

# INVESTMENT PERFORMANCE SUMMARY QUARTER ENDING MARCH 31, 2020

## OFFICE OF THE STATE TREASURER & CASH MANAGEMENT POLICY BOARD

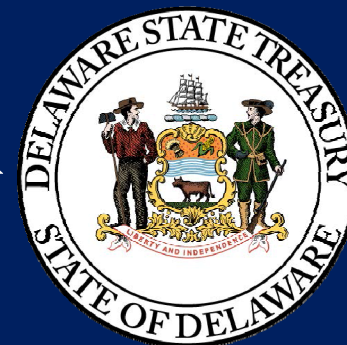
March 31, 2020

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# MARKET ENVIRONMENT

NEPC, LLC

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# PERFORMANCE OVERVIEW

## Q1 Market Summary

Macro			Equity			Credit			Real Assets		
US Dollar	VIX	US 10-Yr	S&P 500	MSCI EAFE	MSCI EM	US Agg.	High Yield	Dollar EMD	Oil	Gold	REITS
											
2.8%	39.8	-124 bps	-19.6%	-22.8%	-23.6%	3.1%	-12.7%	-13.4%	-67.1%	4.0%	-25.5%

### Global risk assets declined during the quarter as markets digested the potential economic impact of COVID-19

Equities experienced the sharpest declines, with most major indices entering bear market territory in March

### Widespread stimulative fiscal and monetary policies have been implemented to help support economic growth

### Energy prices collapsed as tensions intensified between Saudi Arabia and Russia, leading to supply gluts and a sharp decline in prices

Market segment (index representation) as follows: US Dollar (DXY Index), VIX (CBOE Volatility Index), US 10-Year (US 10-Year Treasury Yield), S&P 500 (US Equity), MSCI EAFE Index (International Developed Equity), MSCI Emerging Markets (Emerging Markets Equity), US Agg (Barclays US Aggregate Bond Index), High Yield (Barclays US High Yield Index), Dollar EMD (JPM EMBI Global Diversified Index), Crude Oil (WTI Crude Oil Spot), Gold (Gold Price Spot), and REITs (NAREIT Composite Index). Source: FactSet



# MACRO PERFORMANCE OVERVIEW

## Q1 Macro Market Summary

The US announced a \$2.2 trillion dollar stimulus package, representing roughly 10% of total GDP

Government bond yields declined with the US 10-Year Treasury yields falling 124 bps, ending Q1 at historical lows

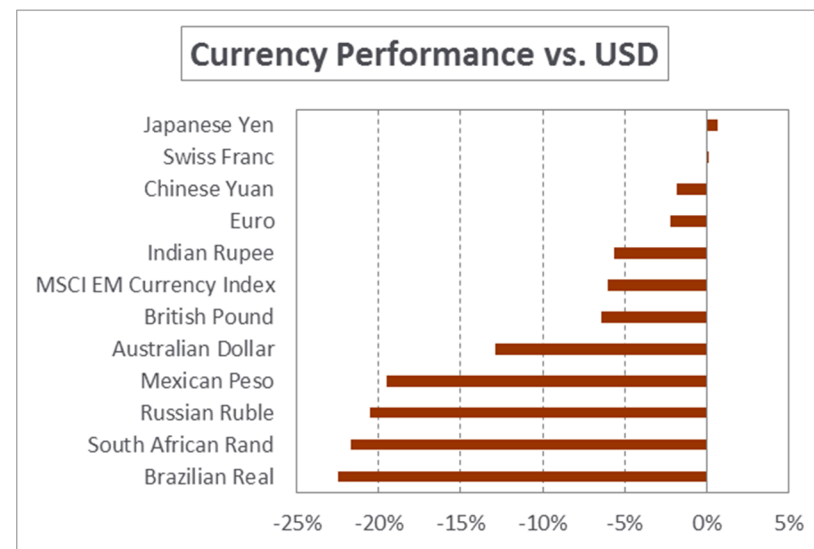
Safe-haven currencies broadly rallied, reflecting a flight-to-quality across markets

Central Banks	Current Rate	CPI YOY	Notes from the Quarter
<b>Federal Reserve</b>	0.00% - 0.25%	2.3%	The Fed cut interest rates by a total of 150 basis points in two emergency meetings in March and announced unlimited QE
<b>European Central Bank</b>	0.00%	1.2%	The ECB maintained its current benchmark interest rates and announced an €750 billion QE program
<b>Bank of Japan</b>	-0.10%	0.5%	The BoJ continued its ultra-easy QE and introduced an unscheduled policy to purchase an additional ¥1 trillion worth of government bond

Source: FactSet

	Yield 12/31/19	Yield 03/31/20	\Delta
<b>US 10-Year</b>	1.92%	0.68%	-1.24%
<b>US 30-Year</b>	2.39%	1.32%	-1.07%
<b>US Real 10-Year</b>	0.15%	-0.17%	-0.32%
<b>German 10-Year</b>	-0.19%	-0.49%	-0.30%
<b>Japan 10-Year</b>	-0.02%	0.02%	0.04%
<b>China 10-Year</b>	3.20%	2.61%	-0.59%
<b>EM Local Debt</b>	5.22%	5.36%	0.14%

Source: FactSet



Source: FactSet



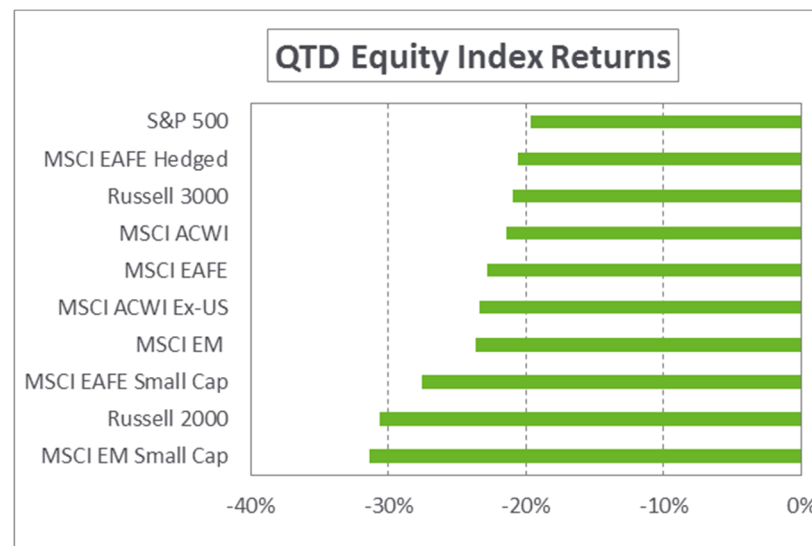
# EQUITY PERFORMANCE OVERVIEW

## Q1 Equity Market Summary

**Global equities entered bear markets, falling over 20% from the peaks, amid COVID-19 concerns**

**Small cap equities underperformed given their sensitivity and vulnerability to an economic slowdown**

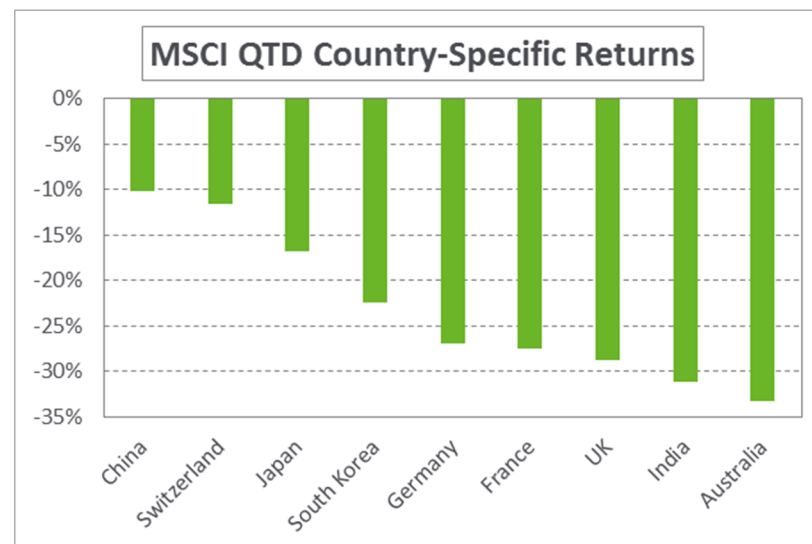
**Chinese equities performed relatively well as COVID-19 cases declined and manufacturing data rebounded**



Source: FactSet

Russell 3000 QTD Sector Returns	
Technology	-12.1%
Health Care	-12.9%
Consumer Discretionary	-20.5%
Consumer Staples	-15.1%
Energy	-51.6%
Materials & Processing	-28.3%
Producer Durables	-27.8%
Financial Services	-28.6%
Utilities	-15.1%

Source: FactSet



Source: FactSet



# CREDIT PERFORMANCE OVERVIEW

## Q1 Credit Market Summary

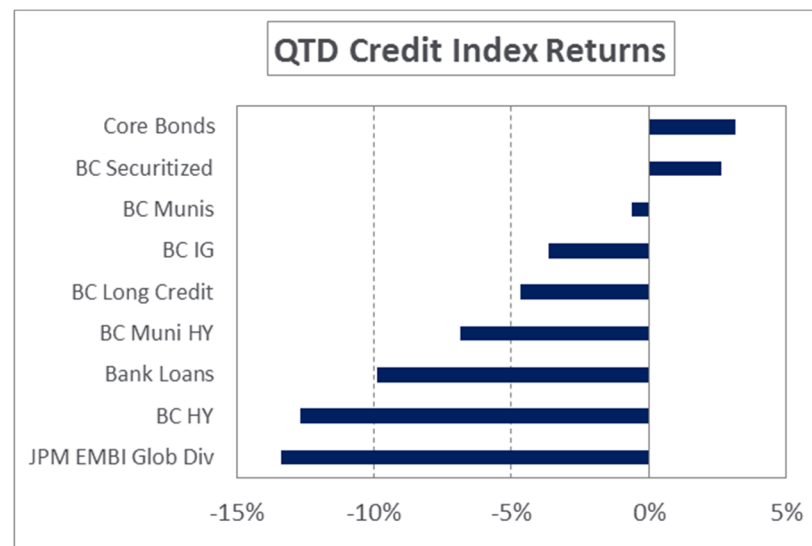
**Credit spreads increased, ending the quarter well above long-term medians**

US corporate high yield bonds fell 12.7% after spreads widened by 544 bps

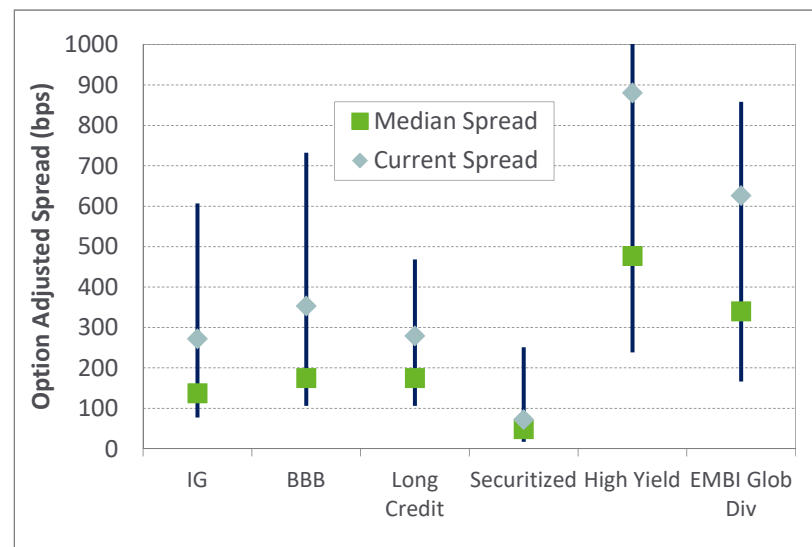
**Long credit returns decreased 4.7%, reflecting spread widening, which offset the decline in rates rates**

Credit Spread (Basis Points)	12/31/2019	3/31/2020	Δ
BC IG Credit	93	272	179
BC Long Credit	139	279	140
BC Securitized	42	72	30
BC High Yield	336	880	544
Muni HY	226	473	247
JPM EMBI	291	626	335
Bank Loans - Libor	372	734	362

Source: FactSet



Source: FactSet



Source: FactSet; Ranges calculated since 11/30/2000



# REAL ASSETS PERFORMANCE OVERVIEW

## Q1 Real Assets Market Summary

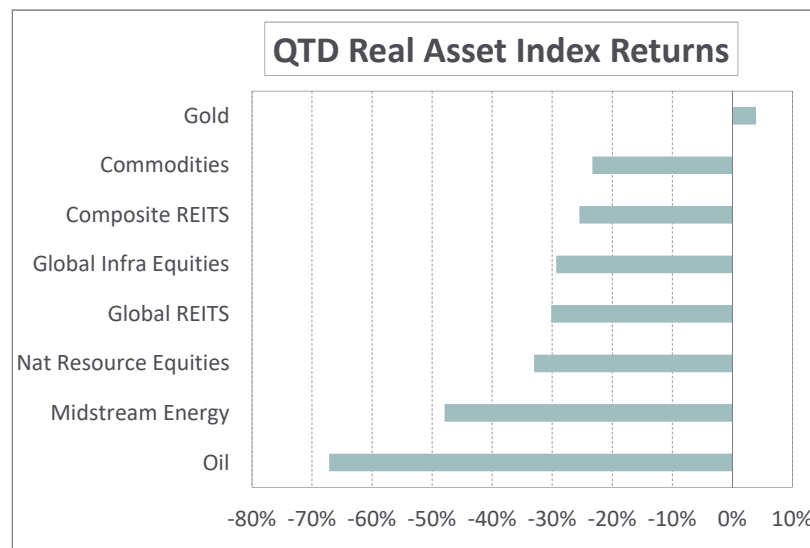
**Spot WTI crude oil fell 67.1% as the Russia-Saudi Arabia price war and demand uncertainties from COVID-19 impacted both supply and demand**

**Commodities declined reflecting waning demand, with the exception of gold, which increased 4.0%, reflecting a flight-to-quality**

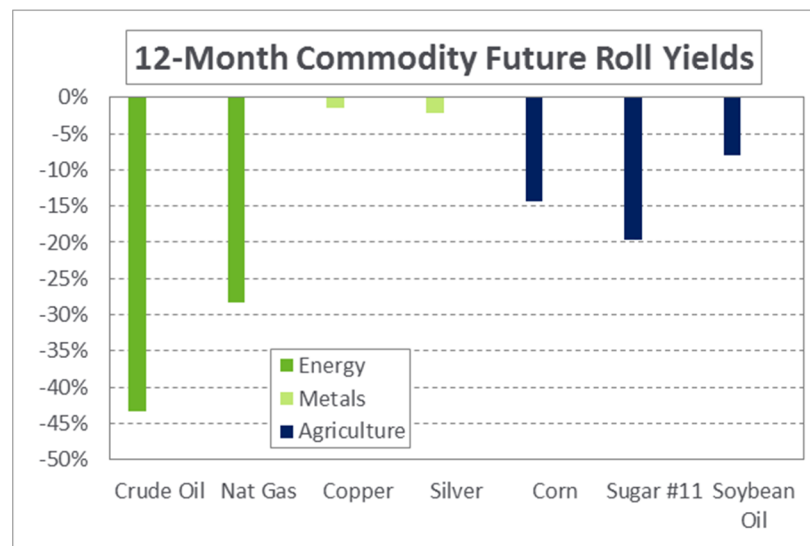
Real Asset Yields	12/31/2019	3/31/2020
Midstream Energy	6.4%	12.0%
Core Real Estate*	4.5%	4.5%
Composite REITs	4.1%	5.4%
Global REITs	4.2%	5.7%
Global Infrastructure Equities	4.0%	4.3%
Natural Resource Equities	3.9%	4.8%
US 10-Year Breakeven Inflation	1.77%	0.85%
Commodity Index Roll Yield	-1.7%	-14.3%
10-Year TIPS Real Yield	0.2%	-0.2%

Source: FactSet

Core Real Estate\* yields are subject to a one quarter lag



Source: FactSet



Source: FactSet



# EXECUTIVE SUMMARY

NEPC, LLC

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Delaware Office of the State Treasurer

# TOTAL FUND PERFORMANCE SUMMARY

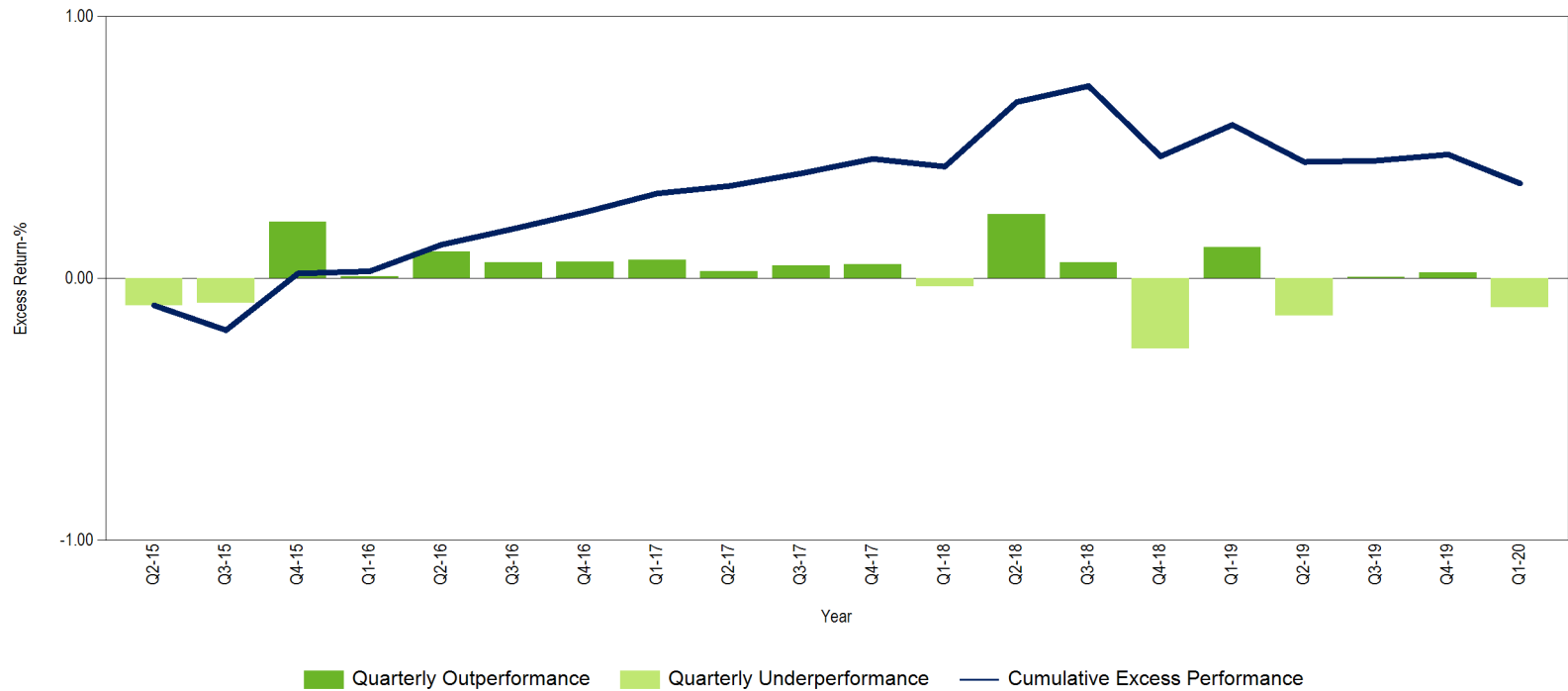
	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	Inception	Inception Date
<b>Delaware Total Consolidation</b>	\$2,793,676,495	2.77%	4.47%	6.48%	3.71%	2.61%	2.30%	Jan-05
<b>Total Liquidity &amp; Reserve</b>	\$2,729,746,924	3.32%	4.91%	6.87%	3.72%	--	3.29%	Nov-16
<b>Total Liquidity</b>	\$675,897,272	0.47%	1.68%	2.54%	2.05%	1.53%	1.83%	Jan-05
<i>eV US Cash Management Net Median</i>		0.37%	1.37%	1.99%	1.76%	1.27%	1.51%	Jan-05
<b>Total Reserve</b>	\$2,053,849,652	4.09%	5.77%	8.48%	4.45%	3.05%	2.72%	Jan-05
<i>Reserve Custom Index</i>		4.20%	5.85%	8.72%	4.43%	2.97%	2.92%	Jan-05
<i>eV US Interm Duration Fixed Inc Net Median</i>		1.15%	2.93%	5.41%	3.34%	2.55%	3.83%	Jan-05
<b>Total Endowment</b>	\$63,929,572	-15.68%	-10.64%	-7.41%	1.58%	--	2.47%	Aug-15
<i>Endowment Custom Index</i>		-11.82%	-6.10%	-2.58%	3.38%	3.54%	3.61%	Aug-15
<i>eV Global Balanced Net Median</i>		-19.25%	-14.19%	-10.36%	0.20%	2.44%	3.15%	Aug-15

