2016. The non-U.S. dollar sensitivities for an instantaneous decrease in rates by 200 and 100 basis points were not material to the Firm's earnings-at-risk at December 31, 2017 and 2016.

The Firm's sensitivity to rates is largely a result of assets repricing at a faster pace than deposits.

The Firm's net U.S. dollar sensitivities for an instantaneous increase in rates by 200 and 100 basis points decreased by approximately $1.6 billion and $700 million, respectively, when compared to December 31, 2016. The primary driver of that decrease was the updating of the Firm's baseline to reflect higher interest rates. As higher interest rates are reflected in the Firm's baselines, the magnitude of the sensitivity to further increases in rates would be expected to be less significant.

Separately, another U.S. dollar interest rate scenario used by the Firm – involving a steeper yield curve with long-term rates rising by 100 basis points and short-term rates staying at current levels – results in a 12-month benefit to net interest income of approximately $700 million and $800 million at December 31, 2017 and 2016, respectively. The increase in net interest income under this scenario reflects the Firm reinvesting at the higher long-term rates, with funding costs remaining unchanged. The results of the comparable non-U.S. dollar scenarios were not material to the Firm at December 31, 2017 and 2016.

Non-U.S. dollar foreign exchange risk

Non-U.S. dollar FX risk is the risk that changes in foreign exchange rates affect the value of the Firm's assets or liabilities or future results. The Firm has structural non-U.S. dollar FX exposures arising from capital investments, forecasted expense and revenue, the investment securities portfolio and non-U.S. dollar-denominated debt issuance. Treasury and CIO, working in partnership with the lines of business, primarily manage these risks on behalf of the Firm. Treasury and CIO may hedge certain of these risks using derivatives within risk limits governed by the CTC Risk Committee.

Other sensitivity-based measures

The Firm quantifies the market risk of certain investment and funding activities by assessing the potential impact on net revenue and OCI due to changes in relevant market variables. For additional information on the positions captured in other sensitivity-based measures, please refer to the Risk identification and classification table on page 122.

The table below represents the potential impact to net revenue or OCI for market risk sensitive instruments that are not included in VaR or earnings-at-risk. Where appropriate, instruments used for hedging purposes are reported along with the positions being hedged. The sensitivities disclosed in the table below may not be representative of the actual gain or loss that would have been realized at December 31, 2017, as the movement in market parameters across maturities may vary and are not intended to imply management's expectation of future deterioration in these sensitivities.

Gain/(loss) (in millions) Activity	Description	Sensitivity measure	December 31, 2017	December 31, 2016
Investment activities				
Investment management activities	Consists of seed capital and related hedges; and fund co-investments	10% decline in market value	$ (110)	$ (166)
Other investments	Consists of private equity and other investments held at fair value	10% decline in market value	(338)	(358)
Funding activities				
Non-USD LTD cross-currency basis	Represents the basis risk on derivatives used to hedge the foreign exchange risk on the non-USD LTD	1 basis point parallel tightening of cross currency basis	(10)	(7)
Non-USD LTD hedges foreign currency ("FX") exposure	Primarily represents the foreign exchange revaluation on the fair value of the derivative hedges	10% depreciation of currency	(13)	(23)
Derivatives – funding spread risk	Impact of changes in the spread related to derivatives FVA	1 basis point parallel increase in spread	(6)	(4)
Fair value option elected liabilities – funding spread risk	Impact of changes in the spread related to fair value option elected liabilities DVA[(a)]	1 basis point parallel increase in spread	22	17
Fair value option elected liabilities – interest rate sensitivity	Interest rate sensitivity on fair value option liabilities resulting from a change in the Firm's own credit spread[(a)]	1 basis point parallel increase in spread	(1)	NA

(a) Impact recognized through OCI.

COUNTRY RISK MANAGEMENT

The Firm has a country risk management framework for monitoring and assessing how financial, economic, political or other significant developments adversely affect the value of the Firm's exposures related to a particular country or set of countries. The Country Risk Management group actively monitors the various portfolios which may be impacted by these developments to ensure the Firm's exposures are diversified and that exposure levels are appropriate given the Firm's strategy and risk tolerance relative to a country.

Organization and management

Country Risk Management is an independent risk management function that assesses, manages and monitors country risk originated across the Firm. The Firmwide Risk Executive for Country Risk reports to the Firm's CRO.

The Firm's country risk management function includes the following activities:

- Establishing policies, procedures and standards consistent with a comprehensive country risk framework
- Assigning sovereign ratings, and assessing country risks and establishing risk tolerance relative to a country
- Measuring and monitoring country risk exposure and stress across the Firm
- Managing and approving country limits and reporting trends and limit breaches to senior management
- Developing surveillance tools, such as signaling models and ratings indicators, for early identification of potential country risk concerns
- Providing country risk scenario analysis

Sources and measurement

The Firm is exposed to country risk through its lending and deposits, investing, and market-making activities, whether cross-border or locally funded. Country exposure includes activity with both government and private-sector entities in a country. Under the Firm's internal country risk management approach, country exposure is reported based on the country where the majority of the assets of the obligor, counterparty, issuer or guarantor are located or where the majority of its revenue is derived, which may be different than the domicile (legal residence) or country of incorporation of the obligor, counterparty, issuer or guarantor. Country exposures are generally measured by considering the Firm's risk to an immediate default of the counterparty or obligor, with zero recovery. Assumptions are sometimes required in determining the measurement and allocation of country exposure, particularly in the case of certain non-linear or index exposures. The use of different measurement approaches or assumptions could affect the amount of reported country exposure.

Under the Firm's internal country risk measurement framework:

- Lending exposures are measured at the total committed amount (funded and unfunded), net of the allowance for credit losses and cash and marketable securities collateral received
- Deposits are measured as the cash balances placed with central and commercial banks
- Securities financing exposures are measured at their receivable balance, net of collateral received
- Debt and equity securities are measured at the fair value of all positions, including both long and short positions
- Counterparty exposure on derivative receivables is measured at the derivative's fair value, net of the fair value of the related collateral. Counterparty exposure on derivatives can change significantly because of market movements
- Credit derivatives protection purchased and sold is reported based on the underlying reference entity and is measured at the notional amount of protection purchased or sold, net of the fair value of the recognized derivative receivable or payable. Credit derivatives protection purchased and sold in the Firm's market-making activities is measured on a net basis, as such activities often result in selling and purchasing protection related to the same underlying reference entity; this reflects the manner in which the Firm manages these exposures

Some activities may create contingent or indirect exposure related to a country (for example, providing clearing services or secondary exposure to collateral on securities financing receivables). These exposures are managed in the normal course of business through the Firm's credit, market, and operational risk governance, rather than through Country Risk Management.

The Firm's internal country risk reporting differs from the reporting provided under the FFIEC bank regulatory requirements. For further information on the FFIEC's reporting methodology, see Cross-border outstandings on page 296 of the 2017 Form 10-K.

Stress testing

Stress testing is an important component of the Firm's country risk management framework, which aims to estimate and limit losses arising from a country crisis by measuring the impact of adverse asset price movements to a country based on market shocks combined with counterparty specific assumptions. Country Risk Management periodically designs and runs tailored stress scenarios to test vulnerabilities to individual countries, or groups of countries, in response to specific or potential market events, sector performance concerns and geopolitical risks. These tailored stress results are used to assess potential risk reduction across the Firm, as necessary.

Risk Reporting

To enable effective risk management of country risk to the Firm, country nominal exposure and stress are measured and reported weekly, and used by Country Risk Management to identify trends, and monitor high usages and breaches against limits.

The following table presents the Firm's top 20 exposures by country (excluding the U.S.) as of December 31, 2017. The selection of countries represents the Firm's largest total exposures by country, based on the Firm's internal country risk management approach, and does not represent the Firm's view of any actual or potentially adverse credit conditions. Country exposures may fluctuate from period to period due to client activity and market flows.

Top 20 country exposures (excluding the U.S.)[a]

	December 31, 2017			
(in billions)	Lending and deposits[b]	Trading and investing[c][d]	Other[e]	Total exposure
Germany	$ 43.3	$ 13.8	$ 0.3	$ 57.4
United Kingdom	32.0	11.5	2.8	46.3
Japan	24.7	5.7	0.4	30.8
France	12.5	6.6	0.3	19.4
China	9.6	5.5	1.2	16.3
Canada	12.2	2.5	0.2	14.9
Switzerland	8.5	1.5	3.9	13.9
India	5.3	6.1	0.9	12.3
Australia	5.8	5.6	–	11.4
Luxembourg	8.7	0.8	–	9.5
Netherlands	6.6	0.8	0.6	8.0
Spain	4.7	2.1	0.1	6.9
South Korea	4.6	1.9	0.3	6.8
Italy	3.5	3.1	0.1	6.7
Singapore	4.0	1.2	1.1	6.3
Mexico	4.0	1.2	–	5.2
Brazil	3.2	1.4	0.5	5.1
Hong Kong	2.3	0.9	1.6	4.8
Saudi Arabia	3.8	0.7	–	4.5
Belgium	2.7	1.5	–	4.2

(a) Country exposures above reflect 86% of total firmwide non U.S. exposure.
(b) Lending and deposits includes loans and accrued interest receivable (net of collateral and the allowance for loan losses), deposits with banks (including central banks), acceptances, other monetary assets, issued letters of credit net of participations, and unused commitments to extend credit. Excludes intra-day and operating exposures, such as from settlement and clearing activities.
(c) Includes market-making inventory, AFS securities, counterparty exposure on derivative and securities financings net of collateral and hedging.
(d) Includes single reference entity ("single-name"), index and other multiple reference entity transactions for which one or more of the underlying reference entities is in a country listed in the above table.
(e) Includes capital invested in local entities and physical commodity inventory.

Operational risk is the risk associated with inadequate or failed internal processes, people and systems, or from external events; operational risk includes cybersecurity risk, business and technology resiliency risk, payment fraud risk, and third-party outsourcing risk. Operational risk is inherent in the Firm's activities and can manifest itself in various ways, including fraudulent acts, business interruptions, inappropriate employee behavior, failure to comply with applicable laws and regulations or failure of vendors to perform in accordance with their arrangements. These events could result in financial losses, litigation and regulatory fines, as well as other damages to the Firm. The goal is to keep operational risk at appropriate levels in light of the Firm's financial position, the characteristics of its businesses, and the markets and regulatory environments in which it operates.

Operational Risk Management Framework

To monitor and control operational risk, the Firm has an Operational Risk Management Framework ("ORMF") which is designed to enable the Firm to maintain a sound and well-controlled operational environment. The ORMF has four main components: Governance, Risk Identification and Assessment, Measurement, and Monitoring and Reporting.

Governance

The lines of business and corporate functions are responsible for owning and managing their operational risks. The Firmwide Oversight and Control Group, which consists of control officers within each line of business and corporate function, is responsible for the day-to-day execution of the ORMF.

Line of business and corporate function control committees oversee the operational risk and control environments of their respective businesses and functions. These committees escalate operational risk issues to the FCC, as appropriate. For additional information on the FCC, see Enterprise-wide Risk Management on pages 75–137.

The Firmwide Risk Executive for Operational Risk Governance ("ORG"), a direct report to the CRO, is responsible for defining the ORMF and establishing minimum standards for its execution. Operational Risk Officers report to both the line of business CROs and to the Firmwide Risk Executive for ORG, and are independent of the respective businesses or corporate functions they oversee.

The Firm's Operational Risk Governance Policy is approved by the DRPC. This policy establishes the Operational Risk Management Framework for the Firm.

Risk identification and assessment

The Firm utilizes several tools to identify, assess, mitigate and manage its operational risk. One such tool is the Risk and Control Self-Assessment ("RCSA") program which is executed by LOBs and corporate functions in accordance with the minimum standards established by ORG. As part of the RCSA program, lines of business and corporate functions identify key operational risks inherent in their activities, evaluate the effectiveness of relevant controls in place to mitigate identified risks, and define actions to reduce residual risk. Action plans are developed for identified control issues and businesses and corporate functions are held accountable for tracking and resolving issues in a timely manner. Operational Risk Officers independently challenge the execution of the RCSA program and evaluate the appropriateness of the residual risk results.

In addition to the RCSA program, the Firm tracks and monitors events that have led to or could lead to actual operational risk losses, including litigation-related events. Responsible businesses and corporate functions analyze their losses to evaluate the effectiveness of their control environment to assess where controls have failed, and to determine where targeted remediation efforts may be required. ORG provides oversight of these activities and may also perform independent assessments of significant operational risk events and areas of concentrated or emerging risk.

Measurement

In addition to the level of actual operational risk losses, operational risk measurement includes operational risk-based capital and operational risk loss projections under both baseline and stressed conditions.

The primary component of the operational risk capital estimate is the Loss Distribution Approach ("LDA") statistical model, which simulates the frequency and severity of future operational risk loss projections based on historical data. The LDA model is used to estimate an aggregate operational risk loss over a one-year time horizon, at a 99.9% confidence level. The LDA model incorporates actual internal operational risk losses in the quarter following the period in which those losses were realized, and the calculation generally continues to reflect such losses even after the issues or business activities giving rise to the losses have been remediated or reduced.

As required under the Basel III capital framework, the Firm's operational risk-based capital methodology, which uses the Advanced Measurement Approach, incorporates internal and external losses as well as management's view of tail risk captured through operational risk scenario analysis, and evaluation of key business environment and internal control metrics.

The Firm considers the impact of stressed economic conditions on operational risk losses and develops a forward looking view of material operational risk events that may occur in a stressed environment. The Firm's operational risk stress testing framework is utilized in calculating results for the Firm's CCAR and ICAAP processes.

For information related to operational risk RWA, CCAR or ICAAP, see Capital Risk Management section, pages 82–91.

Monitoring and reporting
ORG has established standards for consistent operational risk monitoring and reporting. The standards also reinforce escalation protocols to senior management and to the Board of Directors. Operational risk reports are produced on a firmwide basis as well as by line of business and corporate function.

Subcategories and examples of operational risks

As mentioned previously, operational risk can manifest itself in various ways. Operational risk subcategories such as Compliance risk, Conduct risk, Legal risk and Estimations and Model risk, as well as other operational risks, can lead to losses which are captured through the Firm's operational risk measurement processes. More information on Compliance risk, Conduct risk, Legal risk and Estimations and Model risk subcategories are discussed on pages 134, 135, 136 and 137, respectively. Details on other select examples of operational risks are provided below.

Cybersecurity risk
Cybersecurity risk is an important, continuous and evolving focus for the Firm. The Firm devotes significant resources to protecting and continuing to improve the security of the Firm's computer systems, software, networks and other technology assets. The Firm's security efforts are intended to protect against, among other things, cybersecurity attacks by unauthorized parties to obtain access to confidential information, destroy data, disrupt or degrade service, sabotage systems or cause other damage. The Firm continues to make significant investments in enhancing its cyberdefense capabilities and to strengthen its partnerships with the appropriate government and law enforcement agencies and other businesses in order to understand the full spectrum of cybersecurity risks in the operating environment, enhance defenses and improve resiliency against cybersecurity threats. The Firm actively participates in discussions of cybersecurity risks with law enforcement, government officials, peer and industry groups, and has significantly increased efforts to educate employees and certain clients on the topic. Third parties with which the Firm does business or that facilitate the Firm's business activities (e.g., vendors, exchanges, clearing houses, central depositories, and financial intermediaries) could also be sources of cybersecurity risk to the Firm. Third party cybersecurity incidents such as system breakdowns or failures, misconduct by the employees of such parties, or cyberattacks could affect their ability to deliver a product or service to the Firm or result in lost or compromised information of the Firm or its clients. Clients can also be sources of cybersecurity risk to the Firm, particularly when their activities and systems are beyond the Firm's own security and control systems. As a result, the Firm engages in regular and ongoing discussions with certain vendors and clients regarding cybersecurity risks and opportunities to improve security. However, where cybersecurity incidents are due to client failure to maintain the security of their own systems and processes, clients will generally be responsible for losses incurred.

To protect the confidentiality, integrity and availability of the Firm's infrastructure, resources and information, the Firm leverages the ORMF to ensure risks are identified and managed within defined corporate tolerances. The Firm's Board of Directors and the Audit Committee are regularly briefed on the Firm's cybersecurity policies and practices and ongoing efforts to improve security, as well as its efforts regarding significant cybersecurity events.

Business and technology resiliency risk
Business disruptions can occur due to forces beyond the Firm's control such as severe weather, power or telecommunications loss, flooding, transit strikes, terrorist threats or infectious disease. The safety of the Firm's employees and customers is of the highest priority. The Firm's global resiliency program is intended to enable the Firm to recover its critical business functions and supporting assets (i.e., staff, technology and facilities) in the event of a business interruption. The program includes corporate governance, awareness and training, as well as strategic and tactical initiatives to identify, assess, and manage business interruption and public safety risks.

The strength and proficiency of the Firm's global resiliency program has played an integral role in maintaining the Firm's business operations during and after various events.

Payment fraud risk
Payment fraud risk is the risk of external and internal parties unlawfully obtaining personal monetary benefit through misdirected or otherwise improper payment, and exposing the Firm to financial or reputational harm. Over the past year, the risk of payment fraud remained at a heightened level across the industry. The complexities of these attacks along with perpetrators' strategies continue to evolve. A Payments Control Program has been established that includes Cybersecurity, Operations, Technology, Risk and the lines of business to manage the risk, implement controls and provide employee and client education and awareness training. In addition, a new wholesale fraud detection solution has been introduced which monitors high value payments for certain anomalies. The Firm's monitoring of customer behavior is periodically evaluated and enhanced, and attempts to detect and mitigate new strategies implemented by fraud perpetrators. The Firm's consumer and wholesale businesses collaborate closely to deploy risk mitigation controls across their businesses.

Third-party outsourcing risk

To identify and manage the operational risk inherent in its outsourcing activities, the Firm has a Third-Party Oversight ("TPO") framework to assist lines of business and corporate functions in selecting, documenting, onboarding, monitoring and managing their supplier relationships. The objective of the TPO framework is to hold third parties to the same high level of operational performance as is expected of the Firm's internal operations. The Corporate Third-Party Oversight group is responsible for Firmwide TPO training, monitoring, reporting and standards.

Insurance

One of the ways in which operational risk may be mitigated is through insurance maintained by the Firm. The Firm purchases insurance from commercial insurers and utilizes a wholly-owned captive insurer, Park Assurance Company, to ensure compliance with local laws and regulations (e.g., workers compensation), as well as to serve other needs (e.g., property loss and public liability). Insurance may also be required by third parties with whom the Firm does business. The insurance purchased is reviewed and approved by senior management.

COMPLIANCE RISK MANAGEMENT

Compliance risk, a subcategory of operational risk, is the risk of failure to comply with applicable laws, rules and regulations.

Overview

Each line of business and function is accountable for managing its compliance risk. The Firm's Compliance Organization ("Compliance"), which is independent of the lines of business, works closely with senior management to provide independent review, monitoring and oversight of business operations with a focus on compliance with the legal and regulatory obligations applicable to the delivery of the Firm's products and services to clients and customers.

These compliance risks relate to a wide variety of legal and regulatory obligations, depending on the line of business and the jurisdiction, and include those related to financial products and services, relationships and interactions with clients and customers, and employee activities. For example, compliance risks include those associated with anti-money laundering compliance, trading activities, market conduct, and complying with the rules and regulations related to the offering of products and services across jurisdictional borders, among others. Compliance risk is also inherent in the Firm's fiduciary activities, including the failure to exercise the applicable high standard of care (such as the duties of loyalty or care), to act in the best interest of clients and customers or to treat clients and customers fairly.

Other Functions provide oversight of significant regulatory obligations that are specific to their respective areas of responsibility.

Compliance implements various practices designed to identify and mitigate compliance risk by establishing policies, testing, monitoring, training and providing guidance.

Governance and oversight

Compliance is led by the Firms' CCO who reports to the Firm's CRO.

The Firm maintains oversight and coordination of its Compliance Risk Management practices through the Firm's CCO, lines of business CCOs and regional CCOs to implement the Compliance program globally across the lines of business and regions. The Firm's CCO is a member of the FCC and the FRC. The Firm's CCO also provides regular updates to the Audit Committee and DRPC. In addition, certain Special Purpose Committees of the Board have been established to oversee the Firm's compliance with regulatory Consent Orders.

The Firm has a Code of Conduct (the "Code"). Each employee is given annual training on the Code and is required annually to affirm his or her compliance with the Code. All new hires must complete Code training shortly after their start date with the Firm. The Code sets forth the Firm's expectation that employees will conduct themselves with integrity at all times and provides the principles that govern employee conduct with clients, customers, shareholders and one another, as well as with the markets and communities in which the Firm does business. The Code requires employees to promptly report any known or suspected violation of the Code, any internal Firm policy, or any law or regulation applicable to the Firm's business. It also requires employees to report any illegal conduct, or conduct that violates the underlying principles of the Code, by any of the Firm's employees, customers, suppliers, contract workers, business partners, or agents. The Code prohibits retaliation against anyone who raises an issue or concern in good faith. Specified compliance officers are specially trained and designated as "code specialists" who act as a resource to employees on questions related to the Code. Employees can report any known or suspected violations of the Code through the Code Reporting Hotline by phone or the internet. The Hotline is anonymous, except in certain non-U.S. jurisdictions where laws prohibit anonymous reporting, and is available 24/7 globally, with translation services. It is maintained by an outside service provider. Annually, the Chief Compliance Office and Human Resources report to the Audit Committee on the Code of Conduct program and provide an update on the employee completion rate for Code of Conduct training and affirmation.

CONDUCT RISK MANAGEMENT

Conduct risk, a subcategory of operational risk, is the risk that any action or inaction by an employee of the Firm could lead to unfair client/customer outcomes, compromise the Firm's reputation, impact the integrity of the markets in which the Firm operates, or reflect poorly on the Firm's culture.

Overview

Each line of business or function is accountable for identifying and managing its conduct risk to provide appropriate engagement, ownership and sustainability of a culture consistent with the Firm's How We Do Business Principles ("Principles"). The Principles serve as a guide for how employees are expected to conduct themselves. With the Principles serving as a guide, the Firm's Code sets out the Firm's expectations for each employee and provides information and resources to help employees conduct business ethically and in compliance with the law everywhere the Firm operates. For further discussion of the Code, see Compliance Risk Management on page 134.

Governance and oversight

The CMDC is the Board-level Committee with primary oversight of the firm's Culture and Conduct Program. The Audit Committee is responsible for reviewing the program established by management to monitor compliance with the Code. Additionally, the DRPC reviews, at least annually, the Firm's qualitative factors included in the Risk Appetite Framework, including conduct risk. The DRPC also meets annually with the CMDC to review and discuss aspects of the Firm's compensation practices. Finally, the Culture & Conduct Risk Committee provides oversight of certain culture and conduct risk initiatives at the Firm.

Conduct risk management is incorporated into various aspects of people management practices throughout the employee life cycle, including recruiting, onboarding, training and development, performance management, promotion and compensation processes. Businesses undertake annual RCSA assessments, and, as part of these reviews, identify their respective key inherent operational risks (including conduct risks), evaluate the design and effectiveness of their controls, identify control gaps and develop associated action plans. Each LOB and designated corporate function completes an assessment of conduct risk quarterly, reviews metrics and issues which may involve conduct risk, and provides business conduct training as appropriate.

The Firm's Know Your Employee framework generally addresses how the Firm manages, oversees and responds to workforce conduct related matters that may otherwise expose the Firm to financial, reputational, compliance and other operating risks. The Firm also has a HR Control Forum, the primary purpose of which is to discuss conduct and accountability for more significant risk and control issues and review, when appropriate, employee actions including but not limited to promotion and compensation actions.

LEGAL RISK MANAGEMENT

Legal risk, a subcategory of operational risk, is the risk of loss primarily caused by the actual or alleged failure to meet legal obligations that arise from the rule of law in jurisdictions in which the Firm operates, agreements with clients and customers, and products and services offered by the Firm.

Overview

The global Legal function ("Legal") provides legal services and advice to the Firm. Legal is responsible for managing the Firm's exposure to Legal risk by:

- managing actual and potential litigation and enforcement matters, including internal reviews and investigations related to such matters
- advising on products and services, including contract negotiation and documentation
- advising on offering and marketing documents and new business initiatives
- managing dispute resolution
- interpreting existing laws, rules and regulations, and advising on changes thereto
- advising on advocacy in connection with contemplated and proposed laws, rules and regulations, and
- providing legal advice to the LOBs and corporate functions, in alignment with the lines of defense described under Enterprise-wide Risk Management.

Legal selects, engages and manages outside counsel for the Firm on all matters in which outside counsel is engaged. In addition, Legal advises the Firm's Conflicts Office which reviews the Firm's wholesale transactions that may have the potential to create conflicts of interest for the Firm.

Governance and oversight

The Firm's General Counsel reports to the CEO and is a member of the Operating Committee, the Firmwide Risk Committee and the Firmwide Control Committee. The General Counsel's leadership team includes a General Counsel for each line of business, the heads of the Litigation and Corporate & Regulatory practices, as well as the Firm's Corporate Secretary. Each region (e.g., Latin America, Asia Pacific) has a General Counsel who is responsible for managing legal risk across all lines of business and functions in the region.

The Firm's General Counsel and other members of Legal report on significant legal matters at each meeting of the Firm's Board of Directors, at least quarterly to the Audit Committee, and periodically to the DRPC.

Legal serves on and advises various committees (including new business initiative and reputation risk committees) and advises the Firm's businesses to protect the Firm's reputation beyond any particular legal requirements.

ESTIMATIONS AND MODEL RISK MANAGEMENT

Estimations and Model risk, a subcategory of operational risk, is the potential for adverse consequences from decisions based on incorrect or misused estimation outputs.

The Firm uses models and other analytical and judgment-based estimations across various businesses and functions. The estimation methods are of varying levels of sophistication and are used for many purposes, such as the valuation of positions and measurement of risk, assessing regulatory capital requirements, conducting stress testing, and making business decisions. A dedicated independent function, Model Risk Governance and Review ("MRGR"), defines and governs the Firm's model risk management policies and certain analytical and judgment-based estimations, such as those used in risk management, budget forecasting and capital planning and analysis. MRGR reports to the Firm's CRO.

Model risks are owned by the users of the models within the various businesses and functions in the Firm based on the specific purposes of such models. Users and developers of models are responsible for developing, implementing and testing their models, as well as referring models to the Model Risk function for review and approval. Once models have been approved, model users and developers are responsible for maintaining a robust operating environment, and must monitor and evaluate the performance of the models on an ongoing basis. Model users and developers may seek to enhance models in response to changes in the portfolios and in product and market developments, as well as to capture improvements in available modeling techniques and systems capabilities.

Models are tiered based on an internal standard according to their complexity, the exposure associated with the model and the Firm's reliance on the model. This tiering is subject to the approval of the Model Risk function. A model review conducted by the Model Risk function considers the model's suitability for the specific uses to which it will be put. The factors considered in reviewing a model include whether the model accurately reflects the characteristics of the product and its significant risks, the selection and reliability of model inputs, consistency with models for similar products, the appropriateness of any model-related adjustments, and sensitivity to input parameters and assumptions that cannot be observed from the market. When reviewing a model, the Model Risk function analyzes and challenges the model methodology and the reasonableness of model assumptions and may perform or require additional testing, including back-testing of model outcomes. Model reviews are approved by the appropriate level of management within the Model Risk function based on the relevant model tier.

Under the Firm's Estimations and Model Risk Management Policy, the Model Risk function reviews and approves new models, as well as material changes to existing models, prior to implementation in the operating environment. In certain circumstances, the head of the Model Risk function may grant exceptions to the Firm's policy to allow a model to be used prior to review or approval. The Model Risk function may also require the user to take appropriate actions to mitigate the model risk if it is to be used in the interim. These actions will depend on the model and may include, for example, limitation of trading activity.

The governance of analytical and judgment-based estimations, such as those used in risk management, budget forecasting, and capital planning and analysis, within MRGR's scope, follows a consistent approach to the governance of models.

For a summary of valuations based on valuation models and other valuation techniques, see Critical Accounting Estimates Used by the Firm on pages 138–140 and Note 2.

CRITICAL ACCOUNTING ESTIMATES USED BY THE FIRM

JPMorgan Chase's accounting policies and use of estimates are integral to understanding its reported results. The Firm's most complex accounting estimates require management's judgment to ascertain the appropriate carrying value of assets and liabilities. The Firm has established policies and control procedures intended to ensure that estimation methods, including any judgments made as part of such methods, are well-controlled, independently reviewed and applied consistently from period to period. The methods used and judgments made reflect, among other factors, the nature of the assets or liabilities and the related business and risk management strategies, which may vary across the Firm's businesses and portfolios. In addition, the policies and procedures are intended to ensure that the process for changing methodologies occurs in an appropriate manner. The Firm believes its estimates for determining the carrying value of its assets and liabilities are appropriate. The following is a brief description of the Firm's critical accounting estimates involving significant judgments.

Allowance for credit losses

JPMorgan Chase's allowance for credit losses covers the retained consumer and wholesale loan portfolios, as well as the Firm's wholesale and certain consumer lending-related commitments. The allowance for loan losses is intended to adjust the carrying value of the Firm's loan assets to reflect probable credit losses inherent in the loan portfolio as of the balance sheet date. Similarly, the allowance for lending-related commitments is established to cover probable credit losses inherent in the lending-related commitments portfolio as of the balance sheet date.

The allowance for credit losses includes a formula-based component, an asset-specific component, and a component related to PCI loans. The determination of each of these components involves significant judgment on a number of matters. For further discussion of these components, areas of judgment and methodologies used in establishing the Firm's allowance for credit losses, see Note 13.

Allowance for credit losses sensitivity

The Firm's allowance for credit losses is sensitive to numerous factors, which may differ depending on the portfolio. Changes in economic conditions or in the Firm's assumptions and estimates could affect its estimate of probable credit losses inherent in the portfolio at the balance sheet date. The Firm uses its best judgment to assess these economic conditions and loss data in estimating the allowance for credit losses and these estimates are subject to periodic refinement based on changes to underlying external or Firm-specific historical data. The use of alternate estimates, data sources, adjustments to modeled loss estimates for model imprecision and other factors would result in a different estimated allowance for credit losses, as well as impact any related sensitivities described below. During the second quarter of 2017, the Firm refined its loss estimates relating to the wholesale credit portfolio. See Note 13 for further discussion.

To illustrate the potential magnitude of certain alternate judgments, the Firm estimates that changes in the following inputs would have the following effects on the Firm's modeled credit loss estimates as of December 31, 2017, without consideration of any offsetting or correlated effects of other inputs in the Firm's allowance for loan losses:

- A combined 5% decline in housing prices and a 100 basis point increase in unemployment rates from current levels could imply:
  - an increase to modeled credit loss estimates of approximately $525 million for PCI loans.
  - an increase to modeled annual credit loss estimates of approximately $100 million for residential real estate, excluding PCI loans.
- For credit card loans, a 100 basis point increase in unemployment rates from current levels could imply an increase to modeled annual loss estimates of approximately $1.0 billion.
- An increase in PD factors consistent with a one-notch downgrade in the Firm's internal risk ratings for its entire wholesale loan portfolio could imply an increase in the Firm's modeled credit loss estimates of approximately $1.4 billion.
- A 100 basis point increase in estimated loss given default ("LGD") for the Firm's entire wholesale loan portfolio could imply an increase in the Firm's modeled credit loss estimates of approximately $175 million.

The purpose of these sensitivity analyses is to provide an indication of the isolated impacts of hypothetical alternative assumptions on modeled loss estimates. The changes in the inputs presented above are not intended to imply management's expectation of future deterioration of those risk factors. In addition, these analyses are not intended to estimate changes in the overall allowance for loan losses, which would also be influenced by the judgment management applies to the modeled loss estimates to reflect the uncertainty and imprecision of these modeled loss estimates based on then-current circumstances and conditions.

It is difficult to estimate how potential changes in specific factors might affect the overall allowance for credit losses because management considers a variety of factors and inputs in estimating the allowance for credit losses. Changes in these factors and inputs may not occur at the same rate and may not be consistent across all geographies or product types, and changes in factors may be directionally inconsistent, such that improvement in one factor may offset deterioration in other factors. In addition, it is difficult to predict how changes in specific economic conditions or assumptions could affect borrower behavior or other factors considered by management in estimating the allowance for credit losses. Given the process the Firm follows and the judgments made in evaluating the risk factors related to its loss estimates, management believes that its current estimate of the allowance for credit losses is appropriate.

Fair value of financial instruments, MSRs and commodities inventory

JPMorgan Chase carries a portion of its assets and liabilities at fair value. The majority of such assets and liabilities are measured at fair value on a recurring basis. Certain assets and liabilities are measured at fair value on a nonrecurring basis, including certain mortgage, home equity and other loans, where the carrying value is based on the fair value of the underlying collateral.

Assets measured at fair value

The following table includes the Firm's assets measured at fair value and the portion of such assets that are classified within level 3 of the valuation hierarchy. For further information, see Note 2.

December 31, 2017 (in billions, except ratio data)	Total assets at fair value	Total level 3 assets
Trading debt and equity instruments	$ 325.3	$ 5.4
Derivative receivables[(a)]	56.5	6.0
Trading assets	381.8	11.4
AFS securities	202.2	0.3
Loans	2.5	0.3
MSRs	6.0	6.0
Other	33.2	1.2
Total assets measured at fair value on a recurring basis	625.7	19.2
Total assets measured at fair value on a nonrecurring basis	1.3	0.8
Total assets measured at fair value	$ 627.0	$ 20.0
Total Firm assets	$ 2,533.6	
Level 3 assets as a percentage of total Firm assets[(a)]		0.8%
Level 3 assets as a percentage of total Firm assets at fair value[(a)]		3.2%

(a) For purposes of the table above, the derivative receivables total reflects the impact of netting adjustments; however, the $6.0 billion of derivative receivables classified as level 3 does not reflect the netting adjustment as such netting is not relevant to a presentation based on the transparency of inputs to the valuation of an asset. The level 3 balances would be reduced if netting were applied, including the netting benefit associated with cash collateral.

Valuation

Details of the Firm's processes for determining fair value are set out in Note 2. Estimating fair value requires the application of judgment. The type and level of judgment required is largely dependent on the amount of observable market information available to the Firm. For instruments valued using internally developed valuation models and other valuation techniques that use significant unobservable inputs and are therefore classified within level 3 of the valuation hierarchy, judgments used to estimate fair value are more significant than those required when estimating the fair value of instruments classified within levels 1 and 2.

In arriving at an estimate of fair value for an instrument within level 3, management must first determine the appropriate valuation technique to use. Second, the lack of observability of certain significant inputs requires management to assess all relevant empirical data in deriving valuation inputs including, for example, transaction details, yield curves, interest rates, prepayment rates, default rates, volatilities, correlations, equity or debt prices, valuations of comparable instruments, foreign exchange rates and credit curves. For further discussion of the valuation of level 3 instruments, including unobservable inputs used, see Note 2.

For instruments classified in levels 2 and 3, management judgment must be applied to assess the appropriate level of valuation adjustments to reflect counterparty credit quality, the Firm's creditworthiness, market funding rates, liquidity considerations, unobservable parameters, and for portfolios that meet specified criteria, the size of the net open risk position. The judgments made are typically affected by the type of product and its specific contractual terms, and the level of liquidity for the product or within the market as a whole. For further discussion of valuation adjustments applied by the Firm see Note 2.

Imprecision in estimating unobservable market inputs or other factors can affect the amount of gain or loss recorded for a particular position. Furthermore, while the Firm believes its valuation methods are appropriate and consistent with those of other market participants, the methods and assumptions used reflect management judgment and may vary across the Firm's businesses and portfolios.

The Firm uses various methodologies and assumptions in the determination of fair value. The use of methodologies or assumptions different than those used by the Firm could result in a different estimate of fair value at the reporting date. For a detailed discussion of the Firm's valuation process and hierarchy, and its determination of fair value for individual financial instruments, see Note 2.

Goodwill impairment

Under U.S. GAAP, goodwill must be allocated to reporting units and tested for impairment at least annually. The Firm's process and methodology used to conduct goodwill impairment testing is described in Note 15.

Management applies significant judgment when estimating the fair value of its reporting units. Estimates of fair value are dependent upon estimates of the future earnings potential of the Firm's reporting units, long-term growth rates and the estimated market cost of equity. Imprecision in estimating these factors can affect the estimated fair value of the reporting units.

Based upon the updated valuations for all of its reporting units, the Firm concluded that the goodwill allocated to its reporting units was not impaired at December 31, 2017. The fair values of these reporting units exceeded their carrying values by approximately 15% or higher and did not indicate a significant risk of goodwill impairment based on current projections and valuations. Such valuations do not reflect the impact of the TCJA that was enacted in December 2017 as such impact would not alter the conclusion that goodwill is not impaired.

The projections for all of the Firm's reporting units are consistent with management's current short-term business outlook assumptions, and in the longer term, incorporate a set of macroeconomic assumptions and the Firm's best estimates of long-term growth and returns on equity of its businesses. Where possible, the Firm uses third-party and peer data to benchmark its assumptions and estimates.

Declines in business performance, increases in credit losses, increases in capital requirements, as well as deterioration in economic or market conditions, adverse estimates of regulatory or legislative changes or increases in the estimated market cost of equity, could cause the estimated fair values of the Firm's reporting units or their associated goodwill to decline in the future, which could result in a material impairment charge to earnings in a future period related to some portion of the associated goodwill.

For additional information on goodwill, see Note 15.

Credit card rewards liability

JPMorgan Chase offers credit cards with various reward programs which allow cardholders to earn reward points based on their account activity and the terms and conditions of the rewards program. Generally, there are no limits on the points that an eligible cardholder can earn, nor do they expire, and these points can be redeemed for a variety of rewards, including cash (predominantly in the form of account credits), gift cards and travel.

The Firm maintains a rewards liability which represents the estimated cost of reward points earned and expected to be redeemed by cardholders. The rewards liability is sensitive to various assumptions, including cost per point and redemption rates for each of the various reward programs, which are evaluated periodically. The liability is accrued as the cardholder earns the benefit and is reduced when the cardholder redeems points. This liability was $4.9 billion and $3.8 billion at December 31, 2017 and 2016, respectively, and is recorded in accounts payable and other liabilities on the Consolidated balance sheets.

Income taxes

JPMorgan Chase is subject to the income tax laws of the various jurisdictions in which it operates, including U.S. federal, state and local, and non-U.S. jurisdictions. These laws are often complex and may be subject to different interpretations. To determine the financial statement impact of accounting for income taxes, including the provision for income tax expense and unrecognized tax benefits, JPMorgan Chase must make assumptions and judgments about how to interpret and apply these complex tax laws to numerous transactions and business events, as well as make judgments regarding the timing of when certain items may affect taxable income in the U.S. and non-U.S. tax jurisdictions.

JPMorgan Chase's interpretations of tax laws around the world are subject to review and examination by the various taxing authorities in the jurisdictions where the Firm operates, and disputes may occur regarding its view on a tax position. These disputes over interpretations with the various taxing authorities may be settled by audit, administrative appeals or adjudication in the court systems of the tax jurisdictions in which the Firm operates. JPMorgan Chase regularly reviews whether it may be assessed additional income taxes as a result of the resolution of these matters, and the Firm records additional reserves as appropriate. In addition, the Firm may revise its estimate of income taxes due to changes in income tax laws, legal interpretations, and business strategies. It is possible that revisions in the Firm's estimate of income taxes may materially affect the Firm's results of operations in any reporting period.

The Firm's provision for income taxes is composed of current and deferred taxes. Deferred taxes arise from differences between assets and liabilities measured for financial reporting versus income tax return purposes. Deferred tax assets are recognized if, in management's judgment, their realizability is determined to be more likely than not. The Firm has also recognized deferred tax assets in connection with certain tax attributes, including NOLs. The Firm performs regular reviews to ascertain whether its deferred tax assets are realizable. These reviews include management's estimates and assumptions regarding future taxable income, which also incorporates various tax planning strategies, including strategies that may be available to utilize NOLs before they expire. In connection with these reviews, if it is determined that a deferred tax asset is not realizable, a valuation allowance is established. The valuation allowance may be reversed in a subsequent reporting period if the Firm determines that, based on revised estimates of future taxable income or changes in tax planning strategies, it is more likely than not that all or part of the deferred tax asset will become realizable. As of December 31, 2017, management has determined it is more likely than not that the Firm will realize its deferred tax assets, net of the existing valuation allowance.

Prior to December 31, 2017, U.S. federal income taxes had not been provided on the undistributed earnings of certain non-U.S. subsidiaries, to the extent that such earnings had been reinvested abroad for an indefinite period of time. The Firm will no longer maintain the indefinite reinvestment assertion on the undistributed earnings of those non-U.S. subsidiaries in light of the enactment of the TCJA. The U.S. federal and state and local income taxes associated with the undistributed and previously untaxed earnings of those non-U.S. subsidiaries was included in the deemed repatriation charge recorded as of December 31, 2017.

The Firm adjusts its unrecognized tax benefits as necessary when additional information becomes available. Uncertain tax positions that meet the more-likely-than-not recognition threshold are measured to determine the amount of benefit to recognize. An uncertain tax position is measured at the largest amount of benefit that management believes is more likely than not to be realized upon settlement. It is possible that the reassessment of JPMorgan Chase's unrecognized tax benefits may have a material impact on its effective income tax rate in the period in which the reassessment occurs.

The income tax expense for the current year includes a reasonable estimate recorded under SEC Staff Accounting Bulletin No. 118 resulting from the enactment of the TCJA.

For additional information on income taxes, see Note 24.

Litigation reserves

For a description of the significant estimates and judgments associated with establishing litigation reserves, see Note 29.

SEC Staff Accounting Bulletin adopted during 2017

Bulletin	Summary of guidance	Effects on financial statements
Application of U.S. GAAP related to the Tax Cuts and Jobs Act ("TCJA") (SEC Staff Accounting Bulletin No. 118) *Issued December 2017*	• Provides guidance on the accounting for income taxes in the context of the TCJA. • For impacts of the tax law changes that are reasonably estimable, requires the recognition of provisional amounts in year-end 2017 financial statements. • Provides a 1-year measurement period in which to refine previously recorded provisional amounts based on new information or interpretations.	• The TCJA resulted in a $2.4 billion decrease in net income driven by a deemed repatriation charge and adjustments to the value of the Firm's tax oriented investments, partially offset by a benefit from the revaluation of the Firm's net deferred tax liability. Certain of these amounts may be refined in accordance with SEC Staff Accounting Bulletin No. 118. • Refer to Note 24 for additional information related to the impacts of the TCJA.

FASB Standards issued but not adopted as of December 31, 2017

Standard	Summary of guidance	Effects on financial statements
Revenue recognition – revenue from contracts with customers *Issued May 2014*	• Requires that revenue from contracts with customers be recognized upon transfer of control of a good or service in the amount of consideration expected to be received. • Changes the accounting for certain contract costs, including whether they may be offset against revenue in the Consolidated statements of income, and requires additional disclosures about revenue and contract costs. • May be adopted using a full retrospective approach or a modified, cumulative effect approach wherein the guidance is applied only to existing contracts as of the date of initial application, and to new contracts transacted after that date.	• Adopted January 1, 2018. • The Firm adopted the revenue recognition guidance using the full retrospective method of adoption. • The adoption of the guidance did not result in any material changes in the timing of the Firm's revenue recognition, but will require gross presentation of certain costs currently offset against revenue. This change in presentation will be reflected in the first quarter of 2018 and will increase both noninterest revenue and noninterest expense for the Firm by $1.1 billion and $900 million for the years ended December 31, 2017 and 2016, respectively. The increase is predominantly associated with certain distribution costs in AWM (currently offset against Asset management, administration and commissions), with the remainder of the increase associated with certain underwriting costs in CIB (currently offset against Investment banking fees). • The Firm's Note 6 qualitative disclosures are consistent with the guidance.
Recognition and measurement of financial assets and financial liabilities *Issued January 2016*	• Requires that certain equity instruments be measured at fair value, with changes in fair value recognized in earnings. • Provides a measurement alternative for equity securities without readily determinable fair values to be measured at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer. Any such price changes will be reflected in earnings beginning in the period of adoption. • Generally requires a cumulative-effect adjustment to retained earnings as of the beginning of the reporting period of adoption, except for those equity securities that are eligible for the measurement alternative.	• The Firm early adopted the provisions of this guidance related to presenting DVA in OCI for financial liabilities where the fair value option has been elected, effective January 1, 2016. The Firm adopted the portions of the guidance that were not eligible for early adoption on January 1, 2018. • Upon adoption, the Firm elected the measurement alternative for its equity securities that do not have readily determinable fair values, and the Firm did not record a cumulative-effect adjustment related to the adoption of this guidance.

FASB Standards issued but not adopted as of December 31, 2017 (continued)

Standard	Summary of guidance	Effects on financial statements
Classification of certain cash receipts and cash payments in the statement of cash flows *Issued August 2016*	• Provides targeted amendments to the classification of certain cash flows, including treatment of cash payments for settlement of zero-coupon debt instruments and distributions received from equity method investments. • Requires retrospective application to all periods presented.	• Adopted January 1, 2018. • No material impact upon adoption as the Firm was either in compliance with the amendments or the amounts to which it is applied are immaterial.
Treatment of restricted cash on the statement of cash flows *Issued November 2016*	• Requires inclusion of restricted cash in the cash and cash equivalents balances in the Consolidated statements of cash flows. • Requires additional disclosures to supplement the Consolidated statements of cash flows. • Requires retrospective application to all periods presented.	• Adopted January 1, 2018. • The adoption of the guidance will result in reclassification of restricted cash balances into Cash and restricted cash on the Consolidated statements of cash flows in the first quarter of 2018. The Firm will include Cash and due from banks and Deposits with banks in Cash and restricted cash in the Consolidated statements of cash flows, resulting in Deposits with banks no longer being reflected in Investing activities. • In addition, to align with the presentation of Cash and restricted cash on the Consolidated statements of cash flows, the Firm will reclassify restricted cash balances to Cash and due from banks and to Deposits with banks from Other assets and disclose the total for Cash and restricted cash on the Firm's Consolidated balance sheets in the first quarter of 2018.
Definition of a business *Issued January 2017*	• Narrows the definition of a business and clarifies that, to be considered a business, the fair value of the gross assets acquired (or disposed of) may not be substantially all concentrated in a single identifiable asset or a group of similar assets. • In addition, in order to be considered a business, a set of activities and assets must include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create outputs.	• Adopted January 1, 2018. • No impact upon adoption because the guidance is to be applied prospectively. Subsequent to adoption, fewer transactions will be treated as acquisitions or dispositions of a business.
Presentation of net periodic pension cost and net periodic postretirement benefit cost *Issued March 2017*	• Requires the service cost component of net periodic pension and postretirement benefit cost to be reported separately in the consolidated results of operations from the other components (e.g., expected return on assets, interest costs, amortization of gains/losses and prior service costs). • Requires retrospective application and presentation in the consolidated results of operations of the service cost component in the same line item as other employee compensation costs and presentation of the other components in a different line item from the service cost component.	• Adopted January 1, 2018. • The adoption of the guidance in the first quarter of 2018 will result in an increase in compensation expense and a reduction in other expense of $223 million and $250 million for the years ended December 31, 2017 and 2016, respectively.
Premium amortization on purchased callable debt securities *Issued March 2017*	• Requires amortization of premiums to the earliest call date on debt securities with call features that are explicit, noncontingent and callable at fixed prices and on preset dates. • Does not impact securities held at a discount; the discount continues to be amortized to the contractual maturity. • Requires adoption on a modified retrospective basis through a cumulative-effect adjustment directly to retained earnings as of the beginning of the period of adoption.	• The Firm early adopted the new guidance on January 1, 2018. • The new guidance primarily impacts obligations of U.S. states and municipalities held in the Firm's investment securities portfolio. • The adoption of this guidance resulted in a cumulative-effect adjustment that reduced retained earnings by approximately $505 million as of January 1, 2018, with a corresponding increase of $261 million (after tax) in AOCI and related adjustments to securities and tax liabilities. • Subsequent to adoption, although the guidance will reduce the interest income recognized prior to the earliest call date for callable debt securities held at a premium, the effect of this guidance on the Firm's net interest income is not expected to be material.

FASB Standards issued but not adopted as of December 31, 2017 (continued)

Standard	Summary of guidance	Effects on financial statements
Hedge accounting *Issued August 2017*	• Reduces earnings volatility by better aligning the accounting with the economics of the risk management activities. • Expands the ability for certain hedges of interest rate risk to qualify for hedge accounting. • Allows recognition of ineffectiveness in cash flow hedges and net investment hedges in OCI. • Allows a one-time election at adoption to transfer certain securities classified as held-to-maturity to available-for-sale. • Simplifies hedge documentation requirements.	• The Firm early adopted the new guidance on January 1, 2018. • The adoption of the guidance resulted in a cumulative-effect adjustment that increased retained earnings in the amount of $34 million, with related adjustments to debt carrying values and AOCI. • The Firm will also amend its qualitative and quantitative disclosures within its derivative instruments note to the Consolidated Financial Statements in the first quarter of 2018. • In accordance with the new guidance, the Firm elected to transfer certain securities from HTM to AFS. The amendments provide the Firm with additional hedge accounting alternatives for its AFS securities (including those transferred under the election) to be considered as the Firm manages it structural interest rate risk and regulatory capital. The Firm is currently evaluating those risk management alternatives and intends to manage the transferred securities in a manner consistent with its existing AFS securities. This transfer is a non-cash transaction at fair value.
Reclassification of Certain Tax Effects from AOCI *Issued February 2018*	• Provides an election to reclassify from AOCI to retained earnings stranded tax effects due to the revaluation of deferred tax assets and liabilities as a result of changes in applicable tax rates under the TCJA. • Requires additional disclosures related to the Firm's election to reclassify amounts from AOCI to retained earnings and the Firm's policy for releasing income tax effects from AOCI. • The guidance may be applied on a modified retrospective basis through a cumulative-effect adjustment directly to retained earnings as of the beginning of the period of adoption.	• The Firm early adopted the new guidance on January 1, 2018. • The adoption of the guidance resulted in a cumulative-effect adjustment that increased retained earnings in the amount of $288 million in the first quarter of 2018. This amount is an estimate that may be refined in accordance with SEC Staff Accounting Bulletin No. 118, and represents the removal of the stranded tax effects from AOCI, thereby allowing the tax effects within AOCI to reflect the new respective corporate income tax rates. • Refer to Note 24 for additional information related to the impacts of the TCJA.
Leases *Issued February 2016*	• Requires lessees to recognize all leases longer than twelve months on the Consolidated balance sheets as lease liabilities with corresponding right-of-use assets. • Requires lessees and lessors to classify most leases using principles similar to existing lease accounting, but eliminates the "bright line" classification tests. • Permits the Firm to generally account for its existing leases consistent with current guidance, except for the incremental balance sheet recognition. • Expands qualitative and quantitative disclosures regarding leasing arrangements. • May be adopted using a modified cumulative effect approach wherein the guidance is applied only to existing contracts as of the date of initial application, and to new contracts transacted after that date.	• Required effective date: January 1, 2019.[(a)] • The Firm is in the process of its implementation which has included an initial evaluation of its leasing contracts and activities. As a lessee, the Firm is developing its methodology to estimate the right-of-use assets and lease liabilities, which is based on the present value of lease payments. The Firm expects to recognize lease liabilities and corresponding right-of-use assets (at their present value) related to predominantly all of the $10 billion of future minimum payments required under operating leases as disclosed in Note 28. However, the population of contracts subject to balance sheet recognition and their initial measurement remains under evaluation. The Firm does not expect material changes to the recognition of operating lease expense in its Consolidated statements of income. • The Firm plans to adopt the new guidance in the first quarter of 2019.

FASB Standards issued but not adopted as of December 31, 2017 (continued)

Standard	Summary of guidance	Effects on financial statements
Financial instruments – credit losses *Issued June 2016*	• Replaces existing incurred loss impairment guidance and establishes a single allowance framework for financial assets carried at amortized cost (including HTM securities), which will reflect management's estimate of credit losses over the full remaining expected life of the financial assets. • Eliminates existing guidance for PCI loans, and requires recognition of an allowance for expected credit losses on financial assets purchased with more than insignificant credit deterioration since origination. • Amends existing impairment guidance for AFS securities to incorporate an allowance, which will allow for reversals of impairment losses in the event that the credit of an issuer improves. • Requires a cumulative-effect adjustment to retained earnings as of the beginning of the reporting period of adoption.	• Required effective date: January 1, 2020.[(a)] • The Firm has begun its implementation efforts by establishing a Firmwide, cross-discipline governance structure. The Firm is currently identifying key interpretive issues, and is assessing existing credit loss forecasting models and processes against the new guidance to determine what modifications may be required. • The Firm expects that the new guidance will result in an increase in its allowance for credit losses due to several factors, including: 1. The allowance related to the Firm's loans and commitments will increase to cover credit losses over the full remaining expected life of the portfolio, and will consider expected future changes in macroeconomic conditions 2. The nonaccretable difference on PCI loans will be recognized as an allowance, offset by an increase in the carrying value of the related loans 3. An allowance will be established for estimated credit losses on HTM securities • The extent of the increase is under evaluation, but will depend upon the nature and characteristics of the Firm's portfolio at the adoption date, and the macroeconomic conditions and forecasts at that date.
Goodwill *Issued January 2017*	• Requires an impairment loss to be recognized when the estimated fair value of a reporting unit falls below its carrying value. • Eliminates the second condition in the current guidance that requires an impairment loss to be recognized only if the estimated implied fair value of the goodwill is below its carrying value.	• Required effective date: January 1, 2020.[(a)] • Based on current impairment test results, the Firm does not expect a material effect on the Consolidated Financial Statements. • After adoption, the guidance may result in more frequent goodwill impairment losses due to the removal of the second condition. • The Firm is evaluating the timing of adoption.

(a) Early adoption is permitted.

FORWARD-LOOKING STATEMENTS

From time to time, the Firm has made and will make forward-looking statements. These statements can be identified by the fact that they do not relate strictly to historical or current facts. Forward-looking statements often use words such as "anticipate," "target," "expect," "estimate," "intend," "plan," "goal," "believe," or other words of similar meaning. Forward-looking statements provide JPMorgan Chase's current expectations or forecasts of future events, circumstances, results or aspirations. JPMorgan Chase's disclosures in this Annual Report contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. The Firm also may make forward-looking statements in its other documents filed or furnished with the SEC. In addition, the Firm's senior management may make forward-looking statements orally to investors, analysts, representatives of the media and others.

All forward-looking statements are, by their nature, subject to risks and uncertainties, many of which are beyond the Firm's control. JPMorgan Chase's actual future results may differ materially from those set forth in its forward-looking statements. While there is no assurance that any list of risks and uncertainties or risk factors is complete, below are certain factors which could cause actual results to differ from those in the forward-looking statements:

- Local, regional and global business, economic and political conditions and geopolitical events;
- Changes in laws and regulatory requirements, including capital and liquidity requirements affecting the Firm's businesses, and the ability of the Firm to address those requirements;
- Heightened regulatory and governmental oversight and scrutiny of JPMorgan Chase's business practices, including dealings with retail customers;
- Changes in trade, monetary and fiscal policies and laws;
- Changes in income tax laws and regulations;
- Securities and capital markets behavior, including changes in market liquidity and volatility;
- Changes in investor sentiment or consumer spending or savings behavior;
- Ability of the Firm to manage effectively its capital and liquidity, including approval of its capital plans by banking regulators;
- Changes in credit ratings assigned to the Firm or its subsidiaries;
- Damage to the Firm's reputation;
- Ability of the Firm to deal effectively with an economic slowdown or other economic or market disruption;
- Technology changes instituted by the Firm, its counterparties or competitors;
- The success of the Firm's business simplification initiatives and the effectiveness of its control agenda;
- Ability of the Firm to develop new products and services, and the extent to which products or services previously sold by the Firm (including but not limited to mortgages and asset-backed securities) require the Firm to incur liabilities or absorb losses not contemplated at their initiation or origination;
- Acceptance of the Firm's new and existing products and services by the marketplace and the ability of the Firm to innovate and to increase market share;
- Ability of the Firm to attract and retain qualified employees;
- Ability of the Firm to control expenses;
- Competitive pressures;
- Changes in the credit quality of the Firm's customers and counterparties;
- Adequacy of the Firm's risk management framework, disclosure controls and procedures and internal control over financial reporting;
- Adverse judicial or regulatory proceedings;
- Changes in applicable accounting policies, including the introduction of new accounting standards;
- Ability of the Firm to determine accurate values of certain assets and liabilities;
- Occurrence of natural or man-made disasters or calamities or conflicts and the Firm's ability to deal effectively with disruptions caused by the foregoing;
- Ability of the Firm to maintain the security of its financial, accounting, technology, data processing and other operational systems and facilities;
- Ability of the Firm to withstand disruptions that may be caused by any failure of its operational systems or those of third parties;
- Ability of the Firm to effectively defend itself against cyberattacks and other attempts by unauthorized parties to access information of the Firm or its customers or to disrupt the Firm's systems; and
- The other risks and uncertainties detailed in Part I, Item 1A: Risk Factors in the Firm's Annual Report on Form 10-K for the year ended December 31, 2017.

Any forward-looking statements made by or on behalf of the Firm speak only as of the date they are made, and JPMorgan Chase does not undertake to update forward-looking statements. The reader should, however, consult any further disclosures of a forward-looking nature the Firm may make in any subsequent Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, or Current Reports on Form 8-K.

Management's report on internal control over financial reporting

Management of JPMorgan Chase & Co. ("JPMorgan Chase" or the "Firm") is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is a process designed by, or under the supervision of, the Firm's principal executive and principal financial officers, or persons performing similar functions, and effected by JPMorgan Chase's Board of Directors, management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America.

JPMorgan Chase's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records, that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the Firm's assets; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the Firm are being made only in accordance with authorizations of JPMorgan Chase's management and directors; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Firm's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate. Management has completed an assessment of the effectiveness of the Firm's internal control over financial reporting as of December 31, 2017. In making the assessment, management used the "Internal Control — Integrated Framework" ("COSO 2013") promulgated by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO").

Based upon the assessment performed, management concluded that as of December 31, 2017, JPMorgan Chase's internal control over financial reporting was effective based upon the COSO 2013 framework. Additionally, based upon management's assessment, the Firm determined that there were no material weaknesses in its internal control over financial reporting as of December 31, 2017.

The effectiveness of the Firm's internal control over financial reporting as of December 31, 2017, has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which appears herein.

James Dimon
Chairman and Chief Executive Officer

Marianne Lake
Executive Vice President and Chief Financial Officer

February 27, 2018

pwc

To the Board of Directors and Stockholders of JPMorgan Chase & Co.:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of JPMorgan Chase & Co. and its subsidiaries (the "Firm") as of December 31, 2017 and 2016, and the related consolidated statements of income, comprehensive income, changes in stockholders' equity and cash flows for each of the three years in the period ended December 31, 2017, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Firm's internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Firm as of December 31, 2017 and 2016, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2017 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Firm maintained, in all material respects, effective internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the COSO.

Basis for Opinions

The Firm's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's report on internal control over financial reporting. Our responsibility is to express opinions on the Firm's consolidated financial statements and on the Firm's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Firm in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

PricewaterhouseCoopers LLP

February 27, 2018

We have served as the Firm's auditor since 1965.

PricewaterhouseCoopers LLP ▪ 300 Madison Avenue ▪ New York, NY 10017

Consolidated statements of income

Year ended December 31, (in millions, except per share data)	2017	2016	2015
Revenue			
Investment banking fees	**$ 7,248**	$ 6,448	$ 6,751
Principal transactions	**11,347**	11,566	10,408
Lending- and deposit-related fees	**5,933**	5,774	5,694
Asset management, administration and commissions	**15,377**	14,591	15,509
Securities gains/(losses)	**(66)**	141	202
Mortgage fees and related income	**1,616**	2,491	2,513
Card income	**4,433**	4,779	5,924
Other income	**3,639**	3,795	3,032
Noninterest revenue	**49,527**	49,585	50,033
Interest income	**64,372**	55,901	50,973
Interest expense	**14,275**	9,818	7,463
Net interest income	**50,097**	46,083	43,510
Total net revenue	**99,624**	95,668	93,543
Provision for credit losses	**5,290**	5,361	3,827
Noninterest expense			
Compensation expense	**31,009**	29,979	29,750
Occupancy expense	**3,723**	3,638	3,768
Technology, communications and equipment expense	**7,706**	6,846	6,193
Professional and outside services	**6,840**	6,655	7,002
Marketing	**2,900**	2,897	2,708
Other expense	**6,256**	5,756	9,593
Total noninterest expense	**58,434**	55,771	59,014
Income before income tax expense	**35,900**	34,536	30,702
Income tax expense	**11,459**	9,803	6,260
Net income	**$ 24,441**	$ 24,733	$ 24,442
Net income applicable to common stockholders[(a)]	**$ 22,567**	$ 22,834	$ 22,651
Net income per common share data			
Basic earnings per share	**$ 6.35**	$ 6.24	$ 6.05
Diluted earnings per share	**6.31**	6.19	6.00
Weighted-average basic shares[(a)]	**3,551.6**	3,658.8	3,741.2
Weighted-average diluted shares[(a)]	**3,576.8**	3,690.0	3,773.6
Cash dividends declared per common share	**$ 2.12**	$ 1.88	$ 1.72

(a) The prior period amounts have been revised to conform with the current period presentation. The revision had no impact on the Firm's reported earnings per share.

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated statements of comprehensive income

Year ended December 31, (in millions)	**2017**	2016	2015
Net income	**$ 24,441**	$ 24,733	$ 24,442
Other comprehensive income/(loss), after-tax			
Unrealized gains/(losses) on investment securities	**640**	(1,105)	(2,144)
Translation adjustments, net of hedges	**(306)**	(2)	(15)
Cash flow hedges	**176**	(56)	51
Defined benefit pension and OPEB plans	**738**	(28)	111
DVA on fair value option elected liabilities	**(192)**	(330)	–
Total other comprehensive income/(loss), after-tax	**1,056**	(1,521)	(1,997)
Comprehensive income	**$ 25,497**	$ 23,212	$ 22,445

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated balance sheets

December 31, (in millions, except share data)	2017	2016
Assets		
Cash and due from banks	**$ 25,827**	$ 23,873
Deposits with banks	**404,294**	365,762
Federal funds sold and securities purchased under resale agreements (included **$14,732** and $21,506 at fair value)	**198,422**	229,967
Securities borrowed (included **$3,049** and $0 at fair value)	**105,112**	96,409
Trading assets (included assets pledged of **$110,061** and $115,847)	**381,844**	372,130
Securities (included **$202,225** and $238,891 at fair value and assets pledged of **$17,969** and $16,115)	**249,958**	289,059
Loans (included **$2,508** and $2,230 at fair value)	**930,697**	894,765
Allowance for loan losses	**(13,604)**	(13,776)
Loans, net of allowance for loan losses	**917,093**	880,989
Accrued interest and accounts receivable	**67,729**	52,330
Premises and equipment	**14,159**	14,131
Goodwill, MSRs and other intangible assets	**54,392**	54,246
Other assets (included **$16,128** and $7,557 at fair value and assets pledged of **$1,526** and $1,603)	**114,770**	112,076
Total assets[(a)]	**$ 2,533,600**	$ 2,490,972
Liabilities		
Deposits (included **$21,321** and $13,912 at fair value)	**$ 1,443,982**	$ 1,375,179
Federal funds purchased and securities loaned or sold under repurchase agreements (included **$697** and $687 at fair value)	**158,916**	165,666
Short-term borrowings (included **$9,191** and $9,105 at fair value)	**51,802**	34,443
Trading liabilities	**123,663**	136,659
Accounts payable and other liabilities (included **$9,208** and $9,120 at fair value)	**189,383**	190,543
Beneficial interests issued by consolidated VIEs (included **$45** and $120 at fair value)	**26,081**	39,047
Long-term debt (included **$47,519** and $37,686 at fair value)	**284,080**	295,245
Total liabilities[(a)]	**2,277,907**	2,236,782
Commitments and contingencies (see Notes 27, 28 and 29)		
Stockholders' equity		
Preferred stock ($1 par value; authorized 200,000,000 shares: issued **2,606,750** shares)	**26,068**	26,068
Common stock ($1 par value; authorized 9,000,000,000 shares; issued **4,104,933,895** shares)	**4,105**	4,105
Additional paid-in capital	**90,579**	91,627
Retained earnings	**177,676**	162,440
Accumulated other comprehensive income	**(119)**	(1,175)
Shares held in restricted stock units ("RSU") trust, at cost (**472,953** shares)	**(21)**	(21)
Treasury stock, at cost (679,635,064 and 543,744,003 shares)	**(42,595)**	(28,854)
Total stockholders' equity	**255,693**	254,190
Total liabilities and stockholders' equity	**$ 2,533,600**	$ 2,490,972

(a) The following table presents information on assets and liabilities related to VIEs that are consolidated by the Firm at December 31, 2017 and 2016. The difference between total VIE assets and liabilities represents the Firm's interests in those entities, which were eliminated in consolidation.

December 31, (in millions)	2017	2016
Assets		
Trading assets	**$ 1,449**	$ 3,185
Loans	**68,995**	75,614
All other assets	**2,674**	3,321
Total assets	**$ 73,118**	$ 82,120
Liabilities		
Beneficial interests issued by consolidated VIEs	**$ 26,081**	$ 39,047
All other liabilities	**349**	490
Total liabilities	**$ 26,430**	$ 39,537

The assets of the consolidated VIEs are used to settle the liabilities of those entities. The holders of the beneficial interests do not have recourse to the general credit of JPMorgan Chase. At December 31, 2017 and 2016, the Firm provided limited program-wide credit enhancement of $2.7 billion and $2.4 billion, respectively, related to its Firm-administered multi-seller conduits, which are eliminated in consolidation. For further discussion, see Note 14.

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated statements of changes in stockholders' equity

Year ended December 31, (in millions, except per share data)	**2017**	2016	2015
Preferred stock			
Balance at January 1	**$ 26,068**	$ 26,068	$ 20,063
Issuance	**1,258**	–	6,005
Redemption	**(1,258)**	–	–
Balance at December 31	**26,068**	26,068	26,068
Common stock			
Balance at January 1 and December 31	**4,105**	4,105	4,105
Additional paid-in capital			
Balance at January 1	**91,627**	92,500	93,270
Shares issued and commitments to issue common stock for employee share-based compensation awards	**(734)**	(334)	(436)
Other	**(314)**	(539)	(334)
Balance at December 31	**90,579**	91,627	92,500
Retained earnings			
Balance at January 1	**162,440**	146,420	129,977
Cumulative effect of change in accounting principle	**–**	(154)	–
Net income	**24,441**	24,733	24,442
Dividends declared:			
Preferred stock	**(1,663)**	(1,647)	(1,515)
Common stock (**$2.12**, $1.88 and $1.72 per share for 2017, 2016 and 2015, respectively)	**(7,542)**	(6,912)	(6,484)
Balance at December 31	**177,676**	162,440	146,420
Accumulated other comprehensive income			
Balance at January 1	**(1,175)**	192	2,189
Cumulative effect of change in accounting principle	**–**	154	–
Other comprehensive income/(loss)	**1,056**	(1,521)	(1,997)
Balance at December 31	**(119)**	(1,175)	192
Shares held in RSU Trust, at cost			
Balance at January 1 and December 31	**(21)**	(21)	(21)
Treasury stock, at cost			
Balance at January 1	**(28,854)**	(21,691)	(17,856)
Repurchase	**(15,410)**	(9,082)	(5,616)
Reissuance	**1,669**	1,919	1,781
Balance at December 31	**(42,595)**	(28,854)	(21,691)
Total stockholders' equity	**$ 255,693**	$ 254,190	$ 247,573

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated statements of cash flows

Year ended December 31, (in millions)	2017	2016	2015
Operating activities			
Net income	**$ 24,441**	$ 24,733	$ 24,442
Adjustments to reconcile net income to net cash provided by/(used in) operating activities:			
Provision for credit losses	**5,290**	5,361	3,827
Depreciation and amortization	**6,179**	5,478	4,940
Deferred tax expense	**2,312**	4,651	1,333
Other	**2,136**	1,799	1,785
Originations and purchases of loans held-for-sale	**(94,628)**	(61,107)	(48,109)
Proceeds from sales, securitizations and paydowns of loans held-for-sale	**93,270**	60,196	49,363
Net change in:			
Trading assets	**5,673**	(20,007)	62,212
Securities borrowed	**(8,653)**	2,313	12,165
Accrued interest and accounts receivable	**(15,868)**	(5,815)	22,664
Other assets	**4,318**	(4,517)	(3,701)
Trading liabilities	**(26,256)**	5,198	(28,972)
Accounts payable and other liabilities	**(8,518)**	3,740	(23,361)
Other operating adjustments	**7,803**	(1,827)	(5,122)
Net cash provided by/(used in) operating activities	**(2,501)**	20,196	73,466
Investing activities			
Net change in:			
Deposits with banks	**(38,532)**	(25,747)	144,462
Federal funds sold and securities purchased under resale agreements	**31,448**	(17,468)	3,190
Held-to-maturity securities:			
Proceeds from paydowns and maturities	**4,563**	6,218	6,099
Purchases	**(2,349)**	(143)	(6,204)
Available-for-sale securities:			
Proceeds from paydowns and maturities	**56,117**	65,950	76,448
Proceeds from sales	**90,201**	48,592	40,444
Purchases	**(105,309)**	(123,959)	(70,804)
Proceeds from sales and securitizations of loans held-for-investment	**15,791**	15,429	18,604
Other changes in loans, net	**(61,650)**	(80,996)	(108,962)
All other investing activities, net	**(563)**	(2,825)	3,703
Net cash provided by/(used in) investing activities	**(10,283)**	(114,949)	106,980
Financing activities			
Net change in:			
Deposits	**57,022**	97,336	(88,678)
Federal funds purchased and securities loaned or sold under repurchase agreements	**(6,739)**	13,007	(39,415)
Short-term borrowings	**16,540**	(2,461)	(57,828)
Beneficial interests issued by consolidated VIEs	**(1,377)**	(5,707)	(5,632)
Proceeds from long-term borrowings	**56,271**	83,070	79,611
Payments of long-term borrowings	**(83,079)**	(68,949)	(67,247)
Proceeds from issuance of preferred stock	**1,258**	–	5,893
Redemption of preferred stock	**(1,258)**	–	–
Treasury stock repurchased	**(15,410)**	(9,082)	(5,616)
Dividends paid	**(8,993)**	(8,476)	(7,873)
All other financing activities, net	**407**	(467)	(726)
Net cash provided by/(used in) financing activities	**14,642**	98,271	(187,511)
Effect of exchange rate changes on cash and due from banks	**96**	(135)	(276)
Net increase/(decrease) in cash and due from banks	**1,954**	3,383	(7,341)
Cash and due from banks at the beginning of the period	**23,873**	20,490	27,831
Cash and due from banks at the end of the period	**$ 25,827**	$ 23,873	$ 20,490
Cash interest paid	**$ 14,153**	$ 9,508	$ 7,220
Cash income taxes paid, net	**4,325**	2,405	9,423

The Notes to Consolidated Financial Statements are an integral part of these statements.

Note 1 – Basis of presentation

JPMorgan Chase & Co. ("JPMorgan Chase" or the "Firm"), a financial holding company incorporated under Delaware law in 1968, is a leading global financial services firm and one of the largest banking institutions in the U.S., with operations worldwide. The Firm is a leader in investment banking, financial services for consumers and small business, commercial banking, financial transaction processing and asset management. For a discussion of the Firm's business segments, see Note 31.

The accounting and financial reporting policies of JPMorgan Chase and its subsidiaries conform to U.S. GAAP. Additionally, where applicable, the policies conform to the accounting and reporting guidelines prescribed by regulatory authorities.

Certain amounts reported in prior periods have been reclassified to conform with the current presentation.

Consolidation

The Consolidated Financial Statements include the accounts of JPMorgan Chase and other entities in which the Firm has a controlling financial interest. All material intercompany balances and transactions have been eliminated.

Assets held for clients in an agency or fiduciary capacity by the Firm are not assets of JPMorgan Chase and are not included on the Consolidated balance sheets.

The Firm determines whether it has a controlling financial interest in an entity by first evaluating whether the entity is a voting interest entity or a variable interest entity.

Voting Interest Entities

Voting interest entities are entities that have sufficient equity and provide the equity investors voting rights that enable them to make significant decisions relating to the entity's operations. For these types of entities, the Firm's determination of whether it has a controlling interest is primarily based on the amount of voting equity interests held. Entities in which the Firm has a controlling financial interest, through ownership of the majority of the entities' voting equity interests, or through other contractual rights that give the Firm control, are consolidated by the Firm.

Investments in companies in which the Firm has significant influence over operating and financing decisions (but does not own a majority of the voting equity interests) are accounted for (i) in accordance with the equity method of accounting (which requires the Firm to recognize its proportionate share of the entity's net earnings), or (ii) at fair value if the fair value option was elected. These investments are generally included in other assets, with income or loss included in other income.

Certain Firm-sponsored asset management funds are structured as limited partnerships or certain limited liability companies. For many of these entities, the Firm is the general partner or managing member, but the non-affiliated partners or members have the ability to remove the Firm as the general partner or managing member without cause (i.e., kick-out rights), based on a simple majority vote, or the non-affiliated partners or members have rights to participate in important decisions. Accordingly, the Firm does not consolidate these voting interest entities. However, in the limited cases where the non-managing partners or members do not have substantive kick-out or participating rights, the Firm evaluates the funds as VIEs and consolidates if it is the general partner or managing member and has a potentially significant interest.

The Firm's investment companies have investments in both publicly-held and privately-held entities, including investments in buyouts, growth equity and venture opportunities. These investments are accounted for under investment company guidelines and accordingly, irrespective of the percentage of equity ownership interests held, are carried on the Consolidated balance sheets at fair value, and are recorded in other assets, with income or loss included in noninterest revenue.

Variable Interest Entities

VIEs are entities that, by design, either (1) lack sufficient equity to permit the entity to finance its activities without additional subordinated financial support from other parties, or (2) have equity investors that do not have the ability to make significant decisions relating to the entity's operations through voting rights, or do not have the obligation to absorb the expected losses, or do not have the right to receive the residual returns of the entity.

The most common type of VIE is an SPE. SPEs are commonly used in securitization transactions in order to isolate certain assets and distribute the cash flows from those assets to investors. The basic SPE structure involves a company selling assets to the SPE; the SPE funds the purchase of those assets by issuing securities to investors. The legal documents that govern the transaction specify how the cash earned on the assets must be allocated to the SPE's investors and other parties that have rights to those cash flows. SPEs are generally structured to insulate investors from claims on the SPE's assets by creditors of other entities, including the creditors of the seller of the assets.

The primary beneficiary of a VIE (i.e., the party that has a controlling financial interest) is required to consolidate the assets and liabilities of the VIE. The primary beneficiary is the party that has both (1) the power to direct the activities of the VIE that most significantly impact the VIE's economic performance; and (2) through its interests in the VIE, the obligation to absorb losses or the right to receive benefits from the VIE that could potentially be significant to the VIE.

To assess whether the Firm has the power to direct the activities of a VIE that most significantly impact the VIE's economic performance, the Firm considers all the facts and circumstances, including its role in establishing the VIE and its ongoing rights and responsibilities. This assessment includes, first, identifying the activities that most significantly impact the VIE's economic performance; and second, identifying which party, if any, has power over those activities. In general, the parties that make the most significant decisions affecting the VIE (such as asset managers, collateral managers, servicers, or owners of call options or liquidation rights over the VIE's assets) or have the right to unilaterally remove those decision-makers are deemed to have the power to direct the activities of a VIE.

To assess whether the Firm has the obligation to absorb losses of the VIE or the right to receive benefits from the VIE that could potentially be significant to the VIE, the Firm considers all of its economic interests, including debt and equity investments, servicing fees, and derivatives or other arrangements deemed to be variable interests in the VIE. This assessment requires that the Firm apply judgment in determining whether these interests, in the aggregate, are considered potentially significant to the VIE. Factors considered in assessing significance include: the design of the VIE, including its capitalization structure; subordination of interests; payment priority; relative share of interests held across various classes within the VIE's capital structure; and the reasons why the interests are held by the Firm.

The Firm performs on-going reassessments of: (1) whether entities previously evaluated under the majority voting-interest framework have become VIEs, based on certain events, and are therefore subject to the VIE consolidation framework; and (2) whether changes in the facts and circumstances regarding the Firm's involvement with a VIE cause the Firm's consolidation conclusion to change.

Use of estimates in the preparation of consolidated financial statements

The preparation of the Consolidated Financial Statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, revenue and expense, and disclosures of contingent assets and liabilities. Actual results could be different from these estimates.

Foreign currency translation

JPMorgan Chase revalues assets, liabilities, revenue and expense denominated in non-U.S. currencies into U.S. dollars using applicable exchange rates.

Gains and losses relating to translating functional currency financial statements for U.S. reporting are included in OCI within stockholders' equity. Gains and losses relating to nonfunctional currency transactions, including non-U.S. operations where the functional currency is the U.S. dollar, are reported in the Consolidated statements of income.

Offsetting assets and liabilities

U.S. GAAP permits entities to present derivative receivables and derivative payables with the same counterparty and the related cash collateral receivables and payables on a net basis on the Consolidated balance sheets when a legally enforceable master netting agreement exists. U.S. GAAP also permits securities sold and purchased under repurchase agreements and securities borrowed or loaned under securities loan agreements to be presented net when specified conditions are met, including the existence of a legally enforceable master netting agreement. The Firm has elected to net such balances when the specified conditions are met.

The Firm uses master netting agreements to mitigate counterparty credit risk in certain transactions, including derivative, securities repurchase and reverse repurchase, and securities loaned and borrow transactions. A master netting agreement is a single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due). Upon the exercise of derivatives termination rights by the non-defaulting party (i) all transactions are terminated, (ii) all transactions are valued and the positive values of "in the money" transactions are netted against the negative values of "out of the money" transactions and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount. Upon exercise of default rights under repurchase agreements and securities loan agreements in general (i) all transactions are terminated and accelerated, (ii) all values of securities or cash held or to be delivered are calculated, and all such sums are netted against each other and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount.

Typical master netting agreements for these types of transactions also often contain a collateral/margin agreement that provides for a security interest in, or title transfer of, securities or cash collateral/margin to the party that has the right to demand margin (the "demanding party"). The collateral/margin agreement typically requires a party to transfer collateral/margin to the demanding party with a value equal to the amount of the margin deficit on a net basis across all transactions governed by the master netting agreement, less any threshold. The collateral/margin agreement grants to the demanding party, upon default by the counterparty, the right to set-off any amounts payable by the counterparty against any posted collateral or the cash equivalent of any posted collateral/margin. It also grants to the demanding party the right to liquidate collateral/margin and to apply the proceeds to an amount payable by the counterparty.

For further discussion of the Firm's derivative instruments, see Note 5. For further discussion of the Firm's repurchase and reverse repurchase agreements, and securities borrowing and lending agreements, see Note 11.

Statements of cash flows

For JPMorgan Chase's Consolidated statements of cash flows, cash is defined as those amounts included in cash and due from banks.

Significant accounting policies

The following table identifies JPMorgan Chase's other significant accounting policies and the Note and page where a detailed description of each policy can be found.

Note 2 – Fair value measurement

JPMorgan Chase carries a portion of its assets and liabilities at fair value. These assets and liabilities are predominantly carried at fair value on a recurring basis (i.e., assets and liabilities that are measured and reported at fair value on the Firm's Consolidated balance sheets). Certain assets (e.g., held-for-sale loans), liabilities and unfunded lending-related commitments are measured at fair value on a nonrecurring basis; that is, they are not measured at fair value on an ongoing basis but are subject to fair value adjustments only in certain circumstances (for example, when there is evidence of impairment).

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is based on quoted market prices or inputs, where available. If prices or quotes are not available, fair value is based on valuation models and other valuation techniques that consider relevant transaction characteristics (such as maturity) and use as inputs observable or unobservable market parameters, including yield curves, interest rates, volatilities, equity or debt prices, foreign exchange rates and credit curves. Valuation adjustments may be made to ensure that financial instruments are recorded at fair value, as described below.

The level of precision in estimating unobservable market inputs or other factors can affect the amount of gain or loss recorded for a particular position. Furthermore, while the Firm believes its valuation methods are appropriate and consistent with those of other market participants, the methods and assumptions used reflect management judgment and may vary across the Firm's businesses and portfolios.

The Firm uses various methodologies and assumptions in the determination of fair value. The use of different methodologies or assumptions by other market participants compared with those used by the Firm could result in the Firm deriving a different estimate of fair value at the reporting date.

Valuation process

Risk-taking functions are responsible for providing fair value estimates for assets and liabilities carried on the Consolidated balance sheets at fair value. The Firm's VCG, which is part of the Firm's Finance function and independent of the risk-taking functions, is responsible for verifying these estimates and determining any fair value adjustments that may be required to ensure that the Firm's positions are recorded at fair value. The VGF is composed of senior finance and risk executives and is responsible for overseeing the management of risks arising from valuation activities conducted across the Firm. The VGF is chaired by the Firmwide head of the VCG (under the direction of the Firm's Controller), and includes sub-forums covering the CIB, CCB, CB, AWM and certain corporate functions including Treasury and CIO.

Price verification process
The VCG verifies fair value estimates provided by the risk-taking functions by leveraging independently derived prices, valuation inputs and other market data, where available. Where independent prices or inputs are not available, the VCG performs additional review to ensure the reasonableness of the estimates. The additional review may include evaluating the limited market activity including client unwinds, benchmarking valuation inputs to those used for similar instruments, decomposing the valuation of structured instruments into individual components, comparing expected to actual cash flows, reviewing profit and loss trends, and reviewing trends in collateral valuation. There are also additional levels of management review for more significant or complex positions.

The VCG determines any valuation adjustments that may be required to the estimates provided by the risk-taking functions. No adjustments to quoted prices are applied for instruments classified within level 1 of the fair value hierarchy (see below for further information on the fair value hierarchy). For other positions, judgment is required to assess the need for valuation adjustments to appropriately reflect liquidity considerations, unobservable parameters, and, for certain portfolios that meet specified criteria, the size of the net open risk position. The determination of such adjustments follows a consistent framework across the Firm:

- Liquidity valuation adjustments are considered where an observable external price or valuation parameter exists but is of lower reliability, potentially due to lower market activity. Liquidity valuation adjustments are applied and determined based on current market conditions. Factors that may be considered in determining the liquidity adjustment include analysis of: (1) the estimated bid-offer spread for the instrument being traded; (2) alternative pricing points for similar instruments in active markets; and (3) the range of reasonable values that the price or parameter could take.
- The Firm manages certain portfolios of financial instruments on the basis of net open risk exposure and, as permitted by U.S. GAAP, has elected to estimate the fair value of such portfolios on the basis of a transfer of the entire net open risk position in an orderly transaction. Where this is the case, valuation adjustments may be necessary to reflect the cost of exiting a larger-than-normal market-size net open risk position. Where applied, such adjustments are based on factors that a relevant market participant would consider in the transfer of the net open risk position, including the size of the adverse market move that is likely to occur during the period required to reduce the net open risk position to a normal market-size.
- Unobservable parameter valuation adjustments may be made when positions are valued using prices or input parameters to valuation models that are unobservable due to a lack of market activity or because they cannot be implied from observable market data. Such prices or parameters must be estimated and are, therefore, subject to management judgment. Unobservable parameter valuation adjustments are applied to reflect the uncertainty inherent in the resulting valuation estimate.
- Where appropriate, the Firm also applies adjustments to its estimates of fair value in order to appropriately reflect counterparty credit quality (CVA), the Firm's own creditworthiness (DVA) and the impact of funding (FVA), using a consistent framework across the Firm. For more information on such adjustments see Credit and funding adjustments on page 171 of this Note.

Valuation model review and approval
If prices or quotes are not available for an instrument or a similar instrument, fair value is generally determined using valuation models that consider relevant transaction data such as maturity and use as inputs market-based or independently sourced parameters. Where this is the case the price verification process described above is applied to the inputs to those models.

Under the Firm's Estimations and Model Risk Management Policy, the Model Risk function reviews and approves new models, as well as material changes to existing models, prior to implementation in the operating environment. In certain circumstances, the head of the Model Risk function may grant exceptions to the Firm's policy to allow a model to be used prior to review or approval. The Model Risk function may also require the user to take appropriate actions to mitigate the model risk if it is to be used in the interim. These actions will depend on the model and may include, for example, limitation of trading activity.

Valuation hierarchy
A three-level valuation hierarchy has been established under U.S. GAAP for disclosure of fair value measurements. The valuation hierarchy is based on the transparency of inputs to the valuation of an asset or liability as of the measurement date. The three levels are defined as follows.

- Level 1 – inputs to the valuation methodology are quoted prices (unadjusted) for identical assets or liabilities in active markets.
- Level 2 – inputs to the valuation methodology include quoted prices for similar assets and liabilities in active markets, and inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the financial instrument.
- Level 3 – one or more inputs to the valuation methodology are unobservable and significant to the fair value measurement.

A financial instrument's categorization within the valuation hierarchy is based on the lowest level of input that is significant to the fair value measurement.

The following table describes the valuation methodologies generally used by the Firm to measure its significant products/instruments at fair value, including the general classification of such instruments pursuant to the valuation hierarchy.

Product/instrument	Valuation methodology	Classifications in the valuation hierarchy
Securities financing agreements	Valuations are based on discounted cash flows, which consider: • Derivative features: for further information refer to the discussion of derivatives below. • Market rates for the respective maturity • Collateral characteristics	Predominantly level 2
Loans and lending-related commitments – wholesale		
Loans carried at fair value (e.g., trading loans and non-trading loans) and associated lending-related commitments	Where observable market data is available, valuations are based on: • Observed market prices (circumstances are infrequent) • Relevant broker quotes • Observed market prices for similar instruments Where observable market data is unavailable or limited, valuations are based on discounted cash flows, which consider the following: • Credit spreads derived from the cost of CDS; or benchmark credit curves developed by the Firm, by industry and credit rating • Prepayment speed • Collateral characteristics	Level 2 or 3
Loans held-for-investment and associated lending-related commitments	Valuations are based on discounted cash flows, which consider: • Credit spreads, derived from the cost of CDS; or benchmark credit curves developed by the Firm, by industry and credit rating • Prepayment speed Lending-related commitments are valued similarly to loans and reflect the portion of an unused commitment expected, based on the Firm's average portfolio historical experience, to become funded prior to an obligor default. For information regarding the valuation of loans measured at collateral value, see Note 12.	Predominantly level 3
Loans – consumer		
Held-for-investment consumer loans, excluding credit card	Valuations are based on discounted cash flows, which consider: • Credit losses - which consider expected and current default rates, and loss severity • Prepayment speed • Discount rates • Servicing costs For information regarding the valuation of loans measured at collateral value, see Note 12.	Predominantly level 2
Held-for-investment credit card receivables	Valuations are based on discounted cash flows, which consider: • Credit costs - the allowance for loan losses is considered a reasonable proxy for the credit cost • Projected interest income, late-fee revenue and loan repayment rates • Discount rates • Servicing costs	Level 3
Trading loans – conforming residential mortgage loans expected to be sold (CCB, CIB)	Fair value is based on observable prices for mortgage-backed securities with similar collateral and incorporates adjustments to these prices to account for differences between the securities and the value of the underlying loans, which include credit characteristics, portfolio composition, and liquidity.	Predominantly level 2

Product/instrument	Valuation methodology, inputs and assumptions	Classifications in the valuation hierarchy
Investment and trading securities	Quoted market prices are used where available.	Level 1
	In the absence of quoted market prices, securities are valued based on: • Observable market prices for similar securities • Relevant broker quotes • Discounted cash flows In addition, the following inputs to discounted cash flows are used for the following products: Mortgage- and asset-backed securities specific inputs: • Collateral characteristics • Deal-specific payment and loss allocations • Current market assumptions related to yield, prepayment speed, conditional default rates and loss severity Collateralized loan obligations ("CLOs") specific inputs: • Collateral characteristics • Deal-specific payment and loss allocations • Expected prepayment speed, conditional default rates, loss severity • Credit spreads • Credit rating data	Level 2 or 3
Physical commodities	Valued using observable market prices or data.	Predominantly level 1 and 2
Derivatives	Exchange-traded derivatives that are actively traded and valued using the exchange price.	Level 1
	Derivatives that are valued using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that may use observable or unobservable valuation inputs as well as considering the contractual terms. The key valuation inputs used will depend on the type of derivative and the nature of the underlying instruments and may include equity prices, commodity prices, interest rate yield curves, foreign exchange rates, volatilities, correlations, CDS spreads and recovery rates. Additionally, the credit quality of the counterparty and of the Firm as well as market funding levels may also be considered. In addition, specific inputs used for derivatives that are valued based on models with significant unobservable inputs are as follows: Structured credit derivatives specific inputs include: • CDS spreads and recovery rates • Credit correlation between the underlying debt instruments Equity option specific inputs include: • Equity volatilities • Equity correlation • Equity-FX correlation • Equity-IR correlation Interest rate and FX exotic options specific inputs include: • Interest rate spread volatility • Interest rate correlation • Foreign exchange correlation • Interest rate-FX correlation Commodity derivatives specific inputs include: • Commodity volatility • Forward commodity price Additionally, adjustments are made to reflect counterparty credit quality (CVA) and the impact of funding (FVA). See page 171 of this Note.	Level 2 or 3

Product/instrument	Valuation methodology, inputs and assumptions	Classification in the valuation hierarchy
Mortgage servicing rights	See Mortgage servicing rights in Note 15.	Level 3
Private equity direct investments	Fair value is estimated using all available information; the range of potential inputs include: • Transaction prices • Trading multiples of comparable public companies • Operating performance of the underlying portfolio company • Adjustments as required, since comparable public companies are not identical to the company being valued, and for company-specific issues and lack of liquidity. • Additional available inputs relevant to the investment.	Level 2 or 3
Fund investments (e.g., mutual/collective investment funds, private equity funds, hedge funds, and real estate funds)	Net asset value	
	• NAV is supported by the ability to redeem and purchase at the NAV level.	Level 1
	• Adjustments to the NAV as required, for restrictions on redemption (e.g., lock-up periods or withdrawal limitations) or where observable activity is limited.	Level 2 or 3[(a)]
Beneficial interests issued by consolidated VIEs	Valued using observable market information, where available. In the absence of observable market information, valuations are based on the fair value of the underlying assets held by the VIE.	Level 2 or 3
Long-term debt, not carried at fair value	Valuations are based on discounted cash flows, which consider: • Market rates for respective maturity	Predominantly level 2
Structured notes (included in deposits, short-term borrowings and long-term debt)	• Valuations are based on discounted cash flow analyses that consider the embedded derivative and the terms and payment structure of the note. • The embedded derivative features are considered using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that may use observable or unobservable valuation inputs, depending on the embedded derivative. The specific inputs used vary according to the nature of the embedded derivative features, as described in the discussion above regarding derivatives valuation. Adjustments are then made to this base valuation to reflect the Firm's own credit risk (DVA). See page 171 of this Note.	Level 2 or 3

(a) Excludes certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient.

The following table presents the assets and liabilities reported at fair value as of December 31, 2017 and 2016, by major product category and fair value hierarchy.

Assets and liabilities measured at fair value on a recurring basis

	Fair value hierarchy				
December 31, 2017 (in millions)	Level 1	Level 2	Level 3	Derivative netting adjustments	Total fair value
Federal funds sold and securities purchased under resale agreements	$ –	$ 14,732	$ –	$ –	$ 14,732
Securities borrowed	–	3,049	–	–	3,049
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. government agencies[a]	–	41,515	307	–	41,822
Residential – nonagency	–	1,835	60	–	1,895
Commercial – nonagency	–	1,645	11	–	1,656
Total mortgage-backed securities	–	44,995	378	–	45,373
U.S. Treasury and government agencies[a]	30,758	6,475	1	–	37,234
Obligations of U.S. states and municipalities	–	9,067	744	–	9,811
Certificates of deposit, bankers' acceptances and commercial paper	–	226	–	–	226
Non-U.S. government debt securities	28,887	28,831	78	–	57,796
Corporate debt securities	–	24,146	312	–	24,458
Loans[b]	–	35,242	2,719	–	37,961
Asset-backed securities	–	3,284	153	–	3,437
Total debt instruments	59,645	152,266	4,385	–	216,296
Equity securities	87,346	197	295	–	87,838
Physical commodities[c]	4,924	1,322	–	–	6,246
Other	–	14,197	690	–	14,887
Total debt and equity instruments[d]	151,915	167,982	5,370	–	325,267
Derivative receivables:					
Interest rate	181	314,107	1,704	(291,319)	24,673
Credit	–	21,995	1,209	(22,335)	869
Foreign exchange	841	158,834	557	(144,081)	16,151
Equity	–	37,722	2,318	(32,158)	7,882
Commodity	–	19,875	210	(13,137)	6,948
Total derivative receivables[e][f]	1,022	552,533	5,998	(503,030)	56,523
Total trading assets[g]	152,937	720,515	11,368	(503,030)	381,790
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. government agencies[a]	–	70,280	–	–	70,280
Residential – nonagency	–	11,366	1	–	11,367
Commercial – nonagency	–	5,025	–	–	5,025
Total mortgage-backed securities	–	86,671	1	–	86,672
U.S. Treasury and government agencies[a]	22,745	–	–	–	22,745
Obligations of U.S. states and municipalities	–	32,338	–	–	32,338
Certificates of deposit	–	59	–	–	59
Non-U.S. government debt securities	18,140	9,154	–	–	27,294
Corporate debt securities	–	2,757	–	–	2,757
Asset-backed securities:					
Collateralized loan obligations	–	20,720	276	–	20,996
Other	–	8,817	–	–	8,817
Equity securities	547	–	–	–	547
Total available-for-sale securities	41,432	160,516	277	–	202,225
Loans	–	2,232	276	–	2,508
Mortgage servicing rights	–	–	6,030	–	6,030
Other assets[g]	13,795	343	1,265	–	15,403
Total assets measured at fair value on a recurring basis	$ 208,164	$ 901,387	$ 19,216	$ (503,030)	$ 625,737
Deposits	$ –	$ 17,179	$ 4,142	$ –	$ 21,321
Federal funds purchased and securities loaned or sold under repurchase agreements	–	697	–	–	697
Short-term borrowings	–	7,526	1,665	–	9,191
Trading liabilities:					
Debt and equity instruments[d]	64,664	21,183	39	–	85,886
Derivative payables:					
Interest rate	170	282,825	1,440	(277,306)	7,129
Credit	–	22,009	1,244	(21,954)	1,299
Foreign exchange	794	154,075	953	(143,349)	12,473
Equity	–	39,668	5,727	(36,203)	9,192
Commodity	–	21,017	884	(14,217)	7,684
Total derivative payables[e][f]	964	519,594	10,248	(493,029)	37,777
Total trading liabilities	65,628	540,777	10,287	(493,029)	123,663
Accounts payable and other liabilities	9,074	121	13	–	9,208
Beneficial interests issued by consolidated VIEs	–	6	39	–	45
Long-term debt	–	31,394	16,125	–	47,519
Total liabilities measured at fair value on a recurring basis	$ 74,702	$ 597,700	$ 32,271	$ (493,029)	$ 211,644

	Fair value hierarchy				
December 31, 2016 (in millions)	Level 1	Level 2	Level 3	Derivative netting adjustments	Total fair value
Federal funds sold and securities purchased under resale agreements	$ –	$ 21,506	$ –	$ –	$ 21,506
Securities borrowed	–	–	–	–	–
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. government agencies[(a)]	13	40,586	392	–	40,991
Residential – nonagency	–	1,552	83	–	1,635
Commercial – nonagency	–	1,321	17	–	1,338
Total mortgage-backed securities	13	43,459	492	–	43,964
U.S. Treasury and government agencies[(a)]	19,554	5,201	–	–	24,755
Obligations of U.S. states and municipalities	–	8,403	649	–	9,052
Certificates of deposit, bankers' acceptances and commercial paper	–	1,649	–	–	1,649
Non-U.S. government debt securities	28,443	23,076	46	–	51,565
Corporate debt securities	–	22,751	576	–	23,327
Loans[(b)]	–	28,965	4,837	–	33,802
Asset-backed securities	–	5,250	302	–	5,552
Total debt instruments	48,010	138,754	6,902	–	193,666
Equity securities	96,759	281	231	–	97,271
Physical commodities[(c)]	5,341	1,620	–	–	6,961
Other	–	9,341	761	–	10,102
Total debt and equity instruments[(d)]	150,110	149,996	7,894	–	308,000
Derivative receivables:					
Interest rate	715	602,747	2,501	(577,661)	28,302
Credit	–	28,256	1,389	(28,351)	1,294
Foreign exchange	812	231,743	870	(210,154)	23,271
Equity	–	34,032	908	(30,001)	4,939
Commodity	158	18,360	125	(12,371)	6,272
Total derivative receivables[(e)]	1,685	915,138	5,793	(858,538)	64,078
Total trading assets[(g)]	151,795	1,065,134	13,687	(858,538)	372,078
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. government agencies[(a)]	–	64,005	–	–	64,005
Residential – nonagency	–	14,442	1	–	14,443
Commercial – nonagency	–	9,104	–	–	9,104
Total mortgage-backed securities	–	87,551	1	–	87,552
U.S. Treasury and government agencies[(a)]	44,072	29	–	–	44,101
Obligations of U.S. states and municipalities	–	31,592	–	–	31,592
Certificates of deposit	–	106	–	–	106
Non-U.S. government debt securities	22,793	12,495	–	–	35,288
Corporate debt securities	–	4,958	–	–	4,958
Asset-backed securities:					
Collateralized loan obligations	–	26,738	663	–	27,401
Other	–	6,967	–	–	6,967
Equity securities	926	–	–	–	926
Total available-for-sale securities	67,791	170,436	664	–	238,891
Loans	–	1,660	570	–	2,230
Mortgage servicing rights	–	–	6,096	–	6,096
Other assets[(g)]	4,357	–	2,223	–	6,580
Total assets measured at fair value on a recurring basis	$ 223,943	$ 1,258,736	$ 23,240	$ (858,538)	$ 647,381
Deposits	$ –	$ 11,795	$ 2,117	$ –	$ 13,912
Federal funds purchased and securities loaned or sold under repurchase agreements	–	687	–	–	687
Short-term borrowings	–	7,971	1,134	–	9,105
Trading liabilities:					
Debt and equity instruments[(d)]	68,304	19,081	43	–	87,428
Derivative payables:					
Interest rate	539	569,001	1,238	(559,963)	10,815
Credit	–	27,375	1,291	(27,255)	1,411
Foreign exchange	902	231,815	2,254	(214,463)	20,508
Equity	–	35,202	3,160	(30,222)	8,140
Commodity	173	20,079	210	(12,105)	8,357
Total derivative payables[(e)]	1,614	883,472	8,153	(844,008)	49,231
Total trading liabilities	69,918	902,553	8,196	(844,008)	136,659
Accounts payable and other liabilities	9,107	–	13	–	9,120
Beneficial interests issued by consolidated VIEs	–	72	48	–	120
Long-term debt	–	24,836 [(h)]	12,850 [(h)]	–	37,686
Total liabilities measured at fair value on a recurring basis	$ 79,025	$ 947,914 [(h)]	$ 24,358 [(h)]	$ (844,008)	$ 207,289

(a) At December 31, 2017 and 2016, included total U.S. government-sponsored enterprise obligations of $78.0 billion and $80.6 billion, respectively, which were predominantly mortgage-related.

(b) At December 31, 2017 and 2016, included within trading loans were $11.4 billion and $16.5 billion, respectively, of residential first-lien mortgages, and $4.2 billion and $3.3 billion, respectively, of commercial first-lien mortgages. Residential mortgage loans include conforming mortgage loans originated with the intent to sell to U.S. government agencies of $5.7 billion and $11.0 billion, respectively, and reverse mortgages of $836 million and $2.0 billion, respectively.

(c) Physical commodities inventories are generally accounted for at the lower of cost or net realizable value. "Net realizable value" is a term defined in U.S. GAAP as not exceeding fair value less costs to sell ("transaction costs"). Transaction costs for the Firm's physical commodities inventories are either not applicable or immaterial to the value of the inventory. Therefore, net realizable value approximates fair value for the Firm's physical commodities inventories. When fair value hedging has been applied (or when net realizable value is below cost), the carrying value of physical commodities approximates fair value, because under fair value hedge accounting, the cost basis is adjusted for changes in fair value. For a further discussion of the Firm's hedge accounting relationships, see Note 5. To provide consistent fair value disclosure information, all physical commodities inventories have been included in each period presented.

(d) Balances reflect the reduction of securities owned (long positions) by the amount of identical securities sold but not yet purchased (short positions).

(e) As permitted under U.S. GAAP, the Firm has elected to net derivative receivables and derivative payables and the related cash collateral received and paid when a legally enforceable master netting agreement exists. For purposes of the tables above, the Firm does not reduce derivative receivables and derivative payables balances for this netting adjustment, either within or across the levels of the fair value hierarchy, as such netting is not relevant to a presentation based on the transparency of inputs to the valuation of an asset or liability. The level 3 balances would be reduced if netting were applied, including the netting benefit associated with cash collateral.

(f) Reflects the Firm's adoption of rulebook changes made by two CCPs that require or allow the Firm to treat certain OTC-cleared derivative transactions as daily settled. For further information, see Note 5.

(g) Certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient are not required to be classified in the fair value hierarchy. At December 31, 2017 and 2016, the fair values of these investments, which include certain hedge funds, private equity funds, real estate and other funds, were $779 million and $1.0 billion, respectively. Included in these balances at December 31, 2017 and 2016, were trading assets of $54 million and $52 million, respectively, and other assets of $725 million and $977 million, respectively.

(h) The prior period amounts have been revised to conform with the current period presentation.

Transfers between levels for instruments carried at fair value on a recurring basis

For the years ended December 31, 2017 and 2016, there were no significant transfers between levels 1 and 2.

During the year ended December 31, 2017, transfers from level 3 to level 2 included the following:

- $1.5 billion of trading loans driven by an increase in observability.
- $1.2 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.

During the year ended December 31, 2017, transfers from level 2 to level 3 included the following:

- $1.0 billion of gross equity derivative receivables and $2.5 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $1.7 billion of long-term debt driven by a decrease in observability and an increase in the significance of unobservable inputs for certain structured notes.

During the year ended December 31, 2016, transfers from level 3 to level 2 included the following:

- $1.4 billion of long-term debt driven by an increase in observability and a reduction in the significance of unobservable inputs for certain structured notes.

During the year ended December 31, 2016, transfers from level 2 to level 3 included the following:

- $1.1 billion of gross equity derivative receivables and $1.0 billion of gross equity derivative payables as a result of an decrease in observability and an increase in the significance of unobservable inputs.
- $1.0 billion of trading loans driven by a decrease in observability.

During the year ended December 31, 2015, transfers from level 3 to level 2 included the following:

- $3.1 billion of long-term debt and $1.0 billion of deposits driven by an increase in observability on certain structured notes with embedded interest rate and FX derivatives and a reduction in the significance of unobservable inputs for certain structured notes with embedded equity derivatives.
- $2.1 billion of gross equity derivatives for both receivables and payables as a result of an increase in observability and a decrease in the significance of unobservable inputs; partially offset by transfers into level 3 resulting in net transfers of approximately $1.2 billion for both receivables and payables.
- $2.8 billion of trading loans driven by an increase in observability of certain collateralized financing transactions.
- $2.4 billion of corporate debt driven by a decrease in the significance of unobservable inputs and an increase in observability for certain structured products.

During the year ended December 31, 2015, there were no significant transfers from level 2 to level 3.

All transfers are assumed to occur at the beginning of the quarterly reporting period in which they occur.

Level 3 valuations

The Firm has established well-structured processes for determining fair value, including for instruments where fair value is estimated using significant unobservable inputs (level 3). For further information on the Firm's valuation process and a detailed discussion of the determination of fair value for individual financial instruments, see pages 155–159 of this Note.

Estimating fair value requires the application of judgment. The type and level of judgment required is largely dependent on the amount of observable market information available to the Firm. For instruments valued using internally developed valuation models and other valuation techniques that use significant unobservable inputs and are therefore classified within level 3 of the fair value hierarchy, judgments used to estimate fair value are more significant than those required when estimating the fair value of instruments classified within levels 1 and 2.

In arriving at an estimate of fair value for an instrument within level 3, management must first determine the appropriate valuation model or other valuation technique to use. Second, due to the lack of observability of significant inputs, management must assess all relevant empirical data in deriving valuation inputs including transaction details, yield curves, interest rates, prepayment speed, default rates, volatilities, correlations, equity or debt prices, valuations of comparable instruments, foreign exchange rates and credit curves.

The following table presents the Firm's primary level 3 financial instruments, the valuation techniques used to measure the fair value of those financial instruments, the significant unobservable inputs, the range of values for those inputs and, for certain instruments, the weighted averages of such inputs. While the determination to classify an instrument within level 3 is based on the significance of the unobservable inputs to the overall fair value measurement, level 3 financial instruments typically include observable components (that is, components that are actively quoted and can be validated to external sources) in addition to the unobservable components. The level 1 and/or level 2 inputs are not included in the table. In addition, the Firm manages the risk of the observable components of level 3 financial instruments using securities and derivative positions that are classified within levels 1 or 2 of the fair value hierarchy.

The range of values presented in the table is representative of the highest and lowest level input used to value the significant groups of instruments within a product/instrument classification. Where provided, the weighted averages of the input values presented in the table are calculated based on the fair value of the instruments that the input is being used to value.