Fiscal year ends June 30



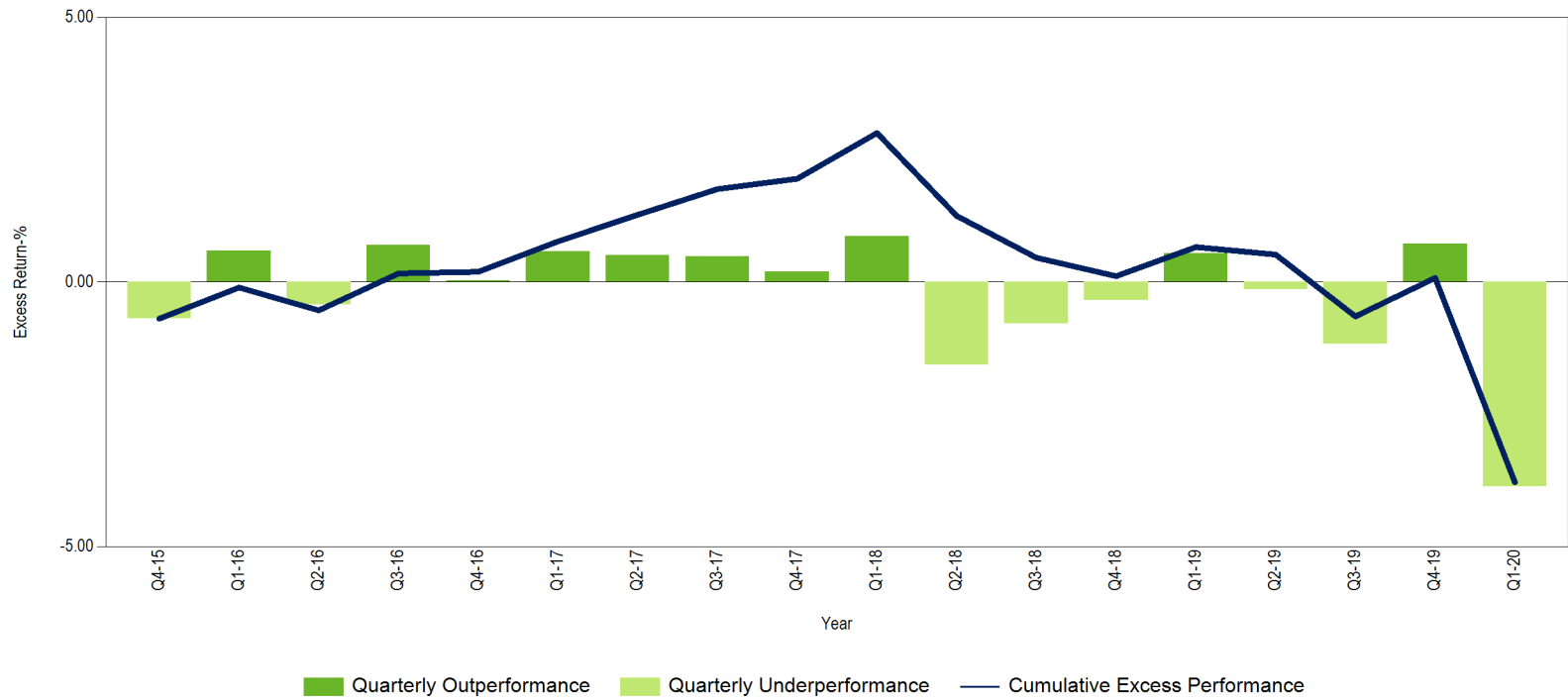
# TOTAL FUND PERFORMANCE SUMMARY

Quarterly and Cumulative Excess Performance  
Total Reserve vs. Reserve Custom Index



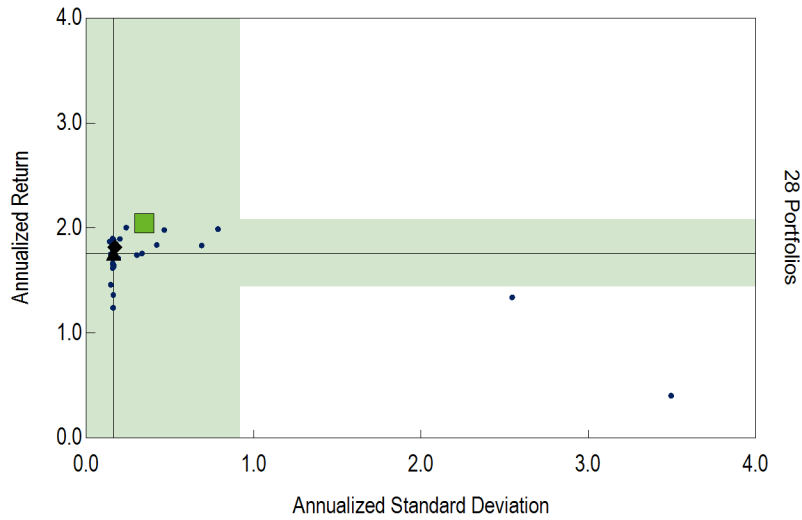
# TOTAL FUND PERFORMANCE SUMMARY

Quarterly and Cumulative Excess Performance  
Total Endowment vs. Endowment Custom Index



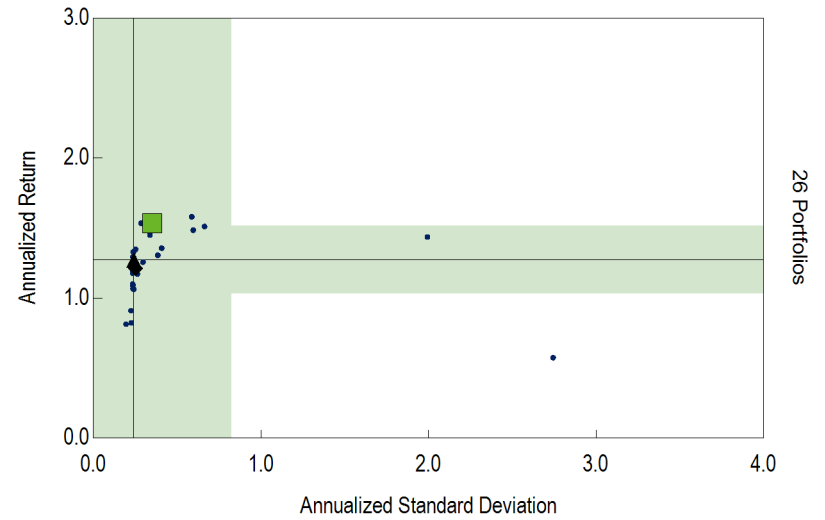
# LIQUIDITY RISK/RETURN - 3 & 5 YEARS

3 Years Ending March 31, 2020



- Total Liquidity
- ◆ FTSE T-Bill 6 Months TR
- ▲ Universe Median
- 68% Confidence Interval
- eV US Cash Management Net

5 Years Ending March 31, 2020



- Total Liquidity
- ◆ FTSE T-Bill 6 Months TR
- ▲ Universe Median
- 68% Confidence Interval
- eV US Cash Management Net

3 Years Ending March 31, 2020

	Anlzd Ret	Anlzd Std Dev	Sharpe Ratio
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Total Liquidity	2.05%	0.35%	0.94
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5 Years Ending March 31, 2020

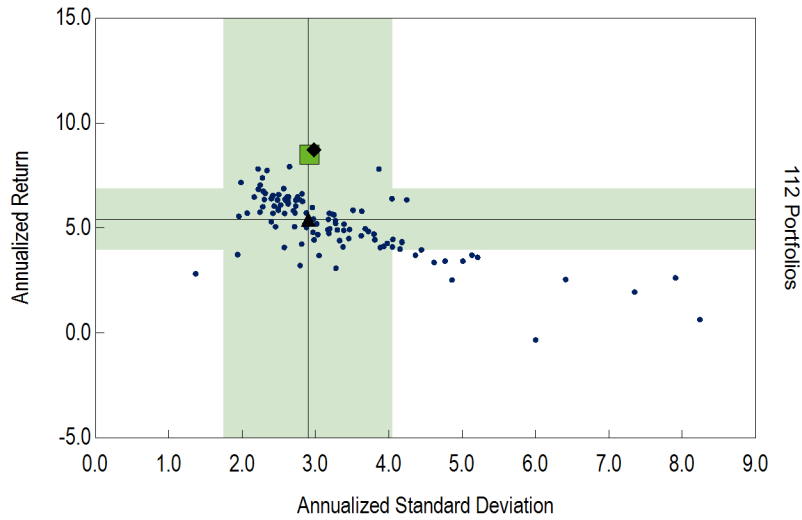
	Anlzd Ret	Anlzd Std Dev	Sharpe Ratio
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Total Liquidity	1.53%	0.35%	1.17
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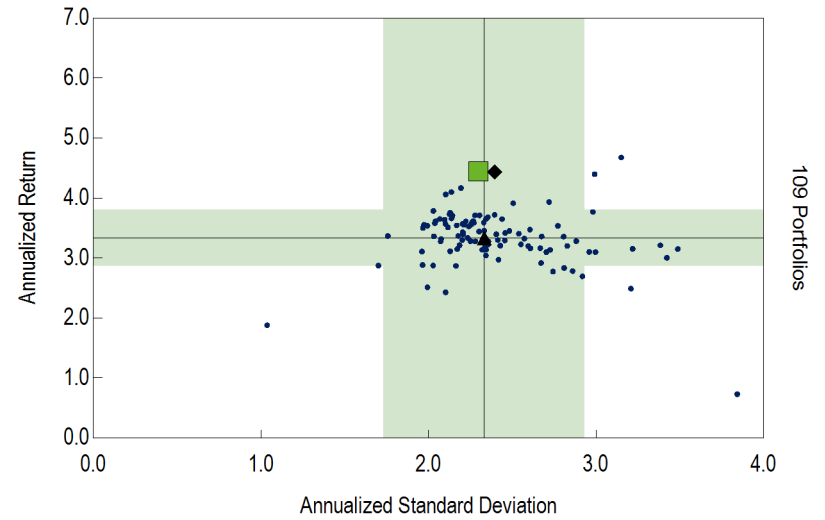
# RESERVE RISK/RETURN - 1 & 3 YEARS

1 Year Ending March 31, 2020



- Total Reserve
- ◆ Reserve Custom Index
- ▲ Universe Median
- 68% Confidence Interval
- eV US Interm Duration Fixed Inc Net

3 Years Ending March 31, 2020



- Total Reserve
- ◆ Reserve Custom Index
- ▲ Universe Median
- 68% Confidence Interval
- eV US Interm Duration Fixed Inc Net

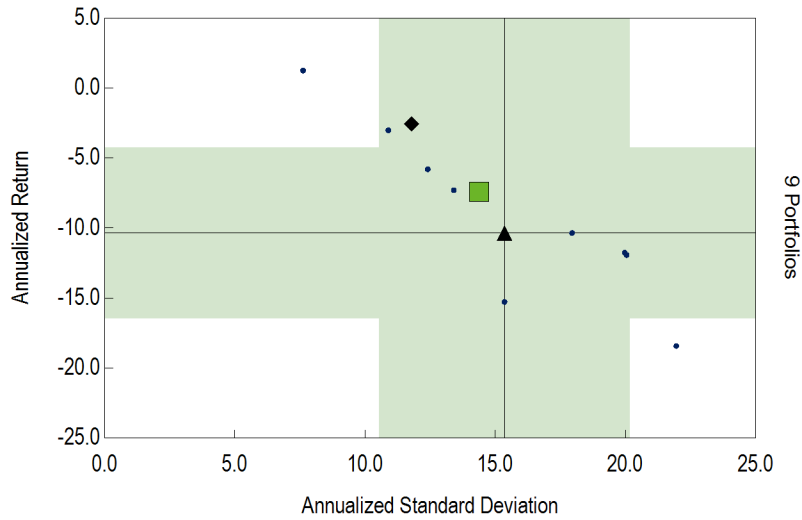
1 Year Ending March 31, 2020			
	Anlzd Ret	Anlzd Std Dev	Sharpe Ratio
Total Reserve	8.48%	2.92%	2.23
Reserve Custom Index	8.72%	2.98%	2.27

3 Years Ending March 31, 2020			
	Anlzd Ret	Anlzd Std Dev	Sharpe Ratio
Total Reserve	4.45%	2.30%	1.20
Reserve Custom Index	4.43%	2.40%	1.14



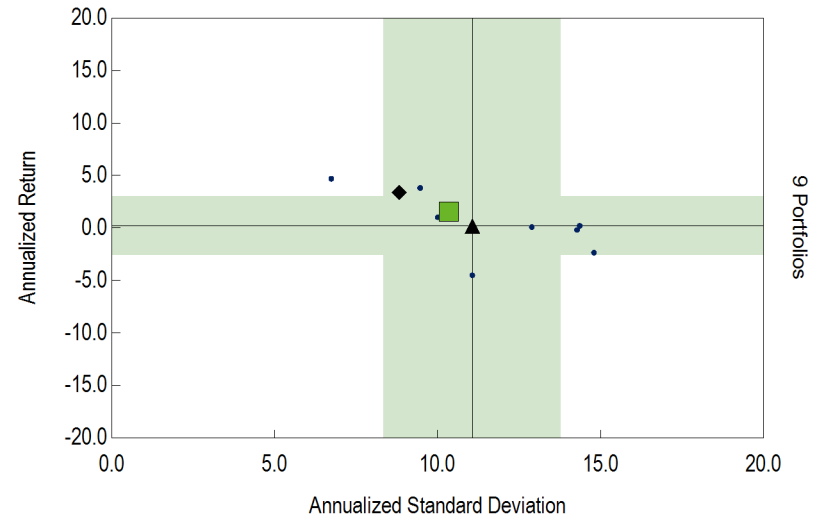
# ENDOWMENT RISK/RETURN - 1 & 3 YEARS

1 Year Ending March 31, 2020



- Total Endowment
- ◆ Endowment Custom Index
- ▲ Universe Median
- 68% Confidence Interval
- eV Global Balanced Net

3 Years Ending March 31, 2020



- Total Endowment
- ◆ Endowment Custom Index
- ▲ Universe Median
- 68% Confidence Interval
- eV Global Balanced Net

1 Year Ending March 31, 2020			
	Anlzd Ret	Anlzd Std Dev	Sharpe Ratio
Total Endowment	-7.41%	14.39%	-0.64
Endowment Custom Index	-2.58%	11.79%	-0.38

3 Years Ending March 31, 2020			
	Anlzd Ret	Anlzd Std Dev	Sharpe Ratio
Total Endowment	1.58%	10.36%	-0.01
Endowment Custom Index	3.38%	8.83%	0.19



# TOTAL FUND PERFORMANCE DETAIL - NET OF FEES

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	Inception (%)	Inception Date
<b>Delaware Total Consolidation</b>	<b>2,793,676,495</b>	<b>100.00</b>	<b>2.77</b>	<b>--</b>	<b>4.47</b>	<b>--</b>	<b>6.48</b>	<b>--</b>	<b>3.71</b>	<b>--</b>	<b>2.61</b>	<b>--</b>	<b>2.30</b>	<b>Jan-05</b>
<b>Total Liquidity &amp; Reserve</b>	<b>2,729,746,924</b>	<b>97.71</b>	<b>3.32</b>	<b>--</b>	<b>4.91</b>	<b>--</b>	<b>6.87</b>	<b>--</b>	<b>3.72</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>3.29</b>	<b>Nov-16</b>
<b>Total Liquidity</b>	<b>675,897,272</b>	<b>24.19</b>	<b>0.47</b>	<b>9</b>	<b>1.68</b>	<b>4</b>	<b>2.54</b>	<b>4</b>	<b>2.05</b>	<b>1</b>	<b>1.53</b>	<b>4</b>	<b>1.83</b>	<b>Jan-05</b>
<i>eV US Cash Management Net Median</i>			0.37		1.37		1.99		1.76		1.27		1.51	Jan-05
PFM Asset Management	339,500,103	12.15	0.59	2	1.81	1	2.64	3	2.09	1	1.61	1	1.33	Jun-13
Wilmington Liquidity	336,397,169	12.04	0.34	59	1.55	7	2.42	6	1.95	13	1.45	17	4.14	Jan-85
<b>Total Reserve</b>	<b>2,053,849,652</b>	<b>73.52</b>	<b>4.09</b>	<b>2</b>	<b>5.77</b>	<b>1</b>	<b>8.48</b>	<b>1</b>	<b>4.45</b>	<b>1</b>	<b>3.05</b>	<b>3</b>	<b>2.72</b>	<b>Jan-05</b>
<i>Reserve Custom Index</i>			4.20	2	5.85	1	8.72	1	4.43	1	2.97	5	2.92	Jan-05
<i>eV US Interm Duration Fixed Inc Net Median</i>			1.15		2.93		5.41		3.34		2.55		3.83	Jan-05
JPM Intermediate	490,682,076	17.56	1.84	14	3.09	13	4.59	14	2.73	12	2.01	21	1.76	Jun-13
<i>J.P. Morgan Custom Index</i>			2.22	7	3.47	7	4.99	9	2.74	12	1.97	26	1.73	Jun-13
Blackrock Financial Mangement	498,574,797	17.85	2.49	5	3.85	2	5.71	2	--	--	--	--	4.58	Mar-18
<i>Blackrock Custom Index</i>			2.97	1	4.28	1	6.22	1	3.30	1	2.30	1	4.72	Mar-18
Chandler Asset Management	528,956,185	18.93	4.73	3	6.85	3	10.35	3	5.49	--	3.66	--	2.99	Jun-13
Lazard Financial Management	535,636,594	19.17	7.18	1	9.14	1	13.18	1	--	--	--	--	9.06	Mar-18
<i>Chandler/Lazard Custom Index</i>			5.82	2	7.84	1	11.88	1	5.84	1	3.81	3	8.45	Mar-18
<b>Total Endowment</b>	<b>63,929,572</b>	<b>2.29</b>	<b>-15.68</b>	<b>40</b>	<b>-10.64</b>	<b>39</b>	<b>-7.41</b>	<b>38</b>	<b>1.58</b>	<b>23</b>	<b>--</b>	<b>--</b>	<b>2.47</b>	<b>Aug-15</b>
<i>Endowment Custom Index</i>			-11.82	16	-6.10	14	-2.58	12	3.38	15	3.54	17	3.61	Aug-15
<i>eV Global Balanced Net Median</i>			-19.25		-14.19		-10.36		0.20		2.44		3.15	Aug-15
SEI Funds	22,604,751	0.81	-14.01	29	-8.39	21	-5.21	23	2.47	19	--	--	3.80	Aug-15
MSIFT Global Strategist	20,102,120	0.72	-17.49	45	-12.93	46	-9.92	49	0.63	43	--	--	1.38	Aug-15
JP Morgan Diversified	21,222,275	0.76	-15.68	40	-10.75	39	-7.27	38	1.80	22	--	--	2.66	Aug-15
Cash Account	426	0.00	0.33	65	1.26	68	1.83	76	1.45	86	--	--	1.01	Aug-15

Notes: Net of Fees. Results for periods longer than one year are annualized.

Performance history through 12/2015 is from BNY Mellon. NEPC Performance start date is January 2016. Fiscal Year end is June 30.

Reserve Custom Index consists of 25% ICE BofAML 1-5 Yrs AAA-A US Corp & Govt TR / 25% ICE BofAML 1-3 Yrs AAA-A US Corp & Govt / 50% ICE BofA ML US Gov/Credit 5-10 Yrs A Rated and Above, as of 4/1/2018. Prior to this, the index comprised 75% ICE BofAML 1-5 Yrs AAA-A US Corp & Govt TR / 25% ICE BofAML 6 Months US T-Bills TR.

Endowment Custom Index consists of 60% MSCI World Index/40% BBgBarc US Aggregate.

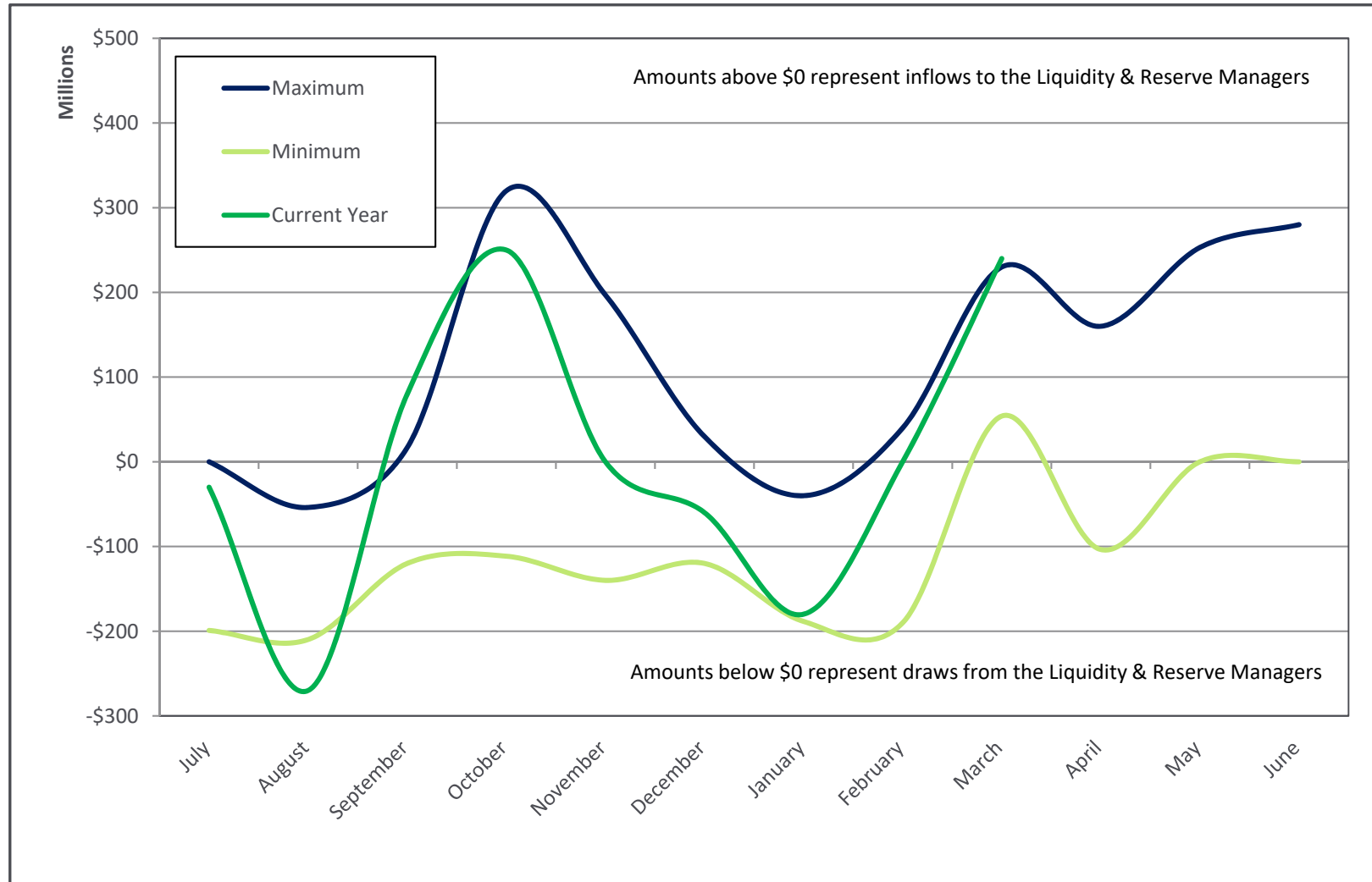
BlackRock Custom Index consists of 100% ICE BofAML 1-5 Yrs AAA-A US Corp & Govt TR.

J.P. Morgan Custom Index consists of 100% ICE BofAML 1-3 Yrs AAA-A US Corp & Govt.

Chandler/Lazard Custom Index consists of ICE BofAML US Gov/Credit 5-10 Yrs A Rated and Above.



# CASH FLOWS – FISCAL YEAR 2020





# MONTH ENDED MARCH 31, 2020

Change in Market Value Month Ending March 31, 2020										
	Beginning Market Value	Contributions	Withdrawals	Fees	Income	Unrealized Gain (Loss)	Realized Gain (Loss)	Amortization / Accretion	Ending Market Value	
<b>Liquidity Managers</b>										
PFM Asset Management	\$ 219,302,759	\$ 119,999,900	\$ (200)	\$ -	\$ 535,829	\$ (383,305)	\$ 87,582	\$ (42,462)	\$ 339,500,103	
Wilmington Liquidity	\$ 216,908,903	\$ 120,000,000	\$ -	\$ -	\$ 464,460	\$ (1,142,357)	\$ 163,881	\$ 2,282	\$ 336,397,169	
<b>Total Liquidity Managers</b>	<b>\$ 436,211,662</b>	<b>\$ 239,999,900</b>	<b>\$ (200)</b>	<b>\$ -</b>	<b>\$ 1,000,289</b>	<b>\$ (1,525,661)</b>	<b>\$ 251,463</b>	<b>\$ (40,180)</b>	<b>\$ 675,897,272</b>	
<b>Reserve Managers</b>										
BlackRock Financial Management	\$ 495,462,198	\$ -	\$ -	\$ -	\$ 872,054	\$ 1,532,498	\$ 701,029	\$ 7,018	\$ 498,574,797	
Chandler Asset Management	\$ 526,975,018	\$ -	\$ -	\$ -	\$ 1,042,018	\$ (573,583)	\$ 1,446,272	\$ 66,461	\$ 528,956,185	
JPM Intermediate	\$ 488,170,659	\$ -	\$ -	\$ -	\$ 824,560	\$ 669,198	\$ 1,066,110	\$ (48,452)	\$ 490,682,076	
Lazard Asset Management	\$ 525,203,838	\$ -	\$ -	\$ -	\$ 1,026,289	\$ 8,384,385	\$ 1,066,173	\$ (44,092)	\$ 535,636,594	
<b>Total Reserve Managers</b>	<b>\$ 2,035,811,713</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 3,764,921</b>	<b>\$ 10,012,497</b>	<b>\$ 4,279,584</b>	<b>\$ (19,065)</b>	<b>\$ 2,053,849,652</b>	
<b>Total Liquidity &amp; Reserve Managers</b>	<b>\$ 2,472,023,375</b>	<b>\$ 239,999,900</b>	<b>\$ (200)</b>	<b>\$ -</b>	<b>\$ 4,765,210</b>	<b>\$ 8,486,836</b>	<b>\$ 4,531,048</b>	<b>\$ (59,245)</b>	<b>\$ 2,729,746,924</b>	
<b>Land &amp; Water Endowment</b>										
SEI Funds	\$ 25,028,224	\$ -	\$ -	\$ -	\$ 22,701	\$ (2,440,635)	\$ (5,540)	\$ -	\$ 22,604,751	
MSIFT Global Strategist	\$ 22,640,515	\$ -	\$ -	\$ -	\$ 488	\$ (2,538,883)	\$ -	\$ -	\$ 20,102,120	
JP Morgan Diversified	\$ 24,112,251	\$ 91	\$ (500)	\$ -	\$ 104,933	\$ (2,994,467)	\$ (33)	\$ -	\$ 21,222,275	
Cash Account	\$ 426	\$ 591	\$ (591)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 425	
<b>Total Land &amp; Water Endowment</b>	<b>\$ 71,781,416</b>	<b>\$ 682</b>	<b>\$ (1,091)</b>	<b>\$ -</b>	<b>\$ 128,122</b>	<b>\$ (7,973,985)</b>	<b>\$ (5,573)</b>	<b>\$ -</b>	<b>\$ 63,929,571</b>	
<b>Total</b>	<b>\$ 2,543,804,791</b>	<b>\$ 240,000,582</b>	<b>\$ (1,291)</b>	<b>\$ -</b>	<b>\$ 4,893,332</b>	<b>\$ 512,851</b>	<b>\$ 4,525,475</b>	<b>\$ (59,245)</b>	<b>\$ 2,793,676,495</b>	

**Footnotes:**

Values provided by Northern Trust and are reconciled to the audited custodian reports.

Income is a product of income received during the month plus accrued income.

Numbers may not add due to rounding.



# FISCAL YEAR TO DATE

	Change in Market Value Fiscal Year-to-Date Through March 31, 2020									
	Beginning Market Value	Contributions	Withdrawals	Fees	Income	Unrealized Gain (Loss)	Realized Gain (Loss)	Amortization / Accretion	Ending Market Value	
<b>Liquidity Managers</b>										
PFM Asset Management	\$ 379,459,861	\$ 309,999,900	\$ (355,000,200)	\$ (201,623)	\$ 4,698,181	\$ (199,997)	\$ 588,880	\$ 155,100	\$ 339,500,103	
Wilmington Liquidity	\$ 377,298,107	\$ 310,000,000	\$ (355,000,000)	\$ (208,399)	\$ 4,150,884	\$ (1,403,945)	\$ 715,745	\$ 844,776	\$ 336,397,169	
<b>Total Liquidity Managers</b>	<b>\$ 756,757,968</b>	<b>\$ 619,999,900</b>	<b>\$ (710,000,200)</b>	<b>\$ (410,022)</b>	<b>\$ 8,849,065</b>	<b>\$ (1,603,941)</b>	<b>\$ 1,304,625</b>	<b>\$ 999,876</b>	<b>\$ 675,897,272</b>	
<b>Reserve Managers</b>										
BlackRock Financial Management	\$ 450,402,164	\$ 30,000,000	\$ -	\$ (230,279)	\$ 7,836,850	\$ 8,691,612	\$ 2,096,191	\$ (221,740)	\$ 498,574,797	
Chandler Asset Management	\$ 465,725,064	\$ 30,000,000	\$ -	\$ (226,507)	\$ 9,149,846	\$ 21,247,162	\$ 2,196,946	\$ 863,675	\$ 528,956,185	
JPM Intermediate	\$ 446,232,523	\$ 30,000,000	\$ -	\$ (255,276)	\$ 7,462,900	\$ 4,259,330	\$ 3,055,352	\$ (72,754)	\$ 490,682,076	
Lazard Asset Management	\$ 461,513,160	\$ 30,000,000	\$ -	\$ (376,687)	\$ 8,848,776	\$ 28,290,438	\$ 7,368,113	\$ (7,206)	\$ 535,636,594	
<b>Total Reserve Managers</b>	<b>\$ 1,823,872,911</b>	<b>\$ 120,000,000</b>	<b>\$ -</b>	<b>\$ (1,088,749)</b>	<b>\$ 33,298,372</b>	<b>\$ 62,488,542</b>	<b>\$ 14,716,603</b>	<b>\$ 561,974</b>	<b>\$ 2,053,849,652</b>	
<b>Total Liquidity &amp; Reserve Managers</b>	<b>\$ 2,580,630,879</b>	<b>\$ 739,999,900</b>	<b>\$ (710,000,200)</b>	<b>\$ (1,498,771)</b>	<b>\$ 42,147,437</b>	<b>\$ 60,884,600</b>	<b>\$ 16,021,228</b>	<b>\$ 1,561,850</b>	<b>\$ 2,729,746,924</b>	
<b>Land &amp; Water Endowment</b>										
SEI Funds	\$ 24,666,596	\$ 26,436	\$ (18,000)	\$ (64,896)	\$ 531,912	\$ (2,939,091)	\$ 401,792	\$ -	\$ 22,604,751	
MSIFT Global Strategist	\$ 23,080,612	\$ 26,436	\$ (18,000)	\$ -	\$ 49,337	\$ (3,407,586)	\$ 371,320	\$ -	\$ 20,102,120	
JP Morgan Diversified	\$ 23,772,475	\$ 26,527	\$ (18,500)	\$ -	\$ 369,179	\$ (4,605,532)	\$ 1,678,125	\$ -	\$ 21,222,275	
Cash Account	\$ 413	\$ 48,762	\$ (48,762)	\$ -	\$ 13	\$ -	\$ -	\$ -	\$ 425	
<b>Total Land &amp; Water Endowment</b>	<b>\$ 71,520,096</b>	<b>\$ 128,161</b>	<b>\$ (103,262)</b>	<b>\$ (64,896)</b>	<b>\$ 950,441</b>	<b>\$ (10,952,210)</b>	<b>\$ 2,451,238</b>	<b>\$ -</b>	<b>\$ 63,929,571</b>	
<b>Total</b>	<b>\$ 2,652,150,975</b>	<b>\$ 740,128,061</b>	<b>\$ (710,103,462)</b>	<b>\$ (1,563,667)</b>	<b>\$ 43,097,878</b>	<b>\$ 49,932,391</b>	<b>\$ 18,472,466</b>	<b>\$ 1,561,850</b>	<b>\$ 2,793,676,495</b>	

## Footnotes:

Values provided by Northern Trust and are reconciled to the audited custodian reports.

Income is a product of income received during the month plus accrued income.

Numbers may not add due to rounding.



# YIELD AND DURATION POSITIONING

Liquidity Portfolio Yield and Duration Analysis							
Portfolio					Benchmark		
	Portfolio Value	% of Assets	Yield	Duration		Yield	Duration
PFM \$	339,500,103	12.4%	1.60%	0.51	6-Month Treasury Bill	0.09%	0.41
Wilmington Trust \$	336,397,169	12.3%	1.26%	0.93	6-Month Treasury Bill	0.09%	0.41
<b>Total Liquidity \$</b>	<b>675,897,272</b>	<b>24.8%</b>	<b>1.43%</b>	<b>0.72</b>	<b>6-Month Treasury Bill</b>	<b>0.09%</b>	<b>0.41</b>

Reserve Portfolio Yield and Duration Analysis							
Portfolio					Benchmark		
	Portfolio Value	% of Assets	Yield	Duration		Yield	Duration
JP Morgan \$	490,682,076	18.0%	1.08%	1.75	BAML 1-3 Yr Govt/Credit A+	0.60%	1.80
BlackRock \$	498,574,797	18.3%	0.91%	2.67	BAML 1-5 Yr Govt/Credit A+	0.66%	2.55
Chandler \$	528,956,185	19.4%	1.40%	6.07	BAML 5-10 Yr Govt/Credit A+	1.18%	6.42
Lazard \$	535,636,594	19.6%	0.90%	6.39	BAML 5-10 Yr Govt/Credit A+	1.18%	6.42
<b>Total Reserve \$</b>	<b>2,053,849,652</b>	<b>75.2%</b>	<b>1.07%</b>	<b>4.30</b>	<b>Custom Reserve Benchmark</b>	<b>0.91%</b>	<b>4.30</b>

Total Liquidity & Reserve Portfolio Yield and Duration Analysis							
Portfolio					Benchmark		
	Portfolio Value	% of Assets	Yield	Duration		Yield	Duration
<b>Total Liquidity &amp; Reserve \$</b>	<b>2,729,746,924</b>	<b>100.0%</b>	<b>1.16%</b>	<b>3.41</b>	<b>Weighted Average</b>	<b>0.70%</b>	<b>3.33</b>

Source: Bloomberg, Barclays, Alerian, Nareit, MSCI, JP Morgan, Credit Suisse, Thomson One



# LIQUIDITY MANAGER REVIEW

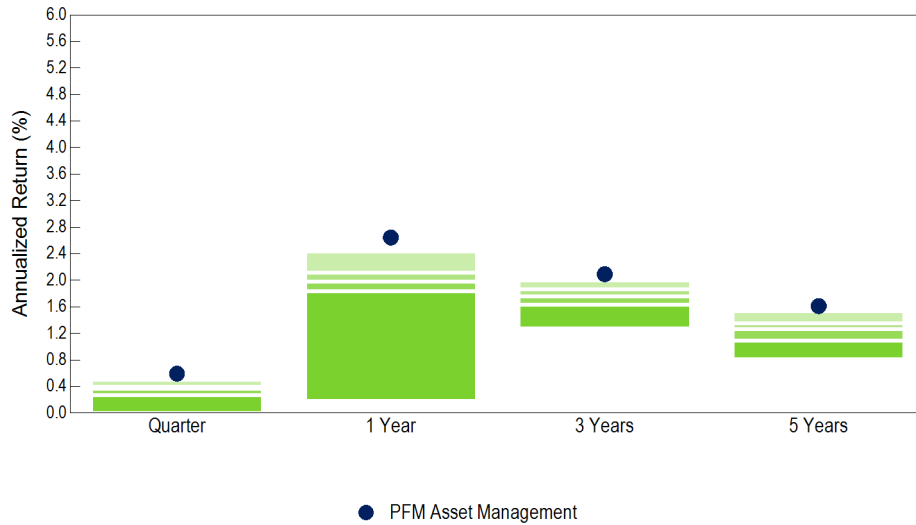
NEPC, LLC

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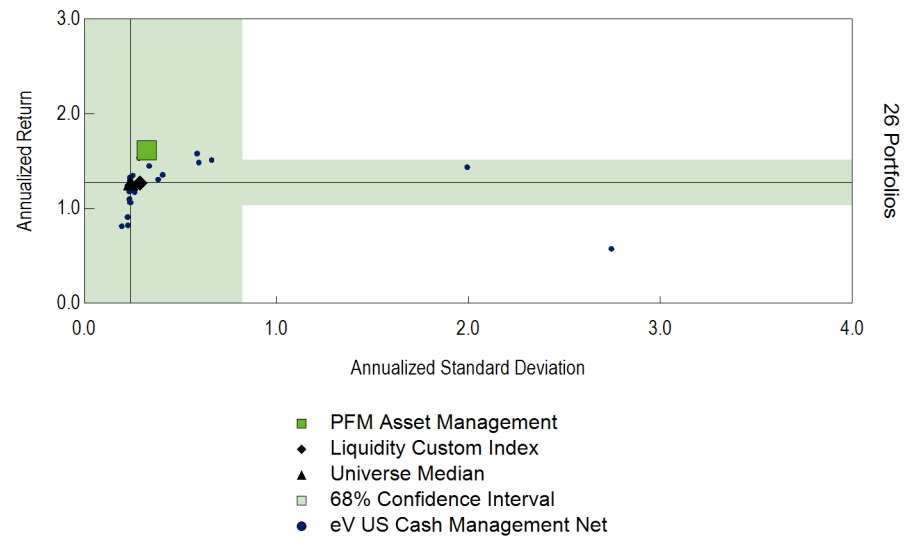
# Delaware Office of the State Treasurer

## PFM ASSET MANAGEMENT

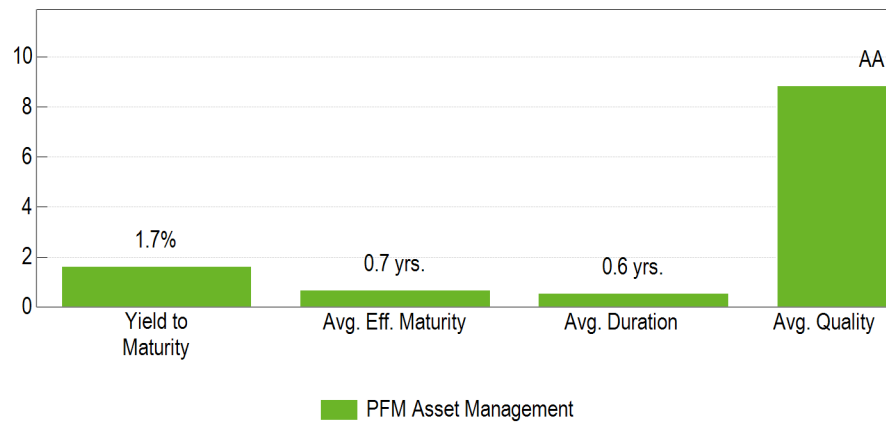
eV US Cash Management Net Return Comparison