In the Firm's view, the input range and the weighted average value do not reflect the degree of input uncertainty or an assessment of the reasonableness of the Firm's estimates and assumptions. Rather, they reflect the characteristics of the various instruments held by the Firm and the relative distribution of instruments within the range of characteristics. For example, two option contracts may have similar levels of market risk exposure and valuation uncertainty, but may have significantly different implied volatility levels because the option contracts have different underlyings, tenors, or strike prices. The input range and weighted average values will therefore vary from period-to-period and parameter-to-parameter based on the characteristics of the instruments held by the Firm at each balance sheet date.

For the Firm's derivatives and structured notes positions classified within level 3 at December 31, 2017, interest rate correlation inputs used in estimating fair value were concentrated towards the upper end of the range; equity correlation, equity-FX and equity-IR correlation inputs were concentrated in the middle of the range; commodity correlation inputs were concentrated in the middle of the range; credit correlation inputs were concentrated towards the lower end of the range; and the interest rate-foreign exchange ("IR-FX") correlation inputs were concentrated towards the lower end of the range. In addition, the interest rate spread volatility inputs used in estimating fair value were distributed across the range; equity volatilities and commodity volatilities were concentrated towards the lower end of the range; and forward commodity prices used in estimating the fair value of commodity derivatives were concentrated towards the lower end of the range. Recovery rate, yield, prepayment speed, conditional default rate, loss severity and price inputs used in estimating the fair value of credit derivatives were distributed across the range; and credit spreads were concentrated towards the lower end of the range.

Level 3 inputs[a]

December 31, 2017					
Product/Instrument	**Fair value (in millions)**	**Principal valuation technique**	**Unobservable inputs[g]**	**Range of input values**	**Weighted average**
Residential mortgage-backed securities and loans[b]	$ 1,418	Discounted cash flows	Yield	3% - 16%	6%
			Prepayment speed	0% - 13%	9%
			Conditional default rate	0% - 5%	1%
			Loss severity	0% - 84%	3%
Commercial mortgage-backed securities and loans[c]	714	Market comparables	Price	$ 0 - $100	$94
Obligations of U.S. states and municipalities	744	Market comparables	Price	$ 59 - $100	$98
Corporate debt securities	312	Market comparables	Price	$ 3 - $111	$82
Loans[d]	1,242	Market comparables	Price	$ 4 - $103	$84
Asset-backed securities	276	Discounted cash flows	Credit spread	204bps - 205bps	205bps
			Prepayment speed	20%	20%
			Conditional default rate	2%	2%
			Loss severity	30%	30%
	153	Market comparables	Price	$ 2 - $160	$79
Net interest rate derivatives	28	Option pricing	Interest rate spread volatility	27bps - 38bps	
			Interest rate correlation	(50)% - 98%	
			IR-FX correlation	60% - 70%	
	236	Discounted cash flows	Prepayment speed	0% - 30%	
Net credit derivatives	(37)	Discounted cash flows	Credit correlation	40 % - 75%	
			Credit spread	6bps - 1,489bps	
			Recovery rate	20% - 70%	
			Yield	1% - 20%	
			Prepayment speed	4% - 21%	
			Conditional default rate	0% - 100%	
			Loss severity	4% - 100%	
	2	Market comparables	Price	$ 10 $98	
Net foreign exchange derivatives	(200)	Option pricing	IR-FX correlation	(50)% - 70%	
	(196)	Discounted cash flows	Prepayment speed	7%	
Net equity derivatives	(3,409)	Option pricing	Equity volatility	20% - 55%	
			Equity correlation	0 % - 85%	
			Equity-FX correlation	(50)% - 30%	
			Equity-IR correlation	10 % - 40%	
Net commodity derivatives	(674)	Option pricing	Forward commodity price	$ 54 - $68 per barrel	
			Commodity volatility	5 % 46%	
			Commodity correlation	(40)% - 70%	
MSRs	6,030	Discounted cash flows	Refer to Note 15		
Other assets	984	Discounted cash flows	Credit spread	40bps - 70bps	55bps
			Yield	8% - 60%	47%
	971	Market comparables	EBITDA multiple	4.7x - 10.6x	8.9x
Long-term debt, short-term borrowings, and deposits[e]	21,932	Option pricing	Interest rate spread volatility	27bps - 38bps	
			Interest rate correlation	(50)% - 98%	
			IR-FX correlation	(50)% - 70%	
			Equity correlation	0% - 85%	
			Equity-FX correlation	(50)% - 30%	
			Equity-IR correlation	10% - 40%	
Other level 3 assets and liabilities, net[f]	283				

(a) The categories presented in the table have been aggregated based upon the product type, which may differ from their classification on the Consolidated balance sheets. Furthermore, the inputs presented for each valuation technique in the table are, in some cases, not applicable to every instrument valued using the technique as the characteristics of the instruments can differ.

(b) Includes U.S. government agency securities of $297 million, nonagency securities of $61 million and trading loans of $1.1 billion.
(c) Includes U.S. government agency securities of $10 million, nonagency securities of $11 million, trading loans of $417 million and non-trading loans of $276 million.
(d) Includes trading loans of $1.2 billion.
(e) Long-term debt, short-term borrowings and deposits include structured notes issued by the Firm that are predominantly financial instruments containing embedded derivatives. The estimation of the fair value of structured notes includes the derivative features embedded within the instrument. The significant unobservable inputs are broadly consistent with those presented for derivative receivables.
(f) Includes level 3 assets and liabilities that are insignificant both individually and in aggregate.
(g) Price is a significant unobservable input for certain instruments. When quoted market prices are not readily available, reliance is generally placed on price-based internal valuation techniques. The price input is expressed assuming a par value of $100.

Changes in and ranges of unobservable inputs

The following discussion provides a description of the impact on a fair value measurement of a change in each unobservable input in isolation, and the interrelationship between unobservable inputs, where relevant and significant. The impact of changes in inputs may not be independent, as a change in one unobservable input may give rise to a change in another unobservable input. Where relationships do exist between two unobservable inputs, those relationships are discussed below. Relationships may also exist between observable and unobservable inputs (for example, as observable interest rates rise, unobservable prepayment rates decline); such relationships have not been included in the discussion below. In addition, for each of the individual relationships described below, the inverse relationship would also generally apply.

The following discussion also provides a description of attributes of the underlying instruments and external market factors that affect the range of inputs used in the valuation of the Firm's positions.

Yield – The yield of an asset is the interest rate used to discount future cash flows in a discounted cash flow calculation. An increase in the yield, in isolation, would result in a decrease in a fair value measurement.

Credit spread – The credit spread is the amount of additional annualized return over the market interest rate that a market participant would demand for taking exposure to the credit risk of an instrument. The credit spread for an instrument forms part of the discount rate used in a discounted cash flow calculation. Generally, an increase in the credit spread would result in a decrease in a fair value measurement.

The yield and the credit spread of a particular mortgage-backed security primarily reflect the risk inherent in the instrument. The yield is also impacted by the absolute level of the coupon paid by the instrument (which may not correspond directly to the level of inherent risk). Therefore, the range of yield and credit spreads reflects the range of risk inherent in various instruments owned by the Firm. The risk inherent in mortgage-backed securities is driven by the subordination of the security being valued and the characteristics of the underlying mortgages within the collateralized pool, including borrower FICO scores, LTV ratios for residential mortgages and the nature of the property and/or any tenants for commercial mortgages. For corporate debt securities, obligations of U.S. states and municipalities and other similar instruments, credit spreads reflect the credit quality of the obligor and the tenor of the obligation.

Prepayment speed – The prepayment speed is a measure of the voluntary unscheduled principal repayments of a prepayable obligation in a collateralized pool. Prepayment speeds generally decline as borrower delinquencies rise. An increase in prepayment speeds, in isolation, would result in a decrease in a fair value measurement of assets valued at a premium to par and an increase in a fair value measurement of assets valued at a discount to par.

Prepayment speeds may vary from collateral pool to collateral pool, and are driven by the type and location of the underlying borrower, and the remaining tenor of the obligation as well as the level and type (e.g., fixed or floating) of interest rate being paid by the borrower. Typically collateral pools with higher borrower credit quality have a higher prepayment rate than those with lower borrower credit quality, all other factors being equal.

Conditional default rate – The conditional default rate is a measure of the reduction in the outstanding collateral balance underlying a collateralized obligation as a result of defaults. While there is typically no direct relationship between conditional default rates and prepayment speeds, collateralized obligations for which the underlying collateral has high prepayment speeds will tend to have lower conditional default rates. An increase in conditional default rates would generally be accompanied by an increase in loss severity and an increase in credit spreads. An increase in the conditional default rate, in isolation, would result in a decrease in a fair value measurement. Conditional default rates reflect the quality of the collateral underlying a securitization and the structure of the securitization itself. Based on the types of securities owned in the Firm's market-making portfolios, conditional default rates are most typically at the lower end of the range presented.

Loss severity – The loss severity (the inverse concept is the recovery rate) is the expected amount of future realized losses resulting from the ultimate liquidation of a particular loan, expressed as the net amount of loss relative to the outstanding loan balance. An increase in loss severity is generally accompanied by an increase in conditional default rates. An increase in the loss severity, in isolation, would result in a decrease in a fair value measurement.

The loss severity applied in valuing a mortgage-backed security investment depends on factors relating to the underlying mortgages, including the LTV ratio, the nature of the lender's lien on the property and other instrument-specific factors.

Correlation – Correlation is a measure of the relationship between the movements of two variables (e.g., how the change in one variable influences the change in the other). Correlation is a pricing input for a derivative product where the payoff is driven by one or more underlying risks. Correlation inputs are related to the type of derivative (e.g., interest rate, credit, equity and foreign exchange) due to the nature of the underlying risks. When parameters are positively correlated, an increase in one parameter will result in an increase in the other parameter. When parameters are negatively correlated, an increase in one parameter will result in a decrease in the other parameter. An increase in correlation can result in an increase or a decrease in a fair value measurement. Given a short correlation position, an increase in correlation, in isolation, would generally result in a decrease in a fair value measurement. The range of correlation inputs between risks within the same asset class are generally narrower than those between underlying risks across asset classes. In addition, the ranges of credit correlation inputs tend to be narrower than those affecting other asset classes.

The level of correlation used in the valuation of derivatives with multiple underlying risks depends on a number of factors including the nature of those risks. For example, the correlation between two credit risk exposures would be different than that between two interest rate risk exposures. Similarly, the tenor of the transaction may also impact the correlation input, as the relationship between the underlying risks may be different over different time periods. Furthermore, correlation levels are very much dependent on market conditions and could have a relatively wide range of levels within or across asset classes over time, particularly in volatile market conditions.

Volatility – Volatility is a measure of the variability in possible returns for an instrument, parameter or market index given how much the particular instrument, parameter or index changes in value over time. Volatility is a pricing input for options, including equity options, commodity options, and interest rate options. Generally, the higher the volatility of the underlying, the riskier the instrument. Given a long position in an option, an increase in volatility, in isolation, would generally result in an increase in a fair value measurement.

The level of volatility used in the valuation of a particular option-based derivative depends on a number of factors, including the nature of the risk underlying the option (e.g., the volatility of a particular equity security may be significantly different from that of a particular commodity index), the tenor of the derivative as well as the strike price of the option.

EBITDA multiple – EBITDA multiples refer to the input (often derived from the value of a comparable company) that is multiplied by the historic and/or expected earnings before interest, taxes, depreciation and amortization ("EBITDA") of a company in order to estimate the company's value. An increase in the EBITDA multiple, in isolation, net of adjustments, would result in an increase in a fair value measurement.

Changes in level 3 recurring fair value measurements

The following tables include a rollforward of the Consolidated balance sheets amounts (including changes in fair value) for financial instruments classified by the Firm within level 3 of the fair value hierarchy for the years ended December 31, 2017, 2016 and 2015. When a determination is made to classify a financial instrument within level 3, the determination is based on the significance of the unobservable parameters to the overall fair value measurement. However, level 3 financial instruments typically include, in addition to the unobservable or level 3 components, observable components (that is, components that are actively quoted and can be validated to external sources); accordingly, the gains and losses in the table below include changes in fair value due in part to observable factors that are part of the valuation methodology. Also, the Firm risk-manages the observable components of level 3 financial instruments using securities and derivative positions that are classified within level 1 or 2 of the fair value hierarchy; as these level 1 and level 2 risk management instruments are not included below, the gains or losses in the following tables do not reflect the effect of the Firm's risk management activities related to such level 3 instruments.

Year ended December 31, 2017 (in millions)	Fair value measurements using significant unobservable inputs								Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2017
	Fair value at January 1, 2017	Total realized/ unrealized gains/ (losses)	Purchases[f]	Sales	Settlements[g]	Transfers into level 3[h]	Transfers (out of) level 3[h]	Fair value at Dec. 31, 2017	
Assets:									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. government agencies	$ 392	$ (11)	$ 161	$ (171)	$ (70)	$ 49	$ (43)	$ 307	$ (20)
Residential – nonagency	83	19	53	(30)	(64)	132	(133)	60	11
Commercial – nonagency	17	9	27	(44)	(13)	64	(49)	11	1
Total mortgage-backed securities	492	17	241	(245)	(147)	245	(225)	378	(8)
U.S. Treasury and government agencies	–	–	–	–	–	1	–	1	–
Obligations of U.S. states and municipalities	649	18	152	(70)	(5)	–	–	744	15
Non-U.S. government debt securities	46	–	559	(518)	–	62	(71)	78	–
Corporate debt securities	576	11	872	(612)	(497)	157	(195)	312	18
Loans	4,837	333	2,389	(2,832)	(1,323)	806	(1,491)	2,719	43
Asset-backed securities	302	32	354	(356)	(56)	75	(198)	153	–
Total debt instruments	6,902	411	4,567	(4,633)	(2,028)	1,346	(2,180)	4,385	68
Equity securities	231	39	176	(148)	(4)	59	(58)	295	21
Other	761	100	30	(46)	(162)	17	(10)	690	39
Total trading assets – debt and equity instruments	7,894	550 [c]	4,773	(4,827)	(2,194)	1,422	(2,248)	5,370	128 [c]
Net derivative receivables:[a]									
Interest rate	1,263	72	60	(82)	(1,040)	(8)	(1)	264	(473)
Credit	98	(164)	1	(6)	–	77	(41)	(35)	32
Foreign exchange	(1,384)	43	13	(10)	854	(61)	149	(396)	42
Equity	(2,252)	(417)	1,116	(551)	(245)	(1,482)	422	(3,409)	(161)
Commodity	(85)	(149)	–	–	(433)	(6)	(1)	(674)	(718)
Total net derivative receivables	(2,360)	(615) [c]	1,190	(649)	(864)	(1,480)	528	(4,250)	(1,278) [c]
Available-for-sale securities:									
Asset-backed securities	663	15	–	(50)	(352)	–	–	276	14
Other	1	–	–	–	–	–	–	1	–
Total available-for-sale securities	664	15 [d]	–	(50)	(352)	–	–	277	14 [d]
Loans	570	35 [c]	–	(26)	(303)	–	–	276	3 [c]
Mortgage servicing rights	6,096	(232) [e]	1,103	(140)	(797)	–	–	6,030	(232) [e]
Other assets	2,223	244 [c]	66	(177)	(870)	–	(221)	1,265	74 [c]

Year ended December 31, 2017 (in millions)	Fair value measurements using significant unobservable inputs									Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2017
	Fair value at January 1, 2017	Total realized/ unrealized (gains)/ losses	Purchases	Sales	Issuances	Settlements[g]	Transfers into level 3[h]	Transfers (out of) level 3[h]	Fair value at Dec. 31, 2017	
Liabilities:[b]										
Deposits	$ 2,117	$ 152 [c][i]	$ –	$ –	$ 3,027	$ (291)	$ 11	$ (874)	$ 4,142	$ 198 [c][i]
Federal funds purchased and securities loaned or sold under repurchase agreements	–	–	–	–	–	–	–	–	–	–
Short-term borrowings	1,134	42 [c][i]	–	–	3,289	(2,748)	150	(202)	1,665	7 [c][i]
Trading liabilities – debt and equity instruments	43	(3) [c]	(46)	48	–	3	3	(9)	39	– [c]
Accounts payable and other liabilities	13	(2)	(1)	–	–	3	–	–	13	(2)
Beneficial interests issued by consolidated VIEs	48	2 [c]	(122)	39	–	(6)	78	–	39	– [c]
Long-term debt	12,850	1,067 [c][i]	–	–	12,458	(10,985)	1,660	(925)	16,125	552 [c][i]

Year ended December 31, 2016 (in millions)	Fair value at January 1, 2016	Total realized/unrealized gains/(losses)	Purchases[f]	Sales	Settlements[g]	Transfers into level 3[h]	Transfers (out of) level 3[h]	Fair value at Dec. 31, 2016	Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2016
	Fair value measurements using significant unobservable inputs								
Assets:									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. government agencies	$ 715	$ (20)	$ 135	$ (295)	$ (115)	$ 111	$ (139)	$ 392	$ (36)
Residential – nonagency	194	4	252	(319)	(20)	67	(95)	83	5
Commercial – nonagency	115	(11)	69	(29)	(3)	173	(297)	17	3
Total mortgage-backed securities	1,024	(27)	456	(643)	(138)	351	(531)	492	(28)
Obligations of U.S. states and municipalities	651	19	149	(132)	(38)	–	–	649	–
Non-U.S. government debt securities	74	(4)	91	(97)	(7)	19	(30)	46	(7)
Corporate debt securities	736	2	445	(359)	(189)	148	(207)	576	(22)
Loans	6,604	(343)	2,228	(2,598)	(1,311)	1,044	(787)	4,837	(169)
Asset-backed securities	1,832	39	655	(712)	(968)	288	(832)	302	19
Total debt instruments	10,921	(314)	4,024	(4,541)	(2,651)	1,850	(2,387)	6,902	(207)
Equity securities	265	–	90	(108)	(40)	29	(5)	231	7
Other	744	79	649	(287)	(360)	26	(90)	761	28
Total trading assets – debt and equity instruments	11,930	(235) [c]	4,763	(4,936)	(3,051)	1,905	(2,482)	7,894	(172) [c]
Net derivative receivables:[a]	–						–	–	
Interest rate	876	756	193	(57)	(713)	(14)	222	1,263	(144)
Credit	549	(742)	10	(2)	211	36	36	98	(622)
Foreign exchange	(725)	67	64	(124)	(649)	(48)	31	(1,384)	(350)
Equity	(1,514)	(145)	277	(852)	213	94	(325)	(2,252)	(86)
Commodity	(935)	194	1	10	645	8	(8)	(85)	(36)
Total net derivative receivables	(1,749)	130 [c]	545	(1,025)	(293)	76	(44)	(2,360)	(1,238) [c]
Available-for-sale securities:									
Asset-backed securities	823	1	–	–	(119)	–	(42)	663	1
Other	1	–	–	–	–	–	–	1	–
Total available-for-sale securities	824	1 [d]	–	–	(119)	–	(42)	664	1 [d]
Loans	1,518	(49) [c]	259	(7)	(838)	–	(313)	570	– [c]
Mortgage servicing rights	6,608	(163) [e]	679	(109)	(919)	–	–	6,096	(163) [e]
Other assets	2,401	130 [c]	487	(496)	(299)	–	–	2,223	48 [c]

Year ended December 31, 2016 (in millions)	Fair value at January 1, 2016	Total realized/unrealized (gains)/losses	Purchases	Sales	Issuances	Settlements[g]	Transfers into level 3[h]	Transfers (out of) level 3[h]	Fair value at Dec. 31, 2016	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2016
	Fair value measurements using significant unobservable inputs									
Liabilities:[b]										
Deposits	$ 2,950	$ (56) [c]	$ –	$ –	$ 1,375	$ (1,283)	$ –	$ (869)	$ 2,117	$ 23 [c]
Federal funds purchased and securities loaned or sold under repurchase agreements	–	–	–	–	–	(2)	6	(4)	–	–
Short-term borrowings	639	(230) [c]	–	–	1,876	(1,210)	114	(55)	1,134	(70) [c]
Trading liabilities – debt and equity instruments	63	(12) [c]	(15)	23	–	(22)	13	(7)	43	(18) [c]
Accounts payable and other liabilities	19	–	–	–	–	(6)	–	–	13	–
Beneficial interests issued by consolidated VIEs	549	(31) [c]	–	–	143	(613)	–	–	48	6 [c]
Long-term debt	11,447 [j]	147 [c][j]	–	–	8,140 [j]	(5,810)	315	(1,389)	12,850 [j]	639 [c][j]

Year ended December 31, 2015 (in millions)	Fair value at January 1, 2015	Total realized/unrealized gains/(losses)	Purchases[f]	Sales	Settlements[g]	Transfers into level 3[h]	Transfers (out of) level 3[h]	Fair value at Dec. 31, 2015	Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2015
	Fair value measurements using significant unobservable inputs								
Assets:									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. government agencies	$ 922	$ (28)	$ 327	$ (303)	$ (132)	$ 25	$ (96)	$ 715	$ (27)
Residential – nonagency	663	130	253	(611)	(23)	180	(398)	194	4
Commercial – nonagency	306	(14)	246	(262)	(22)	117	(256)	115	(5)
Total mortgage-backed securities	1,891	88	826	(1,176)	(177)	322	(750)	1,024	(28)
Obligations of U.S. states and municipalities	1,273	14	352	(133)	(27)	5	(833)	651	(1)
Non-U.S. government debt securities	302	9	205	(123)	(64)	16	(271)	74	(16)
Corporate debt securities	2,989	(77)	1,171	(1,038)	(125)	179	(2,363)	736	2
Loans	13,287	(174)	3,532	(4,661)	(3,112)	509	(2,777)	6,604	(181)
Asset-backed securities	1,264	(41)	1,920	(1,229)	(35)	205	(252)	1,832	(32)
Total debt instruments	21,006	(181)	8,006	(8,360)	(3,540)	1,236	(7,246)	10,921	(256)
Equity securities	431	96	89	(193)	(26)	51	(183)	265	82
Physical commodities	2	(2)	–	–	–	–	–	–	–
Other	1,050	119	1,581	(1,313)	192	33	(918)	744	85
Total trading assets – debt and equity instruments	22,489	32 (c)	9,676	(9,866)	(3,374)	1,320	(8,347)	11,930	(89) (c)
Net derivative receivables:[a]									
Interest rate	626	962	513	(173)	(732)	6	(326)	876	263
Credit	189	118	129	(136)	165	29	55	549	260
Foreign exchange	(526)	657	19	(149)	(296)	36	(466)	(725)	49
Equity	(1,785)	731	890	(1,262)	(158)	17	53	(1,514)	5
Commodity	(565)	(856)	1	(24)	512	(30)	27	(935)	(41)
Total net derivative receivables	(2,061)	1,612 (c)	1,552	(1,744)	(509)	58	(657)	(1,749)	536 (c)
Available-for-sale securities:	–								
Asset-backed securities	908	(32)	51	(43)	(61)	–	–	823	(28)
Other	129	–	–	–	(29)	–	(99)	1	–
Total available-for-sale securities	1,037	(32) (d)	51	(43)	(90)	–	(99)	824	(28) (d)
Loans	2,541	(133) (c)	1,290	(92)	(1,241)	–	(847)	1,518	(32) (c)
Mortgage servicing rights	7,436	(405) (e)	985	(486)	(922)	–	–	6,608	(405) (e)
Other assets	3,184	(29) (c)	346	(509)	(411)	–	(180)	2,401	(289) (c)

Year ended December 31, 2015 (in millions)	Fair value at January 1, 2015	Total realized/unrealized (gains)/losses	Purchases	Sales	Issuances	Settlements[g]	Transfers into level 3[h]	Transfers (out of) level 3[h]	Fair value at Dec. 31, 2015	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2015
	Fair value measurements using significant unobservable inputs									
Liabilities:[b]										
Deposits	$ 2,859	$ (39) (c)	$ –	$ –	$ 1,993	$ (850)	$ –	$ (1,013)	$ 2,950	$ (29) (c)
Short-term borrowings	1,453	(697) (c)	–	–	3,334	(2,963)	243	(731)	639	(57) (c)
Trading liabilities – debt and equity instruments	72	15 (c)	(163)	160	–	(17)	12	(16)	63	(4) (c)
Accounts payable and other liabilities	26	– (c)	–	–	–	(7)	–	–	19	–
Beneficial interests issued by consolidated VIEs	1,146	(82) (c)	–	–	286	(574)	–	(227)	549	(63) (c)
Long-term debt	11,877	(480) (c)	(58)	–	9,359	(6,465) (j)	315	(3,101)	11,447 (j)	385 (c)(j)

(a) All level 3 derivatives are presented on a net basis, irrespective of underlying counterparty.

(b) Level 3 liabilities as a percentage of total Firm liabilities accounted for at fair value (including liabilities measured at fair value on a nonrecurring basis) were 15%, 12% and 13% at December 31, 2017, 2016 and 2015, respectively.
(c) Predominantly reported in principal transactions revenue, except for changes in fair value for CCB mortgage loans, and lending-related commitments originated with the intent to sell, and mortgage loan purchase commitments, which are reported in mortgage fees and related income.
(d) Realized gains/(losses) on AFS securities, as well as other-than-temporary impairment ("OTTI") losses that are recorded in earnings, are reported in securities gains. Unrealized gains/(losses) are reported in OCI. Realized gains/(losses) and foreign exchange hedge accounting adjustments recorded in income on AFS securities were zero, zero, and $(7) million for the years ended December 31, 2017, 2016 and 2015, respectively. Unrealized gains/(losses) recorded on AFS securities in OCI were $15 million, $1 million and $(25) million for the years ended December 31, 2017, 2016 and 2015, respectively.
(e) Changes in fair value for CCB MSRs are reported in mortgage fees and related income.
(f) Loan originations are included in purchases
(g) Includes financial assets and liabilities that have matured, been partially or fully repaid, impacts of modifications, and deconsolidation associated with beneficial interests in VIEs and other items.
(h) All transfers into and/or out of level 3 are based on changes in the observability of the valuation inputs and are assumed to occur at the beginning of the quarterly reporting period in which they occur.
(i) Realized (gains)/losses due to DVA for fair value option elected liabilities are reported in principal transactions revenue. Unrealized (gains)/losses are reported in OCI. Unrealized gains were $48 million for the year ended December 31, 2017. There were no realized gains for the year ended December 31, 2017.
(j) The prior period amounts have been revised to conform with the current period presentation.

Level 3 analysis

Consolidated balance sheets changes

Level 3 assets (including assets measured at fair value on a nonrecurring basis) were 0.8% of total Firm assets at December 31, 2017. The following describes significant changes to level 3 assets since December 31, 2016, for those items measured at fair value on a recurring basis. For further information on changes impacting items measured at fair value on a nonrecurring basis, see Assets and liabilities measured at fair value on a nonrecurring basis on page 172.

For the year ended December 31, 2017

Level 3 assets were $19.2 billion at December 31, 2017, reflecting a decrease of $4.0 billion from December 31, 2016, largely due to the following:

- $2.5 billion decrease in trading assets – debt and equity instruments was predominantly driven by a decrease of $2.1 billion in trading loans largely due to settlements, and a $1.0 billion decrease in other assets due to settlements and transfers from level 3 to level 2 as a result of increased observability in certain valuation inputs

Gains and losses

The following describes significant components of total realized/unrealized gains/(losses) for instruments measured at fair value on a recurring basis for the years ended December 31, 2017, 2016 and 2015. For further information on these instruments, see Changes in level 3 recurring fair value measurements rollforward tables on pages 166–170.

2017

- $1.3 billion of net losses on liabilities largely driven by market movements in long-term debt

2016

- There were no individually significant movements for the year ended December 31, 2016.

2015

- $1.6 billion of net gains in interest rate, foreign exchange and equity derivative receivables largely due to market movements; partially offset by losses on commodity derivatives due to market movements
- $1.3 billion of net gains in liabilities due to market movements

Credit and funding adjustments – derivatives

Derivatives are generally valued using models that use as their basis observable market parameters. These market parameters generally do not consider factors such as counterparty nonperformance risk, the Firm's own credit quality, and funding costs. Therefore, it is generally necessary to make adjustments to the base estimate of fair value to reflect these factors.

CVA represents the adjustment, relative to the relevant benchmark interest rate, necessary to reflect counterparty nonperformance risk. The Firm estimates CVA using a scenario analysis to estimate the expected positive credit exposure across all of the Firm's existing positions with each counterparty, and then estimates losses based on the probability of default and estimated recovery rate as a result of a counterparty credit event considering contractual factors designed to mitigate the Firm's credit exposure, such as collateral and legal rights of offset. The key inputs to this methodology are (i) the probability of a default event occurring for each counterparty, as derived from observed or estimated CDS spreads; and (ii) estimated recovery rates implied by CDS spreads, adjusted to consider the differences in recovery rates as a derivative creditor relative to those reflected in CDS spreads, which generally reflect senior unsecured creditor risk.

FVA represents the adjustment to reflect the impact of funding and is recognized where there is evidence that a market participant in the principal market would incorporate it in a transfer of the instrument. The Firm's FVA framework, applied to uncollateralized (including partially collateralized) over-the-counter ("OTC") derivatives incorporates key inputs such as: (i) the expected funding requirements arising from the Firm's positions with each counterparty and collateral arrangements; and (ii) the estimated market funding cost in the principal market which, for derivative liabilities, considers the Firm's credit risk (DVA). For collateralized derivatives, the fair value is estimated by discounting expected future cash flows at the relevant overnight indexed swap rate given the underlying collateral agreement with the counterparty, and therefore a separate FVA is not necessary.

The following table provides the impact of credit and funding adjustments on principal transactions revenue in the respective periods, excluding the effect of any associated hedging activities. The FVA reported below include the impact of the Firm's own credit quality on the inception value of liabilities as well as the impact of changes in the Firm's own credit quality over time.

Year ended December 31, (in millions)	**2017**	2016	2015
Credit and funding adjustments:			
Derivatives CVA	**$ 802**	$ (84)	$ 620
Derivatives FVA	**(295)**	7	73

Valuation adjustments on fair value option elected liabilities

The valuation of the Firm's liabilities for which the fair value option has been elected requires consideration of the Firm's own credit risk. DVA on fair value option elected liabilities reflects changes (subsequent to the issuance of the liability) in the Firm's probability of default and LGD, which are estimated based on changes in the Firm's credit spread observed in the bond market. Effective January 1, 2016, the effect of DVA on fair value option elected liabilities is recognized in OCI. See Note 23 for further information.

Assets and liabilities measured at fair value on a nonrecurring basis

The following tables present the assets reported on a nonrecurring basis at fair value as of December 31, 2017 and 2016, by major product category and fair value hierarchy.

December 31, 2017 (in millions)	Fair value hierarchy Level 1	Level 2	Level 3	Total fair value
Loans	**$ –**	**$ 238**	**$ 596** [(a)]	**$ 834**
Other assets	**–**	**283**	**183**	**466**
Total assets measured at fair value on a nonrecurring basis	**$ –**	**$ 521**	**$ 779** [(a)]	**$ 1,300**

December 31, 2016 (in millions)	Fair value hierarchy Level 1	Level 2	Level 3	Total fair value
Loans	$ –	$ 730	$ 590	$ 1,320
Other assets	–	5	232	237
Total assets measured at fair value on a nonrecurring basis	$ –	$ 735	$ 822	$ 1,557

(a) Of the $779 million in level 3 assets measured at fair value on a nonrecurring basis as of December 31, 2017, $442 million related to residential real estate loans carried at the net realizable value of the underlying collateral (e.g., collateral-dependent loans and other loans charged off in accordance with regulatory guidance). These amounts are classified as level 3 as they are valued using a broker's price opinion and discounted based upon the Firm's experience with actual liquidation values. These discounts to the broker price opinions ranged from 13% to 48% with a weighted average of 27%.

There were no material liabilities measured at fair value on a nonrecurring basis at December 31, 2017 and 2016.

Nonrecurring fair value changes

The following table presents the total change in value of assets and liabilities for which a fair value adjustment has been recognized for the years ended December 31, 2017 2016 and 2015, related to financial instruments held at those dates.

December 31, (in millions)	2017	2016	2015
Loans	**$ (159)**	$ (209)	$ (226)
Other Assets	**(148)**	37	(60)
Accounts payable and other liabilities	**(1)**	–	(8)
Total nonrecurring fair value gains/ (losses)	**$ (308)**	$ (172)	$ (294)

For further information about the measurement of impaired collateral-dependent loans, and other loans where the carrying value is based on the fair value of the underlying collateral (e.g., residential mortgage loans charged off in accordance with regulatory guidance), see Note 12.

Additional disclosures about the fair value of financial instruments that are not carried on the Consolidated balance sheets at fair value

U.S. GAAP requires disclosure of the estimated fair value of certain financial instruments, and the methods and significant assumptions used to estimate their fair value. Financial instruments within the scope of these disclosure requirements are included in the following table. However, certain financial instruments and all nonfinancial instruments are excluded from the scope of these disclosure requirements. Accordingly, the fair value disclosures provided in the following table include only a partial estimate of the fair value of JPMorgan Chase's assets and liabilities. For example, the Firm has developed long-term relationships with its customers through its deposit base and credit card accounts, commonly referred to as core deposit intangibles and credit card relationships. In the opinion of management, these items, in the aggregate, add significant value to JPMorgan Chase, but their fair value is not disclosed in this Note.

Financial instruments for which carrying value approximates fair value

Certain financial instruments that are not carried at fair value on the Consolidated balance sheets are carried at amounts that approximate fair value, due to their short-term nature and generally negligible credit risk. These instruments include cash and due from banks, deposits with banks, federal funds sold, securities purchased under resale agreements and securities borrowed, short-term receivables and accrued interest receivable, short-term borrowings, federal funds purchased, securities loaned and sold under repurchase agreements, accounts payable, and accrued liabilities. In addition, U.S. GAAP requires that the fair value of deposit liabilities with no stated maturity (i.e., demand, savings and certain money market deposits) be equal to their carrying value; recognition of the inherent funding value of these instruments is not permitted.

The following table presents by fair value hierarchy classification the carrying values and estimated fair values at December 31, 2017 and 2016, of financial assets and liabilities, excluding financial instruments that are carried at fair value on a recurring basis, and their classification within the fair value hierarchy. For additional information regarding the financial instruments within the scope of this disclosure, and the methods and significant assumptions used to estimate their fair value, see pages 156–159 of this Note.

	December 31, 2017					December 31, 2016				
		Estimated fair value hierarchy					Estimated fair value hierarchy			
(in billions)	Carrying value	Level 1	Level 2	Level 3	Total estimated fair value	Carrying value	Level 1	Level 2	Level 3	Total estimated fair value
Financial assets										
Cash and due from banks	**$ 25.8**	**$ 25.8**	**$ –**	**$ –**	**$ 25.8**	$ 23.9	$ 23.9	$ –	$ –	$ 23.9
Deposits with banks	**404.3**	**401.8**	**2.5**	**–**	**404.3**	365.8	362.0	3.8	–	365.8
Accrued interest and accounts receivable	**67.0**	**–**	**67.0**	**–**	**67.0**	52.3	–	52.2	0.1	52.3
Federal funds sold and securities purchased under resale agreements	**183.7**	**–**	**183.7**	**–**	**183.7**	208.5	–	208.3	0.2	208.5
Securities borrowed	**102.1**	**–**	**102.1**	**–**	**102.1**	96.4	–	96.4	–	96.4
Securities, held-to-maturity	**47.7**	**–**	**48.7**	**–**	**48.7**	50.2	–	50.9	–	50.9
Loans, net of allowance for loan losses[a][b]	**914.6**	**–**	**213.2**	**707.1**	**920.3**	878.8	–	24.1	851.0	875.1
Other	**62.9**	**–**	**52.9**	**16.5**	**69.4**	71.4	0.1	60.8	14.3	75.2
Financial liabilities										
Deposits	**$ 1,422.7**	**$ –**	**$ 1,422.7**	**$ –**	**$ 1,422.7**	$ 1,361.3	$ –	$ 1,361.3	$ –	$ 1,361.3
Federal funds purchased and securities loaned or sold under repurchase agreements	**158.2**	**–**	**158.2**	**–**	**158.2**	165.0	–	165.0	–	165.0
Short-term borrowings	**42.6**	**–**	**42.4**	**0.2**	**42.6**	25.3	–	25.3	–	25.3
Accounts payable and other liabilities	**152.0**	**–**	**148.9**	**2.9**	**151.8**	148.0	–	144.8	3.4	148.2
Beneficial interests issued by consolidated VIEs	**26.0**	**–**	**26.0**	**–**	**26.0**	38.9	–	38.9	–	38.9
Long-term debt and junior subordinated deferrable interest debentures	**236.6**	**–**	**240.3**	**3.2**	**243.5**	257.5	–	260.0	2.0	262.0

(a) Fair value is typically estimated using a discounted cash flow model that incorporates the characteristics of the underlying loans (including principal, contractual interest rate and contractual fees) and other key inputs, including expected lifetime credit losses, interest rates, prepayment rates, and primary origination or secondary market spreads. For certain loans, the fair value is measured based on the value of the underlying collateral. The difference between the estimated fair value and carrying value of a financial asset or liability is the result of the different methodologies used to determine fair value as compared with carrying value. For example, credit losses are estimated for a financial asset's remaining life in a fair value calculation but are estimated for a loss emergence period in the allowance for loan loss calculation; future loan income (interest and fees) is incorporated in a fair value calculation but is generally not considered in the allowance for loan losses. For a further discussion of the Firm's methodologies for estimating the fair value of loans and lending-related commitments, see Valuation hierarchy on pages 156–159.

(b) For the year ended December 31, 2017, the Firm transferred certain residential mortgage loans from Level 3 to Level 2 as a result of an increase in observability.

The majority of the Firm's lending-related commitments are not carried at fair value on a recurring basis on the Consolidated balance sheets. The carrying value of the wholesale allowance for lending-related commitments and the estimated fair value of these wholesale lending-related commitments were as follows for the periods indicated.

	December 31, 2017					December 31, 2016				
		Estimated fair value hierarchy					Estimated fair value hierarchy			
(in billions)	Carrying value[a]	Level 1	Level 2	Level 3	Total estimated fair value	Carrying value[a]	Level 1	Level 2	Level 3	Total estimated fair value
Wholesale lending-related commitments	**$ 1.1**	**$ –**	**$ –**	**$ 1.6**	**$ 1.6**	$ 1.1	$ –	$ –	$ 2.1	$ 2.1

(a) Excludes the current carrying values of the guarantee liability and the offsetting asset, each of which is recognized at fair value at the inception of the guarantees.

The Firm does not estimate the fair value of consumer lending-related commitments. In many cases, the Firm can reduce or cancel these commitments by providing the borrower notice or, in some cases as permitted by law, without notice. For a further discussion of the valuation of lending-related commitments, see page 157 of this Note.

Note 3 – Fair value option

The fair value option provides an option to elect fair value as an alternative measurement for selected financial assets, financial liabilities, unrecognized firm commitments, and written loan commitments.

The Firm has elected to measure certain instruments at fair value for several reasons including to mitigate income statement volatility caused by the differences between the measurement basis of elected instruments (e.g., certain instruments elected were previously accounted for on an accrual basis) and the associated risk management arrangements that are accounted for on a fair value basis, as well as to better reflect those instruments that are managed on a fair value basis.

The Firm's election of fair value includes the following instruments:

- Loans purchased or originated as part of securitization warehousing activity, subject to bifurcation accounting, or managed on a fair value basis, including lending-related commitments
- Certain securities financing arrangements with an embedded derivative and/or a maturity of greater than one year
- Owned beneficial interests in securitized financial assets that contain embedded credit derivatives, which would otherwise be required to be separately accounted for as a derivative instrument
- Structured notes, which are predominantly financial instruments that contain embedded derivatives, that are issued as part of CIB's client-driven activities
- Certain long-term beneficial interests issued by CIB's consolidated securitization trusts where the underlying assets are carried at fair value

Changes in fair value under the fair value option election

The following table presents the changes in fair value included in the Consolidated statements of income for the years ended December 31, 2017, 2016 and 2015, for items for which the fair value option was elected. The profit and loss information presented below only includes the financial instruments that were elected to be measured at fair value; related risk management instruments, which are required to be measured at fair value, are not included in the table.

December 31, (in millions)	2017 Principal transactions	2017 All other income	2017 Total changes in fair value recorded	2016 Principal transactions	2016 All other income	2016 Total changes in fair value recorded	2015 Principal transactions	2015 All other income	2015 Total changes in fair value recorded
Federal funds sold and securities purchased under resale agreements	**$ (97)**	**$ –**	**$ (97)**	$ (76)	$ –	$ (76)	$ (38)	$ –	$ (38)
Securities borrowed	**50**	**–**	**50**	1	–	1	(6)	–	(6)
Trading assets:									
Debt and equity instruments, excluding loans	**1,943**	**2** (c)	**1,945**	120	(1) (c)	119	756	(10) (c)	746
Loans reported as trading assets:									
Changes in instrument-specific credit risk	**330**	**14** (c)	**344**	461	43 (c)	504	138	41 (c)	179
Other changes in fair value	**217**	**747** (c)	**964**	79	684 (c)	763	232	818 (c)	1,050
Loans:									
Changes in instrument-specific credit risk	**(1)**	**–**	**(1)**	13	–	13	35	–	35
Other changes in fair value	**(12)**	**3** (c)	**(9)**	(7)	–	(7)	4	–	4
Other assets	**11**	**(55)** (d)	**(44)**	20	62 (d)	82	79	(1) (d)	78
Deposits[a]	**(533)**	**–**	**(533)**	(134)	–	(134)	93	–	93
Federal funds purchased and securities loaned or sold under repurchase agreements	**11**	**–**	**11**	19	–	19	8	–	8
Short-term borrowings[a]	**(747)**	**–**	**(747)**	(236)	–	(236)	1,996	–	1,996
Trading liabilities	**(1)**	**–**	**(1)**	6	–	6	(20)	–	(20)
Beneficial interests issued by consolidated VIEs	**–**	**–**	**–**	23	–	23	49	–	49
Long-term debt[a][b]	**(2,022)**	–	**(2,022)**	(773)	–	(773)	1,388	–	1,388

(a) Unrealized gains/(losses) due to instrument-specific credit risk (DVA) for liabilities for which the fair value option has been elected is recorded in OCI, while realized gains/(losses) are recorded in principal transactions revenue. DVA for 2015 was included in principal transactions revenue, and includes the impact of the Firm's own credit quality on the inception value of liabilities as well as the impact of changes in the Firm's own credit quality subsequent to issuance. See Notes 2 and 23 for further information. Realized gains/(losses) due to instrument-specific credit risk recorded in principal transaction revenue were not material for the years ended December 31, 2017 and 2016.
(b) Long-term debt measured at fair value predominantly relates to structured notes. Although the risk associated with the structured notes is actively managed, the gains/(losses) reported in this table do not include the income statement impact of the risk management instruments used to manage such risk.
(c) Reported in mortgage fees and related income.
(d) Reported in other income.

Determination of instrument-specific credit risk for items for which a fair value election was made

The following describes how the gains and losses that are attributable to changes in instrument-specific credit risk, were determined.

- Loans and lending-related commitments: For floating-rate instruments, all changes in value are attributed to instrument-specific credit risk. For fixed-rate instruments, an allocation of the changes in value for the period is made between those changes in value that are interest rate-related and changes in value that are credit-related. Allocations are generally based on an analysis of borrower-specific credit spread and recovery information, where available, or benchmarking to similar entities or industries.
- Long-term debt: Changes in value attributable to instrument-specific credit risk were derived principally from observable changes in the Firm's credit spread.
- Resale and repurchase agreements, securities borrowed agreements and securities lending agreements: Generally, for these types of agreements, there is a requirement that collateral be maintained with a market value equal to or in excess of the principal amount loaned; as a result, there would be no adjustment or an immaterial adjustment for instrument-specific credit risk related to these agreements.

Difference between aggregate fair value and aggregate remaining contractual principal balance outstanding

The following table reflects the difference between the aggregate fair value and the aggregate remaining contractual principal balance outstanding as of December 31, 2017 and 2016, for loans, long-term debt and long-term beneficial interests for which the fair value option has been elected.

	2017			2016		
December 31, (in millions)	Contractual principal outstanding	Fair value	Fair value over/(under) contractual principal outstanding	Contractual principal outstanding	Fair value	Fair value over/(under) contractual principal outstanding
Loans[a]						
Nonaccrual loans						
Loans reported as trading assets	**$ 4,219**	**$ 1,371**	**$ (2,848)**	$ 3,338	$ 748	$ (2,590)
Loans	**39**	**–**	**(39)**	–	–	–
Subtotal	**4,258**	**1,371**	**(2,887)**	3,338	748	(2,590)
All other performing loans						
Loans reported as trading assets	**38,157**	**36,590**	**(1,567)**	35,477	33,054	(2,423)
Loans	**2,539**	**2,508**	**(31)**	2,259	2,228	(31)
Total loans	**$ 44,954**	**$ 40,469**	**$ (4,485)**	$ 41,074	$ 36,030	$ (5,044)
Long-term debt						
Principal-protected debt	**$ 26,297** (c)	**$ 23,848**	**$ (2,449)**	$ 21,602 (c)	$ 19,195	$ (2,407)
Nonprincipal-protected debt[b]	**NA**	**23,671**	**NA**	NA	18,491	NA
Total long-term debt	**NA**	**$ 47,519**	**NA**	NA	$ 37,686	NA
Long-term beneficial interests						
Nonprincipal-protected debt	**NA**	**$ 45**	**NA**	NA	$ 120	NA
Total long-term beneficial interests	**NA**	**$ 45**	**NA**	NA	$ 120	NA

(a) There were no performing loans that were ninety days or more past due as of December 31, 2017 and 2016.
(b) Remaining contractual principal is not applicable to nonprincipal-protected notes. Unlike principal-protected structured notes, for which the Firm is obligated to return a stated amount of principal at the maturity of the note, nonprincipal-protected structured notes do not obligate the Firm to return a stated amount of principal at maturity, but to return an amount based on the performance of an underlying variable or derivative feature embedded in the note. However, investors are exposed to the credit risk of the Firm as issuer for both nonprincipal-protected and principal protected notes.
(c) Where the Firm issues principal-protected zero-coupon or discount notes, the balance reflects the contractual principal payment at maturity or, if applicable, the contractual principal payment at the Firm's next call date.

At December 31, 2017 and 2016, the contractual amount of lending-related commitments for which the fair value option was elected was $7.4 billion and $4.6 billion respectively, with a corresponding fair value of $(76) million and $(118) million, respectively. For further information regarding off-balance sheet lending-related financial instruments, see Note 27.

Structured note products by balance sheet classification and risk component

The following table presents the fair value of the structured notes issued by the Firm, by balance sheet classification and the primary risk type.

	December 31, 2017				December 31, 2016			
(in millions)	Long-term debt	Short-term borrowings	Deposits	Total	Long-term debt	Short-term borrowings	Deposits	Total
Risk exposure								
Interest rate	**$ 22,056**	**$ 69**	**$ 8,058**	**$ 30,183**	$ 16,296	$ 184	$ 4,296	$ 20,776
Credit	**4,329**	**1,312**	**–**	**5,641**	3,267	225	–	3,492
Foreign exchange	**2,841**	**147**	**38**	**3,026**	2,365	135	6	2,506
Equity	**17,581**	**7,106**	**6,548**	**31,235**	14,831	8,234	5,481	28,546
Commodity	**230**	**15**	**4,468**	**4,713**	488	37	1,811	2,336
Total structured notes	**$ 47,037**	**$ 8,649**	**$ 19,112**	**$ 74,798**	$ 37,247	$ 8,815	$ 11,594	$ 57,656

Note 4 – Credit risk concentrations

Concentrations of credit risk arise when a number of clients, counterparties or customers are engaged in similar business activities or activities in the same geographic region, or when they have similar economic features that would cause their ability to meet contractual obligations to be similarly affected by changes in economic conditions.

JPMorgan Chase regularly monitors various segments of its credit portfolios to assess potential credit risk concentrations and to obtain additional collateral when deemed necessary and permitted under the Firm's agreements. Senior management is significantly involved in the credit approval and review process, and risk levels are adjusted as needed to reflect the Firm's risk appetite.

In the Firm's consumer portfolio, concentrations are evaluated primarily by product and by U.S. geographic region, with a key focus on trends and concentrations at the portfolio level, where potential credit risk concentrations can be remedied through changes in underwriting policies and portfolio guidelines. In the wholesale portfolio, credit risk concentrations are evaluated primarily by industry and monitored regularly on both an aggregate portfolio level and on an individual client or counterparty basis. The Firm's wholesale exposure is managed through loan syndications and participations, loan sales, securitizations, credit derivatives, master netting agreements, collateral and other risk-reduction techniques. For additional information on loans, see Note 12.

The Firm does not believe that its exposure to any particular loan product (e.g., option ARMs), or industry segment (e.g., real estate), or its exposure to residential real estate loans with high LTV ratios, results in a significant concentration of credit risk.

Terms of loan products and collateral coverage are included in the Firm's assessment when extending credit and establishing its allowance for loan losses.

The table below presents both on–balance sheet and off–balance sheet consumer and wholesale-related credit exposure by the Firm's three credit portfolio segments as of December 31, 2017 and 2016.

In 2017 the Firm revised its methodology for the assignment of industry classifications, to better monitor and manage concentrations. This largely resulted in the re-assignment of holding companies from Other to the industry of risk category based on the primary business activity of the holding company's underlying entities. In the tables and industry discussions below, the prior period amounts have been revised to conform with the current period presentation.

	2017				2016				
		On-balance sheet				On-balance sheet			
December 31, (in millions)	Credit exposure[f]	Loans	Derivatives	Off-balance sheet[g]	Credit exposure	Loans	Derivatives	Off-balance sheet[g]	
Consumer, excluding credit card	$ 421,234	$ 372,681	$ –	$ 48,553	$ 417,891	$ 364,644	$ –	$ 53,247	[h]
Receivables from customers[a]	133	–	–	–	120	–	–	–	
Total Consumer, excluding credit card	421,367	372,681	–	48,553	418,011	364,644	–	53,247	[h]
Credit Card	722,342	149,511	–	572,831	695,707	141,816	–	553,891	
Total consumer-related	1,143,709	522,192	–	621,384	1,113,718	506,460	–	607,138	[h]
Wholesale-related[b]									
Real Estate	139,409	113,648	153	25,608	134,287	105,802	207	28,278	
Consumer & Retail	87,679	31,044	1,114	55,521	84,804	29,929	1,082	53,793	
Technology, Media & Telecommunications	59,274	13,665	2,265	43,344	63,324	14,063	1,293	47,968	
Healthcare	55,997	16,273	2,191	37,533	49,445	15,545	2,280	31,620	
Industrials	55,272	18,161	1,163	35,948	55,733	17,295	1,658	36,780	
Banks & Finance Cos	49,037	25,879	6,816	16,342	48,393	22,714	12,257	13,422	
Oil & Gas	41,317	12,621	1,727	26,969	40,367	13,253	1,878	25,236	
Asset Managers	32,531	11,480	7,998	13,053	33,201	10,339	10,820	12,042	
Utilities	29,317	6,187	2,084	21,046	29,672	7,208	888	21,576	
State & Municipal Govt[c]	28,633	12,134	2,888	13,611	28,263	12,416	2,096	13,751	
Central Govt	19,182	3,375	13,937	1,870	20,408	3,964	14,235	2,209	
Chemicals & Plastics	15,945	5,654	208	10,083	15,043	5,292	271	9,480	
Transportation	15,797	6,733	977	8,087	19,096	8,996	751	9,349	
Automotive	14,820	4,903	342	9,575	16,736	4,964	1,196	10,576	
Metals & Mining	14,171	4,728	702	8,741	13,419	4,350	439	8,630	
Insurance	14,089	1,411	2,804	9,874	13,510	1,119	3,382	9,009	
Financial Markets Infrastructure	5,036	351	3,499	1,186	8,732	347	3,884	4,501	
Securities Firms	4,113	952	1,692	1,469	4,211	1,059	1,913	1,239	
All other[d]	147,900	113,699	3,963	30,238	137,238	105,135	3,548	28,555	
Subtotal	829,519	402,898	56,523	370,098	815,882	383,790	64,078	368,014	
Loans held-for-sale and loans at fair value	5,607	5,607	–	–	4,515	4,515	–	–	
Receivables from customers and other[a]	26,139	–	–	–	17,440	–	–	–	
Total wholesale-related	861,265	408,505	56,523	370,098	837,837	388,305	64,078	368,014	
Total exposure[e][f]	$ 2,004,974	$ 930,697	$ 56,523	$ 991,482	$ 1,951,555	$ 894,765	$ 64,078	$ 975,152	[h]

(a) Receivables from customers primarily represent held-for-investment margin loans to brokerage customers (Prime Services in CIB, AWM and CCB) that are collateralized through assets maintained in the clients' brokerage accounts, as such no allowance is held against these receivables. These receivables are reported within accrued interest and accounts receivable on the Firm's Consolidated balance sheets.
(b) The industry rankings presented in the table as of December 31, 2016, are based on the industry rankings of the corresponding exposures at December 31, 2017, not actual rankings of such exposures at December 31, 2016.
(c) In addition to the credit risk exposure to states and municipal governments (both U.S. and non-U.S.) at December 31, 2017 and 2016, noted above, the Firm held: $9.8 billion and $9.1 billion, respectively, of trading securities; $32.3 billion and $31.6 billion, respectively, of AFS securities; and $14.4 billion and $14.5 billion, respectively, of HTM securities, issued by U.S. state and municipal governments. For further information, see Note 2 and Note 10.
(d) All other includes: individuals; SPEs; and private education and civic organizations. For more information on exposures to SPEs, see Note 14.
(e) Excludes cash placed with banks of $421.0 billion and $380.2 billion, at December 31, 2017 and 2016, respectively, which is predominantly placed with various central banks, primarily Federal Reserve Banks.
(f) Credit exposure is net of risk participations and excludes the benefit of credit derivatives used in credit portfolio management activities held against derivative receivables or loans and liquid securities and other cash collateral held against derivative receivables.
(g) Represents lending-related financial instruments.
(h) The prior period amounts have been revised to conform with the current period presentation.

Note 5 – Derivative instruments

Derivative contracts derive their value from underlying asset prices, indices, reference rates, other inputs or a combination of these factors and may expose counterparties to risks and rewards of an underlying asset or liability without having to initially invest in, own or exchange the asset or liability. JPMorgan Chase makes markets in derivatives for clients and also uses derivatives to hedge or manage its own risk exposures. Predominantly all of the Firm's derivatives are entered into for market-making or risk management purposes.

Market-making derivatives
The majority of the Firm's derivatives are entered into for market-making purposes. Clients use derivatives to mitigate or modify interest rate, credit, foreign exchange, equity and commodity risks. The Firm actively manages the risks from its exposure to these derivatives by entering into other derivative transactions or by purchasing or selling other financial instruments that partially or fully offset the exposure from client derivatives.

Risk management derivatives
The Firm manages certain market and credit risk exposures using derivative instruments, including derivatives in hedge accounting relationships and other derivatives that are used to manage risks associated with specified assets and liabilities.

Interest rate contracts are used to minimize fluctuations in earnings that are caused by changes in interest rates. Fixed-rate assets and liabilities appreciate or depreciate in market value as interest rates change. Similarly, interest income and expense increases or decreases as a result of variable-rate assets and liabilities resetting to current market rates, and as a result of the repayment and subsequent origination or issuance of fixed-rate assets and liabilities at current market rates. Gains or losses on the derivative instruments that are related to such assets and liabilities are expected to substantially offset this variability in earnings. The Firm generally uses interest rate swaps, forwards and futures to manage the impact of interest rate fluctuations on earnings.

Foreign currency forward contracts are used to manage the foreign exchange risk associated with certain foreign currency–denominated (i.e., non-U.S. dollar) assets and liabilities and forecasted transactions, as well as the Firm's net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. As a result of fluctuations in foreign currencies, the U.S. dollar–equivalent values of the foreign currency–denominated assets and liabilities or the forecasted revenues or expenses increase or decrease. Gains or losses on the derivative instruments related to these foreign currency–denominated assets or liabilities, or forecasted transactions, are expected to substantially offset this variability.

Commodities contracts are used to manage the price risk of certain commodities inventories. Gains or losses on these derivative instruments are expected to substantially offset the depreciation or appreciation of the related inventory.

Credit derivatives are used to manage the counterparty credit risk associated with loans and lending-related commitments. Credit derivatives compensate the purchaser when the entity referenced in the contract experiences a credit event, such as bankruptcy or a failure to pay an obligation when due. Credit derivatives primarily consist of CDS. For a further discussion of credit derivatives, see the discussion in the Credit derivatives section on pages 189–191 of this Note.

For more information about risk management derivatives, see the risk management derivatives gains and losses table on page 189 of this Note, and the hedge accounting gains and losses tables on pages 187–189 of this Note.

Derivative counterparties and settlement types
The Firm enters into OTC derivatives, which are negotiated and settled bilaterally with the derivative counterparty. The Firm also enters into, as principal, certain ETD such as futures and options, and OTC-cleared derivative contracts with CCPs. ETD contracts are generally standardized contracts traded on an exchange and cleared by the CCP, which is the Firm's counterparty from the inception of the transactions. OTC-cleared derivatives are traded on a bilateral basis and then novated to the CCP for clearing.

Derivative clearing services
The Firm provides clearing services for clients in which the Firm acts as a clearing member at certain derivative exchanges and clearing houses. The Firm does not reflect the clients' derivative contracts in its Consolidated Financial Statements. For further information on the Firm's clearing services, see Note 27.

Accounting for derivatives

All free-standing derivatives that the Firm executes for its own account are required to be recorded on the Consolidated balance sheets at fair value.

As permitted under U.S. GAAP, the Firm nets derivative assets and liabilities, and the related cash collateral receivables and payables, when a legally enforceable master netting agreement exists between the Firm and the derivative counterparty. For further discussion of the offsetting of assets and liabilities, see Note 1. The accounting for changes in value of a derivative depends on whether or not the transaction has been designated and qualifies for hedge accounting. Derivatives that are not designated as hedges are reported and measured at fair value through earnings. The tabular disclosures on pages 183–189 of this Note provide additional information on the amount of, and reporting for, derivative assets, liabilities, gains and losses. For further discussion of derivatives embedded in structured notes, see Notes 2 and 3.

Derivatives designated as hedges
The Firm applies hedge accounting to certain derivatives executed for risk management purposes – generally interest rate, foreign exchange and commodity derivatives. However, JPMorgan Chase does not seek to apply hedge accounting to all of the derivatives involved in the Firm's risk management activities. For example, the Firm does not apply hedge accounting to purchased CDS used to manage the credit risk of loans and lending-related commitments, because of the difficulties in qualifying such contracts as hedges. For the same reason, the Firm does not apply hedge accounting to certain interest rate, foreign exchange, and commodity derivatives used for risk management purposes.

To qualify for hedge accounting, a derivative must be highly effective at reducing the risk associated with the exposure being hedged. In addition, for a derivative to be designated as a hedge, the risk management objective and strategy must be documented. Hedge documentation must identify the derivative hedging instrument, the asset or liability or forecasted transaction and type of risk to be hedged, and how the effectiveness of the derivative is assessed prospectively and retrospectively. To assess effectiveness, the Firm uses statistical methods such as regression analysis, as well as nonstatistical methods including dollar-value comparisons of the change in the fair value of the derivative to the change in the fair value or cash flows of the hedged item. The extent to which a derivative has been, and is expected to continue to be, effective at offsetting changes in the fair value or cash flows of the hedged item must be assessed and documented at least quarterly. Any hedge ineffectiveness (i.e., the amount by which the gain or loss on the designated derivative instrument does not exactly offset the change in the hedged item attributable to the hedged risk) must be reported in current-period earnings. If it is determined that a derivative is not highly effective at hedging the designated exposure, hedge accounting is discontinued.

There are three types of hedge accounting designations: fair value hedges, cash flow hedges and net investment hedges. JPMorgan Chase uses fair value hedges primarily to hedge fixed-rate long-term debt, AFS securities and certain commodities inventories. For qualifying fair value hedges, the changes in the fair value of the derivative, and in the value of the hedged item for the risk being hedged, are recognized in earnings. If the hedge relationship is terminated, then the adjustment to the hedged item continues to be reported as part of the basis of the hedged item, and for benchmark interest rate hedges, is amortized to earnings as a yield adjustment. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item – primarily net interest income and principal transactions revenue.

JPMorgan Chase uses cash flow hedges primarily to hedge the exposure to variability in forecasted cash flows from floating-rate assets and liabilities and foreign currency–denominated revenue and expense. For qualifying cash flow hedges, the effective portion of the change in the fair value of the derivative is recorded in OCI and recognized in the Consolidated statements of income when the hedged cash flows affect earnings. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item – primarily interest income, interest expense, noninterest revenue and compensation expense. The ineffective portions of cash flow hedges are immediately recognized in earnings. If the hedge relationship is terminated, then the value of the derivative recorded in AOCI is recognized in earnings when the cash flows that were hedged affect earnings. For hedge relationships that are discontinued because a forecasted transaction is not expected to occur according to the original hedge forecast, any related derivative values recorded in AOCI are immediately recognized in earnings.

JPMorgan Chase uses net investment hedges to protect the value of the Firm's net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. For foreign currency qualifying net investment hedges, changes in the fair value of the derivatives are recorded in the translation adjustments account within AOCI.

The following table outlines the Firm's primary uses of derivatives and the related hedge accounting designation or disclosure category.

Type of Derivative	Use of Derivative	Designation and disclosure	Affected segment or unit	Page reference
Manage specifically identified risk exposures in qualifying hedge accounting relationships:				
• Interest rate	Hedge fixed rate assets and liabilities	Fair value hedge	Corporate	187
• Interest rate	Hedge floating-rate assets and liabilities	Cash flow hedge	Corporate	188
• Foreign exchange	Hedge foreign currency-denominated assets and liabilities	Fair value hedge	Corporate	187
• Foreign exchange	Hedge foreign currency-denominated forecasted revenue and expense	Cash flow hedge	Corporate	188
• Foreign exchange	Hedge the value of the Firm's investments in non-U.S. dollar functional currency entities	Net investment hedge	Corporate	189
• Commodity	Hedge commodity inventory	Fair value hedge	CIB	187
Manage specifically identified risk exposures not designated in qualifying hedge accounting relationships:				
• Interest rate	Manage the risk of the mortgage pipeline, warehouse loans and MSRs	Specified risk management	CCB	189
• Credit	Manage the credit risk of wholesale lending exposures	Specified risk management	CIB	189
• Commodity	Manage the risk of certain commodities-related contracts and investments	Specified risk management	CIB	189
• Interest rate and foreign exchange	Manage the risk of certain other specified assets and liabilities	Specified risk management	Corporate	189
Market-making derivatives and other activities:				
• Various	Market-making and related risk management	Market-making and other	CIB	189
• Various	Other derivatives	Market-making and other	CIB, Corporate	189

Notional amount of derivative contracts

The following table summarizes the notional amount of derivative contracts outstanding as of December 31, 2017 and 2016.

	Notional amounts[b]	
December 31, (in billions)	**2017**	2016
Interest rate contracts		
Swaps	**$ 21,043**	$ 22,000
Futures and forwards	**4,904**	5,289
Written options	**3,576**	3,091
Purchased options	**3,987**	3,482
Total interest rate contracts	**33,510**	33,862
Credit derivatives[a]	**1,522**	2,032
Foreign exchange contracts		
Cross-currency swaps	**3,953**	3,359
Spot, futures and forwards	**5,923**	5,341
Written options	**786**	734
Purchased options	**776**	721
Total foreign exchange contracts	**11,438**	10,155
Equity contracts		
Swaps	**367**	258
Futures and forwards	**90**	59
Written options	**531**	417
Purchased options	**453**	345
Total equity contracts	**1,441**	1,079
Commodity contracts		
Swaps	**116**	102
Spot, futures and forwards	**168**	130
Written options	**98**	83
Purchased options	**93**	94
Total commodity contracts	**475**	409
Total derivative notional amounts	**$ 48,386**	$ 47,537

(a) For more information on volumes and types of credit derivative contracts, see the Credit derivatives discussion on pages 189–191.
(b) Represents the sum of gross long and gross short third-party notional derivative contracts.

While the notional amounts disclosed above give an indication of the volume of the Firm's derivatives activity, the notional amounts significantly exceed, in the Firm's view, the possible losses that could arise from such transactions. For most derivative transactions, the notional amount is not exchanged; it is used simply as a reference to calculate payments.

Impact of derivatives on the Consolidated balance sheets

The following table summarizes information on derivative receivables and payables (before and after netting adjustments) that are reflected on the Firm's Consolidated balance sheets as of December 31, 2017 and 2016, by accounting designation (e.g., whether the derivatives were designated in qualifying hedge accounting relationships or not) and contract type.

Gross derivative balances as of December 31, 2017, reflect the Firm's adoption of rulebook changes made by two CCPs, that require or allow the Firm to treat certain OTC-cleared derivative transactions with that CCP as settled each day. If such rulebook changes had been in effect as of December 31, 2016, the impact would have been a reduction in gross derivative receivables and payables of $227.1 billion and $224.7 billion, respectively, and a corresponding decrease in amounts netted, with no impact to the Consolidated balance sheets.

Free-standing derivative receivables and payables[(a)]

	Gross derivative receivables				Gross derivative payables			
December 31, 2017 (in millions)	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables[(b)]	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables[(b)]
Trading assets and liabilities								
Interest rate	**$ 313,276**	**$ 2,716**	**$ 315,992**	**$ 24,673**	**$ 283,092**	**$ 1,344**	**$ 284,436**	**$ 7,129**
Credit	**23,205**	**–**	**23,205**	**869**	**23,252**	**–**	**23,252**	**1,299**
Foreign exchange	**159,740**	**491**	**160,231**	**16,151**	**154,601**	**1,221**	**155,822**	**12,473**
Equity	**40,040**	**–**	**40,040**	**7,882**	**45,395**	**–**	**45,395**	**9,192**
Commodity	**20,066**	**19**	**20,085**	**6,948**	**21,498**	**403**	**21,901**	**7,684**
Total fair value of trading assets and liabilities	**$ 556,327**	**$ 3,226**	**$ 559,553**	**$ 56,523**	**$ 527,838**	**$ 2,968**	**$ 530,806**	**$ 37,777**

	Gross derivative receivables				Gross derivative payables			
December 31, 2016 (in millions)	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables[(b)]	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables[(b)]
Trading assets and liabilities								
Interest rate	$ 601,557	$ 4,406	$ 605,963	$ 28,302	$ 567,894	$ 2,884	$ 570,778	$ 10,815
Credit	29,645	–	29,645	1,294	28,666	–	28,666	1,411
Foreign exchange	232,137	1,289	233,426	23,271	233,823	1,148	234,971	20,508
Equity	34,940	–	34,940	4,939	38,362	–	38,362	8,140
Commodity	18,505	137	18,642	6,272	20,283	179	20,462	8,357
Total fair value of trading assets and liabilities	$ 916,784	$ 5,832	$ 922,616	$ 64,078	$ 889,028	$ 4,211	$ 893,239	$ 49,231

(a) Balances exclude structured notes for which the fair value option has been elected. See Note 3 for further information.
(b) As permitted under U.S. GAAP, the Firm has elected to net derivative receivables and derivative payables and the related cash collateral receivables and payables when a legally enforceable master netting agreement exists.

Derivatives netting

The following tables present, as of December 31, 2017 and 2016, gross and net derivative receivables and payables by contract and settlement type. Derivative receivables and payables, as well as the related cash collateral from the same counterparty, have been netted on the Consolidated balance sheets where the Firm has obtained an appropriate legal opinion with respect to the master netting agreement. Where such a legal opinion has not been either sought or obtained, amounts are not eligible for netting on the Consolidated balance sheets, and those derivative receivables and payables are shown separately in the tables below.

In addition to the cash collateral received and transferred that is presented on a net basis with derivative receivables and payables, the Firm receives and transfers additional collateral (financial instruments and cash). These amounts mitigate counterparty credit risk associated with the Firm's derivative instruments, but are not eligible for net presentation:

- collateral that consists of non-cash financial instruments (generally U.S. government and agency securities and other G7 government securities) and cash collateral held at third party custodians, which are shown separately as "Collateral not nettable on the Consolidated balance sheets" in the tables below, up to the fair value exposure amount.
- the amount of collateral held or transferred that exceeds the fair value exposure at the individual counterparty level, as of the date presented, which is excluded from the tables below; and
- collateral held or transferred that relates to derivative receivables or payables where an appropriate legal opinion has not been either sought or obtained with respect to the master netting agreement, which is excluded from the tables below.

	2017			2016		
December 31, (in millions)	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables
U.S. GAAP nettable derivative receivables						
Interest rate contracts:						
Over-the-counter ("OTC")	**$ 305,569**	**$ (284,917)**	**$ 20,652**	$ 365,227	$ (342,173)	$ 23,054
OTC-cleared	**6,531**	**(6,318)**	**213**	235,399	(235,261)	138
Exchange-traded[(a)]	**185**	**(84)**	**101**	241	(227)	14
Total interest rate contracts	**312,285**	**(291,319)**	**20,966**	600,867	(577,661)	23,206
Credit contracts:						
OTC	**15,390**	**(15,165)**	**225**	23,130	(22,612)	518
OTC-cleared	**7,225**	**(7,170)**	**55**	5,746	(5,739)	7
Total credit contracts	**22,615**	**(22,335)**	**280**	28,876	(28,351)	525
Foreign exchange contracts:						
OTC	**155,289**	**(142,420)**	**12,869**	226,271	(208,962)	17,309
OTC-cleared	**1,696**	**(1,654)**	**42**	1,238	(1,165)	73
Exchange-traded[(a)]	**141**	**(7)**	**134**	104	(27)	77
Total foreign exchange contracts	**157,126**	**(144,081)**	**13,045**	227,613	(210,154)	17,459
Equity contracts:						
OTC	**22,024**	**(19,917)**	**2,107**	20,868	(20,570)	298
Exchange-traded[(a)]	**14,188**	**(12,241)**	**1,947**	11,439	(9,431)	2,008
Total equity contracts	**36,212**	**(32,158)**	**4,054**	32,307	(30,001)	2,306
Commodity contracts:						
OTC	**10,903**	**(4,436)**	**6,467**	11,571	(5,605)	5,966
Exchange-traded[(a)]	**8,854**	**(8,701)**	**153**	6,794	(6,766)	28
Total commodity contracts	**19,757**	**(13,137)**	**6,620**	18,365	(12,371)	5,994
Derivative receivables with appropriate legal opinion	**547,995**	**(503,030)** [(b)]	**44,965**	908,028	(858,538) [(b)]	49,490
Derivative receivables where an appropriate legal opinion has not been either sought or obtained	**11,558**		**11,558**	14,588		14,588
Total derivative receivables recognized on the Consolidated balance sheets	**$ 559,553**		**$ 56,523**	$ 922,616		$ 64,078
Collateral not nettable on the Consolidated balance sheets[(c)(d)]			**(13,363)**			(18,638)
Net amounts			**$ 43,160**			$ 45,440

December 31, (in millions)	2017 Gross derivative payables	2017 Amounts netted on the Consolidated balance sheets	2017 Net derivative payables	2016 Gross derivative payables	2016 Amounts netted on the Consolidated balance sheets	2016 Net derivative payables
U.S. GAAP nettable derivative payables						
Interest rate contracts:						
OTC	**$ 276,960**	**$ (271,294)**	**$ 5,666**	$ 338,502	$ (329,325)	$ 9,177
OTC–cleared	**6,004**	**(5,928)**	**76**	230,464	(230,463)	1
Exchange-traded[(a)]	**127**	**(84)**	**43**	196	(175)	21
Total interest rate contracts	**283,091**	**(277,306)**	**5,785**	569,162	(559,963)	9,199
Credit contracts:						
OTC	**16,194**	**(15,170)**	**1,024**	22,366	(21,614)	752
OTC–cleared	**6,801**	**(6,784)**	**17**	5,641	(5,641)	–
Total credit contracts	**22,995**	**(21,954)**	**1,041**	28,007	(27,255)	752
Foreign exchange contracts:						
OTC	**150,966**	**(141,789)**	**9,177**	228,300	(213,296)	15,004
OTC–cleared	**1,555**	**(1,553)**	**2**	1,158	(1,158)	–
Exchange-traded[(a)]	**98**	**(7)**	**91**	328	(9)	319
Total foreign exchange contracts	**152,619**	**(143,349)**	**9,270**	229,786	(214,463)	15,323
Equity contracts:						
OTC	**28,193**	**(23,969)**	**4,224**	24,688	(20,808)	3,880
Exchange-traded[(a)]	**12,720**	**(12,234)**	**486**	10,004	(9,414)	590
Total equity contracts	**40,913**	**(36,203)**	**4,710**	34,692	(30,222)	4,470
Commodity contracts:						
OTC	**12,645**	**(5,508)**	**7,137**	12,885	(5,252)	7,633
Exchange-traded[(a)]	**8,870**	**(8,709)**	**161**	7,099	(6,853)	246
Total commodity contracts	**21,515**	**(14,217)**	**7,298**	19,984	(12,105)	7,879
Derivative payables with appropriate legal opinion	**521,133**	**(493,029)** [(b)]	**28,104**	881,631	(844,008) [(b)]	37,623
Derivative payables where an appropriate legal opinion has not been either sought or obtained	**9,673**		**9,673**	11,608		11,608
Total derivative payables recognized on the Consolidated balance sheets	**$ 530,806**		**$ 37,777**	$ 893,239		$ 49,231
Collateral not nettable on the Consolidated balance sheets[(c)(d)]			**(4,180)**			(8,925)
Net amounts			**$ 33,597**			$ 40,306

(a) Exchange-traded derivative balances that relate to futures contracts are settled daily.

(b) Net derivatives receivable included cash collateral netted of $55.5 billion and $71.9 billion at December 31, 2017 and 2016, respectively. Net derivatives payable included cash collateral netted of $45.5 billion and $57.3 billion related to OTC and OTC-cleared derivatives at December 31, 2017 and 2016, respectively.

(c) Represents liquid security collateral as well as cash collateral held at third-party custodians related to derivative instruments where an appropriate legal opinion has been obtained. For some counterparties, the collateral amounts of financial instruments may exceed the derivative receivables and derivative payables balances. Where this is the case, the total amount reported is limited to the net derivative receivables and net derivative payables balances with that counterparty.

(d) Derivative collateral relates only to OTC and OTC-cleared derivative instruments.

Liquidity risk and credit-related contingent features

In addition to the specific market risks introduced by each derivative contract type, derivatives expose JPMorgan Chase to credit risk — the risk that derivative counterparties may fail to meet their payment obligations under the derivative contracts and the collateral, if any, held by the Firm proves to be of insufficient value to cover the payment obligation. It is the policy of JPMorgan Chase to actively pursue, where possible, the use of legally enforceable master netting arrangements and collateral agreements to mitigate derivative counterparty credit risk. The amount of derivative receivables reported on the Consolidated balance sheets is the fair value of the derivative contracts after giving effect to legally enforceable master netting agreements and cash collateral held by the Firm.

While derivative receivables expose the Firm to credit risk, derivative payables expose the Firm to liquidity risk, as the derivative contracts typically require the Firm to post cash or securities collateral with counterparties as the fair value of the contracts moves in the counterparties' favor or upon specified downgrades in the Firm's and its subsidiaries' respective credit ratings. Certain derivative contracts also provide for termination of the contract, generally upon a downgrade of either the Firm or the counterparty, at the fair value of the derivative contracts. The following table shows the aggregate fair value of net derivative payables related to OTC and OTC-cleared derivatives that contain contingent collateral or termination features that may be triggered upon a ratings downgrade, and the associated collateral the Firm has posted in the normal course of business, at December 31, 2017 and 2016.

OTC and OTC-cleared derivative payables containing downgrade triggers

December 31, (in millions)	**2017**	2016
Aggregate fair value of net derivative payables	**$ 11,916**	$ 21,550
Collateral posted	**9,973**	19,383

The following table shows the impact of a single-notch and two-notch downgrade of the long-term issuer ratings of JPMorgan Chase & Co. and its subsidiaries, predominantly JPMorgan Chase Bank, National Association ("JPMorgan Chase Bank, N.A."), at December 31, 2017 and 2016, related to OTC and OTC-cleared derivative contracts with contingent collateral or termination features that may be triggered upon a ratings downgrade. Derivatives contracts generally require additional collateral to be posted or terminations to be triggered when the predefined threshold rating is breached. A downgrade by a single rating agency that does not result in a rating lower than a preexisting corresponding rating provided by another major rating agency will generally not result in additional collateral (except in certain instances in which additional initial margin may be required upon a ratings downgrade), nor in termination payments requirements. The liquidity impact in the table is calculated based upon a downgrade below the lowest current rating of the rating agencies referred to in the derivative contract.

Liquidity impact of downgrade triggers on OTC and OTC-cleared derivatives

	2017		2016	
December 31, (in millions)	Single-notch downgrade	Two-notch downgrade	Single-notch downgrade	Two-notch downgrade
Amount of additional collateral to be posted upon downgrade[(a)]	**$ 79**	**$ 1,989**	$ 560	$ 2,497
Amount required to settle contracts with termination triggers upon downgrade[(b)]	**320**	**650**	606	1,049

(a) Includes the additional collateral to be posted for initial margin.
(b) Amounts represent fair values of derivative payables, and do not reflect collateral posted.

Derivatives executed in contemplation of a sale of the underlying financial asset

In certain instances the Firm enters into transactions in which it transfers financial assets but maintains the economic exposure to the transferred assets by entering into a derivative with the same counterparty in contemplation of the initial transfer. The Firm generally accounts for such transfers as collateralized financing transactions as described in Note 11, but in limited circumstances they may qualify to be accounted for as a sale and a derivative under U.S. GAAP. There were no such transfers accounted for as a sale where the associated derivative was outstanding at December 31, 2017, and such transfers at December 31, 2016 were not material.

Impact of derivatives on the Consolidated statements of income

The following tables provide information related to gains and losses recorded on derivatives based on their hedge accounting designation or purpose.

Fair value hedge gains and losses

The following tables present derivative instruments, by contract type, used in fair value hedge accounting relationships, as well as pre-tax gains/(losses) recorded on such derivatives and the related hedged items for the years ended December 31, 2017, 2016 and 2015, respectively. The Firm includes gains/(losses) on the hedging derivative and the related hedged item in the same line item in the Consolidated statements of income.

	Gains/(losses) recorded in income			Income statement impact due to:	
Year ended December 31, 2017 (in millions)	Derivatives	Hedged items	Total income statement impact	Hedge ineffectiveness[e]	Excluded components[f]
Contract type					
Interest rate[a][b]	**$ (481)**	**$ 1,359**	**$ 878**	**$ (18)**	**$ 896**
Foreign exchange[c]	**(3,509)**	**3,507**	**(2)**	**–**	**(2)**
Commodity[d]	**(1,275)**	**1,348**	**73**	**29**	**44**
Total	**$ (5,265)**	**$ 6,214**	**$ 949**	**$ 11**	**$ 938**

	Gains/(losses) recorded in income			Income statement impact due to:	
Year ended December 31, 2016 (in millions)	Derivatives	Hedged items	Total income statement impact	Hedge ineffectiveness[e]	Excluded components[f]
Contract type					
Interest rate[a][b]	$ (482)	$ 1,338	$ 856	$ 6	$ 850
Foreign exchange[c]	2,435	(2,261)	174	–	174
Commodity[d]	(536)	586	50	(9)	59
Total	$ 1,417	$ (337)	$ 1,080	$ (3)	$ 1,083

	Gains/(losses) recorded in income			Income statement impact due to:	
Year ended December 31, 2015 (in millions)	Derivatives	Hedged items	Total income statement impact	Hedge ineffectiveness[e]	Excluded components[f]
Contract type					
Interest rate[a][b]	$ 38	$ 911	$ 949	$ 3	$ 946
Foreign exchange[c]	6,030	(6,006)	24	–	24
Commodity[d]	1,153	(1,142)	11	(13)	24
Total	$ 7,221	$ (6,237)	$ 984	$ (10)	$ 994

(a) Primarily consists of hedges of the benchmark (e.g., London Interbank Offered Rate ("LIBOR")) interest rate risk of fixed-rate long-term debt and AFS securities. Gains and losses were recorded in net interest income.
(b) Excludes the amortization expense associated with the inception hedge accounting adjustment applied to the hedged item. This expense is recorded in net interest income and substantially offsets the income statement impact of the excluded components.
(c) Primarily consists of hedges of the foreign currency risk of long-term debt and AFS securities for changes in spot foreign currency rates. Gains and losses related to the derivatives and the hedged items, due to changes in foreign currency rates, were recorded primarily in principal transactions revenue and net interest income.
(d) Consists of overall fair value hedges of physical commodities inventories that are generally carried at the lower of cost or net realizable value (net realizable value approximates fair value). Gains and losses were recorded in principal transactions revenue.
(e) Hedge ineffectiveness is the amount by which the gain or loss on the designated derivative instrument does not exactly offset the gain or loss on the hedged item attributable to the hedged risk.
(f) The assessment of hedge effectiveness excludes certain components of the changes in fair values of the derivatives and hedged items such as forward points on foreign exchange forward contracts and time values.

Cash flow hedge gains and losses

The following tables present derivative instruments, by contract type, used in cash flow hedge accounting relationships, and the pre-tax gains/(losses) recorded on such derivatives, for the years ended December 31, 2017, 2016 and 2015, respectively. The Firm includes the gain/(loss) on the hedging derivative and the change in cash flows on the hedged item in the same line item in the Consolidated statements of income.

	Gains/(losses) recorded in income and other comprehensive income/(loss)				
Year ended December 31, 2017 (in millions)	Derivatives – effective portion reclassified from AOCI to income	Hedge ineffectiveness recorded directly in income[c]	Total income statement impact	Derivatives – effective portion recorded in OCI	Total change in OCI for period
Contract type					
Interest rate[a]	**$ (17)**	**$ –**	**$ (17)**	**$ 12**	**$ 29**
Foreign exchange[b]	**(117)**	**–**	**(117)**	**135**	**252**
Total	**$ (134)**	**$ –**	**$ (134)**	**$ 147**	**$ 281**

	Gains/(losses) recorded in income and other comprehensive income/(loss)				
Year ended December 31, 2016 (in millions)	Derivatives – effective portion reclassified from AOCI to income	Hedge ineffectiveness recorded directly in income[c]	Total income statement impact	Derivatives – effective portion recorded in OCI	Total change in OCI for period
Contract type					
Interest rate[a]	$ (74)	$ –	$ (74)	$ (55)	$ 19
Foreign exchange[b]	(286)	–	(286)	(395)	(109)
Total	$ (360)	$ –	$ (360)	$ (450)	$ (90)

	Gains/(losses) recorded in income and other comprehensive income/(loss)				
Year ended December 31, 2015 (in millions)	Derivatives – effective portion reclassified from AOCI to income	Hedge ineffectiveness recorded directly in income[c]	Total income statement impact	Derivatives – effective portion recorded in OCI	Total change in OCI for period
Contract type					
Interest rate[a]	$ (99)	$ –	$ (99)	$ (44)	$ 55
Foreign exchange[b]	(81)	–	(81)	(53)	28
Total	$ (180)	$ –	$ (180)	$ (97)	$ 83

(a) Primarily consists of benchmark interest rate hedges of LIBOR-indexed floating-rate assets and floating-rate liabilities. Gains and losses were recorded in net interest income.
(b) Primarily consists of hedges of the foreign currency risk of non-U.S. dollar-denominated revenue and expense. The income statement classification of gains and losses follows the hedged item – primarily noninterest revenue and compensation expense.
(c) Hedge ineffectiveness is the amount by which the cumulative gain or loss on the designated derivative instrument exceeds the present value of the cumulative expected change in cash flows on the hedged item attributable to the hedged risk.

The Firm did not experience any forecasted transactions that failed to occur for the years ended 2017 and 2016. In 2015, the Firm reclassified approximately $150 million of net losses from AOCI to other income because the Firm determined that it was probable that the forecasted interest payment cash flows would not occur as a result of the planned reduction in wholesale non-operating deposits.

Over the next 12 months, the Firm expects that approximately $96 million (after-tax) of net gains recorded in AOCI at December 31, 2017, related to cash flow hedges will be recognized in income. For terminated cash flow hedges, the maximum length of time over which forecasted transactions are remaining is approximately five years. For open cash flow hedges, the maximum length of time over which forecasted transactions are hedged is approximately seven years. The Firm's longer-dated forecasted transactions relate to core lending and borrowing activities.

Net investment hedge gains and losses

The following table presents hedging instruments, by contract type, that were used in net investment hedge accounting relationships, and the pre-tax gains/(losses) recorded on such instruments for the years ended December 31, 2017, 2016 and 2015.

	Gains/(losses) recorded in income and other comprehensive income/(loss)					
	2017		2016		2015	
Year ended December 31, (in millions)	Excluded components recorded directly in income[(a)]	Effective portion recorded in OCI	Excluded components recorded directly in income[(a)]	Effective portion recorded in OCI	Excluded components recorded directly in income[(a)]	Effective portion recorded in OCI
Foreign exchange derivatives	**$(172)**	**$(1,294)**	$(282)	$262	$(379)	$1,885

(a) Certain components of hedging derivatives are permitted to be excluded from the assessment of hedge effectiveness, such as forward points on foreign exchange forward contracts. Amounts related to excluded components are recorded in other income. The Firm measures the ineffectiveness of net investment hedge accounting relationships based on changes in spot foreign currency rates and, therefore, there was no significant ineffectiveness for net investment hedge accounting relationships during 2017, 2016 and 2015.

Gains and losses on derivatives used for specified risk management purposes

The following table presents pre-tax gains/(losses) recorded on a limited number of derivatives, not designated in hedge accounting relationships, that are used to manage risks associated with certain specified assets and liabilities, including certain risks arising from the mortgage pipeline, warehouse loans, MSRs, wholesale lending exposures, foreign currency denominated assets and liabilities, and commodities-related contracts and investments.

	Derivatives gains/(losses) recorded in income		
Year ended December 31, (in millions)	**2017**	2016	2015
Contract type			
Interest rate[(a)]	**$ 331**	$ 1,174	$ 853
Credit[(b)]	**(74)**	(282)	70
Foreign exchange[(c)]	**(33)**	27	25
Commodity[(d)]	**–**	–	(12)
Total	**$ 224**	$ 919	$ 936

(a) Primarily represents interest rate derivatives used to hedge the interest rate risk inherent in the mortgage pipeline, warehouse loans and MSRs, as well as written commitments to originate warehouse loans. Gains and losses were recorded predominantly in mortgage fees and related income.

(b) Relates to credit derivatives used to mitigate credit risk associated with lending exposures in the Firm's wholesale businesses. These derivatives do not include credit derivatives used to mitigate counterparty credit risk arising from derivative receivables, which is included in gains and losses on derivatives related to market-making activities and other derivatives. Gains and losses were recorded in principal transactions revenue.

(c) Primarily relates to derivatives used to mitigate foreign exchange risk of specified foreign currency-denominated assets and liabilities. Gains and losses were recorded in principal transactions revenue.

(d) Primarily relates to commodity derivatives used to mitigate energy price risk associated with energy-related contracts and investments. Gains and losses were recorded in principal transactions revenue.

Gains and losses on derivatives related to market-making activities and other derivatives

The Firm makes markets in derivatives in order to meet the needs of customers and uses derivatives to manage certain risks associated with net open risk positions from its market-making activities, including the counterparty credit risk arising from derivative receivables. All derivatives not included in the hedge accounting or specified risk management categories above are included in this category. Gains and losses on these derivatives are primarily recorded in principal transactions revenue. See Note 6 for information on principal transactions revenue.

Credit derivatives

Credit derivatives are financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) and which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Credit derivatives expose the protection purchaser to the creditworthiness of the protection seller, as the protection seller is required to make payments under the contract when the reference entity experiences a credit event, such as a bankruptcy, a failure to pay its obligation or a restructuring. The seller of credit protection receives a premium for providing protection but has the risk that the underlying instrument referenced in the contract will be subject to a credit event.

The Firm is both a purchaser and seller of protection in the credit derivatives market and uses these derivatives for two primary purposes. First, in its capacity as a market-maker, the Firm actively manages a portfolio of credit derivatives by purchasing and selling credit protection, predominantly on corporate debt obligations, to meet the needs of customers. Second, as an end-user, the Firm uses credit derivatives to manage credit risk associated with lending exposures (loans and unfunded commitments) and derivatives counterparty exposures in the Firm's wholesale businesses, and to manage the credit risk arising from certain financial instruments in the Firm's market-making businesses. Following is a summary of various types of credit derivatives.

Credit default swaps
Credit derivatives may reference the credit of either a single reference entity ("single-name") or a broad-based index. The Firm purchases and sells protection on both single-name and index-reference obligations. Single-name CDS and index CDS contracts are either OTC or OTC-cleared derivative contracts. Single-name CDS are used to manage the default risk of a single reference entity, while index CDS contracts are used to manage the credit risk associated with the broader credit markets or credit market segments. Like the S&P 500 and other market indices, a CDS index consists of a portfolio of CDS across many reference entities. New series of CDS indices are periodically established with a new underlying portfolio of reference entities to reflect changes in the credit markets. If one of the reference entities in the index experiences a credit event, then the reference entity that defaulted is removed from the index. CDS can also be referenced against specific portfolios of reference names or against customized exposure levels based on specific client demands: for example, to provide protection against the first $1 million of realized credit losses in a $10 million portfolio of exposure. Such structures are commonly known as tranche CDS.

For both single-name CDS contracts and index CDS contracts, upon the occurrence of a credit event, under the terms of a CDS contract neither party to the CDS contract has recourse to the reference entity. The protection purchaser has recourse to the protection seller for the difference between the face value of the CDS contract and the fair value of the reference obligation at settlement of the credit derivative contract, also known as the recovery value. The protection purchaser does not need to hold the debt instrument of the underlying reference entity in order to receive amounts due under the CDS contract when a credit event occurs.

Credit-related notes
A credit-related note is a funded credit derivative where the issuer of the credit-related note purchases from the note investor credit protection on a reference entity or an index. Under the contract, the investor pays the issuer the par value of the note at the inception of the transaction, and in return, the issuer pays periodic payments to the investor, based on the credit risk of the referenced entity. The issuer also repays the investor the par value of the note at maturity unless the reference entity (or one of the entities that makes up a reference index) experiences a specified credit event. If a credit event occurs, the issuer is not obligated to repay the par value of the note, but rather, the issuer pays the investor the difference between the par value of the note and the fair value of the defaulted reference obligation at the time of settlement. Neither party to the credit-related note has recourse to the defaulting reference entity.

The following tables present a summary of the notional amounts of credit derivatives and credit-related notes the Firm sold and purchased as of December 31, 2017 and 2016. Upon a credit event, the Firm as a seller of protection would typically pay out only a percentage of the full notional amount of net protection sold, as the amount actually required to be paid on the contracts takes into account the recovery value of the reference obligation at the time of settlement. The Firm manages the credit risk on contracts to sell protection by purchasing protection with identical or similar underlying reference entities. Other purchased protection referenced in the following tables includes credit derivatives bought on related, but not identical, reference positions (including indices, portfolio coverage and other reference points) as well as protection purchased through credit-related notes.

The Firm does not use notional amounts of credit derivatives as the primary measure of risk management for such derivatives, because the notional amount does not take into account the probability of the occurrence of a credit event, the recovery value of the reference obligation, or related cash instruments and economic hedges, each of which reduces, in the Firm's view, the risks associated with such derivatives.

Total credit derivatives and credit-related notes

	Maximum payout/Notional amount			
December 31, 2017 (in millions)	Protection sold	Protection purchased with identical underlyings[b]	Net protection (sold)/ purchased[c]	Other protection purchased[d]
Credit derivatives				
Credit default swaps	**$ (690,224)**	**$ 702,098**	**$ 11,874**	**$ 5,045**
Other credit derivatives[a]	**(54,157)**	**59,158**	**5,001**	**11,747**
Total credit derivatives	**(744,381)**	**761,256**	**16,875**	**16,792**
Credit-related notes	**(18)**	**–**	**(18)**	**7,915**
Total	**$ (744,399)**	**$ 761,256**	**$ 16,857**	**$ 24,707**

	Maximum payout/Notional amount			
December 31, 2016 (in millions)	Protection sold	Protection purchased with identical underlyings[b]	Net protection (sold)/ purchased[c]	Other protection purchased[d]
Credit derivatives				
Credit default swaps	$ (961,003)	$ 974,252	$ 13,249	$ 7,935
Other credit derivatives[a]	(36,829)	31,859	(4,970)	19,991
Total credit derivatives	(997,832)	1,006,111	8,279	27,926
Credit-related notes	(41)	–	(41)	4,505
Total	$ (997,873)	$ 1,006,111	$ 8,238	$ 32,431

(a) Other credit derivatives largely consists of credit swap options.
(b) Represents the total notional amount of protection purchased where the underlying reference instrument is identical to the reference instrument on protection sold; the notional amount of protection purchased for each individual identical underlying reference instrument may be greater or lower than the notional amount of protection sold.
(c) Does not take into account the fair value of the reference obligation at the time of settlement, which would generally reduce the amount the seller of protection pays to the buyer of protection in determining settlement value.
(d) Represents protection purchased by the Firm on referenced instruments (single-name, portfolio or index) where the Firm has not sold any protection on the identical reference instrument.

The following tables summarize the notional amounts by the ratings, maturity profile, and total fair value, of credit derivatives and credit-related notes as of December 31, 2017 and 2016, where JPMorgan Chase is the seller of protection. The maturity profile is based on the remaining contractual maturity of the credit derivative contracts. The ratings profile is based on the rating of the reference entity on which the credit derivative contract is based. The ratings and maturity profile of credit derivatives and credit-related notes where JPMorgan Chase is the purchaser of protection are comparable to the profile reflected below.

Protection sold – credit derivatives and credit-related notes ratings[a]/maturity profile

December 31, 2017 (in millions)	<1 year	1–5 years	>5 years	Total notional amount	Fair value of receivables[b]	Fair value of payables[b]	Net fair value
Risk rating of reference entity							
Investment-grade	**$ (159,286)**	**$ (319,726)**	**$ (39,429)**	**$ (518,441)**	**$ 8,516**	**$ (1,134)**	**$ 7,382**
Noninvestment-grade	**(73,394)**	**(134,125)**	**(18,439)**	**(225,958)**	**7,407**	**(5,313)**	**2,094**
Total	**$ (232,680)**	**$ (453,851)**	**$ (57,868)**	**$ (744,399)**	**$ 15,923**	**$ (6,447)**	**$ 9,476**

December 31, 2016 (in millions)	<1 year	1–5 years	>5 years	Total notional amount	Fair value of receivables[b]	Fair value of payables[b]	Net fair value
Risk rating of reference entity							
Investment-grade	$ (273,688)	$ (383,586)	$ (39,281)	$ (696,555)	$ 7,841	$ (3,055)	$ 4,786
Noninvestment-grade	(107,955)	(170,046)	(23,317)	(301,318)	8,184	(8,570)	(386)
Total	$ (381,643)	$ (553,632)	$ (62,598)	$ (997,873)	$ 16,025	$ (11,625)	$ 4,400

(a) The ratings scale is primarily based on external credit ratings defined by S&P and Moody's.
(b) Amounts are shown on a gross basis, before the benefit of legally enforceable master netting agreements and cash collateral received by the Firm.

Note 6 – Noninterest revenue and noninterest expense

Investment banking fees

This revenue category includes debt and equity underwriting and advisory fees. As an underwriter, the Firm helps clients raise capital via public offering and private placement of various types of debt instruments and equity securities. Underwriting fees are primarily based on the issuance price and quantity of the underlying instruments, and are recognized as revenue typically upon execution of the client's transaction. The Firm also manages and syndicates loan arrangements. Credit arrangement and syndication fees, included within debt underwriting fees, are recorded as revenue after satisfying certain retention, timing and yield criteria.

The Firm also provides advisory services, assisting its clients with mergers and acquisitions, divestitures, restructuring and other complex transactions. Advisory fees are recognized as revenue typically upon execution of the client's transaction.

Year ended December 31, (in millions)	2017	2016	2015
Underwriting			
Equity	**$ 1,394**	$ 1,146	$ 1,408
Debt	**3,710**	3,207	3,232
Total underwriting	**5,104**	4,353	4,640
Advisory	**2,144**	2,095	2,111
Total investment banking fees	**$ 7,248**	$ 6,448	$ 6,751

Investment banking fees are earned primarily by CIB. See Note 31 for segment results.

Principal transactions

Principal transactions revenue is driven by many factors, including the bid-offer spread, which is the difference between the price at which the Firm is willing to buy a financial or other instrument and the price at which the Firm is willing to sell that instrument. It also consists of the realized (as a result of the sale of instruments, closing out or termination of transactions, or interim cash payments) and unrealized (as a result of changes in valuation) gains and losses on financial and other instruments (including those accounted for under the fair value option) primarily used in client-driven market-making activities and on private equity investments. In connection with its client-driven market-making activities, the Firm transacts in debt and equity instruments, derivatives and commodities (including physical commodities inventories and financial instruments that reference commodities).

Principal transactions revenue also includes certain realized and unrealized gains and losses related to hedge accounting and specified risk-management activities, including: (a) certain derivatives designated in qualifying hedge accounting relationships (primarily fair value hedges of commodity and foreign exchange risk), (b) certain derivatives used for specific risk management purposes, primarily to mitigate credit risk, foreign exchange risk and commodity risk, and (c) other derivatives. For further information on the income statement classification of gains and losses from derivatives activities, see Note 5.

In the financial commodity markets, the Firm transacts in OTC derivatives (e.g., swaps, forwards, options) and ETD that reference a wide range of underlying commodities. In the physical commodity markets, the Firm primarily purchases and sells precious and base metals and may hold other commodities inventories under financing and other arrangements with clients.

The following table presents all realized and unrealized gains and losses recorded in principal transactions revenue. This table excludes interest income and interest expense on trading assets and liabilities, which are an integral part of the overall performance of the Firm's client-driven market-making activities. See Note 7 for further information on interest income and interest expense. Trading revenue is presented primarily by instrument type. The Firm's client-driven market-making businesses generally utilize a variety of instrument types in connection with their market-making and related risk-management activities; accordingly, the trading revenue presented in the table below is not representative of the total revenue of any individual line of business.

Year ended December 31, (in millions)	2017	2016	2015
Trading revenue by instrument type			
Interest rate	**$ 2,479**	$ 2,325	$ 1,933
Credit	**1,329**	2,096	1,735
Foreign exchange	**2,746**	2,827	2,557
Equity	**3,873**	2,994	2,990
Commodity	**661**	1,067	842
Total trading revenue	**11,088**	11,309	10,057
Private equity gains	**259**	257	351
Principal transactions	**$ 11,347**	$ 11,566	$ 10,408

Principal transactions revenue is earned primarily by CIB. See Note 31 for segment results.

Lending- and deposit-related fees

Lending-related fees include fees earned from loan commitments, standby letters of credit, financial guarantees, and other loan-servicing activities. Deposit-related fees include fees earned in lieu of compensating balances, and fees earned from performing cash management activities and other deposit account services. Lending- and deposit-related fees in this revenue category are recognized over the period in which the related service is provided.

Year ended December 31, (in millions)	2017	2016	2015
Lending-related fees	**$ 1,110**	$ 1,114	$ 1,148
Deposit-related fees	**4,823**	4,660	4,546
Total lending- and deposit-related fees	**$ 5,933**	$ 5,774	$ 5,694

Lending- and deposit-related fees are earned by CCB, CIB, CB, and AWM. See Note 31 for segment results.

Asset management, administration and commissions
This revenue category includes fees from investment management and related services, custody, brokerage services and other products. The Firm manages assets on behalf of its clients, including investors in Firm-sponsored funds and owners of separately managed investment accounts. Management fees are typically based on the value of assets under management and are collected and recognized at the end of each period over which the management services are provided and the value of the managed assets is known. The Firm also receives performance-based management fees, which are earned based on exceeding certain benchmarks or other performance targets and are accrued and recognized when the probability of reversal is remote, typically at the end of the related billing period. The Firm has contractual arrangements with third parties to provide distribution and other services in connection with its asset management activities. Amounts paid to third-party service providers are recorded in professional and outside services expense.

Year ended December 31, (in millions)	2017	2016	2015
Asset management fees			
Investment management fees	**$ 9,526**	$ 8,865	$ 9,403
All other asset management fees[(a)]	**294**	336	352
Total asset management fees	**9,820**	9,201	9,755
Total administration fees[(b)]	**2,029**	1,915	2,015
Commissions and other fees			
Brokerage commissions[(c)]	**2,239**	2,151	2,304
All other commissions and fees	**1,289**	1,324	1,435
Total commissions and fees	**3,528**	3,475	3,739
Total asset management, administration and commissions	**$ 15,377**	$ 14,591	$ 15,509

(a) The Firm receives other asset management fees for services that are ancillary to investment management services, including commissions earned on sales or distribution of mutual funds to clients. These fees are recorded as revenue at the time the service is rendered or, in the case of certain distribution fees based on the underlying fund's asset value and/or investor redemption, recorded over time as the investor remains in the fund or upon investor redemption.
(b) The Firm receives administrative fees predominantly from custody, securities lending, fund services and securities clearance fees. These fees are recorded as revenue over the period in which the related service is provided.
(c) The Firm acts as a broker, facilitating its clients' purchase and sale of securities and other financial instruments. It collects and recognizes brokerage commissions as revenue upon occurrence of the client transaction. The Firm reports certain costs paid to third-party clearing houses and exchanges net against commission revenue.

Asset management, administration and commissions are earned primarily by AWM, CIB, CCB, and CB. See Note 31 for segment results.

Mortgage fees and related income
This revenue category primarily reflects CCB's Home Lending production and servicing revenue, including fees and income derived from mortgages originated with the intent to sell; mortgage sales and servicing including losses related to the repurchase of previously sold loans; the impact of risk-management activities associated with the mortgage pipeline, warehouse loans and MSRs; and revenue related to any residual interests held from mortgage securitizations. This revenue category also includes gains and losses on sales and lower of cost or fair value adjustments for mortgage loans held-for-sale, as well as changes in fair value for mortgage loans originated with the intent to sell and measured at fair value under the fair value option. Changes in the fair value of MSRs are reported in mortgage fees and related income. For a further discussion of MSRs, see Note 15. Net interest income from mortgage loans is recorded in interest income.

Card income
This revenue category includes interchange income from credit and debit cards and fees earned from processing card transactions for merchants, both of which are recognized when purchases are made by a cardholder. Card income also includes annual and other lending fees and costs, which are deferred and recognized on a straight-line basis over a 12-month period.

Certain Chase credit card products offer the cardholder the ability to earn points based on account activity, which the cardholder can choose to redeem for cash and non-cash rewards. The cost to the Firm related to these proprietary rewards programs varies based on multiple factors including the terms and conditions of the rewards programs, cardholder activity, cardholder reward redemption rates and cardholder reward selections. The Firm maintains a liability for its obligations under its rewards programs and reports the current-period cost as a reduction of card income.

Credit card revenue sharing agreements
The Firm has contractual agreements with numerous co-brand partners that grant the Firm exclusive rights to issue co-branded credit card products and market them to the customers of such partners. These partners endorse the co-brand credit card programs and provide their customer or member lists to the Firm. The partners may also conduct marketing activities and provide rewards redeemable under their own loyalty programs that the Firm will grant to co-brand credit cardholders based on account activity. The terms of these agreements generally range from five to ten years.

The Firm typically makes payments to the co-brand credit card partners based on the cost of partners' marketing activities and loyalty program rewards provided to credit cardholders, new account originations and sales volumes. Payments to partners based on marketing efforts undertaken by the partners are expensed by the Firm as incurred and reported as noninterest expense. Payments for partner rewards are reported as a reduction of card income when incurred. Payments to partners based on new credit card account originations are accounted for as direct loan origination costs and are deferred and recognized as a reduction of card income on a straight-line basis over a 12-month period. Payments to partners based on sales volumes are reported as a reduction of card income when the related interchange income is earned.

Card income is earned primarily by CCB and CB. See Note 31 for segment results.

Other income

Other income on the Firm's Consolidated statements of income included the following:

Year ended December 31, (in millions)	**2017**	2016	2015
Operating lease income	**$ 3,613**	$ 2,724	$ 2,081

Operating lease income is recognized on a straight-line basis over the lease term.

Noninterest expense

Other expense

Other expense on the Firm's Consolidated statements of income included the following:

Year ended December 31, (in millions)	**2017**	2016	2015
Legal expense/(benefit)	**$ (35)**	$ (317)	$ 2,969
FDIC-related expense	**1,492**	1,296	1,227

Note 7 – Interest income and Interest expense

Interest income and interest expense are recorded in the Consolidated statements of income and classified based on the nature of the underlying asset or liability.

The following table presents the components of interest income and interest expense:

Year ended December 31, (in millions)	2017	2016	2015
Interest Income			
Loans	**$ 41,008**	$ 36,634	$ 33,134
Taxable securities	**5,535**	5,538	6,550
Non-taxable securities[a]	**1,847**	1,766	1,706
Total securities	**7,382**	7,304	8,256
Trading assets	**7,610**	7,292	6,621
Federal funds sold and securities purchased under resale agreements	**2,327**	2,265	1,592
Securities borrowed[b]	**(37)**	(332)	(532)
Deposits with banks	**4,219**	1,863	1,250
All other interest-earning assets[c]	**1,863**	875	652
Total interest income	**$ 64,372**	$ 55,901	$ 50,973
Interest expense			
Interest bearing deposits	**$ 2,857**	$ 1,356	$ 1,252
Federal funds purchased and securities loaned or sold under repurchase agreements	**1,611**	1,089	609
Short-term borrowings[d]	**481**	203	175
Trading liabilities - debt and all other interest-bearing liabilities[e]	**2,070**	1,102	557
Long-term debt	**6,753**	5,564	4,435
Beneficial interest issued by consolidated VIEs	**503**	504	435
Total interest expense	**$ 14,275**	$ 9,818	$ 7,463
Net interest income	**$ 50,097**	$ 46,083	$ 43,510
Provision for credit losses	**5,290**	5,361	3,827
Net interest income after provision for credit losses	**$ 44,807**	$ 40,722	$ 39,683

(a) Represents securities that are tax-exempt for U.S. federal income tax purposes.
(b) Negative interest income is related to client-driven demand for certain securities combined with the impact of low interest rates. This is matched book activity and the negative interest expense on the corresponding securities loaned is recognized in interest expense.
(c) Includes held-for-investment margin loans, which are classified in accrued interest and accounts receivable, and all other interest-earning assets included in other assets.
(d) Includes commercial paper.
(e) Other interest-bearing liabilities include brokerage customer payables.

Interest income and interest expense includes the current-period interest accruals for financial instruments measured at fair value, except for derivatives and financial instruments containing embedded derivatives that would be separately accounted for in accordance with U.S. GAAP, absent the fair value option election; for those instruments, all changes in fair value including any interest elements, are reported in principal transactions revenue. For financial instruments that are not measured at fair value, the related interest is included within interest income or interest expense, as applicable. For further information on accounting for interest income and interest expense related to loans, securities, securities financing (i.e. securities purchased or sold under resale or repurchase agreements; securities borrowed; and securities loaned) and long-term debt, see Notes 12, 10, 11 and 19, respectively.

Note 8 – Pension and other postretirement employee benefit plans

The Firm has various defined benefit pension plans and OPEB plans that provide benefits to its employees. The Firm has a qualified noncontributory U.S. defined benefit pension plan that provides benefits to substantially all U.S. employees. The Firm also has defined benefit pension plans that are offered in certain non-U.S. locations based on factors such as eligible compensation, age and/or years of service. It is the Firm's policy to fund the pension plans in amounts sufficient to meet the requirements under applicable laws. The Firm does not anticipate at this time any contribution to the U.S. defined benefit pension plan in 2018. The 2018 contributions to the non-U.S. defined benefit pension plans are expected to be $46 million of which $30 million are contractually required.

The Firm also has a number of nonqualified noncontributory defined benefit pension plans that are unfunded. These plans provide supplemental defined pension benefits to certain employees.

The Firm currently provides two qualified defined contribution plans in the U.S. and maintains other similar arrangements in certain non-U.S. locations.

The Firm offers postretirement medical and life insurance benefits to certain U.S. retirees and postretirement medical benefits to qualifying U.S. and U.K. employees.

The Firm defrays the cost of its U.S. OPEB obligation through corporate-owned life insurance ("COLI") purchased on the lives of eligible employees and retirees. While the Firm owns the COLI policies, COLI proceeds (death benefits, withdrawals and other distributions) may be used only to reimburse the Firm for its net postretirement benefit claim payments and related administrative expense. The Firm has generally funded its postretirement benefit obligations through contributions to the relevant trust on a pay-as-you go basis. On December 21, 2017, the Firm contributed $600 million of cash to the trust as a prefunding of a portion of its postretirement benefit obligations. The U.K. OPEB plan is unfunded.

Pension and OPEB accounting generally requires that the difference between plan assets at fair value and the benefit obligation be measured and recorded on the balance sheet. Plans that are overfunded (excess of plan assets over benefit obligation) are recorded in other assets and plans that are underfunded (excess benefit obligation over plan assets) are recorded within other liabilities. Gains or losses resulting from changes in the benefit obligation and the value of plan assets are recorded in other comprehensive income ("OCI") and recognized as part of the net periodic benefit cost over subsequent periods as discussed in the Gains and losses section of this Note. Additionally, service cost, interest cost, and investment returns that would otherwise be classified separately are aggregated and reported net within compensation expense.

The following table presents the changes in benefit obligations, plan assets, the net funded status, and the pretax pension and OPEB amounts recorded in AOCI on the Consolidated balance sheets for the Firm's defined benefit pension and OPEB plans, and the weighted-average actuarial annualized assumptions for the projected and accumulated postretirement benefit obligations.

As of or for the year ended December 31,	Defined benefit pension plans		OPEB plans[f]	
(in millions)	**2017**	2016	**2017**	2016
Change in benefit obligation				
Benefit obligation, beginning of year	**$ (15,594)**	$ (15,259)	**$ (708)**	$ (744)
Benefits earned during the year	**(330)**	(332)	**–**	–
Interest cost on benefit obligations	**(598)**	(629)	**(28)**	(31)
Employee contributions	**(7)**	(7)	**(16)**	(19)
Net gain/(loss)	**(721)**	(743)	**(4)**	4
Benefits paid	**841**	851	**76**	76
Plan settlements	**30**	21	**–**	–
Expected Medicare Part D subsidy receipts	**NA**	NA	**(1)**	–
Foreign exchange impact and other	**(321)**	504	**(3)**	6
Benefit obligation, end of year[a]	**$ (16,700)**	$ (15,594)	**$ (684)**	$ (708)
Change in plan assets				
Fair value of plan assets, beginning of year	**$ 17,703**	$ 17,636	**$ 1,956**	$ 1,855
Actual return on plan assets	**2,356**	1,375	**233**	131
Firm contributions	**78**	86	**602**	2
Employee contributions	**7**	7	**–**	–
Benefits paid	**(841)**	(851)	**(34)**	(32)
Plan settlements	**(30)**	(21)	**–**	–
Foreign exchange impact and other	**330**	(529)	**–**	–
Fair value of plan assets, end of year [a][b][c]	**$ 19,603**	$ 17,703	**$ 2,757**	$ 1,956
Net funded status [d]	**$ 2,903**	$ 2,109	**$ 2,073**	$ 1,248
Accumulated benefit obligation, end of year	**$ (16,530)**	$ (15,421)	**NA**	NA
Pretax pension and OPEB amounts recorded in AOCI				
Net gain/(loss)	**$ (2,800)**	$ (3,667)	**$ 271**	$ 138
Prior service credit/(loss)	**6**	42	**–**	–
Accumulated other comprehensive income/(loss), pretax, end of year	**$ (2,794)**	$ (3,625)	**$ 271**	$ 138
Weighted-average actuarial assumptions used to determine benefit obligations				
Discount Rate [e]	**0.60 - 3.70%**	0.60 - 4.30%	**3.70%**	4.20%
Rate of compensation increase [e]	**2.25 – 3.00**	2.25 – 3.00	**NA**	NA
Health care cost trend rate:				
Assumed for next year	**NA**	NA	**5.00**	5.00
Ultimate	**NA**	NA	**5.00**	5.00
Year when rate will reach ultimate	**NA**	NA	**2018**	2017

(a) At December 31, 2017 and 2016, included non-U.S. benefit obligations of $(3.8) billion and $(3.4) billion, and plan assets of $3.9 billion and $3.4 billion, respectively, predominantly in the U.K.
(b) At December 31, 2017 and 2016, approximately $302 million and $390 million, respectively, of U.S. defined benefit pension plan assets included participation rights under participating annuity contracts.
(c) At December 31, 2017 and 2016, defined benefit pension plan amounts that were not measured at fair value included $377 million and $130 million, respectively, of accrued receivables, and $587 million and $224 million, respectively, of accrued liabilities, for U.S. plans.
(d) Represents plans with an aggregate overfunded balance of $5.6 billion and $4.0 billion at December 31, 2017 and 2016, respectively, and plans with an aggregate underfunded balance of $612 million and $639 million at December 31, 2017 and 2016, respectively.
(e) For the U.S. defined benefit pension plans, the discount rate assumption is 3.70% and 4.30%, and the rate of compensation increase is 2.30% and 2.30%, for 2017 and 2016 respectively.
(f) Includes an unfunded postretirement benefit obligation of $32 million and $35 million at December 31, 2017 and 2016, respectively, for the U.K. plan.

Gains and losses

For the Firm's defined benefit pension plans, fair value is used to determine the expected return on plan assets. Amortization of net gains and losses is included in annual net periodic benefit cost if, as of the beginning of the year, the net gain or loss exceeds 10% of the greater of the PBO or the fair value of the plan assets. Any excess is amortized over the average future service period of defined benefit pension plan participants, which for the U.S. defined benefit pension plan is currently eight years and for the non-U.S. defined benefit pension plans is the period appropriate for the affected plan. In addition, prior service costs are amortized over the average remaining service period of active employees expected to receive benefits under the plan when the prior service cost is first recognized. The average remaining amortization period for the U.S. defined benefit pension plan for current prior service costs is three years.

For the Firm's OPEB plans, a calculated value that recognizes changes in fair value over a five-year period is used to determine the expected return on plan assets. This value is referred to as the market-related value of assets. Amortization of net gains and losses, adjusted for gains and losses not yet recognized, is included in annual net periodic benefit cost if, as of the beginning of the year, the net gain or loss exceeds 10% of the greater of the accumulated postretirement benefit obligation or the market-related value of assets. Any excess net gain or loss is amortized over the average expected lifetime of retired participants, which is currently eleven years; however, prior service costs resulting from plan changes are amortized over the average years of service remaining to full eligibility age, which is currently two years.

The following table presents the components of net periodic benefit costs reported in the Consolidated statements of income for the Firm's defined benefit pension, defined contribution and OPEB plans, and in other comprehensive income for the defined benefit pension and OPEB plans, and the weighted-average annualized actuarial assumptions for the net periodic benefit cost.

	Pension plans			OPEB plans		
Year ended December 31, (in millions)	**2017**	2016	2015	**2017**	2016	2015
Components of net periodic benefit cost						
Benefits earned during the year	**$ 330**	$ 332	$ 377	**$ –**	$ –	$ 1
Interest cost on benefit obligations	**598**	629	610	**28**	31	31
Expected return on plan assets	**(968)**	(1,030)	(1,079)	**(97)**	(105)	(106)
Amortization:						
Net (gain)/loss	**250**	257	282	**–**	–	–
Prior service cost/(credit)	**(36)**	(36)	(36)	**–**	–	–
Special termination benefits	**–**	–	1	**–**	–	–
Settlement loss	**2**	4	–	**–**		
Net periodic defined benefit cost	**$ 176**	$ 156	$ 155	**$ (69)**	$ (74)	$ (74)
Other defined benefit pension plans[a]	**24**	25	24	**NA**	NA	NA
Total defined benefit plans	**$ 200**	$ 181	$ 179	**$ (69)**	$ (74)	$ (74)
Total defined contribution plans	**814**	789	769	**NA**	NA	NA
Total pension and OPEB cost included in compensation expense	**$ 1,014**	$ 970	$ 948	**$ (69)**	$ (74)	$ (74)
Changes in plan assets and benefit obligations recognized in other comprehensive income						
Net (gain)/loss arising during the year	**$ (669)**	$ 395	$ (50)	**$ (133)**	$ (29)	$ 21
Amortization of net loss	**(250)**	(257)	(282)	**–**	–	–
Amortization of prior service (cost)/credit	**36**	36	36	**–**	–	–
Settlement loss	**(2)**	(4)	–	**–**	–	–
Foreign exchange impact and other	**54**	(77)	(33)	**–**	–	–
Total recognized in other comprehensive income	**$ (831)**	$ 93	$ (329)	**$ (133)**	$ (29)	$ 21
Total recognized in net periodic benefit cost and other comprehensive income	**$ (655)**	$ 249	$ (174)	**$ (202)**	$ (103)	$ (53)
Weighted-average assumptions used to determine net periodic benefit costs						
Discount rate[b]	**0.60 - 4.30 %**	0.90 - 4.50%	1.00 - 4.00%	**4.20%**	4.40%	4.10%
Expected long-term rate of return on plan assets [b]	**0.70 - 6.00**	0.80 - 6.50	0.90 - 6.50	**5.00**	5.75	6.00
Rate of compensation increase [b]	**2.25 - 3.00**	2.25 - 4.30	2.75 - 4.20	**NA**	NA	NA
Health care cost trend rate						
Assumed for next year	**NA**	NA	NA	**5.00**	5.50	6.00
Ultimate	**NA**	NA	NA	**5.00**	5.00	5.00
Year when rate will reach ultimate	**NA**	NA	NA	**2017**	2017	2017

(a) Includes various defined benefit pension plans which are individually immaterial.
(b) The rate assumptions for the U.S. defined benefit pension plans are at the upper end of the range, except for the rate of compensation increase, which is 2.30% for 2017 and 3.50% for 2016 and 2015, respectively.

The estimated pretax amounts that will be amortized from AOCI into net periodic benefit cost in 2018 are as follows.

(in millions)	Defined benefit pension plans
Net loss/(gain)	$ 106
Prior service cost/(credit)	$ (25)
Total	**$ 81**

Plan assumptions

JPMorgan Chase's expected long-term rate of return for defined benefit pension and OPEB plan assets is a blended weighted average, by asset allocation of the projected long-term returns for the various asset classes, taking into consideration local market conditions and the specific allocation of plan assets. Returns on asset classes are developed using a forward-looking approach and are not strictly based on historical returns. Consideration is also given to current market conditions and the short-term portfolio mix of each plan.

The discount rate used in determining the benefit obligation under the U.S. defined benefit pension and OPEB plans was provided by the Firm's actuaries. This rate was selected by reference to the yields on portfolios of bonds with maturity dates and coupons that closely match each of the plan's projected cash flows. The discount rate for the U.K. defined benefit pension plan represents a rate of appropriate duration from the analysis of yield curves provided by the Firm's actuaries.

At December 31, 2017, the Firm decreased the discount rates used to determine its benefit obligations for the U.S. defined benefit pension and OPEB plans in light of current market interest rates, which will increase expense by approximately $66 million in 2018. The 2018 expected long-term rate of return on U.S. defined benefit pension plan assets and U.S. OPEB plan assets are 5.50% and 4.00%, respectively. As of December 31, 2017, the interest crediting rate assumption remained at 5.00%.

As of December 31, 2017, the effect of a one-percentage-point increase or decrease in the assumed health care cost trend rate is not material to the accumulated postretirement benefit obligation or total service and interest cost.

The following table represents the effect of a 25-basis point decline in the three listed rates below on estimated 2018 defined benefit pension and OPEB plan expense, as well as the effect on the postretirement benefit obligations.

(in millions)	Defined benefit pension and OPEB plan expense	Benefit obligation
Expected long-term rate of return	$ 54	NA
Discount rate	$ 59	$ 583
Interest crediting rate for U.S. plans	$ (41)	$ (193)

Investment strategy and asset allocation

The assets of the Firm's defined benefit pension plans are held in various trusts and are invested in well-diversified portfolios of equity and fixed income securities, cash and cash equivalents, and alternative investments (e.g., hedge funds, private equity, real estate and real assets). The trust-owned assets of the Firm's U.S. OPEB plan are invested in cash and cash equivalents. COLI policies used to defray the cost of the Firm's U.S. OPEB plan are invested in separate accounts of an insurance company and are allocated to investments intended to replicate equity and fixed income indices.

The investment policies for the assets of the Firm's defined benefit pension plans are to optimize the risk-return relationship as appropriate to the needs and goals of each plan using a global portfolio of various asset classes diversified by market segment, economic sector, and issuer. Assets are managed by a combination of internal and external investment managers. The Firm regularly reviews the asset allocations and asset managers, as well as other factors that impact the portfolios, which are rebalanced when deemed necessary.

Investments held by the plans include financial instruments which are exposed to various risks such as interest rate, market and credit risks. Exposure to a concentration of credit risk is mitigated by the broad diversification of both U.S. and non-U.S. investment instruments. Additionally, the investments in each of the common/collective trust funds and/or registered investment companies are further diversified into various financial instruments. As of December 31, 2017, assets held by the Firm's defined benefit pension and OPEB plans do not include JPMorgan Chase common stock, except through indirect exposures through investments in third-party stock-index funds. The plans hold investments in funds that are sponsored or managed by affiliates of JPMorgan Chase in the amount of $6.0 billion and $4.6 billion, as of December 31, 2017 and 2016, respectively.

The following table presents the weighted-average asset allocation of the fair values of total plan assets at December 31 for the years indicated, as well as the respective approved asset allocation ranges by asset class.

	Defined benefit pension plans			OPEB plan[c]		
	Asset	% of plan assets		Asset	% of plan assets	
December 31,	Allocation	**2017**	2016	Allocation	**2017[d]**	2016
Asset class						
Debt securities[a]	0-80%	**42%**	35%	30-70%	**61%**	50%
Equity securities	0-85	**42**	47	30-70	**39**	50
Real estate	0-10	**3**	4	–	**–**	–
Alternatives [b]	0-35	**13**	14	–	**–**	–
Total	100%	**100%**	100%	100%	**100%**	100%

(a) Debt securities primarily include cash, corporate debt, U.S. federal, state, local and non-U.S. government, and mortgage-backed securities.
(b) Alternatives primarily include limited partnerships.
(c) Represents the U.S. OPEB plan only, as the U.K. OPEB plan is unfunded.
(d) Change in percentage of plan assets due to the contribution to the U.S. OPEB plan.

Fair value measurement of the plans' assets and liabilities

For information on fair value measurements, including descriptions of level 1, 2, and 3 of the fair value hierarchy and the valuation methods employed by the Firm, see Note 2.

Pension and OPEB plan assets and liabilities measured at fair value

	Defined benefit pension plans							
	2017				2016			
December 31, (in millions)	Level 1	Level 2	Level 3	Total fair value	Level 1	Level 2	Level 3	Total fair value
Cash and cash equivalents	**$ 173**	**$ 1**	**$ –**	**$ 174**	$ 196	$ 2	$ –	$ 198
Equity securities	**6,407**	**194**	**2**	**6,603**	6,158	166	2	6,326
Mutual funds	**325**	**–**	**–**	**325**	–	–	–	–
Common/collective trust funds[a]	**778**	**–**	**–**	**778**	384	–	–	384
Limited partnerships[b]	**60**	**–**	**–**	**60**	62	–	–	62
Corporate debt securities[c]	**–**	**2,644**	**4**	**2,648**	–	2,506	4	2,510
U.S. federal, state, local and non-U.S. government debt securities	**1,096**	**784**	**–**	**1,880**	1,139	804	–	1,943
Mortgage-backed securities	**92**	**100**	**2**	**194**	42	75	–	117
Derivative receivables	**–**	**203**	**–**	**203**	–	243	–	243
Other[d]	**2,353**	**60**	**302**	**2,715**	1,497	53	390	1,940
Total assets measured at fair value[e]	**$ 11,284**	**$ 3,986**	**$ 310**	**$ 15,580**	$ 9,478	$ 3,849	$ 396	$ 13,723
Derivative payables	**$ –**	**$ (141)**	**$ –**	**$ (141)**	$ –	$ (208)	$ –	$ (208)
Total liabilities measured at fair value[e]	**$ –**	**$ (141)**	**$ –**	**$ (141)**	$ –	$ (208)	$ –	$ (208)

(a) At December 31, 2017 and 2016, common/collective trust funds primarily included a mix of short-term investment funds, domestic and international equity investments (including index) and real estate funds.
(b) Unfunded commitments to purchase limited partnership investments for the plans were $605 million and $735 million for 2017 and 2016, respectively.
(c) Corporate debt securities include debt securities of U.S. and non-U.S. corporations.
(d) Other consists primarily of money market funds and participating and non-participating annuity contracts. Money market funds are primarily classified within level 1 of the fair value hierarchy given they are valued using market observable prices. Participating and non-participating annuity contracts are classified within level 3 of the fair value hierarchy due to a lack of market mechanisms for transferring each policy and surrender restrictions.
(e) At December 31, 2017 and 2016, excludes $4.4 billion and $4.2 billion of certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient, which are not required to be classified in the fair value hierarchy, $377 million and $130 million of defined benefit pension plan receivables for investments sold and dividends and interest receivables, $561 million and $203 million of defined benefit pension plan payables for investments purchased, and $26 million and $21 million of other liabilities, respectively.

The assets of the U.S. OPEB plan consisted of $600 million and $0 million in cash and cash equivalents classified in level 1 of the valuation hierarchy and $2.2 billion and $2.0 billion of COLI policies classified in level 3 of the valuation hierarchy at December 31, 2017 and 2016, respectively.

Changes in level 3 fair value measurements using significant unobservable inputs

(in millions)	Fair value, Beginning balance	Actual return on plan assets: Realized gains/(losses)	Actual return on plan assets: Unrealized gains/(losses)	Purchases, sales and settlements, net	Transfers in and/or out of level 3	Fair value, Ending balance
Year ended December 31, 2017						
U.S. defined benefit pension plan						
Annuity contracts and other [a]	**$ 396**	**$ –**	**$ 1**	**$ (87)**	**$ –**	**$ 310**
U.S. OPEB plan						
COLI policies	**$ 1,957**	**$ –**	**$ 200**	**$ –**	**$ –**	**$ 2,157**
Year ended December 31, 2016						
U.S. defined benefit pension plan						
Annuity contracts and other [a]	$ 539	$ –	$ (157)	$ –	$ 14	$ 396
U.S. OPEB plan						
COLI policies	$ 1,855	$ –	$ 102	$ –	$ –	$ 1,957

(a) Substantially all are participating and non-participating annuity contracts.

Estimated future benefit payments

The following table presents benefit payments expected to be paid, which include the effect of expected future service, for the years indicated. The OPEB medical and life insurance payments are net of expected retiree contributions.

Year ended December 31, (in millions)	Defined benefit pension plans	OPEB before Medicare Part D subsidy	Medicare Part D subsidy
2018	$ 926	$ 65	$ 1
2019	922	63	1
2020	927	60	1
2021	944	57	–
2022	960	55	–
Years 2023–2027	4,925	235	2

Note 9 – Employee share-based incentives

Employee share-based awards

In 2017, 2016 and 2015, JPMorgan Chase granted long-term share-based awards to certain employees under its LTIP, as amended and restated effective May 19, 2015. Under the terms of the LTIP, as of December 31, 2017, 67 million shares of common stock were available for issuance through May 2019. The LTIP is the only active plan under which the Firm is currently granting share-based incentive awards. In the following discussion, the LTIP, plus prior Firm plans and plans assumed as the result of acquisitions, are referred to collectively as the "LTI Plans," and such plans constitute the Firm's share-based incentive plans.

RSUs are awarded at no cost to the recipient upon their grant. Generally, RSUs are granted annually and vest at a rate of 50% after two years and 50% after three years and are converted into shares of common stock as of the vesting date. In addition, RSUs typically include full-career eligibility provisions, which allow employees to continue to vest upon voluntary termination based on age or service-related requirements, subject to post-employment and other restrictions. All RSU awards are subject to forfeiture until vested and contain clawback provisions that may result in cancellation under certain specified circumstances. Generally, RSUs entitle the recipient to receive cash payments equivalent to any dividends paid on the underlying common stock during the period the RSUs are outstanding and, as such, are considered participating securities as discussed in Note 22.

In January 2017 and 2016, the Firm's Board of Directors approved the grant of performance share units ("PSUs") to members of the Firm's Operating Committee under the variable compensation program for performance years 2016 and 2015. PSUs are subject to the Firm's achievement of specified performance criteria over a three-year period. The number of awards that vest can range from zero to 150% of the grant amount. The awards vest and are converted into shares of common stock in the quarter after the end of the performance period, which is generally three years. In addition, dividends are notionally reinvested in the Firm's common stock and will be delivered only in respect of any earned shares.

Once the PSUs have vested, the shares of common stock that are delivered, after applicable tax withholding, must be held for an additional two-year period, typically for a total combined vesting and holding period of five years from the grant date.

Under the LTI Plans, stock options and stock appreciation rights ("SARs") have generally been granted with an exercise price equal to the fair value of JPMorgan Chase's common stock on the grant date. The Firm periodically grants employee stock options to individual employees. There were no material grants of stock options or SARs in 2017, 2016 and 2015. SARs generally expire ten years after the grant date.

The Firm separately recognizes compensation expense for each tranche of each award, net of estimated forfeitures, as if it were a separate award with its own vesting date. Generally, for each tranche granted, compensation expense is recognized on a straight-line basis from the grant date until the vesting date of the respective tranche, provided that the employees will not become full-career eligible during the vesting period. For awards with full-career eligibility provisions and awards granted with no future substantive service requirement, the Firm accrues the estimated value of awards expected to be awarded to employees as of the grant date without giving consideration to the impact of post-employment restrictions. For each tranche granted to employees who will become full-career eligible during the vesting period, compensation expense is recognized on a straight-line basis from the grant date until the earlier of the employee's full-career eligibility date or the vesting date of the respective tranche.

The Firm's policy for issuing shares upon settlement of employee share-based incentive awards is to issue either new shares of common stock or treasury shares. During 2017, 2016 and 2015, the Firm settled all of its employee share-based awards by issuing treasury shares.

In January 2008, the Firm awarded to its Chairman and Chief Executive Officer up to 2 million SARs. The terms of this award are distinct from, and more restrictive than, other equity grants regularly awarded by the Firm. On July 15, 2014, the Compensation & Management Development Committee and Board of Directors determined that all requirements for the vesting of the 2 million SAR awards had been met and thus, the awards became exercisable. The SARs, which had an expiration date of January 2018, were exercised by Mr. Dimon in October 2017 at the exercise price of $39.83 per share (the price of JPMorgan Chase common stock on the date of grant).

RSUs, PSUs, employee stock options and SARs activity

Generally, compensation expense for RSUs and PSUs is measured based on the number of units granted multiplied by the stock price at the grant date, and for employee stock options and SARs, is measured at the grant date using the Black-Scholes valuation model. Compensation expense for these awards is recognized in net income as described previously. The following table summarizes JPMorgan Chase's RSUs, PSUs, employee stock options and SARs activity for 2017.

Year ended December 31, 2017 (in thousands, except weighted-average data, and where otherwise stated)	RSUs/PSUs		Options/SARs			
	Number of units	Weighted-average grant date fair value	Number of awards	Weighted-average exercise price	Weighted-average remaining contractual life (in years)	Aggregate intrinsic value
Outstanding, January 1	**81,707**	**$ 57.15**	**30,267**	**$ 40.65**		
Granted	**26,017**	**84.30**	**109**	**90.94**		
Exercised or vested	**(32,961)**	**57.80**	**(12,816)**	**40.50**		
Forfeited	**(2,030)**	**63.34**	**(54)**	**55.82**		
Canceled	**NA**	**NA**	**(13)**	**405.47**		
Outstanding, December 31	**72,733**	**$ 66.36**	**17,493**	**$ 40.76**	**3.4**	**$ 1,169,470**
Exercisable, December 31	**NA**	**NA**	**15,828**	**40.00**	**3.3**	**1,070,212**

The total fair value of RSUs that vested during the years ended December 31, 2017, 2016 and 2015, was $2.9 billion, $2.2 billion and $2.8 billion, respectively. The total intrinsic value of options exercised during the years ended December 31, 2017, 2016 and 2015, was $651 million, $338 million and $335 million, respectively.

Compensation expense

The Firm recognized the following noncash compensation expense related to its various employee share-based incentive plans in its Consolidated statements of income.

Year ended December 31, (in millions)	2017	2016	2015
Cost of prior grants of RSUs, PSUs and SARs that are amortized over their applicable vesting periods	**$ 1,125**	$ 1,046	$ 1,109
Accrual of estimated costs of share-based awards to be granted in future periods including those to full-career eligible employees	**945**	894	878
Total noncash compensation expense related to employee share-based incentive plans	**$ 2,070**	$ 1,940	$ 1,987

At December 31, 2017, approximately $704 million (pretax) of compensation expense related to unvested awards had not yet been charged to net income. That cost is expected to be amortized into compensation expense over a weighted-average period of 1 year. The Firm does not capitalize any compensation expense related to share-based compensation awards to employees.

Cash flows and tax benefits

Effective January 1, 2016, the Firm adopted new accounting guidance related to employee share-based payments. As a result of the adoption of this new guidance, all excess tax benefits (including tax benefits from dividends or dividend equivalents) on share-based payment awards are recognized within income tax expense in the Consolidated statements of income. In prior years these tax benefits were recorded as increases to additional paid-in capital. Income tax benefits related to share-based incentive arrangements recognized in the Firm's Consolidated statements of income for the years ended December 31, 2017, 2016 and 2015, were $1.0 billion, $916 million and $746 million, respectively.

The following table sets forth the cash received from the exercise of stock options under all share-based incentive arrangements, and the actual income tax benefit related to tax deductions from the exercise of the stock options.

Year ended December 31, (in millions)	2017	2016	2015
Cash received for options exercised	**$ 18**	$ 26	$ 20
Tax benefit	**190**	70	64

Note 10 – Securities

Securities are classified as trading, AFS or HTM. Securities classified as trading assets are discussed in Note 2. Predominantly all of the Firm's AFS and HTM securities are held by Treasury and CIO in connection with its asset-liability management activities. At December 31, 2017, the investment securities portfolio consisted of debt securities with an average credit rating of AA+ (based upon external ratings where available, and where not available, based primarily upon internal ratings which correspond to ratings as defined by S&P and Moody's). AFS securities are carried at fair value on the Consolidated balance sheets. Unrealized gains and losses, after any applicable hedge accounting adjustments, are reported as net increases or decreases to AOCI. The specific identification method is used to determine realized gains and losses on AFS securities, which are included in securities gains/(losses) on the Consolidated statements of income. HTM debt securities, which management has the intent and ability to hold until maturity, are carried at amortized cost on the Consolidated balance sheets. For both AFS and HTM debt securities, purchase discounts or premiums are generally amortized into interest income over the contractual life of the security.

The amortized cost and estimated fair value of the investment securities portfolio were as follows for the dates indicated.

	2017				2016			
December 31, (in millions)	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value
Available-for-sale debt securities								
Mortgage-backed securities:								
U.S. government agencies[(a)]	**$ 69,879**	**$ 736**	**$ 335**	**$ 70,280**	$ 63,367	$ 1,112	$ 474	$ 64,005
Residential:								
U.S[(b)]	**8,193**	**185**	**14**	**8,364**	8,171	100	28	8,243
Non-U.S.	**2,882**	**122**	**1**	**3,003**	6,049	158	7	6,200
Commercial	**4,932**	**98**	**5**	**5,025**	9,002	122	20	9,104
Total mortgage-backed securities	**85,886**	**1,141**	**355**	**86,672**	86,589	1,492	529	87,552
U.S. Treasury and government agencies[(a)]	**22,510**	**266**	**31**	**22,745**	44,822	75	796	44,101
Obligations of U.S. states and municipalities	**30,490**	**1,881**	**33**	**32,338**	30,284	1,492	184	31,592
Certificates of deposit	**59**	**—**	**—**	**59**	106	—	—	106
Non-U.S. government debt securities	**26,900**	**426**	**32**	**27,294**	34,497	836	45	35,288
Corporate debt securities	**2,657**	**101**	**1**	**2,757**	4,916	64	22	4,958
Asset-backed securities:								
Collateralized loan obligations	**20,928**	**69**	**1**	**20,996**	27,352	75	26	27,401
Other	**8,764**	**77**	**24**	**8,817**	6,950	62	45	6,967
Total available-for-sale debt securities	**198,194**	**3,961**	**477**	**201,678**	235,516	4,096	1,647	237,965
Available-for-sale equity securities	**547**	**—**	**—**	**547**	914	12	—	926
Total available-for-sale securities	**198,741**	**3,961**	**477**	**202,225**	236,430	4,108	1,647	238,891
Held-to-maturity debt securities								
Mortgage-backed securities								
U.S. government agencies[(c)]	**27,577**	**558**	**40**	**28,095**	29,910	638	37	30,511
Commercial	**5,783**	**1**	**74**	**5,710**	5,783	—	129	5,654
Total mortgage-backed securities	**33,360**	**559**	**114**	**33,805**	**35,693**	**638**	**166**	**36,165**
Obligations of U.S. states and municipalities	**14,373**	**554**	**80**	**14,847**	14,475	374	125	14,724
Total held-to-maturity debt securities	**47,733**	**1,113**	**194**	**48,652**	**50,168**	**1,012**	**291**	**50,889**
Total securities	**$ 246,474**	**$ 5,074**	**$ 671**	**$ 250,877**	**$ 286,598**	**$ 5,120**	**$ 1,938**	**$ 289,780**

(a) Includes total U.S. government-sponsored enterprise obligations with a fair value of $45.8 billion for the years ended December 31, 2017 and 2016, which were predominantly mortgage-related.
(b) Prior period amounts have been revised to conform with the current period presentation.
(c) Included total U.S. government-sponsored enterprise obligations with amortized cost of $22.0 billion and $25.6 billion at December 31, 2017 and 2016, respectively, which were mortgage-related.

Securities impairment

The following tables present the fair value and gross unrealized losses for the investment securities portfolio by aging category at December 31, 2017 and 2016.

	Securities with gross unrealized losses					
	Less than 12 months		12 months or more			
December 31, 2017 (in millions)	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses	Total fair value	Total gross unrealized losses
Available-for-sale debt securities						
Mortgage-backed securities:						
U.S. government agencies	$ 36,037	$ 139	$ 7,711	$ 196	$ 43,748	$ 335
Residential:						
U.S	1,112	5	596	9	1,708	14
Non-U.S.	–	–	266	1	266	1
Commercial	528	4	335	1	863	5
Total mortgage-backed securities	37,677	148	8,908	207	46,585	355
U.S. Treasury and government agencies	1,834	11	373	20	2,207	31
Obligations of U.S. states and municipalities	949	7	1,652	26	2,601	33
Certificates of deposit	–	–	–	–	–	–
Non-U.S. government debt securities	6,500	15	811	17	7,311	32
Corporate debt securities	–	–	52	1	52	1
Asset-backed securities:						
Collateralized loan obligations	–	–	276	1	276	1
Other	3,521	20	720	4	4,241	24
Total available-for-sale debt securities	50,481	201	12,792	276	63,273	477
Available-for-sale equity securities	–	–	–	–	–	–
Held-to-maturity securities						
Mortgage-backed securities						
U.S. government securities	4,070	38	205	2	4,275	40
Commercial	3,706	41	1,882	33	5,588	74
Total mortgage-backed securities	7,776	79	2,087	35	9,863	114
Obligations of U.S. states and municipalities	584	9	2,131	71	2,715	80
Total held-to-maturity securities	8,360	88	4,218	106	12,578	194
Total securities with gross unrealized losses	$ 58,841	$ 289	$ 17,010	$ 382	$ 75,851	$ 671

	Securities with gross unrealized losses					
	Less than 12 months		12 months or more			
December 31, 2016 (in millions)	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses	Total fair value	Total gross unrealized losses
Available-for-sale debt securities						
Mortgage-backed securities:						
U.S. government agencies	$ 29,856	$ 463	$ 506	$ 11	$ 30,362	$ 474
Residential:						
U.S.[(a)]	1,373	6	1,073	22	2,446	28
Non-U.S.	–	–	886	7	886	7
Commercial	2,328	17	1,078	3	3,406	20
Total mortgage-backed securities	33,557	486	3,543	43	37,100	529
U.S. Treasury and government agencies	23,543	796	–	–	23,543	796
Obligations of U.S. states and municipalities	7,215	181	55	3	7,270	184
Certificates of deposit	–	–	–	–	–	–
Non-U.S. government debt securities	4,436	36	421	9	4,857	45
Corporate debt securities	797	2	829	20	1,626	22
Asset-backed securities:						
Collateralized loan obligations	766	2	5,263	24	6,029	26
Other	739	6	1,992	39	2,731	45
Total available-for-sale debt securities	71,053	1,509	12,103	138	83,156	1,647
Available-for-sale equity securities	–	–	–	–	–	–
Held-to-maturity debt securities						
Mortgage-backed securities						
U.S. government agencies	3,129	37	–	–	3,129	37
Commercial	5,163	114	441	15	5,604	129
Total mortgage-backed securities	8,292	151	441	15	8,733	166
Obligations of U.S. states and municipalities	4,702	125	–	–	4,702	125
Total held-to-maturity securities	12,994	276	441	15	13,435	291
Total securities with gross unrealized losses	$ 84,047	$ 1,785	$ 12,544	$ 153	$ 96,591	$ 1,938

(a) Prior period amounts have been revised to conform with the current period presentation.

Gross unrealized losses

The Firm has recognized unrealized losses on securities that it intends to sell as OTTI. The Firm does not intend to sell any of the remaining securities with an unrealized loss in AOCI as of December 31, 2017, and it is not likely that the Firm will be required to sell these securities before recovery of their amortized cost basis. Except for the securities for which credit losses have been recognized in income, the Firm believes that the securities with an unrealized loss in AOCI are not other-than-temporarily impaired as of December 31, 2017.

Other-than-temporary impairment

AFS debt and equity securities and HTM debt securities in unrealized loss positions are analyzed as part of the Firm's ongoing assessment of OTTI. For most types of debt securities, the Firm considers a decline in fair value to be other-than-temporary when the Firm does not expect to recover the entire amortized cost basis of the security. For beneficial interests in securitizations that are rated below "AA" at their acquisition, or that can be contractually prepaid or otherwise settled in such a way that the Firm would not recover substantially all of its recorded investment, the Firm considers an impairment to be other-than-temporary when there is an adverse change in expected cash flows. For AFS equity securities, the Firm considers a decline in fair value to be other-than-temporary if it is probable that the Firm will not recover its cost basis.

Potential OTTI is considered using a variety of factors, including the length of time and extent to which the market value has been less than cost; adverse conditions specifically related to the industry, geographic area or financial condition of the issuer or underlying collateral of a security; payment structure of the security; changes to the rating of the security by a rating agency; the volatility of the fair value changes; and the Firm's intent and ability to hold the security until recovery.

For AFS debt securities, the Firm recognizes OTTI losses in earnings if the Firm has the intent to sell the debt security, or if it is more likely than not that the Firm will be required to sell the debt security before recovery of its amortized cost basis. In these circumstances the impairment loss is equal to the full difference between the amortized cost basis and the fair value of the securities. For debt securities in an unrealized loss position that the Firm has the intent and ability to hold, the expected cash flows to be received from the securities are evaluated to determine if a credit loss exists. In the event of a credit loss, only the amount of impairment associated with the credit loss is recognized in income. Amounts relating to factors other than credit losses are recorded in OCI.

The Firm's cash flow evaluations take into account the factors noted above and expectations of relevant market and economic data as of the end of the reporting period. For securities issued in a securitization, the Firm estimates cash flows considering underlying loan-level data and structural features of the securitization, such as subordination, excess spread, overcollateralization or other forms of credit enhancement, and compares the losses projected for the underlying collateral ("pool losses") against the level of credit enhancement in the securitization structure to determine whether these features are sufficient to absorb the pool losses, or whether a credit loss exists. The Firm also performs other analyses to support its cash flow projections, such as first-loss analyses or stress scenarios.

For equity securities, OTTI losses are recognized in earnings if the Firm intends to sell the security. In other cases the Firm considers the relevant factors noted above, as well as the Firm's intent and ability to retain its investment for a period of time sufficient to allow for any anticipated recovery in market value, and whether evidence exists to support a realizable value equal to or greater than the cost basis. Any impairment loss on an equity security is equal to the full difference between the cost basis and the fair value of the security.

Securities gains and losses

The following table presents realized gains and losses and OTTI from AFS securities that were recognized in income.

Year ended December 31, (in millions)	2017	2016	2015
Realized gains	$ 1,013	$ 401	$ 351
Realized losses	(1,072)	(232)	(127)
OTTI losses[(a)]	(7)	(28)	(22)
Net securities gains/(losses)	(66)	141	202
OTTI losses			
Credit losses recognized in income	–	(1)	(1)
Securities the Firm intends to sell[(a)]	(7)	(27)	(21)
Total OTTI losses recognized in income	$ (7)	$ (28)	$ (22)

(a) Excludes realized losses on securities sold of $6 million, $24 million and $5 million for the years ended December 31, 2017, 2016 and 2015, respectively that had been previously reported as an OTTI loss due to the intention to sell the securities.

Changes in the credit loss component of credit-impaired debt securities

The cumulative credit loss component, including any changes therein, of OTTI losses that have been recognized in income related to AFS debt securities was not material as of and during the years ended December 31, 2017, 2016 and 2015.

Contractual maturities and yields

The following table presents the amortized cost and estimated fair value at December 31, 2017, of JPMorgan Chase's investment securities portfolio by contractual maturity.

By remaining maturity December 31, 2017 (in millions)	Due in one year or less	Due after one year through five years	Due after five years through 10 years	Due after 10 years[c]	Total
Available-for-sale debt securities					
Mortgage-backed securities[a]					
Amortized cost	$ 3	$ 698	$ 6,134	$ 79,051	$ 85,886
Fair value	3	708	6,294	79,667	86,672
Average yield[b]	4.76%	2.10%	3.10%	3.35%	3.32%
U.S. Treasury and government agencies					
Amortized cost	$ 60	$ –	$ 17,437	$ 5,013	$ 22,510
Fair value	60	–	17,542	5,143	22,745
Average yield[b]	1.72%	–%	1.96%	1.76%	1.91%
Obligations of U.S. states and municipalities					
Amortized cost	$ 73	$ 750	$ 1,265	$ 28,402	$ 30,490
Fair value	72	765	1,324	30,177	32,338
Average yield[b]	1.78%	3.28%	5.40%	5.50%	5.43%
Certificates of deposit					
Amortized cost	$ 59	$ –	$ –	$ –	$ 59
Fair value	59	–	–	–	59
Average yield[b]	0.50%	–%	–%	–%	0.50%
Non-U.S. government debt securities					
Amortized cost	$ 5,020	$ 13,665	$ 8,215	$ –	$ 26,900
Fair value	5,022	13,845	8,427	–	27,294
Average yield[b]	3.09%	1.55%	1.19%	–%	1.73%
Corporate debt securities					
Amortized cost	$ 150	$ 1,159	$ 1,203	$ 145	$ 2,657
Fair value	151	1,197	1,255	154	2,757
Average yield[b]	3.07%	3.60%	3.58%	3.22%	3.54%
Asset-backed securities					
Amortized cost	$ –	$ 3,372	$ 13,046	$ 13,274	$ 29,692
Fair value	–	3,353	13,080	13,380	29,813
Average yield[b]	–%	2.14%	2.58%	2.36%	2.43%
Total available-for-sale debt securities					
Amortized cost	$ 5,365	$ 19,644	$ 47,300	$ 125,885	$ 198,194
Fair value	5,367	19,868	47,922	128,521	201,678
Average yield[b]	3.03%	1.86%	2.28%	3.66%	3.14%
Available-for-sale equity securities					
Amortized cost	$ –	$ –	$ –	$ 547	$ 547
Fair value	–	–	–	547	547
Average yield[b]	–%	–%	–%	0.71%	0.71%
Total available-for-sale securities					
Amortized cost	$ 5,365	$ 19,644	$ 47,300	$ 126,432	$ 198,741
Fair value	5,367	19,868	47,922	129,068	202,225
Average yield[b]	3.03%	1.86%	2.28%	3.65%	3.13%
Held-to-maturity debt securities					
Mortgage-backed securities[a]					
Amortized Cost	$ –	$ –	$ 49	$ 33,311	$ 33,360
Fair value	–	–	49	33,756	33,805
Average yield[b]	–%	–%	2.88%	3.27%	3.27%
Obligations of U.S. states and municipalities					
Amortized cost	$ –	$ 66	$ 2,019	$ 12,288	$ 14,373
Fair value	–	65	2,067	12,715	14,847
Average yield[b]	–%	4.74%	4.30%	4.72%	4.66%
Total held-to-maturity securities					
Amortized cost	$ –	$ 66	$ 2,068	$ 45,599	$ 47,733
Fair value	–	65	2,116	46,471	48,652
Average yield[b]	–%	4.75%	4.26%	3.66%	3.69%

(a) As of December 31, 2017, mortgage-backed securities issued by Fannie Mae exceeded 10% of JPMorgan Chase's total stockholders' equity; the amortized cost and fair value of such securities was $55.1 billion and $56.0 billion, respectively.

(b) Average yield is computed using the effective yield of each security owned at the end of the period, weighted based on the amortized cost of each security. The effective yield considers the contractual coupon, amortization of premiums and accretion of discounts, and the effect of related hedging derivatives. Taxable-equivalent amounts are used where applicable and reflect the estimated impact of the enactment of the Tax Cuts and Jobs Act ("TCJA"). The effective yield excludes unscheduled principal prepayments; and accordingly, actual maturities of securities may differ from their contractual or expected maturities as certain securities may be prepaid.

(c) Includes securities with no stated maturity. Substantially all of the Firm's U.S. residential MBS and collateralized mortgage obligations are due in 10 years or more, based on contractual maturity. The estimated weighted-average life, which reflects anticipated future prepayments, is approximately six years for agency residential MBS, three years for agency residential collateralized mortgage obligations and three years for nonagency residential collateralized mortgage obligations.

Note 11 – Securities financing activities

JPMorgan Chase enters into resale agreements, repurchase agreements, securities borrowed transactions and securities loaned transactions (collectively, "securities financing agreements") primarily to finance the Firm's inventory positions, acquire securities to cover short positions, accommodate customers' financing needs, and settle other securities obligations.

Securities financing agreements are treated as collateralized financings on the Firm's Consolidated balance sheets. Resale and repurchase agreements are generally carried at the amounts at which the securities will be subsequently sold or repurchased. Securities borrowed and securities loaned transactions are generally carried at the amount of cash collateral advanced or received. Where appropriate under applicable accounting guidance, resale and repurchase agreements with the same counterparty are reported on a net basis. For further discussion of the offsetting of assets and liabilities, see Note 1. Fees received and paid in connection with securities financing agreements are recorded in interest income and interest expense on the Consolidated statements of income.

The Firm has elected the fair value option for certain securities financing agreements. For further information regarding the fair value option, see Note 3. The securities financing agreements for which the fair value option has been elected are reported within securities purchased under resale agreements, securities loaned or sold under repurchase agreements, and securities borrowed on the Consolidated balance sheets. Generally, for agreements carried at fair value, current-period interest accruals are recorded within interest income and interest expense, with changes in fair value reported in principal transactions revenue. However, for financial instruments containing embedded derivatives that would be separately accounted for in accordance with accounting guidance for hybrid instruments, all changes in fair value, including any interest elements, are reported in principal transactions revenue.

Securities financing transactions expose the Firm primarily to credit and liquidity risk. To manage these risks, the Firm monitors the value of the underlying securities (predominantly high-quality securities collateral, including government-issued debt and agency MBS) that it has received from or provided to its counterparties compared to the value of cash proceeds and exchanged collateral, and either requests additional collateral or returns securities or collateral when appropriate. Margin levels are initially established based upon the counterparty, the type of underlying securities, and the permissible collateral, and are monitored on an ongoing basis.

In resale agreements and securities borrowed transactions, the Firm is exposed to credit risk to the extent that the value of the securities received is less than initial cash principal advanced and any collateral amounts exchanged. In repurchase agreements and securities loaned transactions, credit risk exposure arises to the extent that the value of underlying securities exceeds the value of the initial cash principal advanced, and any collateral amounts exchanged.

Additionally, the Firm typically enters into master netting agreements and other similar arrangements with its counterparties, which provide for the right to liquidate the underlying securities and any collateral amounts exchanged in the event of a counterparty default. It is also the Firm's policy to take possession, where possible, of the securities underlying resale agreements and securities borrowed transactions. For further information regarding assets pledged and collateral received in securities financing agreements, see Note 28.

As a result of the Firm's credit risk mitigation practices with respect to resale and securities borrowed agreements as described above, the Firm did not hold any reserves for credit impairment with respect to these agreements as of December 31, 2017 and 2016.

The table below summarizes the gross and net amounts of the Firm's securities financing agreements, as of December 31, 2017, and 2016. When the Firm has obtained an appropriate legal opinion with respect to the master netting agreement with a counterparty and where other relevant netting criteria under U.S. GAAP are met, the Firm nets, on the Consolidated balance sheets, the balances outstanding under its securities financing agreements with the same counterparty. In addition, the Firm exchanges securities and/or cash collateral with its counterparties; this collateral also reduces the economic exposure with the counterparty. Such collateral, along with securities financing balances that do not meet all these relevant netting criteria under U.S. GAAP, is presented as "Amounts not nettable on the Consolidated balance sheets," and reduces the "Net amounts" presented below, if the Firm has an appropriate legal opinion with respect to the master netting agreement with the counterparty. Where a legal opinion has not been either sought or obtained, the securities financing balances are presented gross in the "Net amounts" below, and related collateral does not reduce the amounts presented.

	2017				
December 31, (in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets[b]	Amounts not nettable on the Consolidated balance sheets[c]	Net amounts[d]
Assets					
Securities purchased under resale agreements	**$ 448,608**	**$ (250,505)**	**$ 198,103**	**$ (188,502)**	**$ 9,601**
Securities borrowed	**113,926**	**(8,814)**	**105,112**	**(76,805)**	**28,307**
Liabilities					
Securities sold under repurchase agreements	**$ 398,218**	**$ (250,505)**	**$ 147,713**	**$ (129,178)**	**$ 18,535**
Securities loaned and other[a]	**27,228**	**(8,814)**	**18,414**	**(18,151)**	**263**

	2016				
December 31, (in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets[b]	Amounts not nettable on the Consolidated balance sheets[c]	Net amounts[d]
Assets					
Securities purchased under resale agreements	$ 480,735	$ (250,832)	$ 229,903	$ (222,413)	$ 7,490
Securities borrowed	96,409	–	96,409	(66,822)	29,587
Liabilities					
Securities sold under repurchase agreements	$ 402,465	$ (250,832)	$ 151,633	$ (133,300)	$ 18,333
Securities loaned and other[a]	22,451	–	22,451	(22,177)	274

(a) Includes securities-for-securities lending transactions of $9.2 billion and $9.1 billion at December 31, 2017 and 2016, respectively, accounted for at fair value, where the Firm is acting as lender. These amounts are presented within accounts payable and other liabilities in the Consolidated balance sheets.

(b) Includes securities financing agreements accounted for at fair value. At December 31, 2017 and 2016, included securities purchased under resale agreements of $14.7 billion and $21.5 billion, respectively, and securities sold under agreements to repurchase of $697 million and $687 million, respectively. There were $3.0 billion of securities borrowed at December 31, 2017 and there were no securities borrowed at December 31, 2016. There were no securities loaned accounted for at fair value in either period.

(c) In some cases, collateral exchanged with a counterparty exceeds the net asset or liability balance with that counterparty. In such cases, the amounts reported in this column are limited to the related asset or liability with that counterparty.

(d) Includes securities financing agreements that provide collateral rights, but where an appropriate legal opinion with respect to the master netting agreement has not been either sought or obtained. At December 31, 2017 and 2016, included $7.5 billion and $4.8 billion, respectively, of securities purchased under resale agreements; $25.5 billion and $27.1 billion, respectively, of securities borrowed; $16.5 billion and $15.9 billion, respectively, of securities sold under agreements to repurchase; and $29 million and $90 million, respectively, of securities loaned and other.

The tables below present as of December 31, 2017 and 2016 the types of financial assets pledged in securities financing agreements and the remaining contractual maturity of the securities financing agreements.

	Gross liability balance			
	2017		2016	
December 31, (in millions)	Securities sold under repurchase agreements	Securities loaned and other[b]	Securities sold under repurchase agreements	Securities loaned and other[b]
Mortgage-backed securities:				
U.S. government agencies[a]	**$ 13,100**	**$ –**	$ 14,034	$ –
Residential - nonagency	**2,972**	**–**	6,224	–
Commercial - nonagency	**1,594**	**–**	4,173	–
U.S. Treasury and government agencies[a]	**177,581**	**14**	185,145	–
Obligations of U.S. states and municipalities	**1,557**	**–**	2,491	–
Non-U.S. government debt	**170,196**	**2,485**	149,008	1,279
Corporate debt securities	**14,231**	**287**	18,140	108
Asset-backed securities	**3,508**	**–**	7,721	–
Equity securities	**13,479**	**24,442**	15,529	21,064
Total	**$ 398,218**	**$ 27,228**	$ 402,465	$ 22,451

	Remaining contractual maturity of the agreements				
2017 (in millions)	Overnight and continuous	Up to 30 days	30 – 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	**$ 166,425**	**$ 156,434**	**$ 41,611**	**$ 33,748**	**$ 398,218**
Total securities loaned and other[b]	**22,876**	**375**	**2,328**	**1,649**	**27,228**

	Remaining contractual maturity of the agreements				
2016 (in millions)	Overnight and continuous	Up to 30 days	30 – 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	$ 140,318	$ 157,860	$ 55,621	$ 48,666	$ 402,465
Total securities loaned and other[b]	13,586	1,371	2,877	4,617	22,451

(a) Prior period amounts were revised to conform with the current period presentation.
(b) Includes securities-for-securities lending transactions of $9.2 billion and $9.1 billion at December 31, 2017 and 2016, respectively, accounted for at fair value, where the Firm is acting as lender. These amounts are presented within accounts payable and other liabilities on the Consolidated balance sheets.

Transfers not qualifying for sale accounting

At December 31, 2017 and 2016, the Firm held $1.5 billion and $5.9 billion, respectively, of financial assets for which the rights have been transferred to third parties; however, the transfers did not qualify as a sale in accordance with U.S. GAAP. These transfers have been recognized as collateralized financing transactions. The transferred assets are recorded in trading assets and loans, and the corresponding liabilities are recorded predominantly in short-term borrowings on the Consolidated balance sheets.

Note 12 – Loans

Loan accounting framework

The accounting for a loan depends on management's strategy for the loan, and on whether the loan was credit-impaired at the date of acquisition. The Firm accounts for loans based on the following categories:

- Originated or purchased loans held-for-investment (i.e., "retained"), other than PCI loans
- Loans held-for-sale
- Loans at fair value
- PCI loans held-for-investment

The following provides a detailed accounting discussion of these loan categories:

Loans held-for-investment (other than PCI loans)

Originated or purchased loans held-for-investment, other than PCI loans, are recorded at the principal amount outstanding, net of the following: charge-offs; interest applied to principal (for loans accounted for on the cost recovery method); unamortized discounts and premiums; and net deferred loan fees or costs. Credit card loans also include billed finance charges and fees net of an allowance for uncollectible amounts.

Interest income

Interest income on performing loans held-for-investment, other than PCI loans, is accrued and recognized as interest income at the contractual rate of interest. Purchase price discounts or premiums, as well as net deferred loan fees or costs, are amortized into interest income over the contractual life of the loan to produce a level rate of return.

Nonaccrual loans

Nonaccrual loans are those on which the accrual of interest has been suspended. Loans (other than credit card loans and certain consumer loans insured by U.S. government agencies) are placed on nonaccrual status and considered nonperforming when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest has been in default for a period of 90 days or more, unless the loan is both well-secured and in the process of collection. A loan is determined to be past due when the minimum payment is not received from the borrower by the contractually specified due date or for certain loans (e.g., residential real estate loans), when a monthly payment is due and unpaid for 30 days or more. Finally, collateral-dependent loans are typically maintained on nonaccrual status.

On the date a loan is placed on nonaccrual status, all interest accrued but not collected is reversed against interest income. In addition, the amortization of deferred amounts is suspended. Interest income on nonaccrual loans may be recognized as cash interest payments are received (i.e., on a cash basis) if the recorded loan balance is deemed fully collectible; however, if there is doubt regarding the ultimate collectibility of the recorded loan balance, all interest cash receipts are applied to reduce the carrying value of the loan (the cost recovery method). For consumer loans, application of this policy typically results in the Firm recognizing interest income on nonaccrual consumer loans on a cash basis.

A loan may be returned to accrual status when repayment is reasonably assured and there has been demonstrated performance under the terms of the loan or, if applicable, the terms of the restructured loan.

As permitted by regulatory guidance, credit card loans are generally exempt from being placed on nonaccrual status; accordingly, interest and fees related to credit card loans continue to accrue until the loan is charged off or paid in full. However, the Firm separately establishes an allowance, which is offset against loans and charged to interest income, for the estimated uncollectible portion of accrued and billed interest and fee income on credit card loans. The allowance is established with a charge to interest income and is reported as an offset to loans.

Allowance for loan losses

The allowance for loan losses represents the estimated probable credit losses inherent in the held-for-investment loan portfolio at the balance sheet date and is recognized on the balance sheet as a contra asset, which brings the recorded investment to the net carrying value. Changes in the allowance for loan losses are recorded in the provision for credit losses on the Firm's Consolidated statements of income. See Note 13 for further information on the Firm's accounting policies for the allowance for loan losses.

Charge-offs

Consumer loans, other than risk-rated business banking and auto loans, and PCI loans, are generally charged off or charged down to the net realizable value of the underlying collateral (i.e., fair value less costs to sell), with an offset to the allowance for loan losses, upon reaching specified stages of delinquency in accordance with standards established by the FFIEC. Residential real estate loans and non-modified credit card loans are generally charged off no later than 180 days past due. Scored auto, student and modified credit card loans are charged off no later than 120 days past due.

Certain consumer loans will be charged off or charged down to their net realizable value earlier than the FFIEC charge-off standards in certain circumstances as follows:

- Loans modified in a TDR that are determined to be collateral-dependent.
- Loans to borrowers who have experienced an event that suggests a loss is either known or highly certain are subject to accelerated charge-off standards (e.g., residential real estate and auto loans are charged off within 60 days of receiving notification of a bankruptcy filing).
- Auto loans upon repossession of the automobile.

Other than in certain limited circumstances, the Firm typically does not recognize charge-offs on government-guaranteed loans.

Wholesale loans, risk-rated business banking loans and risk-rated auto loans are charged off when it is highly certain that a loss has been realized, including situations where a loan is determined to be both impaired and collateral-dependent. The determination of whether to recognize a charge-off includes many factors, including the prioritization of the Firm's claim in bankruptcy, expectations of the workout/restructuring of the loan and valuation of the borrower's equity or the loan collateral.

When a loan is charged down to the estimated net realizable value, the determination of the fair value of the collateral depends on the type of collateral (e.g., securities, real estate). In cases where the collateral is in the form of liquid securities, the fair value is based on quoted market prices or broker quotes. For illiquid securities or other financial assets, the fair value of the collateral is estimated using a discounted cash flow model.

For residential real estate loans, collateral values are based upon external valuation sources. When it becomes likely that a borrower is either unable or unwilling to pay, the Firm obtains a broker's price opinion of the home based on an exterior-only valuation ("exterior opinions"), which is then updated at least every six months thereafter. As soon as practicable after the Firm receives the property in satisfaction of a debt (e.g., by taking legal title or physical possession), the Firm generally obtains an appraisal based on an inspection that includes the interior of the home ("interior appraisals"). Exterior opinions and interior appraisals are discounted based upon the Firm's experience with actual liquidation values as compared with the estimated values provided by exterior opinions and interior appraisals, considering state-specific factors.

For commercial real estate loans, collateral values are generally based on appraisals from internal and external valuation sources. Collateral values are typically updated every six to twelve months, either by obtaining a new appraisal or by performing an internal analysis, in accordance with the Firm's policies. The Firm also considers both borrower- and market-specific factors, which may result in obtaining appraisal updates or broker price opinions at more frequent intervals.

Loans held-for-sale

Held-for-sale loans are measured at the lower of cost or fair value, with valuation changes recorded in noninterest revenue. For consumer loans, the valuation is performed on a portfolio basis. For wholesale loans, the valuation is performed on an individual loan basis.

Interest income on loans held-for-sale is accrued and recognized based on the contractual rate of interest.

Loan origination fees or costs and purchase price discounts or premiums are deferred in a contra loan account until the related loan is sold. The deferred fees or costs and discounts or premiums are an adjustment to the basis of the loan and therefore are included in the periodic determination of the lower of cost or fair value adjustments and/or the gain or loss recognized at the time of sale.

Held-for-sale loans are subject to the nonaccrual policies described above.

Because held-for-sale loans are recognized at the lower of cost or fair value, the Firm's allowance for loan losses and charge-off policies do not apply to these loans.

Loans at fair value

Loans used in a market-making strategy or risk managed on a fair value basis are measured at fair value, with changes in fair value recorded in noninterest revenue.

Interest income on these loans is accrued and recognized based on the contractual rate of interest. Changes in fair value are recognized in noninterest revenue. Loan origination fees are recognized upfront in noninterest revenue. Loan origination costs are recognized in the associated expense category as incurred.

Because these loans are recognized at fair value, the Firm's allowance for loan losses and charge-off policies do not apply to these loans.

See Note 3 for further information on the Firm's elections of fair value accounting under the fair value option. See Note 2 and Note 3 for further information on loans carried at fair value and classified as trading assets.

PCI loans

PCI loans held-for-investment are initially measured at fair value. PCI loans have evidence of credit deterioration since the loan's origination date and therefore it is probable, at acquisition, that all contractually required payments will not be collected. Because PCI loans are initially measured at fair value, which includes an estimate of future credit losses, no allowance for loan losses related to PCI loans is recorded at the acquisition date. See page 223 of this Note for information on accounting for PCI loans subsequent to their acquisition.

Loan classification changes

Loans in the held-for-investment portfolio that management decides to sell are transferred to the held-for-sale portfolio at the lower of cost or fair value on the date of transfer. Credit-related losses are charged against the allowance for loan losses; non-credit related losses such as those due to changes in interest rates or foreign currency exchange rates are recognized in noninterest revenue.

In the event that management decides to retain a loan in the held-for-sale portfolio, the loan is transferred to the held-for-investment portfolio at the lower of cost or fair value on the date of transfer. These loans are subsequently assessed for impairment based on the Firm's allowance methodology. For a further discussion of the methodologies used in establishing the Firm's allowance for loan losses, see Note 13.

Loan modifications

The Firm seeks to modify certain loans in conjunction with its loss-mitigation activities. Through the modification, JPMorgan Chase grants one or more concessions to a borrower who is experiencing financial difficulty in order to minimize the Firm's economic loss and avoid foreclosure or repossession of the collateral, and to ultimately maximize payments received by the Firm from the borrower. The concessions granted vary by program and by borrower-specific characteristics, and may include interest rate reductions, term extensions, payment deferrals, principal forgiveness, or the acceptance of equity or other assets in lieu of payments.

Such modifications are accounted for and reported as TDRs. A loan that has been modified in a TDR is generally considered to be impaired until it matures, is repaid, or is otherwise liquidated, regardless of whether the borrower performs under the modified terms. In certain limited cases, the effective interest rate applicable to the modified loan is at or above the current market rate at the time of the restructuring. In such circumstances, and assuming that the loan subsequently performs under its modified terms and the Firm expects to collect all contractual principal and interest cash flows, the loan is disclosed as impaired and as a TDR only during the year of the modification; in subsequent years, the loan is not disclosed as an impaired loan or as a TDR so long as repayment of the restructured loan under its modified terms is reasonably assured.

Loans, except for credit card loans, modified in a TDR are generally placed on nonaccrual status, although in many cases such loans were already on nonaccrual status prior to modification. These loans may be returned to performing status (the accrual of interest is resumed) if the following criteria are met: (i) the borrower has performed under the modified terms for a minimum of six months and/or six payments, and (ii) the Firm has an expectation that repayment of the modified loan is reasonably assured based on, for example, the borrower's debt capacity and level of future earnings, collateral values, LTV ratios, and other current market considerations. In certain limited and well-defined circumstances in which the loan is current at the modification date, such loans are not placed on nonaccrual status at the time of modification.

Because loans modified in TDRs are considered to be impaired, these loans are measured for impairment using the Firm's established asset-specific allowance methodology, which considers the expected re-default rates for the modified loans. A loan modified in a TDR generally remains subject to the asset-specific allowance methodology throughout its remaining life, regardless of whether the loan is performing and has been returned to accrual status and/or the loan has been removed from the impaired loans disclosures (i.e., loans restructured at market rates). For further discussion of the methodology used to estimate the Firm's asset-specific allowance, see Note 13.

Foreclosed property

The Firm acquires property from borrowers through loan restructurings, workouts, and foreclosures. Property acquired may include real property (e.g., residential real estate, land, and buildings) and commercial and personal property (e.g., automobiles, aircraft, railcars, and ships).

The Firm recognizes foreclosed property upon receiving assets in satisfaction of a loan (e.g., by taking legal title or physical possession). For loans collateralized by real property, the Firm generally recognizes the asset received at foreclosure sale or upon the execution of a deed in lieu of foreclosure transaction with the borrower. Foreclosed assets are reported in other assets on the Consolidated balance sheets and initially recognized at fair value less costs to sell. Each quarter the fair value of the acquired property is reviewed and adjusted, if necessary, to the lower of cost or fair value. Subsequent adjustments to fair value are charged/credited to noninterest revenue. Operating expense, such as real estate taxes and maintenance, are charged to other expense.

Loan portfolio

The Firm's loan portfolio is divided into three portfolio segments, which are the same segments used by the Firm to determine the allowance for loan losses: Consumer, excluding credit card; Credit card; and Wholesale. Within each portfolio segment the Firm monitors and assesses the credit risk in the following classes of loans, based on the risk characteristics of each loan class.

Consumer, excluding credit card[(a)]	Credit card	Wholesale[(f)]
Residential real estate – excluding PCI • Residential mortgage[(b)] • Home equity[(c)] Other consumer loans • Auto[(d)] • Consumer & Business Banking[(d)(e)] • Student Residential real estate – PCI • Home equity • Prime mortgage • Subprime mortgage • Option ARMs	• Credit card loans	• Commercial and industrial • Real estate • Financial institutions • Government agencies • Other[(g)]

(a) Includes loans held in CCB, prime mortgage and home equity loans held in AWM and prime mortgage loans held in Corporate.
(b) Predominantly includes prime (including option ARMs) and subprime loans.
(c) Includes senior and junior lien home equity loans.
(d) Includes certain business banking and auto dealer risk-rated loans that apply the wholesale methodology for determining the allowance for loan losses; these loans are managed by CCB, and therefore, for consistency in presentation, are included with the other consumer loan classes.
(e) Predominantly includes Business Banking loans.
(f) Includes loans held in CIB, CB, AWM and Corporate. Excludes prime mortgage and home equity loans held in AWM and prime mortgage loans held in Corporate. Classes are internally defined and may not align with regulatory definitions.
(g) Includes loans to: individuals; SPEs; and private education and civic organizations. For more information on SPEs, see Note 14.

The following tables summarize the Firm's loan balances by portfolio segment.

December 31, 2017 (in millions)	Consumer, excluding credit card	Credit card[(a)]	Wholesale	Total	
Retained	**$ 372,553**	**$ 149,387**	**$ 402,898**	**$ 924,838**	[(b)]
Held-for-sale	**128**	**124**	**3,099**	**3,351**	
At fair value	**–**	**–**	**2,508**	**2,508**	
Total	**$ 372,681**	**$ 149,511**	**$ 408,505**	**$ 930,697**	

December 31, 2016 (in millions)	Consumer, excluding credit card	Credit card[(a)]	Wholesale	Total	
Retained	$ 364,406	$ 141,711	$ 383,790	$ 889,907	[(b)]
Held-for-sale	238	105	2,285	2,628	
At fair value	–	–	2,230	2,230	
Total	$ 364,644	$ 141,816	$ 388,305	$ 894,765	

(a) Includes accrued interest and fees net of an allowance for the uncollectible portion of accrued interest and fee income.
(b) Loans (other than PCI loans and those for which the fair value option has been elected) are presented net of unamortized discounts and premiums and net deferred loan fees or costs. These amounts were not material as of December 31, 2017 and 2016.

The following table provides information about the carrying value of retained loans purchased, sold and reclassified to held-for-sale during the periods indicated. This table excludes loans recorded at fair value. The Firm manages its exposure to credit risk on an ongoing basis. Selling loans is one way that the Firm reduces its credit exposures.

Year ended December 31, (in millions)	2017 Consumer, excluding credit card	2017 Credit card	2017 Wholesale	2017 Total
Purchases	**$ 3,461** [a][b]	**$ –**	**$ 1,799**	**$ 5,260**
Sales	**3,405**	**–**	**11,063**	**14,468**
Retained loans reclassified to held-for-sale	**6,340** [c]	**–**	**1,229**	**7,569**

Year ended December 31, (in millions)	2016 Consumer, excluding credit card	2016 Credit card	2016 Wholesale	2016 Total
Purchases	$ 4,116 [a][b]	$ –	$ 1,448	$ 5,564
Sales	6,368	–	8,739	15,107
Retained loans reclassified to held-for-sale	321	–	2,381	2,702

Year ended December 31, (in millions)	2015 Consumer, excluding credit card	2015 Credit card	2015 Wholesale	2015 Total
Purchases	$ 5,279 [a][b]	$ –	$ 2,154	$ 7,433
Sales	5,099	–	9,188	14,287
Retained loans reclassified to held-for-sale	1,514	79	642	2,235

(a) Purchases predominantly represent the Firm's voluntary repurchase of certain delinquent loans from loan pools as permitted by Government National Mortgage Association ("Ginnie Mae") guidelines. The Firm typically elects to repurchase these delinquent loans as it continues to service them and/or manage the foreclosure process in accordance with applicable requirements of Ginnie Mae, FHA, RHS, and/or VA.
(b) Excludes purchases of retained loans sourced through the correspondent origination channel and underwritten in accordance with the Firm's standards. Such purchases were $23.5 billion, $30.4 billion and $50.3 billion for the years ended December 31, 2017, 2016 and 2015, respectively.
(c) Includes the Firm's student loan portfolio which was sold in 2017.

The following table provides information about gains and losses on loan sales, including lower of cost or fair value adjustments, on loan sales by portfolio segment.

Year ended December 31, (in millions)	2017	2016	2015
Net gains/(losses) on sales of loans (including lower of cost or fair value adjustments)[a]			
Consumer, excluding credit card[b]	**$ (126)**	$ 231	$ 305
Credit card	**(8)**	(12)	1
Wholesale	**41**	26	34
Total net gains/(losses) on sales of loans (including lower of cost or fair value adjustments)	**$ (93)**	$ 245	$ 340

(a) Excludes sales related to loans accounted for at fair value.
(b) Includes amounts related to the Firm's student loan portfolio which was sold in 2017.

Consumer, excluding credit card, loan portfolio

Consumer loans, excluding credit card loans, consist primarily of residential mortgages, home equity loans and lines of credit, auto loans, consumer and business banking loans and student loans, with a focus on serving the prime consumer credit market. The portfolio also includes home equity loans secured by junior liens, prime mortgage loans with an interest-only payment period, and certain payment-option loans that may result in negative amortization.

The table below provides information about retained consumer loans, excluding credit card, by class. In 2017, the Firm sold its student loan portfolio.

December 31, (in millions)	2017	2016
Residential real estate – excluding PCI		
Residential mortgage[(a)]	**$ 216,496**	$ 192,486
Home equity	**33,450**	39,063
Other consumer loans		
Auto	**66,242**	65,814
Consumer & Business Banking[(a)]	**25,789**	24,307
Student[(a)]	**–**	7,057
Residential real estate – PCI		
Home equity	**10,799**	12,902
Prime mortgage	**6,479**	7,602
Subprime mortgage	**2,609**	2,941
Option ARMs	**10,689**	12,234
Total retained loans	**$ 372,553**	$ 364,406

(a) Certain loan portfolios have been reclassified. The prior period amounts have been revised to conform with the current period presentation.

Delinquency rates are a primary credit quality indicator for consumer loans. Loans that are more than 30 days past due provide an early warning of borrowers who may be experiencing financial difficulties and/or who may be unable or unwilling to repay the loan. As the loan continues to age, it becomes more clear whether the borrower is likely either unable or unwilling to pay. In the case of residential real estate loans, late-stage delinquencies (greater than 150 days past due) are a strong indicator of loans that will ultimately result in a foreclosure or similar liquidation transaction. In addition to delinquency rates, other credit quality indicators for consumer loans vary based on the class of loan, as follows:

- For residential real estate loans, including both non-PCI and PCI portfolios, the current estimated LTV ratio, or the combined LTV ratio in the case of junior lien loans, is an indicator of the potential loss severity in the event of default. Additionally, LTV or combined LTV ratios can provide insight into a borrower's continued willingness to pay, as the delinquency rate of high-LTV loans tends to be greater than that for loans where the borrower has equity in the collateral. The geographic distribution of the loan collateral also provides insight as to the credit quality of the portfolio, as factors such as the regional economy, home price changes and specific events such as natural disasters, will affect credit quality. The borrower's current or "refreshed" FICO score is a secondary credit-quality indicator for certain loans, as FICO scores are an indication of the borrower's credit payment history. Thus, a loan to a borrower with a low FICO score (less than 660) is considered to be of higher risk than a loan to a borrower with a higher FICO score. Further, a loan to a borrower with a high LTV ratio and a low FICO score is at greater risk of default than a loan to a borrower that has both a high LTV ratio and a high FICO score.
- For scored auto and scored business banking loans, geographic distribution is an indicator of the credit performance of the portfolio. Similar to residential real estate loans, geographic distribution provides insights into the portfolio performance based on regional economic activity and events.
- Risk-rated business banking and auto loans are similar to wholesale loans in that the primary credit quality indicators are the risk rating that is assigned to the loan and whether the loans are considered to be criticized and/or nonaccrual. Risk ratings are reviewed on a regular and ongoing basis by Credit Risk Management and are adjusted as necessary for updated information about borrowers' ability to fulfill their obligations. For further information about risk-rated wholesale loan credit quality indicators, see page 228 of this Note.

Residential real estate – excluding PCI loans

The following table provides information by class for residential real estate – excluding retained PCI loans.

Residential real estate – excluding PCI loans

December 31, (in millions, except ratios)	Residential mortgage[g]		Home equity		Total residential real estate – excluding PCI	
	2017	2016	**2017**	2016	**2017**	2016
Loan delinquency[a]						
Current	**$ 208,713**	$ 184,133	**$ 32,391**	$ 37,941	**$ 241,104**	$ 222,074
30–149 days past due	**4,234**	3,828	**671**	646	**4,905**	4,474
150 or more days past due	**3,549**	4,525	**388**	476	**3,937**	5,001
Total retained loans	**$ 216,496**	$ 192,486	**$ 33,450**	$ 39,063	**$ 249,946**	$ 231,549
% of 30+ days past due to total retained loans[b]	**0.77%**	0.75%	**3.17%**	2.87%	**1.09%**	1.11%
90 or more days past due and government guaranteed[c]	**$ 4,172**	$ 4,858	**—**	—	**$ 4,172**	$ 4,858
Nonaccrual loans	**2,175**	2,256	**1,610**	1,845	**3,785**	4,101
Current estimated LTV ratios[d][e]						
Greater than 125% and refreshed FICO scores:						
Equal to or greater than 660	**$ 37**	$ 30	**$ 10**	$ 70	**$ 47**	$ 100
Less than 660	**19**	48	**3**	15	**22**	63
101% to 125% and refreshed FICO scores:						
Equal to or greater than 660	**36**	135	**296**	668	**332**	803
Less than 660	**88**	177	**95**	221	**183**	398
80% to 100% and refreshed FICO scores:						
Equal to or greater than 660	**4,369**	4,026	**1,676**	2,961	**6,045**	6,987
Less than 660	**483**	718	**569**	945	**1,052**	1,663
Less than 80% and refreshed FICO scores:						
Equal to or greater than 660	**194,758**	169,579	**25,262**	27,317	**220,020**	196,896
Less than 660	**6,952**	6,759	**3,850**	4,380	**10,802**	11,139
No FICO/LTV available	**1,259**	1,650	**1,689**	2,486	**2,948**	4,136
U.S. government-guaranteed	**8,495**	9,364	**—**	—	**8,495**	9,364
Total retained loans	**$ 216,496**	$ 192,486	**$ 33,450**	$ 39,063	**$ 249,946**	$ 231,549
Geographic region						
California	**$ 68,855**	$ 59,802	**$ 6,582**	$ 7,644	**$ 75,437**	$ 67,446
New York	**27,473**	24,916	**6,866**	7,978	**34,339**	32,894
Illinois	**14,501**	13,126	**2,521**	2,947	**17,022**	16,073
Texas	**12,508**	10,772	**2,021**	2,225	**14,529**	12,997
Florida	**9,598**	8,395	**1,847**	2,133	**11,445**	10,528
New Jersey	**7,142**	6,374	**1,957**	2,253	**9,099**	8,627
Washington	**6,962**	5,451	**1,026**	1,229	**7,988**	6,680
Colorado	**7,335**	6,306	**632**	677	**7,967**	6,983
Massachusetts	**6,323**	5,834	**295**	371	**6,618**	6,205
Arizona	**4,109**	3,595	**1,439**	1,772	**5,548**	5,367
All other[f]	**51,690**	47,915	**8,264**	9,834	**59,954**	57,749
Total retained loans	**$ 216,496**	$ 192,486	**$ 33,450**	$ 39,063	**$ 249,946**	$ 231,549

(a) Individual delinquency classifications include mortgage loans insured by U.S. government agencies as follows: current included $2.4 billion and $2.5 billion; 30-149 days past due included $3.2 billion and $3.1 billion; and 150 or more days past due included $2.9 billion and $3.8 billion at December 31, 2017 and 2016, respectively.

(b) At December 31, 2017 and 2016, residential mortgage loans excluded mortgage loans insured by U.S. government agencies of $6.1 billion and $6.9 billion, respectively, that are 30 or more days past due. These amounts have been excluded based upon the government guarantee.

(c) These balances, which are 90 days or more past due, were excluded from nonaccrual loans as the loans are guaranteed by U.S government agencies. Typically the principal balance of the loans is insured and interest is guaranteed at a specified reimbursement rate subject to meeting agreed-upon servicing guidelines. At December 31, 2017 and 2016, these balances included $1.5 billion and $2.2 billion, respectively, of loans that are no longer accruing interest based on the agreed-upon servicing guidelines. For the remaining balance, interest is being accrued at the guaranteed reimbursement rate. There were no loans that were not guaranteed by U.S. government agencies that are 90 or more days past due and still accruing interest at December 31, 2017 and 2016.

(d) Represents the aggregate unpaid principal balance of loans divided by the estimated current property value. Current property values are estimated, at a minimum, quarterly, based on home valuation models using nationally recognized home price index valuation estimates incorporating actual data to the extent available and forecasted data where actual data is not available. These property values do not represent actual appraised loan level collateral values; as such, the resulting ratios are necessarily imprecise and should be viewed as estimates. Current estimated combined LTV for junior lien home equity loans considers all available lien positions, as well as unused lines, related to the property.

(e) Refreshed FICO scores represent each borrower's most recent credit score, which is obtained by the Firm on at least a quarterly basis.

(f) At December 31, 2017 and 2016, included mortgage loans insured by U.S. government agencies of $8.5 billion and $9.4 billion, respectively.

(g) Certain loan portfolios have been reclassified. The prior period amounts have been revised to conform with the current period presentation.

The following table represents the Firm's delinquency statistics for junior lien home equity loans and lines as of December 31, 2017 and 2016.

December 31, (in millions except ratios)	Total loans 2017	Total loans 2016	Total 30+ day delinquency rate 2017	Total 30+ day delinquency rate 2016
HELOCs:[(a)]				
Within the revolving period[(b)]	**$ 6,363**	$ 10,304	**0.50%**	1.27%
Beyond the revolving period	**13,532**	13,272	**3.56**	3.05
HELOANs	**1,371**	1,861	**3.50**	2.85
Total	**$ 21,266**	$ 25,437	**2.64%**	2.32%

(a) These HELOCs are predominantly revolving loans for a 10-year period, after which time the HELOC converts to a loan with a 20-year amortization period, but also include HELOCs that allow interest-only payments beyond the revolving period.
(b) The Firm manages the risk of HELOCs during their revolving period by closing or reducing the undrawn line to the extent permitted by law when borrowers are experiencing financial difficulty.

HELOCs beyond the revolving period and HELOANs have higher delinquency rates than HELOCs within the revolving period. That is primarily because the fully-amortizing payment that is generally required for those products is higher than the minimum payment options available for HELOCs within the revolving period. The higher delinquency rates associated with amortizing HELOCs and HELOANs are factored into the Firm's allowance for loan losses.

Impaired loans

The table below sets forth information about the Firm's residential real estate impaired loans, excluding PCI loans. These loans are considered to be impaired as they have been modified in a TDR. All impaired loans are evaluated for an asset-specific allowance as described in Note 13.

December 31, (in millions)	Residential mortgage 2017	Residential mortgage 2016	Home equity 2017	Home equity 2016	Total residential real estate – excluding PCI 2017	Total residential real estate – excluding PCI 2016
Impaired loans						
With an allowance	**$ 4,407**	$ 4,689	**$ 1,236**	$ 1,266	**$ 5,643**	$ 5,955
Without an allowance[(a)]	**1,213**	1,343	**882**	998	**2,095**	2,341
Total impaired loans[(b)(c)]	**$ 5,620**	$ 6,032	**$ 2,118**	$ 2,264	**$ 7,738**	$ 8,296
Allowance for loan losses related to impaired loans	**$ 62**	$ 68	**$ 111**	$ 121	**$ 173**	$ 189
Unpaid principal balance of impaired loans[(d)]	**7,741**	8,285	**3,701**	3,847	**11,442**	12,132
Impaired loans on nonaccrual status[(e)]	**1,743**	1,755	**1,032**	1,116	**2,775**	2,871

(a) Represents collateral-dependent residential real estate loans that are charged off to the fair value of the underlying collateral less costs to sell. The Firm reports, in accordance with regulatory guidance, residential real estate loans that have been discharged under Chapter 7 bankruptcy and not reaffirmed by the borrower ("Chapter 7 loans") as collateral-dependent nonaccrual TDRs, regardless of their delinquency status. At December 31, 2017, Chapter 7 residential real estate loans included approximately 12% of home equity and 15% of residential mortgages that were 30 days or more past due.
(b) At December 31, 2017 and 2016, $3.8 billion and $3.4 billion, respectively, of loans modified subsequent to repurchase from Ginnie Mae in accordance with the standards of the appropriate government agency (i.e., FHA, VA, RHS) are not included in the table above. When such loans perform subsequent to modification in accordance with Ginnie Mae guidelines, they are generally sold back into Ginnie Mae loan pools. Modified loans that do not re-perform become subject to foreclosure.
(c) Predominantly all residential real estate impaired loans, excluding PCI loans, are in the U.S.
(d) Represents the contractual amount of principal owed at December 31, 2017 and 2016. The unpaid principal balance differs from the impaired loan balances due to various factors including charge-offs, net deferred loan fees or costs, and unamortized discounts or premiums on purchased loans.
(e) As of December 31, 2017 and 2016, nonaccrual loans included $2.2 billion and $2.3 billion, respectively, of TDRs for which the borrowers were less than 90 days past due. For additional information about loans modified in a TDR that are on nonaccrual status refer to the Loan accounting framework on pages 211–213 of this Note.

The following table presents average impaired loans and the related interest income reported by the Firm.

Year ended December 31, (in millions)	Average impaired loans			Interest income on impaired loans[(a)]			Interest income on impaired loans on a cash basis[(a)]		
	2017	2016	2015	**2017**	2016	2015	**2017**	2016	2015
Residential mortgage	**$ 5,797**	$ 6,376	$ 7,697	**$ 287**	$ 305	$ 348	**$ 75**	$ 77	$ 87
Home equity	**2,189**	2,311	2,369	**127**	125	128	**80**	80	85
Total residential real estate – excluding PCI	**$ 7,986**	$ 8,687	$ 10,066	**$ 414**	$ 430	$ 476	**$ 155**	$ 157	$ 172

(a) Generally, interest income on loans modified in TDRs is recognized on a cash basis until such time as the borrower has made a minimum of six payments under the new terms, unless the loan is deemed to be collateral-dependent.

Loan modifications

Modifications of residential real estate loans, excluding PCI loans, are generally accounted for and reported as TDRs. There were no additional commitments to lend to borrowers whose residential real estate loans, excluding PCI loans, have been modified in TDRs.

The following table presents new TDRs reported by the Firm.

Year ended December 31, (in millions)	**2017**	2016	2015
Residential mortgage	**$ 373**	$ 254	$ 267
Home equity	**321**	385	401
Total residential real estate – excluding PCI	**$ 694**	$ 639	$ 668

Nature and extent of modifications

The U.S. Treasury's Making Home Affordable programs, as well as the Firm's proprietary modification programs, generally provide various concessions to financially troubled borrowers including, but not limited to, interest rate reductions, term or payment extensions and deferral of principal and/or interest payments that would otherwise have been required under the terms of the original agreement.

The following table provides information about how residential real estate loans, excluding PCI loans, were modified under the Firm's loss mitigation programs described above during the periods presented. This table excludes Chapter 7 loans where the sole concession granted is the discharge of debt.

	Residential mortgage			Home equity			Total residential real estate – excluding PCI		
Year ended December 31,	**2017**	**2016**	**2015**	**2017**	2016	2015	**2017**	2016	2015
Number of loans approved for a trial modification	**1,283**	1,945	2,711	**2,321**	3,760	3,933	**3,604**	5,705	6,644
Number of loans permanently modified	**2,628**	3,338	3,145	**5,624**	4,824	4,296	**8,252**	8,162	7,441
Concession granted:[(a)]									
Interest rate reduction	**63%**	76%	71%	**59%**	75%	66%	**60%**	76%	68%
Term or payment extension	**72**	90	81	**69**	83	89	**70**	86	86
Principal and/or interest deferred	**15**	16	27	**10**	19	23	**12**	18	24
Principal forgiveness	**16**	26	28	**13**	9	7	**14**	16	16
Other[(b)]	**33**	25	11	**31**	6	–	**32**	14	5

(a) Represents concessions granted in permanent modifications as a percentage of the number of loans permanently modified. The sum of the percentages exceeds 100% because predominantly all of the modifications include more than one type of concession. A significant portion of trial modifications include interest rate reductions and/or term or payment extensions.
(b) Predominantly represents variable interest rate to fixed interest rate modifications.

Financial effects of modifications and redefaults

The following table provides information about the financial effects of the various concessions granted in modifications of residential real estate loans, excluding PCI, under the loss mitigation programs described above and about redefaults of certain loans modified in TDRs for the periods presented. The following table presents only the final financial effects of permanent modifications and does not include temporary concessions offered through trial modifications. This table also excludes Chapter 7 loans where the sole concession granted is the discharge of debt.

Year ended December 31, (in millions, except weighted-average data and number of loans)	Residential mortgage			Home equity			Total residential real estate – excluding PCI		
	2017	2016	2015	**2017**	2016	2015	**2017**	2016	2015
Weighted-average interest rate of loans with interest rate reductions – before TDR	**5.15%**	5.59%	5.67%	**4.94%**	4.99%	5.20%	**5.06%**	5.36%	5.51%
Weighted-average interest rate of loans with interest rate reductions – after TDR	**2.99**	2.93	2.79	**2.64**	2.34	2.35	**2.83**	2.70	2.64
Weighted-average remaining contractual term (in years) of loans with term or payment extensions – before TDR	**24**	24	25	**21**	18	18	**23**	22	22
Weighted-average remaining contractual term (in years) of loans with term or payment extensions – after TDR	**38**	38	37	**39**	38	35	**38**	38	36
Charge-offs recognized upon permanent modification	**$ 2**	$ 4	$ 11	**$ 1**	$ 1	$ 4	**$ 3**	$ 5	$ 15
Principal deferred	**12**	30	58	**10**	23	27	**22**	53	85
Principal forgiven	**20**	44	66	**13**	7	6	**33**	51	72
Balance of loans that redefaulted within one year of permanent modification[(a)]	**$ 124**	$ 98	$ 133	**$ 56**	$ 40	$ 21	**$ 180**	$ 138	$ 154

(a) Represents loans permanently modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The dollar amounts presented represent the balance of such loans at the end of the reporting period in which such loans defaulted. For residential real estate loans modified in TDRs, payment default is deemed to occur when the loan becomes two contractual payments past due. In the event that a modified loan redefaults, it is probable that the loan will ultimately be liquidated through foreclosure or another similar type of liquidation transaction. Redefaults of loans modified within the last 12 months may not be representative of ultimate redefault levels.

At December 31, 2017, the weighted-average estimated remaining lives of residential real estate loans, excluding PCI loans, permanently modified in TDRs were 14 years for residential mortgage and 10 years for home equity. The estimated remaining lives of these loans reflect estimated prepayments, both voluntary and involuntary (i.e., foreclosures and other forced liquidations).

Active and suspended foreclosure

At December 31, 2017 and 2016, the Firm had non-PCI residential real estate loans, excluding those insured by U.S. government agencies, with a carrying value of $787 million and $932 million, respectively, that were not included in REO, but were in the process of active or suspended foreclosure.

Other consumer loans

The table below provides information for other consumer retained loan classes, including auto and business banking loans. This table excludes student loans that were sold in 2017.

December 31, (in millions, except ratios)	Auto		Consumer & Business Banking[c]	
	2017	2016	**2017**	2016
Loan delinquency				
Current	**$ 65,651**	$ 65,029	**$ 25,454**	$ 23,920
30–119 days past due	**584**	773	**213**	247
120 or more days past due	**7**	12	**122**	140
Total retained loans	**$ 66,242**	$ 65,814	**$ 25,789**	$ 24,307
% of 30+ days past due to total retained loans	**0.89%**	1.19%	**1.30%**	1.59%
Nonaccrual loans[a]	**141**	214	**283**	287
Geographic region				
California	**$ 8,445**	$ 7,975	**$ 5,032**	$ 4,426
Texas	**7,013**	7,041	**2,916**	2,954
New York	**4,023**	4,078	**4,195**	3,979
Illinois	**3,916**	3,984	**2,017**	1,758
Florida	**3,350**	3,374	**1,424**	1,195
Arizona	**2,221**	2,209	**1,383**	1,307
Ohio	**2,105**	2,194	**1,380**	1,402
Michigan	**1,418**	1,567	**1,357**	1,343
New Jersey	**2,044**	2,031	**721**	623
Louisiana	**1,656**	1,814	**849**	979
All other	**30,051**	29,547	**4,515**	4,341
Total retained loans	**$ 66,242**	$ 65,814	**$ 25,789**	$ 24,307
Loans by risk ratings[b]				
Noncriticized	**$ 15,604**	$ 13,899	**$ 17,938**	$ 16,858
Criticized performing	**93**	201	**791**	816
Criticized nonaccrual	**9**	94	**213**	217

(a) There were no loans that were 90 or more days past due and still accruing interest at December 31, 2017, and December 31, 2016.
(b) For risk-rated business banking and auto loans, the primary credit quality indicator is the risk rating of the loan, including whether the loans are considered to be criticized and/or nonaccrual.
(c) Certain loan portfolios have been reclassified. The prior period amounts have been revised to conform with the current period presentation.

Other consumer impaired loans and loan modifications

The following table sets forth information about the Firm's other consumer impaired loans, including risk-rated business banking and auto loans that have been placed on nonaccrual status, and loans that have been modified in TDRs.

December 31, (in millions)	2017	2016
Impaired loans		
With an allowance	**$ 272**	$ 614
Without an allowance[a]	**26**	30
Total impaired loans[b][c]	**$ 298**	$ 644
Allowance for loan losses related to impaired loans	**$ 73**	$ 119
Unpaid principal balance of impaired loans[d]	**402**	753
Impaired loans on nonaccrual status	**268**	508

(a) When discounted cash flows, collateral value or market price equals or exceeds the recorded investment in the loan, the loan does not require an allowance. This typically occurs when the impaired loans have been partially charged off and/or there have been interest payments received and applied to the loan balance.
(b) Predominantly all other consumer impaired loans are in the U.S.
(c) Other consumer average impaired loans were $427 million, $635 million and $566 million for the years ended December 31, 2017, 2016 and 2015, respectively. The related interest income on impaired loans, including those on a cash basis, was not material for the years ended December 31, 2017, 2016 and 2015.
(d) Represents the contractual amount of principal owed at December 31, 2017 and 2016. The unpaid principal balance differs from the impaired loan balances due to various factors, including charge-offs, interest payments received and applied to the principal balance, net deferred loan fees or costs and unamortized discounts or premiums on purchased loans.

Loan modifications

Certain other consumer loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. All of these TDRs are reported as impaired loans. The following table provides information about the Firm's other consumer loans modified in TDRs. New TDRs were not material for the years ended December 31, 2017 and 2016.

December 31, (in millions)	2017	2016
Loans modified in TDRs[a][b]	**$ 102**	$ 362
TDRs on nonaccrual status	**72**	226

(a) The impact of these modifications was not material to the Firm for the years ended December 31, 2017 and 2016.
(b) Additional commitments to lend to borrowers whose loans have been modified in TDRs as of December 31, 2017 and 2016 were immaterial.

Purchased credit-impaired loans

PCI loans are initially recorded at fair value at acquisition. PCI loans acquired in the same fiscal quarter may be aggregated into one or more pools, provided that the loans have common risk characteristics. A pool is then accounted for as a single asset with a single composite interest rate and an aggregate expectation of cash flows. With respect to the Washington Mutual transaction, all of the consumer PCI loans were aggregated into pools of loans with common risk characteristics.

On a quarterly basis, the Firm estimates the total cash flows (both principal and interest) expected to be collected over the remaining life of each pool. These estimates incorporate assumptions regarding default rates, loss severities, the amounts and timing of prepayments and other factors that reflect then-current market conditions. Probable decreases in expected cash flows (i.e., increased credit losses) trigger the recognition of impairment, which is then measured as the present value of the expected principal loss plus any related forgone interest cash flows, discounted at the pool's effective interest rate. Impairments are recognized through the provision for credit losses and an increase in the allowance for loan losses. Probable and significant increases in expected cash flows (e.g., decreased credit losses, the net benefit of modifications) would first reverse any previously recorded allowance for loan losses with any remaining increases recognized prospectively as a yield adjustment over the remaining estimated lives of the underlying loans. The impacts of (i) prepayments, (ii) changes in variable interest rates, and (iii) any other changes in the timing of expected cash flows are generally recognized prospectively as adjustments to interest income.

The Firm continues to modify certain PCI loans. The impact of these modifications is incorporated into the Firm's quarterly assessment of whether a probable and significant change in expected cash flows has occurred, and the loans continue to be accounted for and reported as PCI loans. In evaluating the effect of modifications on expected cash flows, the Firm incorporates the effect of any forgone interest and also considers the potential for redefault. The Firm develops product-specific probability of default estimates, which are used to compute expected credit losses. In developing these probabilities of default, the Firm considers the relationship between the credit quality characteristics of the underlying loans and certain assumptions about home prices and unemployment based upon industry-wide data. The Firm also considers its own historical loss experience to-date based on actual redefaulted modified PCI loans.

The excess of cash flows expected to be collected over the carrying value of the underlying loans is referred to as the accretable yield. This amount is not reported on the Firm's Consolidated balance sheets but is accreted into interest income at a level rate of return over the remaining estimated lives of the underlying pools of loans.

If the timing and/or amounts of expected cash flows on PCI loan pools were determined not to be reasonably estimable, no interest would be accreted and the loan pools would be reported as nonaccrual loans; however, since the timing and amounts of expected cash flows for the Firm's PCI consumer loan pools are reasonably estimable, interest is being accreted and the loan pools are being reported as performing loans.

The liquidation of PCI loans, which may include sales of loans, receipt of payment in full from the borrower, or foreclosure, results in removal of the loans from the underlying PCI pool. When the amount of the liquidation proceeds (e.g., cash, real estate), if any, is less than the unpaid principal balance of the loan, the difference is first applied against the PCI pool's nonaccretable difference for principal losses (i.e., the lifetime credit loss estimate established as a purchase accounting adjustment at the acquisition date). When the nonaccretable difference for a particular loan pool has been fully depleted, any excess of the unpaid principal balance of the loan over the liquidation proceeds is written off against the PCI pool's allowance for loan losses. Write-offs of PCI loans also include other adjustments, primarily related to interest forgiveness modifications. Because the Firm's PCI loans are accounted for at a pool level, the Firm does not recognize charge-offs of PCI loans when they reach specified stages of delinquency (i.e., unlike non-PCI consumer loans, these loans are not charged off based on FFIEC standards).

The PCI portfolio affects the Firm's results of operations primarily through: (i) contribution to net interest margin; (ii) expense related to defaults and servicing resulting from the liquidation of the loans; and (iii) any provision for loan losses. The PCI loans acquired in the Washington Mutual transaction were funded based on the interest rate characteristics of the loans. For example, variable-rate loans were funded with variable-rate liabilities and fixed-rate loans were funded with fixed-rate liabilities with a similar maturity profile. A net spread will be earned on the declining balance of the portfolio, which is estimated as of December 31, 2017, to have a remaining weighted-average life of 9 years.

Residential real estate – PCI loans

The table below sets forth information about the Firm's consumer, excluding credit card, PCI loans.

December 31, (in millions, except ratios)	Home equity		Prime mortgage		Subprime mortgage		Option ARMs		Total PCI	
	2017	2016	**2017**	2016	**2017**	2016	**2017**	2016	**2017**	2016
Carrying value[(a)]	**$10,799**	$12,902	**$ 6,479**	$ 7,602	**$ 2,609**	$ 2,941	**$10,689**	$12,234	**$30,576**	$35,679
Related allowance for loan losses[(b)]	**1,133**	1,433	**863**	829	**150**	–	**79**	49	**2,225**	2,311
Loan delinquency (based on unpaid principal balance)										
Current	**$10,272**	$12,423	**$ 5,839**	$ 6,840	**$ 2,640**	$ 3,005	**$ 9,662**	$11,074	**$28,413**	$33,342
30–149 days past due	**356**	291	**336**	336	**381**	361	**547**	555	**1,620**	1,543
150 or more days past due	**392**	478	**327**	451	**176**	240	**689**	917	**1,584**	2,086
Total loans	**$11,020**	$13,192	**$ 6,502**	$ 7,627	**$ 3,197**	$ 3,606	**$10,898**	$12,546	**$31,617**	$36,971
% of 30+ days past due to total loans	**6.79%**	5.83%	**10.20%**	10.32%	**17.42%**	16.67%	**11.34%**	11.73%	**10.13%**	9.82%
Current estimated LTV ratios (based on unpaid principal balance)[(c)(d)]										
Greater than 125% and refreshed FICO scores:										
Equal to or greater than 660	**$ 33**	$ 69	**$ 4**	$ 6	**$ 2**	$ 7	**$ 6**	$ 12	**$ 45**	$ 94
Less than 660	**21**	39	**16**	17	**20**	31	**9**	18	**66**	105
101% to 125% and refreshed FICO scores:										
Equal to or greater than 660	**274**	555	**16**	52	**20**	39	**43**	83	**353**	729
Less than 660	**132**	256	**42**	84	**75**	135	**71**	144	**320**	619
80% to 100% and refreshed FICO scores:										
Equal to or greater than 660	**1,195**	1,860	**221**	442	**119**	214	**316**	558	**1,851**	3,074
Less than 660	**559**	804	**230**	381	**309**	439	**371**	609	**1,469**	2,233
Lower than 80% and refreshed FICO scores:										
Equal to or greater than 660	**6,134**	6,676	**3,551**	3,967	**895**	919	**6,113**	6,754	**16,693**	18,316
Less than 660	**2,095**	2,183	**2,103**	2,287	**1,608**	1,645	**3,499**	3,783	**9,305**	9,898
No FICO/LTV available	**577**	750	**319**	391	**149**	177	**470**	585	**1,515**	1,903
Total unpaid principal balance	**$11,020**	$13,192	**$ 6,502**	$ 7,627	**$ 3,197**	$ 3,606	**$10,898**	$12,546	**$31,617**	$36,971
Geographic region (based on unpaid principal balance)										
California	**$ 6,555**	$ 7,899	**$ 3,716**	$ 4,396	**$ 797**	$ 899	**$ 6,225**	$ 7,128	**$17,293**	$20,322
Florida	**1,137**	1,306	**428**	501	**296**	332	**878**	1,026	**2,739**	3,165
New York	**607**	697	**457**	515	**330**	363	**628**	711	**2,022**	2,286
Washington	**532**	673	**135**	167	**61**	68	**238**	290	**966**	1,198
Illinois	**273**	314	**200**	226	**161**	178	**249**	282	**883**	1,000
New Jersey	**242**	280	**178**	210	**110**	125	**336**	401	**866**	1,016
Massachusetts	**79**	94	**149**	173	**98**	110	**307**	346	**633**	723
Maryland	**57**	64	**129**	144	**132**	145	**232**	267	**550**	620
Arizona	**203**	241	**106**	124	**60**	68	**156**	181	**525**	614
Virginia	**66**	77	**123**	142	**51**	56	**280**	314	**520**	589
All other	**1,269**	1,547	**881**	1,029	**1,101**	1,262	**1,369**	1,600	**4,620**	5,438
Total unpaid principal balance	**$11,020**	$13,192	**$ 6,502**	$ 7,627	**$ 3,197**	$ 3,606	**$10,898**	$12,546	**$31,617**	$36,971

(a) Carrying value includes the effect of fair value adjustments that were applied to the consumer PCI portfolio at the date of acquisition.

(b) Management concluded, as part of the Firm's regular assessment of the PCI loan pools, that it was probable that higher expected credit losses would result in a decrease in expected cash flows. As a result, an allowance for loan losses for impairment of these pools has been recognized.

(c) Represents the aggregate unpaid principal balance of loans divided by the estimated current property value. Current property values are estimated, at a minimum, quarterly, based on home valuation models using nationally recognized home price index valuation estimates incorporating actual data to the extent available and forecasted data where actual data is not available. These property values do not represent actual appraised loan level collateral values; as such, the resulting ratios are necessarily imprecise and should be viewed as estimates. Current estimated combined LTV for junior lien home equity loans considers all available lien positions, as well as unused lines, related to the property.

(d) Refreshed FICO scores represent each borrower's most recent credit score, which is obtained by the Firm on at least a quarterly basis.

Approximately 25% of the PCI home equity portfolio are senior lien loans; the remaining balance are junior lien HELOANs or HELOCs. The following table sets forth delinquency statistics for PCI junior lien home equity loans and lines of credit based on the unpaid principal balance as of December 31, 2017 and 2016.

December 31,	Total loans		Total 30+ day delinquency rate	
	2017	2016	**2017**	2016
(in millions, except ratios)				
HELOCs:[(a)]				
Within the revolving period[(b)]	**$ 51**	$ 2,126	**1.96%**	3.67%
Beyond the revolving period[(c)]	**7,875**	7,452	**4.63**	4.03
HELOANs	**360**	465	**5.28**	5.38
Total	**$ 8,286**	$ 10,043	**4.65%**	4.01%

(a) In general, these HELOCs are revolving loans for a 10-year period, after which time the HELOC converts to an interest-only loan with a balloon payment at the end of the loan's term.
(b) Substantially all undrawn HELOCs within the revolving period have been closed.
(c) Includes loans modified into fixed rate amortizing loans.

The table below sets forth the accretable yield activity for the Firm's PCI consumer loans for the years ended December 31, 2017, 2016 and 2015, and represents the Firm's estimate of gross interest income expected to be earned over the remaining life of the PCI loan portfolios. The table excludes the cost to fund the PCI portfolios, and therefore the accretable yield does not represent net interest income expected to be earned on these portfolios.

Year ended December 31, (in millions, except ratios)	Total PCI		
	2017	2016	2015
Beginning balance	**$ 11,768**	$ 13,491	$ 14,592
Accretion into interest income	**(1,396)**	(1,555)	(1,700)
Changes in interest rates on variable-rate loans	**503**	260	279
Other changes in expected cash flows[(a)]	**284**	(428)	230
Reclassification from nonaccretable difference[(b)]	**–**	–	90
Balance at December 31	**$ 11,159**	$ 11,768	$ 13,491
Accretable yield percentage	**4.53%**	4.35%	4.20%

(a) Other changes in expected cash flows may vary from period to period as the Firm continues to refine its cash flow model, for example cash flows expected to be collected due to the impact of modifications and changes in prepayment assumptions.
(b) Reclassifications from the nonaccretable difference in the year ended December 31, 2015 were driven by continued improvement in home prices and delinquencies, as well as increased granularity in the impairment estimates.

Active and suspended foreclosure

At December 31, 2017 and 2016, the Firm had PCI residential real estate loans with an unpaid principal balance of $1.3 billion and $1.7 billion, respectively, that were not included in REO, but were in the process of active or suspended foreclosure.

Credit card loan portfolio

The credit card portfolio segment includes credit card loans originated and purchased by the Firm. Delinquency rates are the primary credit quality indicator for credit card loans as they provide an early warning that borrowers may be experiencing difficulties (30 days past due); information on those borrowers that have been delinquent for a longer period of time (90 days past due) is also considered. In addition to delinquency rates, the geographic distribution of the loans provides insight as to the credit quality of the portfolio based on the regional economy.

While the borrower's credit score is another general indicator of credit quality, the Firm does not view credit scores as a primary indicator of credit quality because the borrower's credit score tends to be a lagging indicator. The distribution of such scores provides a general indicator of credit quality trends within the portfolio; however, the score does not capture all factors that would be predictive of future credit performance. Refreshed FICO score information, which is obtained at least quarterly, for a statistically significant random sample of the credit card portfolio is indicated in the following table. FICO is considered to be the industry benchmark for credit scores.

The Firm generally originates new card accounts to prime consumer borrowers. However, certain cardholders' FICO scores may decrease over time, depending on the performance of the cardholder and changes in credit score calculation.

The table below sets forth information about the Firm's credit card loans.