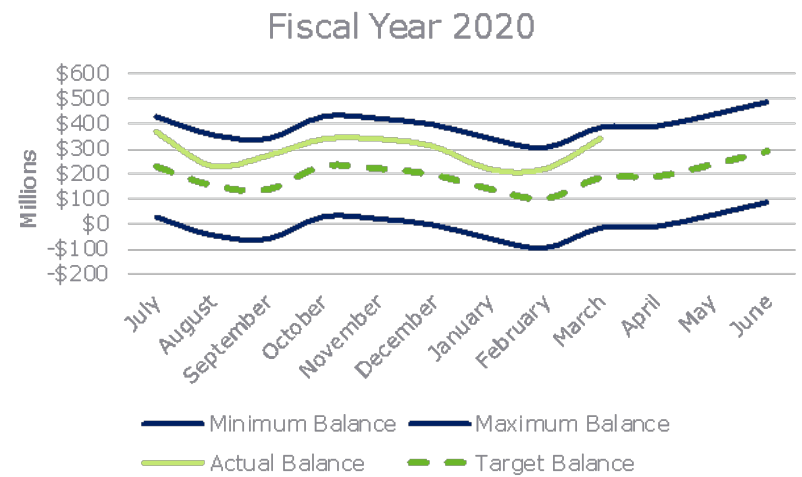
5 Year Risk Return



Characteristics



Manager Balance to Target



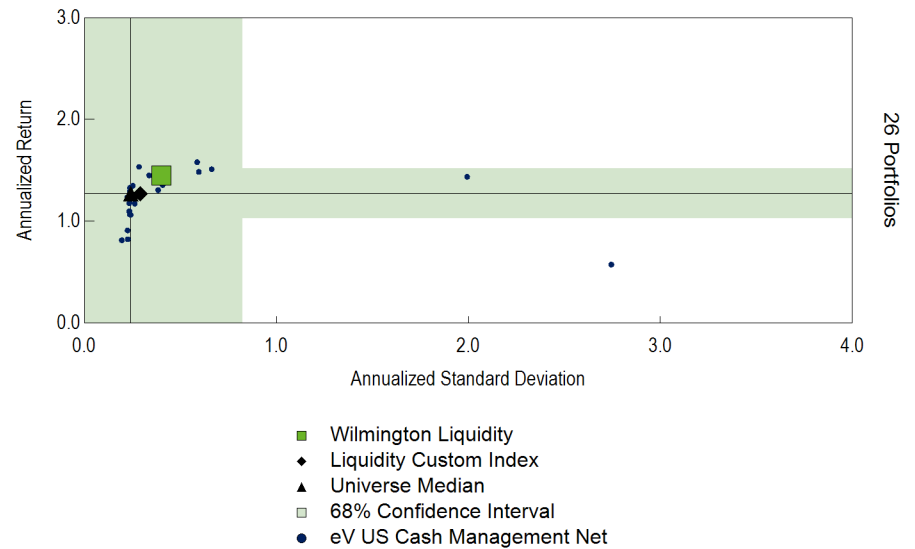
# Delaware Office of the State Treasurer

## WILMINGTON LIQUIDITY

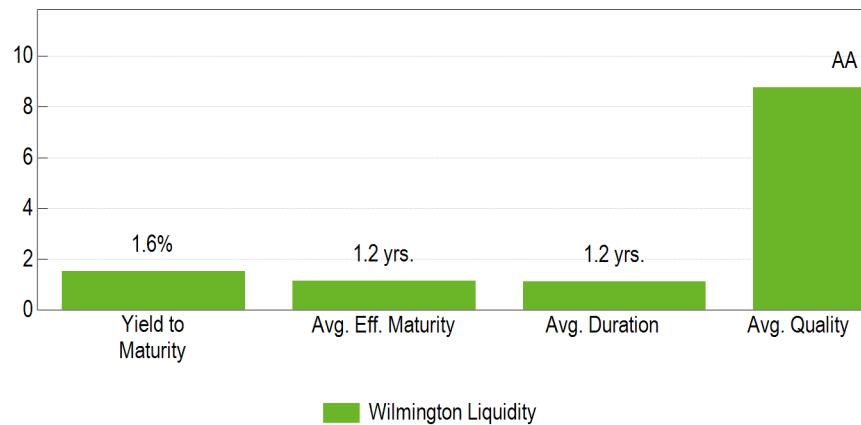
eV US Cash Management Net Return Comparison



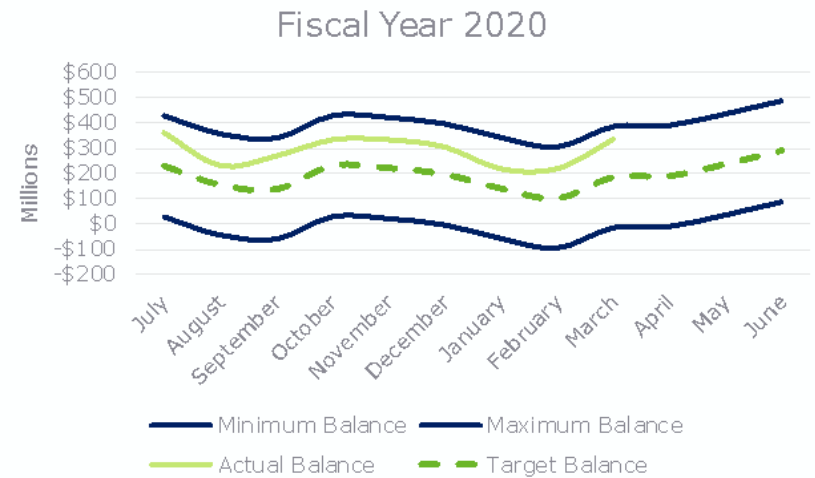
5 Year Risk Return



Characteristics



Manager Balance to Target



# RESERVE MANAGER REVIEW

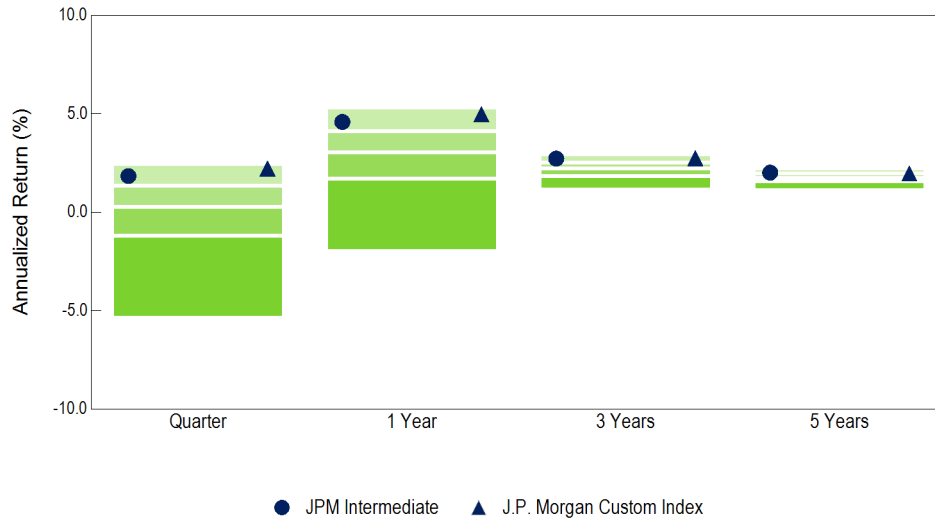
NEPC, LLC

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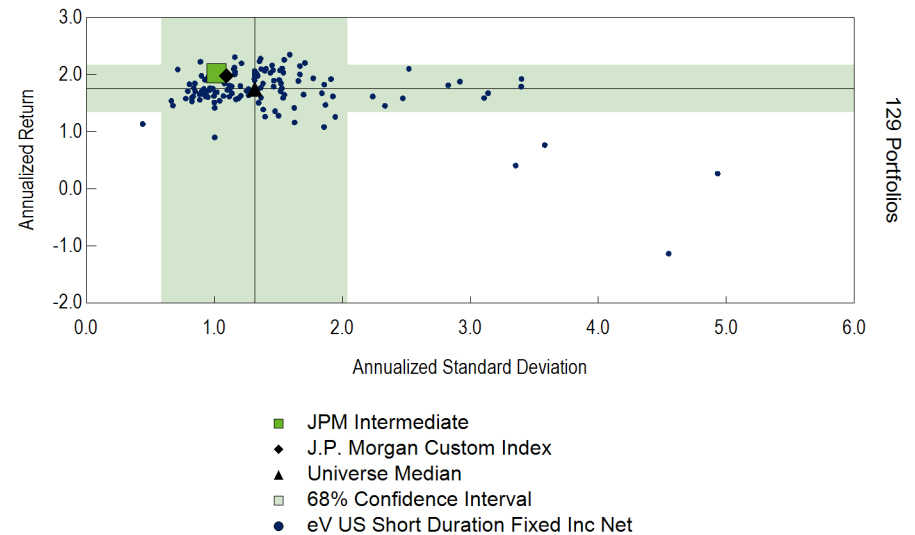
# Delaware Office of the State Treasurer

## JPM INTERMEDIATE

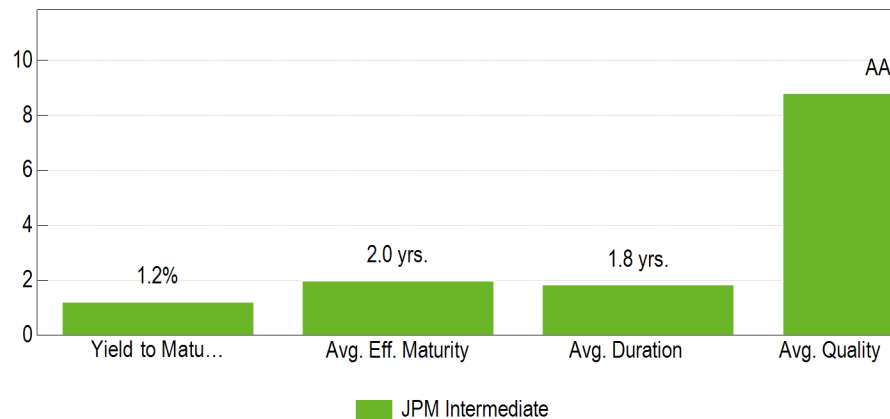
eV US Short Duration Fixed Inc Net Return Comparison



5 Year Risk Return



Characteristics



Qualitative Attribution

**Duration and Yield Positioning:** JPM came into the first quarter thinking that the economy has stabilized and that the Fed would hold interest rates steady (after cutting them three times in 2019) for the foreseeable future. By the end of February JPM had little risk on and the portfolio was similar to benchmark with a neutral duration and a modest overweight to credit. **Result:** Duration/curve positioning had a neutral effect for quarter on the portfolio.

**Credit Positioning:** Going into the quarter JPM was constructive on the economy and credit and chose to maintain an overweight to corporate bonds at the expense of Treasuries, and within the corporate sector JPM thought financial obligations carried the most value.

**Result:** In light COVID-19 and the subsequent flight to safety, JPM's overweight to corporate bonds, particularly financials, caused approximately 34 bps of relative underperformance for the quarter.

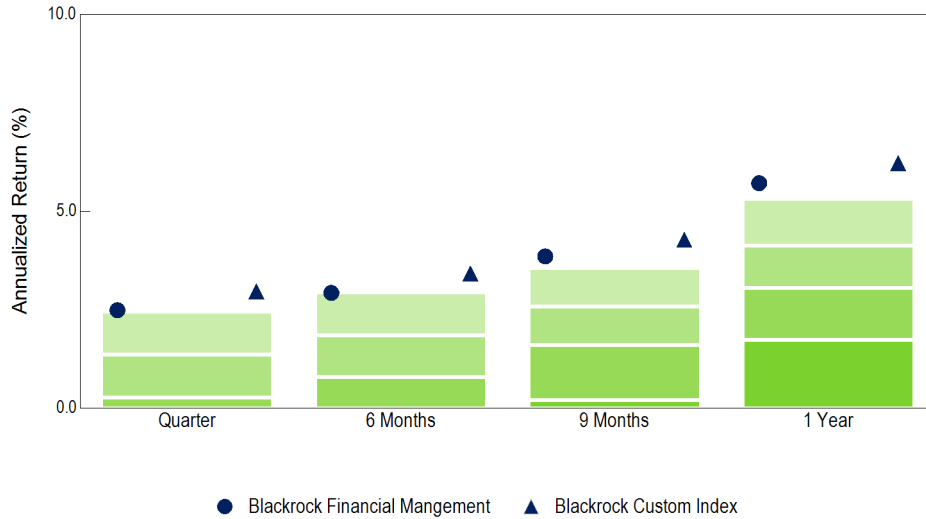
**Other Positioning:** Going forward JPM expects Treasury rates to remain at current yield levels with a bias toward slightly higher rates and JPM will likely look to reduce duration to a slight underweight versus the benchmark.



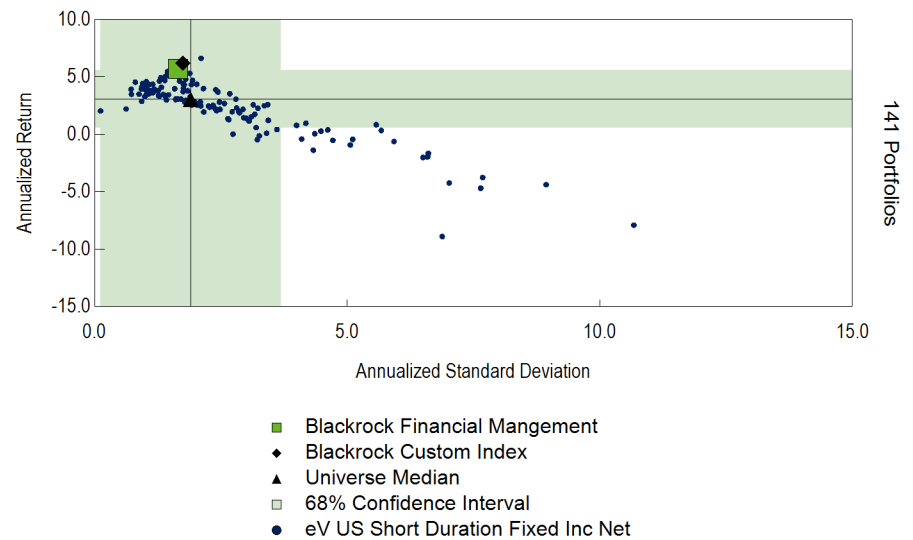


# BLACKROCK FINANCIAL MANAGEMENT

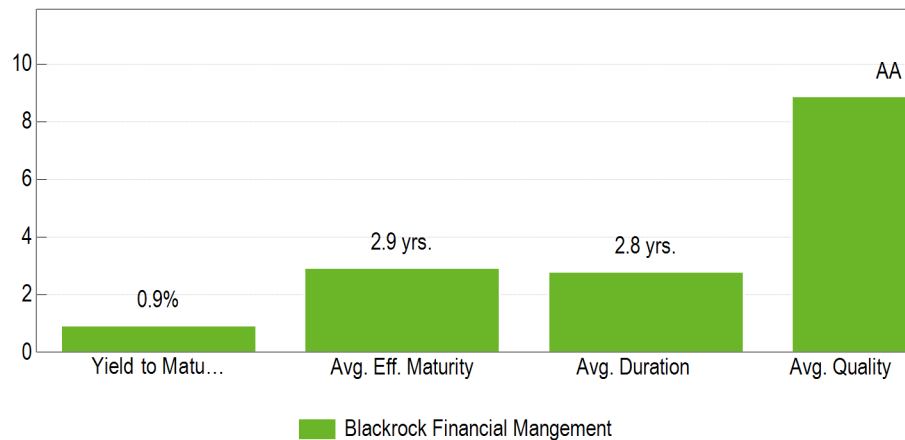
eV US Short Duration Fixed Inc Net Return Comparison



1 Year Risk Return



Characteristics



Qualitative Attribution

**Duration and Yield Positioning:** The portfolio's duration positioning was neutral to long versus the benchmark.

**Result:** BlackRock's duration and curve positioning slightly added to performance.

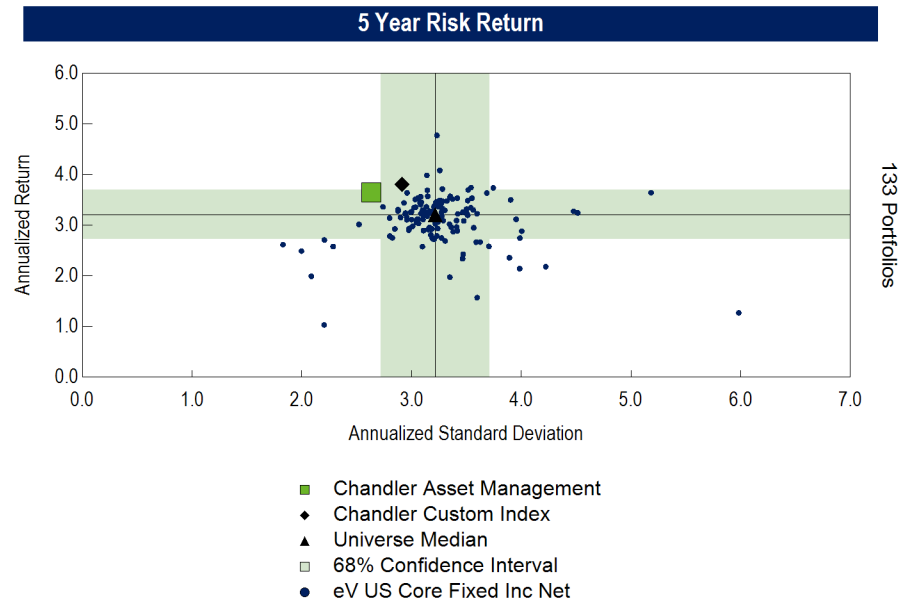
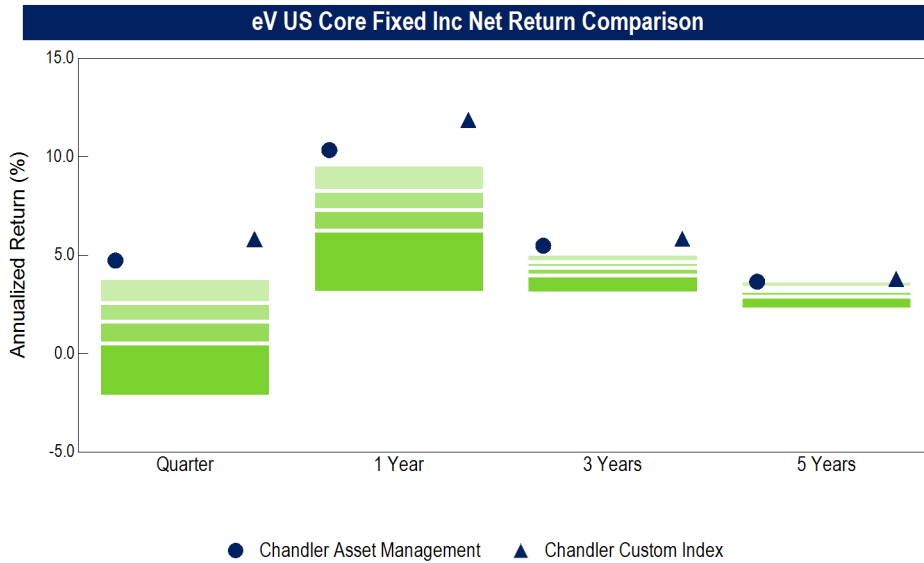
**Credit Positioning:** Overall, the portfolio had an overweight to securitized assets such as MBS and ABS, and a slight overweight to Investment Grade Corporates.

**Result:** The portfolio's overweight allocations to Investment Grade Credit, MBS, and ABS all contributed negatively to performance.

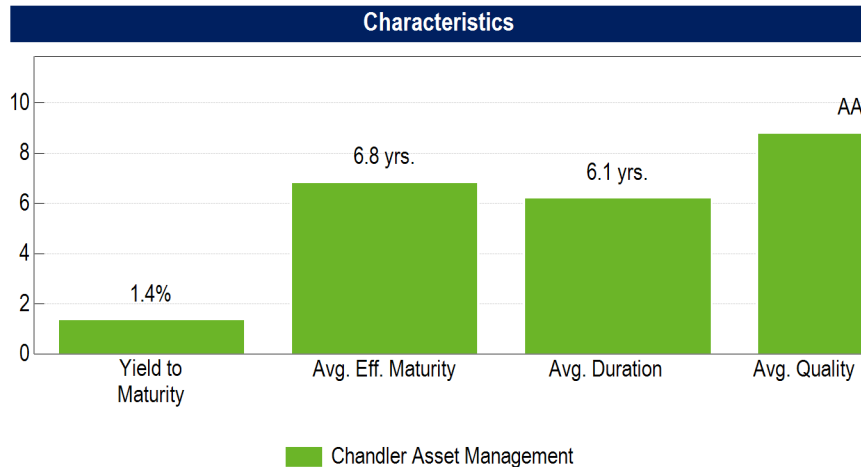
**Other Positioning:** BlackRock is cautiously optimistic on US investment grade credit as credit spreads widened to attractive levels due to the virus outbreak. They prefer high quality names in cable, healthcare, pharma and wireless telecom given their solid balance sheets and expected resiliency during the virus-related slowdown.