As of or for the year ended December 31, (in millions, except ratios)	2017	2016
Net charge-offs	**$ 4,123**	$ 3,442
% of net charge-offs to retained loans	**2.95%**	2.63%
Loan delinquency		
Current and less than 30 days past due and still accruing	**$ 146,704**	$ 139,434
30–89 days past due and still accruing	**1,305**	1,134
90 or more days past due and still accruing	**1,378**	1,143
Total retained credit card loans	**$ 149,387**	$ 141,711
Loan delinquency ratios		
% of 30+ days past due to total retained loans	**1.80%**	1.61%
% of 90+ days past due to total retained loans	**0.92**	0.81
Credit card loans by geographic region		
California	**$ 22,245**	$ 20,571
Texas	**14,200**	13,220
New York	**13,021**	12,249
Florida	**9,138**	8,585
Illinois	**8,585**	8,189
New Jersey	**6,506**	6,271
Ohio	**4,997**	4,906
Pennsylvania	**4,883**	4,787
Colorado	**4,006**	3,699
Michigan	**3,826**	3,741
All other	**57,980**	55,493
Total retained credit card loans	**$ 149,387**	$ 141,711
Percentage of portfolio based on carrying value with estimated refreshed FICO scores		
Equal to or greater than 660	**84.0%**	84.4%
Less than 660	**14.6**	14.2
No FICO available	**1.4**	1.4

Credit card impaired loans and loan modifications

The table below sets forth information about the Firm's impaired credit card loans. All of these loans are considered to be impaired as they have been modified in TDRs.

December 31, (in millions)	2017	2016
Impaired credit card loans with an allowance[(a)(b)]		
Credit card loans with modified payment terms[(c)]	**$ 1,135**	$ 1,098
Modified credit card loans that have reverted to pre-modification payment terms[(d)]	**80**	142
Total impaired credit card loans[(e)]	**$ 1,215**	$ 1,240
Allowance for loan losses related to impaired credit card loans	**$ 383**	$ 358

(a) The carrying value and the unpaid principal balance are the same for credit card impaired loans.
(b) There were no impaired loans without an allowance.
(c) Represents credit card loans outstanding to borrowers enrolled in a credit card modification program as of the date presented.
(d) Represents credit card loans that were modified in TDRs but that have subsequently reverted back to the loans' pre-modification payment terms. At December 31, 2017 and 2016, $43 million and $94 million, respectively, of loans have reverted back to the pre-modification payment terms of the loans due to noncompliance with the terms of the modified loans. The remaining $37 million and $48 million at December 31, 2017 and 2016, respectively, of these loans are to borrowers who have successfully completed a short-term modification program. The Firm continues to report these loans as TDRs since the borrowers' credit lines remain closed.
(e) Predominantly all impaired credit card loans are in the U.S.

The following table presents average balances of impaired credit card loans and interest income recognized on those loans.

Year ended December 31, (in millions)	2017	2016	2015
Average impaired credit card loans	**$ 1,214**	$ 1,325	$ 1,710
Interest income on impaired credit card loans	**59**	63	82

Loan modifications

JPMorgan Chase may offer one of a number of loan modification programs to credit card borrowers who are experiencing financial difficulty. Most of the credit card loans have been modified under long-term programs for borrowers who are experiencing financial difficulties. Modifications under long-term programs involve placing the customer on a fixed payment plan, generally for 60 months. The Firm may also offer short-term programs for borrowers who may be in need of temporary relief; however, none are currently being offered. Modifications under all short- and long-term programs typically include reducing the interest rate on the credit card. Substantially all modifications are considered to be TDRs.

If the cardholder does not comply with the modified payment terms, then the credit card loan continues to age and will ultimately be charged-off in accordance with the Firm's standard charge-off policy. In most cases, the Firm does not reinstate the borrower's line of credit.

New enrollments in these loan modification programs for the years ended December 31, 2017, 2016 and 2015, were $756 million, $636 million and $638 million, respectively.

Financial effects of modifications and redefaults

The following table provides information about the financial effects of the concessions granted on credit card loans modified in TDRs and redefaults for the periods presented.

Year ended December 31, (in millions, except weighted-average data)	2017	2016	2015
Weighted-average interest rate of loans – before TDR	**16.58%**	15.56%	15.08%
Weighted-average interest rate of loans – after TDR	**4.88**	4.76	4.40
Loans that redefaulted within one year of modification[(a)]	**$ 75**	$ 79	$ 85

(a) Represents loans modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The amounts presented represent the balance of such loans as of the end of the quarter in which they defaulted.

For credit card loans modified in TDRs, a substantial portion of these loans are expected to be charged-off in accordance with the Firm's standard charge-off policy. Based on historical experience, the estimated weighted-average default rate for modified credit card loans was expected to be 31.54%, 28.87% and 25.61% as of December 31, 2017, 2016 and 2015, respectively.

Wholesale loan portfolio

Wholesale loans include loans made to a variety of clients, ranging from large corporate and institutional clients to high-net-worth individuals.

The primary credit quality indicator for wholesale loans is the risk rating assigned to each loan. Risk ratings are used to identify the credit quality of loans and differentiate risk within the portfolio. Risk ratings on loans consider the PD and the LGD. The PD is the likelihood that a loan will default. The LGD is the estimated loss on the loan that would be realized upon the default of the borrower and takes into consideration collateral and structural support for each credit facility.

Management considers several factors to determine an appropriate risk rating, including the obligor's debt capacity and financial flexibility, the level of the obligor's earnings, the amount and sources for repayment, the level and nature of contingencies, management strength, and the industry and geography in which the obligor operates. The Firm's definition of criticized aligns with the banking regulatory definition of criticized exposures, which consist of special mention, substandard and doubtful categories. Risk ratings generally represent ratings profiles similar to those defined by S&P and Moody's. Investment-grade ratings range from "AAA/Aaa" to "BBB-/Baa3." Noninvestment-grade ratings are classified as noncriticized ("BB+/Ba1 and B-/B3") and criticized ("CCC+"/"Caa1 and below"), and the criticized portion is further subdivided into performing and nonaccrual loans, representing management's assessment of the collectibility of principal and interest. Criticized loans have a higher probability of default than noncriticized loans.

Risk ratings are reviewed on a regular and ongoing basis by Credit Risk Management and are adjusted as necessary for updated information affecting the obligor's ability to fulfill its obligations.

As noted above, the risk rating of a loan considers the industry in which the obligor conducts its operations. As part of the overall credit risk management framework, the Firm focuses on the management and diversification of its industry and client exposures, with particular attention paid to industries with actual or potential credit concern. See Note 4 for further detail on industry concentrations.

The table below provides information by class of receivable for the retained loans in the Wholesale portfolio segment.

In 2017 the Firm revised its methodology for the assignment of industry classifications, to better monitor and manage concentrations. This largely resulted in the re-assignment of holding companies from Other to the industry of risk category based on the primary business activity of the holding company's underlying entities. In the tables and industry discussions below, the prior period amounts have been revised to conform with the current period presentation.

Below are summaries of the Firm's exposures as of December 31, 2017 and 2016. For additional information on industry concentrations, see Note 4.

As of or for the year ended December 31, (in millions, except ratios)	Commercial and industrial		Real estate		Financial institutions		Government agencies		Other[d]		Total retained loans	
	2017	2016	**2017**	2016	**2017**	2016	**2017**	2016	**2017**	2016	**2017**	2016
Loans by risk ratings												
Investment-grade	**$ 68,071**	$ 65,687	**$ 98,467**	$ 88,649	**$ 26,791**	$24,294	**$ 15,140**	$ 15,935	**$103,212**	$ 95,358	**$ 311,681**	$ 289,923
Noninvestment-grade:												
Noncriticized	**46,558**	47,531	**14,335**	16,155	**13,071**	11,075	**369**	439	**9,988**	9,360	**84,321**	84,560
Criticized performing	**3,983**	6,186	**710**	798	**210**	200	**–**	6	**259**	163	**5,162**	7,353
Criticized nonaccrual	**1,357**	1,491	**136**	200	**2**	9	**–**	–	**239**	254	**1,734**	1,954
Total noninvestment-grade	**51,898**	55,208	**15,181**	17,153	**13,283**	11,284	**369**	445	**10,486**	9,777	**91,217**	93,867
Total retained loans	**$119,969**	$120,895	**$ 113,648**	$105,802	**$ 40,074**	$35,578	**$ 15,509**	$ 16,380	**$113,698**	$105,135	**$ 402,898**	$ 383,790
% of total criticized to total retained loans	**4.45%**	6.35%	**0.74%**	0.94%	**0.53%**	0.59%	**–%**	0.04%	**0.44%**	0.40%	**1.71%**	2.43%
% of nonaccrual loans to total retained loans	**1.13**	1.23	**0.12**	0.19	**–**	0.03	**–**	–	**0.21**	0.24	**0.43**	0.51
Loans by geographic distribution[a]												
Total non-U.S.	**$ 28,470**	$ 30,563	**$ 3,101**	$ 3,302	**$ 16,790**	$15,147	**$ 2,906**	$ 3,726	**$ 44,112**	$ 38,776	**$ 95,379**	$ 91,514
Total U.S.	**91,499**	90,332	**110,547**	102,500	**23,284**	20,431	**12,603**	12,654	**69,586**	66,359	**307,519**	292,276
Total retained loans	**$119,969**	$120,895	**$ 113,648**	$105,802	**$ 40,074**	$35,578	**$ 15,509**	$ 16,380	**$113,698**	$105,135	**$ 402,898**	$ 383,790
Net charge-offs/(recoveries)	**$ 117**	$ 345	**$ (4)**	$ (7)	**$ 6**	$ (1)	**$ 5**	$ (1)	**$ (5)**	$ 5	**$ 119**	$ 341
% of net charge-offs/(recoveries) to end-of-period retained loans	**0.10%**	0.28%	**–%**	(0.01)%	**0.01%**	(0.01)%	**0.03%**	(0.01)%	**–%**	0.01%	**0.03%**	0.09%
Loan delinquency[b]												
Current and less than 30 days past due and still accruing	**$118,288**	$119,050	**$ 113,258**	$105,396	**$ 40,042**	$35,523	**$ 15,493**	$ 16,269	**$112,559**	$104,280	**$ 399,640**	$ 380,518
30–89 days past due and still accruing	**216**	268	**242**	204	**15**	25	**12**	107	**898**	582	**1,383**	1,186
90 or more days past due and still accruing[c]	**108**	86	**12**	2	**15**	21	**4**	4	**2**	19	**141**	132
Criticized nonaccrual	**1,357**	1,491	**136**	200	**2**	9	**–**	–	**239**	254	**1,734**	1,954
Total retained loans	**$119,969**	$120,895	**$ 113,648**	$105,802	**$ 40,074**	$35,578	**$ 15,509**	$ 16,380	**$113,698**	$105,135	**$ 402,898**	$ 383,790

(a) The U.S. and non-U.S. distribution is determined based predominantly on the domicile of the borrower.
(b) The credit quality of wholesale loans is assessed primarily through ongoing review and monitoring of an obligor's ability to meet contractual obligations rather than relying on the past due status, which is generally a lagging indicator of credit quality.
(c) Represents loans that are considered well-collateralized and therefore still accruing interest.
(d) Other includes individuals, SPEs, holding companies, and private education and civic organizations. For more information on exposures to SPEs, see Note 14.

The following table presents additional information on the real estate class of loans within the Wholesale portfolio for the periods indicated. Exposure consists primarily of secured commercial loans, of which multifamily is the largest segment. Multifamily lending finances acquisition, leasing and construction of apartment buildings, and includes exposure to real estate investment trusts ("REITs"). Other commercial lending largely includes financing for acquisition, leasing and construction, largely for office, retail and industrial real estate, and includes exposure to REITs. Included in real estate loans is $10.8 billion and $9.2 billion as of December 31, 2017 and 2016, respectively, of construction and development exposure consisting of loans originally purposed for construction and development, general purpose loans for builders, as well as loans for land subdivision and pre-development.

December 31, (in millions, except ratios)	Multifamily		Other Commercial		Total real estate loans	
	2017	2016	**2017**	2016	**2017**	2016
Real estate retained loans	**$ 77,597**	$ 72,143	**$ 36,051**	$ 33,659	**$ 113,648**	$ 105,802
Criticized	**491**	539	**355**	459	**846**	998
% of criticized to total real estate retained loans	**0.63%**	0.75%	**0.98%**	1.36%	**0.74%**	0.94%
Criticized nonaccrual	**$ 44**	$ 57	**$ 92**	$ 143	**$ 136**	$ 200
% of criticized nonaccrual to total real estate retained loans	**0.06%**	0.08%	**0.26%**	0.42%	**0.12%**	0.19%

Wholesale impaired loans and loan modifications

Wholesale impaired loans consist of loans that have been placed on nonaccrual status and/or that have been modified in a TDR. All impaired loans are evaluated for an asset-specific allowance as described in Note 13.

The table below sets forth information about the Firm's wholesale impaired loans.

December 31, (in millions)	Commercial and industrial		Real estate		Financial institutions		Government agencies		Other		Total retained loans	
	2017	2016	**2017**	2016	**2017**	2016	**2017**	2016	**2017**	2016	**2017**	2016
Impaired loans												
With an allowance	**$ 1,170**	$ 1,127	**$ 78**	$ 124	**$ 93**	$ 9	**$ —**	$ —	**$ 168**	$ 180	**$ 1,509**	$ 1,440
Without an allowance[a]	**228**	414	**60**	87	**—**	—	**—**	—	**70**	76	**358**	577
Total impaired loans	**$ 1,398**	$ 1,541	**$ 138**	$ 211	**$ 93**	$ 9	**$ —**	$ —	**$ 238**	$ 256	**$ 1,867** [c]	$ 2,017 [c]
Allowance for loan losses related to impaired loans	**$ 404**	$ 258	**$ 11**	$ 18	**$ 4**	$ 3	**$ —**	$ —	**$ 42**	$ 63	**$ 461**	$ 342
Unpaid principal balance of impaired loans[b]	**1,604**	1,754	**201**	295	**94**	12	**—**	—	**255**	284	**2,154**	2,345

(a) When the discounted cash flows, collateral value or market price equals or exceeds the recorded investment in the loan, the loan does not require an allowance. This typically occurs when the impaired loans have been partially charged-off and/or there have been interest payments received and applied to the loan balance.
(b) Represents the contractual amount of principal owed at December 31, 2017 and 2016. The unpaid principal balance differs from the impaired loan balances due to various factors, including charge-offs; interest payments received and applied to the carrying value; net deferred loan fees or costs; and unamortized discount or premiums on purchased loans.
(c) Based upon the domicile of the borrower, largely consists of loans in the U.S.

The following table presents the Firm's average impaired loans for the years ended 2017, 2016 and 2015.

Year ended December 31, (in millions)	**2017**	2016	2015
Commercial and industrial	**$ 1,145**	$ 1,480	$ 453
Real estate	**164**	217	250
Financial institutions	**20**	13	13
Government agencies	**—**	—	—
Other	**231**	213	129
Total[a]	**$ 1,560**	$ 1,923	$ 845

(a) The related interest income on accruing impaired loans and interest income recognized on a cash basis were not material for the years ended December 31, 2017, 2016 and 2015.

Certain loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. All TDRs are reported as impaired loans in the tables above. TDRs were $614 million and $733 million as of December 31, 2017 and 2016.

Note 13 – Allowance for credit losses

JPMorgan Chase's allowance for loan losses represents management's estimate of probable credit losses inherent in the Firm's retained loan portfolio, which consists of the two consumer portfolio segments (primarily scored) and the wholesale portfolio segment (risk-rated). The allowance for loan losses includes a formula-based component, an asset-specific component, and a component related to PCI loans, as described below. Management also estimates an allowance for wholesale and certain consumer lending-related commitments using methodologies similar to those used to estimate the allowance on the underlying loans.

During the second quarter of 2017, the Firm refined its credit loss estimates relating to the wholesale portfolio by incorporating the use of internal historical data versus external credit rating agency default statistics to estimate PD. In addition, an adjustment to the statistical calculation for wholesale lending-related commitments was incorporated similar to the adjustment applied for wholesale loans. The impacts of these refinements were not material to the allowance for credit losses.

The Firm's policies used to determine its allowance for credit losses are described in the following paragraphs.

Determining the appropriateness of the allowance is complex and requires judgment by management about the effect of matters that are inherently uncertain. Subsequent evaluations of the loan portfolio, in light of the factors then prevailing, may result in significant changes in the allowances for loan losses and lending-related commitments in future periods. At least quarterly, the allowance for credit losses is reviewed by the CRO, the CFO and the Controller of the Firm and discussed with the DRPC and the Audit Committee. As of December 31, 2017, JPMorgan Chase deemed the allowance for credit losses to be appropriate (i.e., sufficient to absorb probable credit losses inherent in the portfolio).

Formula-based component

The formula-based component is based on a statistical calculation to provide for incurred credit losses in all consumer loans and performing risk-rated loans. All loans restructured in TDRs as well as any impaired risk-rated loans have an allowance assessed as part of the asset-specific component, while PCI loans have an allowance assessed as part of the PCI component. See Note 12 for more information on TDRs, Impaired loans and PCI loans.

Formula-based component - Consumer loans and certain lending-related commitments

The formula-based allowance for credit losses for the consumer portfolio segments is calculated by applying statistical credit loss factors (estimated PD and loss severities) to the recorded investment balances or loan-equivalent amounts of pools of loan exposures with similar risk characteristics over a loss emergence period to arrive at an estimate of incurred credit losses. Estimated loss emergence periods may vary by product and may change over time; management applies judgment in estimating loss emergence periods, using available credit information and trends. In addition, management applies judgment to the statistical loss estimates for each loan portfolio category, using delinquency trends and other risk characteristics to estimate the total incurred credit losses in the portfolio. Management uses additional statistical methods and considers actual portfolio performance, including actual losses recognized on defaulted loans and collateral valuation trends, to review the appropriateness of the primary statistical loss estimate. The economic impact of potential modifications of residential real estate loans is not included in the statistical calculation because of the uncertainty regarding the type and results of such modifications.

The statistical calculation is then adjusted to take into consideration model imprecision, external factors and current economic events that have occurred but that are not yet reflected in the factors used to derive the statistical calculation; these adjustments are accomplished in part by analyzing the historical loss experience for each major product segment. However, it is difficult to predict whether historical loss experience is indicative of future loss levels. Management applies judgment in making this adjustment, taking into account uncertainties associated with current macroeconomic and political conditions, quality of underwriting standards, borrower behavior, and other relevant internal and external factors affecting the credit quality of the portfolio. In certain instances, the interrelationships between these factors create further uncertainties. The application of different inputs into the statistical calculation, and the assumptions used by management to adjust the statistical calculation, are subject to management judgment, and emphasizing one input or assumption over another, or considering other inputs or assumptions, could affect the estimate of the allowance for credit losses for the consumer credit portfolio.

Overall, the allowance for credit losses for consumer portfolios is sensitive to changes in the economic environment (e.g., unemployment rates), delinquency rates, the realizable value of collateral (e.g., housing prices), FICO scores, borrower behavior and other risk factors. While all of these factors are important determinants of overall allowance levels, changes in the various factors may not occur at the same time or at the same rate, or changes may be directionally inconsistent such that improvement in one factor may offset deterioration in another. In addition, changes in these factors would not necessarily be consistent across all geographies or product types. Finally, it is difficult to predict the extent to which changes in these factors would ultimately affect the frequency of losses, the severity of losses or both.

Formula-based component - Wholesale loans and lending-related commitments

The Firm's methodology for determining the allowance for loan losses and the allowance for lending-related commitments involves the early identification of credits that are deteriorating. The formula-based component of the allowance for wholesale loans and lending-related commitments is calculated by applying statistical credit loss factors (estimated PD and LGD) to the recorded investment balances or loan-equivalent over a loss emergence period to arrive at an estimate of incurred credit losses in the portfolio. Estimated loss emergence periods may vary by funded versus unfunded status of the instrument and may change over time.

The Firm assesses the credit quality of its borrower or counterparty and assigns a risk rating. Risk ratings are assigned at origination or acquisition, and if necessary, adjusted for changes in credit quality over the life of the exposure. In assessing the risk rating of a particular loan or lending-related commitment, among the factors considered are the obligor's debt capacity and financial flexibility, the level of the obligor's earnings, the amount and sources for repayment, the level and nature of contingencies, management strength, and the industry and geography in which the obligor operates. These factors are based on an evaluation of historical and current information and involve subjective assessment and interpretation. Determining risk ratings involves significant judgment; emphasizing one factor over another or considering additional factors could affect the risk rating assigned by the Firm.

A PD estimate is determined based on the Firm's history of defaults over more than one credit cycle.

LGD estimate is a judgment-based estimate assigned to each loan or lending-related commitment. The estimate represents the amount of economic loss if the obligor were to default. The type of obligor, quality of collateral, and the seniority of the Firm's lending exposure in the obligor's capital structure affect LGD.

The Firm applies judgment in estimating PD, LGD, loss emergence period and loan-equivalent used in calculating the allowance for credit losses. Estimates of PD, LGD, loss emergence period and loan-equivalent used are subject to periodic refinement based on any changes to underlying external or Firm-specific historical data. Changes to the time period used for PD and LGD estimates could also affect the allowance for credit losses. The use of different inputs, estimates or methodologies could change the amount of the allowance for credit losses determined appropriate by the Firm.

In addition to the statistical credit loss estimates applied to the wholesale portfolio, management applies its judgment to adjust the statistical estimates for wholesale loans and lending-related commitments, taking into consideration model imprecision, external factors and economic events that have occurred but are not yet reflected in the loss factors. Historical experience of both LGD and PD are considered when estimating these adjustments. Factors related to concentrated and deteriorating industries also are incorporated where relevant. These estimates are based on management's view of uncertainties that relate to current macroeconomic conditions, quality of underwriting standards and other relevant internal and external factors affecting the credit quality of the current portfolio.

Asset-specific component

The asset-specific component of the allowance relates to loans considered to be impaired, which includes loans that have been modified in TDRs as well as risk-rated loans that have been placed on nonaccrual status. To determine the asset-specific component of the allowance, larger risk-rated loans (primarily loans in the wholesale portfolio segment) are evaluated individually, while smaller loans (both risk-rated and scored) are evaluated as pools using historical loss experience for the respective class of assets.

The Firm generally measures the asset-specific allowance as the difference between the recorded investment in the loan and the present value of the cash flows expected to be collected, discounted at the loan's original effective interest rate. Subsequent changes in impairment are reported as an adjustment to the allowance for loan losses. In certain cases, the asset-specific allowance is determined using an observable market price, and the allowance is measured as the difference between the recorded investment in the loan and the loan's fair value. Collateral-dependent loans are charged down to the fair value of collateral less costs to sell. For any of these impaired loans, the amount of the asset-specific allowance required to be recorded, if any, is dependent upon the recorded investment in the loan (including prior charge-offs), and either the expected cash flows or fair value of collateral. See Note 12 for more information about charge-offs and collateral-dependent loans.

The asset-specific component of the allowance for impaired loans that have been modified in TDRs (including forgone interest, principal forgiveness, as well as other concessions) incorporates the effect of the modification on the loan's expected cash flows, which considers the potential for redefault. For residential real estate loans modified in TDRs, the Firm develops product-specific probability of default estimates, which are applied at a loan level to compute expected losses. In developing these probabilities of default, the Firm considers the relationship between the credit quality characteristics of the underlying loans and certain assumptions about home prices and unemployment, based upon industry-wide data. The Firm also considers its own historical loss experience to-date based on actual redefaulted modified loans. For credit card loans modified in TDRs, expected losses incorporate projected redefaults based on the Firm's historical experience by type of modification program. For wholesale loans modified in TDRs, expected losses incorporate management's expectation of the borrower's ability to repay under the modified terms.

Estimating the timing and amounts of future cash flows is highly judgmental as these cash flow projections rely upon estimates such as loss severities, asset valuations, default rates (including redefault rates on modified loans), the amounts and timing of interest or principal payments (including any expected prepayments) or other factors that are reflective of current and expected market conditions. These estimates are, in turn, dependent on factors such as the duration of current overall economic conditions, industry-, portfolio-, or borrower-specific factors, the expected outcome of insolvency proceedings as well as, in certain circumstances, other economic factors, including the level of future home prices. All of these estimates and assumptions require significant management judgment and certain assumptions are highly subjective.

PCI loans

In connection with the acquisition of certain PCI loans, which are accounted for as described in Note 12, the allowance for loan losses for the PCI portfolio is based on quarterly estimates of the amount of principal and interest cash flows expected to be collected over the estimated remaining lives of the loans.

These cash flow projections are based on estimates regarding default rates (including redefault rates on modified loans), loss severities, the amounts and timing of prepayments and other factors that are reflective of current and expected future market conditions. These estimates are dependent on assumptions regarding the level of future home prices, and the duration of current overall economic conditions, among other factors. These estimates and assumptions require significant management judgment and certain assumptions are highly subjective.

Allowance for credit losses and related information

The table below summarizes information about the allowances for loan losses and lending-relating commitments, and includes a breakdown of loans and lending-related commitments by impairment methodology.

Year ended December 31, (in millions)	2017 Consumer, excluding credit card	Credit card	Wholesale	Total
Allowance for loan losses				
Beginning balance at January 1,	$ 5,198	$ 4,034	$ 4,544	$ 13,776
Gross charge-offs	1,779	4,521	212	6,512
Gross recoveries	(634)	(398)	(93)	(1,125)
Net charge-offs	1,145	4,123	119	5,387
Write-offs of PCI loans[(a)]	86	–	–	86
Provision for loan losses	613	4,973	(286)	5,300
Other	(1)	–	2	1
Ending balance at December 31,	$ 4,579	$ 4,884	$ 4,141	$ 13,604
Allowance for loan losses by impairment methodology				
Asset-specific[(b)]	$ 246	$ 383 (c)	$ 461	$ 1,090
Formula-based	2,108	4,501	3,680	10,289
PCI	2,225	–	–	2,225
Total allowance for loan losses	$ 4,579	$ 4,884	$ 4,141	$ 13,604
Loans by impairment methodology				
Asset-specific	$ 8,036	$ 1,215	$ 1,867	$ 11,118
Formula-based	333,941	148,172	401,028	883,141
PCI	30,576	–	3	30,579
Total retained loans	$ 372,553	$ 149,387	$ 402,898	$ 924,838
Impaired collateral-dependent loans				
Net charge-offs	$ 64	$ –	$ 31	$ 95
Loans measured at fair value of collateral less cost to sell	2,133	–	233	2,366
Allowance for lending-related commitments				
Beginning balance at January 1,	$ 26	$ –	$ 1,052	$ 1,078
Provision for lending-related commitments	7	–	(17)	(10)
Other	–	–	–	–
Ending balance at December 31,	$ 33	$ –	$ 1,035	$ 1,068
Allowance for lending-related commitments by impairment methodology				
Asset-specific	$ –	$ –	$ 187	$ 187
Formula-based	33	–	848	881
Total allowance for lending-related commitments	$ 33	$ –	$ 1,035	$ 1,068
Lending-related commitments by impairment methodology				
Asset-specific	$ –	$ –	$ 731	$ 731
Formula-based	48,553	572,831	369,367	990,751
Total lending-related commitments	$ 48,553	$ 572,831	$ 370,098	$ 991,482

(a) Write-offs of PCI loans are recorded against the allowance for loan losses when actual losses for a pool exceed estimated losses that were recorded as purchase accounting adjustments at the time of acquisition. A write-off of a PCI loan is recognized when the underlying loan is removed from a pool.
(b) Includes risk-rated loans that have been placed on nonaccrual status and all loans that have been modified in a TDR.
(c) The asset-specific credit card allowance for loan losses is related to loans that have been modified in a TDR; such allowance is calculated based on the loans' original contractual interest rates and does not consider any incremental penalty rates.
(d) The prior period amounts have been revised to conform with the current period presentation.

(table continued from previous page)

2016				2015			
Consumer, excluding credit card	Credit card	Wholesale	Total	Consumer, excluding credit card	Credit card	Wholesale	Total
$ 5,806	$ 3,434	$ 4,315	$ 13,555	$ 7,050	$ 3,439	$ 3,696	$ 14,185
1,500	3,799	398	5,697	1,658	3,488	95	5,241
(591)	(357)	(57)	(1,005)	(704)	(366)	(85)	(1,155)
909	3,442	341	4,692	954	3,122	10	4,086
156	–	–	156	208	–	–	208
467	4,042	571	5,080	(82)	3,122	623	3,663
(10)	–	(1)	(11)	–	(5)	6	1
$ 5,198	$ 4,034	$ 4,544	$ 13,776	$ 5,806	$ 3,434	$ 4,315	$ 13,555
$ 308	$ 358 (c)	$ 342	$ 1,008	$ 364	$ 460 (c)	$ 274	$ 1,098
2,579	3,676	4,202	10,457	2,700	2,974	4,041	9,715
2,311	–	–	2,311	2,742	–	–	2,742
$ 5,198	$ 4,034	$ 4,544	$ 13,776	$ 5,806	$ 3,434	$ 4,315	$ 13,555
$ 8,940	$ 1,240	$ 2,017	$ 12,197	$ 9,606	$ 1,465	$ 1,024	$ 12,095
319,787	140,471	381,770	842,028	293,751	129,922	356,022	779,695
35,679	–	3	35,682	40,998	–	4	41,002
$ 364,406	$ 141,711	$ 383,790	$ 889,907	$ 344,355	$ 131,387	$ 357,050	$ 832,792
$ 98	$ –	$ 7	$ 105	$ 104	$ –	$ 16	$ 120
2,391	–	300	2,691	2,566	–	283	2,849
$ 14	$ –	$ 772	$ 786	$ 13	$ –	$ 609	$ 622
–	–	281	281	1	–	163	164
12	–	(1)	11	–	–	–	–
$ 26	$ –	$ 1,052	$ 1,078	$ 14	$ –	$ 772	$ 786
$ –	$ –	$ 169	$ 169	$ –	$ –	$ 73	$ 73
26	–	883	909	14	–	699	713
$ 26	$ –	$ 1,052	$ 1,078	$ 14	$ –	$ 772	$ 786
$ –	$ –	$ 506	$ 506	$ –	$ –	$ 193	$ 193
53,247 (d)	553,891	367,508	974,646 (d)	56,865 (d)	515,518	366,206	938,589 (d)
$ 53,247 (d)	$ 553,891	$ 368,014	$ 975,152 (d)	$ 56,865 (d)	$ 515,518	$ 366,399	$ 938,782 (d)

Note 14 – Variable interest entities

For a further description of JPMorgan Chase's accounting policies regarding consolidation of VIEs, see Note 1.

The following table summarizes the most significant types of Firm-sponsored VIEs by business segment. The Firm considers a "sponsored" VIE to include any entity where: (1) JPMorgan Chase is the primary beneficiary of the structure; (2) the VIE is used by JPMorgan Chase to securitize Firm assets; (3) the VIE issues financial instruments with the JPMorgan Chase name; or (4) the entity is a JPMorgan Chase–administered asset-backed commercial paper conduit.

Line of Business	*Transaction Type*	*Activity*	*Annual Report page references*
CCB	Credit card securitization trusts	Securitization of originated credit card receivables	236-237
	Mortgage securitization trusts	Servicing and securitization of both originated and purchased residential mortgages	237-239
CIB	Mortgage and other securitization trusts	Securitization of both originated and purchased residential and commercial mortgages and other consumer loans	237-239
	Multi-seller conduits	Assist clients in accessing the financial markets in a cost-efficient manner and structures transactions to meet investor needs	239
	Municipal bond vehicles	Financing of municipal bond investments	239-240

The Firm's other business segments are also involved with VIEs (both third-party and Firm-sponsored), but to a lesser extent, as follows:

- Asset & Wealth Management: AWM sponsors and manages certain funds that are deemed VIEs. As asset manager of the funds, AWM earns a fee based on assets managed; the fee varies with each fund's investment objective and is competitively priced. For fund entities that qualify as VIEs, AWM's interests are, in certain cases, considered to be significant variable interests that result in consolidation of the financial results of these entities.
- Commercial Banking: CB provides financing and lending-related services to a wide spectrum of clients, including certain third party-sponsored entities that may meet the definition of a VIE. CB does not control the activities of these entities and does not consolidate these entities. CB's maximum loss exposure, regardless of whether the entity is a VIE, is generally limited to loans and lending-related commitments which are reported and disclosed in the same manner as any other third-party transaction.
- Corporate: Corporate is involved with entities that may meet the definition of VIEs; however these entities are generally subject to specialized investment company accounting, which does not require the consolidation of investments, including VIEs. In addition, Treasury and CIO invest in securities generally issued by third parties which may meet the definition of VIEs (e.g., issuers of asset-backed securities). In general, the Firm does not have the power to direct the significant activities of these entities and therefore does not consolidate these entities. See Note 10 for further information on the Firm's investment securities portfolio.

In addition, CIB also invests in and provides financing and other services to VIEs sponsored by third parties. See pages 241-242 of this Note for more information on the VIEs sponsored by third parties.

Significant Firm-sponsored variable interest entities

Credit card securitizations

CCB's Card business securitizes originated credit card loans, primarily through the Chase Issuance Trust (the "Trust"). The Firm's continuing involvement in credit card securitizations includes servicing the receivables, retaining an undivided seller's interest in the receivables, retaining certain senior and subordinated securities and maintaining escrow accounts.

The Firm is considered to be the primary beneficiary of these Firm-sponsored credit card securitization trusts based on the Firm's ability to direct the activities of these VIEs through its servicing responsibilities and other duties, including making decisions as to the receivables that are transferred into those trusts and as to any related modifications and workouts. Additionally, the nature and extent of the Firm's other continuing involvement with the trusts, as indicated above, obligates the Firm to absorb losses and gives the Firm the right to receive certain benefits from these VIEs that could potentially be significant.

The underlying securitized credit card receivables and other assets of the securitization trusts are available only for payment of the beneficial interests issued by the securitization trusts; they are not available to pay the Firm's other obligations or the claims of the Firm's creditors.

The agreements with the credit card securitization trusts require the Firm to maintain a minimum undivided interest in the credit card trusts (generally 5%). As of December 31, 2017 and 2016, the Firm held undivided interests in Firm-sponsored credit card securitization trusts of $15.8 billion and $8.9 billion, respectively. The Firm maintained an average undivided interest in principal receivables owned by those trusts of approximately 26% and 16% for the years ended December 31, 2017 and 2016. As of both

December 31, 2017 and 2016, the Firm did not retain any senior securities and retained $4.5 billion and $5.3 billion of subordinated securities in certain of its credit card securitization trusts as of December 31, 2017 and 2016, respectively. The Firm's undivided interests in the credit card trusts and securities retained are eliminated in consolidation.

Firm-sponsored mortgage and other securitization trusts

The Firm securitizes (or has securitized) originated and purchased residential mortgages, commercial mortgages and other consumer loans primarily in its CCB and CIB businesses. Depending on the particular transaction, as well as the respective business involved, the Firm may act as the servicer of the loans and/or retain certain beneficial interests in the securitization trusts.

The following table presents the total unpaid principal amount of assets held in Firm-sponsored private-label securitization entities, including those in which the Firm has continuing involvement, and those that are consolidated by the Firm. Continuing involvement includes servicing the loans, holding senior interests or subordinated interests (including amounts required to be held pursuant to credit risk retention rules), recourse or guarantee arrangements, and derivative transactions. In certain instances, the Firm's only continuing involvement is servicing the loans. See Securitization activity on page 242 of this Note for further information regarding the Firm's cash flows with and interests retained in nonconsolidated VIEs, and page 243 of this Note for information on the Firm's loan sales to U.S. government agencies.

	Principal amount outstanding			JPMorgan Chase interest in securitized assets in nonconsolidated VIEs[c][d][e]			
December 31, 2017 (in millions)	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Securities	Other financial assets	Total interests held by JPMorgan Chase
Securitization-related[a]							
Residential mortgage:							
Prime/Alt-A and option ARMs	**$ 68,874**	**$ 3,615**	**$ 52,280**	**$ 410**	**$ 943**	**$ –**	**$ 1,353**
Subprime	**18,984**	**7**	**17,612**	**93**	**–**	**–**	**93**
Commercial and other[b]	**94,905**	**63**	**63,411**	**745**	**1,133**	**157**	**2,035**
Total	**$ 182,763**	**$ 3,685**	**$ 133,303**	**$ 1,248**	**$ 2,076**	**$ 157**	**$ 3,481**

	Principal amount outstanding			JPMorgan Chase interest in securitized assets in nonconsolidated VIEs[c][d][e]			
December 31, 2016(in millions)	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Securities	Other financial assets	Total interests held by JPMorgan Chase
Securitization-related[a]							
Residential mortgage:							
Prime/Alt-A and option ARMs	$ 76,789	$ 4,209	$ 57,543	$ 226	$ 1,334	$ –	$ 1,560
Subprime	21,542	–	19,903	76	–	–	76
Commercial and other[b]	101,265	107	71,464	509	2,064	–	2,573
Total	$ 199,596	$ 4,316	$ 148,910	$ 811	$ 3,398	$ –	$ 4,209

(a) Excludes U.S. government agency securitizations and re-securitizations, which are not Firm-sponsored. See page 243 of this Note for information on the Firm's loan sales to U.S. government agencies.
(b) Consists of securities backed by commercial loans (predominantly real estate) and non-mortgage-related consumer receivables purchased from third parties.
(c) Excludes the following: retained servicing (see Note 15 for a discussion of MSRs); securities retained from loan sales to U.S. government agencies; interest rate and foreign exchange derivatives primarily used to manage interest rate and foreign exchange risks of securitization entities (See Note 5 for further information on derivatives); senior and subordinated securities of $88 million and $48 million, respectively, at December 31, 2017, and $180 million and $49 million, respectively, at December 31, 2016, which the Firm purchased in connection with CIB's secondary market-making activities.
(d) Includes interests held in re-securitization transactions.
(e) As of December 31, 2017 and 2016, 61% and 61%, respectively, of the Firm's retained securitization interests, which are predominantly carried at fair value and include amounts required to be held pursuant to credit risk retention rules, were risk-rated "A" or better, on an S&P-equivalent basis. The retained interests in prime residential mortgages consisted of $1.3 billion and $1.5 billion of investment-grade and $48 million and $77 million of noninvestment-grade retained interests at December 31, 2017 and 2016, respectively. The retained interests in commercial and other securitizations trusts consisted of $1.6 billion and $2.4 billion of investment-grade and $412 million and $210 million of noninvestment-grade retained interests at December 31, 2017 and 2016, respectively.

Residential mortgage
The Firm securitizes residential mortgage loans originated by CCB, as well as residential mortgage loans purchased from third parties by either CCB or CIB. CCB generally retains servicing for all residential mortgage loans it originated or purchased, and for certain mortgage loans purchased by CIB. For securitizations of loans serviced by CCB, the Firm has the power to direct the significant activities of the VIE because it is responsible for decisions related to loan modifications and workouts. CCB may also retain an interest upon securitization.

In addition, CIB engages in underwriting and trading activities involving securities issued by Firm-sponsored securitization trusts. As a result, CIB at times retains senior and/or subordinated interests (including residual interests and amounts required to be held pursuant to credit risk retention rules) in residential mortgage securitizations at the time of securitization, and/or reacquires positions in the secondary market in the normal course of business. In certain instances, as a result of the positions retained or reacquired by CIB or held by CCB, when considered together with the servicing arrangements entered into by CCB, the Firm is deemed to be the primary beneficiary of certain securitization trusts. See the table on page 241 of this Note for more information on consolidated residential mortgage securitizations.

The Firm does not consolidate a residential mortgage securitization (Firm-sponsored or third-party-sponsored) when it is not the servicer (and therefore does not have the power to direct the most significant activities of the trust) or does not hold a beneficial interest in the trust that could potentially be significant to the trust. See the table on page 241 of this Note for more information on the consolidated residential mortgage securitizations, and the table on the previous page of this Note for further information on interests held in nonconsolidated residential mortgage securitizations.

Commercial mortgages and other consumer securitizations
CIB originates and securitizes commercial mortgage loans, and engages in underwriting and trading activities involving the securities issued by securitization trusts. CIB may retain unsold senior and/or subordinated interests (including amounts required to be held pursuant to credit risk retention rules) in commercial mortgage securitizations at the time of securitization but, generally, the Firm does not service commercial loan securitizations. For commercial mortgage securitizations the power to direct the significant activities of the VIE generally is held by the servicer or investors in a specified class of securities ("controlling class"). The Firm generally does not retain an interest in the controlling class in its sponsored commercial mortgage securitization transactions. See the table on page 241 of this Note for more information on the consolidated commercial mortgage securitizations, and the table on the previous page of this Note for further information on interests held in nonconsolidated securitizations.

Re-securitizations
The Firm engages in certain re-securitization transactions in which debt securities are transferred to a VIE in exchange for new beneficial interests. These transfers occur in connection with both agency (Federal National Mortgage Association ("Fannie Mae"), Federal Home Loan Mortgage Corporation ("Freddie Mac") and Government National Mortgage Association ("Ginnie Mae")) and nonagency (private-label) sponsored VIEs, which may be backed by either residential or commercial mortgages. The Firm's consolidation analysis is largely dependent on the Firm's role and interest in the re-securitization trusts.

The following table presents the principal amount of securities transferred to re-securitization VIEs.

Year ended December 31, (in millions)	**2017**	2016	2015
Transfers of securities to VIEs			
Firm-sponsored private-label	**$ –**	$ 647	$ 777
Agency	**$ 12,617**	$ 11,241	$ 21,908

Most re-securitizations with which the Firm is involved are client-driven transactions in which a specific client or group of clients is seeking a specific return or risk profile. For these transactions, the Firm has concluded that the decision-making power of the entity is shared between the Firm and its clients, considering the joint effort and decisions in establishing the re-securitization trust and its assets, as well as the significant economic interest the client holds in the re-securitization trust; therefore the Firm does not consolidate the re-securitization VIE.

In more limited circumstances, the Firm creates a nonagency re-securitization trust independently and not in conjunction with specific clients. In these circumstances, the Firm is deemed to have the unilateral ability to direct the most significant activities of the re-securitization trust because of the decisions made during the establishment and design of the trust; therefore, the Firm consolidates the re-securitization VIE if the Firm holds an interest that could potentially be significant.

Additionally, the Firm may invest in beneficial interests of third-party re-securitizations and generally purchases these interests in the secondary market. In these circumstances, the Firm does not have the unilateral ability to direct the most significant activities of the re-securitization trust, either because it was not involved in the initial design of the trust, or the Firm is involved with an independent third-party sponsor and demonstrates shared power over the creation of the trust; therefore, the Firm does not consolidate the re-securitization VIE.

The following table presents information on nonconsolidated re-securitization VIEs.

Year ended December 31, (in millions)	**2017**	2016
Firm-sponsored private-label		
Assets held in VIEs with continuing involvement[(a)]	**783**	875
Interest in VIEs	**29**	43
Agency		
Interest in VIEs	**2,250**	**1,986**

(a) Represents the principal amount and includes the notional amount of interest-only securities.

As of December 31, 2017 and 2016, the Firm did not consolidate any agency re-securitizations or any Firm-sponsored private-label re-securitizations.

Multi-seller conduits

Multi-seller conduit entities are separate bankruptcy remote entities that provide secured financing, collateralized by pools of receivables and other financial assets, to customers of the Firm. The conduits fund their financing facilities through the issuance of highly rated commercial paper. The primary source of repayment of the commercial paper is the cash flows from the pools of assets. In most instances, the assets are structured with deal-specific credit enhancements provided to the conduits by the customers (i.e., sellers) or other third parties. Deal-specific credit enhancements are generally structured to cover a multiple of historical losses expected on the pool of assets, and are typically in the form of overcollateralization provided by the seller. The deal-specific credit enhancements mitigate the Firm's potential losses on its agreements with the conduits.

To ensure timely repayment of the commercial paper, and to provide the conduits with funding to provide financing to customers in the event that the conduits do not obtain funding in the commercial paper market, each asset pool financed by the conduits has a minimum 100% deal-specific liquidity facility associated with it provided by JPMorgan Chase Bank, N.A. JPMorgan Chase Bank, N.A. also provides the multi-seller conduit vehicles with uncommitted program-wide liquidity facilities and program-wide credit enhancement in the form of standby letters of credit. The amount of program-wide credit enhancement required is based upon commercial paper issuance and approximates 10% of the outstanding balance of commercial paper.

The Firm consolidates its Firm-administered multi-seller conduits, as the Firm has both the power to direct the significant activities of the conduits and a potentially significant economic interest in the conduits. As administrative agent and in its role in structuring transactions, the Firm makes decisions regarding asset types and credit quality, and manages the commercial paper funding needs of the conduits. The Firm's interests that could potentially be significant to the VIEs include the fees received as administrative agent and liquidity and program-wide credit enhancement provider, as well as the potential exposure created by the liquidity and credit enhancement facilities provided to the conduits. See page 241 of this Note for further information on consolidated VIE assets and liabilities.

In the normal course of business, JPMorgan Chase makes markets in and invests in commercial paper issued by the Firm-administered multi-seller conduits. The Firm held $20.4 billion and $21.2 billion of the commercial paper issued by the Firm-administered multi-seller conduits at December 31, 2017 and 2016, respectively, which have been eliminated in consolidation. The Firm's investments reflect the Firm's funding needs and capacity and were not driven by market illiquidity. Other than the amounts required to be held pursuant to credit risk retention rules, the Firm is not obligated under any agreement to purchase the commercial paper issued by the Firm-administered multi-seller conduits.

Deal-specific liquidity facilities, program-wide liquidity and credit enhancement provided by the Firm have been eliminated in consolidation. The Firm or the Firm-administered multi-seller conduits provide lending-related commitments to certain clients of the Firm-administered multi-seller conduits. The unfunded commitments were $8.8 billion and $7.4 billion at December 31, 2017 and 2016, respectively, and are reported as off-balance sheet lending-related commitments. For more information on off-balance sheet lending-related commitments, see Note 27.

Municipal bond vehicles

Municipal bond vehicles or tender option bond ("TOB") trusts allow institutions to finance their municipal bond investments at short-term rates. In a typical TOB transaction, the trust purchases highly rated municipal bond(s) of a single issuer and funds the purchase by issuing two types of securities: (1) puttable floating-rate certificates ("Floaters") and (2) inverse floating-rate residual interests ("Residuals"). The Floaters are typically purchased by money market funds or other short-term investors and may be tendered, with requisite notice, to the TOB trust. The Residuals are retained by the investor seeking to finance its municipal bond investment. TOB transactions where the Residual is held by a third party investor are typically known as Customer TOB trusts, and Non-Customer TOB trusts are transactions where the Residual is retained by the Firm. Customer TOB trusts are sponsored by a third party; see page 242 on this Note for further information. The Firm serves as sponsor for all Non-Customer TOB transactions. The Firm may provide various services to a TOB trust, including remarketing agent, liquidity or tender option provider, and/or sponsor.

J.P. Morgan Securities LLC may serve as a remarketing agent on the Floaters for TOB trusts. The remarketing agent is responsible for establishing the periodic variable rate on the Floaters, conducting the initial placement and remarketing tendered Floaters. The remarketing agent may, but is not obligated to, make markets in Floaters. The Firm held an insignificant amount of Floaters during 2017 and 2016.

JPMorgan Chase Bank, N.A. or J.P. Morgan Securities LLC often serves as the sole liquidity or tender option provider for the TOB trusts. The liquidity provider's obligation to perform is conditional and is limited by certain events ("Termination Events"), which include bankruptcy or failure to pay by the municipal bond issuer or credit enhancement provider, an event of taxability on the municipal bonds or the immediate downgrade of the municipal bond to below investment grade. In addition, the liquidity provider's exposure is typically further limited by the high credit quality of the underlying municipal bonds, the excess collateralization in the vehicle, or, in certain transactions, the reimbursement agreements with the Residual holders.

Holders of the Floaters may "put," or tender, their Floaters to the TOB trust. If the remarketing agent cannot successfully remarket the Floaters to another investor, the liquidity provider either provides a loan to the TOB trust for the TOB trust's purchase of the Floaters, or it directly purchases the tendered Floaters.

TOB trusts are considered to be variable interest entities. The Firm consolidates Non-Customer TOB trusts because as the Residual holder, the Firm has the right to make decisions that significantly impact the economic performance of the municipal bond vehicle, and it has the right to receive benefits and bear losses that could potentially be significant to the municipal bond vehicle. See page 241 of this Note for further information on consolidated municipal bond vehicles.

Consolidated VIE assets and liabilities

The following table presents information on assets and liabilities related to VIEs consolidated by the Firm as of December 31, 2017 and 2016.

December 31, 2017 (in millions)	Assets				Liabilities		
	Trading assets	Loans	Other[d]	Total assets[e]	Beneficial interests in VIE assets[f]	Other[g]	Total liabilities
VIE program type[a]							
Firm-sponsored credit card trusts	$ –	$ 41,923	$ 652	$ 42,575	$ 21,278	$ 16	$ 21,294
Firm-administered multi-seller conduits	–	23,411	48	23,459	3,045	28	3,073
Municipal bond vehicles	1,278	–	3	1,281	1,265	2	1,267
Mortgage securitization entities[b]	66	3,661	55	3,782	359	199	558
Student loan securitization entities[c]	–	–	–	–	–	–	–
Other	105	–	1,916	2,021	134	104	238
Total	$ 1,449	$ 68,995	$ 2,674	$ 73,118	$ 26,081	$ 349	$ 26,430

December 31, 2016 (in millions)	Assets				Liabilities		
	Trading assets	Loans	Other[d]	Total assets[e]	Beneficial interests in VIE assets[f]	Other[g]	Total liabilities
VIE program type[a]							
Firm-sponsored credit card trusts	$ –	$ 45,919	$ 790	$ 46,709	$ 31,181	$ 18	$ 31,199
Firm-administered multi-seller conduits	–	23,760	43	23,803	2,719	33	2,752
Municipal bond vehicles	2,897	–	8	2,905	2,969	2	2,971
Mortgage securitization entities[b]	143	4,246	103	4,492	468	313	781
Student loan securitization entities [c]	–	1,689	59	1,748	1,527	4	1,531
Other	145	–	2,318	2,463	183	120	303
Total	$ 3,185	$ 75,614	$ 3,321	$ 82,120	$ 39,047	$ 490	$ 39,537

(a) Excludes intercompany transactions, which are eliminated in consolidation.
(b) Includes residential and commercial mortgage securitizations.
(c) The Firm deconsolidated the student loan securitization entities in the second quarter of 2017 as it no longer had a controlling financial interest in these entities as a result of the sale of the student loan portfolio.
(d) Includes assets classified as cash and other assets on the Consolidated balance sheets.
(e) The assets of the consolidated VIEs included in the program types above are used to settle the liabilities of those entities. The difference between total assets and total liabilities recognized for consolidated VIEs represents the Firm's interest in the consolidated VIEs for each program type.
(f) The interest-bearing beneficial interest liabilities issued by consolidated VIEs are classified in the line item on the Consolidated balance sheets titled, "Beneficial interests issued by consolidated variable interest entities." The holders of these beneficial interests do not have recourse to the general credit of JPMorgan Chase. Included in beneficial interests in VIE assets are long-term beneficial interests of $21.8 billion and $33.4 billion at December 31, 2017 and 2016, respectively. For additional information on interest bearing long-term beneficial interest, see Note 19.
(g) Includes liabilities classified as accounts payable and other liabilities on the Consolidated balance sheets.

VIEs sponsored by third parties

The Firm enters into transactions with VIEs structured by other parties. These include, for example, acting as a derivative counterparty, liquidity provider, investor, underwriter, placement agent, remarketing agent, trustee or custodian. These transactions are conducted at arm's-length, and individual credit decisions are based on the analysis of the specific VIE, taking into consideration the quality of the underlying assets. Where the Firm does not have the power to direct the activities of the VIE that most significantly impact the VIE's economic performance, or a variable interest that could potentially be significant, the Firm generally does not consolidate the VIE, but it records and reports these positions on its Consolidated balance sheets in the same manner it would record and report positions in respect of any other third-party transaction.

Tax credit vehicles

The Firm holds investments in unconsolidated tax credit vehicles, which are limited partnerships and similar entities that construct, own and operate affordable housing, wind, solar and other alternative energy projects. These entities are primarily considered VIEs. A third party is typically the general partner or managing member and has control over the significant activities of the tax credit vehicles, and accordingly the Firm does not consolidate tax credit vehicles. The Firm generally invests in these partnerships as a limited partner and earns a return primarily through the receipt of tax credits allocated to the projects. The maximum loss exposure, represented by equity investments and funding commitments, was $13.4 billion and $14.8 billion, of which $3.2 billion and $3.8 billion was unfunded at December 31, 2017 and 2016 respectively. In order to reduce the risk of loss, the Firm assesses each project and withholds varying amounts of its capital investment until qualification of the project for tax credits. See Note 24 for further information on affordable housing tax credits. For more information on off-balance sheet lending-related commitments, see Note 27.

Customer municipal bond vehicles (TOB trusts)
The Firm may provide various services to Customer TOB trusts, including remarketing agent, liquidity or tender option provider. In certain Customer TOB transactions, the Firm, as liquidity provider, has entered into a reimbursement agreement with the Residual holder. In those transactions, upon the termination of the vehicle, the Firm has recourse to the third party Residual holders for any shortfall. The Firm does not have any intent to protect Residual holders from potential losses on any of the underlying municipal bonds. The Firm does not consolidate Customer TOB trusts, since the Firm does not have the power to make decisions that significantly impact the economic performance of the municipal bond vehicle. The Firm's maximum exposure as a liquidity provider to Customer TOB trusts at December 31, 2017 and 2016, was $5.3 billion and $5.0 billion, respectively. The fair value of assets held by such VIEs at December 31, 2017 and 2016 was $9.2 billion and $8.9 billion, respectively. For more information on off-balance sheet lending-related commitments, see Note 27.

Loan securitizations

The Firm has securitized and sold a variety of loans, including residential mortgage, credit card, student and commercial (primarily related to real estate) loans, as well as debt securities. The purposes of these securitization transactions were to satisfy investor demand and to generate liquidity for the Firm.

For loan securitizations in which the Firm is not required to consolidate the trust, the Firm records the transfer of the loan receivable to the trust as a sale when all of the following accounting criteria for a sale are met: (1) the transferred financial assets are legally isolated from the Firm's creditors; (2) the transferee or beneficial interest holder can pledge or exchange the transferred financial assets; and (3) the Firm does not maintain effective control over the transferred financial assets (e.g., the Firm cannot repurchase the transferred assets before their maturity and it does not have the ability to unilaterally cause the holder to return the transferred assets).

For loan securitizations accounted for as a sale, the Firm recognizes a gain or loss based on the difference between the value of proceeds received (including cash, beneficial interests, or servicing assets received) and the carrying value of the assets sold. Gains and losses on securitizations are reported in noninterest revenue.

Securitization activity

The following table provides information related to the Firm's securitization activities for the years ended December 31, 2017, 2016 and 2015, related to assets held in Firm-sponsored securitization entities that were not consolidated by the Firm, and where sale accounting was achieved at the time of the securitization.

	2017		2016		2015	
Year ended December 31, (in millions, except rates)	Residential mortgage[(d)]	Commercial and other[(e)]	Residential mortgage[(d)]	Commercial and other[(e)]	Residential mortgage[(d)]	Commercial and other[(e)]
Principal securitized	**$ 5,532**	**$ 10,252**	$ 1,817	$ 8,964	$ 3,008	$ 11,933
All cash flows during the period:[(a)]						
Proceeds received from loan sales as financial instruments[(b)]	**$ 5,661**	**$ 10,340**	$ 1,831	$ 9,094	$ 3,022	$ 12,011
Servicing fees collected	**525**	**3**	477	3	528	3
Purchases of previously transferred financial assets (or the underlying collateral)[(c)]	**1**	**—**	37	—	3	—
Cash flows received on interests	**463**	**918**	482	1,441	407	597

(a) Excludes re-securitization transactions.
(b) Predominantly includes Level 2 assets.
(c) Includes cash paid by the Firm to reacquire assets from off-balance sheet, nonconsolidated entities – for example, loan repurchases due to representation and warranties and servicer "clean-up" calls.
(d) Includes prime/Alt-A, subprime, and option ARMs. Excludes certain loan securitization transactions entered into with Ginnie Mae, Fannie Mae and Freddie Mac.
(e) Includes commercial mortgage and other consumer loans.

Key assumptions used to value retained interests originated during the year are shown in the table below.

Year ended December 31,	**2017**	2016	2015
Residential mortgage retained interest:			
Weighted-average life (in years)	4.8	4.5	4.2
Weighted-average discount rate	2.9%	4.2%	2.9%
Commercial mortgage retained interest:			
Weighted-average life (in years)	7.1	6.2	6.2
Weighted-average discount rate	4.4%	5.8%	4.1%

Loans and excess MSRs sold to U.S. government-sponsored enterprises, loans in securitization transactions pursuant to Ginnie Mae guidelines, and other third-party-sponsored securitization entities

In addition to the amounts reported in the securitization activity tables above, the Firm, in the normal course of business, sells originated and purchased mortgage loans and certain originated excess MSRs on a nonrecourse basis, predominantly to U.S. government sponsored enterprises ("U.S. GSEs"). These loans and excess MSRs are sold primarily for the purpose of securitization by the U.S. GSEs, who provide certain guarantee provisions (e.g., credit enhancement of the loans). The Firm also sells loans into securitization transactions pursuant to Ginnie Mae guidelines; these loans are typically insured or guaranteed by another U.S. government agency. The Firm does not consolidate the securitization vehicles underlying these transactions as it is not the primary beneficiary. For a limited number of loan sales, the Firm is obligated to share a portion of the credit risk associated with the sold loans with the purchaser. See Note 27 for additional information about the Firm's loan sales- and securitization-related indemnifications.

See Note 15 for additional information about the impact of the Firm's sale of certain excess MSRs.

The following table summarizes the activities related to loans sold to the U.S. GSEs, loans in securitization transactions pursuant to Ginnie Mae guidelines, and other third-party-sponsored securitization entities.

Year ended December 31, (in millions)	2017	2016	2015
Carrying value of loans sold	**$ 64,542**	$ 52,869	$ 42,161
Proceeds received from loan sales as cash	**$ 117**	$ 592	$ 313
Proceeds from loans sales as securities[(a)]	**63,542**	51,852	41,615
Total proceeds received from loan sales[(b)]	**$ 63,659**	$ 52,444	$ 41,928
Gains on loan sales[(c)(d)]	**$ 163**	$ 222	$ 299

(a) Predominantly includes securities from U.S. GSEs and Ginnie Mae that are generally sold shortly after receipt.
(b) Excludes the value of MSRs retained upon the sale of loans.
(c) Gains on loan sales include the value of MSRs.
(d) The carrying value of the loans accounted for at fair value approximated the proceeds received upon loan sale.

Options to repurchase delinquent loans

In addition to the Firm's obligation to repurchase certain loans due to material breaches of representations and warranties as discussed in Note 27, the Firm also has the option to repurchase delinquent loans that it services for Ginnie Mae loan pools, as well as for other U.S. government agencies under certain arrangements. The Firm typically elects to repurchase delinquent loans from Ginnie Mae loan pools as it continues to service them and/or manage the foreclosure process in accordance with the applicable requirements, and such loans continue to be insured or guaranteed. When the Firm's repurchase option becomes exercisable, such loans must be reported on the Consolidated balance sheets as a loan with a corresponding liability.

The following table presents loans the Firm repurchased or had an option to repurchase, real estate owned, and foreclosed government-guaranteed residential mortgage loans recognized on the Firm's Consolidated balance sheets as of December 31, 2017 and 2016. Substantially all of these loans and real estate are insured or guaranteed by U.S. government agencies. For additional information, refer to Note 12.

December 31, (in millions)	2017	2016
Loans repurchased or option to repurchase[(a)]	**$ 8,629**	$ 9,556
Real estate owned	**95**	142
Foreclosed government-guaranteed residential mortgage loans[(b)]	**527**	1,007

(a) Predominantly all of these amounts relate to loans that have been repurchased from Ginnie Mae loan pools.
(b) Relates to voluntary repurchases of loans, which are included in accrued interest and accounts receivable.

Loan delinquencies and liquidation losses

The table below includes information about components of nonconsolidated securitized financial assets held in Firm-sponsored private-label securitization entities, in which the Firm has continuing involvement, and delinquencies as of December 31, 2017 and 2016.

	Securitized assets		90 days past due		Liquidation losses	
As of or for the year ended December 31, (in millions)	2017	2016	2017	2016	2017	2016
Securitized loans						
Residential mortgage:						
Prime/ Alt-A & option ARMs	**$ 52,280**	$ 57,543	**$ 4,870**	$ 6,169	**$ 790**	$ 1,160
Subprime	**17,612**	19,903	**3,276**	4,186	**719**	1,087
Commercial and other	**63,411**	71,464	**957**	1,755	**114**	643
Total loans securitized	**$ 133,303**	$ 148,910	**$ 9,103**	$ 12,110	**$ 1,623**	$ 2,890

Note 15 – Goodwill and Mortgage servicing rights

Goodwill

Goodwill is recorded upon completion of a business combination as the difference between the purchase price and the fair value of the net assets acquired. Subsequent to initial recognition, goodwill is not amortized but is tested for impairment during the fourth quarter of each fiscal year, or more often if events or circumstances, such as adverse changes in the business climate, indicate there may be impairment.

The goodwill associated with each business combination is allocated to the related reporting units, which are determined based on how the Firm's businesses are managed and how they are reviewed by the Firm's Operating Committee. The following table presents goodwill attributed to the business segments.

December 31, (in millions)	**2017**	2016	2015
Consumer & Community Banking	**$ 31,013**	$ 30,797	$ 30,769
Corporate & Investment Bank	**6,776**	6,772	6,772
Commercial Banking	**2,860**	2,861	2,861
Asset & Wealth Management	**6,858**	6,858	6,923
Total goodwill	**$ 47,507**	$ 47,288	$ 47,325

The following table presents changes in the carrying amount of goodwill.

Year ended December 31, (in millions)	**2017**	2016	2015
Balance at beginning of period	**$ 47,288**	$ 47,325	$ 47,647
Changes during the period from:			
Business combinations[(a)]	**199**	–	28
Dispositions[(b)]	**–**	(72)	(160)
Other[(c)]	**20**	35	(190)
Balance at December 31,	**$ 47,507**	$ 47,288	$ 47,325

(a) For 2017, represents CCB goodwill in connection with an acquisition.
(b) For 2016, represents AWM goodwill, which was disposed of as part of an AWM sales transaction. For 2015 includes $101 million of Private Equity goodwill, which was disposed of as part of the Private Equity sale.
(c) Includes foreign currency translation adjustments and other tax-related adjustments.

Impairment testing

The Firm's goodwill was not impaired at December 31, 2017, 2016, and 2015.

The goodwill impairment test is performed in two steps. In the first step, the current fair value of each reporting unit is compared with its carrying value, including goodwill and other intangible assets. If the fair value is in excess of the carrying value, then the reporting unit's goodwill is considered to be not impaired. If the fair value is less than the carrying value, then a second step is performed. In the second step, the implied current fair value of the reporting unit's goodwill is determined by comparing the fair value of the reporting unit (as determined in step one) to the fair value of the net assets of the reporting unit, as if the reporting unit were being acquired in a business combination. The resulting implied current fair value of goodwill is then compared with the carrying value of the reporting unit's goodwill. If the carrying value of the goodwill exceeds its implied current fair value, then an impairment charge is recognized for the excess. If the carrying value of goodwill is less than its implied current fair value, then no goodwill impairment is recognized.

The Firm uses the reporting units' allocated capital plus goodwill and other intangible assets capital as a proxy for the carrying values of equity for the reporting units in the goodwill impairment testing. Reporting unit equity is determined on a similar basis as the allocation of capital to the Firm's lines of business, which takes into consideration the capital the business segment would require if it were operating independently, incorporating sufficient capital to address regulatory capital requirements (including Basel III) and capital levels for similarly rated peers. Proposed line of business equity levels are incorporated into the Firm's annual budget process, which is reviewed by the Firm's Board of Directors. Allocated capital is further reviewed on a periodic basis and updated as needed.

The primary method the Firm uses to estimate the fair value of its reporting units is the income approach. This approach projects cash flows for the forecast period and uses the perpetuity growth method to calculate terminal values. These cash flows and terminal values are then discounted using an appropriate discount rate. Projections of cash flows are based on the reporting units' earnings forecasts which are reviewed with senior management of the Firm. The discount rate used for each reporting unit represents an estimate of the cost of equity for that reporting unit and is determined considering the Firm's overall estimated cost of equity (estimated using the Capital Asset Pricing Model), as adjusted for the risk characteristics specific to each reporting unit (for example, for higher levels of risk or uncertainty associated with the business or management's forecasts and assumptions). To assess the reasonableness of the discount rates used for each reporting unit management compares the discount rate to the estimated cost of equity for publicly traded institutions with similar businesses and risk characteristics. In addition, the weighted average cost of equity (aggregating the various reporting units) is compared with the Firms' overall estimated cost of equity to ensure reasonableness.

The valuations derived from the discounted cash flow analysis are then compared with market-based trading and transaction multiples for relevant competitors. Trading and transaction comparables are used as general indicators to assess the general reasonableness of the estimated fair values, although precise conclusions generally cannot be drawn due to the differences that naturally exist between the Firm's businesses and competitor institutions. Management also takes into consideration a comparison between the aggregate fair values of the Firm's reporting units and JPMorgan Chase's market capitalization. In evaluating this comparison, management considers several factors, including (i) a control premium that would exist in a market transaction, (ii) factors related to the level of execution risk that would exist at the firmwide level that do not exist at the reporting unit level and (iii) short-term market volatility and other factors that do not directly affect the value of individual reporting units.

Declines in business performance, increases in credit losses, increases in capital requirements, as well as deterioration in economic or market conditions, estimates of adverse regulatory or legislative changes or increases in the estimated market cost of equity, could cause the estimated fair values of the Firm's reporting units or their associated goodwill to decline in the future, which could result in a material impairment charge to earnings in a future period related to some portion of the associated goodwill.

Mortgage servicing rights

MSRs represent the fair value of expected future cash flows for performing servicing activities for others. The fair value considers estimated future servicing fees and ancillary revenue, offset by estimated costs to service the loans, and generally declines over time as net servicing cash flows are received, effectively amortizing the MSR asset against contractual servicing and ancillary fee income. MSRs are either purchased from third parties or recognized upon sale or securitization of mortgage loans if servicing is retained.

As permitted by U.S. GAAP, the Firm has elected to account for its MSRs at fair value. The Firm treats its MSRs as a single class of servicing assets based on the availability of market inputs used to measure the fair value of its MSR asset and its treatment of MSRs as one aggregate pool for risk management purposes. The Firm estimates the fair value of MSRs using an option-adjusted spread ("OAS") model, which projects MSR cash flows over multiple interest rate scenarios in conjunction with the Firm's prepayment model, and then discounts these cash flows at risk-adjusted rates. The model considers portfolio characteristics, contractually specified servicing fees, prepayment assumptions, delinquency rates, costs to service, late charges and other ancillary revenue, and other economic factors. The Firm compares fair value estimates and assumptions to observable market data where available, and also considers recent market activity and actual portfolio experience.

The fair value of MSRs is sensitive to changes in interest rates, including their effect on prepayment speeds. MSRs typically decrease in value when interest rates decline because declining interest rates tend to increase prepayments and therefore reduce the expected life of the net servicing cash flows that comprise the MSR asset. Conversely, securities (e.g., mortgage-backed securities), principal-only certificates and certain derivatives (i.e., those for which the Firm receives fixed-rate interest payments) increase in value when interest rates decline. JPMorgan Chase uses combinations of derivatives and securities to manage the risk of changes in the fair value of MSRs. The intent is to offset any interest-rate related changes in the fair value of MSRs with changes in the fair value of the related risk management instruments.

The following table summarizes MSR activity for the years ended December 31, 2017, 2016 and 2015.

As of or for the year ended December 31, (in millions, except where otherwise noted)	**2017**	2016	2015
Fair value at beginning of period	**$ 6,096**	$ 6,608	$ 7,436
MSR activity:			
Originations of MSRs	**1,103**	679	550
Purchase of MSRs	**—**	—	435
Disposition of MSRs[(a)]	**(140)**	(109)	(486)
Net additions	**963**	570	499
Changes due to collection/realization of expected cash flows	**(797)**	(919)	(922)
Changes in valuation due to inputs and assumptions:			
Changes due to market interest rates and other[(b)]	**(202)**	(72)	(160)
Changes in valuation due to other inputs and assumptions:			
Projected cash flows (e.g., cost to service)	**(102)**	(35)	(112)
Discount rates	**(19)**	7	(10)
Prepayment model changes and other[(c)]	**91**	(63)	(123)
Total changes in valuation due to other inputs and assumptions	**(30)**	(91)	(245)
Total changes in valuation due to inputs and assumptions	**(232)**	(163)	(405)
Fair value at December 31,	**$ 6,030**	$ 6,096	$ 6,608
Change in unrealized gains/(losses) included in income related to MSRs held at December 31,	**$ (232)**	$ (163)	$ (405)
Contractual service fees, late fees and other ancillary fees included in income	**1,886**	2,124	2,533
Third-party mortgage loans serviced at December 31, (in billions)	**555.0**	593.3	677.0
Servicer advances, net of an allowance for uncollectible amounts, at December 31, (in billions)[(d)]	**4.0**	4.7	6.5

(a) Includes excess MSRs transferred to agency-sponsored trusts in exchange for stripped mortgage backed securities (“SMBS”). In each transaction, a portion of the SMBS was acquired by third parties at the transaction date; the Firm acquired the remaining balance of those SMBS as trading securities.
(b) Represents both the impact of changes in estimated future prepayments due to changes in market interest rates, and the difference between actual and expected prepayments.
(c) Represents changes in prepayments other than those attributable to changes in market interest rates.
(d) Represents amounts the Firm pays as the servicer (e.g., scheduled principal and interest, taxes and insurance), which will generally be reimbursed within a short period of time after the advance from future cash flows from the trust or the underlying loans. The Firm’s credit risk associated with these servicer advances is minimal because reimbursement of the advances is typically senior to all cash payments to investors. In addition, the Firm maintains the right to stop payment to investors if the collateral is insufficient to cover the advance. However, certain of these servicer advances may not be recoverable if they were not made in accordance with applicable rules and agreements.

The following table presents the components of mortgage fees and related income (including the impact of MSR risk management activities) for the years ended December 31, 2017, 2016 and 2015.

Year ended December 31, (in millions)	2017	2016	2015
CCB mortgage fees and related income			
Net production revenue	**$ 636**	$ 853	$ 769
Net mortgage servicing revenue:			
Operating revenue:			
Loan servicing revenue	**2,014**	2,336	2,776
Changes in MSR asset fair value due to collection/realization of expected cash flows	**(795)**	(916)	(917)
Total operating revenue	**1,219**	1,420	1,859
Risk management:			
Changes in MSR asset fair value due to market interest rates and other[(a)]	**(202)**	(72)	(160)
Other changes in MSR asset fair value due to other inputs and assumptions in model[(b)]	**(30)**	(91)	(245)
Change in derivative fair value and other	**(10)**	380	288
Total risk management	**(242)**	217	(117)
Total net mortgage servicing revenue	**977**	1,637	1,742
Total CCB mortgage fees and related income	**1,613**	2,490	2,511
All other	**3**	1	2
Mortgage fees and related income	**$1,616**	$ 2,491	$2,513

(a) Represents both the impact of changes in estimated future prepayments due to changes in market interest rates, and the difference between actual and expected prepayments.
(b) Represents the aggregate impact of changes in model inputs and assumptions such as projected cash flows (e.g., cost to service), discount rates and changes in prepayments other than those attributable to changes in market interest rates (e.g., changes in prepayments due to changes in home prices).

The table below outlines the key economic assumptions used to determine the fair value of the Firm's MSRs at December 31, 2017 and 2016, and outlines the sensitivities of those fair values to immediate adverse changes in those assumptions, as defined below.

December 31, (in millions, except rates)	2017	2016
Weighted-average prepayment speed assumption ("CPR")	**9.35%**	9.41%
Impact on fair value of 10% adverse change	**$ (221)**	$ (231)
Impact on fair value of 20% adverse change	**(427)**	(445)
Weighted-average option adjusted spread	**9.04%**	8.55%
Impact on fair value of 100 basis points adverse change	**$ (250)**	$ (248)
Impact on fair value of 200 basis points adverse change	**(481)**	(477)

CPR: Constant prepayment rate.

Changes in fair value based on variation in assumptions generally cannot be easily extrapolated, because the relationship of the change in the assumptions to the change in fair value are often highly interrelated and may not be linear. In this table, the effect that a change in a particular assumption may have on the fair value is calculated without changing any other assumption. In reality, changes in one factor may result in changes in another, which would either magnify or counteract the impact of the initial change.

Note 16 – Premises and equipment

Premises and equipment, including leasehold improvements, are carried at cost less accumulated depreciation and amortization. JPMorgan Chase computes depreciation using the straight-line method over the estimated useful life of an asset. For leasehold improvements, the Firm uses the straight-line method computed over the lesser of the remaining term of the leased facility or the estimated useful life of the leased asset.

JPMorgan Chase capitalizes certain costs associated with the acquisition or development of internal-use software. Once the software is ready for its intended use, these costs are amortized on a straight-line basis over the software's expected useful life and reviewed for impairment on an ongoing basis.

Note 17 – Deposits

At December 31, 2017 and 2016, noninterest-bearing and interest-bearing deposits were as follows.

December 31, (in millions)	**2017**	2016
U.S. offices		
Noninterest-bearing	**$ 393,645**	$ 400,831
Interest-bearing (included **$14,947,** and $12,245 at fair value)[a]	**793,618**	737,949
Total deposits in U.S. offices	**1,187,263**	1,138,780
Non-U.S. offices		
Noninterest-bearing	**15,576**	14,764
Interest-bearing (included **$6,374** and $1,667 at fair value)[a]	**241,143**	221,635
Total deposits in non-U.S. offices	**256,719**	236,399
Total deposits	**$ 1,443,982**	$1,375,179

(a) Includes structured notes classified as deposits for which the fair value option has been elected. For further discussion, see Note 3.

At December 31, 2017 and 2016, time deposits in denominations of $250,000 or more were as follows.

December 31, (in millions)	**2017**	2016
U.S. offices	**$ 30,671**	$ 26,180
Non-U.S. offices[a]	**29,049**	29,652
Total[a]	**$ 59,720**	$ 55,832

(a) The prior period amounts have been revised to conform with the current period presentation.

At December 31, 2017, the maturities of interest-bearing time deposits were as follows.

December 31, 2017 (in millions)	U.S.	Non-U.S.	**Total**
2018	$ 37,645	$ 27,621	$ 65,266
2019	3,487	349	3,836
2020	2,332	22	2,354
2021	4,275	26	4,301
2022	2,297	443	2,740
After 5 years	3,391	1,697	5,088
Total	$ 53,427	$ 30,158	$ 83,585

Note 18 – Accounts payable and other liabilities

Accounts payable and other liabilities consist of brokerage payables, which includes payables to customers, dealers and clearing organizations, and payables from security purchases that did not settle; accrued expenses, including income tax payables and credit card rewards liability; and all other liabilities, including obligations to return securities received as collateral and litigation reserves.

The following table details the components of accounts payable and other liabilities.

December 31, (in millions)	**2017**	2016
Brokerage payables	**$ 102,727**	$ 109,842
Other payables and liabilities[a]	**86,656**	80,701
Total accounts payable and other liabilities	**$ 189,383**	$ 190,543

(a) Includes credit card rewards liability of $4.9 billion and $3.8 billion at December 31, 2017 and 2016, respectively.

Note 19 – Long-term debt

JPMorgan Chase issues long-term debt denominated in various currencies, predominantly U.S. dollars, with both fixed and variable interest rates. Included in senior and subordinated debt below are various equity-linked or other indexed instruments, which the Firm has elected to measure at fair value. Changes in fair value are recorded in principal transactions revenue in the Consolidated statements of income, except for unrealized gains/(losses) due to DVA which are recorded in OCI. The following table is a summary of long-term debt carrying values (including unamortized premiums and discounts, issuance costs, valuation adjustments and fair value adjustments, where applicable) by remaining contractual maturity as of December 31, 2017.

By remaining maturity at December 31, (in millions, except rates)		2017				2016
		Under 1 year	1-5 years	After 5 years	**Total**	Total
Parent company						
Senior debt:	Fixed rate	**$ 15,084**	**$ 53,939**	**$ 72,528**	**$ 141,551**	$ 128,967
	Variable rate	**5,547**	**12,802**	**8,112**	**26,461**	34,766
	Interest rates[a]	**0.38-7.25%**	**0.16-6.30%**	**0.45-6.40%**	**0.16-7.25%**	0.09-7.25%
Subordinated debt:	Fixed rate	**$ –**	**$ 149**	**$ 14,497**	**$ 14,646**	$ 16,811
	Variable rate	**–**	**–**	**9**	**9**	1,245
	Interest rates[a]	**–%**	**8.53%**	**3.38-8.00%**	**3.38-8.53%**	0.82-8.53%
	Subtotal	**$ 20,631**	**$ 66,890**	**$ 95,146**	**$ 182,667**	$ 181,789
Subsidiaries						
Federal Home Loan Banks advances:	Fixed rate	**$ 4**	**$ 34**	**$ 129**	**$ 167**	$ 179
	Variable rate	**12,450**	**37,000**	**11,000**	**60,450**	79,340
	Interest rates[a]	**1.58-1.75%**	**1.46-2.00%**	**1.18-1.47%**	**1.18-2.00%**	0.41-1.21%
Senior debt:	Fixed rate	**$ 1,122**	**$ 3,970**	**$ 6,898**	**$ 11,990**	$ 8,329
	Variable rate	**8,967**	**13,287**	**3,964**	**26,218**	19,379
	Interest rates[a]	**0.22-7.50%**	**1.65-7.50%**	**1.00-7.50%**	**0.22-7.50%**	0.00-7.50%
Subordinated debt:	Fixed rate	**$ –**	**$ –**	**$ 313**	**$ 313**	$ 3,884
	Variable rate	**–**	**–**		**–**	–
	Interest rates[a]	**–%**	**–%**	**8.25%**	**8.25%**	6.00-8.25%
	Subtotal	**$ 22,543**	**$ 54,291**	**$ 22,304**	**$ 99,138**	$ 111,111
Junior subordinated debt [b]:	Fixed rate	**$ –**	**$ –**	**$ 690**	**$ 690**	$ 706
	Variable rate	**–**	**–**	**1,585**	**1,585**	1,639
	Interest rates[a]	**–%**	**–%**	**1.88-8.75%**	**1.88-8.75%**	1.39-8.75%
	Subtotal	**$ –**	**$ –**	**$ 2,275**	**$ 2,275**	$ 2,345
Total long-term debt[c][d][e]		**$ 43,174**	**$ 121,181**	**$ 119,725**	**$ 284,080** [g][h]	$ 295,245
Long-term beneficial interests:	Fixed rate	**$ 5,927**	**$ 7,652**	**$ –**	**$ 13,579**	$ 18,678
	Variable rate	**3,399**	**4,472**	**321**	**8,192**	14,681
	Interest rates	**1.10-2.50%**	**1.27-6.54%**	**0.00-3.75%**	**0.00-6.54%**	0.39-7.87%
Total long-term beneficial interests[f]		**$ 9,326**	**$ 12,124**	**$ 321**	**$ 21,771**	$ 33,359

(a) The interest rates shown are the range of contractual rates in effect at December 31, 2017 and 2016, respectively, including non-U.S. dollar fixed- and variable-rate issuances, which excludes the effects of the associated derivative instruments used in hedge accounting relationships, if applicable. The use of these derivative instruments modifies the Firm's exposure to the contractual interest rates disclosed in the table above. Including the effects of the hedge accounting derivatives, the range of modified rates in effect at December 31, 2017, for total long-term debt was (0.19)% to 8.88%, versus the contractual range of 0.16% to 8.75% presented in the table above. The interest rate ranges shown exclude structured notes accounted for at fair value.

(b) As of December 31, 2017, includes $0.7 billion of fixed rate junior subordinated debentures issued to an issuer trust and $1.6 billion of variable rate junior subordinated debentures distributed pro rata to the holders of the $1.6 billion of trust preferred securities which were cancelled on December 18, 2017.

(c) Included long-term debt of $63.5 billion and $82.2 billion secured by assets totaling $208.4 billion and $205.6 billion at December 31, 2017 and 2016, respectively. The amount of long-term debt secured by assets does not include amounts related to hybrid instruments.

(d) Included $47.5 billion and $37.7 billion of long-term debt accounted for at fair value at December 31, 2017 and 2016, respectively.

(e) Included $10.3 billion and $7.5 billion of outstanding zero-coupon notes at December 31, 2017 and 2016, respectively. The aggregate principal amount of these notes at their respective maturities is $33.5 billion and $25.1 billion, respectively. The aggregate principal amount reflects the contractual principal payment at maturity, which may exceed the contractual principal payment at the Firm's next call date, if applicable.

(f) Included on the Consolidated balance sheets in beneficial interests issued by consolidated VIEs. Also included $45 million and $120 million accounted for at fair value at December 31, 2017 and 2016, respectively. Excluded short-term commercial paper and other short-term beneficial interests of $4.3 billion and $5.7 billion at December 31, 2017 and 2016, respectively.

(g) At December 31, 2017, long-term debt in the aggregate of $111.2 billion was redeemable at the option of JPMorgan Chase, in whole or in part, prior to maturity, based on the terms specified in the respective instruments.

(h) The aggregate carrying values of debt that matures in each of the five years subsequent to 2017 is $43.2 billion in 2018, $34.7 billion in 2019, $39.3 billion in 2020, $33.8 billion in 2021 and $13.4 billion in 2022.

The weighted-average contractual interest rates for total long-term debt excluding structured notes accounted for at fair value were 2.87% and 2.49% as of December 31, 2017 and 2016, respectively. In order to modify exposure to interest rate and currency exchange rate movements, JPMorgan Chase utilizes derivative instruments, primarily interest rate and cross-currency interest rate swaps, in conjunction with some of its debt issuances. The use of these instruments modifies the Firm's interest expense on the associated debt. The modified weighted-average interest rates for total long-term debt, including the effects of related derivative instruments, were 2.56% and 2.01% as of December 31, 2017 and 2016, respectively.

JPMorgan Chase & Co. has guaranteed certain long-term debt of its subsidiaries, including both long-term debt and structured notes. These guarantees rank on parity with the Firm's other unsecured and unsubordinated indebtedness. The amount of such guaranteed long-term debt and structured notes was $7.9 billion and $3.9 billion at December 31, 2017 and 2016, respectively.

The Firm's unsecured debt does not contain requirements that would call for an acceleration of payments, maturities or changes in the structure of the existing debt, provide any limitations on future borrowings or require additional collateral, based on unfavorable changes in the Firm's credit ratings, financial ratios, earnings or stock price.

Junior subordinated deferrable interest debentures

At December 31, 2016, the Firm had outstanding eight wholly-owned Delaware statutory business trusts ("issuer trusts") that had issued trust preferred securities. On December 18, 2017, seven of the eight issuer trusts were liquidated, $1.6 billion of trust preferred and $56 million of common securities originally issued by those trusts were cancelled, and the junior subordinated debentures previously held by each trust issuer were distributed pro rata to the holders of the corresponding series of trust preferred and common securities.

Beginning in 2014, the junior subordinated debentures issued to the issuer trusts by the Firm, less the common capital securities of the issuer trusts, began being phased out from inclusion as Tier 1 capital under Basel III and they were fully phased out as of December 31, 2016. As of December 31, 2017 and 2016, $300 million and $1.4 billion, respectively, qualified as Tier 2 capital.

The Firm redeemed $1.6 billion of trust preferred securities in the year ended December 31, 2016.

Note 20 – Preferred stock

At December 31, 2017 and 2016, JPMorgan Chase was authorized to issue 200 million shares of preferred stock, in one or more series, with a par value of $1 per share.

In the event of a liquidation or dissolution of the Firm, JPMorgan Chase's preferred stock then outstanding takes precedence over the Firm's common stock with respect to the payment of dividends and the distribution of assets.

The following is a summary of JPMorgan Chase's non-cumulative preferred stock outstanding as of December 31, 2017 and 2016.

	Shares at December 31,[(a)]		Carrying value (in millions) at December 31,						
	2017	2016	**2017**	2016	Issue date	Contractual rate in effect at December 31, 2017	Earliest redemption date	Date at which dividend rate becomes floating	Floating annual rate of three-month LIBOR plus:
Fixed-rate:									
Series O	–	125,750	**$ –**	$ 1,258	8/27/2012	**N/A**	9/1/2017	NA	NA
Series P	**90,000**	90,000	**900**	900	2/5/2013	**5.450%**	3/1/2018	NA	NA
Series T	**92,500**	92,500	**925**	925	1/30/2014	**6.700**	3/1/2019	NA	NA
Series W	**88,000**	88,000	**880**	880	6/23/2014	**6.300**	9/1/2019	NA	NA
Series Y	**143,000**	143,000	**1,430**	1,430	2/12/2015	**6.125**	3/1/2020	NA	NA
Series AA	**142,500**	142,500	**1,425**	1,425	6/4/2015	**6.100**	9/1/2020	NA	NA
Series BB	**115,000**	115,000	**1,150**	1,150	7/29/2015	**6.150**	9/1/2020	NA	NA
Fixed-to-floating-rate:									
Series I	**600,000**	600,000	**6,000**	6,000	4/23/2008	**7.900%**	4/30/2018	4/30/2018	LIBOR + 3.47%
Series Q	**150,000**	150,000	**1,500**	1,500	4/23/2013	**5.150**	5/1/2023	5/1/2023	LIBOR + 3.25
Series R	**150,000**	150,000	**1,500**	1,500	7/29/2013	**6.000**	8/1/2023	8/1/2023	LIBOR + 3.30
Series S	**200,000**	200,000	**2,000**	2,000	1/22/2014	**6.750**	2/1/2024	2/1/2024	LIBOR + 3.78
Series U	**100,000**	100,000	**1,000**	1,000	3/10/2014	**6.125**	4/30/2024	4/30/2024	LIBOR + 3.33
Series V	**250,000**	250,000	**2,500**	2,500	6/9/2014	**5.000**	7/1/2019	7/1/2019	LIBOR + 3.32
Series X	**160,000**	160,000	**1,600**	1,600	9/23/2014	**6.100**	10/1/2024	10/1/2024	LIBOR + 3.33
Series Z	**200,000**	200,000	**2,000**	2,000	4/21/2015	**5.300**	5/1/2020	5/1/2020	LIBOR + 3.80
Series CC	**125,750**	–	**1,258**	–	10/20/2017	**4.625**	11/1/2022	11/1/2022	LIBOR + 2.58
Total preferred stock	**2,606,750**	2,606,750	**$ 26,068**	$ 26,068					

(a) Represented by depositary shares.

Each series of preferred stock has a liquidation value and redemption price per share of $10,000, plus accrued but unpaid dividends.

Dividends on fixed-rate preferred stock are payable quarterly. Dividends on fixed-to-floating-rate preferred stock are payable semiannually while at a fixed rate, and become payable quarterly after converting to a floating rate.

On October 20, 2017, the Firm issued $1.3 billion of fixed to-floating rate non-cumulative preferred stock, Series CC, with an initial dividend rate of 4.625%. On December 1, 2017, The Firm redeemed all $1.3 billion of its outstanding 5.50% non-cumulative preferred stock, Series O.

Redemption rights

Each series of the Firm's preferred stock may be redeemed on any dividend payment date on or after the earliest redemption date for that series. All outstanding preferred stock series except Series I may also be redeemed following a "capital treatment event," as described in the terms of each series. Any redemption of the Firm's preferred stock is subject to non-objection from the Board of Governors of the Federal Reserve System (the "Federal Reserve").

Note 21 – Common stock

At December 31, 2017 and 2016, JPMorgan Chase was authorized to issue 9.0 billion shares of common stock with a par value of $1 per share.

Common shares issued (newly issued or reissuance from treasury) by JPMorgan Chase during the years ended December 31, 2017, 2016 and 2015 were as follows.

Year ended December 31, (in millions)	2017	2016	2015
Total issued – balance at January 1	**4,104.9**	4,104.9	4,104.9
Treasury – balance at January 1	**(543.7)**	(441.4)	(390.1)
Repurchase	**(166.6)**	(140.4)	(89.8)
Reissuance:			
Employee benefits and compensation plans	**24.5**	26.0	32.8
Warrant exercise	**5.4**	11.1	4.7
Employee stock purchase plans	**0.8**	1.0	1.0
Total reissuance	**30.7**	38.1	38.5
Total treasury – balance at December 31	**(679.6)**	(543.7)	(441.4)
Outstanding at December 31	**3,425.3**	3,561.2	3,663.5

At December 31, 2017, 2016, and 2015, respectively, the Firm had 15.0 million, 24.9 million and 47.4 million warrants outstanding to purchase shares of common stock (the "Warrants"). The Warrants are currently traded on the New York Stock Exchange, and they are exercisable, in whole or in part, at any time and from time to time until October 28, 2018. The original warrant exercise price was $42.42 per share. The number of shares issuable upon the exercise of each warrant and the warrant exercise price is subject to adjustment upon the occurrence of certain events, including, but not limited to, the extent to which regular quarterly cash dividends exceed $0.38 per share. As of December 31, 2017 the exercise price was $41.834 and the Warrant share number was 1.01.

On June 28, 2017, in conjunction with the Federal Reserve's release of its 2017 CCAR results, the Firm's Board of Directors authorized a $19.4 billion common equity (i.e., common stock and warrants) repurchase program. As of December 31, 2017, $9.8 billion of authorized repurchase capacity remained under the program. This authorization includes shares repurchased to offset issuances under the Firm's share-based compensation plans.

The following table sets forth the Firm's repurchases of common equity for the years ended December 31, 2017, 2016 and 2015. There were no warrants repurchased during the years ended December 31, 2017, 2016 and 2015.

Year ended December 31, (in millions)	2017	2016	2015
Total number of shares of common stock repurchased	**166.6**	140.4	89.8
Aggregate purchase price of common stock repurchases	**$15,410**	$ 9,082	$ 5,616

The Firm may, from time to time, enter into written trading plans under Rule 10b5-1 of the Securities Exchange Act of 1934 to facilitate repurchases in accordance with the common equity repurchase program. A Rule 10b5-1 repurchase plan allows the Firm to repurchase its equity during periods when it would not otherwise be repurchasing common equity — for example, during internal trading "blackout periods." All purchases under a Rule 10b5-1 plan must be made according to a predefined plan established when the Firm is not aware of material nonpublic information. For additional information regarding repurchases of the Firm's equity securities, see Part II, Item 5: Market for registrant's common equity, related stockholder matters and issuer purchases of equity securities, on page 28.

As of December 31, 2017, approximately 120 million shares of common stock were reserved for issuance under various employee incentive, compensation, option and stock purchase plans, director compensation plans, and the Warrants.

Note 22 – Earnings per share

Earnings per share ("EPS") is calculated under the two-class method under which all earnings (distributed and undistributed) are allocated to each class of common stock and participating securities based on their respective rights to receive dividends. JPMorgan Chase grants RSUs to certain employees under its share-based compensation programs, which entitle recipients to receive nonforfeitable dividends during the vesting period on a basis equivalent to the dividends paid to holders of common stock; these unvested awards meet the definition of participating securities.

The following table presents the calculation of basic and diluted EPS for the years ended December 31, 2017, 2016 and 2015.

Year ended December 31, (in millions, except per share amounts)	**2017**	2016	2015
Basic earnings per share			
Net income	**$ 24,441**	$ 24,733	$ 24,442
Less: Preferred stock dividends	**1,663**	1,647	1,515
Net income applicable to common equity	**22,778**	23,086	22,927
Less: Dividends and undistributed earnings allocated to participating securities[(a)]	**211**	252	276
Net income applicable to common stockholders[(a)]	**$ 22,567**	$ 22,834	$ 22,651
Total weighted-average basic shares outstanding[(a)]	**3,551.6**	3,658.8	3,741.2
Net income per share	**$ 6.35**	$ 6.24	$ 6.05
Diluted earnings per share			
Net income applicable to common stockholders[(a)]	**$ 22,567**	$ 22,834	$ 22,651
Total weighted-average basic shares outstanding[(a)]	**3,551.6**	3,658.8	3,741.2
Add: Employee stock options, SARs, warrants and PSUs[(a)]	**25.2**	31.2	32.4
Total weighted-average diluted shares outstanding[(a)(b)]	**3,576.8**	3,690.0	3,773.6
Net income per share	**$ 6.31**	$ 6.19	$ 6.00

(a) The prior period amounts have been revised to conform with the current period presentation. The revision had no impact on the Firm's reported earnings per share.

(b) Participating securities were included in the calculation of diluted EPS using the two-class method, as this computation was more dilutive than the calculation using the treasury stock method.

Note 23 – Accumulated other comprehensive income/(loss)

AOCI includes the after-tax change in unrealized gains and losses on investment securities, foreign currency translation adjustments (including the impact of related derivatives), cash flow hedging activities, and net loss and prior service costs/(credit) related to the Firm's defined benefit pension and OPEB plans.

Year ended December 31, (in millions)	Unrealized gains/(losses) on investment securities[b]	Translation adjustments, net of hedges	Cash flow hedges	Defined benefit pension and OPEB plans	DVA on fair value option elected liabilities	Accumulated other comprehensive income/(loss)
Balance at December 31, 2014	$ 4,773	$ (147)	$ (95)	$ (2,342)	$ –	$ 2,189
Net change	(2,144)	(15)	51	111	–	(1,997)
Balance at December 31, 2015	$ 2,629	$ (162)	$ (44)	$ (2,231)	$ –	$ 192
Cumulative effect of change in accounting principle[a]	–	–	–	–	154	154
Net change	(1,105)	(2)	(56)	(28)	(330)	(1,521)
Balance at December 31, 2016	$ 1,524	$ (164)	$ (100)	$ (2,259)	$ (176)	$ (1,175)
Net change	**640**	**(306)**	**176**	**738**	**(192)**	**1,056**
Balance at December 31, 2017	**$ 2,164**	**$ (470)**	**$ 76**	**$ (1,521)**	**(368)**	**$ (119)**

(a) Effective January 1, 2016, the Firm adopted new accounting guidance related to the recognition and measurement of financial liabilities where the fair value option has been elected. This guidance requires the portion of the total change in fair value caused by changes in the Firm's own credit risk (DVA) to be presented separately in OCI; previously these amounts were recognized in net income.
(b) Represents the after-tax difference between the fair value and amortized cost of securities accounted for as AFS, including net unamortized unrealized gains and losses related to AFS securities transferred to HTM.

The following table presents the pre-tax and after-tax changes in the components of OCI.

	2017			2016			2015		
Year ended December 31, (in millions)	Pre-tax	Tax effect	After-tax	Pre-tax	Tax effect	After-tax	Pre-tax	Tax effect	After-tax
Unrealized gains/(losses) on investment securities:									
Net unrealized gains/(losses) arising during the period	**$ 944**	**$ (346)**	**$ 598**	$ (1,628)	$ 611	$ (1,017)	$ (3,315)	$ 1,297	$ (2,018)
Reclassification adjustment for realized (gains)/losses included in net income[a]	**66**	**(24)**	**42**	(141)	53	(88)	(202)	76	(126)
Net change	**1,010**	**(370)**	**640**	(1,769)	664	(1,105)	(3,517)	1,373	(2,144)
Translation adjustments[b]:									
Translation	**1,313**	**(801)**	**512**	(261)	99	(162)	(1,876)	682	(1,194)
Hedges	**(1,294)**	**476**	**(818)**	262	(102)	160	1,885	(706)	1,179
Net change	**19**	**(325)**	**(306)**	1	(3)	(2)	9	(24)	(15)
Cash flow hedges:									
Net unrealized gains/(losses) arising during the period	**147**	**(55)**	**92**	(450)	168	(282)	(97)	35	(62)
Reclassification adjustment for realized (gains)/losses included in net income[c][d]	**134**	**(50)**	**84**	360	(134)	226	180	(67)	113
Net change	**281**	**(105)**	**176**	(90)	34	(56)	83	(32)	51
Defined benefit pension and OPEB plans:									
Net gains/(losses) arising during the period	**802**	**(160)**	**642**	(366)	145	(221)	29	(47)	(18)
Reclassification adjustments included in net income[e]:									
Amortization of net loss	**250**	**(90)**	**160**	257	(97)	160	282	(106)	176
Prior service costs/(credits)	**(36)**	**13**	**(23)**	(36)	14	(22)	(36)	14	(22)
Settlement loss/(gain)	**2**	**(1)**	**1**	4	(1)	3	–	–	–
Foreign exchange and other	**(54)**	**12**	**(42)**	77	(25)	52	33	(58)	(25)
Net change	**964**	**(226)**	**738**	(64)	36	(28)	308	(197)	111
DVA on fair value option elected liabilities, net change:	**$ (303)**	**$ 111**	**$ (192)**	$ (529)	$ 199	$ (330)	$ –	$ –	$ –
Total other comprehensive income/(loss)	**$ 1,971**	**$ (915)**	**$ 1,056**	$ (2,451)	$ 930	$ (1,521)	$ (3,117)	$ 1,120	$ (1,997)

(a) The pre-tax amount is reported in securities gains/(losses) in the Consolidated statements of income.
(b) Reclassifications of pre-tax realized gains/(losses) on translation adjustments and related hedges are reported in other income/expense in the Consolidated statements of income. The amounts were not material for the periods presented.
(c) The pre-tax amounts are primarily recorded in noninterest revenue, net interest income and compensation expense in the Consolidated statements of income.
(d) In 2015, the Firm reclassified approximately $150 million of net losses from AOCI to other income because the Firm determined that it is probable that the forecasted interest payment cash flows would not occur. For additional information, see Note 5.
(e) The pre-tax amount is reported in compensation expense in the Consolidated statements of income.

Note 24 – Income taxes

JPMorgan Chase and its eligible subsidiaries file a consolidated U.S. federal income tax return. JPMorgan Chase uses the asset and liability method to provide income taxes on all transactions recorded in the Consolidated Financial Statements. This method requires that income taxes reflect the expected future tax consequences of temporary differences between the carrying amounts of assets or liabilities for book and tax purposes. Accordingly, a deferred tax asset or liability for each temporary difference is determined based on the tax rates that the Firm expects to be in effect when the underlying items of income and expense are realized. JPMorgan Chase's expense for income taxes includes the current and deferred portions of that expense. A valuation allowance is established to reduce deferred tax assets to the amount the Firm expects to realize.

Due to the inherent complexities arising from the nature of the Firm's businesses, and from conducting business and being taxed in a substantial number of jurisdictions, significant judgments and estimates are required to be made. Agreement of tax liabilities between JPMorgan Chase and the many tax jurisdictions in which the Firm files tax returns may not be finalized for several years. Thus, the Firm's final tax-related assets and liabilities may ultimately be different from those currently reported.

Effective tax rate and expense

A reconciliation of the applicable statutory U.S. federal income tax rate to the effective tax rate for each of the years ended December 31, 2017, 2016 and 2015, is presented in the following table.

Effective tax rate

Year ended December 31,	**2017**	2016	2015
Statutory U.S. federal tax rate	**35.0%**	35.0%	35.0%
Increase/(decrease) in tax rate resulting from:			
U.S. state and local income taxes, net of U.S. federal income tax benefit	**2.2**	2.4	1.5
Tax-exempt income	**(3.3)**	(3.1)	(3.3)
Non-U.S. subsidiary earnings[(a)]	**(3.1)**	(1.7)	(3.9)
Business tax credits	**(4.2)**	(3.9)	(3.7)
Nondeductible legal expense	**—**	0.3	0.8
Tax audit resolutions	**—**	—	(5.7)
Impact of the TCJA	5.4	—	—
Other, net	**(0.1)**	(0.6)	(0.3)
Effective tax rate	**31.9%**	28.4%	20.4%

(a) Predominantly includes earnings of U.K. subsidiaries that were deemed to be reinvested indefinitely through December 31, 2017.

Impact of the TCJA

On December 22, 2017, the TCJA was signed into law. The Firm's effective tax rate increased in 2017 driven by a $1.9 billion income tax expense representing the estimated impact of the enactment of the TCJA. The $1.9 billion tax expense was predominantly driven by a deemed repatriation of the Firm's unremitted non-U.S. earnings and adjustments to the value of certain tax-oriented investments partially offset by a benefit from the revaluation of the Firm's net deferred tax liability.

The deemed repatriation of the Firm's unremitted non-U.S. earnings is based on the post-1986 earnings and profits of each controlled foreign corporation. The calculation resulted in an estimated income tax expense of $3.7 billion. Furthermore, accounting for income taxes requires the remeasurement of certain deferred tax assets and liabilities based on the rates at which they are expected to reverse in the future. The Firm remeasured its deferred tax asset and liability balances in the fourth quarter of 2017 to the new statutory U.S. federal income tax rate of 21% as well as any federal benefit associated with state and local deferred income taxes. The remeasurement resulted in an estimated income tax benefit of $2.1 billion.

The deemed repatriation and remeasurement of deferred taxes were calculated based on all available information and published legislative guidance. These amounts are considered to be estimates under SEC Staff Accounting Bulletin No. 118 as the Firm anticipates refinements to both calculations. Anticipated refinements will result from the issuance of future legislative and accounting guidance as well as those in the normal course of business, including true-ups to the tax liability on the tax return as filed and the resolution of tax audits.

Adjustments were also recorded to income tax expense for certain tax-oriented investments. These adjustments were driven by changes to affordable housing proportional amortization resulting from the reduction of the federal income tax rate under the TCJA. SEC Staff Accounting Bulletin No. 118 does not apply to these adjustments.

The components of income tax expense/(benefit) included in the Consolidated statements of income were as follows for each of the years ended December 31, 2017, 2016, and 2015.

Income tax expense/(benefit)

Year ended December 31, (in millions)	**2017**	2016	2015
Current income tax expense/(benefit)			
U.S. federal	**$ 5,718**	$ 2,488	$ 3,160
Non-U.S.	**2,400**	1,760	1,220
U.S. state and local	**1,029**	904	547
Total current income tax expense/(benefit)	**9,147**	5,152	4,927
Deferred income tax expense/(benefit)			
U.S. federal	**2,174**	4,364	1,213
Non-U.S.	**(144)**	(73)	(95)
U.S. state and local	**282**	360	215
Total deferred income tax expense/(benefit)	**2,312**	4,651	1,333
Total income tax expense	**$ 11,459**	$ 9,803	$ 6,260

Total income tax expense includes $252 million, $55 million and $2.4 billion of tax benefits recorded in 2017, 2016, and 2015, respectively, as a result of tax audit resolutions.

Tax effect of items recorded in stockholders' equity
The preceding table does not reflect the tax effect of certain items that are recorded each period directly in stockholders' equity. The tax effect of all items recorded directly to stockholders' equity resulted in a decrease of $915 million in 2017, an increase of $925 million in 2016, and an increase of $1.5 billion in 2015. Effective January 1, 2016, the Firm adopted new accounting guidance related to employee share-based payments. As a result of the adoption of this new guidance, all excess tax benefits (including tax benefits from dividends or dividend equivalents) on share-based payment awards are recognized within income tax expense in the Consolidated statements of income. In prior years these tax benefits were recorded as increases to additional paid-in capital.

Results from Non-U.S. earnings

The following table presents the U.S. and non-U.S. components of income before income tax expense for the years ended December 31, 2017, 2016 and 2015.

Year ended December 31, (in millions)	**2017**	2016	2015
U.S.	**$ 27,103**	$ 26,651	$ 23,191
Non-U.S.[(a)]	**8,797**	7,885	7,511
Income before income tax expense	**$ 35,900**	$ 34,536	$ 30,702

(a) For purposes of this table, non-U.S. income is defined as income generated from operations located outside the U.S.

Prior to December 31, 2017, U.S. federal income taxes had not been provided on the undistributed earnings of certain non-U.S. subsidiaries, to the extent that such earnings had been reinvested abroad for an indefinite period of time. The Firm will no longer maintain the indefinite reinvestment assertion on the undistributed earnings of those non-U.S. subsidiaries in light of the enactment of the TCJA. The U.S. federal and state and local income taxes associated with the undistributed and previously untaxed earnings of those non-U.S. subsidiaries was included in the deemed repatriation charge recorded as of December 31, 2017.

JPMC will treat any tax it may incur on global intangible low tax income as a period cost to tax expense when the tax is incurred.

Affordable housing tax credits

The Firm recognized $1.7 billion, $1.7 billion and $1.6 billion of tax credits and other tax benefits associated with investments in affordable housing projects within income tax expense for the years 2017, 2016 and 2015, respectively. The amount of amortization of such investments reported in income tax expense under the current period presentation during these years was $1.7 billion, $1.2 billion and $1.1 billion, respectively. The carrying value of these investments, which are reported in other assets on the Firm's Consolidated balance sheets, was $7.8 billion and $8.8 billion at December 31, 2017 and 2016, respectively. The amount of commitments related to these investments, which are reported in accounts payable and other liabilities on the Firm's Consolidated balance sheets, was $2.4 billion and $2.8 billion at December 31, 2017 and 2016, respectively. The results are inclusive of any impacts from the TCJA.

Deferred taxes

Deferred income tax expense/(benefit) results from differences between assets and liabilities measured for financial reporting purposes versus income tax return purposes. Deferred tax assets are recognized if, in management's judgment, their realizability is determined to be more likely than not. If a deferred tax asset is determined to be unrealizable, a valuation allowance is established. The significant components of deferred tax assets and liabilities are reflected in the following table as of December 31, 2017 and 2016.