# CHANDLER ASSET MANAGEMENT



- Chandler Asset Management
- ◆ Chandler Custom Index
- ▲ Universe Median
- 68% Confidence Interval
- eV US Core Fixed Inc Net



### Qualitative Attribution

**Duration and Yield Positioning:** The portfolio continues to be positioned with a duration below the benchmark.

**Result:** The underweight to the Treasury sector relative to the benchmark detracted from the performance of the portfolio compared to the benchmark. Based on the attribution analysis the underweight in the 7-10 year portion of the maturity distribution was the largest detractor.

**Credit Positioning:** Credit positioning was additive to performance based on the attribution analysis during the quarter.

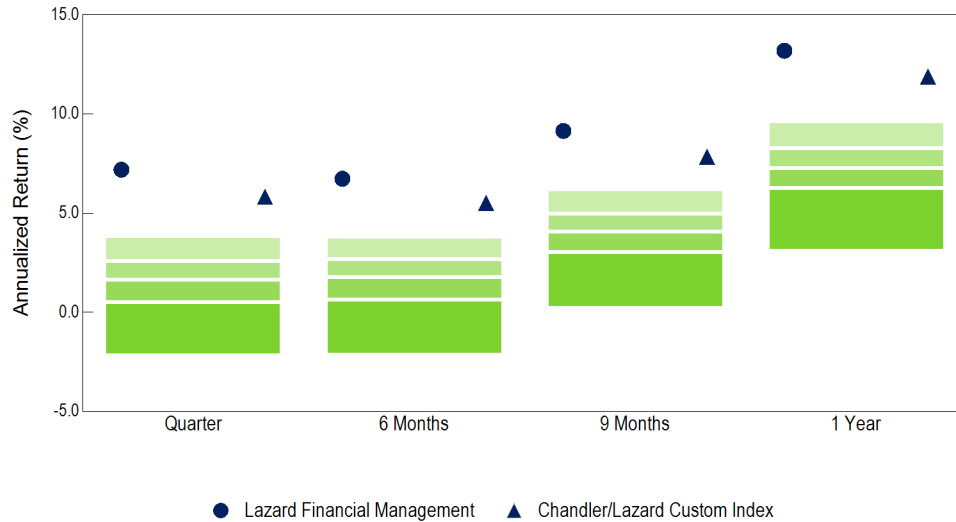
**Result:** The portfolio maintained a higher quality mix of securities compared to the benchmark which was beneficial at the margin in the down market: The mix of securities in the technology sub sector was a positive and the mix of securities in the regional banking sector detracted from performance due to the tight starting point in valuations during the quarter.

**Other Positioning:** Risk assets are performing better in the first half of April 2020 which will benefit the portfolio assuming the trends stay in place. The Chandler team expects the market to remain volatile and will continue to have a higher quality bias with the underlying holdings.

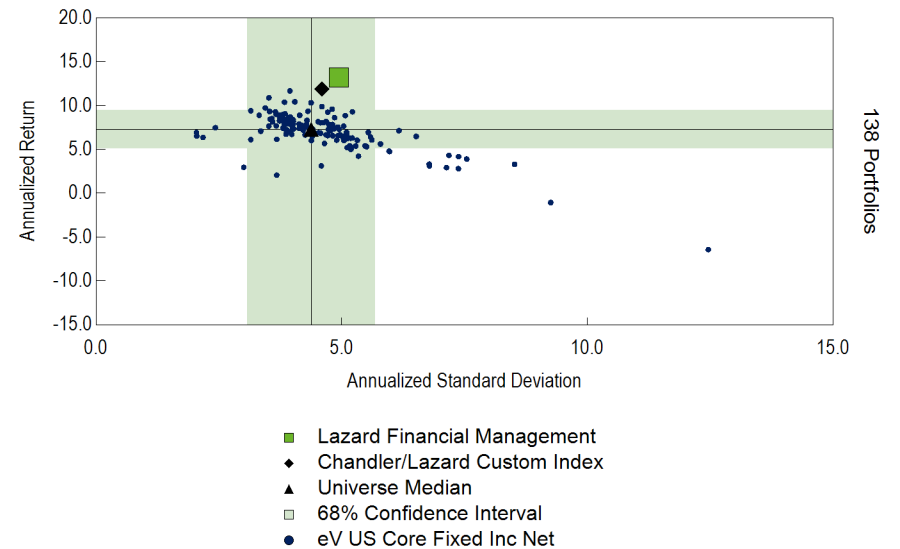


# LAZARD FINANCIAL MANAGEMENT

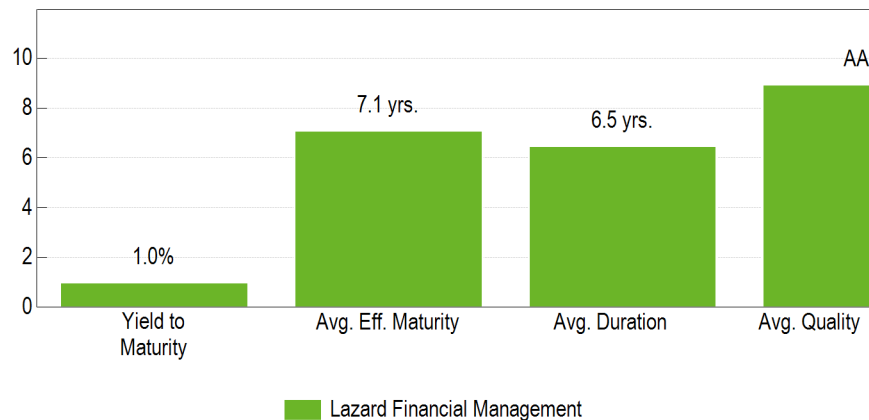
## eV US Core Fixed Inc Net Return Comparison



## 1 Year Risk Return



## Characteristics



## Qualitative Attribution

**Duration and Yield Positioning:** In terms of relative interest rate exposure, the portfolio generally maintained a neutral curve and duration position throughout quarter.

**Result:** Because of the portfolio's neutral positioning in the quarter, interest rate changes were not a material contributor to relative returns.

**Credit Positioning:** The portfolio's overall credit exposure has consistently maintained a defensive posture, carrying an underweight to both Corporate and Non-US Government credit risk.

**Result:** The mandate's built-in underweight to BBB-rated Corporates helped relative performance, as Corporate credit suffered hugely negative absolute and excess returns versus US Treasuries year-to-date, led by the lower levels of the investment grade quality spectrum.

**Other Positioning:** Lazard continues to search for attractively priced A-rated corporate positions with little success. In the meantime, Lazard will continue to engage Taxable Municipal debt opportunities as that market develops going forward.



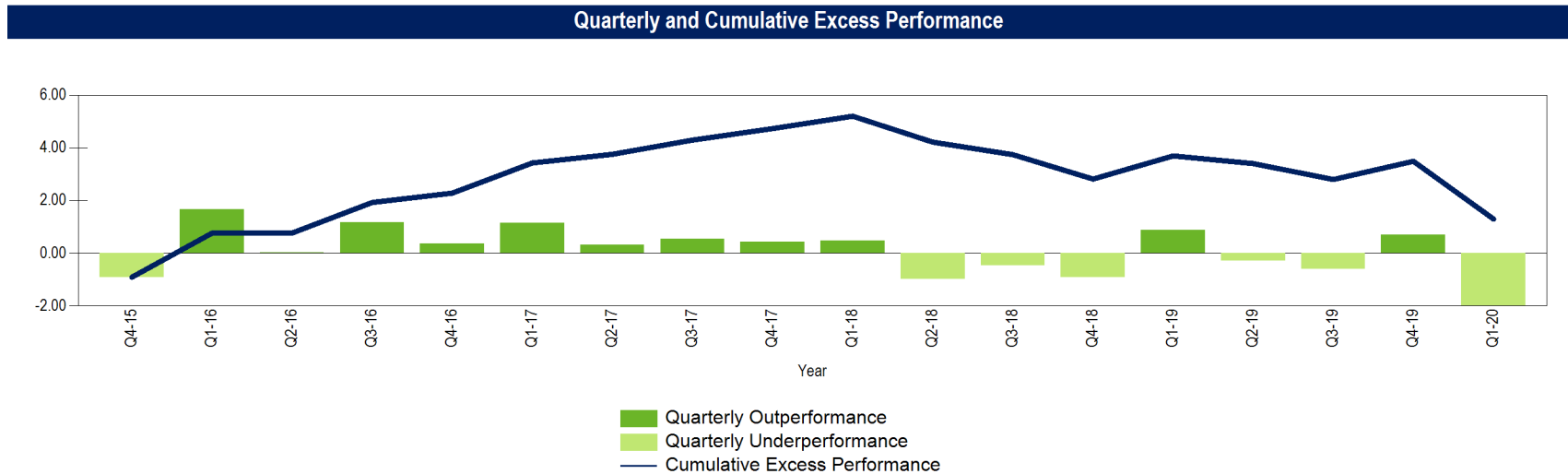
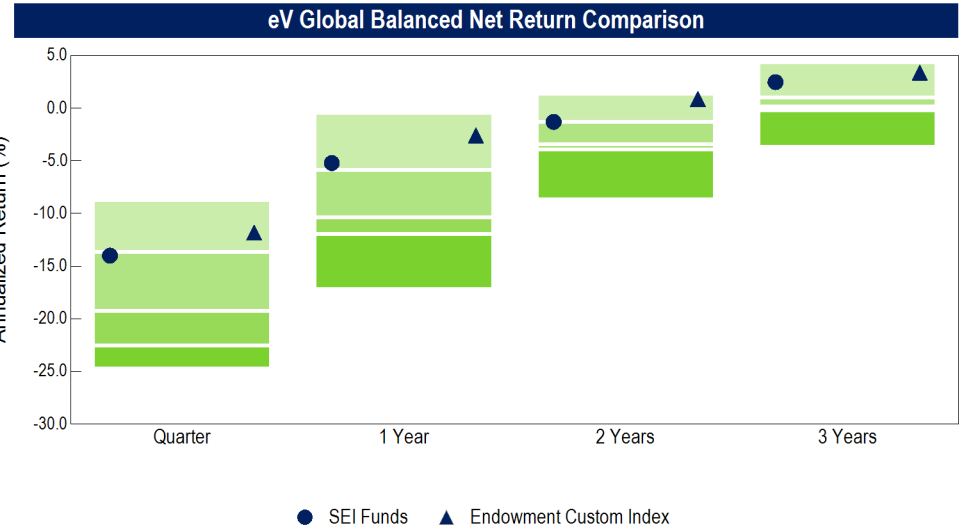
# ENDOWMENT MANAGER REVIEW

NEPC, LLC

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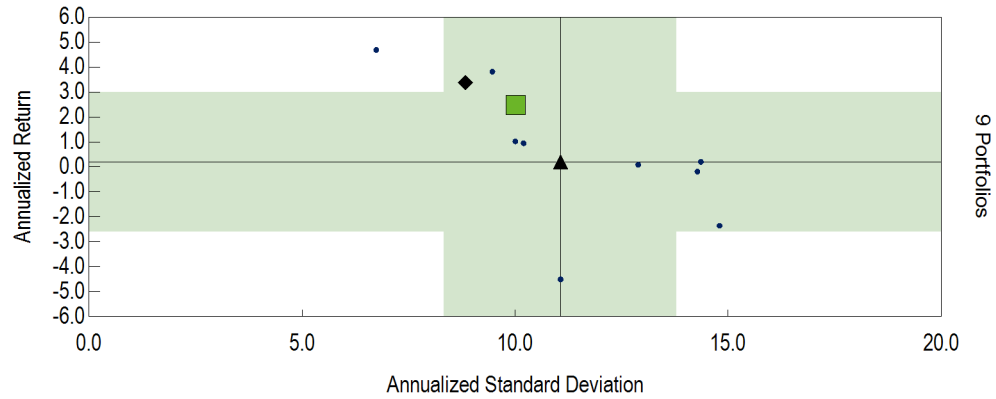
# SEI FUNDS

SEI Funds manages a multi-asset class portfolio subject to a 60% target equity allocation which will be held in a range of 45% to 75%, with international equities not to exceed 35% of the equity allocation. A combination of fixed income, alternative investments, and cash will account for the remaining 40% target allocation. Funds will be managed by the following SEI strategies: SEI US Managed Volatility Strategy, SEI S&P 500 Index Strategy, SEI Extended Markets Index Strategy, SEI Small Cap II Equity Strategy, SEI World Equity ex-US Strategy, SEI Core Fixed Income Strategy, SEI High Yield Strategy, and SEI Emerging Markets Debt Strategy.

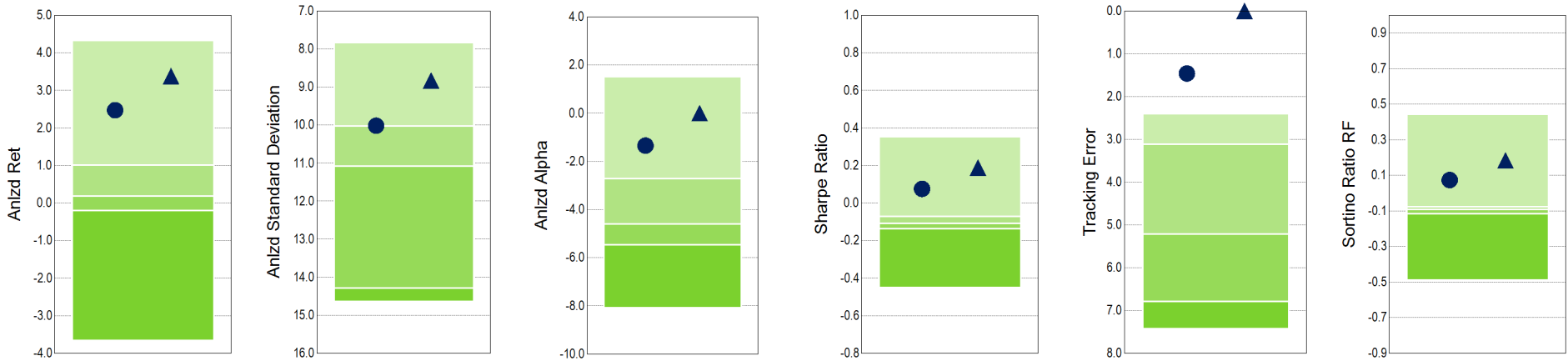


# SEI FUNDS

## 3 Year Risk Return



- SEI Funds
- ◆ Endowment Custom Index
- ▲ Universe Median
- 68% Confidence Interval
- eV Global Balanced Net

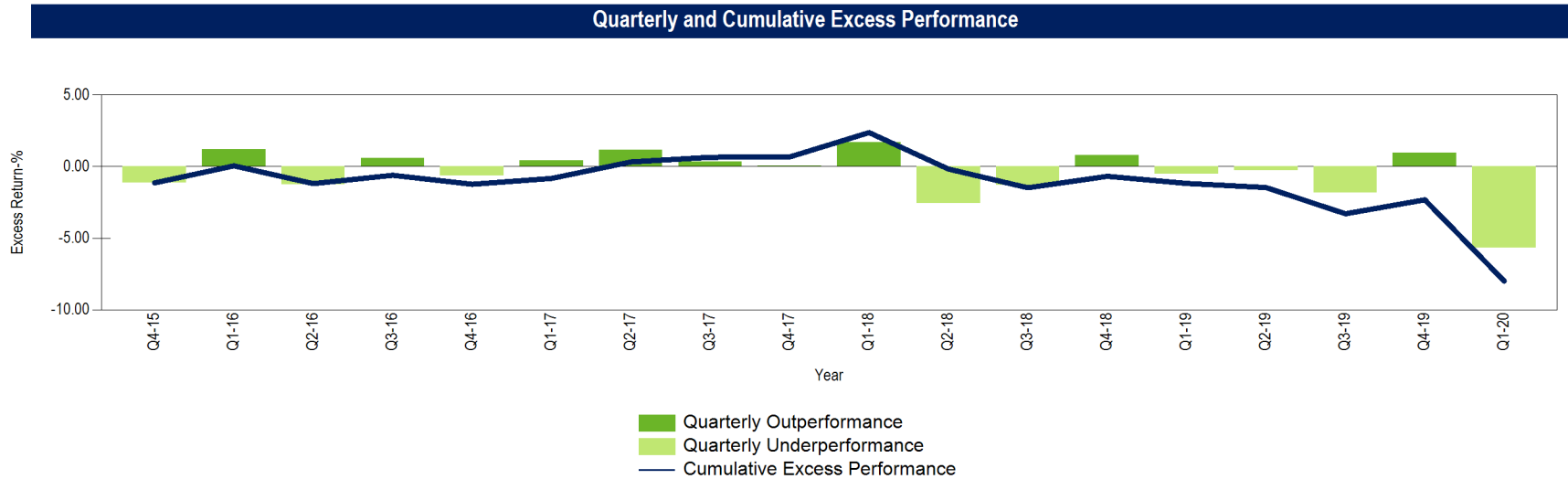
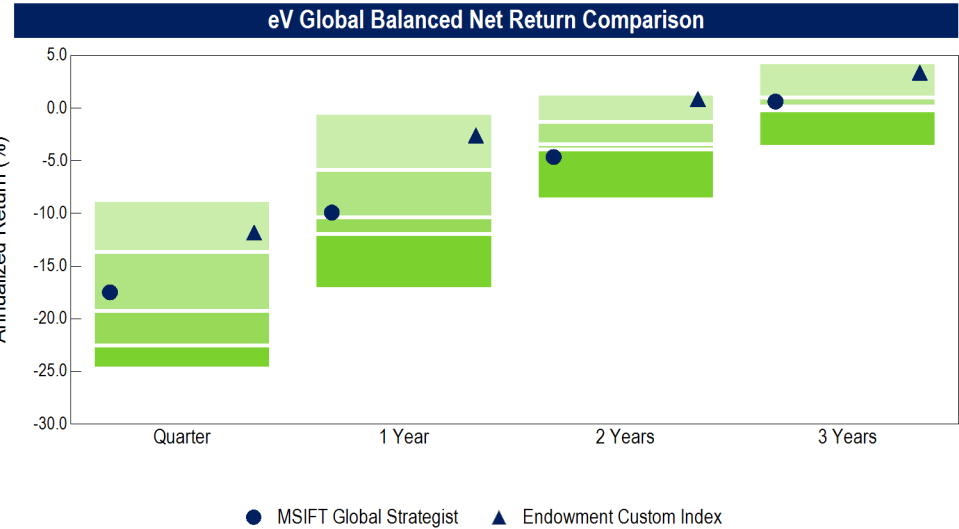


- SEI Funds
- ▲ Endowment Custom Index
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

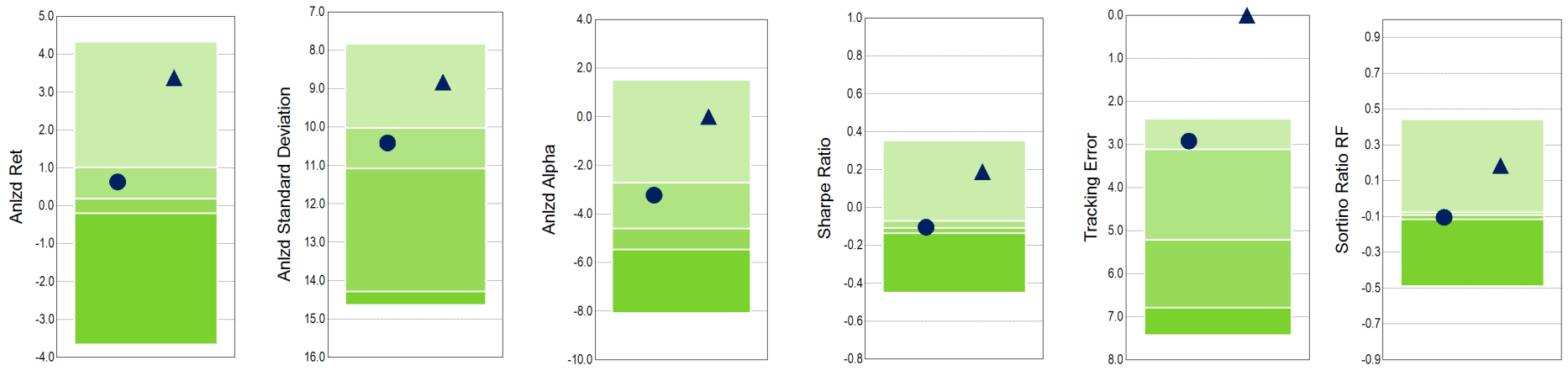
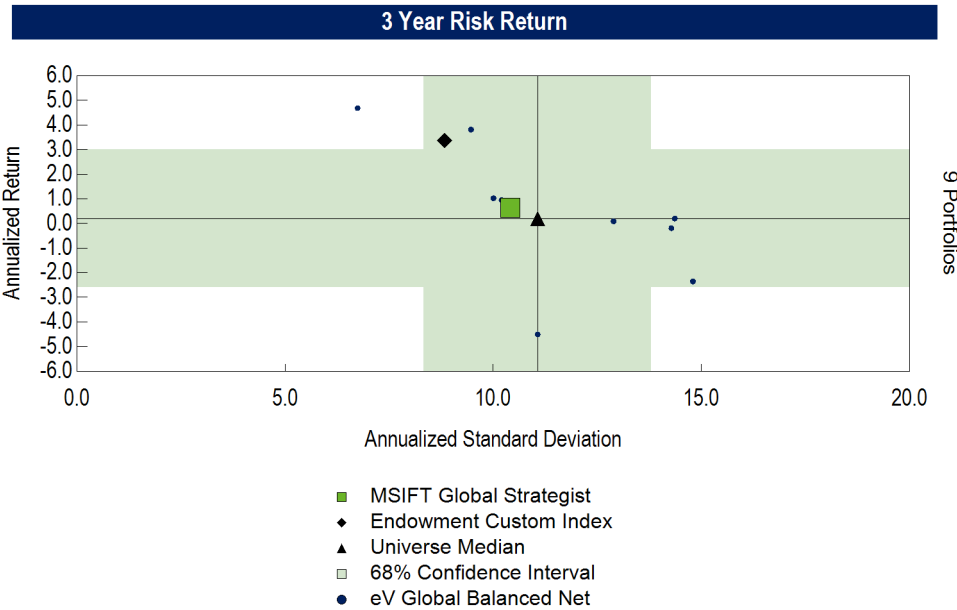


# MSIFT GLOBAL STRATEGIST

Morgan Stanley manages a multi-asset class portfolio. The portfolio seeks to achieve its investment objective by investing primarily in a blend of equity and fixed income securities of U.S. and non-U.S. issuers. The equity portfolio will be diversified by types of securities (i.e. common and preferred shares of equity), issuer, industry and sectors. The fixed income portfolio will be diversified by security types (i.e government, agency and corporate bonds), issuer, duration and yield characteristics.