December 31, (in millions)	2017	2016
Deferred tax assets		
Allowance for loan losses	**$ 3,395**	$ 5,534
Employee benefits	**688**	2,911
Accrued expenses and other	**3,528**	6,831
Non-U.S. operations	**327**	5,368
Tax attribute carryforwards	**219**	2,155
Gross deferred tax assets	**8,157**	22,799
Valuation allowance	**(46)**	(785)
Deferred tax assets, net of valuation allowance	**$ 8,111**	$ 22,014
Deferred tax liabilities		
Depreciation and amortization	**$ 2,299**	$ 3,294
Mortgage servicing rights, net of hedges	**2,757**	4,807
Leasing transactions	**3,483**	4,053
Non-U.S. operations	**200**	4,572
Other, net	**3,502**	5,493
Gross deferred tax liabilities	**12,241**	22,219
Net deferred tax (liabilities)/assets	**$ (4,130)**	$ (205)

JPMorgan Chase has recorded deferred tax assets of $219 million at December 31, 2017, in connection with U.S. federal and non-U.S. net operating loss ("NOL") carryforwards and state and local capital loss carryforwards. At December 31, 2017, total U.S. federal NOL carryforwards were approximately $769 million, non-U.S. NOL carryforwards were approximately $142 million and state and local capital loss carryforwards were $660 million. If not utilized, the U.S. federal NOL carryforwards will expire between 2025 and 2036 and the state and local capital loss carryforwards will expire between 2020 and 2021. Certain non-U.S. NOL carryforwards will expire between 2028 and 2034 whereas others have an unlimited carryforward period.

The valuation allowance at December 31, 2017, was due to the state and local capital loss carryforwards and certain non-U.S. NOL carryforwards.

Unrecognized tax benefits

At December 31, 2017, 2016 and 2015, JPMorgan Chase's unrecognized tax benefits, excluding related interest expense and penalties, were $4.7 billion, $3.5 billion and $3.5 billion, respectively, of which $3.5 billion, $2.6 billion and $2.1 billion, respectively, if recognized, would reduce the annual effective tax rate. Included in the amount of unrecognized tax benefits are certain items that would not affect the effective tax rate if they were recognized in the Consolidated statements of income. These unrecognized items include the tax effect of certain temporary differences, the portion of gross state and local unrecognized tax benefits that would be offset by the benefit from associated U.S. federal income tax deductions, and the portion of gross non-U.S. unrecognized tax benefits that would have offsets in other jurisdictions. JPMorgan Chase is presently under audit by a number of taxing authorities, most notably by the Internal Revenue Service as summarized in the Tax examination status table below. As JPMorgan Chase is presently under audit by a number of taxing authorities, it is reasonably possible that over the next 12 months the resolution of these examinations may increase or decrease the gross balance of unrecognized tax benefits by as much as $1.3 billion. Upon settlement of an audit, the change in the unrecognized tax benefit would result from payment or income statement recognition.

The following table presents a reconciliation of the beginning and ending amount of unrecognized tax benefits for the years ended December 31, 2017, 2016 and 2015.

Year ended December 31, (in millions)	2017	2016	2015
Balance at January 1,	**$ 3,450**	$ 3,497	$ 4,911
Increases based on tax positions related to the current period	**1,355**	262	408
Increases based on tax positions related to prior periods	**626**	583	1,028
Decreases based on tax positions related to prior periods	**(350)**	(785)	(2,646)
Decreases related to cash settlements with taxing authorities	**(334)**	(56)	(204)
Decreases related to a lapse of applicable statute of limitations	**–**	(51)	–
Balance at December 31,	**$ 4,747**	$ 3,450	$ 3,497

After-tax interest expense/(benefit) and penalties related to income tax liabilities recognized in income tax expense were $102 million, $86 million and $(156) million in 2017, 2016 and 2015, respectively.

At December 31, 2017 and 2016, in addition to the liability for unrecognized tax benefits, the Firm had accrued $639 million and $687 million, respectively, for income tax-related interest and penalties.

Tax examination status

JPMorgan Chase is continually under examination by the Internal Revenue Service, by taxing authorities throughout the world, and by many state and local jurisdictions throughout the U.S. The following table summarizes the status of significant income tax examinations of JPMorgan Chase and its consolidated subsidiaries as of December 31, 2017.

December 31, 2017	Periods under examination	Status
JPMorgan Chase – U.S.	2003 – 2005	At Appellate level
JPMorgan Chase – U.S.	2006 – 2010	Field examination of amended returns; certain matters at Appellate level
JPMorgan Chase – U.S.	2011 – 2013	Field Examination
JPMorgan Chase – California	2011 – 2012	Field Examination
JPMorgan Chase – U.K.	2006 – 2015	Field examination of certain select entities

Note 25 – Restrictions on cash and intercompany funds transfers

The business of JPMorgan Chase Bank, National Association ("JPMorgan Chase Bank, N.A.") is subject to examination and regulation by the OCC. The Bank is a member of the U.S. Federal Reserve System, and its deposits in the U.S. are insured by the FDIC, subject to applicable limits.

The Federal Reserve requires depository institutions to maintain cash reserves with a Federal Reserve Bank. The average required amount of reserve balances deposited by the Firm's bank subsidiaries with various Federal Reserve Banks was approximately $24.9 billion and $19.3 billion in 2017 and 2016, respectively.

Restrictions imposed by U.S. federal law prohibit JPMorgan Chase & Co. ("Parent Company") and certain of its affiliates from borrowing from banking subsidiaries unless the loans are secured in specified amounts. Such secured loans provided by any banking subsidiary to the Parent Company or to any particular affiliate, together with certain other transactions with such affiliate (collectively referred to as "covered transactions"), are generally limited to 10% of the banking subsidiary's total capital, as determined by the risk-based capital guidelines; the aggregate amount of covered transactions between any banking subsidiary and all of its affiliates is limited to 20% of the banking subsidiary's total capital.

The Parent Company's two principal subsidiaries are JPMorgan Chase Bank, N.A. and JPMorgan Chase Holdings LLC, an intermediate holding company (the "IHC"). The IHC holds the stock of substantially all of JPMorgan Chase's subsidiaries other than JPMorgan Chase Bank, N.A. and its subsidiaries. The IHC also owns other assets and intercompany indebtedness owing to the holding company. The Parent Company is obligated to contribute to the IHC substantially all the net proceeds received from securities issuances (including issuances of senior and subordinated debt securities and of preferred and common stock).

The principal sources of income and funding for the Parent Company are dividends from JPMorgan Chase Bank, N.A. and dividends and extensions of credit from the IHC.
In addition to dividend restrictions set forth in statutes and regulations, the Federal Reserve, the OCC and the FDIC have authority under the Financial Institutions Supervisory Act to prohibit or to limit the payment of dividends by the banking organizations they supervise, including JPMorgan Chase and its subsidiaries that are banks or bank holding companies, if, in the banking regulator's opinion, payment of a dividend would constitute an unsafe or unsound practice in light of the financial condition of the banking organization. The IHC is prohibited from paying dividends or extending credit to the Parent Company if certain capital or liquidity "thresholds" are breached or if limits are otherwise imposed by JPMorgan Chase's management or Board of Directors.

At January 1, 2018, JPMorgan Chase's banking subsidiaries could pay, in the aggregate, approximately $17 billion in dividends to their respective bank holding companies without the prior approval of their relevant banking regulators. The capacity to pay dividends in 2018 will be supplemented by the banking subsidiaries' earnings during the year.

In compliance with rules and regulations established by U.S. and non-U.S. regulators, as of December 31, 2017 and 2016, cash in the amount of $16.8 billion and $13.4 billion, respectively, were segregated in special bank accounts for the benefit of securities and futures brokerage customers. Also, as of December 31, 2017 and 2016, the Firm had:

- Receivables and securities of $18.0 billion and $18.2 billion, respectively, consisting of cash and securities pledged with clearing organizations for the benefit of customers.
- Securities with a fair value of $3.5 billion and $19.3 billion, respectively, were also restricted in relation to customer activity.

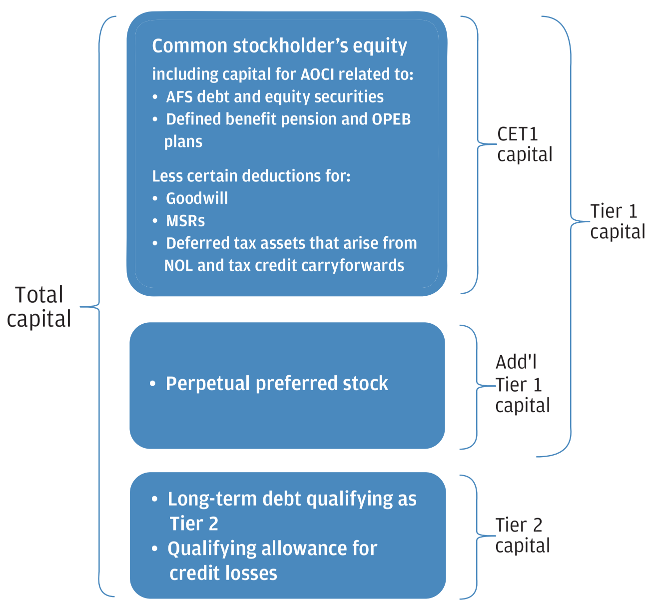
In addition, as of December 31, 2017 and 2016, the Firm had other restricted cash of $3.3 billion and $3.6 billion, respectively, primarily representing cash reserves held at non-U.S. central banks and held for other general purposes.

Note 26 – Regulatory capital

The Federal Reserve establishes capital requirements, including well-capitalized standards, for the consolidated financial holding company. The OCC establishes similar minimum capital requirements and standards for the Firm's IDI, including JPMorgan Chase Bank, N.A. and Chase Bank USA, N.A.

Capital rules under Basel III establish minimum capital ratios and overall capital adequacy standards for large and internationally active U.S. bank holding companies and banks, including the Firm and its IDI subsidiaries. Basel III set forth two comprehensive approaches for calculating RWA: a standardized approach ("Basel III Standardized") and an advanced approach ("Basel III Advanced"). Certain of the requirements of Basel III are subject to phase-in periods that began on January 1, 2014 and continue through the end of 2018 ("transitional period").

The three categories of risk-based capital and their predominant components under the Basel III Transitional rules are illustrated below:



The following tables present the regulatory capital, assets and risk-based capital ratios for JPMorgan Chase and its significant IDI subsidiaries under both Basel III Standardized Transitional and Basel III Advanced Transitional at December 31, 2017 and 2016.

JPMorgan Chase & Co.	Basel III Standardized Transitional		Basel III Advanced Transitional	
(in millions, except ratios)	**Dec 31, 2017**	Dec 31, 2016	**Dec 31, 2017**	Dec 31, 2016
Regulatory capital				
CET1 capital	**$ 183,300**	$ 182,967	**$ 183,300**	$ 182,967
Tier 1 capital[a]	**208,644**	208,112	**208,644**	208,112
Total capital	**238,395**	239,553	**227,933**	228,592
Assets				
Risk-weighted	**1,499,506**	1,483,132 [e]	**1,435,825**	1,476,915
Adjusted average[b]	**2,514,270**	2,484,631	**2,514,270**	2,484,631
Capital ratios[c]				
CET1	**12.2%**	12.3% [e]	**12.8%**	12.4%
Tier 1[a]	**13.9**	14.0 [e]	**14.5**	14.1
Total	**15.9**	16.2 [e]	**15.9**	15.5
Tier 1 leverage[d]	**8.3**	8.4	**8.3**	8.4

JPMorgan Chase Bank, N.A.	Basel III Standardized Transitional		Basel III Advanced Transitional	
(in millions, except ratios)	**Dec 31, 2017**	Dec 31, 2016	**Dec 31, 2017**	Dec 31, 2016
Regulatory capital				
CET1 capital	**$ 184,375**	$ 179,319	**$ 184,375**	$ 179,319
Tier 1 capital[a]	**184,375**	179,341	**184,375**	179,341
Total capital	**195,839**	191,662	**189,419**	184,637
Assets				
Risk-weighted	**1,335,809**	1,311,240 [e]	**1,226,534**	1,262,613
Adjusted average[b]	**2,116,031**	2,088,851	**2,116,031**	2,088,851
Capital ratios[c]				
CET1	**13.8%**	13.7% [e]	**15.0%**	14.2%
Tier 1[a]	**13.8**	13.7 [e]	**15.0**	14.2
Total	**14.7**	14.6 [e]	**15.4**	14.6
Tier 1 leverage[d]	**8.7**	8.6	**8.7**	8.6

	Chase Bank USA, N.A.			
	Basel III Standardized Transitional		Basel III Advanced Transitional	
(in millions, except ratios)	Dec 31, 2017	Dec 31, 2016	Dec 31, 2017	Dec 31, 2016
Regulatory capital				
CET1 capital	$ 21,600	$ 16,784	$ 21,600	$ 16,784
Tier 1 capital	21,600	16,784	21,600	16,784
Total capital	27,691	22,862	26,250	21,434
Assets				
Risk-weighted	113,108	112,297	190,523	186,378
Adjusted average[(b)]	126,517	120,304	126,517	120,304
Capital ratios[(c)]				
CET1	19.1%	14.9%	11.3%	9.0%
Tier 1	19.1	14.9	11.3	9.0
Total	24.5	20.4	13.8	11.5
Tier 1 leverage[(d)]	17.1	14.0	17.1	14.0

(a) Includes the deduction associated with the permissible holdings of covered funds (as defined by the Volcker Rule). The deduction was not material as of December 31, 2017 and 2016.
(b) Adjusted average assets, for purposes of calculating the Tier 1 leverage ratio, includes total quarterly average assets adjusted for unrealized gains/(losses) on AFS securities, less deductions for goodwill and other intangible assets, defined benefit pension plan assets, and deferred tax assets related to tax attributes, including NOLs.
(c) For each of the risk-based capital ratios, the capital adequacy of the Firm and its IDI subsidiaries is evaluated against the lower of the two ratios as calculated under Basel III approaches (Standardized or Advanced) as required by the Collins Amendment of the Dodd-Frank Act (the "Collins Floor")
(d) The Tier 1 leverage ratio is not a risk-based measure of capital. This ratio is calculated by dividing Tier 1 capital by adjusted average assets.
(e) The prior period amounts have been revised to conform with the current period presentation.

Under the risk-based capital guidelines of the Federal Reserve, JPMorgan Chase is required to maintain minimum ratios of CET1, Tier 1 and Total capital to RWA, as well as a minimum leverage ratio (which is defined as Tier 1 capital divided by adjusted quarterly average assets). Failure to meet these minimum requirements could cause the Federal Reserve to take action. IDI subsidiaries also are subject to these capital requirements by their respective primary regulators.

The following table presents the minimum ratios to which the Firm and its IDI subsidiaries are subject as of December 31, 2017.

	Minimum capital ratios		Well-capitalized ratios	
	BHC[(a)(e)]	IDI[(b)(e)]	BHC[(c)]	IDI[(d)]
Capital ratios				
CET1	7.50%	5.75%	–%	6.50%
Tier 1	9.00	7.25	6.00	8.00
Total	11.00	9.25	10.00	10.00
Tier 1 leverage	4.00	4.00	–	5.00

Note: The table above is as defined by the regulations issued by the Federal Reserve, OCC and FDIC and to which the Firm and its IDI subsidiaries are subject.

(a) Represents the Transitional minimum capital ratios applicable to the Firm under Basel III at December 31, 2017. At December 31, 2017, the CET1 minimum capital ratio includes 1.25% resulting from the phase-in of the Firm's 2.5% capital conservation buffer, and 1.75% resulting from the phase-in of the Firm's 3.5% GSIB surcharge.
(b) Represents requirements for JPMorgan Chase's IDI subsidiaries. The CET1 minimum capital ratio includes 1.25% resulting from the phase-in of the 2.5% capital conservation buffer that is applicable to the IDI subsidiaries. The IDI subsidiaries are not subject to the GSIB surcharge.
(c) Represents requirements for bank holding companies pursuant to regulations issued by the Federal Reserve.
(d) Represents requirements for IDI subsidiaries pursuant to regulations issued under the FDIC Improvement Act.
(e) For the period ended December 31, 2016 the CET1, Tier 1, Total and Tier 1 leverage minimum capital ratios applicable to the Firm were 6.25%, 7.75%, 9.75% and 4.0% and the CET1, Tier 1, Total and Tier 1 leverage minimum capital ratios applicable to the Firm's IDI subsidiaries were 5.125%, 6.625%, 8.625% and 4.0% respectively.

As of December 31, 2017 and 2016, JPMorgan Chase and all of its IDI subsidiaries were well-capitalized and met all capital requirements to which each was subject.

Note 27 – Off-balance sheet lending-related financial instruments, guarantees, and other commitments

JPMorgan Chase provides lending-related financial instruments (e.g., commitments and guarantees) to meet the financing needs of its clients or customers. The contractual amount of these financial instruments represents the maximum possible credit risk to the Firm should the counterparty draw upon the commitment or the Firm be required to fulfill its obligation under the guarantee, and should the counterparty subsequently fail to perform according to the terms of the contract. Most of these commitments and guarantees are refinanced, extended, cancelled, or expire without being drawn or a default occurring. As a result, the total contractual amount of these instruments is not, in the Firm's view, representative of its expected future credit exposure or funding requirements.

To provide for probable credit losses inherent in wholesale and certain consumer lending-commitments, an allowance for credit losses on lending-related commitments is maintained. See Note 13 for further information regarding the allowance for credit losses on lending-related commitments. The following table summarizes the contractual amounts and carrying values of off-balance sheet lending-related financial instruments, guarantees and other commitments at December 31, 2017 and 2016. The amounts in the table below for credit card and home equity lending-related commitments represent the total available credit for these products. The Firm has not experienced, and does not anticipate, that all available lines of credit for these products will be utilized at the same time. The Firm can reduce or cancel credit card lines of credit by providing the borrower notice or, in some cases as permitted by law, without notice. In addition, the Firm typically closes credit card lines when the borrower is 60 days or more past due. The Firm may reduce or close HELOCs when there are significant decreases in the value of the underlying property, or when there has been a demonstrable decline in the creditworthiness of the borrower.

Off-balance sheet lending-related financial instruments, guarantees and other commitments

	Contractual amount						Carrying value[i]	
	2017					2016	2017	2016
By remaining maturity at December 31, (in millions)	Expires in 1 year or less	Expires after 1 year through 3 years	Expires after 3 years through 5 years	Expires after 5 years	Total	Total		
Lending-related								
Consumer, excluding credit card:								
Home equity	$ 2,165	$ 1,370	$ 1,379	$ 15,446	$ 20,360	$ 21,714	$ 12	$ 12
Residential mortgage[a][b]	5,723	–	–	13	5,736	10,332	–	–
Auto	8,007	872	292	84	9,255	8,468	2	2
Consumer & Business Banking[b]	11,642	926	112	522	13,202	12,733	19	12
Total consumer, excluding credit card	27,537	3,168	1,783	16,065	48,553	53,247 [h]	33	26
Credit card	572,831	–	–	–	572,831	553,891	–	–
Total consumer[c]	600,368	3,168	1,783	16,065	621,384	607,138 [h]	33	26
Wholesale:								
Other unfunded commitments to extend credit[d]	61,536	118,907	138,289	12,428	331,160	328,497	840	905
Standby letters of credit and other financial guarantees[d]	15,278	9,905	7,963	2,080	35,226	35,947	636	586
Other letters of credit[d]	3,459	114	139	–	3,712	3,570	3	2
Total wholesale[e]	80,273	128,926	146,391	14,508	370,098	368,014	1,479	1,493
Total lending-related	$ 680,641	$ 132,094	$ 148,174	$ 30,573	$ 991,482	$ 975,152 [h]	$ 1,512	$ 1,519
Other guarantees and commitments								
Securities lending indemnification agreements and guarantees[f]	$ 179,490	$ –	$ –	$ –	$ 179,490	$ 137,209	$ –	$ –
Derivatives qualifying as guarantees	4,529	101	12,479	40,065	57,174	51,966	304	80
Unsettled reverse repurchase and securities borrowing agreements	76,859	–	–	–	76,859	50,722	–	–
Unsettled repurchase and securities lending agreements	44,205	–	–	–	44,205	26,948	–	–
Loan sale and securitization-related indemnifications:								
Mortgage repurchase liability	NA	NA	NA	NA	NA	NA	111	133
Loans sold with recourse	NA	NA	NA	NA	1,169	2,730	38	64
Other guarantees and commitments[g]	7,668	1,084	434	2,681	11,867	5,715	(76)	(118)

(a) Includes certain commitments to purchase loans from correspondents.
(b) Certain loan portfolios have been reclassified. The prior period amounts have been revised to conform with the current period presentation.
(c) Predominantly all consumer lending-related commitments are in the U.S.
(d) At December 31, 2017 and 2016, reflected the contractual amount net of risk participations totaling $334 million and $328 million, respectively, for other unfunded commitments to extend credit; $10.4 billion and $11.1 billion, respectively, for standby letters of credit and other financial guarantees; and $405 million and $265 million, respectively, for other letters of credit. In regulatory filings with the Federal Reserve these commitments are shown gross of risk participations.
(e) At December 31, 2017 and 2016, the U.S. portion of the contractual amount of total wholesale lending-related commitments was 77% and 79%, respectively.
(f) At December 31, 2017 and 2016, collateral held by the Firm in support of securities lending indemnification agreements was $188.7 billion and $143.2 billion, respectively. Securities lending collateral consist of primarily cash and securities issued by governments that are members of G7 and U.S. government agencies.
(g) At December 31, 2017, primarily includes letters of credit hedged by derivative transactions and managed on a market risk basis, unfunded commitments related to institutional lending and commitments associated with the Firm's membership in certain clearing houses. Additionally, includes unfunded commitments predominantly related to certain tax-oriented equity investments.
(h) The prior period amounts have been revised to conform with the current period presentation.
(i) For lending-related products, the carrying value represents the allowance for lending-related commitments and the guarantee liability; for derivative-related products, the carrying value represents the fair value.

Other unfunded commitments to extend credit

Other unfunded commitments to extend credit generally consist of commitments for working capital and general corporate purposes, extensions of credit to support commercial paper facilities and bond financings in the event that those obligations cannot be remarketed to new investors, as well as committed liquidity facilities to clearing organizations. The Firm also issues commitments under multipurpose facilities which could be drawn upon in several forms, including the issuance of a standby letter of credit.

The Firm acts as a settlement and custody bank in the U.S. tri-party repurchase transaction market. In its role as settlement and custody bank, the Firm is exposed to the intra-day credit risk of its cash borrower clients, usually broker-dealers. This exposure arises under secured clearance advance facilities that the Firm extends to its clients (i.e. cash borrowers); these facilities contractually limit the Firm's intra-day credit risk to the facility amount and must be repaid by the end of the day. As of December 31, 2017 and 2016, the secured clearance advance facility maximum outstanding commitment amount was $1.5 billion and $2.4 billion, respectively.

Guarantees

U.S. GAAP requires that a guarantor recognize, at the inception of a guarantee, a liability in an amount equal to the fair value of the obligation undertaken in issuing the guarantee. U.S. GAAP defines a guarantee as a contract that contingently requires the guarantor to pay a guaranteed party based upon: (a) changes in an underlying asset, liability or equity security of the guaranteed party; or (b) a third party's failure to perform under a specified agreement. The Firm considers the following off-balance sheet lending-related arrangements to be guarantees under U.S. GAAP: standby letters of credit and other financial guarantees, securities lending indemnifications, certain indemnification agreements included within third-party contractual arrangements and certain derivative contracts.

As required by U.S. GAAP, the Firm initially records guarantees at the inception date fair value of the obligation assumed (e.g., the amount of consideration received or the net present value of the premium receivable). For certain types of guarantees, the Firm records this fair value amount in other liabilities with an offsetting entry recorded in cash (for premiums received), or other assets (for premiums receivable). Any premium receivable recorded in other assets is reduced as cash is received under the contract, and the fair value of the liability recorded at inception is amortized into income as lending and deposit-related fees over the life of the guarantee contract. For indemnifications provided in sales agreements, a portion of the sale proceeds is allocated to the guarantee, which adjusts the gain or loss that would otherwise result from the transaction. For these indemnifications, the initial liability is amortized to income as the Firm's risk is reduced (i.e., over time or when the indemnification expires). Any contingent liability that exists as a result of issuing the guarantee or indemnification is recognized when it becomes probable and reasonably estimable. The contingent portion of the liability is not recognized if the estimated amount is less than the carrying amount of the liability recognized at inception (adjusted for any amortization). The recorded amounts of the liabilities related to guarantees and indemnifications at December 31, 2017 and 2016, excluding the allowance for credit losses on lending-related commitments, are discussed below.

Standby letters of credit and other financial guarantees

Standby letters of credit and other financial guarantees are conditional lending commitments issued by the Firm to guarantee the performance of a client or customer to a third party under certain arrangements, such as commercial paper facilities, bond financings, acquisition financings, trade and similar transactions. The carrying values of standby and other letters of credit were $639 million and $588 million at December 31, 2017 and 2016, respectively, which were classified in accounts payable and other liabilities on the Consolidated balance sheets; these carrying values included $195 million and $147 million, respectively, for the allowance for lending-related commitments, and $444 million and $441 million, respectively, for the guarantee liability and corresponding asset.

The following table summarizes the types of facilities under which standby letters of credit and other letters of credit arrangements are outstanding by the ratings profiles of the Firm's clients, as of December 31, 2017 and 2016.

Standby letters of credit, other financial guarantees and other letters of credit

	2017		2016	
December 31, (in millions)	Standby letters of credit and other financial guarantees	Other letters of credit	Standby letters of credit and other financial guarantees	Other letters of credit
Investment-grade[(a)]	**$ 28,492**	**$ 2,646**	$ 28,245	$ 2,781
Noninvestment-grade[(a)]	**6,734**	**1,066**	7,702	789
Total contractual amount	**$ 35,226**	**$ 3,712**	$ 35,947	$ 3,570
Allowance for lending-related commitments	**$ 192**	**$ 3**	$ 145	$ 2
Guarantee liability	**444**	**–**	441	–
Total carrying value	**$ 636**	**$ 3**	$ 586	$ 2
Commitments with collateral	**$ 17,421**	**$ 878**	$ 19,346	$ 940

(a) The ratings scale is based on the Firm's internal ratings, which generally correspond to ratings as defined by S&P and Moody's.

Securities lending indemnifications
Through the Firm's securities lending program, counterparties' securities, via custodial and non-custodial arrangements, may be lent to third parties. As part of this program, the Firm provides an indemnification in the lending agreements which protects the lender against the failure of the borrower to return the lent securities. To minimize its liability under these indemnification agreements, the Firm obtains cash or other highly liquid collateral with a market value exceeding 100% of the value of the securities on loan from the borrower. Collateral is marked to market daily to help assure that collateralization is adequate. Additional collateral is called from the borrower if a shortfall exists, or collateral may be released to the borrower in the event of overcollateralization. If a borrower defaults, the Firm would use the collateral held to purchase replacement securities in the market or to credit the lending client or counterparty with the cash equivalent thereof.

Derivatives qualifying as guarantees
The Firm transacts certain derivative contracts that have the characteristics of a guarantee under U.S. GAAP. These contracts include written put options that require the Firm to purchase assets upon exercise by the option holder at a specified price by a specified date in the future. The Firm may enter into written put option contracts in order to meet client needs, or for other trading purposes. The terms of written put options are typically five years or less.

Derivatives deemed to be guarantees also includes stable value contracts, commonly referred to as "stable value products", that require the Firm to make a payment of the difference between the market value and the book value of a counterparty's reference portfolio of assets in the event that market value is less than book value and certain other conditions have been met. Stable value products are transacted in order to allow investors to realize investment returns with less volatility than an unprotected portfolio. These contracts are typically longer-term or may have no stated maturity, but allow the Firm to elect to terminate the contract under certain conditions.

The notional value of derivatives guarantees generally represents the Firm's maximum exposure. However, exposure to certain stable value products is contractually limited to a substantially lower percentage of the notional amount.

The fair value of derivative guarantees reflects the probability, in the Firm's view, of whether the Firm will be required to perform under the contract. The Firm reduces exposures to these contracts by entering into offsetting transactions, or by entering into contracts that hedge the market risk related to the derivative guarantees.

The following table summarizes the derivatives qualifying as guarantees as of December 31, 2017, and 2016.

(in millions)	**December 31, 2017**	December 31, 2016
Notional amounts		
Derivative guarantees	**57,174**	51,966
Stable value contracts with contractually limited exposure	**29,104**	28,665
Maximum exposure of stable value contracts with contractually limited exposure	**3,053**	3,012
Fair value		
Derivative payables	**304**	96
Derivative receivables	**–**	16

In addition to derivative contracts that meet the characteristics of a guarantee, the Firm is both a purchaser and seller of credit protection in the credit derivatives market. For a further discussion of credit derivatives, see Note 5.

Unsettled reverse repurchase and securities borrowing agreements, and unsettled repurchase and securities lending agreements
In the normal course of business, the Firm enters into reverse repurchase agreements and securities borrowing agreements, which are secured financing agreements. Such agreements settle at a future date. At settlement, these commitments result in the Firm advancing cash to and receiving securities collateral from the counterparty. The Firm also enters into repurchase agreements and securities lending agreements. At settlement, these commitments result in the Firm receiving cash from and providing securities collateral to the counterparty. These agreements generally do not meet the definition of a derivative, and therefore, are not recorded on the Consolidated balance sheets until settlement date. These agreements predominantly consist of agreements with regular-way settlement periods. For a further discussion of securities purchased under resale agreements and securities borrowed, and securities sold under repurchase agreements and securities loaned, see Note 11.

Loan sales- and securitization-related indemnifications

Mortgage repurchase liability

In connection with the Firm's mortgage loan sale and securitization activities with GSEs, as described in Note 14, the Firm has made representations and warranties that the loans sold meet certain requirements that may require the Firm to repurchase mortgage loans and/or indemnify the loan purchaser. Further, although the Firm's securitizations are predominantly nonrecourse, the Firm does provide recourse servicing in certain limited cases where it agrees to share credit risk with the owner of the mortgage loans. To the extent that repurchase demands that are received relate to loans that the Firm purchased from third parties that remain viable, the Firm typically will have the right to seek a recovery of related repurchase losses from the third party. Generally, the maximum amount of future payments the Firm would be required to make for breaches of these representations and warranties would be equal to the unpaid principal balance of such loans that are deemed to have defects that were sold to purchasers (including securitization-related SPEs) plus, in certain circumstances, accrued interest on such loans and certain expenses.

Private label securitizations

The liability related to repurchase demands associated with private label securitizations is separately evaluated by the Firm in establishing its litigation reserves.

For additional information regarding litigation, see Note 29.

Loans sold with recourse

The Firm provides servicing for mortgages and certain commercial lending products on both a recourse and nonrecourse basis. In nonrecourse servicing, the principal credit risk to the Firm is the cost of temporary servicing advances of funds (i.e., normal servicing advances). In recourse servicing, the servicer agrees to share credit risk with the owner of the mortgage loans, such as Fannie Mae or Freddie Mac or a private investor, insurer or guarantor. Losses on recourse servicing predominantly occur when foreclosure sales proceeds of the property underlying a defaulted loan are less than the sum of the outstanding principal balance, plus accrued interest on the loan and the cost of holding and disposing of the underlying property. The Firm's securitizations are predominantly nonrecourse, thereby effectively transferring the risk of future credit losses to the purchaser of the mortgage-backed securities issued by the trust. At December 31, 2017 and 2016, the unpaid principal balance of loans sold with recourse totaled $1.2 billion and $2.7 billion, respectively. The carrying value of the related liability that the Firm has recorded, which is representative of the Firm's view of the likelihood it will have to perform under its recourse obligations, was $38 million and $64 million at December 31, 2017 and 2016, respectively.

Other off-balance sheet arrangements

Indemnification agreements – general

In connection with issuing securities to investors outside the U.S., the Firm may agree to pay additional amounts to the holders of the securities in the event that, due to a change in tax law, certain types of withholding taxes are imposed on payments on the securities. The terms of the securities may also give the Firm the right to redeem the securities if such additional amounts are payable. The enactment of the TCJA will not cause the Firm to become obligated to pay any such additional amounts. The Firm may also enter into indemnification clauses in connection with the licensing of software to clients ("software licensees") or when it sells a business or assets to a third party ("third-party purchasers"), pursuant to which it indemnifies software licensees for claims of liability or damages that may occur subsequent to the licensing of the software, or third-party purchasers for losses they may incur due to actions taken by the Firm prior to the sale of the business or assets. It is difficult to estimate the Firm's maximum exposure under these indemnification arrangements, since this would require an assessment of future changes in tax law and future claims that may be made against the Firm that have not yet occurred. However, based on historical experience, management expects the risk of loss to be remote.

Card charge-backs .

Under the rules of Visa USA, Inc., and MasterCard International, JPMorgan Chase Bank, N.A., is primarily liable for the amount of each processed card sales transaction that is the subject of a dispute between a cardmember and a merchant. If a dispute is resolved in the cardmember's favor, Merchant Services will (through the cardmember's issuing bank) credit or refund the amount to the cardmember and will charge back the transaction to the merchant. If Merchant Services is unable to collect the amount from the merchant, Merchant Services will bear the loss for the amount credited or refunded to the cardmember. Merchant Services mitigates this risk by withholding future settlements, retaining cash reserve accounts or by obtaining other security. However, in the unlikely event that: (1) a merchant ceases operations and is unable to deliver products, services or a refund; (2) Merchant Services does not have sufficient collateral from the merchant to provide cardmember refunds; and (3) Merchant Services does not have sufficient financial resources to provide cardmember refunds, JPMorgan Chase Bank, N.A., would recognize the loss.

Merchant Services incurred aggregate losses of $28 million, $85 million, and $12 million on $1,191.7 billion, $1,063.4 billion, and $949.3 billion of aggregate volume processed for the years ended December 31, 2017, 2016 and 2015, respectively. Incurred losses from merchant charge-backs are charged to other expense, with the offset recorded in a valuation allowance against accrued interest and accounts receivable on the Consolidated balance sheets. The carrying value of the valuation allowance was $7 million and $45 million at December 31, 2017 and 2016, respectively, which the Firm believes, based on historical experience and the collateral held by Merchant Services of $141 million and $125 million at December 31, 2017 and 2016, respectively, is representative of the payment or performance risk to the Firm related to charge-backs.

Clearing Services – Client Credit Risk
The Firm provides clearing services for clients by entering into securities purchases and sales and derivative transactions with CCPs, including ETDs such as futures and options, as well as OTC-cleared derivative contracts. As a clearing member, the Firm stands behind the performance of its clients, collects cash and securities collateral (margin) as well as any settlement amounts due from or to clients, and remits them to the relevant CCP or client in whole or part. There are two types of margin: variation margin is posted on a daily basis based on the value of clients' derivative contracts and initial margin is posted at inception of a derivative contract, generally on the basis of the potential changes in the variation margin requirement for the contract.

As a clearing member, the Firm is exposed to the risk of nonperformance by its clients, but is not liable to clients for the performance of the CCPs. Where possible, the Firm seeks to mitigate its risk to the client through the collection of appropriate amounts of margin at inception and throughout the life of the transactions. The Firm can also cease providing clearing services if clients do not adhere to their obligations under the clearing agreement. In the event of nonperformance by a client, the Firm would close out the client's positions and access available margin. The CCP would utilize any margin it holds to make itself whole, with any remaining shortfalls required to be paid by the Firm as a clearing member.

The Firm reflects its exposure to nonperformance risk of the client through the recognition of margin receivables from clients and margin payables to CCPs; the clients' underlying securities or derivative contracts are not reflected in the Firm's Consolidated Financial Statements.

It is difficult to estimate the Firm's maximum possible exposure through its role as a clearing member, as this would require an assessment of transactions that clients may execute in the future. However, based upon historical experience, and the credit risk mitigants available to the Firm, management believes it is unlikely that the Firm will have to make any material payments under these arrangements and the risk of loss is expected to be remote.

For information on the derivatives that the Firm executes for its own account and records in its Consolidated Financial Statements, see Note 5.

Exchange & Clearing House Memberships
The Firm is a member of several securities and derivative exchanges and clearing houses, both in the U.S. and other countries, and it provides clearing services. Membership in some of these organizations requires the Firm to pay a pro rata share of the losses incurred by the organization as a result of the default of another member. Such obligations vary with different organizations. These obligations may be limited to members who dealt with the defaulting member or to the amount (or a multiple of the amount) of the Firm's contribution to the guarantee fund maintained by a clearing house or exchange as part of the resources available to cover any losses in the event of a member default. Alternatively, these obligations may include a pro rata share of the residual losses after applying the guarantee fund. Additionally, certain clearing houses require the Firm as a member to pay a pro rata share of losses that may result from the clearing house's investment of guarantee fund contributions and initial margin, unrelated to and independent of the default of another member. Generally a payment would only be required should such losses exceed the resources of the clearing house or exchange that are contractually required to absorb the losses in the first instance. It is difficult to estimate the Firm's maximum possible exposure under these membership agreements, since this would require an assessment of future claims that may be made against the Firm that have not yet occurred. However, based on historical experience, management expects the risk of loss to be remote.

Guarantees of subsidiaries
In the normal course of business, the Parent Company may provide counterparties with guarantees of certain of the trading and other obligations of its subsidiaries on a contract-by-contract basis, as negotiated with the Firm's counterparties. The obligations of the subsidiaries are included on the Firm's Consolidated balance sheets or are reflected as off-balance sheet commitments; therefore, the Parent Company has not recognized a separate liability for these guarantees. The Firm believes that the occurrence of any event that would trigger payments by the Parent Company under these guarantees is remote.

The Parent Company has guaranteed certain long-term debt and structured notes of its subsidiaries, including JPMorgan Chase Financial Company LLC ("JPMFC"), a 100%-owned finance subsidiary. All securities issued by JPMFC are fully and unconditionally guaranteed by the Parent Company. These guarantees, which rank on a parity with the Firm's unsecured and unsubordinated indebtedness, are not included in the table on page 262 of this Note. For additional information, see Note 19.

Note 28 – Commitments, pledged assets and collateral

Lease commitments

At December 31, 2017, JPMorgan Chase and its subsidiaries were obligated under a number of noncancelable operating leases for premises and equipment used primarily for banking purposes. Certain leases contain renewal options or escalation clauses providing for increased rental payments based on maintenance, utility and tax increases, or they require the Firm to perform restoration work on leased premises. No lease agreement imposes restrictions on the Firm's ability to pay dividends, engage in debt or equity financing transactions or enter into further lease agreements.

The following table presents required future minimum rental payments under operating leases with noncancelable lease terms that expire after December 31, 2017.

Year ended December 31, (in millions)	
2018	1,526
2019	1,450
2020	1,300
2021	1,029
2022	815
After 2022	3,757
Total minimum payments required	9,877
Less: Sublease rentals under noncancelable subleases	(1,034)
Net minimum payment required	$ 8,843

Total rental expense was as follows.

Year ended December 31, (in millions)	2017	2016	2015
Gross rental expense	**$ 1,853**	$ 1,860	$ 2,015
Sublease rental income	**(251)**	(241)	(411)
Net rental expense	**$ 1,602**	$ 1,619	$ 1,604

Pledged assets

The Firm may pledge financial assets that it owns to maintain potential borrowing capacity with central banks and for other purposes, including to secure borrowings and public deposits, collateralize repurchase and other securities financing agreements, and cover customer short sales. Certain of these pledged assets may be sold or repledged or otherwise used by the secured parties and are identified as financial instruments owned (pledged to various parties) on the Consolidated balance sheets.

The following table presents the Firm's pledged assets.

December 31, (in billions)	2017	2016
Assets that may be sold or repledged or otherwise used by secured parties	**$ 129.6**	$ 133.6
Assets that may not be sold or repledged or otherwise used by secured parties	**67.9**	53.5
Assets pledged at Federal Reserve banks and FHLBs	**493.7**	441.9
Total assets pledged	**$ 691.2**	$ 629.0

Total assets pledged do not include assets of consolidated VIEs; these assets are used to settle the liabilities of those entities. See Note 14 for additional information on assets and liabilities of consolidated VIEs. For additional information on the Firm's securities financing activities, see Note 11. For additional information on the Firm's long-term debt, see Note 19. The significant components of the Firm's pledged assets were as follows.

December 31, (in billions)	2017	2016
Securities	**$ 86.2**	$ 101.1
Loans	**437.7**	374.9
Trading assets and other	**167.3**	153.0
Total assets pledged	**$ 691.2**	$ 629.0

Collateral

The Firm accepts financial assets as collateral that it is permitted to sell or repledge, deliver or otherwise use. This collateral is generally obtained under resale agreements, securities borrowing agreements, customer margin loans and derivative agreements. Collateral is generally used under repurchase agreements, securities lending agreements or to cover customer short sales and to collateralize deposits and derivative agreements.

The following table presents the fair value of collateral accepted.

December 31, (in billions)	2017	2016
Collateral permitted to be sold or repledged, delivered, or otherwise used	**$ 968.8**	$ 914.1
Collateral sold, repledged, delivered or otherwise used	**775.3**	746.6

Note 29 – Litigation

Contingencies

As of December 31, 2017, the Firm and its subsidiaries and affiliates are defendants or putative defendants in numerous legal proceedings, including private, civil litigations and regulatory/government investigations. The litigations range from individual actions involving a single plaintiff to class action lawsuits with potentially millions of class members. Investigations involve both formal and informal proceedings, by both governmental agencies and self-regulatory organizations. These legal proceedings are at varying stages of adjudication, arbitration or investigation, and involve each of the Firm's lines of business and geographies and a wide variety of claims (including common law tort and contract claims and statutory antitrust, securities and consumer protection claims), some of which present novel legal theories.

The Firm believes the estimate of the aggregate range of reasonably possible losses, in excess of reserves established, for its legal proceedings is from $0 to approximately $1.7 billion at December 31, 2017. This estimated aggregate range of reasonably possible losses was based upon currently available information for those proceedings in which the Firm believes that an estimate of reasonably possible loss can be made. For certain matters, the Firm does not believe that such an estimate can be made, as of that date. The Firm's estimate of the aggregate range of reasonably possible losses involves significant judgment, given the number, variety and varying stages of the proceedings (including the fact that many are in preliminary stages), the existence in many such proceedings of multiple defendants (including the Firm) whose share of liability has yet to be determined, the numerous yet-unresolved issues in many of the proceedings (including issues regarding class certification and the scope of many of the claims) and the attendant uncertainty of the various potential outcomes of such proceedings, including where the Firm has made assumptions concerning future rulings by the court or other adjudicator, or about the behavior or incentives of adverse parties or regulatory authorities, and those assumptions prove to be incorrect. In addition, the outcome of a particular proceeding may be a result which the Firm did not take into account in its estimate because the Firm had deemed the likelihood of that outcome to be remote. Accordingly, the Firm's estimate of the aggregate range of reasonably possible losses will change from time to time, and actual losses may vary significantly.

Set forth below are descriptions of the Firm's material legal proceedings.

Foreign Exchange Investigations and Litigation. The Firm previously reported settlements with certain government authorities relating to its foreign exchange ("FX") sales and trading activities and controls related to those activities. FX-related investigations and inquiries by government authorities, including competition authorities, are ongoing, and the Firm is cooperating with and working to resolve those matters. In May 2015, the Firm pleaded guilty to a single violation of federal antitrust law. In January 2017, the Firm was sentenced, with judgment entered thereafter. The Department of Labor has granted the Firm a five-year exemption of disqualification, effective upon expiration of a temporary one-year exemption previously granted, that allows the Firm and its affiliates to continue to rely on the Qualified Professional Asset Manager exemption under the Employee Retirement Income Security Act ("ERISA"). The Firm will need to reapply in due course for a further exemption to cover the remainder of the ten-year disqualification period. Separately, in February 2017 the South Africa Competition Commission referred its FX investigation of the Firm and other banks to the South Africa Competition Tribunal, which is conducting civil proceedings concerning that matter.

The Firm is also one of a number of foreign exchange dealers defending a class action filed in the United States District Court for the Southern District of New York by U.S.-based plaintiffs, principally alleging violations of federal antitrust laws based on an alleged conspiracy to manipulate foreign exchange rates (the "U.S. class action"). In January 2015, the Firm entered into a settlement agreement in the U.S. class action. Following this settlement, a number of additional putative class actions were filed seeking damages for persons who transacted FX futures and options on futures (the "exchanged-based actions"), consumers who purchased foreign currencies at allegedly inflated rates (the "consumer action"), participants or beneficiaries of qualified ERISA plans (the "ERISA actions"), and purported indirect purchasers of FX instruments (the "indirect purchaser action"). Since then, the Firm has entered into a revised settlement agreement to resolve the consolidated U.S. class action, including the exchange-based actions, and that agreement has been preliminarily approved by the Court. The District Court has dismissed one of the ERISA actions, and the plaintiffs have filed an appeal. The consumer action, a second ERISA action and the indirect purchaser action remain pending in the District Court.

General Motors Litigation. JPMorgan Chase Bank, N.A. participated in, and was the Administrative Agent on behalf of a syndicate of lenders on, a $1.5 billion syndicated Term Loan facility ("Term Loan") for General Motors Corporation ("GM"). In July 2009, in connection with the GM bankruptcy proceedings, the Official Committee of Unsecured Creditors of Motors Liquidation Company ("Creditors Committee") filed a lawsuit against JPMorgan Chase Bank, N.A., in its individual capacity and as Administrative Agent for other lenders on the Term Loan, seeking to hold the underlying lien invalid based on the filing of a UCC-3 termination statement relating to the Term Loan. In January 2015, following several court proceedings, the United States Court of Appeals for the Second Circuit reversed the Bankruptcy Court's dismissal of the Creditors Committee's claim and remanded the case to the Bankruptcy Court with instructions to enter partial summary judgment for the Creditors Committee as to the termination statement. The proceedings in the Bankruptcy Court continue with respect to, among other things, additional defenses asserted by JPMorgan Chase Bank, N.A. and the value of additional collateral on the Term Loan that was unaffected by the filing of the termination statement at issue. In connection with that additional collateral, a trial in the Bankruptcy Court regarding the value of certain representative assets concluded in May 2017, and a ruling was issued in September 2017. The Bankruptcy Court found that 33 of the 40 representative assets are fixtures and that these fixtures generally should be valued on a "going concern" basis. The Creditors Committee is seeking leave to appeal the Bankruptcy Court's ruling that the fixtures should be valued on a "going concern" basis rather than on a liquidation basis. In addition, certain Term Loan lenders filed cross-claims in the Bankruptcy Court against JPMorgan Chase Bank, N.A. seeking indemnification and asserting various claims. The parties are engaged in mediation concerning, among other things, the characterization and value of the remaining additional collateral, in light of the Bankruptcy Court's ruling regarding the representative assets, as well as other issues, including the cross-claims.

Hopper Estate Litigation. The Firm is a defendant in an action in connection with its role as an independent administrator of an estate. The plaintiffs sought in excess of $7 million in compensatory damages, primarily relating to attorneys' fees incurred by the plaintiffs. After a trial in probate court in Dallas, Texas that ended in September 2017, the jury returned a verdict against the Firm, awarding plaintiffs their full compensatory damages and multiple billions in punitive damages. Notwithstanding the jury verdict, in light of legal limitations on the availability of damages, certain of the plaintiffs moved for entry of judgment in the total amount of approximately $71 million, including punitive damages, while another plaintiff has not yet moved for judgment. The court has not yet entered a judgment in this matter. The parties are engaged in post-trial briefing.

Interchange Litigation. A group of merchants and retail associations filed a series of class action complaints alleging that Visa and MasterCard, as well as certain banks, conspired to set the price of credit and debit card interchange fees and enacted respective rules in violation of antitrust laws. The parties settled the cases for a cash payment of $6.1 billion to the class plaintiffs (of which the Firm's share is approximately 20%) and an amount equal to ten basis points of credit card interchange for a period of 8 months to be measured from a date within 60 days of the end of the opt-out period. The settlement also provided for modifications to each credit card network's rules, including those that prohibit surcharging credit card transactions. In December 2013, the District Court granted final approval of the settlement.

A number of merchants appealed to the United States Court of Appeals for the Second Circuit, which, in June 2016, vacated the District Court's certification of the class action and reversed the approval of the class settlement. In March 2017, the U.S. Supreme Court declined petitions seeking review of the decision of the Court of Appeals. The case has been remanded to the District Court for further proceedings consistent with the appellate decision.

In addition, certain merchants have filed individual actions raising similar allegations against Visa and MasterCard, as well as against the Firm and other banks, and those actions are proceeding.

LIBOR and Other Benchmark Rate Investigations and Litigation. JPMorgan Chase has received subpoenas and requests for documents and, in some cases, interviews, from federal and state agencies and entities, including the U.S. Commodity Futures Trading Commission ("CFTC") and various state attorneys general, as well as the European Commission ("EC"), the Swiss Competition Commission ("ComCo") and other regulatory authorities and banking associations around the world relating primarily to the process by which interest rates were submitted to the British Bankers Association ("BBA") in connection with the setting of the BBA's London Interbank Offered Rate ("LIBOR") for various currencies, principally in 2007 and 2008. Some of the inquiries also relate to similar processes by which information on rates was submitted to the European Banking Federation ("EBF") in connection with the setting of the EBF's Euro Interbank Offered Rates ("EURIBOR") and to the Japanese Bankers' Association for the setting of Tokyo Interbank Offered Rates ("TIBOR") during similar time periods, as well as processes for the setting of U.S. dollar ISDAFIX rates and other reference rates in various parts of the world during similar time periods, including through 2012. The Firm continues to cooperate with these ongoing investigations, and is currently engaged in discussions with the CFTC about resolving its U.S. dollar ISDAFIX-related investigation with respect to the Firm. There is no assurance that such discussions will result in a settlement. As previously reported, the Firm has resolved EC inquiries relating to Yen LIBOR and Swiss Franc LIBOR. In December 2016, the Firm resolved ComCo inquiries relating to these same rates. ComCo's investigation relating to EURIBOR, to which the Firm and other banks are subject, continues. In December 2016, the EC issued a decision against the Firm and other banks finding an infringement of European antitrust rules relating to EURIBOR. The Firm has filed an appeal with the European General Court.

In addition, the Firm has been named as a defendant along with other banks in a series of individual and putative class actions filed in various United States District Courts. These actions have been filed, or consolidated for pre-trial purposes, in the United States District Court for the Southern District of New York. In these actions, plaintiffs make varying allegations that in various periods, starting in 2000 or later, defendants either individually or collectively manipulated various benchmark rates by submitting rates that were artificially low or high. Plaintiffs allege that they transacted in loans, derivatives or other financial instruments whose values are affected by changes in these rates and assert a variety of claims including antitrust claims seeking treble damages. These matters are in various stages of litigation.

The Firm has agreed to settle a putative class action related to Swiss franc LIBOR, and that settlement remains subject to final court approval.

In an action related to EURIBOR, the District Court dismissed all claims except a single antitrust claim and two common law claims, and dismissed all defendants except the Firm and Citibank.

In actions related to U.S. dollar LIBOR, the District Court dismissed certain claims, including antitrust claims brought by some plaintiffs whom the District Court found did not have standing to assert such claims, and permitted antitrust claims, claims under the Commodity Exchange Act and common law claims to proceed. The plaintiffs whose antitrust claims were dismissed for lack of standing have filed an appeal. In May 2017, plaintiffs in three putative class actions moved in the District Court for class certification, and the Firm and other defendants have opposed that motion. In January 2018, the District Court heard oral arguments on the class certification motions and reserved decision.

In an action related to the Singapore Interbank Offered Rate and the Singapore Swap Offer Rate, the District Court dismissed without prejudice all claims except a single antitrust claim, and dismissed without prejudice all defendants except the Firm, Bank of America and Citibank. The plaintiffs filed an amended complaint in September 2017, which the Firm and other defendants have moved to dismiss.

The Firm is one of the defendants in a number of putative class actions alleging that defendant banks and ICAP conspired to manipulate the U.S. dollar ISDAFIX rates. In April 2016, the Firm settled this litigation, along with certain other banks. Those settlements have been preliminarily approved by the Court.

Mortgage-Backed Securities and Repurchase Litigation and Related Regulatory Investigations. The Firm and affiliates (together, "JPMC"), Bear Stearns and affiliates (together, "Bear Stearns") and certain Washington Mutual affiliates (together, "Washington Mutual") have been named as defendants in a number of cases in their various roles in offerings of MBS. The remaining civil cases include one investor action and actions for repurchase of mortgage loans. The Firm and certain of its current and former officers and Board members have also been sued in a shareholder derivative action relating to the Firm's MBS activities, which remains pending.

Issuer Litigation – Individual Purchaser Actions. With the exception of one remaining action, the Firm has resolved all of the individual actions brought against JPMC, Bear Stearns and Washington Mutual as MBS issuers (and, in some cases, also as underwriters of their own MBS offerings).

Repurchase Litigation. The Firm is defending a few actions brought by trustees and/or securities administrators of various MBS trusts on behalf of purchasers of securities issued by those trusts. These cases generally allege breaches of various representations and warranties regarding securitized loans and seek repurchase of those loans or equivalent monetary relief, as well as indemnification of attorneys' fees and costs and other remedies. The trustees and/or securities administrators have accepted settlement offers on these MBS transactions, and these settlements are subject to court approval.

In addition, the Firm and a group of 21institutional MBS investors made a binding offer to the trustees of MBS issued by JPMC and Bear Stearns providing for the payment of $4.5 billion and the implementation of certain servicing changes by JPMC, to resolve all repurchase and servicing claims that have been asserted or could have been asserted with respect to 330 MBS trusts created between 2005 and 2008. The offer does not resolve claims relating to Washington Mutual MBS. The trustees (or separate and successor trustees) for this group of 330 trusts have accepted the settlement for 319 trusts in whole or in part and excluded from the settlement 16 trusts in whole or in part. The trustees' acceptance received final approval from the court and the Firm paid the settlement in December 2017.

Additional actions have been filed against third-party trustees that relate to loan repurchase and servicing claims involving trusts sponsored by JPMC, Bear Stearns and Washington Mutual.

In actions against the Firm involving offerings of MBS issued by the Firm, the Firm has contractual rights to indemnification from sellers of mortgage loans that were securitized in such offerings. However, certain of those indemnity rights may prove effectively unenforceable in various situations, such as where the loan sellers are now defunct.

The Firm has entered into agreements with a number of MBS trustees or entities that purchased MBS that toll applicable statute of limitations periods with respect to their claims, and has settled, and in the future may settle, tolled claims. There is no assurance that the Firm will not be named as a defendant in additional MBS-related litigation.

Derivative Action. A shareholder derivative action against the Firm, as nominal defendant, and certain of its current and former officers and members of its Board of Directors relating to the Firm's MBS activities was filed in California federal court in 2013. In June 2017, the court granted defendants' motion to dismiss the cause of action that alleged material misrepresentations and omissions in the

Firm's proxy statement, found that the court did not have personal jurisdiction over the individual defendants with respect to the remaining causes of action, and transferred that remaining portion of the case to the United States District Court for the Southern District of New York without ruling on the merits. The motion by the defendants to dismiss is pending.

Municipal Derivatives Litigation. Several civil actions were commenced in New York and Alabama courts against the Firm relating to certain Jefferson County, Alabama (the "County") warrant underwritings and swap transactions. The claims in the civil actions generally alleged that the Firm made payments to certain third parties in exchange for being chosen to underwrite more than $3.0 billion in warrants issued by the County and to act as the counterparty for certain swaps executed by the County. The County filed for bankruptcy in November 2011. In June 2013, the County filed a Chapter 9 Plan of Adjustment, as amended (the "Plan of Adjustment"), which provided that all the above-described actions against the Firm would be released and dismissed with prejudice. In November 2013, the Bankruptcy Court confirmed the Plan of Adjustment, and in December 2013, certain sewer rate payers filed an appeal challenging the confirmation of the Plan of Adjustment. All conditions to the Plan of Adjustment's effectiveness, including the dismissal of the actions against the Firm, were satisfied or waived and the transactions contemplated by the Plan of Adjustment occurred in December 2013. Accordingly, all the above-described actions against the Firm have been dismissed pursuant to the terms of the Plan of Adjustment. The appeal of the Bankruptcy Court's order confirming the Plan of Adjustment remains pending.

Petters Bankruptcy and Related Matters. JPMorgan Chase and certain of its affiliates, including One Equity Partners ("OEP"), were named as defendants in several actions filed in connection with the receivership and bankruptcy proceedings pertaining to Thomas J. Petters and certain affiliated entities (collectively, "Petters") and the Polaroid Corporation. The principal actions against JPMorgan Chase and its affiliates were brought by a court-appointed receiver for Petters and the trustees in bankruptcy proceedings for three Petters entities. These actions generally sought to avoid certain putative transfers in connection with (i) the 2005 acquisition by Petters of Polaroid, which at the time was majority-owned by OEP; (ii) two credit facilities that JPMorgan Chase and other financial institutions entered into with Polaroid; and (iii) a credit line and investment accounts held by Petters. In January 2017, the Court substantially denied the defendants' motion to dismiss an amended complaint filed by the plaintiffs. In October 2017, JPMorgan Chase and its affiliates reached an agreement in principle to settle the litigation brought by the Petters bankruptcy trustees, or their successors, and the receiver for Thomas J. Petters. The settlement is subject to final documentation and Court approval.

Wendel. Since 2012, the French criminal authorities have been investigating a series of transactions entered into by senior managers of Wendel Investissement ("Wendel") during the period from 2004 through 2007 to restructure their shareholdings in Wendel. JPMorgan Chase Bank, N.A., Paris branch provided financing for the transactions to a number of managers of Wendel in 2007. JPMorgan Chase has cooperated with the investigation. The investigating judges issued an *ordonnance de renvoi* in November 2016, referring JPMorgan Chase Bank, N.A. to the French *tribunal correctionnel* for alleged complicity in tax fraud. No date for trial has been set by the court. The Firm has been successful in legal challenges made to the Court of Cassation, France's highest court, with respect to the criminal proceedings. In January 2018, the Paris Court of Appeal issued a decision cancelling the *mise en examen* of JPMorgan Chase Bank, N.A. The Firm is requesting clarification from the Court of Cassation concerning the Court of Appeal's decision before seeking direction on next steps in the criminal proceedings. In addition, a number of the managers have commenced civil proceedings against JPMorgan Chase Bank, N.A. The claims are separate, involve different allegations and are at various stages of proceedings.

* * *

In addition to the various legal proceedings discussed above, JPMorgan Chase and its subsidiaries are named as defendants or are otherwise involved in a substantial number of other legal proceedings. The Firm believes it has meritorious defenses to the claims asserted against it in its currently outstanding legal proceedings and it intends to defend itself vigorously. Additional legal proceedings may be initiated from time to time in the future.

The Firm has established reserves for several hundred of its currently outstanding legal proceedings. In accordance with the provisions of U.S. GAAP for contingencies, the Firm accrues for a litigation-related liability when it is probable that such a liability has been incurred and the amount of the loss can be reasonably estimated. The Firm evaluates its outstanding legal proceedings each quarter to assess its litigation reserves, and makes adjustments in such reserves, upwards or downward, as appropriate, based on management's best judgment after consultation with counsel. During the years ended December 31, 2017, 2016 and 2015, the Firm's legal expense was a benefit of $(35) million, a benefit of $(317) million, and an expense of $3.0 billion, respectively. There is no assurance that the Firm's litigation reserves will not need to be adjusted in the future.

In view of the inherent difficulty of predicting the outcome of legal proceedings, particularly where the claimants seek very large or indeterminate damages, or where the matters present novel legal theories, involve a large number of parties or are in early stages of discovery, the Firm cannot state with confidence what will be the eventual outcomes of the currently pending matters, the timing of their ultimate resolution or the eventual losses, fines, penalties or consequences related to those matters. JPMorgan Chase believes, based upon its current knowledge, after consultation with counsel and after taking into account its current litigation reserves, that the legal proceedings currently pending against it should not have a material adverse effect on the Firm's consolidated financial condition. The Firm notes, however, that in light of the uncertainties involved in such proceedings, there is no assurance that the ultimate resolution of these matters will not significantly exceed the reserves it has currently accrued or that a matter will not have material reputational consequences. As a result, the outcome of a particular matter may be material to JPMorgan Chase's operating results for a particular period, depending on, among other factors, the size of the loss or liability imposed and the level of JPMorgan Chase's income for that period.

Note 30 – International operations

The following table presents income statement- and balance sheet-related information for JPMorgan Chase by major international geographic area. The Firm defines international activities for purposes of this footnote presentation as business transactions that involve clients residing outside of the U.S., and the information presented below is based predominantly on the domicile of the client, the location from which the client relationship is managed, or the location of the trading desk. However, many of the Firm's U.S. operations serve international businesses.

As the Firm's operations are highly integrated, estimates and subjective assumptions have been made to apportion revenue and expense between U.S. and international operations. These estimates and assumptions are consistent with the allocations used for the Firm's segment reporting as set forth in Note 31.

The Firm's long-lived assets for the periods presented are not considered by management to be significant in relation to total assets. The majority of the Firm's long-lived assets are located in the U.S.

As of or for the year ended December 31, (in millions)	Revenue[b]	Expense[c]	Income before income tax expense	Net income	Total assets
2017					
Europe/Middle East/Africa	**$ 14,426**	**$ 8,653**	**$ 5,773**	**$ 4,007**	**$ 407,145** [d]
Asia/Pacific	**5,805**	**4,277**	**1,528**	**852**	**163,718**
Latin America/Caribbean	**1,994**	**1,523**	**471**	**299**	**44,569**
Total international	**22,225**	**14,453**	**7,772**	**5,158**	**615,432**
North America[a]	**77,399**	**49,271**	**28,128**	**19,283**	**1,918,168**
Total	**$ 99,624**	**$ 63,724**	**$ 35,900**	**$ 24,441**	**$ 2,533,600**
2016					
Europe/Middle East/Africa	$ 13,842	$ 8,550	$ 5,292	$ 3,783	$ 394,134 [d]
Asia/Pacific	6,112	4,213	1,899	1,212	156,946
Latin America/Caribbean	1,959	1,632	327	208	42,971
Total international	21,913	14,395	7,518	5,203	594,051
North America[a]	73,755	46,737	27,018	19,530	1,896,921
Total	$ 95,668	$ 61,132	$ 34,536	$ 24,733	$ 2,490,972
2015					
Europe/Middle East/Africa	$ 14,206	$ 8,871	$ 5,335	$ 4,158	$ 347,647 [d]
Asia/Pacific	6,151	4,241	1,910	1,285	138,747
Latin America/Caribbean	1,923	1,508	415	253	48,185
Total international	22,280	14,620	7,660	5,696	534,579
North America[a]	71,263	48,221	23,042	18,746	1,817,119
Total	$ 93,543	$ 62,841	$ 30,702	$ 24,442	$ 2,351,698

(a) Substantially reflects the U.S.
(b) Revenue is composed of net interest income and noninterest revenue.
(c) Expense is composed of noninterest expense and the provision for credit losses.
(d) Total assets for the U.K. were approximately $310 billion, $310 billion, and $306 billion at December 31, 2017, 2016 and 2015, respectively.

Note 31 – Business segments

The Firm is managed on a line of business basis. There are four major reportable business segments – Consumer & Community Banking, Corporate & Investment Bank, Commercial Banking and Asset & Wealth Management. In addition, there is a Corporate segment. The business segments are determined based on the products and services provided, or the type of customer served, and they reflect the manner in which financial information is currently evaluated by management. Results of these lines of business are presented on a managed basis. For a further discussion concerning JPMorgan Chase's business segments, see Segment results of this footnote.

The following is a description of each of the Firm's business segments, and the products and services they provide to their respective client bases.

Consumer & Community Banking

CCB offers services to consumers and businesses through bank branches, ATMs, online, mobile and telephone banking. CCB is organized into Consumer & Business Banking (including Consumer Banking/Chase Wealth Management and Business Banking), Home Lending (including Home Lending Production, Home Lending Servicing and Real Estate Portfolios) and Card, Merchant Services & Auto. Consumer & Business Banking offers deposit and investment products and services to consumers, and lending, deposit, and cash management and payment solutions to small businesses. Home Lending includes mortgage origination and servicing activities, as well as portfolios consisting of residential mortgages and home equity loans. Card, Merchant Services & Auto issues credit cards to consumers and small businesses, offers payment processing services to merchants, and originates and services auto loans and leases.

Corporate & Investment Bank

The CIB, which consists of Banking and Markets & Investor Services, offers a broad suite of investment banking, market-making, prime brokerage, and treasury and securities products and services to a global client base of corporations, investors, financial institutions, government and municipal entities. Banking offers a full range of investment banking products and services in all major capital markets, including advising on corporate strategy and structure, capital-raising in equity and debt markets, as well as loan origination and syndication. Banking also includes Treasury Services, which provides transaction services, consisting of cash management and liquidity solutions. Markets & Investor Services is a global market-maker in cash securities and derivative instruments, and also offers sophisticated risk management solutions, prime brokerage, and research. Markets & Investor Services also includes Securities Services, a leading global custodian which provides custody, fund accounting and administration, and securities lending products principally for asset managers, insurance companies and public and private investment funds.

Commercial Banking

CB delivers extensive industry knowledge, local expertise and dedicated service to U.S. and U.S. multinational clients, including corporations, municipalities, financial institutions and nonprofit entities with annual revenue generally ranging from $20 million to $2 billion. In addition, CB provides financing to real estate investors and owners. Partnering with the Firm's other businesses, CB provides comprehensive financial solutions, including lending, treasury services, investment banking and asset management to meet its clients' domestic and international financial needs.

Asset & Wealth Management

AWM, with client assets of $2.8 trillion, is a global leader in investment and wealth management. AWM clients include institutions, high-net-worth individuals and retail investors in many major markets throughout the world. AWM offers investment management across most major asset classes including equities, fixed income, alternatives and money market funds. AWM also offers multi-asset investment management, providing solutions for a broad range of clients' investment needs. For Wealth Management clients, AWM also provides retirement products and services, brokerage and banking services including trusts and estates, loans, mortgages and deposits. The majority of AWM's client assets are in actively managed portfolios.

Corporate

The Corporate segment consists of Treasury and CIO and Other Corporate, which includes corporate staff units and expense that is centrally managed. Treasury and CIO are predominantly responsible for measuring, monitoring, reporting and managing the Firm's liquidity, funding and structural interest rate and foreign exchange risks, as well as executing the Firm's capital plan. The major Other Corporate units include Real Estate, Enterprise Technology, Legal, Compliance, Finance, Human Resources, Internal Audit, Risk Management, Oversight & Control, Corporate Responsibility and various Other Corporate groups.

Segment results

The following tables provide a summary of the Firm's segment results as of or for the years ended December 31, 2017, 2016 and 2015 on a managed basis. The Firm's definition of managed basis starts with the reported U.S. GAAP results and includes certain reclassifications to present total net revenue (noninterest revenue and net interest income) for each of the reportable business segments on a FTE basis. Accordingly, revenue from investments receiving tax credits and tax-exempt securities is presented in the managed results on a basis comparable to taxable investments and securities. This allows management to assess the comparability of revenue from year-to-year arising from both taxable and tax-exempt sources. The corresponding income tax impact related to tax-exempt items is recorded within income tax expense/(benefit).

Effective January 1, 2017, the Firm's methodology used to allocate capital to the Firm's business segments was updated. The new methodology incorporates Basel III Standardized Fully Phased-In RWA (as well as Basel III Advanced Fully Phased-In RWA), leverage, the GSIB surcharge, and a simulation of capital in a severe stress environment. The methodology will continue to be weighted towards Basel III Advanced Fully Phased-In RWA because the Firm believes it to be the best proxy for economic risk.

Segment results and reconciliation

As of or for the year ended December 31, (in millions, except ratios)	Consumer & Community Banking			Corporate & Investment Bank			Commercial Banking			Asset & Wealth Management		
	2017	2016	2015	**2017**	2016	2015	**2017**	2016	2015	**2017**	2016	2015
Noninterest revenue	**$ 14,710**	$ 15,255	$ 15,592	**$ 24,375**	$ 24,325	$ 23,693	**$ 2,522**	$ 2,320	$ 2,365	**$ 9,539**	$ 9,012	$ 9,563
Net interest income	**31,775**	29,660	28,228	**10,118**	10,891	9,849	**6,083**	5,133	4,520	**3,379**	3,033	2,556
Total net revenue	**46,485**	44,915	43,820	**34,493**	35,216	33,542	**8,605**	7,453	6,885	**12,918**	12,045	12,119
Provision for credit losses	**5,572**	4,494	3,059	**(45)**	563	332	**(276)**	282	442	**39**	26	4
Noninterest expense	**26,062**	24,905	24,909	**19,243**	18,992	21,361	**3,327**	2,934	2,881	**9,301**	8,478	8,886
Income/(loss) before income tax expense/(benefit)	**14,851**	15,516	15,852	**15,295**	15,661	11,849	**5,554**	4,237	3,562	**3,578**	3,541	3,229
Income tax expense/(benefit)	**5,456**	5,802	6,063	**4,482**	4,846	3,759	**2,015**	1,580	1,371	**1,241**	1,290	1,294
Net income/(loss)	**$ 9,395**	$ 9,714	$ 9,789	**$ 10,813**	$ 10,815	$ 8,090	**$ 3,539**	$ 2,657	$ 2,191	**$ 2,337**	$ 2,251	$ 1,935
Average equity	**$ 51,000**	$ 51,000	$ 51,000	**$ 70,000**	$ 64,000	$ 62,000	**$ 20,000**	$ 16,000	$ 14,000	**$ 9,000**	$ 9,000	$ 9,000
Total assets	**552,601**	535,310	502,652	**826,384**	803,511	748,691	**221,228**	214,341	200,700	**151,909**	138,384	131,451
Return on equity	**17%**	18%	18%	**14%**	16%	12%	**17%**	16%	15%	**25%**	24%	21%
Overhead ratio	**56**	55	57	**56**	54	64	**39**	39	42	**72**	70	73

(table continued from above)

As of or for the year ended December 31, (in millions, except ratios)	Corporate			Reconciling Items[(a)]			Total		
	2017	2016	2015	**2017**	2016	2015	**2017**	2016	2015
Noninterest revenue	**$ 1,085**	$ 938	$ 800	**$ (2,704)** [(b)]	$ (2,265)	$ (1,980)	**$ 49,527**	$ 49,585	$ 50,033
Net interest income	**55**	(1,425)	(533)	**(1,313)**	(1,209)	(1,110)	**50,097**	46,083	43,510
Total net revenue	**1,140**	(487)	267	**(4,017)**	(3,474)	(3,090)	**99,624**	95,668	93,543
Provision for credit losses	**–**	(4)	(10)	**–**	–	–	**5,290**	5,361	3,827
Noninterest expense	**501**	462	977	**–**	–	–	**58,434**	55,771	59,014
Income/(loss) before income tax expense/(benefit)	**639**	(945)	(700)	**(4,017)**	(3,474)	(3,090)	**35,900**	34,536	30,702
Income tax expense/(benefit)	**2,282**	(241)	(3,137)	**(4,017)** [(b)]	(3,474)	(3,090)	**11,459**	9,803	6,260
Net income/(loss)	**$ (1,643)**	$ (704)	$ 2,437	**$ –**	$ –	$ –	**$ 24,441**	$ 24,733	$ 24,442
Average equity	**$ 80,350**	$ 84,631	$ 79,690	**$ –**	$ –	$ –	**$ 230,350**	$ 224,631	$ 215,690
Total assets	**781,478**	799,426	768,204	**NA**	NA	NA	**2,533,600**	2,490,972	2,351,698
Return on equity	**NM**	NM	NM	**NM**	NM	NM	**10%**	10%	11%
Overhead ratio	**NM**	NM	NM	**NM**	NM	NM	**59**	58	63

(a) Segment results on a managed basis reflect revenue on a FTE basis with the corresponding income tax impact recorded within income tax expense/(benefit). These adjustments are eliminated in reconciling items to arrive at the Firm's reported U.S. GAAP results.
(b) Included $375 million related to tax-oriented investments as a result of the enactment of the TCJA.

Note 32 – Parent Company

The following tables present Parent Company-only financial statements.

Statements of income and comprehensive income[(a)]

Year ended December 31, (in millions)	2017	2016	2015
Income			
Dividends from subsidiaries and affiliates:			
Bank and bank holding company	**$ 13,000**	$ 10,000	$ 10,653
Non-bank[(b)]	**540**	3,873	8,172
Interest income from subsidiaries	**72**	794	443
Other interest income	**41**	207	234
Other income from subsidiaries, primarily fees:			
Bank and bank holding company	**1,553**	852	1,438
Non-bank	**(88)**	1,165	(1,402)
Other income	**(623)**	(846)	1,773
Total income	**14,495**	16,045	21,311
Expense			
Interest expense to subsidiaries and affiliates[(b)]	**400**	105	98
Other interest expense	**5,202**	4,413	3,720
Noninterest expense	**(1,897)**	1,643	2,611
Total expense	**3,705**	6,161	6,429
Income before income tax benefit and undistributed net income of subsidiaries	**10,790**	9,884	14,882
Income tax benefit	**1,007**	876	1,640
Equity in undistributed net income of subsidiaries	**12,644**	13,973	7,920
Net income	**$ 24,441**	$ 24,733	$ 24,442
Other comprehensive income, net	**1,056**	(1,521)	(1,997)
Comprehensive income	**$ 25,497**	$ 23,212	$ 22,445

Balance sheets[(a)]

December 31, (in millions)	2017	2016
Assets		
Cash and due from banks	**$ 163**	$ 113
Deposits with banking subsidiaries	**5,306**	5,450
Trading assets	**4,773**	10,326
Available-for-sale securities	**–**	2,694
Loans	**–**	77
Advances to, and receivables from, subsidiaries:		
Bank and bank holding company	**2,106**	524
Non-bank	**82**	46
Investments (at equity) in subsidiaries and affiliates:		
Bank and bank holding company	**451,713**	422,028
Non-bank[(b)]	**422**	13,103
Other assets	**10,458**	10,257
Total assets	**$ 475,023**	$ 464,618
Liabilities and stockholders' equity		
Borrowings from, and payables to, subsidiaries and affiliates[(b)]	**$ 23,426**	$ 13,584
Short-term borrowings	**3,350**	3,831
Other liabilities	**8,302**	11,224
Long-term debt[(c)(d)]	**184,252**	181,789
Total liabilities[(d)]	**219,330**	210,428
Total stockholders' equity	**255,693**	254,190
Total liabilities and stockholders' equity	**$ 475,023**	$ 464,618

Statements of cash flows[(a)]

Year ended December 31, (in millions)	2017	2016	2015
Operating activities			
Net income	**$ 24,441**	$ 24,733	$ 24,442
Less: Net income of subsidiaries and affiliates[(b)]	**26,185**	27,846	26,745
Parent company net loss	**(1,744)**	(3,113)	(2,303)
Cash dividends from subsidiaries and affiliates[(b)]	**13,540**	13,873	17,023
Other operating adjustments	**4,635**	(18,166)	2,483
Net cash provided by/(used in) operating activities	**16,431**	(7,406)	17,203
Investing activities			
Net change in:			
Deposits with banking subsidiaries	**144**	60,349	30,085
Available-for-sale securities:			
Proceeds from paydowns and maturities	**–**	353	120
Other changes in loans, net	**78**	1,793	321
Advances to and investments in subsidiaries and affiliates, net	**(280)**	(51,967)	(81)
All other investing activities, net	**17**	114	153
Net cash provided by/(used in) investing activities	**(41)**	10,642	30,598
Financing activities			
Net change in:			
Borrowings from subsidiaries and affiliates[(b)]	**13,862**	2,957	(4,062)
Short-term borrowings	**(481)**	109	(47,483)
Proceeds from long-term borrowings	**25,855**	41,498	42,121
Payments of long-term borrowings	**(29,812)**	(29,298)	(30,077)
Proceeds from issuance of preferred stock	**1,258**	–	5,893
Redemption of preferred stock	**(1,258)**	–	–
Treasury stock repurchased	**(15,410)**	(9,082)	(5,616)
Dividends paid	**(8,993)**	(8,476)	(7,873)
All other financing activities, net	**(1,361)**	(905)	(840)
Net cash used in financing activities	**(16,340)**	(3,197)	(47,937)
Net increase/(decrease) in cash and due from banks	**50**	39	(137)
Cash and due from banks at the beginning of the year	**113**	74	211
Cash and due from banks at the end of the year	**$ 163**	$ 113	$ 74
Cash interest paid	**$ 5,426**	$ 4,550	$ 3,873
Cash income taxes paid, net	**1,775**	1,053	8,251

(a) In 2016, in connection with the Firm's 2016 Resolution Submission, the Parent Company established the IHC, and contributed substantially all of its direct subsidiaries (totaling $55.4 billion) other than JPMorgan Chase Bank, N.A., as well as most of its other assets (totaling $160.5 billion) and intercompany indebtedness to the IHC. Total noncash assets contributed were $62.3 billion. In 2017, the Parent Company transferred $16.2 billion of noncash assets to the IHC to complete the contributions to the IHC.

(b) Affiliates include trusts that issued guaranteed capital debt securities ("issuer trusts"). For further discussion on these issuer trusts, see Note 19.

(c) At December 31, 2017, long-term debt that contractually matures in 2018 through 2022 totaled $20.6 billion, $13.3 billion, $22.4 billion, $20.6 billion and $10.5 billion, respectively.

(d) For information regarding the Parent Company's guarantees of its subsidiaries' obligations, see Notes 19 and 27.

Selected quarterly financial data (unaudited)

As of or for the period ended (in millions, except per share, ratio, headcount data and where otherwise noted)	2017				2016			
	4th quarter	3rd quarter	2nd quarter	1st quarter	4th quarter	3rd quarter	2nd quarter	1st quarter
Selected income statement data								
Total net revenue	**$ 24,153**	**$ 25,326**	**$ 25,470**	**$ 24,675**	$ 23,376	$ 24,673	$ 24,380	$ 23,239
Total noninterest expense	**14,591**	**14,318**	**14,506**	**15,019**	13,833	14,463	13,638	13,837
Pre-provision profit	**9,562**	**11,008**	**10,964**	**9,656**	9,543	10,210	10,742	9,402
Provision for credit losses	**1,308**	**1,452**	**1,215**	**1,315**	864	1,271	1,402	1,824
Income before income tax expense	**8,254**	**9,556**	**9,749**	**8,341**	8,679	8,939	9,340	7,578
Income tax expense	**4,022**	**2,824**	**2,720**	**1,893**	1,952	2,653	3,140	2,058
Net income[(a)]	**$ 4,232**	**$ 6,732**	**$ 7,029**	**$ 6,448**	$ 6,727	$ 6,286	$ 6,200	$ 5,520
Per common share data								
Net income: Basic	**$ 1.08**	**$ 1.77**	**$ 1.83**	**$ 1.66**	$ 1.73	$ 1.60	$ 1.56	$ 1.36
Diluted	**1.07**	**1.76**	**1.82**	**1.65**	1.71	1.58	1.55	1.35
Average shares: Basic	**3,489.7**	**3,534.7**	**3,574.1**	**3,601.7**	3,611.3	3,637.7	3,675.5	3,710.6
Diluted	**3,512.2**	**3,559.6**	**3,599.0**	**3,630.4**	3,646.6	3,669.8	3,706.2	3,737.6
Market and per common share data								
Market capitalization	**$ 366,301**	**$ 331,393**	**$ 321,633**	**$ 312,078**	$ 307,295	$ 238,277	$ 224,449	$ 216,547
Common shares at period-end	**3,425.3**	**3,469.7**	**3,519.0**	**3,552.8**	3,561.2	3,578.3	3,612.0	3,656.7
Share price:[(b)]								
High	**$ 108.46**	**$ 95.88**	**$ 92.65**	**$ 93.98**	$ 87.39	$ 67.90	$ 66.20	$ 64.13
Low	**94.96**	**88.08**	**81.64**	**83.03**	66.10	58.76	57.05	52.50
Close	**106.94**	**95.51**	**91.40**	**87.84**	86.29	66.59	62.14	59.22
Book value per share	**67.04**	**66.95**	**66.05**	**64.68**	64.06	63.79	62.67	61.28
TBVPS[(c)]	**53.56**	**54.03**	**53.29**	**52.04**	51.44	51.23	50.21	48.96
Cash dividends declared per share	**0.56**	**0.56**	**0.50**	**0.50**	0.48	0.48	0.48	0.44
Selected ratios and metrics								
ROE	**7%**	**11%**	**12%**	**11%**	11%	10%	10%	9%
ROTCE[(c)]	**8**	**13**	**14**	**13**	14	13	13	12
ROA	**0.66**	**1.04**	**1.10**	**1.03**	1.06	1.01	1.02	0.93
Overhead ratio	**60**	**57**	**57**	**61**	59	59	56	60
Loans-to-deposits ratio	**64**	**63**	**63**	**63**	65	65	66	64
HQLA (in billions)[(d)]	**$ 560**	**$ 568**	**$ 541**	**$ 528**	$ 524	$ 539	$ 516	$ 505
LCR (average)	**119%**	**120%**	**115%**	**NA%**	NA%	NA%	NA%	NA%
CET1 capital ratio[(e)]	**12.2**	**12.5** [(i)]	**12.5** [(i)]	**12.4** [(i)]	12.3 [(i)]	12.0	12.0	11.9
Tier 1 capital ratio[(e)]	**13.9**	**14.1** [(i)]	**14.2** [(i)]	**14.1** [(i)]	14.0 [(i)]	13.6	13.6	13.5
Total capital ratio[(e)]	**15.9**	**16.1**	**16.0**	**15.6**	15.5	15.1	15.2	15.1
Tier 1 leverage ratio[(e)]	**8.3**	**8.4**	**8.5**	**8.4**	8.4	8.5	8.5	8.6
Selected balance sheet data (period-end)								
Trading assets	**$ 381,844**	**$ 420,418**	**$ 407,064**	**$ 402,513**	$ 372,130	$ 374,837	$ 380,793	$ 366,153
Securities	**249,958**	**263,288**	**263,458**	**281,850**	$ 289,059	272,401	278,610	285,323
Loans	**930,697**	**913,761**	**908,767**	**895,974**	$ 894,765	888,054	872,804	847,313
Core loans	**863,683**	**843,432**	**834,935**	**812,119**	806,152	795,077	775,813	746,196
Average core loans	**850,166**	**837,522**	**824,583**	**805,382**	799,698	779,383	760,721	737,297
Total assets	**2,533,600**	**2,563,074**	**2,563,174**	**2,546,290**	2,490,972	2,521,029	2,466,096	2,423,808
Deposits	**1,443,982**	**1,439,027**	**1,439,473**	**1,422,999**	1,375,179	1,376,138	1,330,958	1,321,816
Long-term debt[(f)]	**284,080**	**288,582**	**292,973**	**289,492**	295,245	309,418	295,627	290,754
Common stockholders' equity	**229,625**	**232,314**	**232,415**	**229,795**	228,122	228,263	226,355	224,089
Total stockholders' equity	**255,693**	**258,382**	**258,483**	**255,863**	254,190	254,331	252,423	250,157
Headcount	**252,539**	**251,503**	**249,257**	**246,345**	243,355	242,315	240,046	237,420
Credit quality metrics								
Allowance for credit losses	**$ 14,672**	**$ 14,648**	**$ 14,480**	**$ 14,490**	$ 14,854	$ 15,304	$ 15,187	$ 15,008
Allowance for loan losses to total retained loans	**1.47%**	**1.49%**	**1.49%**	**1.52%**	1.55%	1.61%	1.64%	1.66%
Allowance for loan losses to retained loans excluding purchased credit-impaired loans[(g)]	**1.27**	**1.29**	**1.28**	**1.31**	1.34	1.37	1.40	1.40
Nonperforming assets	**$ 6,426**	**$ 6,154**	**$ 6,432**	**$ 6,826**	$ 7,535	$ 7,779	$ 7,757	$ 8,023
Net charge-offs[(h)]	**1,264**	**1,265**	**1,204**	**1,654**	1,280	1,121	1,181	1,110
Net charge-off rate[(h)]	**0.55%**	**0.56%**	**0.54%**	**0.76%**	0.58%	0.51%	0.56%	0.53%

(a) The Firm's results for the three months ended December 31, 2017, included a $2.4 billion decrease to net income as a result of the enactment of the TCJA. For additional information related to the impact of the TCJA, see Note 24.
(b) Based on daily prices reported by the New York Stock Exchange.
(c) TBVPS and ROTCE are non-GAAP financial measures. For further discussion of these measures, see Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures and Key Financial Performance Measures on pages 52–54.
(d) HQLA represents the amount of assets that qualify for inclusion in the liquidity coverage ratio. For December 31, 2017, September 30,2017 and June 30, 2017 the balance represents the average of quarterly reported results per the U.S. LCR public disclosure requirements effective April 1, 2017 and period-end balances for the remaining periods. For additional information, see HQLA on page 93.
(e) Ratios presented are calculated under the Basel III Transitional rules and for the capital ratios represent the Collins Floor. See Capital Risk Management on pages 82–91 for additional information on Basel III.
(f) Included unsecured long-term debt of $218.8 billion, $221.7 billion, $221.0 billion, $212.0 billion, $212.6 billion, $226.8 billion, $220.6 billion, $216.1 billion respectively, for the periods presented.
(g) Excludes the impact of residential real estate PCI loans, a non-GAAP financial measure. For further discussion of these measures, see Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures and Key Performance Measures on pages 52–54, and the Allowance for credit losses on pages 117–119.
(h) Excluding net charge-offs of $467 million related to the student loan portfolio sale, the net charge-off rates for the three months ended March 31, 2017 would have been 0.54%.
(i) The prior period ratios have been revised to conform with the current period presentation.

Distribution of assets, liabilities and stockholders' equity; interest rates and interest differentials

Consolidated average balance sheet, interest and rates

Provided below is a summary of JPMorgan Chase's consolidated average balances, interest rates and interest differentials on a taxable-equivalent basis for the years 2015 through 2017. Income computed on a taxable-equivalent basis is the income reported in the Consolidated statements of income, adjusted to present interest income and average rates earned on assets exempt from income taxes (i.e. federal taxes) on a basis comparable with other taxable investments. The incremental tax rate used for calculating the taxable-equivalent adjustment was approximately 37% in 2017, and 38% in 2016 and 2015.

(Table continued on next page)

	2017		
Year ended December 31, (Taxable-equivalent interest and rates; in millions, except rates)	Average balance	Interest[g]	Average rate
Assets			
Deposits with banks	$ 438,240	$ 4,219	0.96%
Federal funds sold and securities purchased under resale agreements	191,819	2,327	1.21
Securities borrowed	95,324	(37) [h]	(0.04)
Trading assets – debt instruments	237,206	7,714	3.25
Taxable securities	223,592	5,534	2.48
Non-taxable securities[a]	45,086	2,769	6.14
Total securities	268,678	8,303	3.09 [j]
Loans	906,397	41,296 [i]	4.56
All other interest-earning assets[b]	42,928	1,863	4.34
Total interest-earning assets	2,180,592	65,685	3.01
Allowance for loan losses	(13,453)		
Cash and due from banks	20,364		
Trading assets – equity instruments	115,913		
Trading assets – derivative receivables	59,588		
Goodwill, MSRs and other intangible assets	53,999		
Other assets	139,059		
Total assets	$ 2,556,062		
Liabilities			
Interest-bearing deposits	$ 1,013,221	$ 2,857	0.28%
Federal funds purchased and securities loaned or sold under repurchase agreements	187,386	1,611	0.86
Short-term borrowings[c]	46,532	481	1.03
Trading liabilities – debt and other interest-bearing liabilities[d][e]	171,814	2,070	1.21
Beneficial interests issued by consolidated VIEs	32,457	503	1.55
Long-term debt	291,489	6,753	2.32
Total interest-bearing liabilities	1,742,899	14,275	0.82
Noninterest-bearing deposits	404,165		
Trading liabilities – equity instruments[e]	21,022		
Trading liabilities – derivative payables	44,122		
All other liabilities, including the allowance for lending-related commitments	87,292		
Total liabilities	2,299,500		
Stockholders' equity			
Preferred stock	26,212		
Common stockholders' equity	230,350		
Total stockholders' equity	256,562 [f]		
Total liabilities and stockholders' equity	$ 2,556,062		
Interest rate spread			2.19%
Net interest income and net yield on interest-earning assets		$ 51,410	2.36

(a) Represents securities that are tax-exempt for U.S. federal income tax purposes.
(b) Includes held-for-investment margin loans, which are classified in accrued interest and accounts receivable, and all other interest-earning assets included in other assets.
(c) Includes commercial paper.
(d) Other interest-bearing liabilities include brokerage customer payables.
(e) Included trading liabilities – debt and equity instruments of $90.7 billion, $92.8 billion and $81.4 billion for the twelve months ended December 31, 2017, 2016 and 2015, respectively.
(f) The ratio of average stockholders' equity to average assets was 10.0% for 2017, 10.2% for 2016, and 9.7% for 2015. The return on average stockholders' equity, based on net income, was 9.5% for 2017, 9.9% for 2016, and 10.2% for 2015.
(g) Interest includes the effect of related hedging derivatives. Taxable-equivalent amounts are used where applicable.
(h) Negative interest income and yield is related to client-driven demand for certain securities combined with the impact of low interest rates; this is matched book activity and the negative interest expense on the corresponding securities loaned is recognized in interest expense and reported within trading liabilities – debt, short-term and other liabilities.
(i) Fees and commissions on loans included in loan interest amounted to $1.0 billion in 2017, $808 million in 2016, and $936 million in 2015.
(j) The annualized rate for securities based on amortized cost was 3.13% in 2017, 2.99% in 2016, and 2.94% in 2015, and does not give effect to changes in fair value that are reflected in AOCI.

Within the Consolidated average balance sheets, interest and rates summary, the principal amounts of nonaccrual loans have been included in the average loan balances used to determine the average interest rate earned on loans. For additional information on nonaccrual loans, including interest accrued, see Note 12.

(Table continued from previous page)

2016			2015		
Average balance	Interest[g]	Average rate	Average balance	Interest[g]	Average rate
$ 392,160	$ 1,863	0.48%	$ 427,963	$ 1,250	0.29%
205,368	2,265	1.10	206,637	1,592	0.77
102,964	(332) [h]	(0.32)	105,273	(532) [h]	(0.50)
215,565	7,373	3.42	206,385	6,694	3.24
235,211	5,538	2.35	273,730	6,550	2.39
44,176	2,662	6.03	42,125	2,556	6.07
279,387	8,200	2.94 [j]	315,855	9,106	2.88 [j]
866,378	36,866 [i]	4.26	787,318	33,321 [i]	4.23
39,782	875	2.20	38,811	652	1.68
2,101,604	57,110	2.72	2,088,242	52,083	2.49
(13,965)			(13,885)		
18,660			22,042		
95,528			105,489		
70,897			73,290		
53,752			55,439		
135,143			138,792		
$ 2,461,619			$ 2,469,409		
$ 925,270	$ 1,356	0.15%	$ 876,840	$ 1,252	0.14%
178,720	1,089	0.61	192,510	609	0.32
36,140	203	0.56	66,956	175	0.26
177,765	1,102	0.62	178,994	557	0.31
40,180	504	1.25	49,200	435	0.88
295,573	5,564	1.88	284,940	4,435	1.56
1,653,648	9,818	0.59	1,649,440	7,463	0.45
402,698			418,948		
20,737			17,282		
55,927			64,716		
77,910			79,293		
2,210,920			2,229,679		
26,068			24,040		
224,631			215,690		
250,699 [f]			239,730 [f]		
$ 2,461,619			$ 2,469,409		
		2.13%			2.04%
	$ 47,292	2.25		$ 44,620	2.14

Interest rates and interest differential analysis of net interest income – U.S. and non-U.S.

Presented below is a summary of interest rates and interest differentials segregated between U.S. and non-U.S. operations for the years 2015 through 2017. The segregation of U.S. and non-U.S. components is based on the location of the office recording the transaction. Intercompany funding generally consists of dollar-denominated deposits originated in various locations that are centrally managed by Treasury and CIO.

(Table continued on next page)

Year ended December 31, (Taxable-equivalent interest and rates; in millions, except rates)	2017		
	Average balance	Interest	Average rate
Interest-earning assets			
Deposits with banks:			
U.S.	$ 366,177	$ 4,091	1.12%
Non-U.S.	72,063	128	0.18
Federal funds sold and securities purchased under resale agreements:			
U.S.	90,878	1,360	1.50
Non-U.S.	100,941	967	0.96
Securities borrowed:			
U.S.	68,110	(66) (c)	(0.10)
Non-U.S.	27,214	29	0.11
Trading assets – debt instruments:			
U.S.	128,293	4,186	3.26
Non-U.S.	108,913	3,528	3.24
Securities:			
U.S.	223,140	7,490	3.36
Non-U.S.	45,538	813	1.79
Loans:			
U.S.	832,608	39,439	4.74
Non-U.S.	73,789	1,857	2.52
All other interest-earning assets, predominantly U.S.	42,928	1,863	4.34
Total interest-earning assets	2,180,592	65,685	3.01
Interest-bearing liabilities			
Interest-bearing deposits:			
U.S.	776,049	2,223	0.29
Non-U.S.	237,172	634	0.27
Federal funds purchased and securities loaned or sold under repurchase agreements:			
U.S.	115,574	1,349	1.17
Non-U.S.	71,812	262	0.37
Trading liabilities – debt, short-term and all other interest-bearing liabilities:[a]			
U.S.	138,470	1,271	0.92
Non-U.S.	79,876	1,280	1.60
Beneficial interests issued by consolidated VIEs, predominantly U.S.	32,457	503	1.55
Long-term debt:			
U.S.	276,750	6,745	2.44
Non-U.S.	14,739	8	0.05
Intercompany funding:			
U.S.	(2,874)	(25)	–
Non-U.S.	2,874	25	–
Total interest-bearing liabilities	1,742,899	14,275	0.82
Noninterest-bearing liabilities[b]	437,693		
Total investable funds	$ 2,180,592	$ 14,275	0.65%
Net interest income and net yield:		$ 51,410	2.36%
U.S.		46,059	2.68
Non-U.S.		5,351	1.15
Percentage of total assets and liabilities attributable to non-U.S. operations:			
Assets			22.5
Liabilities			21.1

(a) Includes commercial paper.
(b) Represents the amount of noninterest-bearing liabilities funding interest-earning assets.
(c) Negative interest income and yield is related to client-driven demand for certain securities combined with the impact of low interest rates; this is matched book activity and the negative interest expense on the corresponding securities loaned is recognized in interest expense and reported within trading liabilities – debt, short-term and other liabilities.

For further information, see the “Net interest income” discussion in Consolidated Results of Operations on pages 44–46.

(Table continued from previous page)

2016			2015		
Average balance	Interest	Average rate	Average balance	Interest	Average rate
$ 328,831	$ 1,708	0.52%	$ 388,833	$ 1,021	0.26%
63,329	155	0.25	39,130	229	0.59
112,902	1,166	1.03	118,945	900	0.76
92,466	1,099	1.19	87,692	692	0.79
73,297	(341) (c)	(0.46)	78,815	(562) (c)	(0.71)
29,667	9	0.03	26,458	30	0.11
116,211	3,825	3.29	106,465	3,572	3.35
99,354	3,548	3.57	99,920	3,122	3.12
216,726	6,971	3.22	200,240	6,676	3.33
62,661	1,229	1.97	115,615	2,430	2.10
788,213	35,110	4.45	699,664	31,468	4.50
78,165	1,756	2.25	87,654	1,853	2.11
39,782	875	2.20	38,811	652	1.68
2,101,604	57,110	2.72	2,088,242	52,083	2.49
703,738	1,029	0.15	638,756	761	0.12
221,532	327	0.15	238,084	491	0.21
121,945	773	0.63	140,609	366	0.26
56,775	316	0.56	51,901	243	0.47
133,788	86	0.06	166,838	(394) (c)	(0.24)
80,117	1,219	1.52	79,112	1,126	1.42
40,180	504	1.25	49,200	435	0.88
283,169	5,533	1.95	273,033	4,386	1.61
12,404	31	0.25	11,907	49	0.41
(20,405)	10	–	(50,517)	7	–
20,405	(10)	–	50,517	(7)	–
1,653,648	9,818	0.59	1,649,440	7,463	0.45
447,956			438,802		
$ 2,101,604	$ 9,818	0.47%	$ 2,088,242	$ 7,463	0.36%
	$ 47,292	2.25%		$ 44,620	2.14%
	40,705	2.49		38,033	2.34
	6,587	1.42		6,587	1.42
		23.1			24.7
		20.7			21.1

Changes in net interest income, volume and rate analysis

The table below presents an attribution of net interest income between volume and rate. The attribution between volume and rate is calculated using annual average balances for each category of assets and liabilities shown in the table and the corresponding annual average rates (see pages 278-282 for more information on average balances and rates). In this analysis, when the change cannot be isolated to either volume or rate, it has been allocated to volume. The average annual rates include the impact of changes in market rates as well as the impact of any change in composition of the various products within each category of asset or liability. This analysis is calculated separately for each category without consideration of the relationship between categories (for example, the net spread between the rates earned on assets and the rates paid on liabilities that fund those assets). As a result, changes in the granularity or groupings considered in this analysis would produce a different attribution result, and due to the complexities involved, precise allocation of changes in interest rates between volume and rates is inherently complex and judgmental.

Year ended December 31, (On a taxable-equivalent basis; in millions)	2017 versus 2016 Increase/(decrease) due to change in: Volume	Rate	Net change	2016 versus 2015 Increase/(decrease) due to change in: Volume	Rate	Net change
Interest-earning assets						
Deposits with banks:						
U.S.	**$ 410**	**$ 1,973**	**$ 2,383**	$ (324)	$ 1,011	$ 687
Non-U.S.	**17**	**(44)**	**(27)**	59	(133)	(74)
Federal funds sold and securities purchased under resale agreements:						
U.S.	**(337)**	**531**	**194**	(55)	321	266
Non-U.S.	**81**	**(213)**	**(132)**	56	351	407
Securities borrowed:						
U.S.	**11**	**264**	**275**	24	197	221
Non-U.S.	**(4)**	**24**	**20**	–	(21)	(21)
Trading assets – debt instruments:						
U.S.	**396**	**(35)**	**361**	317	(64)	253
Non-U.S.	**308**	**(328)**	**(20)**	(24)	450	426
Securities:						
U.S.	**216**	**303**	**519**	515	(220)	295
Non-U.S.	**(303)**	**(113)**	**(416)**	(1,051)	(150)	(1,201)
Loans:						
U.S.	**2,043**	**2,286**	**4,329**	3,992	(350)	3,642
Non-U.S.	**(110)**	**211**	**101**	(220)	123	(97)
All other interest-earning assets, predominantly U.S.	**137**	**851**	**988**	21	202	223
Change in interest income	**2,865**	**5,710**	**8,575**	3,310	1,717	5,027
Interest-bearing liabilities						
Interest-bearing deposits:						
U.S.	**209**	**985**	**1,194**	76	192	268
Non-U.S.	**41**	**266**	**307**	(21)	(143)	(164)
Federal funds purchased and securities loaned or sold under repurchase agreements:						
U.S.	**(83)**	**659**	**576**	(113)	520	407
Non-U.S.	**54**	**(108)**	**(54)**	26	47	73
Trading liabilities – debt, short-term and other interest-bearing liabilities: [(a)]						
U.S.	**45**	**1,140**	**1,185**	(24)	504	480
Non-U.S.	**(3)**	**64**	**61**	14	79	93
Beneficial interests issued by consolidated VIEs, predominantly U.S.	**(122)**	**121**	**(1)**	(113)	182	69
Long-term debt:						
U.S.	**(176)**	**1,388**	**1,212**	219	928	1,147
Non-U.S.	**2**	**(25)**	**(23)**	1	(19)	(18)
Intercompany funding:						
U.S.	**151**	**(186)**	**(35)**	(17)	20	3
Non-U.S.	**(151)**	**186**	**35**	17	(20)	(3)
Change in interest expense	**(33)**	**4,490**	**4,457**	65	2,290	2,355
Change in net interest income	**$ 2,898**	**$ 1,220**	**$ 4,118**	$ 3,245	$ (573)	$ 2,672

(a) Includes commercial paper.

Glossary of Terms and Acronyms

2017 Annual Report or 2017 Form 10-K: Annual report on Form 10-K for year ended December 31, 2017, filed with the U.S. Securities and Exchange Commission.

ABS: Asset-backed securities

Active foreclosures: Loans referred to foreclosure where formal foreclosure proceedings are ongoing. Includes both judicial and non-judicial states.

AFS: Available-for-sale

ALCO: Asset Liability Committee

Allowance for loan losses to total loans: Represents period-end allowance for loan losses divided by retained loans.

Alternative assets: The following types of assets constitute alternative investments – hedge funds, currency, real estate, private equity and other investment funds designed to focus on nontraditional strategies.

AWM: Asset & Wealth Management

AOCI: Accumulated other comprehensive income/(loss)

ARM: Adjustable rate mortgage(s)

AUC: Assets under custody

AUM: "Assets under management": Represent assets managed by AWM on behalf of its Private Banking, Institutional and Retail clients. Includes "Committed capital not Called."

Auto loan and lease origination volume: Dollar amount of auto loans and leases originated.

Beneficial interests issued by consolidated VIEs: Represents the interest of third-party holders of debt, equity securities, or other obligations, issued by VIEs that JPMorgan Chase consolidates.

Benefit obligation: Refers to the projected benefit obligation for pension plans and the accumulated postretirement benefit obligation for OPEB plans.

BHC: Bank holding company

Card Services includes the Credit Card and Merchant Services businesses.

CB: Commercial Banking

CBB: Consumer & Business Banking

CCAR: Comprehensive Capital Analysis and Review

CCB: Consumer & Community Banking

CCO: Chief Compliance Officer

CCP: "Central counterparty" is a clearing house that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the future performance of open contracts. A CCP becomes counterparty to trades with market participants through novation, an open offer system, or another legally binding arrangement.

CDS: Credit default swaps

CEO: Chief Executive Officer

CET1 Capital: Common equity Tier 1 Capital

CFTC: Commodity Futures Trading Commission

CFO: Chief Financial Officer

Chase Bank USA, N.A.: Chase Bank USA, National Association

CIB: Corporate & Investment Bank

CIO: Chief Investment Office

Client assets: Represent assets under management as well as custody, brokerage, administration and deposit accounts.

Client deposits and other third-party liabilities: Deposits, as well as deposits that are swept to on-balance sheet liabilities (e.g., commercial paper, federal funds purchased and securities loaned or sold under repurchase agreements) as part of client cash management programs.

CLO: Collateralized loan obligations

CLTV: Combined loan-to-value

Collateral-dependent: A loan is considered to be collateral-dependent when repayment of the loan is expected to be provided solely by the underlying collateral, rather than by cash flows from the borrower's operations, income or other resources.

Merchant Services: is a business that primarily processes transactions for merchants.

Commercial Card: provides a wide range of payment services to corporate and public sector clients worldwide through the commercial card products. Services include procurement, corporate travel and entertainment, expense management services, and business-to-business payment solutions.

COO: Chief Operating Officer

Core loans: Represents loans considered central to the Firm's ongoing businesses; core loans exclude loans classified as trading assets, runoff portfolios, discontinued portfolios and portfolios the Firm has an intent to exit.

Credit cycle: A period of time over which credit quality improves, deteriorates and then improves again (or vice versa). The duration of a credit cycle can vary from a couple of years to several years.

Credit derivatives: Financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Upon the occurrence of a credit event by the reference entity, which may include, among other events, the bankruptcy or failure to pay its obligations, or certain restructurings of the debt of the reference entity, neither party has recourse to the reference entity. The protection purchaser has recourse to the protection seller for the difference between the face value of the CDS contract and the fair value at the time of settling the credit derivative contract. The determination as to whether a credit event has occurred is generally made by the relevant International Swaps and Derivatives Association ("ISDA") Determinations Committee.

Criticized: Criticized loans, lending-related commitments and derivative receivables that are classified as special mention, substandard and doubtful categories for regulatory purposes and are generally consistent with a rating of CCC+/Caa1 and below, as defined by S&P and Moody's.

CRO: Chief Risk Officer

CTC: CIO, Treasury and Corporate

CVA: Credit valuation adjustments

Debit and credit card sales volume: Dollar amount of card member purchases, net of returns.

Deposit margin/deposit spread: Represents net interest income expressed as a percentage of average deposits.

Distributed denial-of-service attack: The use of a large number of remote computer systems to electronically send a high volume of traffic to a target website to create a service outage at the target. This is a form of cyberattack.

DFAST: Dodd-Frank Act Stress Test

Dodd-Frank Act: Wall Street Reform and Consumer Protection Act

DOJ: U.S. Department of Justice

DOL: U.S. Department of Labor

DRPC: Board of Directors' Risk Policy Committee

DVA: Debit valuation adjustment

E&P: Exploration & Production

EC: European Commission

Eligible LTD: Long-term debt satisfying certain eligibility criteria

Embedded derivatives: are implicit or explicit terms or features of a financial instrument that affect some or all of the cash flows or the value of the instrument in a manner similar to a derivative. An instrument containing such terms or features is referred to as a "hybrid." The component of the hybrid that is the non-derivative instrument is referred to as the "host." For example, callable debt is a hybrid instrument that contains a plain vanilla debt instrument (i.e., the host) and an embedded option that allows the issuer to redeem the debt issue at a specified date for a specified amount (i.e., the embedded derivative). However, a floating rate instrument is not a hybrid composed of a fixed-rate instrument and an interest rate swap.

ERISA: Employee Retirement Income Security Act of 1974

EPS: Earnings per share

ETD: "Exchange-traded derivatives": Derivative contracts that are executed on an exchange and settled via a central clearing house.