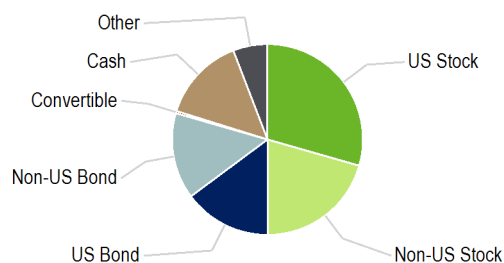
# MSIFT GLOBAL STRATEGIST





# MSIFT GLOBAL STRATEGIST

## Mutual Fund Allocation as of December 31, 2019



## Portfolio Fund Information as of December 31, 2019

Ticker	MPBAX
Morningstar Category	World Allocation
Average Market Cap (\$mm)	67,113.11
Net Assets (\$mm)	59.49
% Assets in Top 10 Holdings	36.11
Total Number of Holdings	1,731
Manager Name	Mark A. Bavoso
Manager Tenure	9
Expense Ratio	0.74%
Closed to New Investors	No

## Fund Characteristics as of December 31, 2019

Sharpe Ratio (3 Year)	1.02
Average Market Cap (\$mm)	67,113.11
Price/Earnings	16.42
Price/Book	2.32
Price/Sales	1.66
Price/Cash Flow	8.52
Dividend Yield	2.54
Number of Equity Holdings	1,368
R-Squared (3 Year)	0.92
Alpha (3 Year)	-0.04%

## Top Holdings as of December 31, 2019

E-MINI S&P 500 FUTURES MAR20	5.45%
MS INST. FUND TRUST GBL STRATEGIST CAYMAN POR LTD	5.37%
1265771 TRS USD R E II1760260190123 EQUITYTRS	4.92%
1265771 TRS USD P V 03MLIBOR II1758120190123 EQUITYTRS	4.55%
1265804 TRS USD R E II2084320190206 EQUITYTRS	3.57%
1265804 TRS USD P V 03MLIBOR II2081480190206 EQUITYTRS	3.50%
ULTRA 10 YEAR US TREASURY NOTE FUTURE MAR 20	3.19%
MSCI USA INDEX FUTURE MAR 20	2.19%
1266723 TRS USD R E II6332360191206 EQUITYTRS	1.70%
1266753 TRS USD R E II8338940191211 EQUITYTRS	1.66%

## Sector Allocation as of December 31, 2019

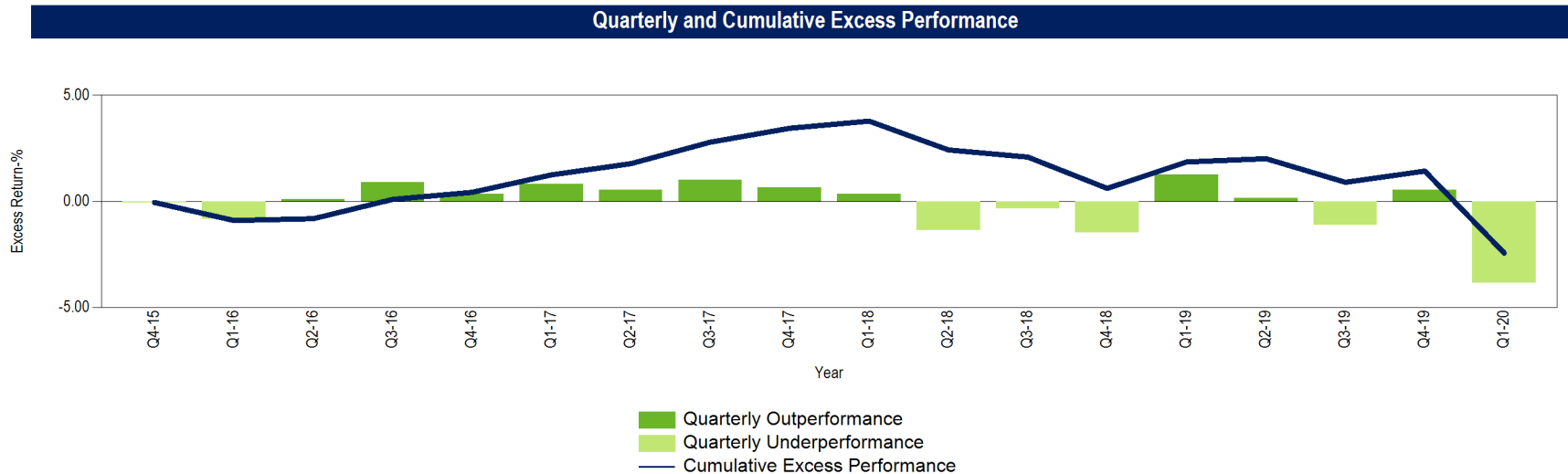
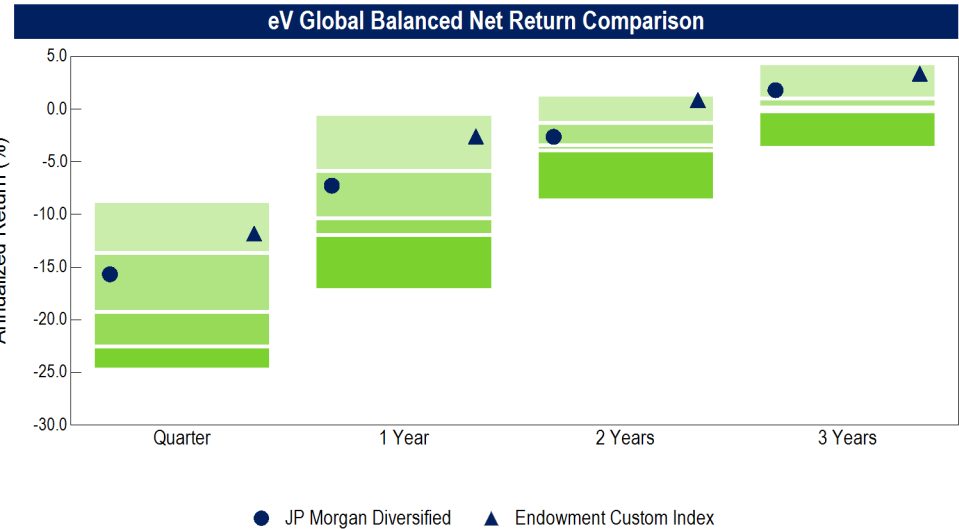
BASIC MATERIALS	3.85%
COMMUNICATION SERVICES	7.88%
CONSUMER CYCLICAL	9.75%
CONSUMER DEFENSIVE	7.73%
ENERGY	4.47%
FINANCIAL SERVICES	18.47%
HEALTHCARE	11.54%
INDUSTRIALS	13.76%
REAL ESTATE	4.98%
TECHNOLOGY	14.44%
UTILITIES	3.13%

Data as of 12/31/2019

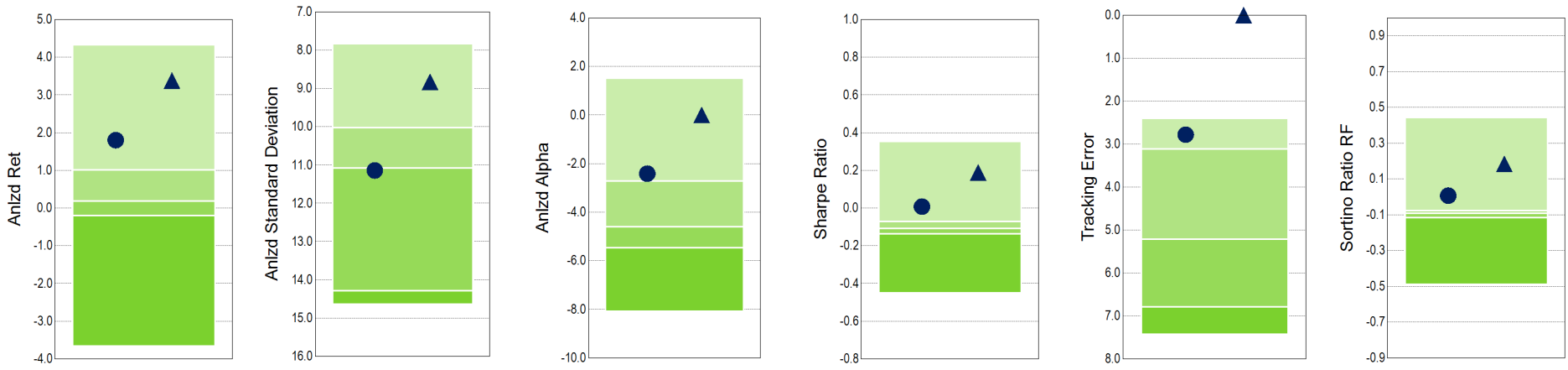
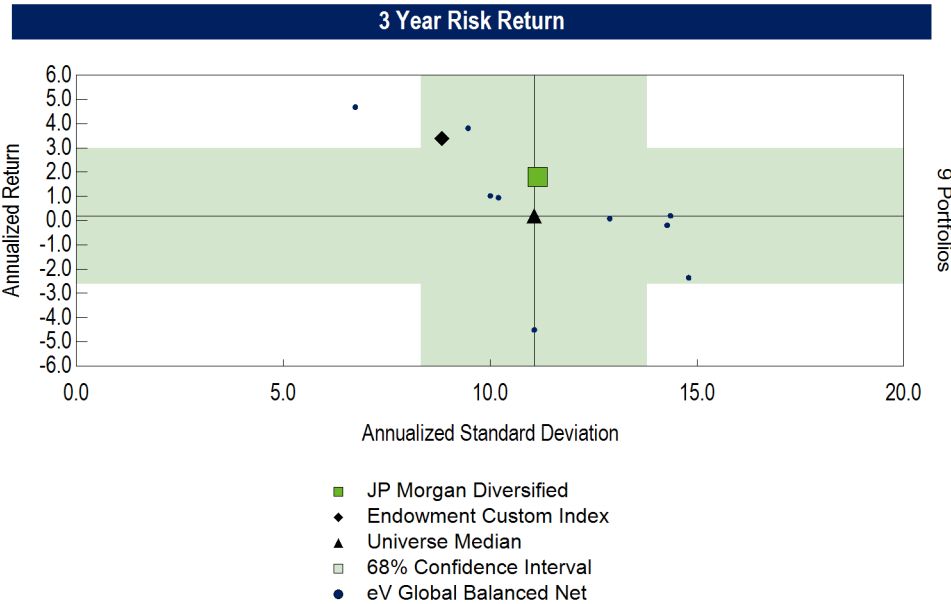


# JP MORGAN DIVERSIFIED

J.P Morgan manages a diversified mutli-asset class portfolio. The strategy seeks to provide a high total return from a diversified portfolio of equity and fixed income investments based on a model allocation. JP Morgan may periodically increase or decrease the Fund’s actual asset allocation according to the relative attractiveness of each asset class. Within its equity allocations, the Fund primarily invests in the common stock and convertible securities of U.S. and foreign companies. Within its fixed income allocations, the Fund primarily invests in corporate bonds, mortgage-backed securities, mortgage “dollar rolls” and U.S. government securities.



# JP MORGAN DIVERSIFIED

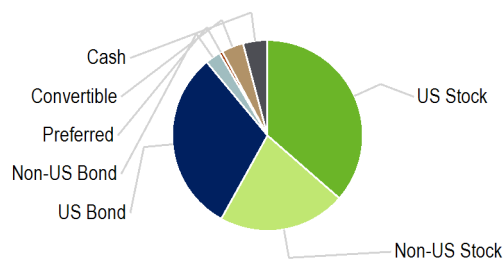


● JP Morgan Diversified    ▲ Endowment Custom Index    5th to 25th Percentile    25th to Median    Median to 75th Percentile    75th to 95th Percentile



# JP MORGAN DIVERSIFIED

## Mutual Fund Allocation as of March 31, 2020



## Portfolio Fund Information as of March 31, 2020

Ticker	JPDVX
Morningstar Category	Allocation--50% to 70% Equity
Average Market Cap (\$mm)	51,376.65
Net Assets (\$mm)	129.33
% Assets in Top 10 Holdings	14.09
Total Number of Holdings	3,265
Manager Name	Jeffrey A. Geller
Manager Tenure	1
Expense Ratio	0.66%
Closed to New Investors	No

## Fund Characteristics as of March 31, 2020

Sharpe Ratio (3 Year)	0.01
Average Market Cap (\$mm)	51,376.65
Price/Earnings	15.54
Price/Book	1.98
Price/Sales	1.58
Price/Cash Flow	7.92
Dividend Yield	2.86
Number of Equity Holdings	1,827
R-Squared (3 Year)	0.98
Alpha (3 Year)	-0.19%

## Top Holdings as of March 31, 2020

JPMORGAN BETABUILDERS MSCI US REIT ETF	2.68%
UNITED STATES TREASURY NOTES 2.5%	2.55%
MICROSOFT CORP	1.80%
AMAZON.COM INC	1.47%
JPMORGAN EMERGING MARKETS DEBT R6	1.41%
APPLE INC	0.99%
UNITED STATES TREASURY NOTES 1.62%	0.87%
ALPHABET INC CLASS C	0.86%
UNITEDHEALTH GROUP INC	0.81%
NESTLE SA	0.64%

## Sector Allocation as of March 31, 2020

BASIC MATERIALS	2.72%
COMMUNICATION SERVICES	8.08%
CONSUMER CYCLICAL	11.76%
CONSUMER DEFENSIVE	6.64%
ENERGY	2.53%
FINANCIAL SERVICES	17.33%
HEALTHCARE	12.79%
INDUSTRIALS	10.64%
REAL ESTATE	7.27%
TECHNOLOGY	17.34%
UTILITIES	2.91%

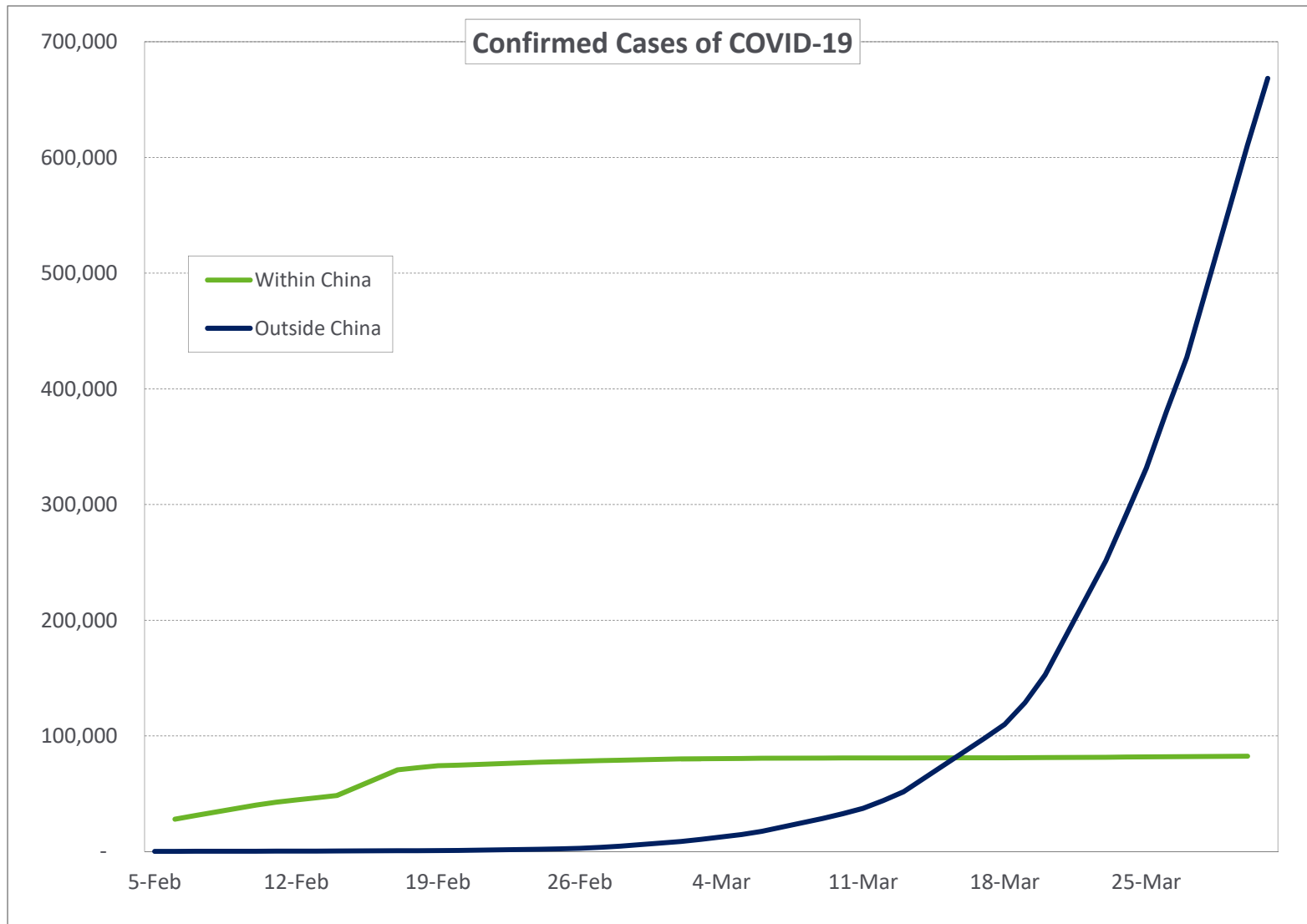


# APPENDIX

NEPC, LLC

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# CONFIRMED COVID-19 CASES CONTINUE TO RISE



Source: World Health Organization, FactSet  
Data as of 3/31/2020



# DURATION OF CONTAINMENT POLICY IS UNCLEAR

## Policymakers are focused on “bending the curve” and ensuring ICU bed capacity is not overwhelmed all at once by COVID-19 cases

COVID-19 containment efforts or suppression strategies are designed entirely with the goal of “bending the curve”

## The duration of containment policies is the key unknown as the market struggles to discount the potential scale of the economic costs

The chart below is a modeling study reviewed by key policymakers in Europe and the US that estimates a potential 5-month containment policy could be needed to protect ICU bed capacity and may require variable containment strategies in late 2020 early 2021.

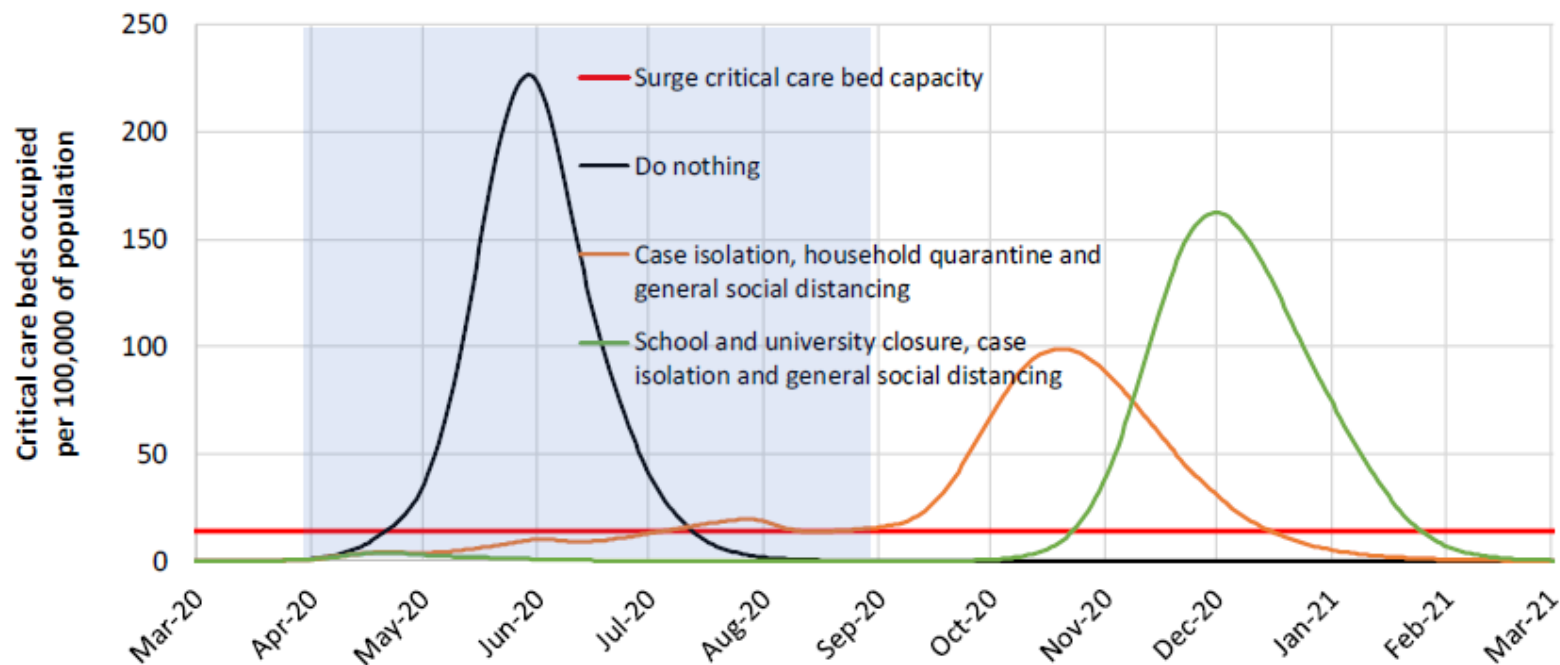


Chart: The blue shaded area represents the 5-month period in which these containment policies are assumed to remain in place. The redline is US critical care bed capacity

Source: Imperial College COVID-19 Response Team  
Data as of 03/16/2020



# ASSESSING THE ECONOMIC IMPACT

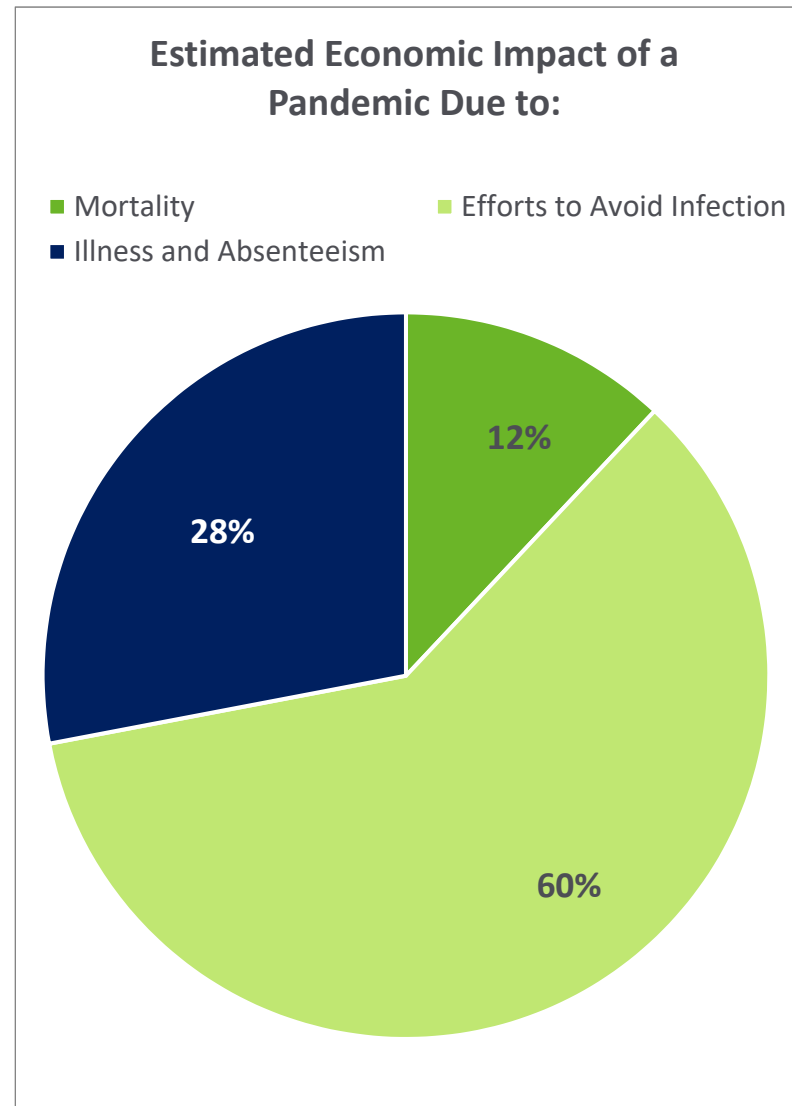
**Based on a World Bank study the impact and severity of containment and quarantine is likely the largest economic cost from a pandemic**

**Restrictive containment strategies can lead to both a demand and a supply shock to economic activity**

**The weak economic data from China shows how swift the decline can be**

**The unknown is the duration of the containment strategy and whether the economic impact is short-term or has a longer-term economic impact on consumer consumption**

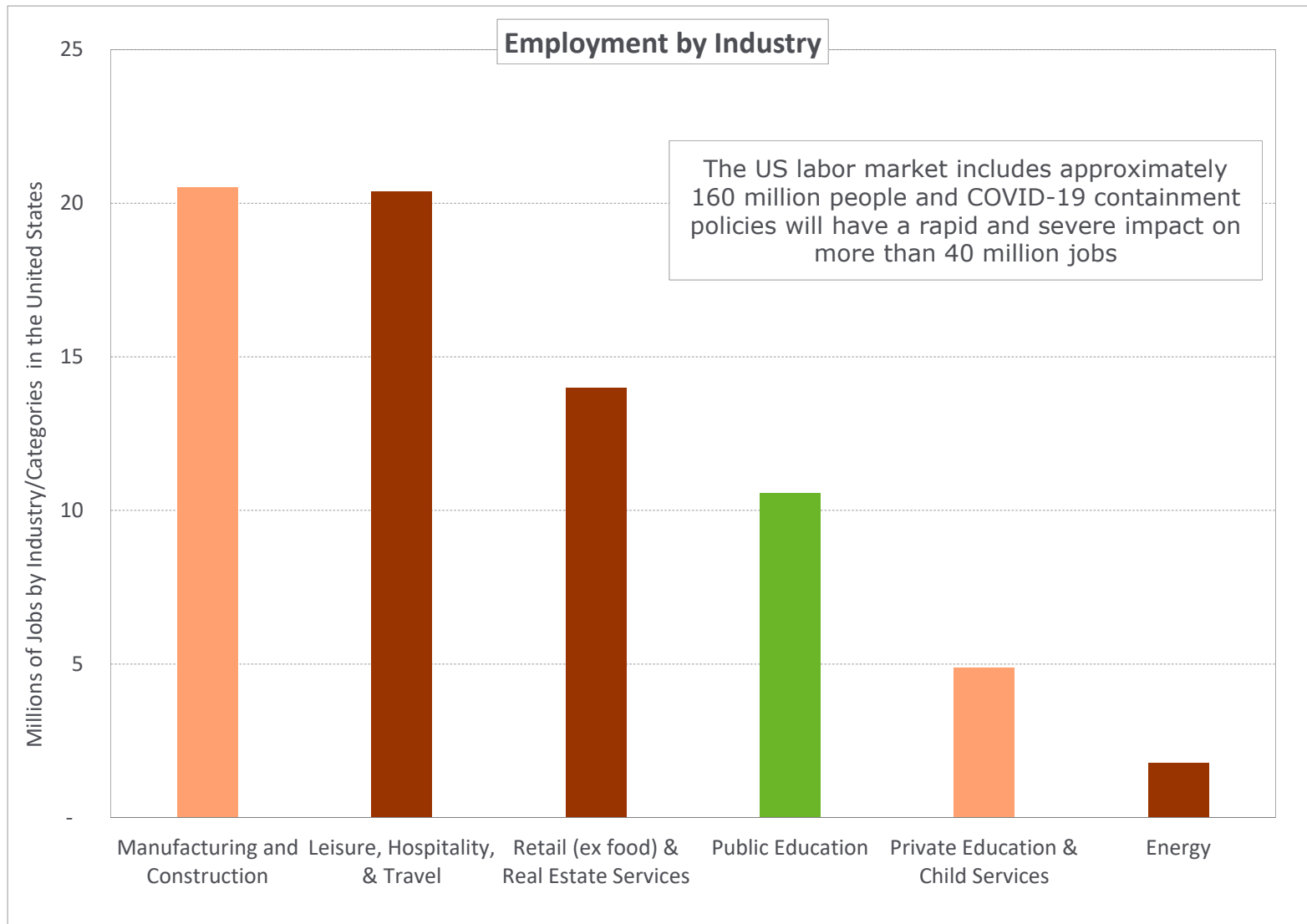
**The COVID-19 case fatality rate is estimated at 1-3% and largely depends on the ability to “bend the curve”**



Source: The World Bank



# CONTAINMENT STRATEGIES IMPACT EMPLOYMENT



Source: US Bureau of Labor Statistics, FactSet, NEPC  
Data as of 2/28/2020



# A REAL TIME LOOK AT THE ECONOMIC IMPACT

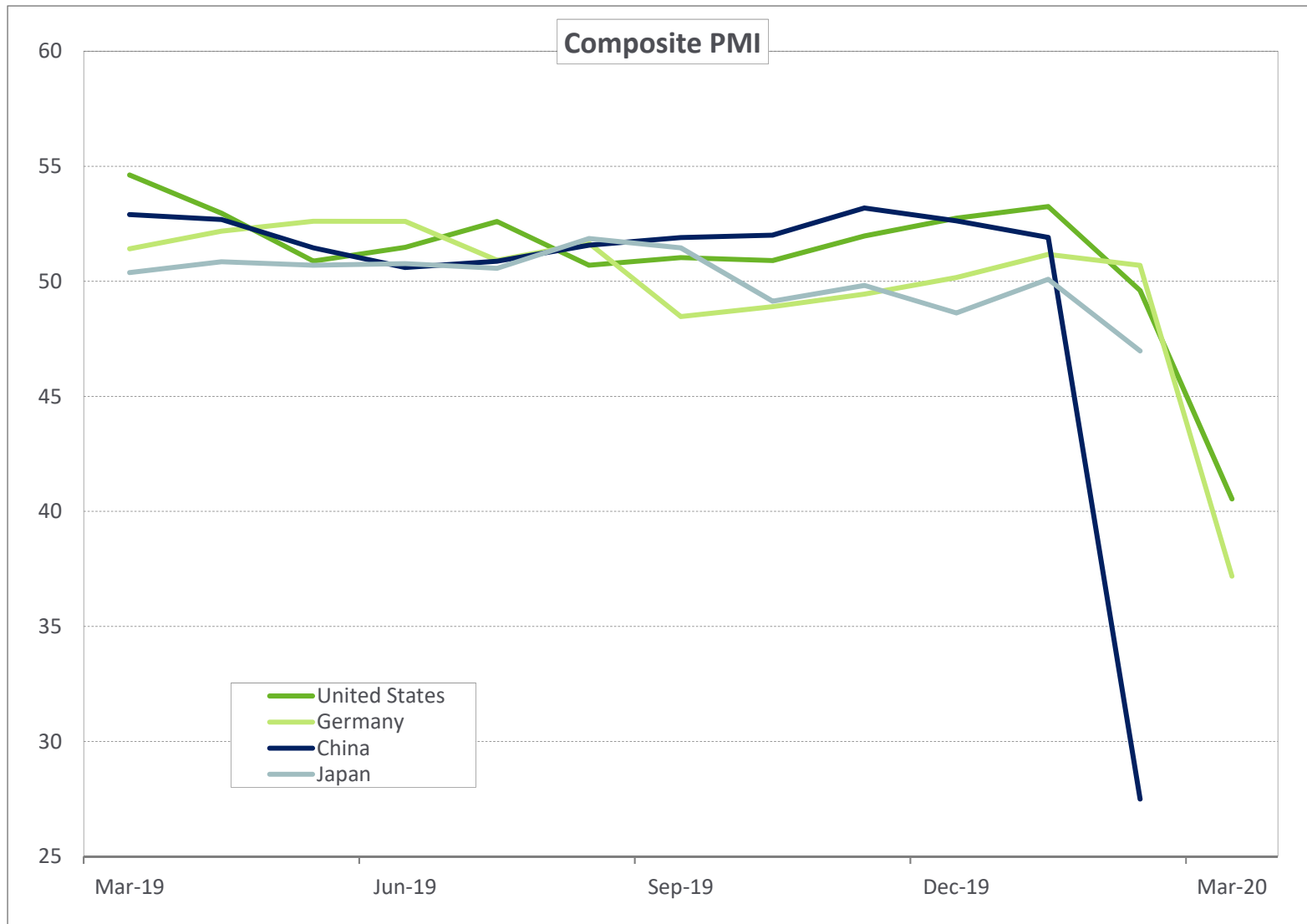
The data below shows the year-over-year change in seated diners at restaurants on OpenTable in different cities and countries

Location	23-Mar	21-Mar	19-Mar	17-Mar	15-Mar	13-Mar	11-Mar	9-Mar	7-Mar	5-Mar	3-Mar	1-Mar
Global	-100%	-99%	-96%	-83%	-47%	-36%	-19%	-14%	-4%	-7%	-9%	0%
Australia	-100%	-54%	-53%	-43%	-12%	-8%	-10%	-10%	-3%	-8%	-6%	4%
Canada	-100%	-100%	-99%	-94%	-47%	-40%	-19%	-13%	-9%	-4%	-7%	-7%
Germany	-100%	-100%	-98%	-90%	-46%	-28%	-11%	-10%	4%	-6%	0%	9%
Ireland	-100%	-99%	-99%	-86%	-75%	-51%	-27%	-10%	-5%	-15%	-7%	10%
Mexico	-95%	-91%	-78%	-62%	-35%	-16%	-15%	-19%	-2%	-6%	-10%	-7%
United Kingdom	-100%	-100%	-91%	-82%	-31%	-26%	-14%	-18%	-3%	-12%	-11%	-2%
London	-100%	-100%	-100%	-89%	-43%	-36%	-19%	-22%	-7%	-13%	-10%	-2%
United States	-100%	-100%	-98%	-84%	-48%	-36%	-19%	-14%	-3%	-5%	-9%	2%
Atlanta	-100%	-100%	-97%	-93%	-44%	-35%	-14%	1%	1%	-9%	-21%	8%
Boston	-100%	-100%	-100%	-100%	-70%	-56%	-30%	-14%	-1%	11%	-10%	1%
Chicago	-100%	-100%	-100%	-100%	-53%	-37%	-27%	-25%	4%	-11%	-16%	1%
Dallas	-100%	-100%	-100%	-100%	-42%	-35%	-12%	-15%	-1%	0%	-6%	11%
Las Vegas	-100%	-100%	-100%	-88%	-48%	-32%	-13%	-11%	-7%	-9%	-31%	-17%
New York	-100%	-100%	-100%	-100%	-69%	-61%	-36%	-18%	-10%	-9%	-12%	-2%
Portland	-100%	-100%	-100%	-100%	-54%	-41%	-20%	-16%	-3%	3%	-3%	9%
San Francisco	-100%	-100%	-100%	-100%	-72%	-53%	-43%	-41%	-18%	-22%	-24%	-18%

Source: OpenTable, <https://www.opentable.com/state-of-industry>;  
Data includes online reservations, phone reservations, and walk-ins