EU: European Union

Fannie Mae: Federal National Mortgage Association

FASB: Financial Accounting Standards Board

FCA: Financial Conduct Authority

FCC: Firmwide Control Committee

FDIA: Federal Depository Insurance Act

FDIC: Federal Deposit Insurance Corporation

Federal Reserve: The Board of the Governors of the Federal Reserve System

Fee share: Proportion of fee revenue based on estimates of investment banking fees generated across the industry from investment banking transactions in M&A, equity and debt underwriting, and loan syndications. Source: Dealogic, a third-party provider of investment banking fee competitive analysis and volume-based league tables for the above noted industry products.

FFELP: Federal Family Education Loan Program

FFIEC: Federal Financial Institutions Examination Council

FHA: Federal Housing Administration

FHLB: Federal Home Loan Bank

FICO score: A measure of consumer credit risk provided by credit bureaus, typically produced from statistical models by Fair Isaac Corporation utilizing data collected by the credit bureaus.

Firm: JPMorgan Chase & Co.

Forward points: Represents the interest rate differential between two currencies, which is either added to or subtracted from the current exchange rate (i.e., "spot rate") to determine the forward exchange rate.

FRC: Firmwide Risk Committee

Freddie Mac: Federal Home Loan Mortgage Corporation

Free standing derivatives: a derivative contract entered into either separate and apart from any of the Firm's other financial instruments or equity transactions. Or, in conjunction with some other transaction and is legally detachable and separately exercisable.

FSB: Financial Stability Board

FTE: Fully taxable equivalent

FVA: Funding valuation adjustment

FX: Foreign exchange

Glossary of Terms and Acronyms

G7: Group of Seven nations: Countries in the G7 are Canada, France, Germany, Italy, Japan, the U.K. and the U.S.

G7 government bonds: Bonds issued by the government of one of the G7 nations.

Ginnie Mae: Government National Mortgage Association

GSE: Fannie Mae and Freddie Mac

GSIB: Global systemically important banks

HAMP: Home affordable modification program

Headcount-related expense: Includes salary and benefits (excluding performance-based incentives), and other noncompensation costs related to employees.

HELOAN: Home equity loan

HELOC: Home equity line of credit

Home equity – senior lien: Represents loans and commitments where JPMorgan Chase holds the first security interest on the property.

Home equity – junior lien: Represents loans and commitments where JPMorgan Chase holds a security interest that is subordinate in rank to other liens.

Households: A household is a collection of individuals or entities aggregated together by name, address, tax identifier and phone. Reported on a one-month lag.

HQLA: High quality liquid assets

HTM: Held-to-maturity

ICAAP: Internal capital adequacy assessment process

IDI: Insured depository institutions

IHC: JPMorgan Chase Holdings LLC, an intermediate holding company

Impaired loan: Impaired loans are loans measured at amortized cost, for which it is probable that the Firm will be unable to collect all amounts due, including principal and interest, according to the contractual terms of the agreement. Impaired loans include the following:

- All wholesale nonaccrual loans
- All TDRs (both wholesale and consumer), including ones that have returned to accrual status

Interchange income: A fee paid to a credit card issuer in the clearing and settlement of a sales or cash advance transaction.

Investment-grade: An indication of credit quality based on JPMorgan Chase's internal risk assessment system. "Investment grade" generally represents a risk profile similar to a rating of a "BBB-"/"Baa3" or better, as defined by independent rating agencies.

ISDA: International Swaps and Derivatives Association

JPMorgan Chase: JPMorgan Chase & Co.

JPMorgan Chase Bank, N.A.: JPMorgan Chase Bank, National Association

JPMorgan Clearing: J.P. Morgan Clearing Corp.

JPMorgan Securities: J.P. Morgan Securities LLC

Loan-equivalent: Represents the portion of the unused commitment or other contingent exposure that is expected, based on historical portfolio experience, to become drawn prior to an event of a default by an obligor.

LCR: Liquidity coverage ratio

LDA: Loss Distribution Approach

LGD: Loss given default

LIBOR: London Interbank Offered Rate

LLC: Limited Liability Company

LOB: Line of business

Loss emergence period: Represents the time period between the date at which the loss is estimated to have been incurred and the ultimate realization of that loss.

LTIP: Long-term incentive plan

LTV: "Loan-to-value": For residential real estate loans, the relationship, expressed as a percentage, between the principal amount of a loan and the appraised value of the collateral (i.e., residential real estate) securing the loan.

Origination date LTV ratio

The LTV ratio at the origination date of the loan. Origination date LTV ratios are calculated based on the actual appraised values of collateral (i.e., loan-level data) at the origination date.

Current estimated LTV ratio

An estimate of the LTV as of a certain date. The current estimated LTV ratios are calculated using estimated collateral values derived from a nationally recognized home price index measured at the metropolitan statistical area ("MSA") level. These MSA-level home price indices consist of actual data to the extent available and forecasted data where actual data is not available. As a result, the estimated collateral values used to calculate these ratios do not represent actual appraised loan-level collateral values; as such, the resulting LTV ratios are necessarily imprecise and should therefore be viewed as estimates.

Combined LTV ratio

The LTV ratio considering all available lien positions, as well as unused lines, related to the property. Combined LTV ratios are used for junior lien home equity products.

Managed basis: A non-GAAP presentation of financial results that includes reclassifications to present revenue on a fully taxable-equivalent basis. Management uses this non-GAAP financial measure at the segment level, because it believes this provides information to enable investors to understand the underlying operational performance and trends of the particular business segment and facilitates a comparison of the business segment with the performance of competitors.

Master netting agreement: A single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due).

MBS: Mortgage-backed securities

MD&A: Management's discussion and analysis

MMDA: Money Market Deposit Accounts

Moody's: Moody's Investor Services

Mortgage origination channels:

Retail – Borrowers who buy or refinance a home through direct contact with a mortgage banker employed by the Firm using a branch office, the Internet or by phone. Borrowers are frequently referred to a mortgage banker by a banker in a Chase branch, real estate brokers, home builders or other third parties.

Correspondent – Banks, thrifts, other mortgage banks and other financial institutions that sell closed loans to the Firm.

Mortgage product types:

Alt-A

Alt-A loans are generally higher in credit quality than subprime loans but have characteristics that would disqualify the borrower from a traditional prime loan. Alt-A lending characteristics may include one or more of the following: (i) limited documentation; (ii) a high CLTV ratio; (iii) loans secured by non-owner occupied properties; or (iv) a debt-to-income ratio above normal limits. A substantial proportion of the Firm's Alt-A loans are those where a borrower does not provide complete documentation of his or her assets or the amount or source of his or her income.

Option ARMs

The option ARM real estate loan product is an adjustable-rate mortgage loan that provides the borrower with the option each month to make a fully amortizing, interest-only or minimum payment. The minimum payment on an option ARM loan is based on the interest rate charged during the introductory period. This introductory rate is usually significantly below the fully indexed rate. The fully indexed rate is calculated using an index rate plus a margin. Once the introductory period ends, the contractual interest rate charged on the loan increases to the fully indexed rate and adjusts monthly to reflect movements in the index. The minimum payment is typically insufficient to cover interest accrued in the prior month, and any unpaid interest is deferred and added to the principal balance of the loan. Option ARM loans are subject to payment recast, which converts the loan to a variable-rate fully amortizing loan upon meeting specified loan balance and anniversary date triggers.

Prime

Prime mortgage loans are made to borrowers with good credit records who meet specific underwriting requirements, including prescriptive requirements related to income and overall debt levels. New prime mortgage borrowers provide full documentation and generally have reliable payment histories.

Subprime

Subprime loans are loans that, prior to mid-2008, were offered to certain customers with one or more high risk characteristics, including but not limited to: (i) unreliable or poor payment histories; (ii) a high LTV ratio of greater than 80% (without borrower-paid mortgage insurance); (iii) a high debt-to-income ratio; (iv) an occupancy type for the loan is other than the borrower's primary residence; or (v) a history of delinquencies or late payments on the loan.

MSA: Metropolitan statistical areas

MSR: Mortgage servicing rights

Multi-asset: Any fund or account that allocates assets under management to more than one asset class.

NA: Data is not applicable or available for the period presented.

NAV: Net Asset Value

Net Capital Rule: Rule 15c3-1 under the Securities Exchange Act of 1934.

Net charge-off/(recovery) rate: Represents net charge-offs/(recoveries) (annualized) divided by average retained loans for the reporting period.

Net mortgage servicing revenue includes the following components:

Operating revenue predominantly represents the return on Home Lending Servicing's MSR asset and includes:

- Actual gross income earned from servicing third-party mortgage loans, such as contractually specified servicing fees and ancillary income; and
- The change in the fair value of the MSR asset due to the collection or realization of expected cash flows.

Risk management represents the components of

Home Lending Servicing's MSR asset that are subject to ongoing risk management activities, together with derivatives and other instruments used in those risk management activities.

Net production revenue: Includes net gains or losses on originations and sales of mortgage loans, other production-related fees and losses related to the repurchase of previously sold loans.

Net revenue rate: Represents Card Services net revenue (annualized) expressed as a percentage of average loans for the period.

Net yield on interest-earning assets: The average rate for interest-earning assets less the average rate paid for all sources of funds.

NM: Not meaningful

NOL: Net operating loss

Nonaccrual loans: Loans for which interest income is not recognized on an accrual basis. Loans (other than credit card loans and certain consumer loans insured by U.S. government agencies) are placed on nonaccrual status when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest have been in default for a period of 90 days or more unless the loan is both well-secured and in the process of collection. Collateral-dependent loans are typically maintained on nonaccrual status.

Nonperforming assets: Nonperforming assets include nonaccrual loans, nonperforming derivatives and certain assets acquired in loan satisfaction, predominantly real estate owned and other commercial and personal property.

NOW: Negotiable Order of Withdrawal

NSFR: Net stable funding ratio

OAS: Option-adjusted spread

OCC: Office of the Comptroller of the Currency

OCI: Other comprehensive income/(loss)

OEP: One Equity Partners

OIS: Overnight index swap

OPEB: Other postretirement employee benefit

ORMF: Operational Risk Management Framework

OTTI: Other-than-temporary impairment

Over-the-counter ("OTC") derivatives: Derivative contracts that are negotiated, executed and settled bilaterally between two derivative counterparties, where one or both counterparties is a derivatives dealer.

Over-the-counter cleared ("OTC-cleared") derivatives: Derivative contracts that are negotiated and executed bilaterally, but subsequently settled via a central clearing house, such that each derivative counterparty is only exposed to the default of that clearing house.

Overhead ratio: Noninterest expense as a percentage of total net revenue.

Parent Company: JPMorgan Chase & Co.

Participating securities: Represents unvested share-based compensation awards containing nonforfeitable rights to dividends or dividend equivalents (collectively, "dividends"), which are included in the earnings per share calculation using the two-class method. JPMorgan Chase grants RSUs to certain employees under its share-based compensation programs, which entitle the recipients to receive nonforfeitable dividends during the vesting period on a basis equivalent to the dividends paid to holders of common stock. These unvested awards meet the definition of participating securities. Under the two-class method, all earnings (distributed and undistributed) are allocated to each class of common stock and participating securities, based on their respective rights to receive dividends.

PCA: Prompt corrective action

PCI: "Purchased credit-impaired" loans represents certain loans that were acquired and deemed to be credit-impaired on the acquisition date in accordance with the guidance of the FASB. The guidance allows purchasers to aggregate credit-impaired loans acquired in the same fiscal quarter into one or more pools, provided that the loans have common risk characteristics(e.g., product type, LTV ratios, FICO scores, past due status, geographic location). A pool is then accounted for as a single asset with a single composite interest rate and an aggregate expectation of cash flows.

PD: Probability of default

PRA: Prudential Regulatory Authority

Pre-provision profit/(loss): Represents total net revenue less noninterest expense. The Firm believes that this financial measure is useful in assessing the ability of a lending institution to generate income in excess of its provision for credit losses.

Pretax margin: Represents income before income tax expense divided by total net revenue, which is, in management's view, a comprehensive measure of pretax performance derived by measuring earnings after all costs are taken into consideration. It is one basis upon which management evaluates the performance of AWM against the performance of their respective competitors.

Principal transactions revenue: Principal transactions revenue is driven by many factors, including the bid-offer spread, which is the difference between the price at which the Firm is willing to buy a financial or other instrument and the price at which the Firm is willing to sell that instrument. It also consists of realized (as a result of closing out or termination of transactions, or interim cash payments) and unrealized (as a result of changes in valuation) gains and losses on financial and other instruments (including those accounted for under the fair value option) primarily used in client-driven market-making activities and on private equity investments. In connection with its client-driven market-making activities, the Firm transacts in debt and equity instruments, derivatives and commodities (including physical commodities inventories and financial instruments that reference commodities).

Principal transactions revenue also includes certain realized and unrealized gains and losses related to hedge accounting and specified risk-management activities, including: (a) certain derivatives designated in qualifying hedge accounting relationships (primarily fair value hedges of commodity and foreign exchange risk), (b) certain derivatives used for specific risk management purposes, primarily to mitigate credit risk, foreign exchange risk and commodity risk, and (c) other derivatives.

PSU(s): Performance share units

RCSA: Risk and Control Self-Assessment

Real assets: Real assets include investments in productive assets such as agriculture, energy rights, mining and timber properties and exclude raw land to be developed for real estate purposes.

REIT: "Real estate investment trust": A special purpose investment vehicle that provides investors with the ability to participate directly in the ownership or financing of real-estate related assets by pooling their capital to purchase and manage income property (i.e., equity REIT) and/or mortgage loans (i.e., mortgage REIT). REITs can be publicly or privately held and they also qualify for certain favorable tax considerations.

Receivables from customers: Primarily represents margin loans to brokerage customers that are collateralized through assets maintained in the clients' brokerage accounts, as such no allowance is held against these receivables. These receivables are reported within accrued interest and accounts receivable on the Firm's Consolidated balance sheets.

Regulatory VaR: Daily aggregated VaR calculated in accordance with regulatory rules.

REO: Real estate owned

Reported basis: Financial statements prepared under U.S. GAAP, which excludes the impact of taxable-equivalent adjustments.

Retained loans: Loans that are held-for-investment (i.e., excludes loans held-for-sale and loans at fair value).

Revenue wallet: Proportion of fee revenue based on estimates of investment banking fees generated across the industry (i.e., the revenue wallet) from investment banking transactions in M&A, equity and debt underwriting, and loan syndications. Source: Dealogic, a third-party provider of investment banking competitive analysis and volume-based league tables for the above noted industry products.

RHS: Rural Housing Service of the U.S. Department of Agriculture

Risk-rated portfolio: Credit loss estimates are based on estimates of the probability of default ("PD") and loss severity given a default. The probability of default is the likelihood that a borrower will default on its obligation; the loss given default ("LGD") is the estimated loss on the loan that would be realized upon the default and takes into consideration collateral and structural support for each credit facility.

ROA: Return on assets

ROE: Return on equity

ROTCE: Return on tangible common equity

RSU(s): Restricted stock units

RWA: "Risk-weighted assets": Basel III establishes two comprehensive methodologies for calculating RWA (a Standardized approach and an Advanced approach) which include capital requirements for credit risk, market risk, and in the case of Basel III Advanced, also operational risk. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent basis between Basel III Standardized and Basel III Advanced.

S&P: Standard and Poor's 500 Index

SAR(s): Stock appreciation rights

SCCL: single-counterparty credit limits

Scored portfolio: The scored portfolio predominantly includes residential real estate loans, credit card loans and certain auto and business banking loans where credit loss estimates are based on statistical analysis of credit losses over discrete periods of time. The statistical analysis uses portfolio modeling, credit scoring and decision-support tools.

SEC: Securities and Exchange Commission

Seed capital: Initial JPMorgan capital invested in products, such as mutual funds, with the intention of ensuring the fund is of sufficient size to represent a viable offering to clients, enabling pricing of its shares, and allowing the manager to develop a track record. After these goals are achieved, the intent is to remove the Firm's capital from the investment.

Short sale: A short sale is a sale of real estate in which proceeds from selling the underlying property are less than the amount owed the Firm under the terms of the related mortgage, and the related lien is released upon receipt of such proceeds.

Single-name: Single reference-entities

SLR: Supplementary leverage ratio

SMBS: Stripped mortgage-backed securities

SOA: Society of Actuaries

SPEs: Special purpose entities

Structural interest rate risk: Represents interest rate risk of the non-trading assets and liabilities of the Firm.

Structured notes: Structured notes are predominantly financial instruments containing embedded derivatives.

Suspended foreclosures: Loans referred to foreclosure where formal foreclosure proceedings have started but are currently on hold, which could be due to bankruptcy or loss mitigation. Includes both judicial and non-judicial states.

Taxable-equivalent basis: In presenting results on a managed basis, the total net revenue for each of the business segments and the Firm is presented on a tax-equivalent basis. Accordingly, revenue from investments that receive tax credits and tax-exempt securities is presented in managed basis results on a level comparable to taxable investments and securities; the corresponding income tax impact related to tax-exempt items is recorded within income tax expense.

TBVPS: Tangible book value per share

TCE: Tangible common equity

TDR: "Troubled debt restructuring" is deemed to occur when the Firm modifies the original terms of a loan agreement by granting a concession to a borrower that is experiencing financial difficulty.

TLAC: Total Loss Absorbing Capacity

U.K.: United Kingdom

Unaudited: Financial statements and information that have not been subjected to auditing procedures sufficient to permit an independent certified public accountant to express an opinion.

U.S.: United States of America

U.S. GAAP: Accounting principles generally accepted in the U.S.

U.S. government-sponsored enterprises ("U.S. GSEs") and U.S. GSE obligations: In the U.S., GSEs are quasi-governmental, privately held entities established by Congress to improve the flow of credit to specific sectors of the economy and provide certain essential services to the public. U.S. GSEs include Fannie Mae and Freddie Mac, but do not include Ginnie Mae, which is directly owned by the U.S. Department of Housing and Urban Development. U.S. GSE obligations are not explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government.

U.S. LCR: Liquidity coverage ratio under the final U.S. rule.

U.S. Treasury: U.S. Department of the Treasury

VA: U.S. Department of Veterans Affairs

VaR: "Value-at-risk" is a measure of the dollar amount of potential loss from adverse market moves in an ordinary market environment.

VCG: Valuation Control Group

VGF: Valuation Governance Forum

VIEs: Variable interest entities

Warehouse loans: Consist of prime mortgages originated with the intent to sell that are accounted for at fair value and classified as trading assets.

Washington Mutual transaction: On September 25, 2008, JPMorgan Chase acquired certain of the assets of the banking operations of Washington Mutual Bank ("Washington Mutual") from the FDIC.

Board of Directors

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3 Corporate Governance & Nominating Committee
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5 Directors' Risk Policy Committee

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Head of Corporate Responsibility;
Chair of the Mid-Atlantic Region

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Nicole Giles
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Europe/Middle East/Africa

Viswas Raghavan

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Korea
Tae Jin Park

Vietnam
Van Bich Phan

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Sub-Saharan Africa
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Kevin G. Latter

Turkey
Mustafa Bagriacik

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Austria
Anton J. Ulmer

Ireland
Carin Bryans

Israel
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Kyril Courboin

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Tanguy A. Piret

Iberia
Ignacio de la Colina

Italy
Guido M. Nola

The Netherlands
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Argentina
Facundo D. Gomez Minujin

Brazil
José Berenguer

Chile
Alfonso Eyzaguirre

Mexico
Eduardo F. Cepeda

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Canada
David E. Rawlings

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E. John Rosenwald

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The Hon. Robert M. Gates
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Partner
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Washington, District of Columbia

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Vevey, Switzerland

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ALFA
Nuevo León, Mexico

Herman Gref
Chief Executive Officer,
Chairman of the Executive Board
Sberbank
Moscow, Russia

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Chief Executive Officer
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New York, New York

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Fiat Chrysler Automobiles
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Paris la Défense, France

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Nassef Sawiris
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Ratan Naval Tata
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Tata Trusts
Mumbai, India

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Vice Chairman
National Committee of the Chinese People's Political Consultative Conference
Hong Kong, China

Masahiko Uotani
President and Group Chief Executive Officer
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Tokyo, Japan

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Akzo Nobel
Amsterdam, The Netherlands

Douglas A. Warner III
Former Chairman of the Board
JPMorgan Chase & Co.
New York, New York

Yang Yuanqing
Chairman and Chief Executive Officer
Lenovo
Beijing, China

Jaime Augusto Zobel de Ayala
Chairman and Chief Executive Officer
Ayala Corporation
Makati City, Philippines

*Ex-officio

JPMorgan Chase & Co.

Corporate headquarters

270 Park Avenue
New York, NY 10017-2070
Telephone: 212-270-6000
jpmorganchase.com

Principal subsidiaries

JPMorgan Chase Bank, National Association
Chase Bank USA, National Association
JPMorgan Chase Holdings LLC
J.P. Morgan Securities LLC
J.P. Morgan Securities plc

Annual Report on Form 10-K

The Annual Report on Form 10-K of JPMorgan Chase & Co. as filed with the U.S. Securities and Exchange Commission will be made available without charge upon request to:

Office of the Secretary
JPMorgan Chase & Co.
270 Park Avenue
New York, NY 10017-2070

Stock listing

New York Stock Exchange

The New York Stock Exchange ticker symbol for the common stock of JPMorgan Chase & Co. is JPM.

Financial information about JPMorgan Chase & Co. can be accessed by visiting the Investor Relations website at jpmorganchase.com. Additional questions should be addressed to:

Investor Relations
JPMorgan Chase & Co.
270 Park Avenue
New York, NY 10017-2070
Telephone: 212-270-7325

Directors

To contact any of the Board members or committee chairs, the Lead Independent Director or the non-management directors as a group, please mail correspondence to:

JPMorgan Chase & Co.
Attention (Board member(s))
Office of the Secretary
270 Park Avenue
New York, NY 10017-2070

The Corporate Governance Principles of the Board, the charters of the principal Board committees, the Code of Conduct, the Code of Ethics for Finance Professionals and other governance information can be accessed by visiting our website at jpmorganchase.com and clicking on "Governance" under the "About us" tab.

Transfer agent and registrar

Computershare
480 Washington Boulevard
Jersey City, NJ 07310-2053
Telephone: 800-758-4651
www.computershare.com/investor

Investor Services Program

JPMorgan Chase & Co.'s Investor Services Program offers a variety of convenient, low-cost services to make it easier to reinvest dividends and buy and sell shares of JPMorgan Chase & Co. common stock. A brochure and enrollment materials may be obtained by contacting the Program Administrator, Computershare, by calling 800-758-4651, by writing to the address indicated above or by visiting its website at www-us.computershare.com/Investor.

Direct deposit of dividends

For information about direct deposit of dividends, please contact Computershare.

Stockholder inquiries

Contact Computershare:

By telephone:

Within the United States, Canada and Puerto Rico: 800-758-4651 (toll free)

From all other locations: 201-680-6862 (collect)

TDD service for the hearing impaired within the United States, Canada and Puerto Rico: 800-231-5469 (toll free)

All other locations: 201-680-6610 (collect)

By regular mail:

Computershare
P.O. Box 505000
Louisville, KY 40233
United States

By overnight delivery:

Computershare
462 South 4th Street
Suite 1660
Louisville, KY 40202
United States

Duplicate mailings

If you receive duplicate mailings because you have more than one account listing and you wish to consolidate your accounts, please write to Computershare at the address above.

Independent registered public accounting firm

PricewaterhouseCoopers LLP
300 Madison Avenue
New York, NY 10017

"JPMorgan Chase," "J.P. Morgan," "Chase," the Octagon symbol and other words or symbols in this report that identify JPMorgan Chase services are service marks of JPMorgan Chase & Co. Other words or symbols in this report that identify other parties' goods or services may be trademarks or service marks of those other parties.

JPMorgan Chase & Co. distributes shareholder information under the U.S. Securities and Exchange Commission "Notice and Access" rule. As a result, the firm prints 700,000 fewer Annual Reports and Proxy Statements, which saves on an annual basis approximately 6,400 trees and 800 metric tons of CO_2 emissions.

This Annual Report is printed on paper made from well-managed forests and other controlled sources. The paper is independently certified by Bureau Veritas Quality International according to Forest Stewardship Council® standards.

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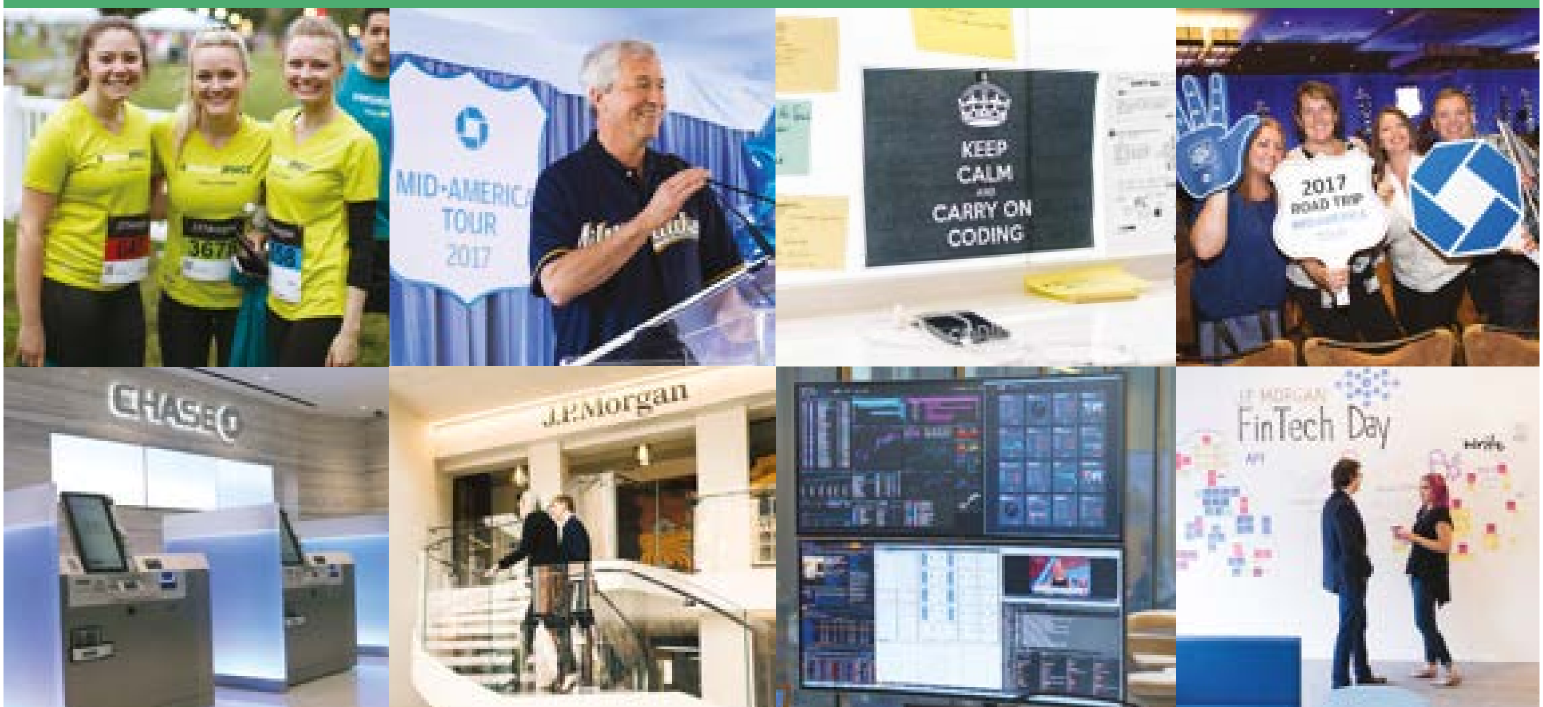

jpmorganchase.com

Tab J: Business References

Provide at least three business references using the form provided in Attachment 6. Include one reference form for each component being proposed, and clearly mark which component the references are for. The same reference, if applicable, could be used for multiple components.

Tab K: Business Continuity and Disaster Recovery Plans

Vendors responding to this RFP must attach summaries or copies of their business continuity and disaster recovery plans.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Tab L: Retention Policies

Vendors responding to this RFP must attach copies of their retention policies and documents or substantive summaries of the same.

The bank as a regulated financial institution is subject to requirements and obligations that mandate retention of certain records, including but not limited to international, country-specific, federal or state regulations or requirements. These record retention requirements require the firm to maintain and dispose of certain records for or at a prescribed period of time, in accordance with law and regulation where applicable.

Pursuant to the applicable record retention requirements, the bank has adopted a firm-wide Record Retention Policy (Policy) which describes the requirements to be applied in the creation, maintenance, retention, management, storage and, where appropriate, destruction of applicable records. Therefore, the Policy will often require retention of documentation and information after the termination of J.P. Morgan's relationship with the relevant customer. The period of such retention beyond termination of the relationship will be dependent on the type of information and will be governed by the Policy.

Furthermore, the bank is required to retain certain information pursuant to the Policy and therefore is prohibited from removing or destroying certain information at the request of the client. In addition, it is not feasible for certain client-specific information to be erased or deleted from electronic systems.

However, the bank will maintain the confidentiality of all information it retains after termination of any agreement with the State until such time as the information is destroyed eventually in accordance with the Policy of the bank and in conformity with industry standards applicable to the destruction of sensitive financial information. The bank's media sanitization standard requires the destruction of all client data, including that on storage media, to a level compliant with NIST 800-88 requirements prior to disposal.

Tab M: Proposed Vendor Form of Agreement

Vendors responding to this RFP must attach the proposed form of agreement covering the Services, including, without limitation, all proposed exhibits, attachments, schedules, ancillary agreements, authorization or acknowledgement forms, and any other documents that the Vendor proposes to govern the terms and conditions of the Services.

[redacted]

[redacted]

- [redacted]
- [redacted]
- [redacted]

[redacted]

[redacted]

Know Your Customer (KYC)

J.P. Morgan is required to know its customer and to adhere to policies and procedures intended to meet those regulatory requirements that apply to safety and soundness and to fight against the funding of terrorism, money laundering and sanction related activities including performing certain transaction screenings. This means J.P. Morgan will request information about the State and its management and those having authority to transact business with J.P. Morgan in order for J.P. Morgan to comply with its policies and procedures. This is an ongoing requirement and the provision of services pursuant to this proposal and any additional products or services that may be requested is subject to and conditioned upon the ongoing satisfaction of those policies and procedures and compliance by the State with applicable law with respect to the services provided and J.P. Morgan's policies of which the State is informed.

Tab N: Non-Collusion Statement

Vendors responding to this RFP must complete and return a statement of non-collusion in the form of Attachment 7.

Attachment 7: Non-collusion Statement

CONTRACT NUMBER: TRE18101-BANKINGSVC

CONTRACT NO.: TRE-18101-BANKINGSVC **TITLE:** *Professional Services (Banking)*
DEADLINE TO RESPOND: August 3, 2018 at 4:00 PM (local time)

NON-COLLUSION STATEMENT

This is to certify that the undersigned Vendor, *to the best knowledge of the undersigned,* has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal, **and further certifies that it is not a sub-contractor to another Vendor who also submitted a proposal as a primary Vendor in response to this solicitation** submitted this date to the State of Delaware, *Office of the State Treasurer.*

VZuk 9-22-18

It is agreed by the undersigned Vendor that the signed delivery of this bid represents, subject to any express exceptions set forth at ~~Attachment 7~~ *in the undersigned Vendor's response to the RFP*, the Vendor's acceptance of the terms and conditions of this solicitation including all specifications and special provisions.

NOTE: Signature of the authorized representative **MUST** be of an individual who legally may enter his/her organization into a formal contract with the State of Delaware, *Office of the State Treasurer.*

✓	Corporation
	Partnership
	Individual

COMPANY NAME *JPMorgan Chase Bank, N.A.* (Check one)

NAME OF AUTHORIZED REPRESENTATIVE *Vasyl Zuk*

SIGNATURE Vasyl Zuk TITLE *Authorized Officer*

COMPANY ADDRESS *250 Pehle Avenue, Floor 1, Saddle Brook, NJ 07663*

PHONE NUMBER *(201) 994-4706* FAX NUMBER *(201) 291-8526*

EMAIL ADDRESS *vasyl.zuk@jpmorgan.com*

FEDERAL E.I. NUMBER *13-4994650* STATE OF DELAWARE LICENSE NUMBER *Not Applicable*

	Certification type(s)	Circle all that apply	
COMPANY CLASSIFICATIONS:	Minority Business Enterprise (MBE)	Yes	No
	Woman Business Enterprise (WBE)	Yes	No
CERT. NO.: N/A	Disadvantaged Business Enterprise (DBE)	Yes	No
	Veteran Owned Business Enterprise (VOBE)	Yes	No
	Service Disabled Veteran Owned Business Enterprise (SDVOBE)	Yes	No

[The above table is for informational and statistical use only.]

PURCHASE ORDERS SHOULD BE SENT TO:

COMPANY NAME: *JPMorgan Chase Bank, N.A.*

ADDRESS *250 Pehle Avenue, Floor 1, Saddle Brook, NJ 07663* CONTACT *Vasyl Zuk*

PHONE NUMBER *(201) 994-4706* FAX NUMBER *(201) 291-8526*

EMAIL ADDRESS *vasyl.zuk@jpmorgan.com*

AFFIRMATION: Within the past five years, has your firm, any affiliate, any predecessor company or entity, owner, Director, officer, partner or proprietor been the subject of a Federal, State, Local government suspension or debarment?

YES ___ NO ✓ IF YES, PLEASE EXPLAIN

THIS PAGE SHALL BE SIGNED, NOTARIZED AND RETURNED FOR YOUR BID TO BE CONSIDERED

SWORN TO AND SUBSCRIBED BEFORE ME this 27th day of July, 20 18

Notary Public Kelly Sylvester My Commission Expires August 20, 2020

City of Ramsey State of New Jersey

OFFICIAL SEAL
KELLY SYLVESTER
NOTARY PUBLIC - NEW JERSEY
My Comm. Expires Aug. 20, 2020

Tab O: Employing Delawareans Report

Vendors responding to this RFP must complete and return Attachment 8, for the total employees of the Firm and those that may be Delaware residents.

Attachment 8: Employing Delawareans Report

CONTRACT NUMBER: TRE18101-BANKINGSVC

As required by House Bill # 410 (Bond Bill) of the 146th General Assembly and under Section 30, no bid for any public works or professional services contract shall be responsive unless the prospective vendor discloses its reasonable, good-faith determination of:

1. Number of employees reasonably anticipated to be employed on the project: [redacted]_____
2. Number of such employees who are bona fide legal residents[4] of Delaware: [redacted]
3. Percentage of such employees who are bona fide legal residents of Delaware: [redacted]___
4. Total number of employees of the vendor: [redacted]__________
5. Total percentage of employees who are bona fide residents of Delaware: [redacted]

If subcontractors are to be used:

1. Number of employees who are residents of Delaware: [redacted]___________
2. Percentage of employees who are residents of Delaware: [redacted]___________

[4] "Bona fide legal resident" shall mean any resident who has established residence of at least 90 days in the State.

Board of Governors of the Federal Reserve System
Federal Deposit Insurance Corporation
Office of the Comptroller of the Currency

Federal Financial Institutions Examination Council

Consolidated Reports of Condition and Income for A Bank With Domestic and Foreign Offices - FFIEC 031

Institution Name	**JPMORGAN CHASE BANK, NATIONAL ASSOCIATION**
City	**COLUMBUS**
State	**OH**
Zip Code	**43240**
Call Report Report Date	**3/31/2018**
Report Type	**031**
RSSD-ID	**852218**
FDIC Certificate Number	**628**
OCC Charter Number	**8**
ABA Routing Number	**21000021**
Last updated on	**5/18/2018**

Federal Financial Institutions Examination Council

Consolidated Reports of Condition and Income for A Bank With Domestic and Foreign Offices - FFIEC 031

Report at the close of business March 31, 2018

(20180331)
(RCON 9999)

This report is required by law: 12 U.S.C. §324 (State member banks); 12 U.S.C. §1817 (State non member banks); 12 U.S.C. §161 (National banks); and 12 U.S.C. §1464 (Savings associations).

Unless the context indicates otherwise, the term "bank" in this report form refers to both banks and savings associations.

This report form is to be filed by banks with branches and consolidated subsidiaries in U.S. territories and possessions, Edge or Agreement subsidiaries, foreign branches, consolidated foreign subsidiaries, or International Banking Facilities.

NOTE: Each bank's board of directors and senior management are responsible for establishing and maintaining an effective system of internal control, including controls over the Reports of Condition and Income. The Reports of Condition and Income are to be prepared in accordance with federal regulatory authority instructions. The Reports of Condition and Income must be signed by the Chief Financial Officer (CFO) of the reporting bank (or by the individual performing an equivalent function) and attested to by not less than two directors (trustees) for state non member banks and three directors for state member banks, national banks, and savings associations.

I, the undersigned CFO (or equivalent) of the named bank, attest that the Reports of Condition and Income (including the supporting schedules) for this report date have been prepared in conformance with the instructions issued by the appropriate Federal regulatory authority and are true and correct to the best of my knowledge and belief.

We, the undersigned directors (trustees), attest to the correctness of the Reports of Condition and Income (including the supporting schedules) for this report date and declare that the Reports of Condition and Income have been examined by us and to the best of our knowledge and belief have been prepared in conformance with the instructions issued by the appropriate Federal regulatory authority and are true and correct.

Signature of Chief Financial Officer (or Equivalent)

Date of Signature

Director (Trustee)

Director (Trustee)

Director (Trustee)

Submission of Reports

Each bank must file its Reports of Condition and Income (Call Report) data by either:

(a) Using computer software to prepare its Call Report and then submitting the report data directly to the FFIEC's Central Data Repository (CDR), an Internet-based system for datacollection (https://cdr.ffiec.gov/cdr/), or

(b) Completing its Call Report in paper form and arranging with a software vendor or another party to convert the data in to the electronic format that can be processed by the CDR. The software vendor or other party then must electronically submit the bank's data file to the CDR.

For technical assistance with submissions to the CDR, please contact the CDR Help Desk by telephone at (888) CDR-3111, by fax at (703) 774-3946, or by e-mail at CDR.Help@ffiec.gov.

FDIC Certificate Number **628** (RSSD 9050)

To fulfill the signature and attestation requirement for the Reports of Condition and Income for this report date, attach your bank's completed signature page (or a photocopy or a computer generated version of this page) to the hard-copy record of the data file submitted to the CDR that your bank must place in its files.

The appearance of your bank's hard-copy record of the submitted data file need not match exactly the appearance of the FFIEC's sample report forms, but should show at least the caption of each Call Report item and the reported amount.

JPMORGAN CHASE BANK, NATIONAL ASSOCIATION
Legal Title of Bank (RSSD 9017)

COLUMBUS
City (RSSD 9130)

OH — **43240**
State Abbreviation (RSSD 9200) — Zip Code (RSSD 9220)

The estimated average burden associated with this information collection is 50.4 hours per respondent and is estimated to vary from 20 to 775 hours per response, depending on individual circumstances. Burden estimates include the time for reviewing instructions, gathering and maintaining data in the required form, and completing the information collection, but exclude the time for compiling and maintaining business records in the normal course of a respondent's activities. A Federal agency may not conduct or sponsor, and an organization (or a person) is not required to respond to a collection of information, unless it displays a currently valid OMB control number. Comments concerning the accuracy of this burden estimate and suggestions for reducing this burden should be directed to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503, and to one of the following: Secretary, Board of Governors of the Federal Reserve System, 20th and C Streets, NW, Washington, DC 20551; Legislative and Regulatory Analysis Division, Office of the Comptroller of the Currency, Washington, DC 20219; Assistant Executive Secretary, Federal Deposit Insurance Corporation, Washington, DC 20429.

Consolidated Reports of Condition and Income for A Bank With Domestic and Foreign Offices - FFIEC 031

Table of Contents

For information or assistance, national banks, state nonmember banks, and savings associations should contact the FDIC's Data Collection and Analysis Section, 550 17th Street, NW, Washington, DC 20429, toll free on (800) 688-FDIC(3342), Monday through Friday between 8:00 a.m. and 5:00 p.m., Eastern Time. State member banks should contact their Federal Reserve District Bank.

Legend: NR - Not Reported, CONF - Confidential

Contact Information for the Reports of Condition and Income

To facilitate communication between the Agencies and the bank concerning the Reports of Condition and Income, please provide contact information for (1) the Chief Financial Officer (or equivalent) of the bank signing the reports for this quarter, and (2) the person at the bank—other than the Chief Financial Officer (or equivalent)—to whom questions about the reports should be directed. If the Chief Financial Officer (or equivalent) is the primary contact for questions about the reports, please provide contact information for another person at the bank who will serve as a secondary contact for communications between the Agencies and the bank concerning the Reports of Condition and Income. Enter “none” for the contact’s e-mail address or fax number if not available. Contact information for the Reports of Condition and Income is for the confidential use of the Agencies and will not be released to the public.

Chief Financial Officer (or Equivalent) Signing the Reports

CONF
Name (TEXT C490)

CONF
Title (TEXT C491)

CONF
E-mail Address (TEXT C492)

CONF
Area Code / Phone Number / Extension (TEXT C493)

CONF
Area Code / FAX Number (TEXT C494)

Other Person to Whom Questions about the Reports Should be Directed

CONF
Name (TEXT C495)

CONF
Title (TEXT C496)

CONF
E-mail Address (TEXT 4086)

CONF
Area Code / Phone Number / Extension (TEXT 8902)

CONF
Area Code / FAX Number (TEXT 9116)

Emergency Contact Information

This information is being requested so the Agencies can distribute critical, time-sensitive information to emergency contacts at banks. Please provide primary contact information for a senior official of the bank who has decision-making authority. Also provide information for a secondary contact if available. Enter “none” for the contact’s e-mail address or fax number if not available. Emergency contact information is for the confidential use of the Agencies and will not be released to the public.

Primary Contact

CONF
Name (TEXT C366)

CONF
Title (TEXT C367)

CONF
E-mail Address (TEXT C368)

CONF
Area Code / Phone Number / Extension (TEXT C369)

CONF
Area Code / FAX Number (TEXT C370)

Secondary Contact

CONF
Name (TEXT C371)

CONF
Title (TEXT C372)

CONF
E-mail Address (TEXT C373)

CONF
Area Code / Phone Number / Extension (TEXT C374)

CONF
Area Code / FAX Number (TEXT C375)

USA PATRIOT Act Section 314(a) Anti-Money Laundering

Contact Information

This information is being requested to identify points-of-contact who are in charge of your bank's USA PATRIOT Act Section 314(a) information requests. Bank personnel listed could be contacted by law enforcement officers or the Financial Crimes Enforcement Network (FinCEN) for additional information related to specific Section 314(a) search requests or other anti-terrorist financing and anti- money laundering matters. Communications sent by FinCEN to the bank for purposes other than Section 314(a) notifications will state the intended purpose and should be directed to the appropriate bank personnel for review. Any disclosure of customer records to law enforcement officers or FinCEN must be done in compliance with applicable law, including the Right to Financial Privacy Act (12 U.S.C. 3401 et seq.).

Please provide information for a primary and secondary contact. Information for a third and fourth contact may be provided at the bank's option. Enter "none" for the contact's e-mail address if not available. This contact information is for the confidential use of the Agencies, FinCEN, and law enforcement officers and will not be released to the public.

Primary Contact

CONF
Name (TEXT C437)

CONF
Title (TEXT C438)

CONF
E-mail Address (TEXT C439)

CONF
Area Code / Phone Number / Extension (TEXT C440)

Secondary Contact

CONF
Name (TEXT C442)

CONF
Title (TEXT C443)

CONF
E-mail Address (TEXT C444)

CONF
Area Code / Phone Number / Extension (TEXT 8902)

Third Contact

CONF
Name (TEXT C870)

CONF
Title (TEXT C871)

CONF
E-mail Address (TEXT C368)

CONF
Area Code / Phone Number / Extension (TEXT C873)

Fourth Contact

CONF
Name (TEXT C875)

CONF
Title (TEXT C876)

CONF
E-mail Address (TEXT C877)

CONF
Area Code / Phone Number / Extension (TEXT C878)

Bank Demographic Information

Dollar amounts in thousands			
1. Reporting date	RCON9999	**20180331**	1.
2. FDIC certificate number	RSSD9050	**628**	2.
3. Legal title of bank	RSSD9017	**Click here for value**	3.
4. City	RSSD9130	**Columbus**	4.
5. State abbreviation	RSSD9200	**OH**	5.
6. Zip code	RSSD9220	**43240**	6.
7. Legal Entity Identifier (LEI) (Report only if your institution already has an LEI.)	RCON9224	**Click here for value**	7.

(RCON9224) 7H6GLXDRUGQFU57RNE97

(RSSD9017) JPMorgan Chase Bank, National Association

Contact Information

Dollar amounts in thousands			
1. Contact Information for the Reports of Condition and Income			1.
a. Chief Financial Officer (or Equivalent) Signing the Reports			1.a.
1. Name	TEXTC490	**CONF**	1.a.1.
2. Title	TEXTC491	**CONF**	1.a.2.
3. E-mail Address	TEXTC492	**CONF**	1.a.3.
4. Telephone	TEXTC493	**CONF**	1.a.4.
5. FAX	TEXTC494	**CONF**	1.a.5.
b. Other Person to Whom Questions about the Reports Should be Directed			1.b.
1. Name	TEXTC495	**CONF**	1.b.1.
2. Title	TEXTC496	**CONF**	1.b.2.
3. E-mail Address	TEXT4086	**CONF**	1.b.3.
4. Telephone	TEXT8902	**CONF**	1.b.4.
5. FAX	TEXT9116	**CONF**	1.b.5.
2. Person to whom questions about Schedule RC-T - Fiduciary and Related Services should be directed			2.
a. Name and Title	TEXTB962	**CONF**	2.a.
b. E-mail Address	TEXTB926	**CONF**	2.b.
c. Telephone	TEXTB963	**CONF**	2.c.
d. FAX	TEXTB964	**CONF**	2.d.
3. Emergency Contact Information			3.
a. Primary Contact			3.a.
1. Name	TEXTC366	**CONF**	3.a.1.
2. Title	TEXTC367	**CONF**	3.a.2.
3. E-mail Address	TEXTC368	**CONF**	3.a.3.
4. Telephone	TEXTC369	**CONF**	3.a.4.
5. FAX	TEXTC370	**CONF**	3.a.5.
b. Secondary Contact			3.b.
1. Name	TEXTC371	**CONF**	3.b.1.
2. Title	TEXTC372	**CONF**	3.b.2.
3. E-mail Address	TEXTC373	**CONF**	3.b.3.
4. Telephone	TEXTC374	**CONF**	3.b.4.
5. FAX	TEXTC375	**CONF**	3.b.5.
4. USA PATRIOT Act Section 314(a) Anti-Money Laundering Contact Information			4.
a. Primary Contact			4.a.

Dollar amounts in thousands			
1. Name	TEXTC437	**CONF**	4.a.1.
2. Title	TEXTC438	**CONF**	4.a.2.
3. E-mail Address	TEXTC439	**CONF**	4.a.3.
4. Telephone	TEXTC440	**CONF**	4.a.4.
b. Secondary Contact			4.b.
1. Name	TEXTC442	**CONF**	4.b.1.
2. Title	TEXTC443	**CONF**	4.b.2.
3. E-mail Address	TEXTC444	**CONF**	4.b.3.
4. Telephone	TEXTC445	**CONF**	4.b.4.
c. Third Contact			4.c.
1. Name	TEXTC870	**CONF**	4.c.1.
2. Title	TEXTC871	**CONF**	4.c.2.
3. E-mail Address	TEXTC872	**CONF**	4.c.3.
4. Telephone	TEXTC873	**CONF**	4.c.4.
d. Fourth Contact			4.d.
1. Name	TEXTC875	**CONF**	4.d.1.
2. Title	TEXTC876	**CONF**	4.d.2.
3. E-mail Address	TEXTC877	**CONF**	4.d.3.
4. Telephone	TEXTC878	**CONF**	4.d.4.
5. Chief Executive Officer Contact Information			5.
a. Chief Executive Officer			5.a.
1. Name	TEXTFT42	**CONF**	5.a.1.
2. E-mail Address	TEXTFT44	**CONF**	5.a.2.
3. Telephone	TEXTFT43	**CONF**	5.a.3.
4. FAX	TEXTFT45	**CONF**	5.a.4.

Schedule RI - Income Statement

All Report of Income schedules are to be reported on a calendar year-to-date basis in thousands of dollars.

Dollar amounts in thousands			
1. Interest income:			1.
a. Interest and fee income on loans:			1.a.
1. In domestic offices:			1.a.1.
a. Loans secured by real estate:			1.a.1.a.
1. Loans secured by 1-4 family residential properties	RIAD4435	**2,628,000**	1.a.1.a.1.
2. All other loans secured by real estate	RIAD4436	**1,157,000**	1.a.1.a.2.
b. Loans to finance agricultural production and other loans to farmers	RIAD4024	**6,000**	1.a.1.b.
c. Commercial and industrial loans	RIAD4012	**1,282,000**	1.a.1.c.
d. Loans to individuals for household, family, and other personal expenditures:			1.a.1.d.
1. Credit cards	RIADB485	**1,088,000**	1.a.1.d.1.
2. Other (includes revolving credit plans other than credit cards, automobile loans, and other consumer loans)	RIADB486	**522,000**	1.a.1.d.2.
e. Loans to foreign governments and official institutions	RIAD4056	**0**	1.a.1.e.
f. All other loans in domestic offices	RIADB487	**1,122,000**	1.a.1.f.
2. In foreign offices, Edge and Agreement subsidiaries, and IBFs	RIAD4059	**575,000**	1.a.2.
3. Total interest and fee income on loans (sum of items 1.a.(1)(a) through 1.a.(2))	RIAD4010	**8,380,000**	1.a.3.
b. Income from lease financing receivables	RIAD4065	**5,000**	1.b.
c. Interest income on balances due from depository institutions[1]	RIAD4115	**1,275,000**	1.c.
d. Interest and dividend income on securities:			1.d.
1. U.S. Treasury securities and U.S. Government agency obligations (excluding mortgage-backed securities)	RIADB488	**122,000**	1.d.1.
2. Mortgage-backed securities	RIADB489	**863,000**	1.d.2.
3. All other securities (includes securities issued by states and political subdivisions in the U.S.)	RIAD4060	**711,000**	1.d.3.
e. Interest income from trading assets	RIAD4069	**1,297,000**	1.e.
f. Interest income on federal funds sold and securities purchased under agreements to resell	RIAD4020	**459,000**	1.f.
g. Other interest income	RIAD4518	**146,000**	1.g.
h. Total interest income (sum of items 1.a.(3) through 1.g)	RIAD4107	**13,258,000**	1.h.
2. Interest expense:			2.
a. Interest on deposits:			2.a.
1. Interest on deposits in domestic offices:			2.a.1.
a. Transaction accounts (interest-bearing demand deposits, NOW accounts, ATS accounts, and telephone and preauthorized transfer accounts)	RIAD4508	**521,000**	2.a.1.a.
b. Nontransaction accounts:			2.a.1.b.
1. Savings deposits (includes MMDAs)	RIAD0093	**338,000**	2.a.1.b.1.
2. Time deposits of $250,000 or less	RIADHK03	**11,000**	2.a.1.b.2.
3. Time deposits of more than $250,000	RIADHK04	**205,000**	2.a.1.b.3.
2. Interest on deposits in foreign offices, Edge and Agreement subsidiaries, and IBFs	RIAD4172	**246,000**	2.a.2.
b. Expense of federal funds purchased and securities sold under agreements to repurchase	RIAD4180	**228,000**	2.b.
c. Interest on trading liabilities and other borrowed money	RIAD4185	**725,000**	2.c.
d. Interest on subordinated notes and debentures	RIAD4200	**3,000**	2.d.
e. Total interest expense (sum of items 2.a through 2.d)	RIAD4073	**2,277,000**	2.e.
3. Net interest income (item 1.h minus 2.e)	RIAD4074	**10,981,000**	3.
4. Provision for loan and lease losses	RIAD4230	**400,000**	4.
5. Noninterest income:			5.
a. Income from fiduciary activities[1]	RIAD4070	**1,091,000**	5.a.
b. Service charges on deposit accounts in domestic offices	RIAD4080	**1,190,000**	5.b.

1. Includes interest income on time certificates of deposit not held for trading.
1. For banks required to complete Schedule RC-T, items 14 through 22, income from fiduciary activities reported in Schedule RI, item 5.a, must equal the amount reported in Schedule RC-T, item 22.

Dollar amounts in thousands			
c. Trading revenue[2]	RIADA220	3,478,000	5.c.
d. Not available			5.d.
1. Fees and commissions from securities brokerage	RIADC886	346,000	5.d.1.
2. Investment banking, advisory, and underwriting fees and commissions	RIADC888	690,000	5.d.2.
3. Fees and commissions from annuity sales	RIADC887	0	5.d.3.
4. Underwriting income from insurance and reinsurance activities	RIADC386	0	5.d.4.
5. Income from other insurance activities	RIADC387	3,000	5.d.5.
e. Venture capital revenue	RIADB491	0	5.e.
f. Net servicing fees	RIADB492	731,000	5.f.
g. Net securitization income	RIADB493	0	5.g.
h. Not applicable			5.h.
i. Net gains (losses) on sales of loans and leases	RIAD5416	29,000	5.i.
j. Net gains (losses) on sales of other real estate owned	RIAD5415	6,000	5.j.
k. Net gains (losses) on sales of other assets[3]	RIADB496	43,000	5.k.
l. Other noninterest income*	RIADB497	4,040,000	5.l.
m. Total noninterest income (sum of items 5.a through 5.l)	RIAD4079	11,647,000	5.m.
6. Not available			6.
a. Realized gains (losses) on held-to-maturity securities	RIAD3521	0	6.a.
b. Realized gains (losses) on available-for-sale securities	RIAD3196	-245,000	6.b.
7. Noninterest expense:			7.
a. Salaries and employee benefits	RIAD4135	7,039,000	7.a.
b. Expenses of premises and fixed assets (net of rental income) (excluding salaries and employee benefits and mortgage interest)	RIAD4217	2,326,000	7.b.
c. Not available			7.c.
1. Goodwill impairment losses	RIADC216	0	7.c.1.
2. Amortization expense and impairment losses for other intangible assets	RIADC232	18,000	7.c.2.
d. Other noninterest expense*	RIAD4092	4,673,000	7.d.
e. Total noninterest expense (sum of items 7.a through 7.d)	RIAD4093	14,056,000	7.e.
8. Not available			8.
a. Income (loss) before unrealized holding gains (losses) on equity securities not held for trading, applicable income taxes, and discontinued operations (item 3 plus or minus items 4, 5.m, 6.a, 6.b, and 7.e)	RIADHT69	7,927,000	8.a.
b. Unrealized holding gains (losses) on equity securities not held for trading[4]	RIADHT70	450,000	8.b.
c. Income (loss) before applicable income taxes and discontinued operations (sum of items 8.a and 8.b)	RIAD4301	8,377,000	8.c.
9. Applicable income taxes (on item 8.c)	RIAD4302	1,704,000	9.
10. Income (loss) before discontinued operations (item 8.c minus item 9)	RIAD4300	6,673,000	10.
11. Discontinued operations, net of applicable income taxes (Describe on Schedule RI-E - Explanations)*	RIADFT28	0	11.
12. Net income (loss) attributable to bank and noncontrolling (minority) interests (sum of items 10 and 11)	RIADG104	6,673,000	12.
13. LESS: Net income (loss) attributable to noncontrolling (minority) interests (if net income, report as a positive value; if net loss, report as a negative value)	RIADG103	3,000	13.
14. Net income (loss) attributable to bank (item 12 minus item 13)	RIAD4340	6,670,000	14.
1. Interest expense incurred to carry tax-exempt securities, loans, and leases acquired after August 7, 1986, that is not deductible for federal income tax purposes	RIAD4513	48,000	M.1.
Memorandum item 2 is to be completed by banks with $1 billion or more in total assets 2. Income from the sale and servicing of mutual funds and annuities in domestic offices (included in Schedule RI, item 8)	RIAD8431	19,000	M.2.
3. Income on tax-exempt loans and leases to states and political subdivisions in the U.S. (included in Schedule RI, items 1.a and 1.b)	RIAD4313	135,000	M.3.
4. Income on tax-exempt securities issued by states and political subdivisions in the U.S. (included in Schedule RI, item 1.d.(3))	RIAD4507	385,000	M.4.
5. Number of full-time equivalent employees at end of current period (round to nearest whole number)	RIAD4150	193480	M.5.

2. For banks required to complete Schedule RI, Memorandum item 8, trading revenue reported in Schedule RI, item 5.c, must equal the sum of Memorandum items 8.a through 8.e.
3. Exclude net gains (losses) on sales of trading assets and held-to-maturity and available-for-sale securities.
*. Describe on Schedule RI-E—Explanations.
4. Item 8.b is to be completed only by institutions that have adopted ASU 2016-01, which includes provisions governing the accounting for investments in equity securities. See the instructions for further detail on ASU 2016-01.

Dollar amounts in thousands			
6. Not applicable			M.6.
7. If the reporting institution has applied pushdown accounting this calendar year, report the date of the institution's acquisition (see instructions)[2]	RIAD9106	0	M.7.
8. Trading revenue (from cash instruments and derivative instruments) (sum of Memorandum items 8.a through 8.e must equal Schedule RI, item 5.c):			M.8.
Memorandum items 8.a through 8.e are to be completed by banks that reported average trading assets (Schedule RC-K, item 7) of $2 million or more for any quarter of the preceding calendar year. a. Interest rate exposures	RIAD8757	797,000	M.8.a.
b. Foreign exchange exposures	RIAD8758	1,131,000	M.8.b.
c. Equity security and index exposures	RIAD8759	1,099,000	M.8.c.
d. Commodity and other exposures	RIAD8760	179,000	M.8.d.
e. Credit exposures	RIADF186	272,000	M.8.e.
Memorandum items 8.f through 8.h are to be completed by banks with $100 billion or more in total assets that are required to complete Schedule RI, Memorandum items 8.a through 8.e, above. f. Impact on trading revenue of changes in the creditworthiness of the bank's derivatives counterparties on the bank's derivative assets (year-to-date changes) (included in Memorandum items 8.a through 8.e above):			M.8.f.
1. Gross credit valuation adjustment (CVA)	RIADFT36	84,000	M.8.f.1.
2. CVA hedge	RIADFT37	-107,000	M.8.f.2.
g. Impact on trading revenue of changes in the creditworthiness of the bank on the bank's derivative liabilities (year-to-date changes) (included in Memorandum items 8.a through 8.e above):			M.8.g.
1. Gross debit valuation adjustment (DVA)	RIADFT38	55,000	M.8.g.1.
2. DVA hedge	RIADFT39	0	M.8.g.2.
h. Gross trading revenue, before including positive or negative net CVA and net DVA	RIADFT40	3,446,000	M.8.h.
9. Net gains (losses) recognized in earnings on credit derivatives that economically hedge credit exposures held outside the trading account:			M.9.
a. Net gains (losses) on credit derivatives held for trading	RIADC889	-8,000	M.9.a.
b. Net gains (losses) on credit derivatives held for purposes other than trading	RIADC890	0	M.9.b.
10. Credit losses on derivatives (see instructions)	RIADA251	-1,000	M.10.
11. Does the reporting bank have a Subchapter S election in effect for federal income tax purposes for the current tax year?	RIADA530	No	M.11.
Memorandum item 12 is to be completed by banks that are required to complete Schedule RC-C, Part I, Memorandum items 8.b and 8.c. 12. Noncash income from negative amortization on closed-end loans secured by 1-4 family residential properties (included in Schedule RI, item 1.a.(1)(a)(1))	RIADF228	0	M.12.
Memorandum item 13 is to be completed by banks that have elected to account for assets and liabilities under a fair value option. 13. Net gains (losses) recognized in earnings on assets and liabilities that are reported at fair value under a fair value option:			M.13.
a. Net gains (losses) on assets	RIADF551	856,000	M.13.a.
1. Estimated net gains (losses) on loans attributable to changes in instrument-specific credit risk	RIADF552	121,000	M.13.a.1.
b. Net gains (losses) on liabilities	RIADF553	485,000	M.13.b.
1. Estimated net gains (losses) on liabilities attributable to changes in instrument-specific credit risk	RIADF554	0	M.13.b.1.
14. Other-than-temporary impairment losses on held-to-maturity and available-for-sale debt securities	RIADJ321	20,000	M.14.
Memorandum item 15 is to be completed by institutions with $1 billion or more in total assets that answered "Yes" to Schedule RC-E, Part I, Memorandum item 5. 15. Components of service charges on deposit accounts in domestic offices (sum of Memorandum items 15.a through 15.d must equal Schedule RI, item 5.b):			M.15.
a. Consumer overdraft-related service charges levied on those transaction account and nontransaction savings account deposit products intended primarily for individuals for personal, household, or family use	RIADH032	455,000	M.15.a.
b. Consumer account periodic maintenance charges levied on those transaction account and nontransaction savings account deposit products intended primarily for individuals for personal, household, or family use	RIADH033	145,000	M.15.b.
c. Consumer customer automated teller machine (ATM) fees levied on those transaction account and nontransaction savings account deposit products intended primarily for individuals for personal, household, or family use	RIADH034	72,000	M.15.c.
d. All other service charges on deposit accounts	RIADH035	518,000	M.15.d.

2. For example, a bank acquired on March 1, 2016, would report 20160301.

Schedule RI-A - Changes in Bank Equity Capital

Dollar amounts in thousands			
1. Total bank equity capital most recently reported for the December 31, 2017, Reports of Condition and Income (i.e., after adjustments from amended Reports of Income)	RIAD3217	**211,685,000**	1.
2. Cumulative effect of changes in accounting principles and corrections of material accounting errors*	RIADB507	**-73,000**	2.
3. Balance end of previous calendar year as restated (sum of items 1 and 2)	RIADB508	**211,612,000**	3.
4. Net income (loss) attributable to bank (must equal Schedule RI, item 14)	RIAD4340	**6,670,000**	4.
5. Sale, conversion, acquisition, or retirement of capital stock, net (excluding treasury stock transactions)	RIADB509	**0**	5.
6. Treasury stock transactions, net	RIADB510	**0**	6.
7. Changes incident to business combinations, net	RIAD4356	**0**	7.
8. LESS: Cash dividends declared on preferred stock	RIAD4470	**0**	8.
9. LESS: Cash dividends declared on common stock	RIAD4460	**5,500,000**	9.
10. Other comprehensive income[1]	RIADB511	**-2,825,000**	10.
11. Other transactions with stockholders (including a parent holding company) (not included in items 5, 6, 8, or 9 above)*	RIAD4415	**4,848,000**	11.
12. Total bank equity capital end of current period (sum of items 3 through 11) (must equal Schedule RC, item 27.a)	RIAD3210	**214,805,000**	12.

*. Describe on Schedule RI-E—Explanations

1. Includes, but is not limited to, changes in net unrealized holding gains (losses) on available-for-sale securities, changes in accumulated net gains (losses) on cash flow hedges, foreign currency translation adjustments, and pension and other postretirement plan-related changes other than net periodic benefit cost.

Schedule RI-B Part I - Charge-offs and Recoveries on Loans and Leases

Part I includes charge-offs and recoveries through the allocated transfer risk reserve.

Dollar amounts in thousands	(Column A) Charge-offs Calendar year-to-date		(Column B) Recoveries Calendar year-to-date		
1. Loans secured by real estate:					1.
a. Construction, land development, and other land loans in domestic offices:					1.a.
1. 1-4 family residential construction loans	RIADC891	**0**	RIADC892	**0**	1.a.1.
2. Other construction loans and all land development and other land loans	RIADC893	**0**	RIADC894	**0**	1.a.2.
b. Secured by farmland in domestic offices	RIAD3584	**0**	RIAD3585	**0**	1.b.
c. Secured by 1-4 family residential properties in domestic offices:					1.c.
1. Revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit	RIAD5411	**58,000**	RIAD5412	**40,000**	1.c.1.
2. Closed-end loans secured by 1-4 family residential properties:					1.c.2.
a. Secured by first liens	RIADC234	**31,000**	RIADC217	**34,000**	1.c.2.a.
b. Secured by junior liens	RIADC235	**6,000**	RIADC218	**6,000**	1.c.2.b.
d. Secured by multifamily (5 or more) residential properties in domestic offices	RIAD3588	**0**	RIAD3589	**0**	1.d.
e. Secured by nonfarm nonresidential properties in domestic offices:					1.e.
1. Loans secured by owner-occupied nonfarm nonresidential properties	RIADC895	**1,000**	RIADC896	**1,000**	1.e.1.
2. Loans secured by other nonfarm nonresidential properties	RIADC897	**0**	RIADC898	**1,000**	1.e.2.
f. In foreign offices	RIADB512	**0**	RIADB513	**0**	1.f.
2. Not applicable					2.
3. Loans to finance agricultural production and other loans to farmers	RIAD4655	**0**	RIAD4665	**0**	3.
4. Commercial and industrial loans:					4.
a. To U.S. addressees (domicile)	RIAD4645	**74,000**	RIAD4617	**42,000**	4.a.
b. To non-U.S. addressees (domicile)	RIAD4646	**43,000**	RIAD4618	**12,000**	4.b.
5. Loans to individuals for household, family, and other personal expenditures:					5.
a. Credit cards	RIADB514	**347,000**	RIADB515	**35,000**	5.a.
b. Automobile loans	RIADK129	**106,000**	RIADK133	**32,000**	5.b.
c. Other (includes revolving credit plans other than credit cards and other consumer loans)	RIADK205	**2,000**	RIADK206	**0**	5.c.
6. Loans to foreign governments and official institutions	RIAD4643	**0**	RIAD4627	**0**	6.
7. All other loans	RIAD4644	**60,000**	RIAD4628	**17,000**	7.
8. Lease financing receivables:					8.
a. Leases to individuals for household, family, and other personal expenditures	RIADF185	**0**	RIADF187	**0**	8.a.
b. All other leases	RIADC880	**0**	RIADF188	**0**	8.b.
9. Total (sum of items 1 through 8)	RIAD4635	**728,000**	RIAD4605	**220,000**	9.
1. Loans to finance commercial real estate, construction, and land development activities (not secured by real estate) included in Schedule RI-B, part I, items 4 and 7, above	RIAD5409	**0**	RIAD5410	**13,000**	M.1.
2. Loans secured by real estate to non-U.S. addressees (domicile) (included in Schedule RI-B, part I, item 1, above)	RIAD4652	**0**	RIAD4662	**0**	M.2.
3. Not applicable					M.3.

Dollar amounts in thousands			
Memorandum item 4 is to be completed by banks that (1) together with affiliated institutions, have outstanding credit card receivables (as defined in the instructions) that exceed $500 million as of the report date, or (2) are credit card specialty banks as defined for Uniform Bank Performance Report purposes. 4. Uncollectible retail credit card fees and finance charges reversed against income (i.e., not included in charge-offs against the allowance for loan and lease losses)	RIADC388	**58,000**	M.4.

Schedule RI-B Part II - Changes in Allowance for Loan and Lease Losses

Dollar amounts in thousands			
1. Balance most recently reported for the December 31, 2017, Reports of Condition and Income (i.e., after adjustments from amended Reports of Income)	RIADB522	**10,081,000**	1.
2. Recoveries (must equal part I, item 9, column B, above)	RIAD4605	**220,000**	2.
3. LESS: Charge-offs (must equal part I, item 9, column A, above less Schedule RI-B, part II, item 4)	RIADC079	**728,000**	3.
4. LESS: Write-downs arising from transfers of loans to a held-for-sale account	RIAD5523	**0**	4.
5. Provision for loan and lease losses (must equal Schedule RI, item 4)	RIAD4230	**400,000**	5.
6. Adjustments (see instructions for this schedule)*	RIADC233	**-21,000**	6.
7. Balance end of current period (sum of items 1, 2, 5, and 6, less items 3 and 4) (must equal Schedule RC, item 4.c)	RIAD3123	**9,952,000**	7.
1. Allocated transfer risk reserve included in Schedule RI-B, part II, item 7, above	RIADC435	**0**	M.1.
Memorandum items 2 and 3 are to be completed by banks that (1) together with affiliated institutions, have outstanding credit card receivables (as defined in the instructions) that exceed $500 million as of the report date, or (2) are credit card specialty banks as defined for Uniform Bank Performance Report purposes. 2. Separate valuation allowance for uncollectible retail credit card fees and finance charges	RIADC389	**90,000**	M.2.
3. Amount of allowance for loan and lease losses attributable to retail credit card fees and finance charges	RIADC390	**0**	M.3.
Memorandum item 4 is to be completed by all banks. 4. Amount of allowance for post-acquisition credit losses on purchased credit-impaired loans accounted for in accordance with FASB ASC 310-30 (former AICPA Statement of Position 03-3) (included in Schedule RI-B, Part II, item 7, above).	RIADC781	**2,205,000**	M.4.

*. Describe on Schedule RI-E—Explanations.

Schedule RI-C - Disaggregated Data on the Allowance for Loan and Lease Losses

Schedule RI-C is to be completed by institutions with $1 billion or more in total assets.

Dollar amounts in thousands	(Column A) Recorded Investment: Individually Evaluated for Impairment and Determined to be Impaired (ASC 310-10-35)	(Column B) Allowance Balance: Individually Evaluated for Impairment and Determined to be Impaired (ASC 310-10-35)	(Column C) Recorded Investment: Collectively Evaluated for Impairment (ASC 450-20)	(Column D) Allowance Balance: Collectively Evaluated for Impairment (ASC 450-20)	(Column E) Recorded Investment: Purchased Credit-Impaired Loans (ASC 310-30)	(Column F) Allowance Balance: Purchased Credit-Impaired Loans (ASC 310-30)	
1. Real estate loans:							1.
a. Construction loans	RCFDM708 17,000	RCFDM709 1,000	RCFDM710 8,570,000	RCFDM711 74,000	RCFDM712 6,000	RCFDM713 1,000	1.a.
b. Commercial real estate loans	RCFDM714 289,000	RCFDM715 56,000	RCFDM716 106,060,000	RCFDM717 1,636,000	RCFDM719 3,000	RCFDM720 0	1.b.
c. Residential real estate loans	RCFDM721 11,978,000	RCFDM722 205,000	RCFDM723 241,781,000	RCFDM724 905,000	RCFDM725 29,467,000	RCFDM726 2,200,000	1.c.
2. Commercial loans[2]	RCFDM727 1,528,000	RCFDM728 443,000	RCFDM729 333,684,000	RCFDM730 2,619,000	RCFDM731 0	RCFDM732 0	2.
3. Credit cards	RCFDM733 301,000	RCFDM734 94,000	RCFDM735 36,170,000	RCFDM736 1,298,000	RCFDM737 0	RCFDM738 0	3.
4. Other consumer loans	RCFDM739 66,000	RCFDM740 14,000	RCFDM741 62,390,000	RCFDM742 402,000	RCFDM743 32,000	RCFDM744 4,000	4.
5. Unallocated, if any				RCFDM745 0			5.
6. Total (for each column, sum of items 1.a through 5)[3]	RCFDM746 14,179,000	RCFDM747 813,000	RCFDM748 788,655,000	RCFDM749 6,934,000	RCFDM750 29,508,000	RCFDM751 2,205,000	6.

2. Include all loans and leases not reported as real estate loans, credit cards, or other consumer loans in items 1, 3, or 4 of Schedule RI-C.
3. The sum of item 6, columns B, D, and F, must equal Schedule RC, item 4.c. Item 6, column E, must equal Schedule RC-C, Part I, Memorandum item 7.b. Item 6, column F, must equal Schedule RI-B, Part II, Memorandum item 4.

Schedule RI-D - Income from Foreign Offices

For all banks with foreign offices (including Edge or Agreement subsidiaries and IBFs) where foreign office revenues, assets, or net income exceed 10 percent of consolidated total revenues, total assets, or net income.

Dollar amounts in thousands			
1. Total interest income in foreign offices	RIADC899	**2,795,000**	1.
2. Total interest expense in foreign offices	RIADC900	**1,451,000**	2.
3. Provision for loan and lease losses in foreign offices	RIADC901	**67,000**	3.
4. Noninterest income in foreign offices:			4.
a. Trading revenue	RIADC902	**2,591,000**	4.a.
b. Investment banking, advisory, brokerage, and underwriting fees and commissions	RIADC903	**786,000**	4.b.
c. Net securitization income	RIADC904	**0**	4.c.
d. Other noninterest income	RIADC905	**1,374,000**	4.d.
5. Realized gains (losses) on held-to-maturity and available-for-sale debt securities and unrealized holding gains (losses) on equity securities not held for trading in foreign offices	RIADJA28	**472,000**	5.
6. Total noninterest expense in foreign offices	RIADC907	**3,990,000**	6.
7. Adjustments to pretax income in foreign offices for internal allocations to foreign offices to reflect the effects of equity capital on overall bank funding costs	RIADC908	**0**	7.
8. Applicable income taxes (on items 1 through 7)	RIADC909	**618,000**	8.
9. Discontinued operations, net of applicable income taxes, in foreign offices	RIADGW64	**0**	9.
10. Net income attributable to foreign offices before internal allocations of income and expense (item 1 plus or minus items 2 through 9)	RIADC911	**1,892,000**	10.
11. Not applicable			11.
12. Eliminations arising from the consolidation of foreign offices with domestic offices	RIADC913	**1,656,000**	12.
13. Consolidated net income attributable to foreign offices (sum of items 10 and 12)	RIADC914	**3,548,000**	13.

Schedule RI-E - Explanations

Schedule RI-E is to be completed each quarter on a calendar year-to-date basis.

Detail all adjustments in Schedule RI-A and RI-B, all extraordinary items and other adjustments in Schedule RI, and all significant items of other noninterest income and other noninterest expense in Schedule RI. (See instructions for details.)

Dollar amounts in thousands			
1. Other noninterest income (from Schedule RI, item 5.l) Itemize and describe amounts greater than $100,000 that exceed 3% of Schedule RI, item 5.l:			1.
a. Income and fees from the printing and sale of checks	RIADC013	**0**	1.a.
b. Earnings on/increase in value of cash surrender value of life insurance	RIADC014	**0**	1.b.
c. Income and fees from automated teller machines (ATMs)	RIADC016	**0**	1.c.
d. Rent and other income from other real estate owned	RIAD4042	**0**	1.d.
e. Safe deposit box rent	RIADC015	**0**	1.e.
f. Net change in the fair values of financial instruments accounted for under a fair value option	RIADF229	**0**	1.f.
g. Bank card and credit card interchange fees	RIADF555	**597,000**	1.g.
h. Gains on bargain purchases	RIADJ447	**0**	1.h.
i. Income and fees from wire transfers	RIADT047	**0**	1.i.
j. Disclose component and the dollar amount of that component:			1.j.
1. Describe component	TEXT4461	**Click here for value**	1.j.1.
2. Amount of component	RIAD4461	**1,045,000**	1.j.2.
k. Disclose component and the dollar amount of that component:			1.k.
1. Describe component	TEXT4462	**Click here for value**	1.k.1.
2. Amount of component	RIAD4462	**519,000**	1.k.2.
l. Disclose component and the dollar amount of that component:			1.l.
1. Describe component	TEXT4463	**Click here for value**	1.l.1.
2. Amount of component	RIAD4463	**172,000**	1.l.2.
2. Other noninterest expense (from Schedule RI, item 7.d) Itemize and describe amounts greater than $100,000 that exceed 3% of Schedule RI, item 7.d:			2.
a. Data processing expenses	RIADC017	**147,000**	2.a.

Dollar amounts in thousands			
b. Advertising and marketing expenses	RIAD0497	**253,000**	2.b.
c. Directors' fees	RIAD4136	**0**	2.c.
d. Printing, stationery, and supplies	RIADC018	**0**	2.d.
e. Postage	RIAD8403	**0**	2.e.
f. Legal fees and expenses	RIAD4141	**0**	2.f.
g. FDIC deposit insurance assessments	RIAD4146	**CONF**	2.g.
h. Accounting and auditing expenses	RIADF556	**0**	2.h.
i. Consulting and advisory expenses	RIADF557	**546,000**	2.i.
j. Automated teller machine (ATM) and interchange expenses	RIADF558	**0**	2.j.
k. Telecommunications expenses	RIADF559	**195,000**	2.k.
l. Other real estate owned expenses	RIADY923	**0**	2.l.
m. Insurance expenses (not included in employee expenses, premises and fixed asset expenses, and other real estate owned expenses)	RIADY924	**0**	2.m.
n. Disclose component and the dollar amount of that component:			2.n.
1. Describe component	TEXT4464	**Click here for value**	2.n.1.
2. Amount of component	RIAD4464	**278,000**	2.n.2.
o. Disclose component and the dollar amount of that component:			2.o.
1. Describe component	TEXT4467	**Click here for value**	2.o.1.
2. Amount of component	RIAD4467	**384,000**	2.o.2.
p. Disclose component and the dollar amount of that component:			2.p.
1. Describe component	TEXT4468		2.p.1.
2. Amount of component	RIAD4468	**0**	2.p.2.
3. Discontinued operations and applicable income tax effect (from Schedule RI, item 11) (itemize and describe each discontinued operation):			3.
a. Disclose component, the gross dollar amount of that component, and its related income tax:			3.a.
1. Describe component	TEXTFT29		3.a.1.
2. Amount of component	RIADFT29	**0**	3.a.2.
3. Applicable income tax effect	RIADFT30	**0**	3.a.3.
b. Disclose component, the gross dollar amount of that component, and its related income tax:			3.b.
1. Describe component	TEXTFT31		3.b.1.
2. Amount of component	RIADFT31	**0**	3.b.2.
3. Applicable income tax effect	RIADFT32	**0**	3.b.3.
4. Cumulative effect of changes in accounting principles and corrections of material accounting errors (from Schedule RI-A, item 2) (itemize and describe all such effects):			4.
a. Disclose component and the dollar amount of that component:			4.a.
1. Describe component	TEXTB526	**Click here for value**	4.a.1.
2. Amount of component	RIADB526	**-73,000**	4.a.2.
b. Disclose component and the dollar amount of that component:			4.b.
1. Describe component	TEXTB527		4.b.1.
2. Amount of component	RIADB527	**0**	4.b.2.
5. Other transactions with stockholders (including a parent holding company) (from Schedule RI-A, item 11) (itemize and describe all such transactions):			5.
a. Disclose component and the dollar amount of that component:			5.a.
1. Describe component	TEXT4498	**Click here for value**	5.a.1.
2. Amount of component	RIAD4498	**4,848,000**	5.a.2.
b. Disclose component and the dollar amount of that component:			5.b.
1. Describe component	TEXT4499		5.b.1.
2. Amount of component	RIAD4499	**0**	5.b.2.
6. Adjustments to allowance for loan and lease losses (from Schedule RI-B, part II, item 6) (itemize and describe all adjustments):			6.
a. Disclose component and the dollar amount of that component:			6.a.
1. Describe component	TEXT4521		6.a.1.
2. Amount of component	RIAD4521	**0**	6.a.2.
b. Disclose component and the dollar amount of that component:			6.b.

Dollar amounts in thousands			
1. Describe component	TEXT4522	**Click here for value**	6.b.1.
2. Amount of component	RIAD4522	**-21,000**	6.b.2.
7. Other explanations (the space below is provided for the bank to briefly describe, at its option, any other significant items affecting the Report of Income):			7.
a. Comments?	RIAD4769	**Yes**	7.a.
b. Other explanations	TEXT4769	**Click here for value**	7.b.

(TEXT4461) Operating Leases

(TEXT4462) Credit Card Revenues

(TEXT4463) Loan Commitment Fees

(TEXT4464) Amortization of Software

(TEXT4467) Brokerage and Clearing Expenses

(TEXT4498) Capital Contributions and Others

(TEXT4522) Writeoff of PCI Loans

(TEXT4769) Other Non-interest income greater than $100,000 that exceeds 3 percent of Schedule RI, 5.L Valuation Adjustment of Derivatives Risk Managing MSRs $(355) million. Statements in the 'Other explanations' section summarizes the net adjustment to retained earnings and AOCI, and material impact to the Income Statement, respectively, as a result of the new accounting standards JPMC adopted in the first quarter of 2018 ? Retained Earnings and AOCI: Premium amortization on purchased callable debt securities:$ (73) million; no material impact from 'Hedge Accounting' and 'Reclassification of certain tax effects from AOCI'; Impact to the Income Statement: New recognition and measurement accounting guidance ? mark-to-market gains on certain equity investments previously held at cost: $450 million gain in the first quarter of 2018.

(TEXTB526) Cumulative effect of changes in accounting principles

Schedule RC - Balance Sheet

All schedules are to be reported in thousands of dollars. Unless otherwise indicated, report the amount outstanding as of the last business day of the quarter.

Dollar amounts in thousands			
1. Cash and balances due from depository institutions (from Schedule RC-A):			1.
a. Noninterest-bearing balances and currency and coin[1]	RCFD0081	**21,811,000**	1.a.
b. Interest-bearing balances[2]	RCFD0071	**423,406,000**	1.b.
2. Securities:			2.
a. Held-to-maturity securities (from Schedule RC-B, column A)	RCFD1754	**29,042,000**	2.a.
b. Available-for-sale securities (from Schedule RC-B, column D)	RCFD1773	**206,854,000**	2.b.
c. Equity securities with readily determinable fair values not held for trading[7]	RCFDJA22	**7,000**	2.c.
3. Federal funds sold and securities purchased under agreements to resell:			3.
a. Federal funds sold in domestic offices	RCONB987	**2,348,000**	3.a.
b. Securities purchased under agreements to resell[3]	RCFDB989	**237,918,000**	3.b.
4. Loans and lease financing receivables (from Schedule RC-C):			4.
a. Loans and leases held for sale	RCFD5369	**5,905,000**	4.a.
b. Loans and leases held for investment	RCFDB528	**835,250,000**	4.b.
c. LESS: Allowance for loan and lease losses	RCFD3123	**9,952,000**	4.c.
d. Loans and leases held for investment, net of allowance (item 4.b minus 4.c)	RCFDB529	**825,298,000**	4.d.
5. Trading assets (from Schedule RC-D)	RCFD3545	**270,574,000**	5.
6. Premises and fixed assets (including capitalized leases)	RCFD2145	**11,299,000**	6.
7. Other real estate owned (from Schedule RC-M)	RCFD2150	**405,000**	7.
8. Investments in unconsolidated subsidiaries and associated companies	RCFD2130	**101,000**	8.
9. Direct and indirect investments in real estate ventures	RCFD3656	**7,867,000**	9.
10. Intangible assets:			10.
a. Goodwill	RCFD3163	**27,343,000**	10.a.
b. Other intangible assets (from Schedule RC-M)	RCFD0426	**6,376,000**	10.b.
11. Other assets (from Schedule RC-F)	RCFD2160	**121,742,000**	11.
12. Total assets (sum of items 1 through 11)	RCFD2170	**2,198,296,000**	12.
13. Deposits:			13.
a. In domestic offices (sum of totals of columns A and C from Schedule RC-E, part I)	RCON2200	**1,288,758,000**	13.a.
1. Noninterest-bearing[4]	RCON6631	**401,009,000**	13.a.1.
2. Interest-bearing	RCON6636	**887,749,000**	13.a.2.
b. In foreign offices, Edge and Agreement subsidiaries, and IBFs (from Schedule RC-E, part II)	RCFN2200	**270,395,000**	13.b.
1. Noninterest-bearing	RCFN6631	**17,945,000**	13.b.1.
2. Interest-bearing	RCFN6636	**252,450,000**	13.b.2.
14. Federal funds purchased and securities sold under agreements to repurchase:			14.
a. Federal funds purchased in domestic offices[5]	RCONB993	**1,217,000**	14.a.
b. Securities sold under agreements to repurchase[6]	RCFDB995	**103,656,000**	14.b.
15. Trading liabilities (from Schedule RC-D)	RCFD3548	**102,635,000**	15.
16. Other borrowed money (includes mortgage indebtedness and obligations under capitalized leases) (from Schedule RC-M)	RCFD3190	**119,161,000**	16.
17. Not applicable			17.
18. Not applicable			18.
19. Subordinated notes and debentures[1]	RCFD3200	**304,000**	19.

1. Includes cash items in process of collection and unposted debits.
2. Includes time certificates of deposit not held for trading.
7. Item 2.c is to be completed only by institutions that have adopted ASU 2016-01, which includes provisions governing the accounting for investments in equity securities. See the instructions for further detail on ASU 2016-01.
3. Includes all securities resale agreements in domestic and foreign offices, regardless of maturity.
4. Includes noninterest-bearing demand, time, and savings deposits.
5. Report overnight Federal Home Loan Bank advances in Schedule RC, item 16, "Other borrowed money."
6. Includes all securities repurchase agreements in domestic and foreign offices, regardless of maturity.
1. Includes limited-life preferred stock and related surplus.

Dollar amounts in thousands			
20. Other liabilities (from Schedule RC-G)	RCFD2930	97,201,000	20.
21. Total liabilities (sum of items 13 through 20)	RCFD2948	1,983,327,000	21.
22. Not applicable			22.
23. Perpetual preferred stock and related surplus	RCFD3838	0	23.
24. Common stock	RCFD3230	1,785,000	24.
25. Surplus (exclude all surplus related to preferred stock)	RCFD3839	99,132,000	25.
26. Not available			26.
a. Retained earnings	RCFD3632	114,732,000	26.a.
b. Accumulated other comprehensive income[2]	RCFDB530	-844,000	26.b.
c. Other equity capital components[3]	RCFDA130	0	26.c.
27. Not available			27.
a. Total bank equity capital (sum of items 23 through 26.c)	RCFD3210	214,805,000	27.a.
b. Noncontrolling (minority) interests in consolidated subsidiaries	RCFD3000	164,000	27.b.
28. Total equity capital (sum of items 27.a and 27.b)	RCFDG105	214,969,000	28.
29. Total liabilities and equity capital (sum of items 21 and 28)	RCFD3300	2,198,296,000	29.
1. Indicate in the box at the right the number of the statement below that best describes the most comprehensive level of auditing work performed for the bank by independent external auditors as of any date during 2017	RCFD6724	1b	M.1.
2. Bank's fiscal year-end date (report the date in MMDD format)	RCON8678	1231	M.2.

Schedule RC-A - Cash and Balances Due From Depository Institutions

Exclude assets held for trading.

Dollar amounts in thousands	(Column A) Consolidated Bank		(Column B) Domestic Offices		
1. Cash items in process of collection, unposted debits, and currency and coin	RCFD0022	15,111,000			1.
a. Cash items in process of collection and unposted debits			RCON0020	5,969,000	1.a.
b. Currency and coin			RCON0080	8,848,000	1.b.
2. Balances due from depository institutions in the U.S.			RCON0082	42,860,000	2.
a. U.S. branches and agencies of foreign banks (including their IBFs)	RCFD0083	730,000			2.a.
b. Other commercial banks in the U.S. and other depository institutions in the U.S. (including their IBFs)	RCFD0085	42,166,000			2.b.
3. Balances due from banks in foreign countries and foreign central banks			RCON0070	1,204,000	3.
a. Foreign branches of other U.S. banks	RCFD0073	1,151,000			3.a.
b. Other banks in foreign countries and foreign central banks	RCFD0074	102,505,000			3.b.
4. Balances due from Federal Reserve Banks	RCFD0090	283,554,000	RCON0090	283,554,000	4.
5. Total	RCFD0010	445,217,000	RCON0010	342,435,000	5.

2. Includes, but is not limited to, net unrealized holding gains (losses) on available-for-sale securities, accumulated net gains (losses) on cash flow hedges, cumulative foreign currency translation adjustments, and accumulated defined benefit pension and other postretirement plan adjustments.
3. Includes treasury stock and unearned Employee Stock Ownership Plan shares.

Schedule RC-B - Securities

Exclude assets held for trading.

Dollar amounts in thousands	(Column A) Held-to-maturity Amortized Cost		(Column B) Held-to-maturity Fair Value		(Column C) Available-for-sale Amortized Cost		(Column D) Available-for-sale Fair Value		
1. U.S. Treasury securities	RCFD0211	**0**	RCFD0213	**0**	RCFD1286	**25,164,000**	RCFD1287	**25,450,000**	1.
2. U.S. Government agency obligations (exclude mortgage-backed securities):									2.
a. Issued by U.S. Government agencies[1]	RCFD1289	**0**	RCFD1290	**0**	RCFD1291	**0**	RCFD1293	**0**	2.a.
b. Issued by U.S. Government-sponsored agencies[2]	RCFD1294	**0**	RCFD1295	**0**	RCFD1297	**0**	RCFD1298	**0**	2.b.
3. Securities issued by states and political subdivisions in the U.S.	RCFD8496	**4,845,000**	RCFD8497	**4,926,000**	RCFD8498	**35,618,000**	RCFD8499	**37,434,000**	3.
4. Mortgage-backed securities (MBS):									4.
a. Residential mortgage pass-through securities:									4.a.
1. Guaranteed by GNMA	RCFDG300	**6,084,000**	RCFDG301	**5,965,000**	RCFDG302	**21,461,000**	RCFDG303	**21,101,000**	4.a.1.
2. Issued by FNMA and FHLMC	RCFDG304	**17,831,000**	RCFDG305	**17,885,000**	RCFDG306	**41,941,000**	RCFDG307	**41,850,000**	4.a.2.
3. Other pass-through securities	RCFDG308	**0**	RCFDG309	**0**	RCFDG310	**0**	RCFDG311	**0**	4.a.3.
b. Other residential mortgage-backed securities (include CMOs, REMICs, and stripped MBS):									4.b.
1. Issued or guaranteed by U.S. Government agencies or sponsored agencies[1]	RCFDG312	**0**	RCFDG313	**0**	RCFDG314	**393,000**	RCFDG315	**397,000**	4.b.1.
2. Collateralized by MBS issued or guaranteed by U.S. Government agencies or sponsored agencies[1]	RCFDG316	**0**	RCFDG317	**0**	RCFDG318	**0**	RCFDG319	**0**	4.b.2.
3. All other residential MBS	RCFDG320	**0**	RCFDG321	**0**	RCFDG322	**10,345,000**	RCFDG323	**10,603,000**	4.b.3.
c. Commercial MBS:									4.c.
1. Commercial mortgage pass-through securities:									4.c.1.
a. Issued or guaranteed by FNMA, FHLMC, or GNMA	RCFDK142	**282,000**	RCFDK143	**282,000**	RCFDK144	**3,568,000**	RCFDK145	**3,608,000**	4.c.1.a.
b. Other pass-through securities	RCFDK146	**0**	RCFDK147	**0**	RCFDK148	**0**	RCFDK149	**0**	4.c.1.b.
2. Other commercial MBS:									4.c.2.
a. Issued or guaranteed by U.S. Government agencies or sponsored agencies[1]	RCFDK150	**0**	RCFDK151	**0**	RCFDK152	**251,000**	RCFDK153	**253,000**	4.c.2.a.
b. All other commercial MBS	RCFDK154	**0**	RCFDK155	**0**	RCFDK156	**9,133,000**	RCFDK157	**9,009,000**	4.c.2.b.
5. Asset-backed securities and structured financial products:									5.
a. Asset-backed securities (ABS)	RCFDC026	**0**	RCFDC988	**0**	RCFDC989	**8,110,000**	RCFDC027	**8,149,000**	5.a.
b. Structured financial products:									5.b.
1. Cash	RCFDG336	**0**	RCFDG337	**0**	RCFDG338	**19,989,000**	RCFDG339	**20,039,000**	5.b.1.
2. Synthetic	RCFDG340	**0**	RCFDG341	**0**	RCFDG342	**0**	RCFDG343	**0**	5.b.2.
3. Hybrid	RCFDG344	**0**	RCFDG345	**0**	RCFDG346	**0**	RCFDG347	**0**	5.b.3.
6. Other debt securities:									6.
a. Other domestic debt securities	RCFD1737	**0**	RCFD1738	**0**	RCFD1739	**421,000**	RCFD1741	**441,000**	6.a.
b. Other foreign debt securities	RCFD1742	**0**	RCFD1743	**0**	RCFD1744	**28,118,000**	RCFD1746	**28,520,000**	6.b.
7. Investments in mutual funds and other equity securities with readily determinable fair values[2]					RCFDA510	**NR**	RCFDA511	**NR**	7.
8. Total (sum of items 1 through 7) (total of column A must equal Schedule RC, item 2.a) (total of column D must equal Schedule RC, item 2.b)	RCFD1754	**29,042,000**	RCFD1771	**29,058,000**	RCFD1772	**204,512,000**	RCFD1773	**206,854,000**	8.

Dollar amounts in thousands			
1. Pledged securities[1]	RCFD0416	**77,436,000**	M.1.
2. Maturity and repricing data for debt securities (excluding those in nonaccrual status):			M.2.
a. Securities issued by the U.S. Treasury, U.S. Government agencies, and states and political subdivisions in the U.S.; other non-mortgage debt securities; and mortgage pass-through securities other than those backed by closed-end first lien 1-4 family residential mortgages with a remaining maturity or next repricing date of:			M.2.a.
1. Three months or less	RCFDA549	**26,382,000**	M.2.a.1.
2. Over three months through 12 months	RCFDA550	**4,209,000**	M.2.a.2.
3. Over one year through three years	RCFDA551	**7,205,000**	M.2.a.3.
4. Over three years through five years	RCFDA552	**10,974,000**	M.2.a.4.
5. Over five years through 15 years	RCFDA553	**44,976,000**	M.2.a.5.
6. Over 15 years	RCFDA554	**35,022,000**	M.2.a.6.
b. Mortgage pass-through securities backed by closed-end first lien 1-4 family residential mortgages with a remaining maturity or next repricing date of:			M.2.b.
1. Three months or less	RCFDA555	**99,000**	M.2.b.1.
2. Over three months through 12 months	RCFDA556	**718,000**	M.2.b.2.
3. Over one year through three years	RCFDA557	**1,887,000**	M.2.b.3.
4. Over three years through five years	RCFDA558	**501,000**	M.2.b.4.
5. Over five years through 15 years	RCFDA559	**3,300,000**	M.2.b.5.
6. Over 15 years	RCFDA560	**80,361,000**	M.2.b.6.
c. Other mortgage-backed securities (include CMOs, REMICs, and stripped MBS; exclude mortgage pass-through securities) with an expected average life of:[6]			M.2.c.
1. Three years or less	RCFDA561	**8,355,000**	M.2.c.1.
2. Over three years	RCFDA562	**11,907,000**	M.2.c.2.
d. Debt securities with a REMAINING MATURITY of one year or less (included in Memorandum items 2.a through 2.c above)	RCFDA248	**5,365,000**	M.2.d.
3. Amortized cost of held-to-maturity securities sold or transferred to available-for-sale or trading securities during the calendar year-to-date (report the amortized cost at date of sale or transfer)	RCFD1778	**22,433,000**	M.3.
4. Structured notes (included in the held-to-maturity and available-for-sale accounts in Schedule RC-B, items 2, 3, 5, and 6):			M.4.
a. Amortized cost	RCFD8782	**0**	M.4.a.
b. Fair value	RCFD8783	**0**	M.4.b.

1. Includes Small Business Administration "Guaranteed Loan Pool Certificates," U.S. Maritime Administration obligations, and Export-Import Bank participation certificates.
2. Includes obligations (other than mortgage-backed securities) issued by the Farm Credit System, the Federal Home Loan Bank System, the Federal Home Loan Mortgage Corporation, the Federal National Mortgage Association, the Financing Corporation, Resolution Funding Corporation, the Student Loan Marketing Association, and the Tennessee Valley Authority.
1. U.S. Government agencies include, but are not limited to, such agencies as the Government National Mortgage Association (GNMA), the Federal Deposit Insurance Corporation (FDIC), and the National Credit Union Administration (NCUA). U.S. Government-sponsored agencies include, but are not limited to, such agencies as the Federal Home Loan Mortgage Corporation (FHLMC) and the Federal National Mortgage Association (FNMA).
1. U.S. Government agencies include, but are not limited to, such agencies as the Government National Mortgage Association (GNMA), the Federal Deposit Insurance Corporation (FDIC), and the National Credit Union Administration (NCUA). U.S. Government-sponsored agencies include, but are not limited to, such agencies as the Federal Home Loan Mortgage Corporation (FHLMC) and the Federal National Mortgage Association (FNMA).
2. Report Federal Reserve stock, Federal Home Loan Bank stock, and bankers' bank stock in Schedule RC-F, item 4.

Dollar amounts in thousands	(Column A) Held-to-maturity Amortized Cost		(Column B) Held-to-maturity Fair Value		(Column C) Available-for-sale Amortized Cost		(Column D) Available-for-sale Fair Value		
Memorandum items 5.a through 5.f are to be completed by banks with $1 billion or more in total assets. 5. Asset-backed securities (ABS) (for each column, sum of Memorandum items 5.a through 5.f must equal Schedule RC-B, item 5.a):									M.5.
a. Credit card receivables	RCFDB838	**0**	RCFDB839	**0**	RCFDB840	**172,000**	RCFDB841	**173,000**	M5a.
b. Home equity lines	RCFDB842	**0**	RCFDB843	**0**	RCFDB844	**0**	RCFDB845	**0**	M5b.
c. Automobile loans	RCFDB846	**0**	RCFDB847	**0**	RCFDB848	**275,000**	RCFDB849	**276,000**	M5c.
d. Other consumer loans	RCFDB850	**0**	RCFDB851	**0**	RCFDB852	**4,471,000**	RCFDB853	**4,534,000**	M5d.
e. Commercial and industrial loans	RCFDB854	**0**	RCFDB855	**0**	RCFDB856	**502,000**	RCFDB857	**502,000**	M5e.
f. Other	RCFDB858	**0**	RCFDB859	**0**	RCFDB860	**2,690,000**	RCFDB861	**2,664,000**	M.5.f.
6. Structured financial products by underlying collateral or reference assets (for each column, sum of Memorandum items 6.a through 6.g must equal Schedule RC-B, sum of items 5.b(1) through(3)):									M.6.
a. Trust preferred securities issued by financial institutions	RCFDG348	**0**	RCFDG349	**0**	RCFDG350	**0**	RCFDG351	**0**	M6a.
b. Trust preferred securities issued by real estate investment trusts	RCFDG352	**0**	RCFDG353	**0**	RCFDG354	**0**	RCFDG355	**0**	M6b.
c. Corporate and similar loans	RCFDG356	**0**	RCFDG357	**0**	RCFDG358	**19,938,000**	RCFDG359	**19,988,000**	M6c.
d. 1-4 family residential MBS issued or guaranteed by U.S. government-sponsored enterprises (GSEs)	RCFDG360	**0**	RCFDG361	**0**	RCFDG362	**0**	RCFDG363	**0**	M6d.
e. 1-4 family residential MBS not issued or guaranteed by GSEs	RCFDG364	**0**	RCFDG365	**0**	RCFDG366	**0**	RCFDG367	**0**	M6e.
f. Diversified (mixed) pools of structured financial products	RCFDG368	**0**	RCFDG369	**0**	RCFDG370	**0**	RCFDG371	**0**	M.6.f.
g. Other collateral or reference assets	RCFDG372	**0**	RCFDG373	**0**	RCFDG374	**51,000**	RCFDG375	**51,000**	M6g.

1. Includes held-to-maturity securities at amortized cost and available-for-sale securities at fair value.

6. Sum of Memorandum items 2.c.(1) and 2.c.(2) plus any nonaccrual “Other mortgage-backed securities” included in Schedule RC-N, item 9, column C, must equal Schedule RC-B, sum of items 4.b and 4.c.(2), columns A and D.

Schedule RC-C Part I - Loans and Leases

Do not deduct the allowance for loan and lease losses or the allocated transfer risk reserve from amounts reported in this schedule. Report (1) loans and leases held for sale at the lower of cost or fair value, (2) loans and leases held for investment, net of unearned income, and (3) loans and leases accounted for at fair value under a fair value option. Exclude assets held for trading and commercial paper.

Dollar amounts in thousands	(Column A) Consolidated Bank		(Column B) Domestic Offices		
1. Loans secured by real estate[1]	RCFD1410	NR			1.
a. Construction, land development, and other land loans:					1.a.
1. 1-4 family residential construction loans	RCFDF158	331,000	RCONF158	331,000	1.a.1.
2. Other construction loans and all land development and other land loans	RCFDF159	9,925,000	RCONF159	9,925,000	1.a.2.
b. Secured by farmland (including farm residential and other improvements)	RCFD1420	197,000	RCON1420	197,000	1.b.
c. Secured by 1-4 family residential properties:					1.c.
1. Revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit	RCFD1797	38,881,000	RCON1797	38,360,000	1.c.1.
2. Closed-end loans secured by 1-4 family residential properties:					1.c.2.
a. Secured by first liens	RCFD5367	242,818,000	RCON5367	241,281,000	1.c.2.a.
b. Secured by junior liens	RCFD5368	1,679,000	RCON5368	1,679,000	1.c.2.b.
d. Secured by multifamily (5 or more) residential properties	RCFD1460	70,578,000	RCON1460	70,524,000	1.d.
e. Secured by nonfarm nonresidential properties:					1.e.
1. Loans secured by owner-occupied nonfarm nonresidential properties	RCFDF160	17,255,000	RCONF160	17,225,000	1.e.1.
2. Loans secured by other nonfarm nonresidential properties	RCFDF161	19,146,000	RCONF161	18,899,000	1.e.2.
2. Loans to depository institutions and acceptances of other banks:					2.
a. To commercial banks in the U.S.			RCONB531	5,652,000	2.a.
1. To U.S. branches and agencies of foreign banks	RCFDB532	3,000			2.a.1.
2. To other commercial banks in the U.S.	RCFDB533	5,653,000			2.a.2.
b. To other depository institutions in the U.S.	RCFDB534	2,000	RCONB534	2,000	2.b.
c. To banks in foreign countries			RCONB535	1,159,000	2.c.
1. To foreign branches of other U.S. banks	RCFDB536	30,000			2.c.1.
2. To other banks in foreign countries	RCFDB537	9,205,000			2.c.2.
3. Loans to finance agricultural production and other loans to farmers	RCFD1590	564,000	RCON1590	542,000	3.
4. Commercial and industrial loans:					4.
a. To U.S. addressees (domicile)	RCFD1763	126,517,000	RCON1763	124,809,000	4.a.
b. To non-U.S. addressees (domicile)	RCFD1764	37,390,000	RCON1764	8,871,000	4.b.
5. Not applicable					5.
6. Loans to individuals for household, family, and other personal expenditures (i.e., consumer loans) (includes purchased paper):					6.
a. Credit cards	RCFDB538	36,538,000	RCONB538	36,471,000	6.a.
b. Other revolving credit plans	RCFDB539	11,693,000	RCONB539	9,849,000	6.b.
c. Automobile loans	RCFDK137	48,756,000	RCONK137	48,756,000	6.c.
d. Other consumer loans (includes single payment and installment loans other than automobile loans, and all student loans)	RCFDK207	2,040,000	RCONK207	1,859,000	6.d.
7. Loans to foreign governments and official institutions (including foreign central banks)	RCFD2081	2,432,000	RCON2081	0	7.
8. Obligations (other than securities and leases) of states and political subdivisions in the U.S.	RCFD2107	23,377,000	RCON2107	23,377,000	8.
9. Loans to nondepository financial institutions and other loans	RCFD1563	135,906,000			9.
a. Loans to nondepository financial institutions			RCONJ454	27,529,000	9.a.
b. Other loans:					9.b.
1. Loans for purchasing or carrying securities (secured and unsecured)			RCON1545	8,253,000	9.b.1.
2. All other loans (exclude consumer loans)			RCONJ451	59,931,000	9.b.2.
10. Lease financing receivables (net of unearned income)			RCON2165	239,000	10.
a. Leases to individuals for household, family, and other personal expenditures (i.e., consumer leases)	RCFDF162	0			10.a.
b. All other leases	RCFDF163	239,000			10.b.
11. LESS: Any unearned income on loans reflected in items 1-9 above	RCFD2123	0	RCON2123	0	11.
12. Total loans and leases held for investment and held for sale (item 12, column A must equal Schedule RC, sum of items 4.a and 4.b)	RCFD2122	841,155,000	RCON2122	755,720,000	12.

1. When reporting "Loans secured by real estate," "large institutions" and "highly complex institutions," as defined for deposit insurance assessment purposes in FDIC regulations, should complete items 1.a.(1) through 1.e.(2) in columns A and B (but not item 1 in column A); all other institutions should complete item 1 in column A and items 1.a.(1) through 1.e.(2) in column B (but not items 1.a.(1) through 1.e.(2) in column A).

Dollar amounts in thousands			
1. Loans restructured in troubled debt restructurings that are in compliance with their modified terms (included in Schedule RC-C, part 1, and not reported as past due or nonaccrual in Schedule RC-N, Memorandum item 1):			M.1.
a. Construction, land development, and other land loans in domestic offices:			M.1.a.
1. 1-4 family residential construction loans	RCONK158	**1,000**	M.1.a.1.
2. Other construction loans and all land development and other land loans	RCONK159	**0**	M.1.a.2.
b. Loans secured by 1-4 family residential properties in domestic offices	RCONF576	**6,405,000**	M.1.b.
c. Secured by multifamily (5 or more) residential properties in domestic offices	RCONK160	**1,000**	M.1.c.
d. Secured by nonfarm nonresidential properties in domestic offices:			M.1.d.
1. Loans secured by owner-occupied nonfarm nonresidential properties	RCONK161	**16,000**	M.1.d.1.
2. Loans secured by other nonfarm nonresidential properties	RCONK162	**4,000**	M.1.d.2.
e. Commercial and industrial loans:			M.1.e.
1. To U.S. addressees (domicile)	RCFDK163	**143,000**	M.1.e.1.
2. To non-U.S. addressees (domicile)	RCFDK164	**20,000**	M.1.e.2.
f. All other loans (include loans to individuals for household, family, and other personal expenditures)	RCFDK165	**270,000**	M.1.f.
Itemize loan categories included in Memorandum item 1.f, above that exceed 10 percent of total loans restructured in troubled debt restructurings that are in compliance with their modified terms (sum of Memorandum items 1.a through 1.f): 1. Loans secured by farmland in domestic offices	RCONK166	**0**	M.1.f.1.
2. Not applicable			M.1.f.2.
3. Loans to finance agricultural production and other loans to farmers	RCFDK168	**0**	M.1.f.3.
4. Loans to individuals for household, family, and other personal expenditures:			M.1.f.4.
a. Credit cards	RCFDK098	**0**	M.1.f.4.a.
b. Automobile loans	RCFDK203	**0**	M.1.f.4.b.
c. Other (includes revolving credit plans other than credit cards and other consumer loans)	RCFDK204	**0**	M.1.f.4.c.
g. Total loans restructured in troubled debt restructurings that are in compliance with their modified terms (sum of Memorandum items 1.a.(1) through 1.f)	RCFDHK25	**6,860,000**	M.1.g.
2. Maturity and repricing data for loans and leases (excluding those in nonaccrual status):			M.2.
a. Closed-end loans secured by first liens on 1-4 family residential properties in domestic offices (reported in Schedule RC-C, part I, item 1.c.(2)(a), column B) with a remaining maturity or next repricing date of:			M.2.a.
1. Three months or less	RCONA564	**5,942,000**	M.2.a.1.
2. Over three months through 12 months	RCONA565	**7,178,000**	M.2.a.2.
3. Over one year through three years	RCONA566	**9,757,000**	M.2.a.3.
4. Over three years through five years	RCONA567	**14,341,000**	M.2.a.4.
5. Over five years through 15 years	RCONA568	**45,545,000**	M.2.a.5.
6. Over 15 years	RCONA569	**154,442,000**	M.2.a.6.
b. All loans and leases (reported in Schedule RC-C, part I, items 1 through 10, column A) EXCLUDING closed-end loans secured by first liens on 1-4 family residential properties in domestic offices (reported in Schedule RC-C, part I, item 1.c.(2)(a), column B) with a remaining maturity or next repricing date of:			M.2.b.
1. Three months or less	RCFDA570	**343,121,000**	M.2.b.1.
2. Over three months through 12 months	RCFDA571	**47,365,000**	M.2.b.2.
3. Over one year through three years	RCFDA572	**65,965,000**	M.2.b.3.
4. Over three years through five years	RCFDA573	**74,928,000**	M.2.b.4.
5. Over five years through 15 years	RCFDA574	**58,378,000**	M.2.b.5.
6. Over 15 years	RCFDA575	**6,878,000**	M.2.b.6.
c. Loans and leases (reported in Schedule RC-C, part I, items 1 through 10, column A) with a REMAINING MATURITY of one year or less (excluding those in nonaccrual status)	RCFDA247	**143,929,000**	M.2.c.
3. Loans to finance commercial real estate, construction, and land development activities (not secured by real estate) included in Schedule RC-C, part I, items 4 and 9, column A[4]	RCFD2746	**15,920,000**	M.3.
4. Adjustable rate closed-end loans secured by first liens on 1-4 family residential properties in domestic offices (included in Schedule RC-C, part I, item 1.c.(2)(a), column B)	RCON5370	**74,702,000**	M.4.
5. Loans secured by real estate to non-U.S. addressees (domicile) (included in Schedule RC-C, Part I, item 1, column A, or Schedule RC-C, Part I, items 1.a.(1) through 1.e.(2), column A, as appropriate)	RCFDB837	**2,949,000**	M.5.
Memorandum item 6 is to be completed by banks that (1) together with affiliated institutions, have outstanding credit card receivables (as defined in the instructions) that exceed $500 million as of the report date, or (2) are credit card specialty banks as defined for Uniform Bank Performance Report purposes. 6. Outstanding credit card fees and finance charges included in Schedule RC-C, part I, item 6.a, column A	RCFDC391	**412,000**	M.6.

4. Exclude loans secured by real estate that are included in Schedule RC-C, Part I, item 1, column A.

Dollar amounts in thousands			
Memorandum item 7 is to be completed by all banks. 7. Purchased credit-impaired loans held for investment accounted for in accordance with FASB ASC 310-30 (former AICPA Statement of Position 03-3) (exclude loans held for sale):			M.7.
a. Outstanding balance	RCFDC779	**30,764,000**	M.7.a.
b. Amount included in Schedule RC-C, part I, items 1 through 9	RCFDC780	**29,508,000**	M.7.b.
8. Closed-end loans with negative amortization features secured by 1-4 family residential properties in domestic offices:			M.8.
a. Total amount of closed-end loans with negative amortization features secured by 1-4 family residential properties (included in Schedule RC-C, part I, items 1.c.(2)(a) and 1.c.(2)(b))	RCONF230	**13,121,000**	M.8.a.
Memorandum items 8.b and 8.c are to be completed by banks that had closed-end loans with negative amortization features secured by 1–4 family residential properties (as reported in Schedule RC-C, Part I, Memorandum item 8.a) as of December 31, 2017, that exceeded the lesser of $100 million or 5 percent of total loans and leases, net of unearned income, in domestic offices (as reported in Schedule RC-C, Part I, item 12, column B). b. Total maximum remaining amount of negative amortization contractually permitted on closed-end loans secured by 1-4 family residential properties	RCONF231	**3,512,000**	M.8.b.
c. Total amount of negative amortization on closed-end loans secured by 1-4 family residential properties included in the amount reported in Memorandum item 8.a above	RCONF232	**275,000**	M.8.c.
9. Loans secured by 1-4 family residential properties in domestic offices in process of foreclosure (included in Schedule RC-C, part I, items 1.c.(1), 1.c.(2)(a), and 1.c.(2)(b))	RCONF577	**5,027,000**	M.9.

Dollar amounts in thousands			
10. Not applicable			M.10.
11. Not applicable			M.11.

Dollar amounts in thousands	(Column A) Fair value of acquired loans and leases at acquisition date		(Column B) Gross contractual amounts receivable at acquisition date		(Column C) Best estimate at acquisition date of contractual cash flows not expected to be collected		
12. Loans (not subject to the requirements of FASB ASC 310-30 (former AICPA Statement of Position 03-3)) and leases held for investment that were acquired in business combinations with acquisition dates in the current calendar year:							M.12.
a. Loans secured by real estate	RCFDG091	**0**	RCFDG092	**0**	RCFDG093	**0**	M.12.a.
b. Commercial and industrial loans	RCFDG094	**0**	RCFDG095	**0**	RCFDG096	**0**	M.12.b.
c. Loans to individuals for household, family, and other personal expenditures	RCFDG097	**0**	RCFDG098	**0**	RCFDG099	**0**	M.12.c.
d. All other loans and all leases	RCFDG100	**0**	RCFDG101	**0**	RCFDG102	**0**	M.12.d.

Dollar amounts in thousands			
Memoranda item 13 is to be completed by banks that had construction, land development, and other land loans in domestic offices (as reported in Schedule RC-C, Part I, item 1.a., column B) that exceeded 100 percent of total capital (as reported in Schedule RC-R, Part I, item 35.a) as of December 31, 2017. 13. Construction, land development, and other land loans in domestic offices with interest reserves:			M.13.
a. Amount of loans that provide for the use of interest reserves (included in Schedule RC-C, part I, item 1.a, column B)	RCONG376	**0**	M.13.a.
b. Amount of interest capitalized from interest reserves on construction, land development, and other land loans that is included in interest and fee income on loans during the quarter (included in Schedule RI, item 1.a.(1)(a)(2)).	RIADG377	**0**	M.13.b.
Memorandum item 14 is to be completed by all banks. 14. Pledged loans and leases	RCFDG378	**411,410,000**	M.14.
Memorandum item 15 is to be completed for the December report only. 15. Reverse mortgages in domestic offices:			M.15.
a. Reverse mortgages outstanding that are held for investment (included in Schedule RC-C, item 1.c, above):			M.15.a.
1. Home Equity Conversion Mortgage (HECM) reverse mortgages	RCONJ466	**NR**	M.15.a.1.
2. Proprietary reverse mortgages	RCONJ467	**NR**	M.15.a.2.
b. Estimated number of reverse mortgage loan referrals to other lenders during the year from whom compensation has been received for services performed in connection with the origination of the reverse mortgages:			M.15.b.
1. Home Equity Conversion Mortgage (HECM) reverse mortgages	RCONJ468	**NR**	M.15.b.1.
2. Proprietary reverse mortgages	RCONJ469	**NR**	M.15.b.2.
c. Principal amount of reverse mortgage originations that have been sold during the year:			M.15.c.
1. Home Equity Conversion Mortgage (HECM) reverse mortgages	RCONJ470	**NR**	M.15.c.1.
2. Proprietary reverse mortgages	RCONJ471	**NR**	M.15.c.2.

Schedule RC-C Part II - Loans to Small Businesses and Small Farms

Report the number and amount currently outstanding as of the report date of business loans with "original amounts" of $1,000,000 or less and farm loans with "original amounts" of $500,000 or less. The following guidelines should be used to determine the "original amount" of a loan:
(1) For loans drawn down under lines of credit or loan commitments, the "original amount" of the loan is the size of the line of credit or loan commitment when the line of credit or loan commitment was most recently approved, extended, or renewed prior to the report date. However, if the amount currently outstanding as of the report date exceeds this size, the "original amount" is the amount currently outstanding on the report date. (2) For loan participations and syndications, the "original amount" of the loan participation or syndication is the entire amount of the credit originated by the lead lender. (3) For all other loans, the "original amount" is the total amount of the loan at origination or the amount currently outstanding as of the report date, whichever is larger.

Dollar amounts in thousands			
1. Not applicable			1.
2. Not applicable			2.

Dollar amounts in thousands	(Column A) Number of Loans		(Column B) Amount Currently Outstanding		
3. Number and amount currently outstanding of "Loans secured by nonfarm nonresidential properties" in domestic offices reported in Schedule RC-C, part I, items 1.e.(1) and 1.e.(2), column B:					3.
a. With original amounts of $100,000 or less	RCON5564	**1034**	RCON5565	**36,000**	3.a.
b. With original amounts of more than $100,000 through $250,000	RCON5566	**4299**	RCON5567	**511,000**	3.b.
c. With original amounts of more than $250,000 through $1,000,000	RCON5568	**11623**	RCON5569	**4,813,000**	3.c.
4. Number and amount currently outstanding of "Commercial and industrial loans to U.S. addressees" in domestic offices reported in Schedule RC-C, part I, item 4.a, column B:					4.
a. With original amounts of $100,000 or less	RCON5570	**2044699**	RCON5571	**8,551,000**	4.a.
b. With original amounts of more than $100,000 through $250,000	RCON5572	**25419**	RCON5573	**1,792,000**	4.b.
c. With original amounts of more than $250,000 through $1,000,000	RCON5574	**16872**	RCON5575	**3,428,000**	4.c.

Dollar amounts in thousands			
5. Not applicable			5.
6. Not applicable			6.

Dollar amounts in thousands	(Column A) Number of Loans		(Column B) Amount Currently Outstanding		
7. Number and amount currently outstanding of "Loans secured by farmland (including farm residential and other improvements)" in domestic offices reported in Schedule RC-C, part I, item 1.b, column B:					7.
a. With original amounts of $100,000 or less	RCON5578	**21**	RCON5579	**1,000**	7.a.
b. With original amounts of more than $100,000 through $250,000	RCON5580	**85**	RCON5581	**9,000**	7.b.
c. With original amounts of more than $250,000 through $500,000	RCON5582	**73**	RCON5583	**19,000**	7.c.
8. Number and amount currently outstanding of "Loans to finance agricultural production and other loans to farmers" in domestic offices reported in Schedule RC-C, part I, item 3, column B:					8.
a. With original amounts of $100,000 or less	RCON5584	**37784**	RCON5585	**97,000**	8.a.
b. With original amounts of more than $100,000 through $250,000	RCON5586	**139**	RCON5587	**11,000**	8.b.
c. With original amounts of more than $250,000 through $500,000	RCON5588	**90**	RCON5589	**17,000**	8.c.

Schedule RC-D - Trading Assets and Liabilities

Schedule RC-D is to be completed by banks that reported average trading assets (Schedule RC-K, item 7) of $2 million or more in any of the four preceding calendar quarters.

Dollar amounts in thousands	(Column A) Consolidated Bank		(Column B) Domestic Offices		
1. U.S. Treasury securities	RCFD3531	4,022,000	RCON3531	2,282,000	1.
2. U.S. Government agency obligations (exclude mortgage-backed securities)	RCFD3532	0	RCON3532	0	2.
3. Securities issued by states and political subdivisions in the U.S.	RCFD3533	703,000	RCON3533	703,000	3.
4. Mortgage-backed securities (MBS):					4.
a. Residential mortgage pass-through securities issued or guaranteed by FNMA, FHLMC, or GNMA	RCFDG379	95,000	RCONG379	95,000	4.a.
b. Other residential MBS issued or guaranteed by U.S. Government agencies or sponsored agencies (include CMOs, REMICs, and stripped MBS)[1]	RCFDG380	494,000	RCONG380	494,000	4.b.
c. All other residential MBS	RCFDG381	995,000	RCONG381	111,000	4.c.
d. Commercial MBS issued or guaranteed by U.S. Government agencies or sponsored agencies[1]	RCFDK197	0	RCONK197	0	4.d.
e. All other commercial MBS	RCFDK198	87,000	RCONK198	60,000	4.e.
5. Other debt securities:					5.
a. Structured financial products:					5.a.
1. Cash	RCFDG383	3,809,000	RCONG383	3,456,000	5.a.1.
2. Synthetic	RCFDG384	0	RCONG384	0	5.a.2.
3. Hybrid	RCFDG385	0	RCONG385	0	5.a.3.
b. All other debt securities	RCFDG386	83,067,000	RCONG386	99,000	5.b.
6. Loans:					6.
a. Loans secured by real estate	RCFDF610	15,241,000			6.a.
1. Construction, land development, and other land loans			RCONF604	0	6.a.1.
2. Secured by farmland (including farm residential and other improvements)			RCONF605	0	6.a.2.
3. Secured by 1-4 family residential properties:					6.a.3.
a. Revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit			RCONF606	0	6.a.3.a.
b. Closed-end loans secured by 1-4 family residential properties:					6.a.3.b.
1. Secured by first liens			RCONF607	12,545,000	6a3b1.
2. Secured by junior liens			RCONF611	0	6a3b2.
4. Secured by multifamily (5 or more) residential properties			RCONF612	0	6.a.4.
5. Secured by nonfarm nonresidential properties			RCONF613	2,032,000	6.a.5.
b. Commercial and industrial loans	RCFDF614	4,743,000	RCONF614	3,042,000	6.b.
c. Loans to individuals for household, family, and other personal expenditures (i.e., consumer loans) (includes purchased paper):					6.c.
1. Credit cards	RCFDF615	0	RCONF615	0	6.c.1.
2. Other revolving credit plans	RCFDF616	0	RCONF616	0	6.c.2.
3. Automobile loans	RCFDK199	0	RCONK199	0	6.c.3.
4. Other consumer loans	RCFDK210	0	RCONK210	0	6.c.4.
d. Other loans	RCFDF618	20,839,000	RCONF618	2,305,000	6.d.
7. Not appliable					7.
8. Not applicable					8.
9. Other trading assets	RCFD3541	80,733,000	RCON3541	1,302,000	9.
10. Not applicable					10.
11. Derivatives with a positive fair value	RCFD3543	55,746,000	RCON3543	16,479,000	11.
12. Total trading assets (sum of items 1 through 11) (total of column A must equal Schedule RC, item 5)	RCFD3545	270,574,000	RCON3545	45,005,000	12.
13. Not available					13.
a. Liability for short positions	RCFD3546	67,511,000	RCON3546	1,798,000	13.a.

1. U.S. Government agencies include, but are not limited to, such agencies as the Government National Mortgage Association (GNMA), the Federal Deposit Insurance Corporation (FDIC), and the National Credit Union Administration (NCUA). U.S. Government-sponsored agencies include, but are not limited to, such agencies as the Federal Home Loan Mortgage Corporation (FHLMC) and the Federal National Mortgage Association (FNMA).

Dollar amounts in thousands	(Column A) Consolidated Bank		(Column B) Domestic Offices		
b. Other trading liabilities	RCFDF624	124,000	RCONF624	74,000	13.b.
14. Derivatives with a negative fair value	RCFD3547	35,000,000	RCON3547	9,263,000	14.
15. Total trading liabilities (sum of items 13.a through 14) (total of column A must equal Schedule RC, item 15)	RCFD3548	102,635,000	RCON3548	11,135,000	15.
1. Unpaid principal balance of loans measured at fair value (reported in Schedule RC-D, items 6.a through 6.d):					M.1.
a. Loans secured by real estate	RCFDF790	15,515,000			M.1.a.
1. Construction, land development, and other land loans			RCONF625	0	M.1.a.1.
2. Secured by farmland (including farm residential and other improvements)			RCONF626	0	M.1.a.2.
3. Secured by 1-4 family residential properties:					M.1.a.3.
a. Revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit			RCONF627	0	M.1.a.3.a.
b. Closed-end loans secured by 1-4 family residential properties:					M.1.a.3.b.
1. Secured by first liens			RCONF628	12,683,000	M.1.a.3.b.1.
2. Secured by junior liens			RCONF629	3,000	M.1.a.3.b.2.
4. Secured by multifamily (5 or more) residential properties			RCONF630	0	M.1.a.4.
5. Secured by nonfarm nonresidential properties			RCONF631	2,118,000	M.1.a.5.
b. Commercial and industrial loans	RCFDF632	6,470,000	RCONF632	3,885,000	M.1.b.
c. Loans to individuals for household, family, and other personal expenditures (i.e., consumer loans) (includes purchased paper):					M.1.c.
1. Credit cards	RCFDF633	0	RCONF633	0	M.1.c.1.
2. Other revolving credit plans	RCFDF634	0	RCONF634	0	M.1.c.2.
3. Automobile loans	RCFDK200	0	RCONK200	0	M.1.c.3.
4. Other consumer loans	RCFDK211	0	RCONK211	0	M.1.c.4.
d. Other loans	RCFDF636	21,056,000	RCONF636	2,454,000	M.1.d.
2. Loans measured at fair value that are past due 90 days or more:					M.2.
a. Fair value	RCFDF639	782,000	RCONF639	620,000	M.2.a.
b. Unpaid principal balance	RCFDF640	2,241,000	RCONF640	1,274,000	M.2.b.
3. Structured financial products by underlying collateral or reference assets (for each column, sum of Memorandum items 3.a through 3.g must equal Schedule RC-D, sum of items 5.a.(1) through (3)):					M.3.
a. Trust preferred securities issued by financial institutions	RCFDG299	3,455,000	RCONG299	3,456,000	M.3.a.
b. Trust preferred securities issued by real estate investment trusts	RCFDG332	0	RCONG332	0	M.3.b.
c. Corporate and similar loans	RCFDG333	354,000	RCONG333	0	M.3.c.
d. 1-4 family residential MBS issued or guaranteed by U.S. government-sponsored enterprises (GSEs)	RCFDG334	0	RCONG334	0	M.3.d.
e. 1-4 family residential MBS not issued or guaranteed by GSEs	RCFDG335	0	RCONG335	0	M.3.e.
f. Diversified (mixed) pools of structured financial products	RCFDG651	0	RCONG651	0	M.3.f.
g. Other collateral or reference assets	RCFDG652	0	RCONG652	0	M.3.g.
4. Pledged trading assets:					M.4.
a. Pledged securities	RCFDG387	79,574,000	RCONG387	3,332,000	M.4.a.

Dollar amounts in thousands	(Column A) Consolidated Bank		(Column B) Domestic Offices		
b. Pledged loans	RCFDG388	1,811,000	RCONG388	1,811,000	M.4.b.

Dollar amounts in thousands			
Memorandum items 5 through 10 are to be completed by banks that reported average trading assets (Schedule RC-K, item 7) of $1 billion or more in any of the four preceding calendar quarters. 5. Asset-backed securities:			M.5.
a. Credit card receivables	RCFDF643	12,000	M.5.a.
b. Home equity lines	RCFDF644	0	M.5.b.
c. Automobile loans	RCFDF645	6,000	M.5.c.
d. Other consumer loans	RCFDF646	202,000	M.5.d.
e. Commercial and industrial loans	RCFDF647	0	M.5.e.
f. Other	RCFDF648	17,000	M.5.f.
6. Retained beneficial interests in securitizations (first-loss or equity tranches)	RCFDF651	0	M.6.
7. Equity securities (included in Schedule RC-D, item 9, above):			M.7.
a. Readily determinable fair values	RCFDF652	65,017,000	M.7.a.
b. Other	RCFDF653	168,000	M.7.b.
8. Loans pending securitization	RCFDF654	12,207,000	M.8.
9. Other trading assets (itemize and describe amounts included in Schedule RC-D, item 9, that are greater than $1,000,000 and exceed 25% of the item):[1]			M.9.
a. Disclose component and the dollar amount of that component:			M.9.a.
1. Describe component	TEXTF655		M.9.a.1.
2. Amount of component	RCFDF655	0	M.9.a.2.
b. Disclose component and the dollar amount of that component:			M.9.b.
(TEXTF656)	RCFDF656	0	M.9.b.1.
c. Disclose component and the dollar amount of that component:			M.9.c.
(TEXTF657)	RCFDF657	0	M.9.c.1.
10. Other trading liabilities (itemize and describe amounts included in Schedule RC-D, item 13.b, that are greater than $1,000,000 and exceed 25% of the item):			M.10.
a. Disclose component and the dollar amount of that component:			M.10.a.
1. Describe component	TEXTF658		M.10.a.1.
2. Amount of component	RCFDF658	0	M.10.a.2.
b. Disclose component and the dollar amount of that component:			M.10.b.
(TEXTF659)	RCFDF659	0	M.10.b.1.
c. Disclose component and the dollar amount of that component:			M.10.c.
(TEXTF660)	RCFDF660	0	M.10.c.1.

1. Exclude equity securities.

Schedule RC-E Part I - Deposits in Domestic Offices

Dollar amounts in thousands	(Column A) Transaction Accounts Total Transaction accounts (including total demand deposits)		(Column B) Transaction Accounts Memo: Total demand deposits (included in column A)		(Column C) Nontransaction Accounts Total nontransaction accounts (including MMDAs)		
Deposits of:							
1. Individuals, partnerships, and corporations (include all certified and official checks)	RCONB549	281,842,000			RCONB550	909,953,000	1.
2. U.S. Government	RCON2202	41,000			RCON2520	65,000	2.
3. States and political subdivisions in the U.S.	RCON2203	4,945,000			RCON2530	28,913,000	3.
4. Commercial banks and other depository institutions in the U.S.	RCONB551	1,184,000			RCONB552	4,226,000	4.
5. Banks in foreign countries	RCON2213	37,002,000			RCON2236	11,302,000	5.
6. Foreign governments and official institutions (including foreign central banks)	RCON2216	2,732,000			RCON2377	6,553,000	6.
7. Total (sum of items 1 through 6) (sum of columns A and C must equal Schedule RC, item 13.a)	RCON2215	327,746,000	RCON2210	289,456,000	RCON2385	961,012,000	7.

Dollar amounts in thousands			
1. Selected components of total deposits (i.e., sum of item 7, columns A and C):			M.1.
a. Total Individual Retirement Accounts (IRAs) and Keogh Plan accounts	RCON6835	**9,665,000**	M.1.a.
b. Total brokered deposits	RCON2365	**14,130,000**	M.1.b.
c. Brokered deposits of $250,000 or less (fully insured brokered deposits)[2]	RCONHK05	**13,170,000**	M.1.c.
d. Maturity data for brokered deposits:			M.1.d.
1. Brokered deposits of $250,000 or less with a remaining maturity of one year or less (included in Memorandum item 1.c above)	RCONHK06	**1,971,000**	M.1.d.1.
2. Not applicable			M.1.d.2.
3. Brokered deposits of more than $250,000 with a remaining maturity of one year or less (included in Memorandum item 1.b above)	RCONK220	**960,000**	M.1.d.3.
e. Preferred deposits (uninsured deposits of states and political subdivisions in the U.S. reported in item 3 above which are secured or collateralized as required under state law) (to be completed for the December report only).	RCON5590	**NR**	M.1.e.
f. Estimated amount of deposits obtained through the use of deposit listing services that are not brokered deposits	RCONK223	**0**	M.1.f.
2. Components of total nontransaction accounts (sum of Memorandum items 2.a through 2.d must equal item 7, column C above):			M.2.
a. Savings deposits:			M.2.a.
1. Money market deposit accounts (MMDAs)	RCON6810	**540,624,000**	M.2.a.1.
2. Other savings deposits (excludes MMDAs)	RCON0352	**356,635,000**	M.2.a.2.
b. Total time deposits of less than $100,000	RCON6648	**19,517,000**	M.2.b.
c. Total time deposits of $100,000 through $250,000	RCONJ473	**2,832,000**	M.2.c.
d. Total time deposits of more than $250,000	RCONJ474	**41,404,000**	M.2.d.
e. Individual Retirement Accounts (IRAs) and Keogh Plan accounts of $100,000 or more included in Memorandum items 2.c and 2.d above	RCONF233	**545,000**	M.2.e.
3. Maturity and repricing data for time deposits of $250,000 or less:			M.3.
a. Time deposits of $250,000 or less with a remaining maturity or next repricing date of:			M.3.a.
1. Three months or less	RCONHK07	**3,064,000**	M.3.a.1.
2. Over three months through 12 months	RCONHK08	**6,130,000**	M.3.a.2.
3. Over one year through three years	RCONHK09	**5,686,000**	M.3.a.3.
4. Over three years	RCONHK10	**7,469,000**	M.3.a.4.
b. Time deposits of $250,000 or less with a REMAINING MATURITY of one year or less (included in Memorandum items 3.a.(1) and 3.a.(2) above)[3]	RCONHK11	**7,898,000**	M.3.b.
4. Maturity and repricing data for time deposits of more than $250,000:			M.4.
a. Time deposits of more than $250,000 with a remaining maturity or next repricing date of:			M.4.a.
1. Three months or less	RCONHK12	**36,999,000**	M.4.a.1.
2. Over three months through 12 months	RCONHK13	**1,428,000**	M.4.a.2.
3. Over one year through three years	RCONHK14	**553,000**	M.4.a.3.
4. Over three years	RCONHK15	**2,424,000**	M.4.a.4.
b. Time deposits of more than $250,000 with a REMAINING MATURITY of one year or less (included in Memorandum items 4.a.(1) and 4.a.(2) above)[3]	RCONK222	**31,371,000**	M.4.b.
5. Does your institution offer one or more consumer deposit account products, i.e., transaction account or nontransaction savings account deposit products intended primarily for individuals for personal, household, or family use?	RCONP752	**Yes**	M.5.
Memorandum items 6 and 7 are to be completed by institutions with $1 billion or more in total assets that answered "Yes" to Memorandum item 5 above. 6. Components of total transaction account deposits of individuals, partnerships, and corporations (sum of Memorandum items 6.a and 6.b must be less than or equal to item 1, column A, above):			M.6.
a. Total deposits in those noninterest-bearing transaction account deposit products intended primarily for individuals for personal, household, or family use	RCONP753	**19,365,000**	M.6.a.
b. Total deposits in those interest-bearing transaction account deposit products intended primarily for individuals for personal, household, or family use	RCONP754	**42,220,000**	M.6.b.
7. Components of total nontransaction account deposits of individuals, partnerships, and corporations (sum of Memorandum items 7.a.(1), 7.a.(2), 7.b.(1), and 7.b.(2) plus all time deposits of individuals, partnerships, and corporations must equal item 1, column C, above):			M.7.
a. Money market deposit accounts (MMDAs) of individuals, partnerships, and corporations (sum of Memorandum items 7.a.(1) and 7.a.(2) must be less than or equal to Memorandum item 2.a.(1) above):			M.7.a.

2. The dollar amount used as the basis for reporting in Memorandum item 1.c reflects the deposit insurance limit in effect on the report date.
3. Report both fixed- and floating-rate time deposits by remaining maturity. Exclude floating rate time deposits with a next repricing date of one year or less that have a remaining maturity of over one year.

Dollar amounts in thousands			
1. Total deposits in those MMDA deposit products intended primarily for individuals for personal, household, or family use	RCONP756	**206,187,000**	M.7.a.1.
2. Deposits in all other MMDAs of individuals, partnerships, and corporations	RCONP757	**298,314,000**	M.7.a.2.
b. Other savings deposit accounts of individuals, partnerships, and corporations (sum of Memorandum items 7.b.(1) and 7.b.(2) must be less than or equal to Memorandum item 2.a.(2) above):			M.7.b.
1. Total deposits in those other savings deposit account deposit products intended primarily for individuals for personal, household, or family use	RCONP758	**296,953,000**	M.7.b.1.
2. Deposits in all other savings deposit accounts of individuals, partnerships, and corporations	RCONP759	**52,414,000**	M.7.b.2.

Schedule RC-E Part II - Deposits in Foreign Offices including Edge and Agreement subsidiaries and IBFs

Dollar amounts in thousands			
Deposits of:			
1. Individuals, partnerships, and corporations (include all certified and official checks)	RCFNB553	**212,241,000**	1.
2. U.S. banks (including IBFs and foreign branches of U.S. banks) and other U.S. depository institutions	RCFNB554	**2,039,000**	2.
3. Foreign banks (including U.S. branches and agencies of foreign banks, including their IBFs)	RCFN2625	**26,409,000**	3.
4. Foreign governments and official institutions (including foreign central banks)	RCFN2650	**29,666,000**	4.
5. U.S. Government and states and political subdivisions in the U.S.	RCFNB555	**40,000**	5.
6. Total	RCFN2200	**270,395,000**	6.
1. Time deposits with a remaining maturity of one year or less (included in Schedule RC, item 13.b)	RCFNA245	**27,970,000**	M.1.

Schedule RC-F - Other Assets

Dollar amounts in thousands			
1. Accrued interest receivable[1]	RCFDB556	5,063,000	1.
2. Net deferred tax assets[2]	RCFD2148	637,000	2.
3. Interest-only strips receivable (not in the form of a security) on:[3]			3.
a. Mortgage loans	RCFDA519	0	3.a.
b. Other financial assets	RCFDA520	0	3.b.
4. Equity investments without readily determinable fair values[4]	RCFD1752	5,216,000	4.
5. Life insurance assets:			5.
a. General account life insurance assets	RCFDK201	5,859,000	5.a.
b. Separate account life insurance assets	RCFDK202	5,350,000	5.b.
c. Hybrid account life insurance assets	RCFDK270	0	5.c.
6. All other assets (itemize and describe amounts greater than $100,000 that exceed 25% of this item)	RCFD2168	99,617,000	6.
a. Prepaid expenses	RCFD2166	0	6.a.
b. Repossessed personal property (including vehicles)	RCFD1578	0	6.b.
c. Derivatives with a positive fair value held for purposes other than trading	RCFDC010	0	6.c.
d. Retained interests in accrued interest receivable related to securitized credit cards	RCFDC436	0	6.d.
e. FDIC loss-sharing indemnification assets	RCFDJ448	0	6.e.
f. Computer software	RCFDFT33	0	6.f.
g. Accounts receivable	RCFDFT34	42,028,000	6.g.
h. Receivables from foreclosed government-guaranteed mortgage loans	RCFDFT35	0	6.h.
i. Disclose component and the dollar amount of that component:			6.i.
1. Describe component	TEXT3549		6.i.1.
2. Amount of component	RCFD3549	0	6.i.2.
j. Disclose component and the dollar amount of that component:			6.j.
1. Describe component	TEXT3550		6.j.1.
2. Amount of component	RCFD3550	0	6.j.2.
k. Disclose component and the dollar amount of that component:			6.k.
1. Describe component	TEXT3551		6.k.1.
2. Amount of component	RCFD3551	0	6.k.2.
7. Total (sum of items 1 through 6) (must equal Schedule RC, item 11)	RCFD2160	121,742,000	7.

1. Include accrued interest receivable on loans, leases, debt securities, and other interest-bearing assets.
2. See discussion of deferred income taxes in Glossary entry on "income taxes."
3. Report interest-only strips receivable in the form of a security as available-for-sale securities in Schedule RC, item 2.b, or as trading assets in Schedule RC, item 5, as appropriate.
4. Include Federal Reserve stock, Federal Home Loan Bank stock, and bankers' bank stock.

Schedule RC-G - Other Liabilities

Dollar amounts in thousands			
1. Not available			1.
a. Interest accrued and unpaid on deposits in domestic offices[5]	RCON3645	**179,000**	1.a.
b. Other expenses accrued and unpaid (includes accrued income taxes payable)	RCFD3646	**15,093,000**	1.b.
2. Net deferred tax liabilities[2]	RCFD3049	**4,916,000**	2.
3. Allowance for credit losses on off-balance sheet credit exposures	RCFDB557	**1,106,000**	3.
4. All other liabilities (itemize and describe amounts greater than $100,000 that exceed 25 percent of this item)	RCFD2938	**75,907,000**	4.
a. Accounts payable	RCFD3066	**58,433,000**	4.a.
b. Deferred compensation liabilities	RCFDC011	**0**	4.b.
c. Dividends declared but not yet payable	RCFD2932	**0**	4.c.
d. Derivatives with a negative fair value held for purposes other than trading	RCFDC012	**0**	4.d.
e. Disclose component and the dollar amount of that component:			4.e.
1. Describe component	TEXT3552		4.e.1.
2. Amount of component	RCFD3552	**0**	4.e.2.
f. Disclose component and the dollar amount of that component:			4.f.
1. Describe component	TEXT3553		4.f.1.
2. Amount of component	RCFD3553	**0**	4.f.2.
g. Disclose component and the dollar amount of that component:			4.g.
1. Describe component	TEXT3554		4.g.1.
2. Amount of component	RCFD3554	**0**	4.g.2.
5. Total	RCFD2930	**97,201,000**	5.

5. For savings banks, include "dividends" accrued and unpaid on deposits.
2. See discussion of deferred income taxes in Glossary entry on "income taxes."

Schedule RC-H - Selected Balance Sheet Items for Domestic Offices

Dollar amounts in thousands			
1. Not applicable			1.
2. Not applicable			2.
3. Securities purchased under agreements to resell	RCONB989	**74,161,000**	3.
4. Securities sold under agreements to repurchase	RCONB995	**6,628,000**	4.
5. Other borrowed money	RCON3190	**86,873,000**	5.
EITHER 6. Net due from own foreign offices, Edge and Agreement subsidiaries, and IBFs	RCON2163	**143,090,000**	6.
OR 7. Net due to own foreign offices, Edge and Agreement subsidiaries, and IBFs	RCON2941	**0**	7.
8. Total assets (excludes net due from foreign offices, Edge and Agreement subsidiaries, and IBFs)	RCON2192	**1,533,716,000**	8.
9. Total liabilities (excludes net due to foreign offices, Edge and Agreement subsidiaries, and IBFs)	RCON3129	**1,430,618,000**	9.

Dollar amounts in thousands	(Column A) Amortized Cost of Held-to-Maturity Securities		(Column B) Fair Value of Available-for-Sale Securities		
10. U.S. Treasury securities	RCON0211	**0**	RCON1287	**25,396,000**	10.
11. U.S. Government agency obligations (exclude mortgage-backed securities)	RCON8492	**0**	RCON8495	**0**	11.
12. Securities issued by states and political subdivisions in the U.S.	RCON8496	**4,845,000**	RCON8499	**37,434,000**	12.
13. Mortgage-backed securities (MBS):					13.
a. Mortgage pass-through securities:					13.a.
1. Issued or guaranteed by FNMA, FHLMC, or GNMA	RCONG389	**24,197,000**	RCONG390	**66,559,000**	13.a.1.
2. Other mortgage pass-through securities	RCON1709	**0**	RCON1713	**0**	13.a.2.
b. Other mortgage-backed securities (include CMOs, REMICs, and stripped MBS):					13.b.
1. Issued or guaranteed by U.S. Government agencies or sponsored agencies[1]	RCONG393	**0**	RCONG394	**650,000**	13.b.1.
2. All other mortgage-backed securities	RCON1733	**0**	RCON1736	**16,477,000**	13.b.2.
14. Other domestic debt securities (include domestic structured financial products and domestic asset-backed securities)	RCONG397	**0**	RCONG398	**8,310,000**	14.
15. Other foreign debt securities (include foreign structured financial products and foreign asset-backed securities)	RCONG399	**0**	RCONG400	**14,457,000**	15.
16. Investments in mutual funds and other equity securities with readily determinable fair values[2]			RCONA511	**NR**	16.
17. Total held-to-maturity and available-for-sale securities (sum of items 10 through 16)	RCON1754	**29,042,000**	RCON1773	**169,283,000**	17.

Dollar amounts in thousands			
18. Equity investments not held for trading:			18.
a. Equity securities with readily determinable fair values[3]	RCONJA22	**7,000**	18.a.
b. Equity investments without readily determinable fair values	RCON1752	**4,623,000**	18.b.

Schedule RC-I - Assets and Liabilities of IBFs

To be completed only by banks with IBFs and other "foreign" offices.

Dollar amounts in thousands			
1. Total IBF assets of the consolidated bank (component of Schedule RC, item 12)	RCFN2133	**8,288,000**	1.
2. Total IBF liabilities (component of Schedule RC, item 21)	RCFN2898	**16,607,000**	2.

1. U.S. Government agencies include, but are not limited to, such agencies as the Government National Mortgage Association (GNMA), the Federal Deposit Insurance Corporation (FDIC), and the National Credit Union Administration (NCUA). U.S. Government-sponsored agencies include, but are not limited to, such agencies as the Federal Home Loan Mortgage Corporation (FHLMC) and the Federal National Mortgage Association (FNMA).
2. Item 16 is to be completed only by institutions that have not adopted ASU 2016-01, which includes provisions governing the accounting for investments in equity securities. See the instructions for further detail on ASU 2016-01.
3. Item 18.a is to be completed only by institutions that have adopted ASU 2016-01. See the instructions for further detail on ASU 2016-01.

Schedule RC-K - Quarterly Averages

Dollar amounts in thousands			
1. Interest-bearing balances due from depository institutions	RCFD3381	**459,580,000**	1.
2. U.S. Treasury securities and U.S. Government agency obligations (excluding mortgage-backed securities)[2]	RCFDB558	**24,543,000**	2.
3. Mortgage-backed securities[2]	RCFDB559	**111,647,000**	3.
4. All other debt securities and equity securities with readily determinable fair values not held for trading purposes	RCFDB560	**99,484,000**	4.
5. Federal funds sold and securities purchased under agreements to resell	RCFD3365	**183,313,000**	5.
6. Loans:			6.
a. Loans in domestic offices:			6.a.
1. Total loans	RCON3360	**749,212,000**	6.a.1.
2. Loans secured by real estate:			6.a.2.
a. Loans secured by 1-4 family residential properties	RCON3465	**280,984,000**	6.a.2.a.
b. All other loans secured by real estate	RCON3466	**116,838,000**	6.a.2.b.
3. Loans to finance agricultural production and other loans to farmers	RCON3386	**565,000**	6.a.3.
4. Commercial and industrial loans	RCON3387	**130,653,000**	6.a.4.
5. Loans to individuals for household, family, and other personal expenditures:			6.a.5.
a. Credit cards	RCONB561	**36,006,000**	6.a.5.a.
b. Other (includes revolving credit plans other than credit cards, automobile loans, and other consumer loans)	RCONB562	**60,813,000**	6.a.5.b.
b. Total loans in foreign offices, Edge and Agreement subsidiaries, and IBFs	RCFN3360	**79,989,000**	6.b.
7. Trading assets	RCFD3401	**273,848,000**	7.
8. Lease financing receivables (net of unearned income)	RCFD3484	**211,000**	8.
9. Total assets[4]	RCFD3368	**2,160,698,000**	9.
10. Interest-bearing transaction accounts in domestic offices (interest-bearing demand deposits, NOW accounts, ATS accounts, and telephone and preauthorized transfer accounts)	RCON3485	**224,970,000**	10.
11. Nontransaction accounts in domestic offices:			11.
a. Savings deposits (includes MMDAs)	RCONB563	**866,788,000**	11.a.
b. Time deposits of $250,000 or less	RCONHK16	**22,622,000**	11.b.
c. Time deposits of more than $250,000	RCONHK17	**43,233,000**	11.c.
12. Interest-bearing deposits in foreign offices, EDGE and Agreement subsidiaries, and IBFs	RCFN3404	**249,042,000**	12.
13. Federal funds purchased and securities sold under agreements to repurchase	RCFD3353	**111,319,000**	13.
14. Other borrowed money (includes mortgage indebtedness and obligations under capitalized leases)	RCFD3355	**116,815,000**	14.

2. Quarterly averages for all debt securities should be based on amortized cost.
4. The quarterly average for total assets should reflect all debt securities (not held for trading) at amortized cost, equity securities with readily determinable fair values at the lower of cost or fair value, and equity securities without readily determinable fair values at historical cost.

Schedule RC-L - Derivatives and Off-Balance Sheet Items

Please read carefully the instructions for the preparation of Schedule RC-L. Some of the amounts reported in Schedule RC-L are regarded as volume indicators and not necessarily as measures of risk.

Dollar amounts in thousands			
1. Unused commitments:			1.
a. Revolving, open-end lines secured by 1-4 family residential properties, i.e., home equity lines	RCFD3814	20,605,000	1.a.
Items 1.a.(1) and 1.a.(2) are to be completed for the December report only. 1. Unused commitments for Home Equity Conversion Mortgage (HECM) reverse mortgages outstanding that are held for investment in domestic offices (included in item 1.a above)	RCONJ477	NR	1.a.1.
2. Unused commitments for proprietary reverse mortgages outstanding that are held for investment in domestic offices (included in item 1.a above)	RCONJ478	NR	1.a.2.
b. Credit card lines (Sum of items 1.b.(1) and 1.b.(2) must equal item 1.b)	RCFD3815	10,369,000	1.b.
Items 1.b.(1) and 1.b.(2) are to be completed by banks with either $300 million or more in total assets or $300 million or more in credit card lines. (Sum of items 1.b.(1) and 1.b.(2) must equal item 1.b) 1. Unused consumer credit card lines	RCFDJ455	0	1.b.1.
2. Other unused credit card lines	RCFDJ456	10,369,000	1.b.2.
c. Commitments to fund commercial real estate, construction, and land development loans:			1.c.
1. Secured by real estate:			1.c.1.
a. 1-4 family residential construction loan commitments	RCFDF164	253,000	1.c.1.a.
b. Commercial real estate, other construction loan, and land development loan commitments	RCFDF165	8,675,000	1.c.1.b.
2. Not secured by real estate	RCFD6550	11,456,000	1.c.2.
d. Securities underwriting	RCFD3817	0	1.d.
e. Other unused commitments:			1.e.
1. Commercial and industrial loans	RCFDJ457	265,603,000	1.e.1.
2. Loans to financial institutions	RCFDJ458	26,372,000	1.e.2.
3. All other unused commitments	RCFDJ459	178,289,000	1.e.3.
2. Financial standby letters of credit and foreign office guarantees	RCFD3819	109,779,000	2.
Item 2.a is to be completed by banks with $1 billion or more in total assets. a. Amount of financial standby letters of credit conveyed to others	RCFD3820	47,281,000	2.a.
3. Performance standby letters of credit and foreign office guarantees	RCFD3821	9,952,000	3.
Item 3.a is to be completed by banks with $1 billion or more in total assets. a. Amount of performance standby letters of credit conveyed to others	RCFD3822	1,937,000	3.a.
4. Commercial and similar letters of credit	RCFD3411	3,279,000	4.
5. Not applicable			5.
6. Securities lent and borrowed:			6.
a. Securities lent (including customers' securities lent where the customer is indemnified against loss by the reporting bank)	RCFD3433	233,969,000	6.a.
b. Securities borrowed	RCFD3432	209,354,000	6.b.

Dollar amounts in thousands	(Column A) Sold Protection		(Column B) Purchased Protection		
7. Credit derivatives:					7.
a. Notional amounts:					7.a.
1. Credit default swaps	RCFDC968	715,268,000	RCFDC969	727,005,000	7.a.1.
2. Total return swaps	RCFDC970	13,588,000	RCFDC971	20,531,000	7.a.2.
3. Credit options	RCFDC972	49,119,000	RCFDC973	46,780,000	7.a.3.
4. Other credit derivatives	RCFDC974	127,000	RCFDC975	4,092,000	7.a.4.
b. Gross fair values:					7.b.
1. Gross positive fair value	RCFDC219	16,370,000	RCFDC221	6,118,000	7.b.1.
2. Gross negative fair value	RCFDC220	5,278,000	RCFDC222	17,228,000	7.b.2.

Dollar amounts in thousands			
c. Notional amounts by regulatory capital treatment:[1]			7.c.
1. Positions covered under the Market Risk Rule:			7.c.1.
a. Sold protection	RCFDG401	695,709,000	7.c.1.a.
b. Purchased protection	RCFDG402	695,232,000	7.c.1.b.
2. All other positions:			7.c.2.
a. Sold protection	RCFDG403	82,393,000	7.c.2.a.
b. Purchased protection that is recognized as a guarantee for regulatory capital purposes	RCFDG404	751,000	7.c.2.b.
c. Purchased protection that is not recognized as a guarantee for regulatory capital purposes	RCFDG405	102,425,000	7.c.2.c.

Dollar amounts in thousands	(Column A) Remaining Maturity of One Year or Less		(Column B) Remaining Maturity of Over One Year Through Five Years		(Column C) Remaining Maturity of Over Five Years		
d. Notional amounts by remaining maturity:							7.d.
1. Sold credit protection:[2]							7.d.1.
a. Investment grade	RCFDG406	162,749,000	RCFDG407	305,794,000	RCFDG408	61,690,000	7.d.1.a.
b. Subinvestment grade	RCFDG409	77,265,000	RCFDG410	142,476,000	RCFDG411	28,128,000	7.d.1.b.
2. Purchased credit protection:[3]							7.d.2.
a. Investment grade	RCFDG412	156,170,000	RCFDG413	303,713,000	RCFDG414	71,133,000	7.d.2.a.
b. Subinvestment grade	RCFDG415	84,715,000	RCFDG416	147,832,000	RCFDG417	34,845,000	7.d.2.b.

Dollar amounts in thousands			
8. Spot foreign exchange contracts	RCFD8765	**660,582,000**	8.
9. All other off-balance sheet liabilities (exclude derivatives) (itemize and describe each component of this item over 25% of Schedule RC, item 27.a, "Total bank equity capital")	RCFD3430	**90,279,000**	9.
a. Not applicable			9.a.
b. Commitments to purchase when-issued securities	RCFD3434	**0**	9.b.
c. Standby letters of credit issued by another party (e.g., a Federal Home Loan Bank) on the bank's behalf	RCFDC978	**0**	9.c.
d. Disclose component and the dollar amount of that component:			9.d.
1. Describe component	TEXT3555	**Click here for value**	9.d.1.
2. Amount of component	RCFD3555	**67,827,000**	9.d.2.
e. Disclose component and the dollar amount of that component:			9.e.
1. Describe component	TEXT3556		9.e.1.
2. Amount of component	RCFD3556	**0**	9.e.2.
f. Disclose component and the dollar amount of that component:			9.f.
(TEXT3557)	RCFD3557	**0**	9.f.1.
10. All other off-balance sheet assets (exclude derivatives) (itemize and describe each component of this item over 25% of Schedule RC, item 27.a, "Total bank equity capital")	RCFD5591	**0**	10.
a. Commitments to sell when-issued securities	RCFD3435	**0**	10.a.
b. Disclose component and the dollar amount of that component:			10.b.
1. Describe component	TEXT5592		10.b.1.
2. Amount of component	RCFD5592	**0**	10.b.2.
c. Disclose component and the dollar amount of that component:			10.c.
1. Describe component	TEXT5593		10.c.1.
2. Amount of component	RCFD5593	**0**	10.c.2.
d. Disclose component and the dollar amount of that component:			10.d.
1. Describe component	TEXT5594		10.d.1.
2. Amount of component	RCFD5594	**0**	10.d.2.
e. Disclose component and the dollar amount of that component:			10.e.
1. Describe component	TEXT5595		10.e.1.
2. Amount of component	RCFD5595	**0**	10.e.2.
11. Year-to-date merchant credit card sales volume:			11.
a. Sales for which the reporting bank is the acquiring bank	RCFDC223	**286,748,000**	11.a.
b. Sales for which the reporting bank is the agent bank with risk	RCFDC224	**0**	11.b.

1. Sum of items 7.c.(1)(a) and 7.c.(2)(a), must equal sum of items 7.a.(1) through (4), column A. Sum of items 7.c.(1)(b), 7.c.(2)(b), and 7.c.(2)(c) must equal sum of items 7.a.(1) through (4), column B.
2. Sum of items 7.d.(1)(a) and (b), columns A through C, must equal sum of items 7.a.(1) through (4), column A.
3. Sum of items 7.d.(2)(a) and (b), columns A through C, must equal sum of items 7.a.(1) through (4), column B.

(TEXT3555) Forward Repo Agreements

Dollar amounts in thousands	(Column A) Interest Rate Contracts		(Column B) Foreign Exchange Contracts		(Column C) Equity Derivative Contracts		(Column D) Commodity and Other Contracts		
12. Gross amounts (e.g., notional amounts):									12.
a. Futures contracts	RCFD8693	2,008,772,000	RCFD8694	22,843,000	RCFD8695	77,178,000	RCFD8696	82,254,000	12.a.
b. Forward contracts	RCFD8697	4,840,079,000	RCFD8698	6,381,044,000	RCFD8699	9,811,000	RCFD8700	103,760,000	12.b.
c. Exchange-traded option contracts:									12.c.
1. Written options	RCFD8701	715,994,000	RCFD8702	1,910,000	RCFD8703	220,014,000	RCFD8704	52,052,000	12c1.
2. Purchased options	RCFD8705	1,160,044,000	RCFD8706	3,949,000	RCFD8707	245,600,000	RCFD8708	61,839,000	12c2.
d. Over-the-counter option contracts:									12.d.
1. Written options	RCFD8709	3,345,992,000	RCFD8710	872,876,000	RCFD8711	384,831,000	RCFD8712	80,446,000	12d1.
2. Purchased options	RCFD8713	3,237,165,000	RCFD8714	875,150,000	RCFD8715	321,252,000	RCFD8716	60,684,000	12d2.
e. Swaps	RCFD3450	23,414,874,000	RCFD3826	4,219,582,000	RCFD8719	516,719,000	RCFD8720	594,002,000	12.e.
13. Total gross notional amount of derivative contracts held for trading	RCFDA126	38,557,533,000	RCFDA127	12,273,474,000	RCFD8723	1,775,405,000	RCFD8724	1,035,037,000	13.
14. Total gross notional amount of derivative contracts held for purposes other than trading	RCFD8725	165,387,000	RCFD8726	103,880,000	RCFD8727	0	RCFD8728	0	14.
a. Interest rate swaps where the bank has agreed to pay a fixed rate	RCFDA589	49,738,000							14.a.
15. Gross fair values of derivative contracts:									15.
a. Contracts held for trading:									15.a.
1. Gross positive fair value	RCFD8733	308,404,000	RCFD8734	165,242,000	RCFD8735	62,842,000	RCFD8736	30,936,000	15a1.
2. Gross negative fair value	RCFD8737	277,676,000	RCFD8738	152,442,000	RCFD8739	66,071,000	RCFD8740	32,128,000	15a2.
b. Contracts held for purposes other than trading:									15.b.
1. Gross positive fair value	RCFD8741	1,848,000	RCFD8742	802,000	RCFD8743	0	RCFD8744	0	15b1.
2. Gross negative fair value	RCFD8745	1,084,000	RCFD8746	718,000	RCFD8747	0	RCFD8748	0	15b2.

Dollar amounts in thousands	(Column A) Banks and Securities Firms	(Column B) Monoline Financial Guarantors	(Column C) Hedge Funds	(Column D) Sovereign Governments	(Column E) Corporations and All Other Counterparties	
16. Over-the counter derivatives:						16.
a. Net current credit exposure	RCFDG418 40,700,000	RCFDG419 66,000	RCFDG420 3,206,000	RCFDG421 8,710,000	RCFDG422 64,557,000	16.a.
b. Fair value of collateral:						16.b.
1. Cash - U.S. dollar	RCFDG423 14,628,000	RCFDG424 0	RCFDG425 18,339,000	RCFDG426 0	RCFDG427 11,437,000	16.b.1.
2. Cash - Other currencies	RCFDG428 24,503,000	RCFDG429 0	RCFDG430 1,524,000	RCFDG431 413,000	RCFDG432 23,892,000	16.b.2.
3. U.S. Treasury securities	RCFDG433 5,216,000	RCFDG434 0	RCFDG435 4,652,000	RCFDG436 0	RCFDG437 3,944,000	16.b.3.
4. U.S. Government agency and U.S. Government-sponsored agency debt securities	RCFDG438 1,805,000	RCFDG439 0	RCFDG440 9,000	RCFDG441 0	RCFDG442 693,000	16.b.4.
5. Corporate bonds	RCFDG443 92,000	RCFDG444 0	RCFDG445 0	RCFDG446 0	RCFDG447 3,236,000	16.b.5.
6. Equity securities	RCFDG448 477,000	RCFDG449 0	RCFDG450 58,000	RCFDG451 0	RCFDG452 12,651,000	16.b.6.
7. All other collateral	RCFDG453 5,247,000	RCFDG454 0	RCFDG455 226,000	RCFDG456 210,000	RCFDG457 11,991,000	16.b.7.
8. Total fair value of collateral (sum of items 16.b.(1) through (7))	RCFDG458 51,968,000	RCFDG459 0	RCFDG460 24,808,000	RCFDG461 623,000	RCFDG462 67,844,000	16.b.8.

Schedule RC-M - Memoranda

Dollar amounts in thousands			
1. Extensions of credit by the reporting bank to its executive officers, directors, principal shareholders, and their related interests as of the report date:			1.
a. Aggregate amount of all extensions of credit to all executive officers, directors, principal shareholders, and their related interests	RCFD6164	2,042,000	1.a.
b. Number of executive officers, directors, and principal shareholders to whom the amount of all extensions of credit by the reporting bank (including extensions of credit to related interests) equals or exceeds the lesser of $500,000 or 5 percent of total capital as defined for this purpose in agency regulations	RCFD6165	9	1.b.
2. Intangible assets other than goodwill:			2.
a. Mortgage servicing assets	RCFD3164	6,202,000	2.a.
1. Estimated fair value of mortgage servicing assets	RCFDA590	6,202,000	2.a.1.
b. Purchased credit card relationships and nonmortgage servicing assets	RCFDB026	0	2.b.
c. All other identifiable intangible assets	RCFD5507	174,000	2.c.
d. Total (sum of items 2.a, 2.b, and 2.c) (must equal Schedule RC, item 10.b)	RCFD0426	6,376,000	2.d.
3. Other real estate owned:			3.
a. Construction, land development, and other land in domestic offices	RCON5508	0	3.a.
b. Farmland in domestic offices	RCON5509	0	3.b.
c. 1-4 family residential properties in domestic offices	RCON5510	250,000	3.c.
d. Multifamily (5 or more) residential properties in domestic offices	RCON5511	0	3.d.
e. Nonfarm nonresidential properties in domestic offices	RCON5512	59,000	3.e.
f. Foreclosed properties from "GNMA loans"	RCONC979	94,000	3.f.
g. In foreign offices	RCFN5513	2,000	3.g.
h. Total (sum of items 3.a through 3.g) (must equal Schedule RC, item 7)	RCFD2150	405,000	3.h.
4. Cost of equity securities with readily determinable fair values not held for trading[5]	RCFDJA29	0	4.
5. Other borrowed money:			5.
a. Federal Home Loan Bank advances:			5.a.
1. Advances with a remaining maturity or next repricing date of:[1]			5.a.1.
a. One year or less	RCFDF055	44,503,000	5.a.1.a.
b. Over one year through three years	RCFDF056	16,000	5.a.1.b.
c. Over three years through five years	RCFDF057	17,000	5.a.1.c.
d. Over five years	RCFDF058	128,000	5.a.1.d.
2. Advances with a remaining maturity of one year or less (included in item 5.a.(1)(a) above)[2]	RCFD2651	8,703,000	5.a.2.
3. Structured advances (included in items 5.a.(1)(a) - (d) above)	RCFDF059	0	5.a.3.
b. Other borrowings:			5.b.
1. Other borrowings with a remaining maturity of next repricing date of:[3]			5.b.1.
a. One year or less	RCFDF060	62,392,000	5.b.1.a.
b. Over one year through three years	RCFDF061	3,435,000	5.b.1.b.
c. Over three years through five years	RCFDF062	1,585,000	5.b.1.c.
d. Over five years	RCFDF063	7,085,000	5.b.1.d.
2. Other borrowings with a remaining maturity of one year or less (included in item 5.b.(1)(a) above)[4]	RCFDB571	24,471,000	5.b.2.
c. Total (sum of items 5.a.(1)(a)-(d) and items 5.b.(1)(a)-(d)) (must equal Schedule RC, item 16)	RCFD3190	119,161,000	5.c.
6. Does the reporting bank sell private label or third party mutual funds and annuities?	RCFDB569	Yes	6.
7. Assets under the reporting bank's management in proprietary mutual funds and annuities	RCFDB570	0	7.
8. Internet Web site addresses and physical office trade names:			8.
a. Uniform Resource Locator (URL) of the reporting institution's primary Internet Web site (home page), if any (Example: www.examplebank.com):	TEXT4087	Click here for value	8.a.

5. Item 4 is to be completed only by insured state banks that have adopted ASU 2016-01, which includes provisions governing the accounting for investments in equity securities, and have been approved to hold grandfathered equity investments. See instructions for further detail on ASU 2016-01.
1. Report fixed-rate advances by remaining maturity and floating-rate advances by next repricing date.
2. Report both fixed- and floating-rate advances by remaining maturity. Exclude floating-rate advances with a next repricing date of one year or less that have a remaining maturity of over one year.
3. Report fixed-rate other borrowings by remaining maturity and floating-rate other borrowings by next repricing date.
4. Report both fixed- and floating-rate other borrowings by remaining maturity. Exclude floating rate other borrowings with a next repricing date of one year or less that have a remaining maturity of over one year.

Dollar amounts in thousands			
b. URLs of all other public-facing Internet Web sites that the reporting institution uses to accept or solicit deposits from the public, if any (Example: www.examplebank.biz):[1]			8.b.
1. URL 1	TE01N528	Click here for value	8.b.1.
2. URL 2	TE02N528	Click here for value	8.b.2.
3. URL 3	TE03N528	Click here for value	8.b.3.
4. URL 4	TE04N528		8.b.4.
5. URL 5	TE05N528		8.b.5.
6. URL 6	TE06N528		8.b.6.
7. URL 7	TE07N528		8.b.7.
8. URL 8	TE08N528		8.b.8.
9. URL 9	TE09N528		8.b.9.
10. URL 10	TE10N528		8.b.10.
c. Trade names other than the reporting institution's legal title used to identify one or more of the institution's physical offices at which deposits are accepted or solicited from the public, if any:			8.c.
1. Trade name 1	TE01N529	Chase	8.c.1.
2. Trade name 2	TE02N529	J.P.Morgan	8.c.2.
3. Trade name 3	TE03N529	Click here for value	8.c.3.
4. Trade name 4	TE04N529	Click here for value	8.c.4.
5. Trade name 5	TE05N529	Click here for value	8.c.5.
6. Trade name 6	TE06N529		8.c.6.
9. Do any of the bank's Internet Web sites have transactional capability, i.e., allow the bank's customers to execute transactions on their accounts through the Web site?	RCFD4088	Yes	9.
10. Secured liabilities:			10.
a. Amount of "Federal funds purchased in domestic offices" that are secured (included in Schedule RC, item 14.a)	RCONF064	0	10.a.
b. Amount of "Other borrowings" that are secured (included in Schedule RC-M, items 5.b.(1)(a) - (d))	RCFDF065	16,223,000	10.b.
11. Does the bank act as trustee or custodian for Individual Retirement Accounts, Health Savings Accounts, and other similar accounts?	RCONG463	Yes	11.
12. Does the bank provide custody, safekeeping, or other services involving the acceptance of orders for the sale or purchase of securities?	RCONG464	Yes	12.
13. Assets covered by loss-sharing agreements with the FDIC:			13.
a. Loans and leases (included in Schedule RC, items 4.a and 4.b):			13.a.
1. Loans secured by real estate in domestic offices:			13.a.1.
a. Construction, land development, and other land loans:			13.a.1.a.
1. 1-4 family residential construction loans	RCONK169	0	13.a.1.a.1.
2. Other construction loans and all land development and other land loans	RCONK170	0	13.a.1.a.2.
b. Secured by farmland	RCONK171	0	13.a.1.b.
c. Secured by 1-4 family residential properties:			13.a.1.c.
1. Revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit	RCONK172	0	13.a.1.c.1.
2. Closed-end loans secured by 1-4 family residential properties:			13.a.1.c.2.
a. Secured by first liens	RCONK173	0	13.a.1.c.2.a.
b. Secured by junior liens	RCONK174	0	13.a.1.c.2.b.
d. Secured by multifamily (5 or more) residential properties	RCONK175	0	13.a.1.d.
e. Secured by nonfarm nonresidential properties:			13.a.1.e.
1. Loans secured by owner-occupied nonfarm nonresidential properties	RCONK176	0	13.a.1.e.1.
2. Loans secured by other nonfarm nonresidential properties	RCONK177	0	13.a.1.e.2.
2. Not applicable			13.a.2.
3. Not applicable			13.a.3.
4. Not applicable			13.a.4.
5. All other loans and all leases	RCFDK183	0	13.a.5.
b. Other real estate owned (included in Schedule RC, item 7):			13.b.

1. Report only highest level URLs (for example, report www.examplebank.biz, but do not also report www.examplebank.biz/checking). Report each top level domain name used (for example, report both www.examplebank.biz and www.examplebank.net).

Dollar amounts in thousands			
1. Construction, land development, and other land in domestic offices	RCONK187	**0**	13.b.1.
2. Farmland in domestic offices	RCONK188	**0**	13.b.2.
3. 1-4 family residential properties in domestic offices	RCONK189	**0**	13.b.3.
4. Multifamily (5 or more) residential properties in domestic offices	RCONK190	**0**	13.b.4.
5. Nonfarm nonresidential properties in domestic offices	RCONK191	**0**	13.b.5.
6. In foreign offices	RCFNK260	**0**	13.b.6.
7. Portion of covered other real estate owned included in items 13.b.(1) through (6) above that is protected by FDIC loss-sharing agreements	RCFDK192	**0**	13.b.7.
c. Debt securities (included in Schedule RC, items 2.a and 2.b)	RCFDJ461	**0**	13.c.
d. Other assets (exclude FDIC loss-sharing indemnification assets)	RCFDJ462	**0**	13.d.
14. Captive insurance and reinsurance subsidiaries:			14.
a. Total assets of captive insurance subsidiaries[2]	RCFDK193	**11,167,000**	14.a.
b. Total assets of captive reinsurance subsidiaries[2]	RCFDK194	**88,000**	14.b.
Item 15 is to be completed by institutions that are required or have elected to be treated as a Qualified Thrift Lender. 15. Qualified Thrift Lender (QTL) test:			15.
a. Does the institution use the Home Owners' Loan Act (HOLA) QTL test or the Internal Revenue Service Domestic Building and Loan Association (IRS DBLA) test to determine its QTL compliance? (for the HOLA QTL test, enter 1; for the IRS DBLA test, enter 2)	RCONL133	**NR**	15.a.
b. Has the institution been in compliance with the HOLA QTL test as of each month end during the quarter or the IRS DBLA test for its most recent taxable year, as applicable?	RCONL135	**NR**	15.b.
Item 16.a and, if appropriate, items 16.c and 16.d are to be completed semiannually in the June and December reports only. Item 16.b is to be completed annually in the June report only. 16. International remittance transfers offered to consumers:			16.
a. As of the report date, did your institution offer to consumers in any state any of the following mechanisms for sending international remittance transfers?			16.a.
1. International wire transfers	RCONN517	**NR**	16.a.1.
2. International ACH transactions	RCONN518	**NR**	16.a.2.
3. Other proprietary services operated by your institution	RCONN519	**NR**	16.a.3.
4. Other proprietary services operated by another party	RCONN520	**NR**	16.a.4.
b. Did your institution provide more than 100 international remittance transfers in the previous calendar year or does your institution estimate that it will provide more than 100 international remittance transfers in the current calendar year?	RCONN521	**NR**	16.b.
Items 16.c and 16.d are to be completed by institutions that answered "Yes" to item 16.b in the current report or, if item 16.b is not required to be completed in the current report, in the most recent prior report in which item 16.b was required to be completed. c. Indicate which of the mechanisms described in items 16.a.(1), (2), and (3) above is the mechanism that your institution estimates accounted for the largest number of international remittance transfers your institution provided during the two calendar quarters ending on the report date. (For international wire transfers, enter 1; for international ACH transactions, enter 2; for other proprietary services operated by your institution, enter 3. If your institution did not provide any international remittance transfers using the mechanisms described in items 16.a.(1), (2), and (3) above during the two calendar quarters ending on the report date, enter 0.)	RCONN522	**NR**	16.c.
d. Estimated number and dollar value of international remittance transfers provided by your institution during the two calendar quarters ending on the report date:			16.d.
1. Estimated number of international remittance transfers	RCONN523	**NR**	16.d.1.
2. Estimated dollar value of international remittance transfers	RCONN524	**NR**	16.d.2.
3. Estimated number of international remittance transfers for which your institution applied the temporary exception	RCONN527	**NR**	16.d.3.

(TE01N528) www.chase.com

(TE02N528) www.jpmorgan.com

(TE03N528) www.jpmorgan.chase.com

(TE03N529) JPMorgan Chase

2. Report total assets before eliminating intercompany transactions between the consolidated insurance or reinsurance subsidiary and other offices or consolidated subsidiaries of the reporting bank.

(TE04N529) Chase Private Client

(TE05N529) J.P.Morgan Private Bank

(TEXT4087) www.jpmorganchase.com

Schedule RC-N - Past Due and Nonaccrual Loans Leases and Other Assets

Dollar amounts in thousands	(Column A) Past due 30 through 89 days and still accruing		(Column B) Past due 90 days or more and still accruing		(Column C) Nonaccrual		
1. Loans secured by real estate:							1.
a. Construction, land development, and other land loans in domestic offices:							1.a.
1. 1-4 family residential construction loans	RCONF172	**0**	RCONF174	**4,000**	RCONF176	**21,000**	1.a.1.
2. Other construction loans and all land development and other land loans	RCONF173	**10,000**	RCONF175	**0**	RCONF177	**4,000**	1.a.2.
b. Secured by farmland in domestic offices	RCON3493	**1,000**	RCON3494	**4,000**	RCON3495	**5,000**	1.b.
c. Secured by 1-4 family residential properties in domestic offices:							1.c.
1. Revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit	RCON5398	**423,000**	RCON5399	**436,000**	RCON5400	**1,205,000**	1.c.1.
2. Closed-end loans secured by 1-4 family residential properties:							1.c.2.
a. Secured by first liens	RCONC236	**2,960,000**	RCONC237	**3,785,000**	RCONC229	**4,076,000**	1.c.2.a.
b. Secured by junior liens	RCONC238	**24,000**	RCONC239	**7,000**	RCONC230	**68,000**	1.c.2.b.
d. Secured by multifamily (5 or more) residential properties in domestic offices	RCON3499	**25,000**	RCON3500	**0**	RCON3501	**48,000**	1.d.
e. Secured by nonfarm nonresidential properties in domestic offices:							1.e.
1. Loans secured by owner-occupied nonfarm nonresidential properties	RCONF178	**50,000**	RCONF180	**0**	RCONF182	**139,000**	1.e.1.
2. Loans secured by other nonfarm nonresidential properties	RCONF179	**71,000**	RCONF181	**5,000**	RCONF183	**87,000**	1.e.2.
f. In foreign offices	RCFNB572	**0**	RCFNB573	**0**	RCFNB574	**87,000**	1.f.
2. Loans to depository institutions and acceptances of other banks:							2.
a. To U.S. banks and other U.S. depository institutions	RCFD5377	**0**	RCFD5378	**0**	RCFD5379	**0**	2.a.
b. To foreign banks	RCFD5380	**19,000**	RCFD5381	**0**	RCFD5382	**0**	2.b.
3. Loans to finance agricultural production and other loans to farmers	RCFD1594	**9,000**	RCFD1597	**1,000**	RCFD1583	**5,000**	3.
4. Commercial and industrial loans:							4.
a. To U.S. addressees (domicile)	RCFD1251	**509,000**	RCFD1252	**54,000**	RCFD1253	**770,000**	4.a.
b. To non-U.S. addressees (domicile)	RCFD1254	**78,000**	RCFD1255	**1,000**	RCFD1256	**602,000**	4.b.
5. Loans to individuals for household, family, and other personal expenditures:							5.
a. Credit cards	RCFDB575	**344,000**	RCFDB576	**384,000**	RCFDB577	**0**	5.a.
b. Automobile loans	RCFDK213	**389,000**	RCFDK214	**0**	RCFDK215	**115,000**	5.b.
c. Other (includes revolving credit plans other than credit cards and other consumer loans)	RCFDK216	**306,000**	RCFDK217	**11,000**	RCFDK218	**25,000**	5.c.
6. Loans to foreign governments and official institutions	RCFD5389	**0**	RCFD5390	**0**	RCFD5391	**0**	6.
7. All other loans	RCFD5459	**673,000**	RCFD5460	**9,000**	RCFD5461	**58,000**	7.
8. Lease financing receivables:							8.
a. Leases to individuals for household, family, and other personal expenditures	RCFDF166	**0**	RCFDF167	**0**	RCFDF168	**0**	8.a.
b. All other leases	RCFDF169	**0**	RCFDF170	**0**	RCFDF171	**0**	8.b.
9. Total loans and leases (sum of items 1 through 8.b)	RCFD1406	**5,891,000**	RCFD1407	**4,701,000**	RCFD1403	**7,315,000**	9.
10. Debt securities and other assets (exclude other real estate owned and other repossessed assets)	RCFD3505	**0**	RCFD3506	**0**	RCFD3507	**132,000**	10.
11. Loans and leases reported in items 1 through 8 above that are wholly or partially guaranteed by the U.S. Government, excluding loans and leases covered by loss-sharing agreements with the FDIC:	RCFDK036	**1,745,000**	RCFDK037	**2,460,000**	RCFDK038	**1,570,000**	11.
a. Guaranteed portion of loans and leases included in item 11 above, excluding rebooked "GNMA loans"	RCFDK039	**6,000**	RCFDK040	**2,000**	RCFDK041	**29,000**	11.a.
b. Rebooked "GNMA loans" that have been repurchased or are eligible for repurchase included in item 11 above	RCFDK042	**1,732,000**	RCFDK043	**2,458,000**	RCFDK044	**1,502,000**	11.b.
12. Loans and leases reported in items 1 through 8 above that are covered by loss-sharing agreements with the FDIC:							12.
a. Loans secured by real estate in domestic offices:							12.a.
1. Construction, land development, and other land loans:							12.a.1.
a. 1-4 family residential construction loans	RCONK045	**0**	RCONK046	**0**	RCONK047	**0**	12.a.1.a.
b. Other construction loans and all land development and other land loans	RCONK048	**0**	RCONK049	**0**	RCONK050	**0**	12.a.1.b.

Dollar amounts in thousands	(Column A) Past due 30 through 89 days and still accruing		(Column B) Past due 90 days or more and still accruing		(Column C) Nonaccrual		
2. Secured by farmland	RCONK051	0	RCONK052	0	RCONK053	0	12.a.2.
3. Secured by 1-4 family residential properties:							12.a.3.
a. Revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit	RCONK054	0	RCONK055	0	RCONK056	0	12.a.3.a.
b. Closed-end loans secured by 1-4 family residential properties:							12.a.3.b.
1. Secured by first liens	RCONK057	0	RCONK058	0	RCONK059	0	12.a.3.b.1.
2. Secured by junior liens	RCONK060	0	RCONK061	0	RCONK062	0	12.a.3.b.2.
4. Secured by multifamily (5 or more) residential properties	RCONK063	0	RCONK064	0	RCONK065	0	12.a.4.
5. Secured by nonfarm nonresidential properties:							12.a.5.
a. Loans secured by owner-occupied nonfarm nonresidential properties	RCONK066	0	RCONK067	0	RCONK068	0	12.a.5.a.
b. Loans secured by other nonfarm nonresidential properties	RCONK069	0	RCONK070	0	RCONK071	0	12.a.5.b.
b. Not applicable							12.b.
c. Not applicable							12.c.
d. Not applicable							12.d.
e. All other loans and all leases	RCFDK087	0	RCFDK088	0	RCFDK089	0	12.e.
f. Portion of covered loans and leases included in items 12.a through 12.e above that is protected by FDIC loss-sharing agreements	RCFDK102	0	RCFDK103	0	RCFDK104	0	12.f.
1. Loans restructured in troubled debt restructurings included in Schedule RC-N, items 1 through 7, above (and not reported in Schedule RC-C, Part 1, Memorandum item 1):							M.1.
a. Construction, land development, and other land loans in domestic offices:							M.1.a.
1. 1-4 family residential construction loans	RCONK105	0	RCONK106	0	RCONK107	6,000	M.1.a.1.
2. Other construction loans and all land development and other land loans	RCONK108	0	RCONK109	0	RCONK110	0	M.1.a.2.
b. Loans secured by 1-4 family residential properties in domestic offices	RCONF661	821,000	RCONF662	1,196,000	RCONF663	3,459,000	M.1.b.
c. Secured by multifamily (5 or more) residential properties in domestic offices	RCONK111	0	RCONK112	0	RCONK113	1,000	M.1.c.
d. Secured by nonfarm nonresidential properties in domestic offices:							M.1.d.
1. Loans secured by owner-occupied nonfarm nonresidential properties	RCONK114	1,000	RCONK115	0	RCONK116	24,000	M.1.d.1.
2. Loans secured by other nonfarm nonresidential properties	RCONK117	0	RCONK118	0	RCONK119	37,000	M.1.d.2.
e. Commercial and industrial loans:							M.1.e.
1. To U.S. addressees (domicile)	RCFDK120	3,000	RCFDK121	2,000	RCFDK122	329,000	M.1.e.1.
2. To non-U.S. addressees (domicile)	RCFDK123	0	RCFDK124	0	RCFDK125	351,000	M.1.e.2.
f. All other loans (include loans to individuals for household, family, and other personal expenditures)	RCFDK126	23,000	RCFDK127	14,000	RCFDK128	103,000	M.1.f.
Itemize loan categories included in Memorandum item 1.f, above that exceed 10 percent of total loans restructured in troubled debt restructurings that are past due 30 days or more or in nonaccrual status (sum of Memorandum items 1.a through 1.f, columns A through C): 1. Loans secured by farmland in domestic offices	RCONK130	0	RCONK131	0	RCONK132	0	M.1.f.1.
2. Not applicable							M.1.f.2.
3. Loans to finance agricultural production and other loans to farmers	RCFDK138	0	RCFDK139	0	RCFDK140	0	M.1.f.3.
4. Loans to individuals for household, family, and other personal expenditures:							M.1.f.4.
a. Credit cards	RCFDK274	0	RCFDK275	0	RCFDK276	0	M.1.f.4.a.
b. Automobile loans	RCFDK277	0	RCFDK278	0	RCFDK279	0	M.1.f.4.b.
c. Other (includes revolving credit plans other than credit cards and other consumer loans)	RCFDK280	0	RCFDK281	0	RCFDK282	0	M.1.f.4.c.
g. Total loans restructured in troubled debt restructurings included in Schedule RC-N, items 1 through 7, above and not reported in Schedule RC-C, Part I, Memorandum item 1 (sum of items Memorandum item 1.a.(1) through Memorandum item 1.f)	RCFDHK26	848,000	RCFDHK27	1,212,000	RCFDHK28	4,310,000	M.1.g.
2. Loans to finance commercial real estate, construction, and land development activities (not secured by real estate) included in Schedule RC-N, items 4 and 7, above	RCFD6558	184,000	RCFD6559	1,000	RCFD6560	43,000	M.2.
3. Loans secured by real estate to non-U.S. addressees (domicile) (included in Schedule RC-N, item 1, above)	RCFD1248	2,000	RCFD1249	1,000	RCFD1250	88,000	M.3.

Dollar amounts in thousands	(Column A) Past due 30 through 89 days and still accruing		(Column B) Past due 90 days or more and still accruing		(Column C) Nonaccrual		
4. Not applicable							M.4.
5. Loans and leases held for sale and loans measured at fair value (included in Schedule RC-N, items 1 through 8, above):							M.5.
a. Loans and leases held for sale	RCFDC240	11,000	RCFDC241	49,000	RCFDC226	97,000	M.5.a.
b. Loans measured at fair value:							M.5.b.
1. Fair value	RCFDF664	0	RCFDF665	0	RCFDF666	0	M.5.b.1.
2. Unpaid principal balance	RCFDF667	0	RCFDF668	0	RCFDF669	0	M.5.b.2.

Dollar amounts in thousands	(Column A) Past due 30 through 89 days		(Column B) Past due 90 days or more		
6. Derivative contracts: Fair value of amounts carried as assets	RCFD3529	7,000	RCFD3530	12,000	M.6.

Dollar amounts in thousands			
7. Additions to nonaccrual assets during the quarter	RCFDC410	1,435,000	M.7.
8. Nonaccrual assets sold during the quarter	RCFDC411	71,000	M.8.

Dollar amounts in thousands	(Column A) Past due 30 through 89 days and still accruing		(Column B) Past due 90 days or more and still accruing		(Column C) Nonaccrual		
9. Purchased credit-impaired loans accounted for in accordance with FASB ASC 310-30 (former AICPA Stament of Position 03-3):							M.9.
a. Outstanding balance	RCFDL183	1,074,000	RCFDL184	2,013,000	RCFDL185	28,000	M.9.a.
b. Amount included in Schedule RC-N, items 1 through 7, above	RCFDL186	990,000	RCFDL187	1,783,000	RCFDL188	3,000	M.9.b.

Schedule RC-O - Other Data for Deposit Insurance and FICO Assessments

All FDIC-insured depository institutions must complete items 1 through 9, 10, and 11, Memorandum item 1, and, if applicable, item 9.a, Memorandum items 2, 3, and 6 through 18 each quarter. Unless otherwise indicated, complete items 1 through 11 and Memorandum items 1 through 3 on an "unconsolidated single FDIC certificate number basis" (see instructions) and complete Memorandum items 6 through 18 on a fully consolidated basis.

Dollar amounts in thousands			
1. Total deposit liabilities before exclusions (gross) as defined in Section 3(l) of the Federal Deposit Insurance Act and FDIC regulations	RCFDF236	**1,623,112,000**	1.
2. Total allowable exclusions, including interest accrued and unpaid on allowable exclusions (including foreign deposits)	RCFDF237	**290,741,000**	2.
3. Total foreign deposits, including interest accrued and unpaid thereon (included in item 2 above)	RCFNF234	**290,741,000**	3.
4. Average consolidated total assets for the calendar quarter	RCFDK652	**2,160,698,000**	4.
a. Averaging method used (for daily averaging, enter 1; for weekly averaging, enter 2)	RCFDK653	**1**	4.a.
5. Average tangible equity for the calendar quarter[1]	RCFDK654	**187,315,000**	5.
6. Holdings of long-term unsecured debt issued by other FDIC-insured depository institutions	RCFDK655	**5,605,000**	6.
7. Unsecured "Other borrowings" with a remaining maturity of (sum of items 7.a through 7.d must be less than or equal to Schedule RC-M, items 5.b.(1)(a)-(d) minus item 10.b):			7.
a. One year or less	RCFDG465	**13,591,000**	7.a.
b. Over one year through three years	RCFDG466	**32,815,000**	7.b.
c. Over three years through five years	RCFDG467	**3,659,000**	7.c.
d. Over five years	RCFDG468	**8,209,000**	7.d.
8. Subordinated notes and debentures with a remaining maturity of (sum of items 8.a through 8.d must equal Schedule RC, item 19):			8.
a. One year or less	RCFDG469	**0**	8.a.
b. Over one year through three years	RCFDG470	**0**	8.b.
c. Over three years through five years	RCFDG471	**0**	8.c.
d. Over five years	RCFDG472	**304,000**	8.d.
9. Reciprocal brokered deposits (included in Schedule RC-E, part I, Memorandum item 1.b)	RCONG803	**0**	9.
Item 9.a is to be completed on a fully consolidated basis by all institutions that own another insured depository institution. a. Fully consolidated reciprocal brokered deposits	RCONL190	**NR**	9.a.
10. Banker's bank certification: Does the reporting institution meet both the statutory definition of a banker's bank and the business conduct test set forth in FDIC regulations? If the answer to item 10 is "YES," complete items 10.a and 10.b	RCFDK656	**No**	10.
If the answer to item 10 is "YES," complete items 10.a and 10.b. a. Banker's bank deduction	RCFDK657	**NR**	10.a.
b. Banker's bank deduction limit	RCFDK658	**NR**	10.b.
11. Custodial bank certification: Does the reporting institution meet the definition of a custodial bank set forth in FDIC regulations? If the answer to item 11 is "YES," complete items 11.a and 11.b	RCFDK659	**Yes**	11.
If the answer to item 11 is "YES," complete items 11.a and 11.b. a. Custodial bank deduction	RCFDK660	**547,152,000**	11.a.
b. Custodial bank deduction limit	RCFDK661	**210,374,000**	11.b.
1. Total deposit liabilities of the bank (including related interest accrued and unpaid) less allowable exclusions (including related interest accrued and unpaid) (sum of Memorandum items 1.a.(1), 1.b.(1), 1.c.(1), and 1.d.(1) must equal Schedule RC-O, item 1 less item 2):			M.1.
a. Deposit accounts (excluding retirement accounts) of $250,000 or less:[1]			M.1.a.
1. Amount of deposit accounts (excluding retirement accounts) of $250,000 or less	RCONF049	**488,939,000**	M.1.a.1.
2. Number of deposit accounts (excluding retirement accounts) of $250,000 or less	RCONF050	**51103078**	M.1.a.2.
b. Deposit accounts (excluding retirement accounts) of more than $250,000:[1]			M.1.b.
1. Amount of deposit accounts (excluding retirement accounts) of more than $250,000	RCONF051	**833,765,000**	M.1.b.1.
2. Number of deposit accounts (excluding retirement accounts) of more than $250,000	RCONF052	**447211**	M.1.b.2.
c. Retirement deposit accounts of $250,000 or less:[1]			M.1.c.
1. Amount of retirement deposit accounts of $250,000 or less	RCONF045	**8,332,000**	M.1.c.1.
2. Number of retirement deposit accounts of $250,000 or less	RCONF046	**1315263**	M.1.c.2.
d. Retirement deposit accounts of more than $250,000:[1]			M.1.d.
1. Amount of retirement deposit accounts of more than $250,000	RCONF047	**1,335,000**	M.1.d.1.

1. See instructions for averaging methods. For deposit insurance assessment purposes, tangible equity is defined as Tier 1 capital as set forth in the banking agencies' regulatory capital standards and reported in Schedule RC-R, Part I, item 26, except as described in the instructions.

1. The dollar amounts used as the basis for reporting in Memorandum items 1.a through 1.d reflect the deposit insurance limits in effect on the report date.

Dollar amounts in thousands			
2. Number of retirement deposit accounts of more than $250,000	RCONF048	**2997**	M.1.d.2.
Memorandum item 2 is to be completed by banks with $1 billion or more in total assets. 2. Estimated amount of uninsured deposits in domestic offices of the bank and in insured branches in Puerto Rico and U.S. territories and possessions, including related interest accrued and unpaid (see instructions)[3]	RCON5597	**730,468,000**	M.2.
3. Has the reporting institution been consolidated with a parent bank or savings association in that parent bank's or parent savings association's Call Report? If so, report the legal title and FDIC Certificate Number of the parent bank or parent savings association:			M.3.
a. Legal title	TEXTA545		M.3.a.
b. FDIC Certificate Number	RCONA545	**0**	M.3.b.
4. Dually payable deposits in the reporting institution's foreign branches	RCFNGW43	**0**	M.4.
5. Not applicable			M.5.
Memorandum items 6 through 12 are to be completed by "large institutions" and "highly complex institutions" as defined in FDIC regulations. 6. Criticized and classified items:			M.6.
a. Special mention	RCFDK663	**CONF**	M.6.a.
b. Substandard	RCFDK664	**CONF**	M.6.b.
c. Doubtful	RCFDK665	**CONF**	M.6.c.
d. Loss	RCFDK666	**CONF**	M.6.d.
7. "Nontraditional 1-4 family residential mortgage loans" as defined for assessment purposes only in FDIC regulations:			M.7.
a. Nontraditional 1-4 family residential mortgage loans	RCFDN025	**CONF**	M.7.a.
b. Securitizations of nontraditional 1-4 family residential mortgage loans	RCFDN026	**CONF**	M.7.b.
8. "Higher-risk consumer loans" as defined for assessment purposes only in FDIC regulations:			M.8.
a. Higher-risk consumer loans	RCFDN027	**CONF**	M.8.a.
b. Securitizations of higher-risk consumer loans	RCFDN028	**CONF**	M.8.b.
9. "Higher-risk commercial and industrial loans and securities" as defined for assessment purposes only in FDIC regulations:			M.9.
a. Higher-risk commercial and industrial loans and securities	RCFDN029	**CONF**	M.9.a.
b. Securitizations of higher-risk commercial and industrial loans and securities	RCFDN030	**CONF**	M.9.b.
10. Commitments to fund construction, land development, and other land loans secured by real estate for the consolidated bank:			M.10.
a. Total unfunded commitments	RCFDK676	**6,595,000**	M.10.a.
b. Portion of unfunded commitments guaranteed or insured by the U.S. government (including the FDIC)	RCFDK677	**1,000**	M.10.b.
11. Amount of other real estate owned recoverable from the U.S. government under guarantee or insurance provisions (excluding FDIC loss-sharing agreements)	RCFDK669	**94,000**	M.11.
12. Nonbrokered time deposits of more than $250,000 in domestic offices (included in Schedule RC-E, Memorandum item 2.d)	RCONK678	**40,444,000**	M.12.
Memorandum item 13.a is to be completed by "large institutions" and "highly complex institutions" as defined in FDIC regulations. Memorandum items 13.b through 13.h are to be completed by "large institutions" only. 13. Portion of funded loans and securities in domestic and foreign offices guaranteed or insured by the U.S. government (including FDIC loss-sharing agreements):			M.13.
a. Construction, land development, and other land loans secured by real estate	RCFDN177	**7,000**	M.13.a.
b. Loans secured by multifamily residential and nonfarm nonresidential properties	RCFDN178	**0**	M.13.b.
c. Closed-end loans secured by first liens on 1-4 family residential properties	RCFDN179	**0**	M.13.c.
d. Closed-end loans secured by junior liens on 1-4 family residential properties and revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit	RCFDN180	**0**	M.13.d.
e. Commercial and industrial loans	RCFDN181	**0**	M.13.e.
f. Credit card loans to individuals for household, family, and other personal expenditures	RCFDN182	**0**	M.13.f.
g. All other loans to individuals for household, family, and other personal expenditures	RCFDN183	**0**	M.13.g.
h. Non-agency residential mortgage-backed securities	RCFDM963	**0**	M.13.h.
Memorandum items 14 and 15 are to be completed by "highly complex institutions" as defined in FDIC regulations. 14. Amount of the institution's largest counterparty exposure	RCFDK673	**CONF**	M.14.
15. Total amount of the institution's 20 largest counterparty exposures	RCFDK674	**CONF**	M.15.
Memorandum item 16 is to be completed by "large institutions" and "highly complex institutions" as defined in FDIC regulations. 16. Portion of loans restructured in troubled debt restructurings that are in compliance with their modified terms and are guaranteed or insured by the U.S. government (including the FDIC) (included in Schedule RC-C, part I, Memorandum item 1)	RCFDL189	**1,166,000**	M.16.

3. Uninsured deposits should be estimated based on the deposit insurance limits set forth in Memorandum items 1.a through 1.d.

Dollar amounts in thousands			
Memorandum item 17 is to be completed on a fully consolidated basis by those "large institutions" and "highly complex institutions" as defined in FDIC regulations that own another insured depository institution. 17. Selected fully consolidated data for deposit insurance assessment purposes:			M.17.
a. Total deposit liabilities before exclusions (gross) as defined in Section 3(l) of the Federal Deposit Insurance Act and FDIC regulations	RCFDL194	**NR**	M.17.a.
b. Total allowable exclusions, including interest accrued and unpaid on allowable exclusions (including foreign deposits)	RCFDL195	**NR**	M.17.b.
c. Unsecured "Other borrowings" with a remaining maturity of one year or less	RCFDL196	**NR**	M.17.c.
d. Estimated amount of uninsured deposits in domestic offices of the institution and in insured branches in Puerto Rico and U.S. territories and possessions, including related interest accrued and unpaid	RCONL197	**NR**	M.17.d.

Dollar amounts in thousands	(Column A) Two-Year Probability of Default (PD) <= 1%	(Column B) Two-Year Probability of Default (PD) 1.01–4%	(Column C) Two-Year Probability of Default (PD) 4.01–7%	(Column D) Two-Year Probability of Default (PD) 7.01–10%	(Column E) Two-Year Probability of Default (PD) 10.01–14%	(Column F) Two-Year Probability of Default (PD) 14.01–16%	(Column G) Two-Year Probability of Default (PD) 16.01–18%	(Column H) Two-Year Probability of Default (PD) 18.01–20%	(Column I) Two-Year Probability of Default (PD) 20.01–22%	(Column J) Two-Year Probability of Default (PD) 22.01–26%	(Column K) Two-Year Probability of Default (PD) 26.01–30%	(Column L) Two-Year Probability of Default (PD) > 30%	(Column M) Two-Year Probability of Default (PD) Unscoreable	(Column N) Two-Year Probability of Default (PD) Total	(Column O) PDs Were Derived Using	
18. Outstanding balance of 1-4 family residential mortgage loans, consumer loans, and consumer leases by two-year probability of default:																M18.
a. "Nontraditional 1-4 family residential mortgage loans" as defined for assessment purposes only in FDIC regulations	RCFDM964 CONF	RCFDM965 CONF	RCFDM966 CONF	RCFDM967 CONF	RCFDM968 CONF	RCFDM969 CONF	RCFDM970 CONF	RCFDM971 CONF	RCFDM972 CONF	RCFDM973 CONF	RCFDM974 CONF	RCFDM975 CONF	RCFDM976 CONF	RCFDM977 CONF	RCFDM978 CONF	M18.a.
b. Closed-end loans secured by first liens on 1-4 family residential properties	RCFDM979 CONF	RCFDM980 CONF	RCFDM981 CONF	RCFDM982 CONF	RCFDM983 CONF	RCFDM984 CONF	RCFDM985 CONF	RCFDM986 CONF	RCFDM987 CONF	RCFDM988 CONF	RCFDM989 CONF	RCFDM990 CONF	RCFDM991 CONF	RCFDM992 CONF	RCFDM993 CONF	M18.b.
c. Closed-end loans secured by junior liens on 1-4 family residential properties	RCFDM994 CONF	RCFDM995 CONF	RCFDM996 CONF	RCFDM997 CONF	RCFDM998 CONF	RCFDM999 CONF	RCFDN001 CONF	RCFDN002 CONF	RCFDN003 CONF	RCFDN004 CONF	RCFDN005 CONF	RCFDN006 CONF	RCFDN007 CONF	RCFDN008 CONF	RCFDN009 CONF	M18.c.
d. Revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit	RCFDN010 CONF	RCFDN011 CONF	RCFDN012 CONF	RCFDN013 CONF	RCFDN014 CONF	RCFDN015 CONF	RCFDN016 CONF	RCFDN017 CONF	RCFDN018 CONF	RCFDN019 CONF	RCFDN020 CONF	RCFDN021 CONF	RCFDN022 CONF	RCFDN023 CONF	RCFDN024 CONF	M18.d.
e. Credit cards	RCFDN040 CONF	RCFDN041 CONF	RCFDN042 CONF	RCFDN043 CONF	RCFDN044 CONF	RCFDN045 CONF	RCFDN046 CONF	RCFDN047 CONF	RCFDN048 CONF	RCFDN049 CONF	RCFDN050 CONF	RCFDN051 CONF	RCFDN052 CONF	RCFDN053 CONF	RCFDN054 CONF	M18.e.
f. Automobile loans	RCFDN055 CONF	RCFDN056 CONF	RCFDN057 CONF	RCFDN058 CONF	RCFDN059 CONF	RCFDN060 CONF	RCFDN061 CONF	RCFDN062 CONF	RCFDN063 CONF	RCFDN064 CONF	RCFDN065 CONF	RCFDN066 CONF	RCFDN067 CONF	RCFDN068 CONF	RCFDN069 CONF	M18.f.
g. Student loans	RCFDN070 CONF	RCFDN071 CONF	RCFDN072 CONF	RCFDN073 CONF	RCFDN074 CONF	RCFDN075 CONF	RCFDN076 CONF	RCFDN077 CONF	RCFDN078 CONF	RCFDN079 CONF	RCFDN080 CONF	RCFDN081 CONF	RCFDN082 CONF	RCFDN083 CONF	RCFDN084 CONF	M18.g.
h. Other consumer loans and revolving credit plans other than credit cards	RCFDN085 CONF	RCFDN086 CONF	RCFDN087 CONF	RCFDN088 CONF	RCFDN089 CONF	RCFDN090 CONF	RCFDN091 CONF	RCFDN092 CONF	RCFDN093 CONF	RCFDN094 CONF	RCFDN095 CONF	RCFDN096 CONF	RCFDN097 CONF	RCFDN098 CONF	RCFDN099 CONF	M18.h.
i. Consumer leases	RCFDN100 CONF	RCFDN101 CONF	RCFDN102 CONF	RCFDN103 CONF	RCFDN104 CONF	RCFDN105 CONF	RCFDN106 CONF	RCFDN107 CONF	RCFDN108 CONF	RCFDN109 CONF	RCFDN110 CONF	RCFDN111 CONF	RCFDN112 CONF	RCFDN113 CONF	RCFDN114 CONF	M18.i.
j. Total	RCFDN115 CONF	RCFDN116 CONF	RCFDN117 CONF	RCFDN118 CONF	RCFDN119 CONF	RCFDN120 CONF	RCFDN121 CONF	RCFDN122 CONF	RCFDN123 CONF	RCFDN124 CONF	RCFDN125 CONF	RCFDN126 CONF	RCFDN127 CONF	RCFDN128 CONF		M18.j.

Schedule RC-P - 1-4 Family Residential Mortgage Banking Activities in Domestic Offices

Schedule RC-P is to be completed by (1) all banks with $1 billion or more in total assets and (2) banks with less than $1 billion in total assets at which either 1-4 family residential mortgage loan originations and purchases for resale from all sources, loan sales, or quarter-end loans held for sale or trading in domestic offices exceed $10 million for two consecutive quarters.

Dollar amounts in thousands			
1. Retail originations during the quarter of 1-4 family residential mortgage loans for sale:[2]			1.
a. Closed-end first liens	RCONF066	4,964,000	1.a.
b. Closed-end junior liens	RCONF067	0	1.b.
c. Open-end loans extended under lines of credit:			1.c.
1. Total commitment under the lines of credit	RCONF670	0	1.c.1.
2. Principal amount funded under the lines of credit	RCONF671	0	1.c.2.
2. Wholesale originations and purchases during the quarter of 1-4 family residential mortgage loans for sale:[2]			2.
a. Closed-end first liens	RCONF068	8,981,000	2.a.
b. Closed-end junior liens	RCONF069	0	2.b.
c. Open-end loans extended under lines of credit:			2.c.
1. Total commitment under the lines of credit	RCONF672	0	2.c.1.
2. Principal amount funded under the lines of credit	RCONF673	0	2.c.2.
3. 1-4 family residential mortgages sold during the quarter:			3.
a. Closed-end first liens	RCONF070	11,774,000	3.a.
b. Closed-end junior liens	RCONF071	0	3.b.
c. Open-end loans extended under lines of credit:			3.c.
1. Total commitment under the lines of credit	RCONF674	0	3.c.1.
2. Principal amount funded under the lines of credit	RCONF675	0	3.c.2.
4. 1-4 family residential mortgages held for sale at quarter-end (included in Schedule RC, item 4.a):			4.
a. Closed-end first liens	RCONF072	12,697,000	4.a.
b. Closed-end junior liens	RCONF073	0	4.b.
c. Open-end loans extended under lines of credit:			4.c.
1. Total commitment under the lines of credit	RCONF676	0	4.c.1.
2. Principal amount funded under the lines of credit	RCONF677	0	4.c.2.
5. Noninterest income for the quarter from the sale, securitization, and servicing of 1-4 family residential mortgage loans (included in Schedule RI, items 5.c, 5.f, 5.g, and 5.i):			5.
a. Closed-end 1-4 family residential mortgage loans	RIADF184	445,000	5.a.
b. Open-end 1-4 family residential mortgage loans extended under lines of credit	RIADF560	0	5.b.
6. Repurchases and indemnifications of 1-4 family residential mortgage loans during the quarter:			6.
a. Closed-end first liens	RCONF678	11,000	6.a.
b. Closed-end junior liens	RCONF679	0	6.b.
c. Open-end loans extended under line of credit:			6.c.
1. Total commitment under the lines of credit	RCONF680	0	6.c.1.
2. Principal amount funded under the lines of credit	RCONF681	0	6.c.2.
7. Representation and warranty reserves for 1-4 family residential mortgage loans sold:			7.
a. For representations and warranties made to U.S. government agencies and government-sponsored agencies	RCONL191	CONF	7.a.
b. For representations and warranties made to other parties	RCONL192	CONF	7.b.
c. Total representation and warranty reserves (sum of items 7.a and 7.b)	RCONM288	111,000	7.c.

Schedule RC-Q - Assets and Liabilities Measured at Fair Value on a Recurring Basis

Schedule RC-Q is to be completed by banks that:
(1) Had total assets of $500 million or more as of the beginning of their fiscal year; or
(2) Had total assets of less than $500 million as of the beginning of their fiscal year and either:
(a) Have elected to report financial instruments or servicing assets and liabilities at fair value under a fair value option with changes in fair value recognized in earnings, or

(b) Are required to complete Schedule RC-D, Trading Assets and Liabilities.

2. Exclude originations and purchases of 1–4 family residential mortgage loans that are held for investment.

Dollar amounts in thousands	(Column A) Total Fair Value Reported on Schedule RC	(Column B) LESS: Amounts Netted in the Determination of Total Fair Value	(Column C) Level 1 Fair Value Measurements	(Column D) Level 2 Fair Value Measurements	(Column E) Level 3 Fair Value Measurements	
1. Available-for-sale debt securities and equity securities with readily determinable fair values not held for trading purposes[1]	RCFDJA36 206,861,000	RCFDG474 0	RCFDG475 43,604,000	RCFDG476 163,052,000	RCFDG477 205,000	1.
2. Federal funds sold and securities purchased under agreements to resell	RCFDG478 6,210,000	RCFDG479 492,000	RCFDG480 0	RCFDG481 6,702,000	RCFDG482 0	2.
3. Loans and leases held for sale	RCFDG483 0	RCFDG484 0	RCFDG485 0	RCFDG486 0	RCFDG487 0	3.
4. Loans and leases held for investment	RCFDG488 2,908,000	RCFDG489 0	RCFDG490 0	RCFDG491 2,512,000	RCFDG492 396,000	4.
5. Trading assets:						5.
a. Derivative assets	RCFD3543 55,746,000	RCFDG493 534,174,000	RCFDG494 778,000	RCFDG495 578,496,000	RCFDG496 10,646,000	5.a.
b. Other trading assets	RCFDG497 214,828,000	RCFDG498 -51,000	RCFDG499 99,560,000	RCFDG500 111,822,000	RCFDG501 3,395,000	5.b.
1. Nontrading securities at fair value with changes in fair value reported in current earnings (included in Schedule RC-Q, item 5.b, above)	RCFDF240 0	RCFDF684 0	RCFDF692 0	RCFDF241 0	RCFDF242 0	5.b.1.
6. All other assets	RCFDG391 14,022,000	RCFDG392 171,000	RCFDG395 7,597,000	RCFDG396 380,000	RCFDG804 6,216,000	6.
7. Total assets measured at fair value on a recurring basis (sum of items 1 through 5.b plus item 6)	RCFDG502 500,575,000	RCFDG503 534,786,000	RCFDG504 151,539,000	RCFDG505 862,964,000	RCFDG506 20,858,000	7.
8. Deposits	RCFDF252 20,268,000	RCFDF686 0	RCFDF694 0	RCFDF253 16,237,000	RCFDF254 4,031,000	8.
9. Federal funds purchased and securities sold under agreements to repurchase	RCFDG507 3,544,000	RCFDG508 492,000	RCFDG509 0	RCFDG510 4,036,000	RCFDG511 0	9.
10. Trading liabilities:						10.
a. Derivative liabilities	RCFD3547 35,000,000	RCFDG512 515,829,000	RCFDG513 690,000	RCFDG514 537,503,000	RCFDG515 12,636,000	10.a.
b. Other trading liabilities	RCFDG516 67,635,000	RCFDG517 0	RCFDG518 50,185,000	RCFDG519 17,403,000	RCFDG520 47,000	10.b.
11. Other borrowed money	RCFDG521 28,320,000	RCFDG522 0	RCFDG523 0	RCFDG524 15,879,000	RCFDG525 12,441,000	11.
12. Subordinated notes and debentures	RCFDG526 0	RCFDG527 0	RCFDG528 0	RCFDG529 0	RCFDG530 0	12.
13. All other liabilities	RCFDG805 7,718,000	RCFDG806 210,000	RCFDG807 7,631,000	RCFDG808 297,000	RCFDG809 0	13.
14. Total liabilities measured at fair value on a recurring basis (sum of items 8 through 13)	RCFDG531 162,485,000	RCFDG532 516,531,000	RCFDG533 58,506,000	RCFDG534 591,355,000	RCFDG535 29,155,000	14.
1. All other assets (itemize and describe amounts included in Schedule RC-Q, item 6, that are greater than $100,000 and exceed 25% of item 6):						M.1.
a. Mortgage servicing assets	RCFDG536 6,202,000	RCFDG537 0	RCFDG538 0	RCFDG539 0	RCFDG540 6,202,000	M.1.a.
b. Nontrading derivative assets	RCFDG541 0	RCFDG542 0	RCFDG543 0	RCFDG544 0	RCFDG545 0	M.1.b.

Dollar amounts in thousands			
c. Disclose component and the dollar amount of that component:			M.1.c.
1. Describe component	TEXTG546		M.1.c.1.

Dollar amounts in thousands	(Column A) Total Fair Value Reported on Schedule RC	(Column B) LESS: Amounts Netted in the Determination of Total Fair Value	(Column C) Level 1 Fair Value Measurements	(Column D) Level 2 Fair Value Measurements	(Column E) Level 3 Fair Value Measurements	
2. Amount of component	RCFDG546 0	RCFDG547 0	RCFDG548 0	RCFDG549 0	RCFDG550 0	M.1.c.2.

Dollar amounts in thousands			
d. Disclose component and the dollar amount of that component:			M.1.d.
1. Describe component	TEXTG551		M.1.d.1.

Dollar amounts in thousands	(Column A) Total Fair Value Reported on Schedule RC	(Column B) LESS: Amounts Netted in the Determination of Total Fair Value	(Column C) Level 1 Fair Value Measurements	(Column D) Level 2 Fair Value Measurements	(Column E) Level 3 Fair Value Measurements	
2. Amount of component	RCFDG551 0	RCFDG552 0	RCFDG553 0	RCFDG554 0	RCFDG555 0	M.1.d.2.

Dollar amounts in thousands			
e. Disclose component and the dollar amount of that component:			M.1.e.
1. Describe component	TEXTG556		M.1.e.1.

Dollar amounts in thousands	(Column A) Total Fair Value Reported on Schedule RC	(Column B) LESS: Amounts Netted in the Determination of Total Fair Value	(Column C) Level 1 Fair Value Measurements	(Column D) Level 2 Fair Value Measurements	(Column E) Level 3 Fair Value Measurements	
2. Amount of component	RCFDG556 0	RCFDG557 0	RCFDG558 0	RCFDG559 0	RCFDG560 0	M.1.e.2.

Dollar amounts in thousands			
f. Disclose component and the dollar amount of that component:			M.1.f.
1. Describe component	TEXTG561		M.1.f.1.

Dollar amounts in thousands	(Column A) Total Fair Value Reported on Schedule RC	(Column B) LESS: Amounts Netted in the Determination of Total Fair Value	(Column C) Level 1 Fair Value Measurements	(Column D) Level 2 Fair Value Measurements	(Column E) Level 3 Fair Value Measurements	
2. Amount of component	RCFDG561 0	RCFDG562 0	RCFDG563 0	RCFDG564 0	RCFDG565 0	M.1.f.2.
2. All other liabilities (itemize and describe amounts included in Schedule RC-Q, item 13, that are greater than $100,000 and exceed 25% of item 13):						M.2.
a. Loan commitments (not accounted for as derivatives)	RCFDF261 0	RCFDF689 0	RCFDF697 0	RCFDF262 0	RCFDF263 0	M.2.a.
b. Nontrading derivative liabilities	RCFDG566 0	RCFDG567 0	RCFDG568 0	RCFDG569 0	RCFDG570 0	M.2.b.

Dollar amounts in thousands			
c. Disclose component and the dollar amount of that component:			M.2.c.
1. Describe component	TEXTG571		M.2.c.1.

Dollar amounts in thousands	(Column A) Total Fair Value Reported on Schedule RC	(Column B) LESS: Amounts Netted in the Determination of Total Fair Value	(Column C) Level 1 Fair Value Measurements	(Column D) Level 2 Fair Value Measurements	(Column E) Level 3 Fair Value Measurements	
2. Amount of component	RCFDG571 0	RCFDG572 0	RCFDG573 0	RCFDG574 0	RCFDG575 0	M.2.c.2.

Dollar amounts in thousands			
d. Disclose component and the dollar amount of that component:			M.2.d.
1. Describe component	TEXTG576		M.2.d.1.

1. For institutions that have adopted ASU 2016-01, which includes provisions governing the accounting for investments in equity securities, the amount reported in item 1, column A, must equal the sum of Schedule RC, items 2.b and 2.c. For institutions that have not adopted ASU 2016-01, the amount reported in item 1, column A, must equal Schedule RC, item 2.b.

Dollar amounts in thousands	(Column A) Total Fair Value Reported on Schedule RC	(Column B) LESS: Amounts Netted in the Determination of Total Fair Value	(Column C) Level 1 Fair Value Measurements	(Column D) Level 2 Fair Value Measurements	(Column E) Level 3 Fair Value Measurements	
2. Amount of component	RCFDG576 0	RCFDG577 0	RCFDG578 0	RCFDG579 0	RCFDG580 0	M.2.d.2.

Dollar amounts in thousands			
e. Disclose component and the dollar amount of that component:			M.2.e.
1. Describe component	TEXTG581		M.2.e.1.

Dollar amounts in thousands	(Column A) Total Fair Value Reported on Schedule RC	(Column B) LESS: Amounts Netted in the Determination of Total Fair Value	(Column C) Level 1 Fair Value Measurements	(Column D) Level 2 Fair Value Measurements	(Column E) Level 3 Fair Value Measurements	
2. Amount of component	RCFDG581 0	RCFDG582 0	RCFDG583 0	RCFDG584 0	RCFDG585 0	M.2.e.2.

Dollar amounts in thousands			
f. Disclose component and the dollar amount of that component:			M.2.f.
1. Describe component (TEXTG586)			M.2.f.1.

Dollar amounts in thousands	(Column A) Total Fair Value Reported on Schedule RC	(Column B) LESS: Amounts Netted in the Determination of Total Fair Value	(Column C) Level 1 Fair Value Measurements	(Column D) Level 2 Fair Value Measurements	(Column E) Level 3 Fair Value Measurements	
2. Amount of component	RCFDG586 0	RCFDG587 0	RCFDG588 0	RCFDG589 0	RCFDG590 0	M.2.f.2.

Dollar amounts in thousands	(Column A) Consolidated Bank		(Column B) Domestic Offices		
3. Loans measured at fair value (included in Schedule RC-C, Part I, items 1 through 9):					M.3.
a. Loans secured by real estate:	RCFDF608	2,487,000			M.3.a.
1. Construction, land development, and other land loans			RCONF578	1,436,000	M.3.a.1.
2. Secured by farmland (including farm residential and other improvements)			RCONF579	0	M.3.a.2.
3. Secured by 1-4 family residential properties:					M.3.a.3.
a. Revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit			RCONF580	227,000	M.3.a.3.a.
b. Closed-end loans secured by 1-4 family residential properties:					M.3.a.3.b.
1. Secured by first liens			RCONF581	0	M.3.a.3.b.1.
2. Secured by junior liens			RCONF582	0	M.3.a.3.b.2.
4. Secured by multifamily (5 or more) residential properties			RCONF583	49,000	M.3.a.4.
5. Secured by nonfarm nonresidential properties			RCONF584	601,000	M.3.a.5.
b. Commercial and industrial loans	RCFDF585	386,000	RCONF585	0	M.3.b.
c. Loans to individuals for household, family, and other personal expenditures (i.e., consumer loans) (includes purchased paper):					M.3.c.
1. Credit cards	RCFDF586	0	RCONF586	0	M.3.c.1.
2. Other revolving credit plans	RCFDF587	0	RCONF587	0	M.3.c.2.
3. Automobile loans	RCFDK196	0	RCONK196	0	M.3.c.3.
4. Other consumer loans	RCFDK208	0	RCONK208	0	M.3.c.4.
d. Other loans	RCFDF589	34,000	RCONF589	34,000	M.3.d.
4. Unpaid principal balance of loans measured at fair value (reported in Schedule RC-Q, Memorandum item 3):					M.4.
a. Loans secured by real estate:	RCFDF609	2,573,000			M.4.a.
1. Construction, land development, and other land loans			RCONF590	1,468,000	M.4.a.1.
2. Secured by farmland (including farm residential and other improvements)			RCONF591	0	M.4.a.2.
3. Secured by 1-4 family residential properties:					M.4.a.3.
a. Revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit			RCONF592	236,000	M.4.a.3.a.
b. Closed-end loans secured by 1-4 family residential properties:					M.4.a.3.b.
1. Secured by first liens			RCONF593	0	M.4.a.3.b.1.
2. Secured by junior liens			RCONF594	0	M.4.a.3.b.2.
4. Secured by multifamily (5 or more) residential properties			RCONF595	49,000	M.4.a.4.
5. Secured by nonfarm nonresidential properties			RCONF596	606,000	M.4.a.5.
b. Commercial and industrial loans	RCFDF597	387,000	RCONF597	0	M.4.b.
c. Loans to individuals for household, family, and other personal expenditures (i.e., consumer loans) (includes purchased paper):					M.4.c.
1. Credit cards	RCFDF598	0	RCONF598	0	M.4.c.1.
2. Other revolving credit plans	RCFDF599	0	RCONF599	0	M.4.c.2.
3. Automobile loans	RCFDK195	0	RCONK195	0	M.4.c.3.
4. Other consumer loans	RCFDK209	0	RCONK209	0	M.4.c.4.
d. Other loans	RCFDF601	34,000	RCONF601	34,000	M.4.d.

Schedule RC-R Part I - Regulatory Capital Components and Ratios

Part I is to be completed on a consolidated basis.

Dollar amounts in thousands			
1. Common stock plus related surplus, net of treasury stock and unearned employee stock ownership plan (ESOP) shares	RCFAP742	100,917,000	1.
2. Retained earnings	RCFD3632	114,732,000	2.
3. Accumulated other comprehensive income (AOCI)	RCFAB530	-844,000	3.
a. AOCI opt-out election (enter "1" for Yes; enter "0" for No.) (Advanced approaches institutions must enter "0" for No.)	RCOAP838	0	3.a.
4. Common equity tier 1 minority interest includable in common equity tier 1 capital	RCFAP839	0	4.
5. Common equity tier 1 capital before adjustments and deductions (sum of items 1 through 4)	RCFAP840	214,805,000	5.
6. LESS: Goodwill net of associated deferred tax liabilities (DTLs)	RCFAP841	26,169,000	6.
7. LESS: Intangible assets (other than goodwill and mortgage servicing assets (MSAs)), net of associated DTLs	RCFAP842	150,000	7.
8. LESS: Deferred tax assets (DTAs) that arise from net operating loss and tax credit carryforwards, net of any related valuation allowances and net of DTLs	RCFAP843	20,000	8.
9. AOCI-related adjustments (items 9.a through 9.e are effective January 1, 2015) (if entered "1" for Yes in item 3.a, complete only items 9.a through 9.e; if entered "0" for No in item 3.a, complete only item 9.f):			9.
a. LESS: Net unrealized gains (losses) on available-for-sale securities (if a gain, report as a positive value; if a loss, report as a negative value)	RCFAP844	NR	9.a.
b. LESS: Net unrealized loss on available-for-sale preferred stock classified as an equity security under GAAP and available-for-sale equity exposures (report loss as a positive value)	RCFAP845	NR	9.b.
c. LESS: Accumulated net gains (losses) on cash flow hedges (if a gain, report as a positive value; if a loss, report as a negative value)	RCFAP846	NR	9.c.
d. LESS: Amounts recorded in AOCI attributed to defined benefit postretirement plans resulting from the initial and subsequent application of the relevant GAAP standards that pertain to such plans (if a gain, report as a positive value; if a loss, report as a negative value)	RCFAP847	NR	9.d.
e. LESS: Net unrealized gains (losses) on held-to-maturity securities that are included in AOCI (if a gain, report as a positive value; if a loss, report as a negative value)	RCFAP848	NR	9.e.
f. LESS: Accumulated net gain (loss) on cash flow hedges included in AOCI, net of applicable income taxes, that relate to the hedging of items that are not recognized at fair value on the balance sheet (if a gain, report as a positive value; if a loss, report as a negative value) (To be completed only by institutions that entered "0" for No in item 3.a)	RCFAP849	20,000	9.f.
10. Other deductions from (additions to) common equity tier 1 capital before threshold-based deductions:			10.
a. LESS: Unrealized net gain (loss) related to changes in the fair value of liabilities that are due to changes in own credit risk (if a gain, report as a positive value; if a loss, report as a negative value)	RCFAQ258	223,000	10.a.
b. LESS: All other deductions from (additions to) common equity tier 1 capital before threshold-based deductions.	RCFAP850	246,000	10.b.
11. LESS: Non-significant investments in the capital of unconsolidated financial institutions in the form of common stock that exceed the 10 percent threshold for non-significant investments	RCFAP851	0	11.
12. Subtotal (item 5 minus items 6 through 11)	RCFAP852	187,977,000	12.
13. LESS: Significant investments in the capital of unconsolidated financial institutions in the form of common stock, net of associated DTLs, that exceed the 10 percent common equity tier 1 capital deduction threshold	RCFAP853	0	13.
14. LESS: MSAs, net of associated DTLs, that exceed the 10 percent common equity tier 1 capital deduction threshold	RCFAP854	0	14.
15. LESS: DTAs arising from temporary differences that could not be realized through net operating loss carrybacks, net of related valuation allowances and net of DTLs, that exceed the 10 percent common equity tier 1 capital deduction threshold	RCFAP855	0	15.
16. LESS: Amount of significant investments in the capital of unconsolidated financial institutions in the form of common stock, net of associated DTLs; MSAs, net of associated DTLs; and DTAs arising from temporary differences that could not be realized through net operating loss carrybacks, net of related valuation allowances and net of DTLs; that exceeds the 15 percent common equity tier 1 capital deduction threshold	RCFAP856	0	16.
17. LESS: Deductions applied to common equity tier 1 capital due to insufficient amounts of additional tier 1 capital and tier 2 capital to cover deductions	RCFAP857	74,000	17.
18. Total adjustments and deductions for common equity tier 1 capital (sum of items 13 through 17)	RCFAP858	74,000	18.
19. Common equity tier 1 capital (item 12 minus item 18)	RCFAP859	187,903,000	19.
20. Additional tier 1 capital instruments plus related surplus	RCFAP860	0	20.
21. Non-qualifying capital instruments subject to phase out from additional tier 1 capital	RCFAP861	0	21.
22. Tier 1 minority interest not included in common equity tier 1 capital	RCFAP862	20,000	22.
23. Additional tier 1 capital before deductions (sum of items 20, 21, and 22)	RCFAP863	20,000	23.
24. LESS: Additional tier 1 capital deductions	RCFAP864	94,000	24.
25. Additional tier 1 capital (greater of item 23 minus item 24, or zero)	RCFAP865	0	25.
26. Tier 1 capital (sum of items 19 and 25)	RCFA8274	187,903,000	26.
27. Tier 2 capital instruments plus related surplus	RCFAP866	304,000	27.

Dollar amounts in thousands			
28. Non-qualifying capital instruments subject to phase out from tier 2 capital	RCFAP867	**0**	28.
29. Total capital minority interest that is not included in tier 1 capital	RCFAP868	**6,000**	29.
30. Allowance for loan and lease losses and eligible credit reserves includable in tier 2 capital			30.
a. Allowance for loan and lease losses includable in tier 2 capital	RCFA5310	**11,058,000**	30.a.
b. (Advanced approaches institutions that exit parallel run only): Eligible credit reserves includable in tier 2 capital.	RCFW5310	**4,886,000**	30.b.
31. Unrealized gains on available-for-sale preferred stock classified as an equity security under GAAP and available-for-sale equity exposures includable in tier 2 capital	RCFAQ257	**NR**	31.
32. Tier 2 capital before deductions			32.
a. Tier 2 capital before deductions (sum of items 27 through 30.a, plus item 31)	RCFAP870	**11,368,000**	32.a.
b. (Advanced approaches institutions that exit parallel run only): Tier 2 capital before deductions (sum of items 27 through 29, plus items 30.b and 31)	RCFWP870	**5,196,000**	32.b.
33. LESS: Tier 2 capital deductions	RCFAP872	**0**	33.
34. Tier 2 capital			34.
a. Tier 2 capital (greater of item 32.a minus item 33, or zero)	RCFA5311	**11,368,000**	34.a.
b. (Advanced approaches institutions that exit parallel run only): Tier 2 capital (greater of item 32.b minus item 33, or zero)	RCFW5311	**5,196,000**	34.b.
35. Total capital			35.
a. Total capital (sum of items 26 and 34.a)	RCFA3792	**199,271,000**	35.a.
b. (Advanced approaches institutions that exit parallel run only): Total capital (sum of items 26 and 34.b)	RCFW3792	**193,099,000**	35.b.
36. Average total consolidated assets	RCFD3368	**2,160,698,000**	36.
37. LESS: Deductions from common equity tier 1 capital and additional tier 1 capital (sum of items 6, 7, 8, 10.b, 11, 13 through 17, and certain elements of item 24 - see instructions)	RCFAP875	**26,680,000**	37.
38. LESS: Other deductions from (additions to) assets for leverage ratio purposes	RCFAB596	**-2,219,000**	38.
39. Total assets for the leverage ratio (item 36 minus items 37 and 38)	RCFAA224	**2,136,237,000**	39.
40. Total risk-weighted assets			40.
a. Total risk-weighted assets (from Schedule RC-R, Part II, item 31)	RCFAA223	**1,382,770,270**	40.a.
b. (Advanced approaches institutions that exit parallel run only): Total riskweighted assets using advanced approaches rule (from FFIEC 101 Schedule A, item 60)	RCFWA223	**1,260,775,000**	40.b.

Dollar amounts in thousands	(Column A) Percentage		(Column B) Percentage		
41. Common equity tier 1 capital ratio (Column A: item 19 divided by item 40.a) (Advanced approaches institutions that exit parallel run only: Column B: item 19 divided by item 40.b)	RCFAP793	**13.5889%**	RCFWP793	**14.9038%**	41.
42. Tier 1 capital ratio (Column A: item 26 divided by item 40.a) (Advanced approaches institutions that exit parallel run only: Column B: item 26 divided by item 40.b)	RCFA7206	**13.5889%**	RCFW7206	**14.9038%**	42.
43. Total capital ratio (Column A: item 35.a divided by item 40.a) (Advanced approaches institutions that exit parallel run only: Column B: item 35.b divided by item 40.b)	RCFA7205	**14.4110%**	RCFW7205	**15.3159%**	43.

Dollar amounts in thousands			
44. Tier 1 leverage ratio (item 26 divided by item 39)	RCFA7204	**8.7960%**	44.
45. Advanced approaches institutions only: Supplementary leverage ratio information:			45.
a. Total leverage exposure	RCFAH015	**2,799,403,000**	45.a.
b. Supplementary leverage ratio	RCFAH036	**6.7123%**	45.b.
46. Institution-specific capital buffer necessary to avoid limitations on distributions and discretionary bonus payments:			46.
a. Capital conservation buffer	RCFAH311	**6.4110%**	46.a.
b. (Advanced approaches institutions that exit parallel run only): Total applicable capital buffer	RCFWH312	**6.3750%**	46.b.
Institutions must complete items 47 and 48 if the amount in item 46.a (or the lower of item 46.a or 46.b for an advanced approaches institution that has exited parallel run) is less than or equal to the applicable minimum capital conservation buffer: 47. Eligible retained income	RCFAH313	**NR**	47.
48. Distributions and discretionary bonus payments during the quarter (effective January 1, 2016)	RCFAH314	**NR**	48.

Schedule RC-R Part II - Risk-Weighted Assets

Institutions are required to assign a 100 percent risk weight to all assets not specifically assigned a risk weight under Subpart D of the federal banking agencies' regulatory capital rules and not deducted from tier 1 or tier 2 capital.

Dollar amounts in thousands	(Column A) Totals from Schedule RC	(Column B) Adjustments to Totals Reported in Column A	(Column C) Allocation by Risk-Weight Category 0%	(Column D) Allocation by Risk-Weight Category 2%	(Column E) Allocation by Risk-Weight Category 4%	(Column F) Allocation by Risk-Weight Category 10%	(Column G) Allocation by Risk-Weight Category 20%	(Column H) Allocation by Risk-Weight Category 50%	(Column I) Allocation by Risk-Weight Category 100%	(Column J) Allocation by Risk-Weight Category 150%	
1. Cash and balances due from depository institutions	RCFDD957 445,217,000	RCFDS396 0	RCFDD958 367,628,000				RCFDD959 71,656,000	RCFDS397 3,674,000	RCFDD960 1,096,000	RCFDS398 1,163,000	1.
2. Securities:											2.
a. Held-to-maturity securities	RCFDD961 29,042,000	RCFDS399 0	RCFDD962 6,084,000	RCFDHJ74 0	RCFDHJ75 0		RCFDD963 20,687,000	RCFDD964 2,271,000	RCFDD965 0	RCFDS400 0	2.a.
b. Available-for-sale debt securities and equity securities with readily determinable fair values not held for trading	RCFDJA21 159,658,000	RCFDS402 0	RCFDD967 69,464,000	RCFDHJ76 0	RCFDHJ77 0		RCFDD968 58,798,000	RCFDD969 28,838,000	RCFDD970 2,558,000	RCFDS403 0	2.b.
3. Federal funds sold and securities purchased under agreements to resell:											3.
a. Federal funds sold in domestic offices	RCOND971 2,348,000		RCOND972 0				RCOND973 2,348,000	RCONS410 0	RCOND974 0	RCONS411 0	3.a.
b. Securities purchased under agreements to resell	RCFDH171 237,918,000	RCFDH172 237,918,000									3.b.
4. Loans and leases held for sale:											4.
a. Residential mortgage exposures	RCFDS413 152,000	RCFDS414 0	RCFDH173 0				RCFDS415 119,000	RCFDS416 0	RCFDS417 33,000		4.a.
b. High volatility commercial real estate exposures	RCFDS419 0	RCFDS420 0	RCFDH174 0				RCFDH175 0	RCFDH176 0	RCFDH177 0	RCFDS421 0	4.b.
c. Exposures past due 90 days or more or on nonaccrual[3]	RCFDS423 30,000	RCFDS424 0	RCFDS425 0	RCFDHJ78 0	RCFDHJ79 0		RCFDS426 0	RCFDS427 0	RCFDS428 0	RCFDS429 30,000	4.c.

Dollar amounts in thousands	(Column K) Allocation by Risk-Weight Category 250%	(Column L) Allocation by Risk-Weight Category 300%	(Column M) Allocation by Risk-Weight Category 400%	(Column N) Allocation by Risk-Weight Category 600%	(Column O) Allocation by Risk-Weight Category 625%	(Column P) Allocation by Risk-Weight Category 937.5%	(Column Q) Allocation by Risk-Weight Category 1,250%	(Column R) Application of Other Risk-Weighting Approaches Exposure Amount	(Column S) Application of Other Risk-Weighting Approaches Risk-Weighted Asset Amount	
1. Cash and balances due from depository institutions										1.
2. Securities:										2.
a. Held-to-maturity securities										2.a.
b. Available-for-sale debt securities and equity securities with readily determinable fair values not held for trading	RCFDH270 0	RCFDS405 0		RCFDS406 0				RCFDH271 0	RCFDH272 0	2.b.
3. Federal funds sold and securities purchased under agreements to resell:										3.
a. Federal funds sold in domestic offices										3.a.
b. Securities purchased under agreements to resell										3.b.

3. For loans and leases held for sale, exclude residential mortgage exposures, high volatility commercial real estate exposures, or sovereign exposures that are past due 90 days or more or on nonaccrual.

Dollar amounts in thousands	(Column K) Allocation by Risk-Weight Category 250%	(Column L) Allocation by Risk-Weight Category 300%	(Column M) Allocation by Risk-Weight Category 400%	(Column N) Allocation by Risk-Weight Category 600%	(Column O) Allocation by Risk-Weight Category 625%	(Column P) Allocation by Risk-Weight Category 937.5%	(Column Q) Allocation by Risk-Weight Category 1,250%	(Column R) Application of Other Risk-Weighting Approaches Exposure Amount	(Column S) Application of Other Risk-Weighting Approaches Risk-Weighted Asset Amount	
4. Loans and leases held for sale:										4.
a. Residential mortgage exposures..								RCFDH273 0	RCFDH274 0	4.a.
b. High volatility commercial real estate exposures................								RCFDH275 0	RCFDH276 0	4.b.

Dollar amounts in thousands	(Column K) Allocation by Risk-Weight Category 250%	(Column L) Allocation by Risk-Weight Category 300%	(Column M) Allocation by Risk-Weight Category 400%	(Column N) Allocation by Risk-Weight Category 600%	(Column O) Allocation by Risk-Weight Category 625%	(Column P) Allocation by Risk-Weight Category 937.5%	(Column Q) Allocation by Risk-Weight Category 1,250%	(Column R) Application of Other Risk-Weighting Approaches Exposure Amount	(Column S) Application of Other Risk-Weighting Approaches Risk-Weighted Asset Amount	
c. Exposures past due 90 days or more or on nonaccrual[6]								RCFDH277 0	RCFDH278 0	4.c.

Dollar amounts in thousands	(Column A) Totals from Schedule RC	(Column B) Adjustments to Totals Reported in Column A	(Column C) Allocation by Risk-Weight Category 0%	(Column D) Allocation by Risk-Weight Category 2%	(Column E) Allocation by Risk-Weight Category 4%	(Column F) Allocation by Risk-Weight Category 10%	(Column G) Allocation by Risk-Weight Category 20%	(Column H) Allocation by Risk-Weight Category 50%	(Column I) Allocation by Risk-Weight Category 100%	(Column J) Allocation by Risk-Weight Category 150%	
4. Loans and leases held for sale (continued):											4.
d. All other exposures	RCFDS431 5,723,000	RCFDS432 -24,000	RCFDS433 0	RCFDHJ80 0	RCFDHJ81 0		RCFDS434 160,000	RCFDS435 150,000	RCFDS436 5,402,000	RCFDS437 35,000	4.d.
5. Loans and leases held for investment:											5.
a. Residential mortgage exposures	RCFDS439 338,314,000	RCFDS440 0	RCFDH178 2,000				RCFDS441 8,663,000	RCFDS442 280,777,000	RCFDS443 48,872,000		5.a.
b. High volatility commercial real estate exposures	RCFDS445 2,151,000	RCFDS446 0	RCFDH179 0				RCFDH180 0	RCFDH181 0	RCFDH182 158,000	RCFDS447 1,993,000	5.b.
c. Exposures past due 90 days or more or on nonaccrual[7]	RCFDS449 2,309,000	RCFDS450 0	RCFDS451 0	RCFDHJ82 0	RCFDHJ83 0		RCFDS452 13,000	RCFDS453 0	RCFDS454 0	RCFDS455 2,296,000	5.c.
d. All other exposures	RCFDS457 457,659,000	RCFDS458 -88,000	RCFDS459 9,943,000	RCFDHJ84 2,000	RCFDHJ85 0		RCFDS460 18,966,000	RCFDS461 7,979,000	RCFDS462 416,459,000	RCFDS463 2,524,000	5.d.
6. LESS: Allowance for loan and lease losses	RCFD3123 9,952,000	RCFD3123 9,952,000									6.
7. Trading assets	RCFDD976 265,011,000	RCFDS466 229,770,000	RCFDD977 701,000	RCFDHJ86 0	RCFDHJ87 0		RCFDD978 940,000	RCFDD979 14,941,000	RCFDD980 17,164,000	RCFDS467 1,215,000	7.
8. All other assets[8]	RCFDD981 171,395,000	RCFDS469 54,820,000	RCFDD982 10,089,000	RCFDHJ88 0	RCFDHJ89 0		RCFDD983 4,861,000	RCFDD984 1,626,000	RCFDD985 80,334,000	RCFDH185 825,000	8.
a. Separate account bank-owned life insurance											8.a.
b. Default fund contributions to central counterparties											8.b.

Dollar amounts in thousands	(Column K) Allocation by Risk-Weight Category 250%	(Column L) Allocation by Risk-Weight Category 300%	(Column M) Allocation by Risk-Weight Category 400%	(Column N) Allocation by Risk-Weight Category 600%	(Column O) Allocation by Risk-Weight Category 625%	(Column P) Allocation by Risk-Weight Category 937.5%	(Column Q) Allocation by Risk-Weight Category 1,250%	(Column R) Application of Other Risk-Weighting Approaches Exposure Amount	(Column S) Application of Other Risk-Weighting Approaches Risk-Weighted Asset Amount	
4. Loans and leases held for sale (continued):										4.
d. All other exposures								RCFDH279 0	RCFDH280 0	4.d.
5. Loans and leases held for investment:										5.
a. Residential mortgage exposures								RCFDH281 0	RCFDH282 0	5.a.
b. High volatility commercial real estate exposures								RCFDH283 0	RCFDH284 0	5.b.
c. Exposures past due 90 days or more or on nonaccrual[11]								RCFDH285 0	RCFDH286 0	5.c.
d. All other exposures								RCFDH287 1,874,000	RCFDH288 2,925,000	5.d.
6. LESS: Allowance for loan and lease losses										6.
7. Trading assets	RCFDH289 29,000	RCFDH186 0	RCFDH290 0	RCFDH187 6,000				RCFDH291 245,000	RCFDH292 634,000	7.
8. All other assets[12]	RCFDH293 6,515,000	RCFDH188 0	RCFDS470 0	RCFDS471 0				RCFDH294 3,323,000	RCFDH295 2,940,000	8.
a. Separate account bank-owned life insurance								RCFDH296 5,301,000	RCFDH297 2,386,000	8.a.
b. Default fund contributions to central counterparties								RCFDH298 3,701,000	RCFDH299 3,200,000	8.b.

6. For loans and leases held for sale, exclude residential mortgage exposures, high volatility commercial real estate exposures, or sovereign exposures that are past due 90 days or more or on nonaccrual.
7. For loans and leases, net of unearned income, exclude residential mortgage exposures, high volatility commercial real estate exposures, or sovereign exposures that are past due 90 days or more or on nonaccrual.
8. Includes premises and fixed assets; other real estate owned; investments in unconsolidated subsidiaries and associated companies; direct and indirect investments in real estate ventures; intangible assets; and other assets.
11. For loans and leases, net of unearned income, exclude residential mortgage exposures, high volatility commercial real estate exposures, or sovereign exposures that are past due 90 days or more or on nonaccrual.
12. Includes premises and fixed assets; other real estate owned; investments in unconsolidated subsidiaries and associated companies; direct and indirect investments in real estate ventures; intangible assets; and other assets.

Dollar amounts in thousands	(Column A) Totals	(Column B) Adjustments to Totals Reported in Column A	(Column Q) Exposure Amount 1,250%	(Column T) Total Risk-Weighted Asset Amount by Calculation Methodology SSFA	(Column U) Total Risk-Weighted Asset Amount by Calculation Methodology Gross-Up	
9. On-balance sheet securitization exposures:						9.
a. Held-to-maturity securities	RCFDS475 0	RCFDS476 0	RCFDS477 0	RCFDS478 0	RCFDS479 0	9.a.
b. Available-for-sale securities	RCFDS480 47,203,000	RCFDS481 47,202,000	RCFDS482 1,000	RCFDS483 9,516,000	RCFDS484 0	9.b.
c. Trading assets	RCFDS485 5,563,000	RCFDS486 5,555,000	RCFDS487 8,000	RCFDS488 1,167,000	RCFDS489 0	9.c.
d. All other on-balance sheet securitization exposures	RCFDS490 38,555,000	RCFDS491 38,536,000	RCFDS492 19,000	RCFDS493 8,956,000	RCFDS494 0	9.d.
10. Off-balance sheet securitization exposures	RCFDS495 18,370,000	RCFDS496 18,217,000	RCFDS497 153,000	RCFDS498 4,033,000	RCFDS499 0	10.

Dollar amounts in thousands	(Column A) Totals From Schedule RC	(Column B) Adjustments to Totals Reported in Column A	(Column C) Allocation by Risk-Weight Category 0%	(Column D) Allocation by Risk-Weight Category 2%	(Column E) Allocation by Risk-Weight Category 4%	(Column F) Allocation by Risk-Weight Category 10%	(Column G) Allocation by Risk-Weight Category 20%	(Column H) Allocation by Risk-Weight Category 50%	(Column I) Allocation by Risk-Weight Category 100%	(Column J) Allocation by Risk-Weight Category 150%	
11. Total balance sheet assets[14]	RCFD2170 2,198,296,000	RCFDS500 603,737,000	RCFDD987 463,911,000	RCFDHJ90 2,000	RCFDHJ91 0		RCFDD988 187,211,000	RCFDD989 340,256,000	RCFDD990 572,076,000	RCFDS503 10,081,000	11.

Dollar amounts in thousands	(Column K) Allocation by Risk-Weight Category 250%	(Column L) Allocation by Risk-Weight Category 300%	(Column M) Allocation by Risk-Weight Category 400%	(Column N) Allocation by Risk-Weight Category 600%	(Column O) Allocation by Risk-Weight Category 625%	(Column P) Allocation by Risk-Weight Category 937.5%	(Column Q) Allocation by Risk-Weight Category 1,250%	(Column R) Application of Other Risk-Weighting Approaches Exposure Amount	
11. Total balance sheet assets[14]	RCFDS504 6,544,000	RCFDS505 0	RCFDS506 0	RCFDS507 6,000			RCFDS510 28,000	RCFDH300 14,444,000	11.

Dollar amounts in thousands	(Column A) Face, Notional, or Other Amount	(Column B) Credit Equivalent Amount	(Column C) Allocation by Risk-Weight Category 0%	(Column D) Allocation by Risk-Weight Category 2%	(Column E) Allocation by Risk-Weight Category 4%	(Column F) Allocation by Risk-Weight Category 10%	(Column G) Allocation by Risk-Weight Category 20%	(Column H) Allocation by Risk-Weight Category 50%	(Column I) Allocation by Risk-Weight Category 100%	(Column J) Allocation by Risk-Weight Category 150%	
12. Financial standby letters of credit	RCFDD991 66,394,000	RCFDD992 66,394,000	RCFDD993 447,000	RCFDHJ92 0	RCFDHJ93 0		RCFDD994 39,317,000	RCFDD995 1,982,000	RCFDD996 24,122,000	RCFDS511 526,000	12.
13. Performance standby letters of credit and transaction-related contingent items	RCFDD997 10,816,000	RCFDD998 5,408,000	RCFDD999 303,000				RCFDG603 1,589,000	RCFDG604 244,000	RCFDG605 3,151,000	RCFDS512 121,000	13.
14. Commercial and similar letters of credit with an original maturity of one year or less	RCFDG606 0	RCFDG607 0	RCFDG608 0	RCFDHJ94 0	RCFDHJ95 0		RCFDG609 0	RCFDG610 0	RCFDG611 0	RCFDS513 0	14.
15. Retained recourse on small business obligations sold with recourse	RCFDG612 0	RCFDG613 0	RCFDG614 0				RCFDG615 0	RCFDG616 0	RCFDG617 0	RCFDS514 0	15.

Dollar amounts in thousands	(Column A) Face, Notional, or Other Amount	(Column B) Credit Equivalent Amount	(Column C) Allocation by Risk-Weight Category 0%	(Column D) Allocation by Risk-Weight Category 2%	(Column E) Allocation by Risk-Weight Category 4%	(Column F) Allocation by Risk-Weight Category 10%	(Column G) Allocation by Risk-Weight Category 20%	(Column H) Allocation by Risk-Weight Category 50%	(Column I) Allocation by Risk-Weight Category 100%	(Column J) Allocation by Risk-Weight Category 150%	
16. Repo-style transactions[21]	RCFDS515 108,364,000	RCFDS516 108,364,000	RCFDS517 12,050,000	RCFDS518 16,598,000	RCFDS519 0		RCFDS520 18,526,000	RCFDS521 1,842,000	RCFDS522 54,237,000	RCFDS523 5,111,000	16.
17. All other off-balance sheet liabilities	RCFDG618 67,920,000	RCFDG619 67,920,000	RCFDG620 67,827,000				RCFDG621 7,000	RCFDG622 74,000	RCFDG623 12,000	RCFDS524 0	17.
18. Unused commitments:[*]											18.
a. Original maturity of one year or less	RCFDS525 72,775,000	RCFDS526 14,555,000	RCFDS527 3,000	RCFDHJ96 0	RCFDHJ97 0		RCFDS528 881,000	RCFDS529 37,000	RCFDS530 12,917,000	RCFDS531 717,000	18.a.

14. For each of columns A through R of item 11, report the sum of items 1 through 9. For item 11, the sum of columns B through R must equal column A. Item 11, column A, must equal Schedule RC, item 12.
21. Includes securities purchased under agreements to resell (reverse repos), securities sold under agreements to repurchase (repos), securities borrowed, and securities lent.
*. Excludes unused commitments to asset-backed commercial paper conduits.

Dollar amounts in thousands	(Column A) Face, Notional, or Other Amount	(Column B) Credit Equivalent Amount	(Column C) Allocation by Risk-Weight Category 0%	(Column D) Allocation by Risk-Weight Category 2%	(Column E) Allocation by Risk-Weight Category 4%	(Column F) Allocation by Risk-Weight Category 10%	(Column G) Allocation by Risk-Weight Category 20%	(Column H) Allocation by Risk-Weight Category 50%	(Column I) Allocation by Risk-Weight Category 100%	(Column J) Allocation by Risk-Weight Category 150%	
b. Original maturity exceeding one year	RCFDG624 336,974,000	RCFDG625 168,487,000	RCFDG626 720,000	RCFDHJ98 284,000	RCFDHJ99 0		RCFDG627 23,155,000	RCFDG628 4,600,000	RCFDG629 136,721,000	RCFDS539 3,007,000	18.b.
19. Unconditionally cancelable commitments	RCFDS540 41,221,000	RCFDS541 0									19.
20. Over-the-counter derivatives		RCFDS542 273,614,000	RCFDS543 23,792,000	RCFDHK00 0	RCFDHK01 0	RCFDS544 0	RCFDS545 99,628,000	RCFDS546 6,170,000	RCFDS547 142,447,000	RCFDS548 1,577,000	20.
21. Centrally cleared derivatives		RCFDS549 118,447,000	RCFDS550 0	RCFDS551 115,559,000	RCFDS552 1,484,000		RCFDS554 0	RCFDS555 0	RCFDS556 1,404,000	RCFDS557 0	21.
22. Unsettled transactions (failed trades)[22]	RCFDH191 748,000		RCFDH193 37,000				RCFDH194 0	RCFDH195 0	RCFDH196 682,000	RCFDH197 0	22.

22. For item 22, the sum of columns C through Q must equal column A.

Dollar amounts in thousands	(Column O) Allocation by Risk-Weight Category 625%	(Column P) Allocation by Risk-Weight Category 937.5%	(Column Q) Allocation by Risk-Weight Category 1,250%	(Column R) Application of Other Risk-Weighting Approaches Credit Equivalent Amount	(Column S) Application of Other Risk-Weighting Approaches Risk-Weighted Asset Amount	
16. Repo-style transactions[24]				RCFDH301 0	RCFDH302 0	16.
17. All other off-balance sheet liabilities						17.
18. Unused commitments:[*]						18.
a. Original maturity of one year or less				RCFDH303 0	RCFDH304 0	18.a.
b. Original maturity exceeding one year				RCFDH307 0	RCFDH308 0	18.b.
19. Unconditionally cancelable commitments						19.
20. Over-the-counter derivatives				RCFDH309 0	RCFDH310 0	20.
21. Centrally cleared derivatives						21.
22. Unsettled transactions (failed trades)[25]	RCFDH198 1,000	RCFDH199 0	RCFDH200 28,000			22.

24. Includes securities purchased under agreements to resell (reverse repos), securities sold under agreements to repurchase (repos), securities borrowed, and securities lent.
*. Excludes unused commitments to asset-backed commercial paper conduits.
25. For item 22, the sum of columns C through Q must equal column A.

Dollar amounts in thousands	(Column C) Allocation by Risk-Weight Category 0%	(Column D) Allocation by Risk-Weight Category 2%	(Column E) Allocation by Risk-Weight Category 4%	(Column F) Allocation by Risk-Weight Category 10%	(Column G) Allocation by Risk-Weight Category 20%	(Column H) Allocation by Risk-Weight Category 50%	(Column I) Allocation by Risk-Weight Category 100%	(Column J) Allocation by Risk-Weight Category 150%	
23. Total assets, derivatives, off-balance sheet items, and other items subject to risk weighting by risk-weight category (for each of columns C through P, sum of items 11 through 22; for column Q, sum of items 10 through 22)........	RCFDG630 569,090,000	RCFDS558 132,443,000	RCFDS559 1,484,000	RCFDS560 0	RCFDG631 370,314,000	RCFDG632 355,205,000	RCFDG633 947,769,000	RCFDS561 21,140,000	23.
24. Risk weight factor									24.
25. Risk-weighted assets by risk-weight category (for each column, item 23 multiplied by item 24)........	RCFDG634 0	RCFDS569 2,648,860	RCFDS570 59,360	RCFDS571 0	RCFDG635 74,062,800	RCFDG636 177,602,500	RCFDG637 947,769,000	RCFDS572 31,710,000	25.

Dollar amounts in thousands	(Column K) Allocation by Risk-Weight Category 250%	(Column L) Allocation by Risk-Weight Category 300%	(Column M) Allocation by Risk-Weight Category 400%	(Column N) Allocation by Risk-Weight Category 600%	(Column O) Allocation by Risk-Weight Category 625%	(Column P) Allocation by Risk-Weight Category 937.5%	(Column Q) Allocation by Risk-Weight Category 1,250%	
23. Total assets, derivatives, off-balance sheet items, and other items subject to risk weighting by risk-weight category (for each of columns C through P, sum of items 11 through 22; for column Q, sum of items 10 through 22)........	RCFDS562 6,544,000	RCFDS563 0	RCFDS564 0	RCFDS565 6,000	RCFDS566 1,000	RCFDS567 0	RCFDS568 209,000	23.
24. Risk weight factor								24.
25. Risk-weighted assets by risk-weight category (for each column, item 23 multiplied by item 24)........	RCFDS573 16,360,000	RCFDS574 0	RCFDS575 0	RCFDS576 36,000	RCFDS577 6,250	RCFDS578 0	RCFDS579 2,612,500	25.

Dollar amounts in thousands			
26. Risk-weighted assets base for purposes of calculating the allowance for loan and lease losses 1.25 percent threshold	RCFDS580	1,288,718,270	26.
27. Standardized market-risk weighted assets (applicable only to banks that are covered by the market risk capital rule)	RCFDS581	94,146,000	27.
28. Risk-weighted assets before deductions for excess allowance of loan and lease losses and allocated risk transfer risk reserve[27]	RCFDB704	1,382,770,270	28.
29. LESS: Excess allowance for loan and lease losses	RCFDA222	0	29.
30. LESS: Allocated transfer risk reserve	RCFD3128	0	30.
31. Total risk-weighted assets (item 28 minus items 29 and 30)	RCFDG641	1,382,770,270	31.
1. Current credit exposure across all derivative contracts covered by the regulatory capital rules	RCFDG642	139,975,000	M.1.

Dollar amounts in thousands	(Column A) With a remaining maturity of One year or less		(Column B) With a remaining maturity of Over one year through five years		(Column C) With a remaining maturity of Over five years		
2. Notional principal amounts of over-the-counter derivative contracts:							M.2.
a. Interest rate	RCFDS582	16,746,508,000	RCFDS583	10,334,545,000	RCFDS584	4,897,580,000	M.2.a.
b. Foreign exchange rate and gold	RCFDS585	8,805,071,000	RCFDS586	2,304,322,000	RCFDS587	1,146,364,000	M.2.b.
c. Credit (investment grade reference asset)	RCFDS588	223,775,000	RCFDS589	297,919,000	RCFDS590	79,769,000	M.2.c.
d. Credit (non-investment grade reference asset)	RCFDS591	165,789,000	RCFDS592	217,381,000	RCFDS593	51,472,000	M.2.d.
e. Equity	RCFDS594	1,193,320,000	RCFDS595	425,520,000	RCFDS596	96,113,000	M.2.e.
f. Precious metals (except gold)	RCFDS597	17,534,000	RCFDS598	591,000	RCFDS599	0	M.2.f.
g. Other	RCFDS600	771,474,000	RCFDS601	81,220,000	RCFDS602	6,737,000	M.2.g.
3. Notional principal amounts of centrally cleared derivative contracts:							M.3.
a. Interest rate	RCFDS603	12,965,066,000	RCFDS604	8,508,197,000	RCFDS605	4,240,511,000	M.3.a.
b. Foreign exchange rate and gold	RCFDS606	159,793,000	RCFDS607	1,304,000	RCFDS608	81,000	M.3.b.
c. Credit (investment grade reference asset)	RCFDS609	64,684,000	RCFDS610	246,560,000	RCFDS611	61,074,000	M.3.c.
d. Credit (non-investment grade reference asset)	RCFDS612	36,044,000	RCFDS613	144,869,000	RCFDS614	34,891,000	M.3.d.
e. Equity	RCFDS615	708,167,000	RCFDS616	137,178,000	RCFDS617	5,796,000	M.3.e.
f. Precious metals (except gold)	RCFDS618	0	RCFDS619	0	RCFDS620	0	M.3.f.
g. Other	RCFDS621	69,242,000	RCFDS622	6,150,000	RCFDS623	253,000	M.3.g.

27. Sum of items 2.b through 20, column S; items 9.a, 9.b, 9.c, 9.d, and 10, columns T and U; item 25, columns C through Q; and item 27 (if applicable).

Schedule RC-S - Servicing Securitization and Asset Sale Activities

Dollar amounts in thousands	(Column A) 1-4 Family Residential Loans	(Column B) Home Equity Lines	(Column C) Credit Card Receivables	(Column D) Auto Loans	(Column E) Other Consumer Loans	(Column F) Commercial and Industrial Loans	(Column G) All Other Loans, All Leases, and All Other Assets	
1. Outstanding principal balance of assets sold and securitized by the reporting bank with servicing retained or with recourse or other seller-provided credit enhancements	RCFDB705 129,776,000	RCFDB706 0	RCFDB707 0	RCFDB708 0	RCFDB709 740,000	RCFDB710 0	RCFDB711 8,743,000	1.
2. Maximum amount of credit exposure arising from recourse or other seller-provided credit enhancements provided to structures reported in item 1 in the form of:								2.
a. Credit-enhancing interest-only strips (included in Schedules RC-B or RC-F or in Schedule RC, item 5)	RCFDB712 0	RCFDB713 0	RCFDB714 0	RCFDB715 0	RCFDB716 0	RCFDB717 0	RCFDB718 0	2.a.
b. Subordinated securities and other residual interests	RCFDC393 306,000	RCFDC394 0	RCFDC395 0	RCFDC396 0	RCFDC397 0	RCFDC398 0	RCFDC399 893,000	2.b.
c. Standby letters of credit and other enhancements	RCFDC400 0	RCFDC401 0	RCFDC402 0	RCFDC403 0	RCFDC404 0	RCFDC405 0	RCFDC406 0	2.c.
3. Reporting bank's unused commitments to provide liquidity to structures reported in item 1	RCFDB726 0	RCFDB727 0	RCFDB728 0	RCFDB729 0	RCFDB730 0	RCFDB731 0	RCFDB732 0	3.
4. Past due loan amounts included in item 1:								4.
a. 30-89 days past due	RCFDB733 2,369,000	RCFDB734 0	RCFDB735 0	RCFDB736 0	RCFDB737 52,000	RCFDB738 0	RCFDB739 4,000	4.a.
b. 90 days or more past due	RCFDB740 5,027,000	RCFDB741 0	RCFDB742 0	RCFDB743 0	RCFDB744 62,000	RCFDB745 0	RCFDB746 3,000	4.b.
5. Charge-offs and recoveries on assets sold and securitized with servicing retained or with recourse or other seller-provided credit enhancements (calendar year-to-date):								5.
a. Charge-offs	RIADB747 125,000	RIADB748 0	RIADB749 0	RIADB750 0	RIADB751 0	RIADB752 0	RIADB753 0	5.a.
b. Recoveries	RIADB754 742,000	RIADB755 0	RIADB756 0	RIADB757 0	RIADB758 0	RIADB759 0	RIADB760 0	5.b.
6. Amount of ownership (or seller's) interests carried as:								6.
a. Securities (included in Schedule RC-B or in Schedule RC, item 5)		RCFDB761 0	RCFDB762 0			RCFDB763 0		6.a.
b. Loans (included in Schedule RC-C)		RCFDB500 0	RCFDB501 0			RCFDB502 0		6.b.
7. Past due loan amounts included in interests reported in item 6.a:								7.
a. 30-89 days past due		RCFDB764 0	RCFDB765 0			RCFDB766 0		7.a.
b. 90 days or more past due		RCFDB767 0	RCFDB768 0			RCFDB769 0		7.b.
8. Charge-offs and recoveries on loan amounts included in interests reported in item 6.a (calendar year-to-date):								8.
a. Charge-offs		RIADB770 0	RIADB771 0			RIADB772 0		8.a.
b. Recoveries		RIADB773 0	RIADB774 0			RIADB775 0		8.b.
9. Maximum amount of credit exposure arising from credit enhancements provided by the reporting bank to other institutions' securitization structures in the form of standby letters of credit, purchased subordinated securities, and other enhancements	RCFDB776 4,365,000	RCFDB777 0	RCFDB778 8,000	RCFDB779 0	RCFDB780 382,000	RCFDB781 659,000	RCFDB782 10,472,000	9.

Dollar amounts in thousands	(Column A) 1-4 Family Residential Loans	(Column B) Home Equity Lines	(Column C) Credit Card Receivables	(Column D) Auto Loans	(Column E) Other Consumer Loans	(Column F) Commercial and Industrial Loans	(Column G) All Other Loans, All Leases, and All Other Assets	
10. Reporting bank's unused commitments to provide liquidity to other institutions' securitization structures...	RCFDB783 165,000	RCFDB784 0	RCFDB785 0	RCFDB786 0	RCFDB787 0	RCFDB788 0	RCFDB789 57,000	10.
11. Assets sold with recourse or other seller-provided credit enhancements and not securitized by the reporting bank..	RCFDB790 231,000	RCFDB791 0	RCFDB792 0	RCFDB793 0	RCFDB794 0	RCFDB795 31,000	RCFDB796 634,000	11.
12. Maximum amount of credit exposure arising from recourse or other seller-provided credit enhancements provided to assets reported in item 11....	RCFDB797 168,000	RCFDB798 0	RCFDB799 0	RCFDB800 0	RCFDB801 0	RCFDB802 0	RCFDB803 199,000	12.

Dollar amounts in thousands			
1. Small business obligations transferred with recourse under Section 208 of the Riegle Community Development and Regulatory Improvement Act of 1994:			M.1.
a. Outstanding principal balance	RCFDA249	0	M.1.a.
b. Amount of retained recourse on these obligations as of the report date	RCFDA250	0	M.1.b.
2. Outstanding principal balance of assets serviced for others (includes participations serviced for others):			M.2.
a. Closed-end 1-4 family residential mortgages serviced with recourse or other servicer-provided credit enhancements	RCFDB804	7,714,000	M.2.a.
b. Closed-end 1-4 family residential mortgages serviced with no recourse or other servicer-provided credit enhancements	RCFDB805	531,302,000	M.2.b.
c. Other financial assets (includes home equity lines)[1]	RCFDA591	458,615,000	M.2.c.
d. 1-4 family residential mortgages serviced for others that are in process of foreclosure at quarter-end (includes closed-end and open-end loans)	RCFDF699	6,813,000	M.2.d.
3. Asset-backed commercial paper conduits: *			M.3.
a. Maximum amount of credit exposure arising from credit enhancements provided to conduit structures in the form of standby letters of credit, subordinated securities, and other enhancements:			M.3.a.
1. Conduits sponsored by the bank, a bank affiliate, or the bank's holding company	RCFDB806	13,833,000	M.3.a.1.
2. Conduits sponsored by other unrelated institutions	RCFDB807	0	M.3.a.2.
b. Unused commitments to provide liquidity to conduit structures:			M.3.b.
1. Conduits sponsored by the bank, a bank affiliate, or the bank's holding company	RCFDB808	22,407,000	M.3.b.1.
2. Conduits sponsored by other unrelated institutions	RCFDB809	0	M.3.b.2.
4. Outstanding credit card fees and finance charges included in Schedule RC-S, item 1, column C[2]	RCFDC407	0	M.4.

Schedule RC-T - Fiduciary and Related Services

Dollar amounts in thousands			
1. Does the institution have fiduciary powers? (If "NO," do not complete Schedule RC-T.)	RCFDA345	Yes	1.
2. Does the institution exercise the fiduciary powers it has been granted?	RCFDA346	Yes	2.
3. Does the institution have any fiduciary or related activity (in the form of assets or accounts) to report in this schedule? (If "NO," do not complete the rest of Schedule RC-T.)	RCFDB867	Yes	3.

Dollar amounts in thousands	(Column A) Managed Assets		(Column B) Non-Managed Assets		(Column C) Number of Managed Accounts		(Column D) Number of Non-Managed Accounts		
4. Personal trust and agency accounts	RCFDB868	44,282,000	RCFDB869	9,631,000	RCFDB870	18169	RCFDB871	615	4.
5. Employee benefit and retirement-related trust and agency accounts:									5.
a. Employee benefit - defined contribution	RCFDB872	44,138,000	RCFDB873	62,294,000	RCFDB874	312	RCFDB875	53	5.a.
b. Employee benefit - defined benefit	RCFDB876	23,566,000	RCFDB877	317,178,000	RCFDB878	324	RCFDB879	118	5.b.
c. Other employee benefit and retirement-related accounts	RCFDB880	12,585,000	RCFDB881	9,594,000	RCFDB882	28176	RCFDB883	99	5.c.
6. Corporate trust and agency accounts	RCFDB884	0	RCFDB885	1,367,000	RCFDC001	0	RCFDC002	1730	6.
7. Investment management and investment advisory agency accounts	RCFDB886	313,987,000	RCFDJ253	133,970,000	RCFDB888	104333	RCFDJ254	22308	7.
8. Foundation and endowment trust and agency accounts	RCFDJ255	11,460,000	RCFDJ256	228,000	RCFDJ257	1132	RCFDJ258	77	8.
9. Other fiduciary accounts	RCFDB890	283,000	RCFDB891	246,833,000	RCFDB892	30	RCFDB893	559	9.
10. Total fiduciary accounts (sum of items 4 through 9)	RCFDB894	450,301,000	RCFDB895	781,095,000	RCFDB896	152476	RCFDB897	25559	10.
11. Custody and safekeeping accounts			RCFDB898	22,923,761,000			RCFDB899	438329	11.
12. Fiduciary accounts held in foreign offices (included in items 10 and 11)	RCFNB900	90,379,000	RCFNB901	6,229,862,000	RCFNB902	10148	RCFNB903	261510	12.
13. Individual Retirement Accounts, Health Savings Accounts, and other similar accounts (included in items 5.c and 11)	RCFDJ259	12,568,000	RCFDJ260	14,127,000	RCFDJ261	28170	RCFDJ262	17898	13.

1. Memorandum item 2.c is to be completed if the principal balance of other financial assets serviced for others is more than $10 million.

*. Memorandum items 3.a.(1) through 3.b.(2) are to be completed by banks with $1 billion or more in total assets.

2. Memorandum item 4 is to be completed by banks that (1) together with affiliated institutions, have outstanding credit card receivables (as defined in the instructions) that exceed $500 million as of the report date, or (2) are credit card specialty banks as defined for Uniform Bank Performance Report purposes.

Dollar amounts in thousands			
14. Personal trust and agency accounts	RIADB904	68,000	14.
15. Employee benefit and retirement-related trust and agency accounts:			15.
a. Employee benefit - defined contribution	RIADB905	41,000	15.a.
b. Employee benefit - defined benefit	RIADB906	55,000	15.b.
c. Other employee benefit and retirement-related accounts	RIADB907	20,000	15.c.
16. Corporate trust and agency accounts	RIADA479	0	16.
17. Investment management and investment advisory agency accounts	RIADJ315	322,000	17.
18. Foundation and endowment trust and agency accounts	RIADJ316	13,000	18.
19. Other fiduciary accounts	RIADA480	34,000	19.
20. Custody and safekeeping accounts	RIADB909	506,000	20.
21. Other fiduciary and related services income	RIADB910	32,000	21.
22. Total gross fiduciary and related services income (sum of items 14 through 21) (must equal Schedule RI, item 5.a)	RIAD4070	1,091,000	22.
a. Fiduciary and related services income - foreign offices (included in item 22)	RIADB912	418,000	22.a.
23. Less: Expenses	RIADC058	NR	23.
24. Less: Net losses from fiduciary and related services	RIADA488	NR	24.
25. Plus: Intracompany income credits for fiduciary and related services	RIADB911	NR	25.
26. Net fiduciary and related services income	RIADA491	NR	26.

Dollar amounts in thousands	(Column A) Personal Trust and Agency and Investment Management Agency Accounts		(Column B) Employee Benefit and Retirement-Related Trust and Agency Accounts		(Column C) All Other Accounts		
1. Managed assets held in fiduciary accounts:							M.1.
a. Noninterest-bearing deposits	RCFDJ263	NR	RCFDJ264	NR	RCFDJ265	NR	M.1.a.
b. Interest-bearing deposits	RCFDJ266	NR	RCFDJ267	NR	RCFDJ268	NR	M.1.b.
c. U.S. Treasury and U.S. Government agency obligations	RCFDJ269	NR	RCFDJ270	NR	RCFDJ271	NR	M.1.c.
d. State, county, and municipal obligations	RCFDJ272	NR	RCFDJ273	NR	RCFDJ274	NR	M.1.d.
e. Money market mutual funds	RCFDJ275	NR	RCFDJ276	NR	RCFDJ277	NR	M.1.e.
f. Equity mutual funds	RCFDJ278	NR	RCFDJ279	NR	RCFDJ280	NR	M.1.f.
g. Other mutual funds	RCFDJ281	NR	RCFDJ282	NR	RCFDJ283	NR	M.1.g.
h. Common trust funds and collective investment funds	RCFDJ284	NR	RCFDJ285	NR	RCFDJ286	NR	M.1.h.
i. Other short-term obligations	RCFDJ287	NR	RCFDJ288	NR	RCFDJ289	NR	M.1.i.
j. Other notes and bonds	RCFDJ290	NR	RCFDJ291	NR	RCFDJ292	NR	M.1.j.
k. Investments in unregistered funds and private equity investments	RCFDJ293	NR	RCFDJ294	NR	RCFDJ295	NR	M.1.k.
l. Other common and preferred stocks	RCFDJ296	NR	RCFDJ297	NR	RCFDJ298	NR	M.1.l.
m. Real estate mortgages	RCFDJ299	NR	RCFDJ300	NR	RCFDJ301	NR	M.1.m.
n. Real estate	RCFDJ302	NR	RCFDJ303	NR	RCFDJ304	NR	M.1.n.
o. Miscellaneous assets	RCFDJ305	NR	RCFDJ306	NR	RCFDJ307	NR	M.1.o.
p. Total managed assets held in fiduciary accounts (for each column, sum of Memorandum items 1.a through 1.o)	RCFDJ308	NR	RCFDJ309	NR	RCFDJ310	NR	M.1.p.

Dollar amounts in thousands	(Column A) Managed Assets		(Column B) Number of Managed Accounts		
q. Investments of managed fiduciary accounts in advised or sponsored mutual funds	RCFDJ311	NR	RCFDJ312	NR	M.1.q.

Dollar amounts in thousands	(Column A) Number of Issues		(Column B) Principal Amount Outstanding		
2. Corporate trust and agency accounts:					M.2.
a. Corporate and municipal trusteeships	RCFDB927	**NR**	RCFDB928	**NR**	M.2.a.
1. Issues reported in Memorandum item 2.a that are in default	RCFDJ313	**NR**	RCFDJ314	**NR**	M.2.a.1.
b. Transfer agent, registrar, paying agent, and other corporate agency	RCFDB929	**NR**			M.2.b.

Dollar amounts in thousands	(Column A) Number of Funds		(Column B) Market Value of Fund Assets		
3. Collective investment funds and common trust funds:					M.3.
a. Domestic equity	RCFDB931	**21**	RCFDB932	**26,479,000**	M.3.a.
b. International/Global equity	RCFDB933	**13**	RCFDB934	**17,102,000**	M.3.b.
c. Stock/Bond blend	RCFDB935	**37**	RCFDB936	**37,904,000**	M.3.c.
d. Taxable bond	RCFDB937	**23**	RCFDB938	**30,604,000**	M.3.d.
e. Municipal bond	RCFDB939	**0**	RCFDB940	**0**	M.3.e.
f. Short term investments/Money market	RCFDB941	**2**	RCFDB942	**13,096,000**	M.3.f.
g. Specialty/Other	RCFDB943	**6**	RCFDB944	**39,438,000**	M.3.g.
h. Total collective investment funds (sum of Memorandum items 3.a through 3.g)	RCFDB945	**102**	RCFDB946	**164,623,000**	M.3.h.

Dollar amounts in thousands	(Column A) Gross Losses Managed Accounts		(Column B) Gross Losses Non-Managed Accounts		(Column C) Recoveries		
4. Fiduciary settlements, surcharges, and other losses:							M.4.
a. Personal trust and agency accounts	RIADB947	**NR**	RIADB948	**NR**	RIADB949	**NR**	M.4.a.
b. Employee benefit and retirement-related trust and agency accounts	RIADB950	**NR**	RIADB951	**NR**	RIADB952	**NR**	M.4.b.
c. Investment management agency accounts	RIADB953	**NR**	RIADB954	**NR**	RIADB955	**NR**	M.4.c.
d. Other fiduciary accounts and related services	RIADB956	**NR**	RIADB957	**NR**	RIADB958	**NR**	M.4.d.
e. Total fiduciary settlements, surcharges, and other losses (sum of Memorandum items 4.a through 4.d) (sum of columns A and B minus column C must equal Schedule RC-T, item 24)	RIADB959	**NR**	RIADB960	**NR**	RIADB961	**NR**	M.4.e.

Schedule RC-V - Variable Interest Entities

Dollar amounts in thousands	(Column A) Securitization Vehicles		(Column B) ABCP Conduits		(Column C) Other VIEs		
1. Assets of consolidated variable interest entities (VIEs) that can be used only to settle obligations of the consolidated VIEs:							1.
a. Cash and balances due from depository institutions	RCFDJ981	174,000	RCFDJ982	0	RCFDJ983	0	1.a.
b. Held-to-maturity securities	RCFDJ984	0	RCFDJ985	0	RCFDJ986	0	1.b.
c. Available-for-sale securities	RCFDJ987	0	RCFDJ988	0	RCFDJ989	0	1.c.
d. Securities purchased under agreements to resell	RCFDJ990	0	RCFDJ991	0	RCFDJ992	0	1.d.
e. Loans and leases held for sale	RCFDJ993	0	RCFDJ994	0	RCFDJ995	0	1.e.
f. Loans and leases, net of unearned income	RCFDJ996	3,564,000	RCFDJ997	22,081,000	RCFDJ998	0	1.f.
g. Less: Allowance for loan and lease losses	RCFDJ999	2,000	RCFDK001	0	RCFDK002	0	1.g.
h. Trading assets (other than derivatives)	RCFDK003	1,203,000	RCFDK004	0	RCFDK005	0	1.h.
i. Derivative trading assets	RCFDK006	0	RCFDK007	0	RCFDK008	0	1.i.
j. Other real estate owned	RCFDK009	0	RCFDK010	0	RCFDK011	0	1.j.
k. Other assets	RCFDK012	12,000	RCFDK013	51,000	RCFDK014	1,300,000	1.k.
2. Liabilities of consolidated VIEs for which creditors do not have recourse to the general credit of the reporting bank:							2.
a. Securities sold under agreements to repurchase	RCFDK015	0	RCFDK016	0	RCFDK017	0	2.a.
b. Derivative trading liabilities	RCFDK018	0	RCFDK019	3,000	RCFDK020	0	2.b.
c. Commercial paper	RCFDK021	0	RCFDK022	3,067,000	RCFDK023	0	2.c.
d. Other borrowed money (exclude commercial paper)	RCFDK024	1,552,000	RCFDK025	0	RCFDK026	140,000	2.d.
e. Other liabilities	RCFDK027	6,000	RCFDK028	50,000	RCFDK029	0	2.e.
3. All other assets of consolidated VIEs (not included in items 1.a. through 1.k above)	RCFDK030	0	RCFDK031	0	RCFDK032	0	3.
4. All other liabilities of consolidated VIEs (not included in items 2.a through 2.e above)	RCFDK033	187,000	RCFDK034	0	RCFDK035	0	4.

Optional Narrative Statement Concerning the Amounts Reported in the Reports of Condition and Income

Dollar amounts in thousands			
1. Comments?	RCON6979	No	1.
2. Bank Management Statement	TEXT6980		2.

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JPMorgan Chase & Co.

FAQs Regarding Evidence of Coverage for JPMorgan Chase & Co.

1. **What is an Evidence of Coverage (EOC)?**
   An EOC is an ACORD certificate of insurance that is available on the internet. The certificate is issued to the Named Insured rather than to a Certificate Holder.

2. **What are the key benefits of an EOC document?**
   - It is available 24 hours a day, 7 days a week (subject to web site maintenance and updates).
   - No waiting for verification of coverage.
   - The online process simplifies the generally paper-intensive Certificate process, although a recipient can print a hard copy EOC if desired.
   - Neither our client nor Aon need to track or respond to requests.

3. **How long will the EOC be available for access?**
   For the duration of the policy, unless otherwise requested by JPMorgan Chase & Co. or Aon.

4. **What happens at renewal time when coverage expires?**
   Based on instructions to the Aon service team by JPMorgan Chase & Co., Aon will post a new EOC when coverage renews. The policies stated in the EOC are in force as of the date printed on the EOC. The username and password will remain unchanged unless our client has requested this and you are thus provided with a new one.

5. **What if the EOC does not meet my needs and I require a certificate to be issued with my firm as the certificate holder?**
   Contact information is provided on the EOC page for each client. Please contact those listed to discuss your needs.

6. **Can the EOC document be printed?**
   Yes. Click on the Printer icon from the Adobe menu bar and the page is formatted to print on 8 ½" x 11" paper.

7. **When was the standard ACORD form introduced for EOC?**
   Beginning in January 2012, EOCs are produced in the format of a standard ACORD certificate form.

8. **How do I know if I have Additional Insured status if my company's name does not appear on the EOC?**
   If Additional Insured status is granted, it is granted by a blanket Additional Insured Endorsement to the policy. Insurance maintained by JPMorgan Chase & Co. provides Additional Insured status where required, per the terms of signed contracts, leases and/or agreements. The EOC indicates that the insurance policies have been extended to provide Additional Insured status to those entities with whom JPMorgan Chase & Co. has a written contract in place. Please review the Description of Operations section of the EOC carefully as it lists a number of specific policy provisions provided to those parties that have a written contract in place with JPMorgan Chase & Co., including:

   A. **Blanket Additional Insured where required**
   B. **Coverages are primary and non-contributory where required**
   C. **Blanket Contractual Liability**
   D. **Host Liquor Liability is included in the General Liability policy**
   E. **Waiver of Subrogation is included where required**
   F. **The Landlord, Landlords Agent(s), Landlords Lender(s), Ground Lessor(s), Vendors, Clients, and any other party as required by the signed contract, lease and/or agreement are listed as additional insured as their interests may appear and when applicable.**

9. **What are the financial ratings of the carriers listed on the EOC?**
   Ratings are available through A.M. Best Company at www.ambest.com. The financial ratings of the carriers are not guaranteed.

Account Schematic

State of Delaware | July 2018

J.P.Morgan

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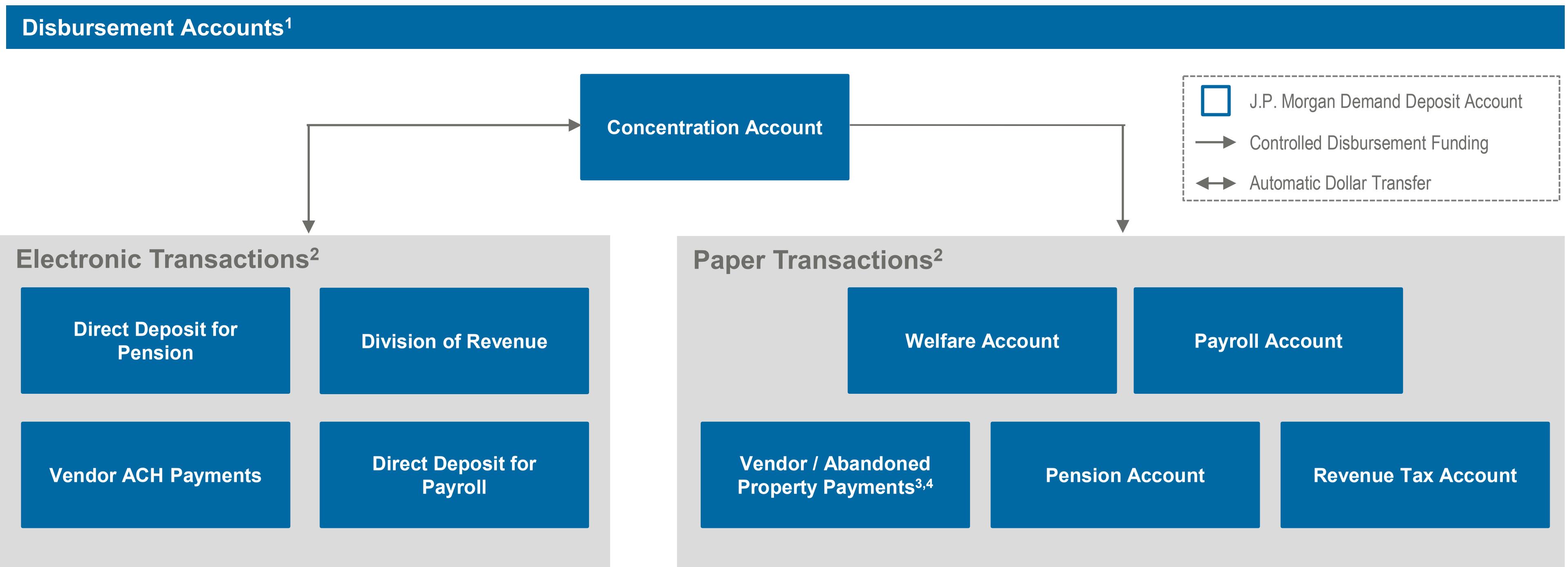
Sample OST Account Structure



Services include:

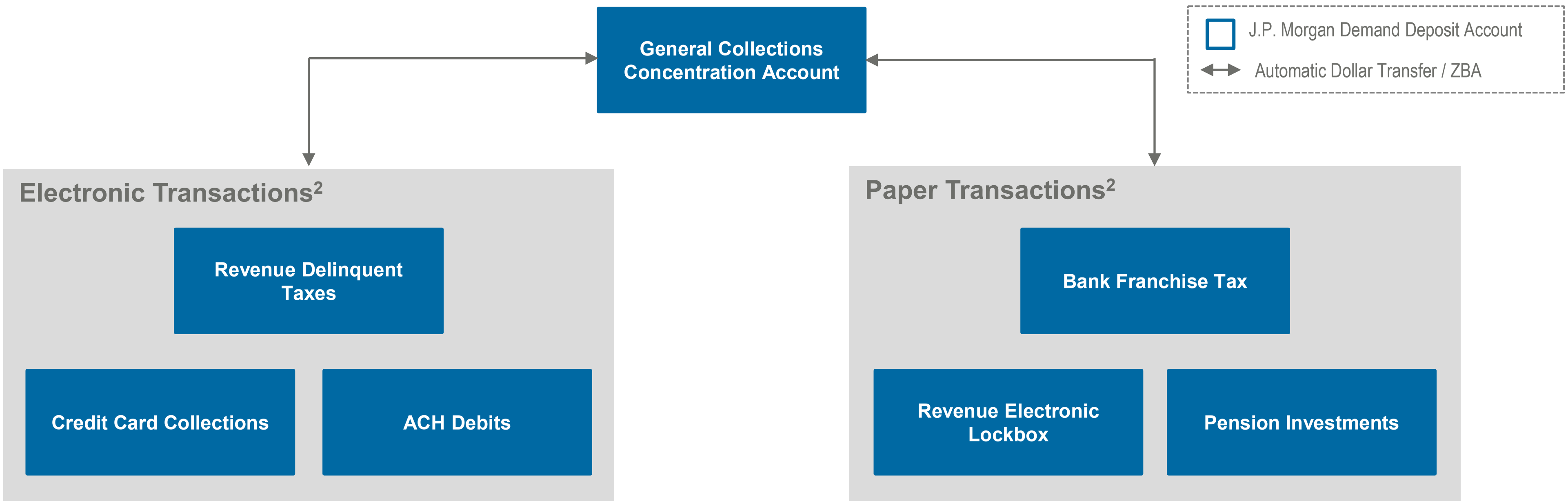
- Access Online Banking
  - Single sign on for modules
  - 7 years online retention: bank statements and reports
  - Cash Reporting
  - Check Inquiry
  - Stop Payments
- BAI File Reporting
- ACH Debit Block
- Full Reconciliation
- Payee Name Positive Pay
- ACH Origination

[redacted]

J.P.Morgan

Sample OST Account Structure

Collection Accounts[1]



Services include:

- Access Online Banking
  - Single sign on for modules
  - 7 years online retention: bank statements and reports
  - Cash Reporting
- BAI File Reporting
- ACH Debit Block
- ACH Origination
- Post No Checks
- ICL
- Remote Deposit Capture

[redacted]

Sample OST Account Structure

Standalone Accounts

J.P. Morgan Demand Deposit Account

LOSAP Fireman's Pension

DDDS Rep Payee for Client Beneficiaries

DPERS Qualified Excess Benefit Arrangement Plan

Services include:

- Access Online Banking
  - Single sign on for modules
  - 7 years online retention: bank statements and reports
  - Cash Reporting
- BAI File Reporting
- ACH Debit Block
- Post No Checks

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SPECIFICATION SHEET

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WorkForce® DS-860
Color Document Scanner

Ultra fast
up to 65 ppm[1]

The ultra fast scanner for efficient document management.

*At retail. Excludes specialty receipt scanners.[3]

Ultra fast — up to 65 ppm/130 ipm scan speeds[1]; scans both sides in just one pass

Advanced paper feed technology — dynamic skew correction prevents misfeeds and paper jams; also features auto paper size detection and double-feed detection

Robust — 80-page Automatic Document Feeder, duty cycle of up to 6000 sheets per day

Compatible with existing office software — includes TWAIN and ISIS® drivers

Advanced color and image adjustments made simple — Variable Color Enhance, Color Dropout and other innovative features

Scan directly to the cloud — scan to SharePoint®, Evernote®, Google Drive™, SugarSync® and more[2]

Scan and edit documents — save scanned documents as searchable PDF files; OCR software included

Save on office space — compact scanner fits in any environment

Versatile paper handling — scan folded pages up to 11" x 17", rigid ID cards, stacks of business cards and single sheets

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Shown with optional Network Interface Unit

The ultra fast scanner for efficient document management.

Providing world-class performance for fast-paced businesses, the ultra fast WorkForce DS-860 document scanner was designed for situations where speed is critical and dependability is paramount. Blazing through scans up to 65 ppm[1], it features auto paper size detection and dynamic skew correction to prevent paper jams and avoid downtime. A robust and reliable workhorse, the DS-860 includes an 80-page ADF and 6000-page daily duty cycle. TWAIN and ISIS compatibility make it ideal for use with existing professional document management systems, while advanced image adjustments make getting sharp scans simple. The DS-860 even scans directly to popular cloud services[2].

Scanners at a glance

	WorkForce DS-760	WorkForce DS-860
Scan Speed:	Up to 45 ppm/90 ipm[1]	Up to 65 ppm/130 ipm[1]
Paper Handling:	Up to 4500 sheets per day	Up to 6000 sheets per day
Software Support:	TWAIN and ISIS drivers	TWAIN and ISIS drivers

Efficient document management

Scan to the cloud

Scan directly to the cloud[2]

The WorkForce DS-860 scans directly to popular cloud services[2]. Just install the included software on your PC and you're ready to get started. Scan and send data wherever it needs to be.

Advanced paper feed technology

Tackle any task with little to no downtime. Dynamic skew correction and multi-roller paper feed play a vital role by detecting misfeeds and correcting the angle at which the paper enters the scanner. Double-feed detection helps to eliminate paper jams. And, auto size detection makes it easy to scan multiple sizes in a single stack.

Scan oversized documents in one pass

Scan multiple sizes in a single stack

Manage critical documents

Scan directly to popular cloud services[2]. Scan to email, an FTP server or any folder on your PC. The WorkForce DS-860 supports ISIS and TWAIN drivers. And, it includes OCR software for creating searchable PDFs or scanning directly to Word and Excel® files.

Color Enhance

Color Enhance allows users to select and enhance a color from the RGB color channel when scanning in Black-and-White. This can help bring out a particular element that might not otherwise show up clearly in a Black-and-White scan, such as a signature made with a light-blue pen.

Color Dropout

Color Dropout allows users to remove a color from the RGB color channel — a color that might cause noise or other image issues during a document scan. For example, a user scanning an invoice printed on pink paper could use "Color Dropout: Red" to ignore all red elements and pull out the crisp black text.

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Scanners | Documents

WorkForce® DS-860 Color Document Scanner

Specifications

Type
Sheet-fed, one pass duplex color scanner

Sensor
600 dpi/1 line CISM

Optical Resolution
600 dpi

Output Resolution
75 to 1200 dpi

Effective Pixels
5100 x 8400 pixels

Color Scan Mode (output bit depth)
48-bit internal/24-bit external

Grayscale Scan Mode (output bit depth)
16-bit internal/8-bit external

Monochrome (output bit depth)
1-bit

Automatic Document Feeder Capacity
80 sheets

Paper size
Minimum: 2" x 2"
Maximum: 8.5" x 120"

Paper weight
40 to 210 g/m

Buttons
4 push buttons: Start, Cancel, Job Select, Power

Light Source
Three-color RGB LED

Interface
Hi-Speed USB 2.0
Optional Network Interface Unit (RJ-45, 10BaseT/100BaseTX)

Scan Speed (letter sized)
65 ppm/130 ipm: 200 dpi Black & White, Color, Gray
65 ppm/130 ipm: 300 dpi Black & White, Color, Gray
50 ppm/100 ipm: 400 dpi Black & White, Gray
14 ppm/28 ipm: 400 dpi Color
33 ppm/66 ipm: 600 dpi Black & White, Gray
8 ppm/16 ipm: 600 dpi Color

Reliability
Daily duty cycle: 6000 sheets
Consumables – Roller assembly kit: 200,000 cycles

System Requirements

Windows® 8/8.1, Windows 7, Windows Vista® (32/64-bit), Windows XP® Professional x64, Windows XP Professional, Windows XP Home Edition

General

Environmental Conditions
Temperature (Operating): 41 ° to 95 °F (5 ° to 35 °C)
Humidity: 10 – 80% (no condensation)

Power Requirements
Voltage: 100 – 240 VAC
Frequency: 50 – 60 Hz
Power consumption: 42 W
Ready: 8 W
Sleep: 1.6 W
Off: 0.4 W

Warranty
One-year limited warranty in the U.S. and Canada

Country of Origin
China

Software Included

Epson Scan, Document Capture Pro, EMC Captiva ISIS

Driver Support
TWAIN, ISIS

Other Features

Rigid plastic ID card scanning (including embossed cards)
Business card scanning
Oversized folded document scanning without carrier sheet
Up to 30 user-definable scan job settings with 9 jobs selectable from front control panel
Optional Network Interface Unit
Security lock (Kensington® type)

Dimensions (W x D x H)

Product only: 8.8 lb, 11.8" x 8.7" x 8.1"

Eco Features

RoHS compliant
Recyclable product[4]
Epson America, Inc. is a SmartWay℠ Transport Partner[5]

What's In The Box

WorkForce DS-860, CD-ROM with scanner software, Start Here poster, Hi-Speed USB 2.0 cable, AC adapter with power cable

Ordering Information

Product Name	Product Code
WorkForce DS-860	B11B222201

Accessories	Product Code
Roller Assembly Kit	B11B813581
Carrier Sheets	B11B813431
Network Interface Unit	B12B808441

1 Based on letter-sized scans at 300 dpi in Black-and-white, Grayscale or Color Mode, using the USB interface.
2 With Epson Document Capture Pro software installed on the connected Windows PC.
3 Based on U.S. and Canada NPD retail scanner databases, March 2013. NPD sample period CY2012.
4 See our website for convenient and reasonable recycling options at www.epson.com/recycle
5 SmartWay is an innovative partnership of the U.S. Environmental Protection Agency that reduces greenhouse gases and other air pollutants and improves fuel efficiency.

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DATA TRANSMISSION GUIDELINES AND FORMATS

J.P. Morgan has established the following Bank Administration Institute (B.A.I.) record formats to assist our customers in their system design. Please feel free to use this standard format as an example or useful guide in creating your format.

Standard Record Formats - Description

The standard output record formats are comprised of eight record types which are defined functionally as follows:

Type 1 - **Immediate Address Header:** This record is the beginning of the data and identifies both the source and destination of all data contained therein. In essence, this record (1) identifies the originator of the data and (2) enables your company to verify that the data was intended for your company.

Type 2 - **Service Record:** This record identifies the purpose, content and physical characteristics of the data contained in the data file. There is only one service record per transmission data set, and this record remains in effect until the end of transmission.

Type 5 - **Detail Header:** The detail header record is used to reduce the size of ensuing detail records by carrying the required information that is common to all the detail records it precedes for a given deposit date.

Type 6 - **Detail Record:** This record carries the data belonging to a single remittance transaction (check amount; transit routing number from the check; remitter's account number; check number; 30 "free" positions which can be structured according to customer instructions to contain remittance detail such as invoice numbers and amounts or remitter name). This record does not contain detail information common to all transactions.

Type 4 - **Detail Overflow Record:** This record provides a means of handling remittance detail in excess of the 30 positions which can be accommodated in the Detail Record Type 6. This record has 69 "free" positions which can be structured according to customer instructions, and is most commonly used to hold additional invoice data.

Type 7 - **Batch Total Record:** This record marks the end of a batch of detail records and is used for balance and control purposes. Note that each batch will have a unique, identifying set of sequential batch and item numbers.

Type 8 - **Service Total Record:** The service total record marks the end of all batches for a given lockbox and is used to balance all detail batches to that lockbox. Each service total record also contains the daily cumulative control information.

Type 9 - **Destination Trailer:** The destination trailer record marks the end of the data and includes the total number or records.

File Data Sequence

A typical file generated by the bank will use the eight standard record formats as follows:

One Lockbox Account, One Remittance Batch

(1)	Immediate Address Header
(2)	Service Record
(5) (6) (4) (6) (7)	Single Lockbox With One Batch
(8)	Service Total for Single Lockbox and the Data Set
(9)	Destination Trailer Record

One Lockbox Account, Multiple Remittance Batches

(1)	Immediate Address Header
(2)	Service Record
(5) (6) (4) (4) (6) (6) (7)	Single Lockbox - Batch No. 1
(5) (6) (4) (4) (6) (6) (7)	Single Lockbox - Batch No. 2
(8)	Service Total for Single Lockbox and the Data Set
(9)	Destination Trailer Record

Multiple Lockbox Accounts, Multiple Remittance Batches

(1)	Immediate Address Header
(2)	Service Record
(5)	Lockbox No. 1 Header Record
(6) (4) (6) (4) (6) (7)	Lockbox No. 1 - Batch No. 1
(6) (6) (6) (6) (6) (7)	Lockbox No. 1 - Batch No. 2
(8)	Service Total - Lockbox No. 1
(5)	Lockbox No. 2 Header Record
(6) (4) (4) (6) (6) (7)	Lockbox No. 2 - Batch No. 1
(8)	Service Total - Lockbox No. 2
(9)	Destination Trailer Record

Standard Record Formats - Specifications

For your company's system and programming personnel, the following pages contain detailed BAI record layouts and field contents for each of the standard record formats.

Immediate Address Header

Field Number	Field Size	Positions	Contents	Description
1	1	01	'1'	Record Type
2	2	02-03	'00'	Priority Code
3	10	04-13	Company's Account No.	Immediate Destination
4	10	14-23	'b071000013'	Origin Code
5	6	24-29	YYMMDD Format	Deposit Date
6	4	30-33	HHMM Format	Transmission Time
7	47	34-80	Blanks	Record Filler

Service Record

Field Number	Field Size	Positions	Contents	Description
1	1	01	'2'	Record Type
2	10	02-11	Company's Account No.	Ultimate Destination
3	10	12-21	'b071000013'	Origin Code
4	10	22-31	'0000000000'	Reference Code
5	3	32-34	'400'	Service Type
6	3	35-37	'080'	Record Size
7	4	38-41	'0080'	Block Size
8	1	42	'2'	Format
9	38	43-80	Blanks	Record Filler

Detail Header

Field Number	Field Size	Positions	Contents	Description
1	1	01	'5'	Record Type
2	3	02-04	'000'	Batch Number
3	3	05-07	'000'	Item Number
4	7	08-14	Alphanumeric	Lockbox Number
5	6	15-20	YYMMDD Format	Deposit Date
6	10	21-30	Company's Account No.	Ultimate Destination
7	10	31-40	'b071000013'	Origin Code
8	40	41-80	Blanks	Record Filler

Detail Record

Field Number	Field Size	Positions	Contents	Description
1	1	01	'6'	Record Type
2	3	02-04	'001' to '999'	Batch Number
3	3	05-07	1-999	Item Number
4	10	08-17	'$$$$$$$$cc'	Check Amount
5	9	18-26	Remitter Identification	Transit Routing Number From Check
5a	14	27-40	Remitter Identification	Account Number From Check*
6	10	41-50	Numeric	Check Number*
7	30	51-80	Alphanumeric	See Note

NOTE: These 30 positions can be formatted according to customer instructions, such as three 9-digit invoice numbers or a 15-character remitter name and one 9-digit invoice number.

* Left justify. Fill with blanks. If needed, field 5a can be enlarged to accomodate up to 17 characters, and field 6 can be enlarged to accomodate up to 13 characters.

Detail Overflow Record

Field Number	Field Size	Positions	Contents	Description
1	1	01	'4'	Record Type
2	3	02-04	Same as detail	Batch Number
3	3	05-07	Same as detail	Item Number
4	1	08	'6'	Overflow
5	2	09-10	Begin with '01'	Overflow Sequence Number
6	1	11	'0' or '9'	Overflow Indicator**
7	69	12-80	Alphanumeric	See Note

NOTE: These 69 positions can be formatted according to customer instructions, such as seven 9-digit invoice numbers (and six blanks), or four 9-digit invoice number with 6-digit invoice amount sequences, followed by nine blanks.

** '9' if last invoice of a series overflows for a given '6' detail record, otherwise '0'.

Batch Total Record

Field Number	Field Size	Positions	Contents	Description
1	1	01	'7'	Record Type
2	3	02-04	Same as detail record	Batch Number
3	3	05-07	'000'	Item Number
4	7	08-14	Alphanumeric	Lockbox Number
5	6	15-20	YYMMDD Format	Deposit Date
6	4	21-24	Numeric	Total Number of Checks
7	10	25-34	'$$$$$$$$cc'	Batch Dollar Total
8	46	35-80	Blanks	Record Filler

Service Total Record

Field Number	Field Size	Positions	Contents	Description
1	1	01	'8'	Record Type
2	3	02-04	'999'	Batch Number
3	3	05-07	'999'	Item Number
4	7	08-14	Alphanumeric	Lockbox Number
5	6	15-20	YYMMDD Format	Deposit Date
6	5	21-25	Numeric	Total Number of Checks
7	10	26-35	'$$$$$$$$cc'	Lockbox Dollar Total
8	10	36-45	'$$$$$$$$cc'	Cumulative Transmission Dollar Total
9	35	46-80	Blanks	Record Filler

Destination Trailer

Field Number	Field Size	Positions	Contents	Description
1	1	01	'9'	Record Type
2	6	02-07	Numeric	Total Number of Records
3	73	08-80	Blanks	Record Filler

Commercial Card
Application & Agreement | JPMORGAN CHASE BANK, N.A.

V2.5_12_16_16

Client		**State of Incorporation:**	
Address Line 1			
Address Line 2			
City			
State			
Zip Code			
Phone			
Fax			

REBATES
Please identify a Business Account to which rebates associated with Client's Commercial Card rebate program should be deposited. Deposits will be made via Wire Transfer only.

Business Account at:	*(Enter the name of Client's financial institution)*
ABA:	*(Enter ABA for Client's financial institution)*
Business Account Number:	*(Enter Client's business account number)*
Business Account Name:	*(Enter the name of Client's business account)*

Please enter the Financial Institution and Business Account Name exactly as it appears on Client's account. Black ink only.

*Requests to modify the account information set forth above must be provided to J.P. Morgan in writing and sent to the following address: CCS.Rebate@jpmchase.com. A form will be provided to Client upon receipt of Client's request to modify the business account information. Client will be instructed to complete the form and return it to J.P. Morgan at the address specified. Changes to the business account information will be effective when J.P. Morgan has a reasonable opportunity to act upon such request.

SIGNATURE
This Application must be signed by an owner, officer or partner of the Client with the authority to bind the Client to the terms and conditions of the following Commercial Card Agreement. I hereby certify that I am the duly authorized and acting officer, partner or owner of this Client with the authority to bind the Client to the obligations of the Commercial Card Agreement. I have read and agree to the terms of the Commercial Card Agreement. Black ink only.

Signature of Authorized Officer	Date
Name	
Title	

CLIENT ATTESTATION
The undersigned, a duly authorized officer or representative of Client, does hereby certify that Client has been duly authorized to enter into and perform the Commercial Card Agreement and that the person signing above on behalf of Client, whose execution of this Commercial Card Agreement was witnessed by the undersigned, is an owner, officer, partner, or other representative of Client possessing authority to execute this Commercial Card Agreement.* Black ink only.

Signature	Date
Name	
Title	

*Note: The person signing the attestation shall be someone different from the person signing above on behalf of Client.

ADDRESS FOR NOTICES

Client	See above
Bank	JPMorgan Chase Bank, N.A. 10 South Dearborn, Floor 06 Mail Code IL1-0286 Chicago, IL, 60603-2300 Attn: Commercial Card Contracts Manager

SAMPLE

This Commercial Card Agreement (the "Agreement") sets forth the terms and conditions under which JPMorgan Chase Bank, N.A. ("Bank") shall provide commercial card services to Client who executes this Agreement and/or one or more of such Client's Affiliates. This Agreement is effective as of the date of the first signature above. By signing this Agreement Client hereby agrees to be bound by the terms and conditions referenced herein.

1. Definitions

Each capitalized term used in this Agreement shall have the following defined meanings set forth below or as otherwise set forth herein.

Account means each account established in the name of Client pursuant to the Agreement.

Affiliate means an entity controlling, controlled by, or under common control with, directly or indirectly, a party to this Agreement. For this purpose, one entity "controls" another entity if it has the power to direct the management and policies of the other entity (for example, through the ownership of voting securities or other equity interest, representation on its board of directors or other governing body, or by contract).

Agreement means the Commercial Card Agreement in each case as amended, supplemented or replaced from time to time.

Applicable Law means for any country, all federal, state, provincial and local laws, statutes, regulations, rules, executive orders, supervisory requirements, licensing requirements, export requirements, directives, circulars, decrees, interpretive letters, guidance or other official releases of or by any government, any authority, department or agency thereof, or any regulatory or self-regulatory organization, that apply to a party's obligations under the Agreement.

Business Day means a day on which Bank is open for business.

Card means a Network-branded card that is issued to Cardholders by the Bank upon the request of the Client and approval by the Bank, and includes any plastic card bearing a card number and Accounts with no associated plastic card, which includes Single-Use Accounts.

Cardholder means: (A) an individual in whose name a Card is issued, and (B) any person or entity authorized by Client or named Cardholder to use a Card.

Cardholder Agreement means documentation provided by Bank to Client or Cardholder governing use of a Card by such Cardholder.

Cardholder Credit Limit means the maximum spending limit established in relation to a Cardholder.

Corporate Liability means Client is solely liable for the Transactions, subject to the Agreement and any Cardholder Agreement.

Credit Limit means the maximum spending limit established for Client in connection with the Program.

Cycle means the monthly period ending on the same day each month or, if that day is not a Business Day, then the following Business Day or preceding Business Day, as systems may require, or such other period as Bank may specify.

Effective Date means the date indicated as such on the introductory paragraph.

Fraudulent Transactions means transactions made on a Card by a person, other than Client or Cardholder, who does not have actual, implied, or apparent authority for such use, and for which neither Cardholder nor Client receives direct or indirect benefit.

Joint and Several Liability means Client and Cardholder are jointly and severally liable for the Transactions, subject to the Agreement, and the Cardholder Agreement.

MCC means merchant category code.

Network means MasterCard International, Inc.

Program means the commercial card system composed of Accounts, Card-use controls, reports to facilitate purchases of and payments for business goods and services, and related services, all as established in connection with the Agreement.

Single-Use Account means a one-time virtual card number generated for a single transaction.

System means the system through which Client can access Account and Transaction data and reports.

Transaction means a purchase, a cash advance, fees, charges or any other activity charged to an Account in respect of a Card.

SAMPLE

2. Conditions Precedent

Prior to the commencement of the Program rendered by Bank pursuant to this Agreement, Client will provide the information listed on the Application, included with this Agreement, and additional documents as required by the Bank, and will certify to the accuracy of such information.

3. Certain Bank Services

A. Subject to prior financial, risk management and compliance approvals by Bank, Bank shall: (i) establish Accounts in the name of Client; (ii) issue Cards to Cardholders designated by a person authorized to bind the Client to these terms and conditions (an "Authorized Person"); (iii) implement the Credit Limits specified by an Authorized Person from time to time and accepted by Bank; and (iv) deliver Cards and billing statements only to a U.S. address. Notwithstanding anything contained in this Agreement to the contrary, Bank shall not be obligated to extend credit to Client in violation of any limitation or prohibition imposed by Applicable Law or Bank policies and procedures.

B. Notwithstanding the foregoing, Bank shall not be obligated to provide any Account to Client or any Client Affiliate or any Card to an employee or authorized representative of Client or any Client Affiliate or to process any transactions in violation of any limitation or prohibition imposed by Applicable Law, including, but not limited to, the regulations issued by the U.S. Department of Treasury's Office of Foreign Assets Control ("OFAC").

C. Extension of Program. Upon Client's submission of a request from time to time in the form required by Bank and following Bank's agreement to do so, Bank will extend Program to Client's Affiliates. Client is responsible as principal obligor for all obligations under the Agreement (including, without limitation, as principal obligor with respect to all payment and other obligations as the same relate to its Affiliates and their respective Cardholders and waives any defenses or offsets available to such Affiliates). Client shall cause each of its Affiliates and their respective Cardholders to comply with the Agreement.

4. Obligations of Client

In connection with the Program, Client shall:

A. Notify each Cardholder at the earliest opportunity: (i) that Cards are to be used only for business purposes; (ii) of the Cardholder Credit Limit and any other applicable limit; (iii) of the extent, if any, to which Bank will provide Transaction and Account information to third parties at Client's request; and (iv) to collect and destroy any Cards which are no longer required.

B. Client represents that the Cards to be issued under this Agreement are substitutes for an accepted credit card or will be issued in response only to a written request or application for such Card, by a prospective Cardholder, which Client has obtained in accordance with the requirements of Section 226.12(a) of Regulation Z of the Federal Truth in Lending Act. Client further represents that Client will retain the applications (paper or electronic) for any Card, when such application is not provided to Bank, for a period of two (2) years after the application has been received and acted upon.

C. Client will immediately notify Bank by telephone of any lost, stolen, misappropriated, improperly used, or compromised Cards.

   i. **<u>Liability for Fraudulent Transactions Following Notification</u>**. Notwithstanding anything to the contrary contained herein, Client shall not be liable for any Fraudulent Transactions occurring on a Card after the effective time of such notification to Bank of such Fraudulent Transaction.

   ii. **<u>Liability for Fraudulent Transactions Prior to Notification</u>**. Subject to the terms and conditions contained in subsection (iii) below, Client shall not be liable for Fraudulent Transactions occurring on a Card prior to the effective time of such notification to Bank of such Fraudulent Transactions.

   iii. Bank reserves the right, in its sole and absolute discretion, to hold Client liable for Fraudulent Transactions should Bank determine that subsequent to implementation of Client's Program and at the time that the Fraudulent Transaction occurred, Client failed to operate Client's Program in accordance with Bank's fraud reduction requirements as set forth below:

      a. Client must block high risk MCC's identified by Bank and presented to Client;

      b. Client must maintain reasonable security precautions and controls regarding the dissemination, use and storage of Card and Transaction data; and

      c. Client must comply with all other requirements as Bank may reasonably require from time to time.

If Client fails to comply with Client's obligations described in this subsection (iii), and Bank determines Client to be liable for Fraudulent Transactions, Bank will either: (i) invoice Client for the amount of such Fraudulent Transaction minus any amounts collected, or (ii) deduct the amount of such Fraudulent Transaction from Client's rebate.

D. Notify Bank of any Transaction that Client disputes as soon as practicable after the last day of the Cycle during which such Transaction is charged to Client and, in any event, within sixty (60) days of such day. Client shall use commercially reasonable efforts to assist in obtaining reimbursement from a merchant. Client or, subject to any Cardholder Agreement and in the case of Cards under any Joint and Several Liability Accounts, the Cardholder, shall not be relieved of liability for any disputed Transaction if the charge-back is rejected in accordance with the applicable Network's charge-back policy. Bank shall not be liable to Client where notice is received after such sixty (60) day period. Client shall not make a claim against Bank or refuse to pay any amount because Client or the person using the Card may have a dispute with any merchant.

E. Unless previously provided to Bank, obtain and provide to Bank such information as Bank may reasonably request for the purposes of investigating the identity of an actual or prospective Cardholder or Client, evidencing authority for Card issuance requests, and assisting in any review of Bank by a regulator with relevant jurisdiction. Any information provided by Client to Bank shall be, to the best of Client's knowledge, information and belief, accurate and complete in all material respects.

F. Make payments for all Transactions posted to Accounts no later than the payment date (the "Payment Date"), as specified in the periodic statement. In the event that Client makes payments other than as contemplated by the periodic statement, Bank may require, and Client shall provide, such documentation as reasonably required by Bank to reconcile such payments to the amounts stated as due in the periodic statement by the Payment Date. Any amount due which is not received by the Payment Date shall be subject to the late fees and delinquency fees as set forth in the fees schedule of Exhibit A attached hereto. If collection is initiated by Bank, Client shall be liable for payment of Bank's reasonable attorneys' fees and other costs and expenses of collection.

G. In the case of any Joint and Several Liability Account, Client shall pay Bank within ten (10) days of written notice, for any Transactions not paid by a Cardholder within one hundred and twenty (120) days of the first billing in respect of the relevant Transaction.

H. Unless otherwise provided to Bank, provide Bank with such financial statements and other related information requested by Bank in form and in such detail as Bank may reasonably request, from time to time.

I. Client represents and warrants that it will use commercially reasonable efforts to ensure that such applicants to whom it requests Bank issue Cards and whom Client authorizes to use the Cards/Accounts are not identified on a prohibited government sanctions list, are not located or resident in a sanctioned country, or otherwise subject to a sanctions program applicable to Client.

J. Adhere to, and hereby acknowledges the existence of, all license agreements, security procedures, and terms and conditions regarding the System.

5. Credit Limits and Certain Bank Rights

A. Bank may establish a Credit Limit and Cardholder Credit Limit and may establish other limits from time-to-time. Client will not exceed the Credit Limit; provided however, that if Client exceeds the Credit Limit, Client shall pay all amounts exceeding the Credit Limits.

B. Bank may at any time: (i) increase or decrease any Credit Limit or the Cardholder Credit Limit or any other limit in connection with any Card or any Account or the Program; (ii) refuse to authorize Transactions; (iii) vary the payment terms, or require the provision of security or additional security; (iv) suspend or terminate any Card or any Account; (v) decline to open any Account or issue any Card; or (vi) require MCC authorization restrictions in connection with a Program.

6. Notices. All notices required or permitted to be given under this Agreement shall be addressed as set forth above or as otherwise agreed in writing by the parties from time to time, and shall be effective upon receipt.

7. Representations and Warranties. Client represents and warrants that this Agreement constitutes a legal, valid, and binding obligation, enforceable against Client, in accordance with its terms, and that execution and performance of this Agreement: (i) does not breach any agreement with any third party; (ii) does not violate any law, rule, or regulation, or any duty arising in law or equity applicable to it; (iii) is within Client's organizational powers; and (iv) has been authorized by all necessary organizational action.

8. Fees. Client agrees to pay the fees and charges incurred by Client as specified by Bank, from time to time, on a periodic invoice. The fees initially applicable are specified in Exhibit A attached hereto. Bank may change the fees and charges payable by Client at any time, provided Bank notifies Client at least thirty (30) days prior to the effective date of the change.

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9. Term and Termination. This Agreement shall have an initial term of three (3) years from the date first written above unless otherwise terminated pursuant to the provisions of this paragraph. Thereafter, this Agreement shall be successively renewed for one-year terms upon the anniversary of the effective date. This Agreement may be terminated by either party at any time for any reason. In the event this Agreement is terminated, Client shall immediately pay all amounts owing under this Agreement, without set-off or deduction, and destroy all physical Cards furnished to Cardholders. Sections 4.B, 4.E, 4.F, 4.G, 4.I, 7, 8, 9, 10.A, 10.B, 11, 12.D, 12.F, 12.G, 12.H, 12.K, 12.L, 12.M, and 12.N shall survive the termination of this Agreement.

10. Limitation of Liability.

A. Subject to Section 10.B below, Bank shall be liable only for Client's actual damages which Client suffers or incurs as a direct result of Bank's negligence or willful misconduct and shall not be liable for any other loss or damage of any nature.

B. TO THE MAXIMUM EXTENT PERMITTED BY LAW, IN NO EVENT SHALL EITHER PARTY BE LIABLE TO THE OTHER UNDER ANY THEORY OF TORT, CONTRACT, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE THEORY FOR ANY EXEMPLARY, PUNITIVE, SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OR THE LIKE, INCLUDING, WITHOUT LIMITIATION, LOST PROFITS, EACH OF WHICH ARE EXPRESSLY EXCLUDED BY AGREEMENT OF THE PARTIES HEREIN REGARDLESS OF WHETHER SUCH DAMAGES WERE REASONABLY FORESEEABLE AND WHETHER EITHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

11. Confidentiality. Except as expressly provided in the Agreement, all information furnished by either party in connection with the Agreement shall be kept confidential. The foregoing obligation shall not apply to information that: (A) is already lawfully known when received without an obligation of confidentiality other than under this Agreement; (B) is or becomes lawfully obtainable from other sources; (C) is in the public domain when received or thereafter enters the public domain through no breach of this Section; (D) is required to be disclosed to, or in any document filed with, the U.S. Securities and Exchange Commission (or any analogous body or any registrar of companies or other organizations in any relevant jurisdiction), banking regulator, or any other governmental agencies; (E) is required by law to be disclosed and notice of such disclosure is given (when legally permissible) by the disclosing party; or (F) may be disclosed as provided in the Cardholder Agreement or other Cardholder-related documentation. Notice under (E), when practicable, shall be given sufficiently in advance of the disclosure to permit the other party to take legal action to prevent disclosure. Bank may exchange (and the Client insofar as necessary hereby consents to such exchange) Client and (to the extent authorized) Cardholder confidential information with Affiliates. Bank may also disclose confidential information to service providers in connection with Bank's provision of Program services; provided that the service providers comply with the terms of this **Section 11**. Bank may exchange information concerning the Client or Cardholders with merchants and, in the case of Cardholder information, with the Client.

12. Miscellaneous

A. If any provision of this Agreement is found by a court of competent jurisdiction to be unenforceable, such provision shall not affect the other provisions, but such unenforceable provision shall be deemed modified to the extent necessary to render it enforceable, preserving to the fullest extent permissible the intent of the parties set forth in this Agreement. The failure of either party hereto to enforce any right or pursue any remedy hereunder shall not be construed to be a waiver thereof.

B. In the regular course of business, Bank may monitor, record, and retain telephone conversations made or initiated to or by Bank from or to Client or Cardholders.

C. The terms and provisions of this Agreement shall be binding upon and inure to the benefit of Client and Bank and their respective successors and assigns. This Agreement, or any of the rights or obligations hereunder, may not be assigned by Client without the prior written consent of Bank.

D. This Agreement embodies the entire agreement and understanding between Client and Bank and supersedes all prior agreements and understandings between Client and Bank relating to the subject matter thereof.

E. This Agreement may be signed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were upon the same document. Facsimile signatures shall have the same force and effect as the original.

F. If applicable, to the extent that Client would have been able to claim sovereign immunity in any action, claim, suit, or proceeding brought by Bank, Client irrevocably waives and agrees not to claim such immunity.

G. Neither Bank nor Client shall be liable for any loss or damage to the other for its failure to perform or delay in the performance of its obligations under this Agreement, if such non-performance or delay is caused directly or indirectly by an act of God, act of governmental authority, de jure or de facto, legal constraint, war, terrorism, catastrophe, fire, flood or electrical, computer, mechanical or telecommunications failure, or failure of any agent or correspondent, or unavailability of a payment system, or other natural disaster or any cause beyond its reasonable control.

H. CHOICE OF LAW. THIS AGREEMENT AND ANY CLAIM, CONTROVERSY, OR DISPUTE ARISING UNDER OR RELATED TO THIS AGREEMENT, THE RELATIONSHIP OF THE PARTIES, AND/OR THE INTERPRETATION AND ENFORCEMENT OF THE RIGHTS AND DUTIES OF THE PARTIES SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE INTERNAL LAWS (AND NOT THE LAW OF CONFLICTS) OF THE STATE OF NEW YORK, BUT GIVING EFFECT TO FEDERAL LAWS APPLICABLE TO NATIONAL BANKS. TO THE EXTENT PERMITTED BY APPLICABLE LAW, EACH PARTY HEREBY WAIVES ANY AND ALL RIGHT TO A TRIAL BY JURY IN ANY ACTION OR PROCEEDING OF ANY KIND ARISING OUT OF, BY REASON OF, OR RELATING TO THIS AGREEMENT, THE

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INTERPRETATION THEREOF OR TO ANY TRANSACTIONS HEREUNDER. THIS WAIVER IS KNOWINGLY, WILLINGLY, AND VOLUNTARILY MADE BY THE PARTIES.

I. Client acknowledges that Bank prohibits the use of Cards under any Accounts to conduct transactions (including, without limitation, the acceptance or receipt of credit or other receipt of funds through an electronic funds transfer, or by check, draft or similar instrument, or the proceeds of any of the foregoing) that are related, directly or indirectly, to unlawful internet gambling. The term "unlawful internet gambling," as used here, shall have the meaning as set forth in 12 C.F.R. Section 233.2(bb).

J. International Transactions include any transaction made in a foreign currency or that is made outside the United States of America even it if it made in U.S. dollars. If an international transaction is made in a currency other than U.S. dollars, the Network will convert the transaction into U.S. dollars using its respective currency conversion procedures. The exchange rate the Network uses to convert currency is a rate that it selects either from the range of rates available in the wholesale currency markets for the applicable processing date (which rate may vary from the rate the respective entity itself receives), or the government-mandated rate in effect on the applicable processing date. The rate in effect on the applicable processing date may differ from the rate on the date when the international transaction occurred or when the Account was used. Bank reserves the right to charge an international transaction fee, as specified in Exhibit A. Bank may charge a commission on the relevant currency amount at the rate provided to it by the Network as set forth in the fee schedules attached hereto. The international transaction fee will be calculated on the U.S. dollar amount provided to Bank by the Network. The same process and charges may apply if any international transaction is reversed.

K. Bank may at any time offset any obligation of Client to Bank under this Agreement or otherwise against any obligation Bank owes to Client.

L. This Agreement and Cards are non-transferable, non-assignable, and shall remain the property of Bank.

M. *USA PATRIOT Act Disclosure*. Section 326 of the USA PATRIOT Act mandates that Bank obtain, verify and record information that identifies each business or person that opens a new account. By signing this Agreement Client agrees to provide and consent to us obtaining, if necessary from third parties, any and all information reasonably necessary to verify Client's identity.

N. This Agreement may be amended or waived only by notice to Client, in writing from Bank.

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EXHIBIT A to the Commercial Card Application & Agreement
INCENTIVES & FEES

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