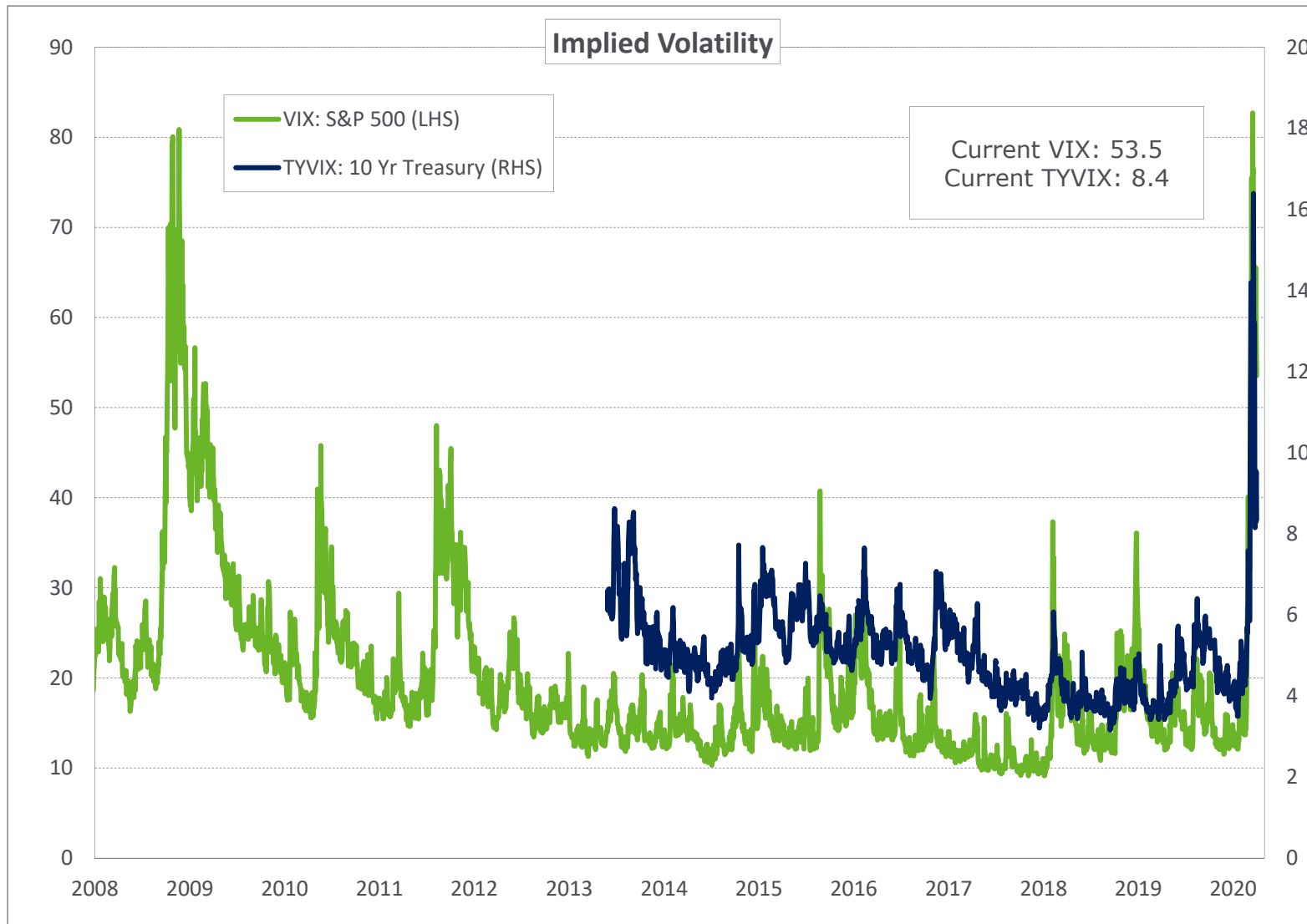
# GLOBAL ECONOMY EXPECTED TO CONTRACT



Source: Markit, FactSet



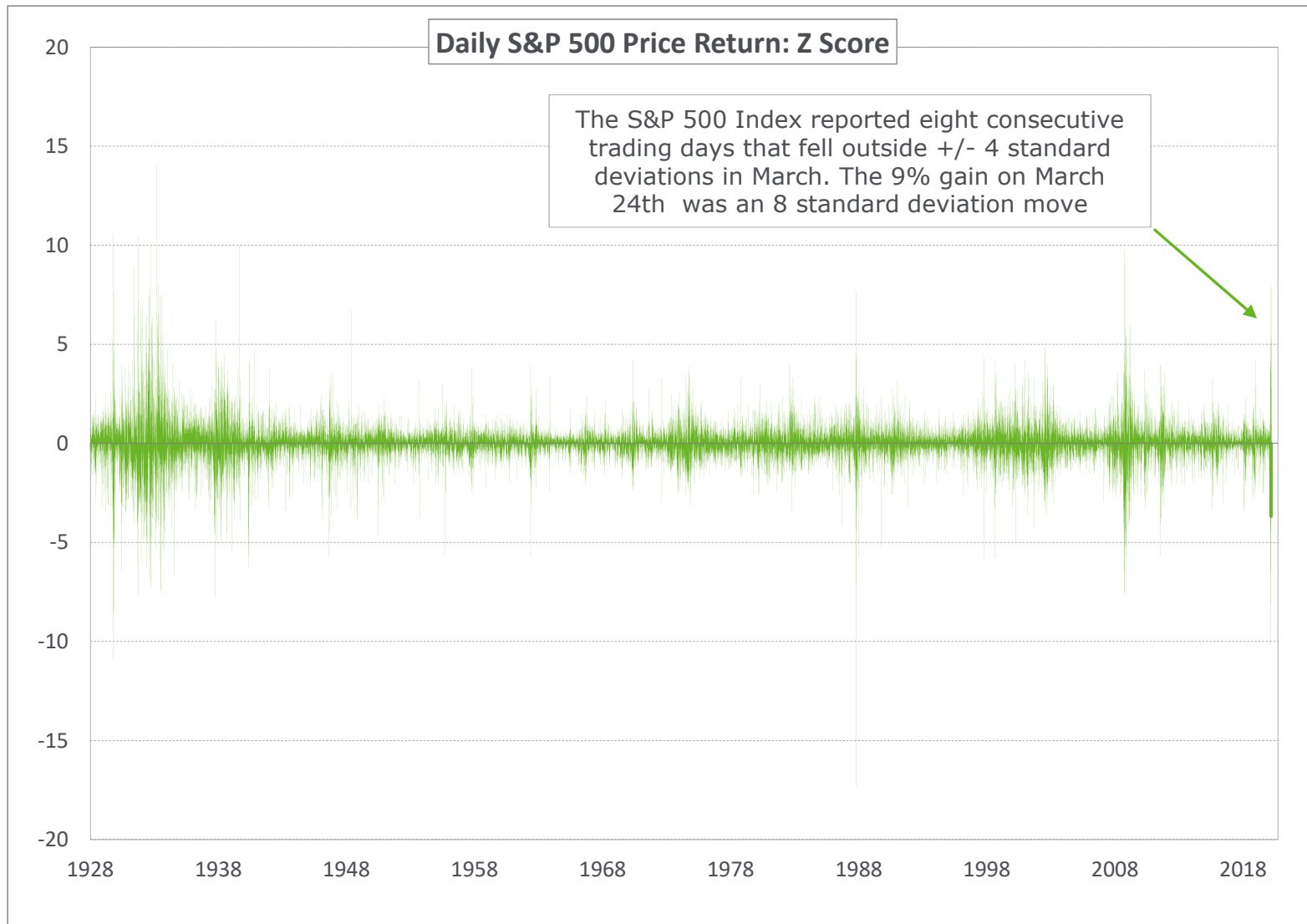
# CORRELATIONS AND VOLATILITY ARE ELEVATED



Source: CBOE, FactSet  
Data as of 3/31/2020



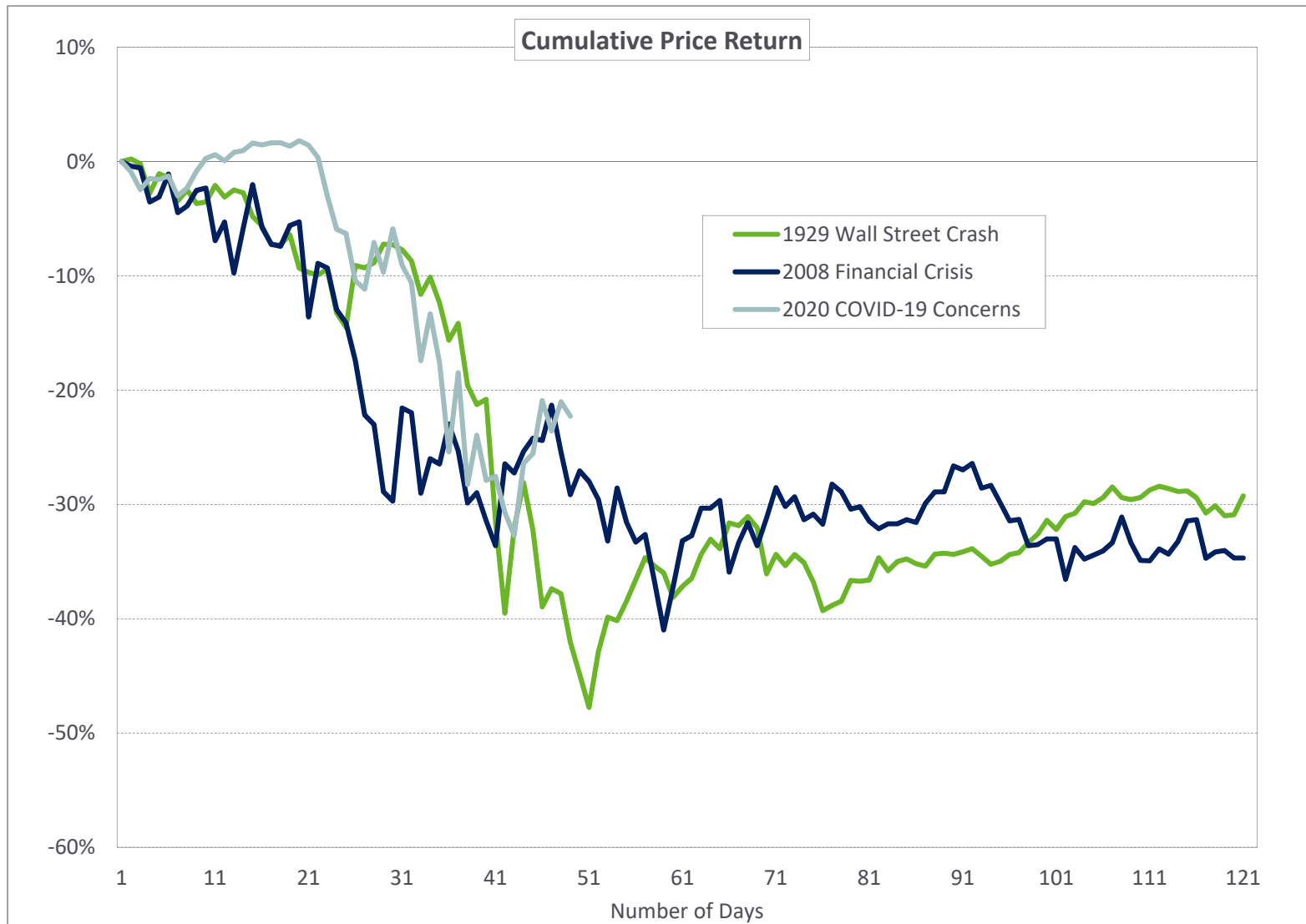
# ABNORMALLY LARGE PRICE MOVEMENTS



Source: S&P, FactSet  
Calculated of as 1/04/28 - 3/31/2020



# US EQUITY DURING MARKET DELEVERAGING

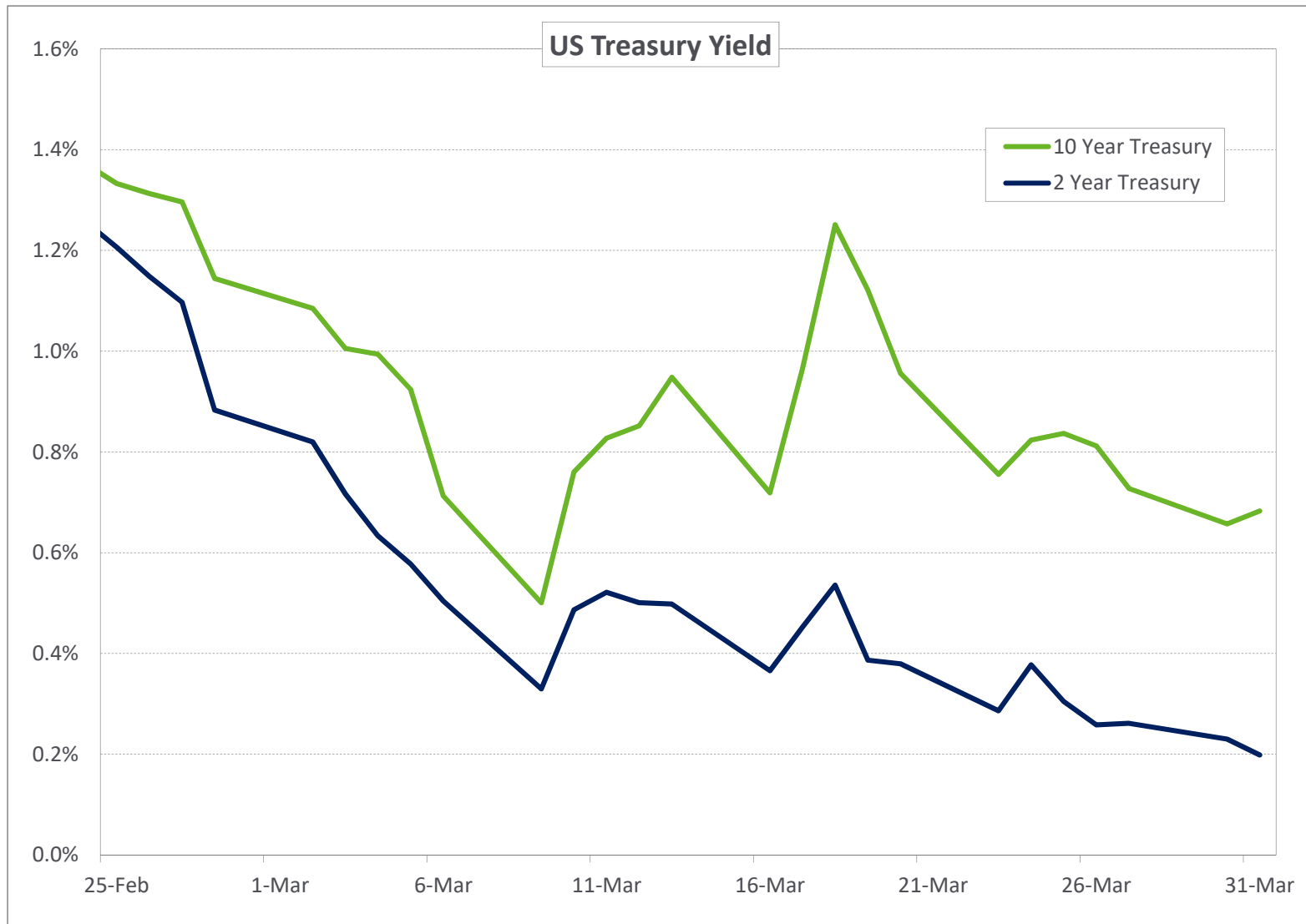


Source: S&P, Dow Jones, FactSet

Financial Crisis represents S&P returns from 9/1/2008 – 3/9/2009; Wall Street Crash represents Dow Jones returns from 8/30/1929 – 2/26/1930; COVID-19 represents S&P returns from 1/23/2020 (representing the start of the Wuhan, China lockdown) – 3/31/2020



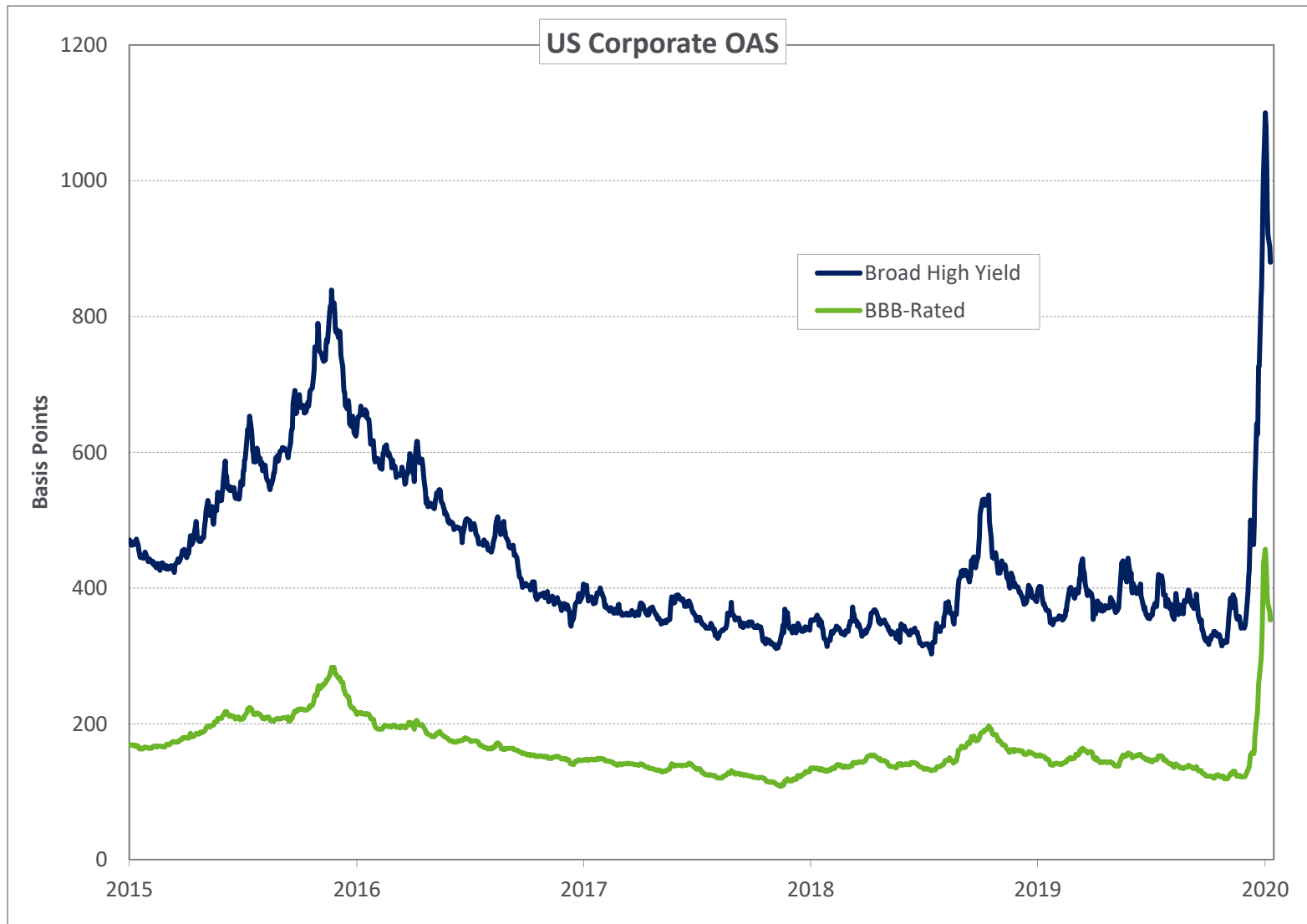
# U.S. TREASURY YIELDS ARE STRESSED



Source: FactSet  
Data as of 3/31/2020



# CREDIT SPREADS HAVE WIDENED



Source: Bloomberg, FactSet  
Data as of 3/31/2020





# MONETARY AND FISCAL RESPONSES

Fed Action	Description
Fed Rate Cuts	The Fed cut rates in two emergency sessions by a total of 1.50% to a range of 0.00% - 0.25%.
Balance Sheet Expansion	The Fed announced an unlimited expansion of the balance sheet to support the US economy. This move expanded on previous announcements for smaller QE denominations
Liquidity Support Facilities	The Fed announced additional measures to ensure market liquidity, including facilities to support money market funds, commercial paper, and broad credit support systems
Credit Support Facilities	The Fed established programs aimed at supporting consumers and businesses, such as the Term Asset-Backed Securities Loan Facility (TALF) and a Main Street Business Lending Program. These programs provide preferential borrower agreements, such as deferred interest and principal payments, for consumers and small businesses.

US Government Action	Description
Families First Coronavirus Response Act	The bill was passed to provide sick leave, expand food assistance and unemployment benefits, and provide additional protection for health care employees
Fiscal Stimulus Package	Congress is finalizing a \$2 trillion economic stimulus package aimed at providing direct financial assistance, expanded benefits programs, and loans to individuals, small businesses, and industries impacted by COVID-19



# GLOSSARY OF INVESTMENT TERMINOLOGY

**# Of Portfolios/Observations<sup>1</sup>** - The total number of data points that make up a specified universe

**Allocation Index<sup>3</sup>** - The allocation index measures the value added (or subtracted) to each portfolio by active management. It is calculated monthly: The portfolio asset allocation to each category from the prior month-end is multiplied by a specified market index.

**Asset Allocation Effect<sup>2</sup>** - Measures an investment manager's ability to effectively allocate their portfolio's assets to various sectors. The allocation effect determines whether the overweighting or underweighting of sectors relative to benchmark contributes positively or negatively to the overall portfolio return. Positive allocation occurs when the portfolio is over weighted in a sector that outperforms the benchmark and underweighted in a sector that underperforms the benchmark. Negative allocation occurs when the portfolio is over weighted in a sector that underperforms the benchmark and under weighted in a sector that outperforms the benchmark.

**Agency Bonds (Agencies)<sup>3</sup>** - The full faith and credit of the United States government is normally not pledged to payment of principal and interest on the majority of government agencies issuing these bonds, with maturities of up to ten years. Their yields, therefore, are normally higher than government and their marketability is good, thereby qualifying them as a low risk-high liquidity type of investment. They are eligible as security for advances to the member banks by the Federal Reserve, which attests to their standing.

**Asset Backed Securities (ABS)<sup>3</sup>** - Bonds which are similar to mortgage-backed securities but are collateralized by assets other than mortgages; commonly backed by credit card receivables, auto loans, or other types of consumer financing.

**Attribution<sup>3</sup>** - Attribution is an analytical technique that allows us to evaluate the performance of the portfolio relative to the benchmark. A proper attribution tells us where value was added or subtracted as a result of the manager's decisions.

**Average Effective Maturity<sup>4</sup>** - For a single bond, it is a measure of maturity that takes into account the possibility that a bond might be called back to the issuer.

For a portfolio of bonds, average effective maturity is the weighted average of the maturities of the underlying bonds. The measure is computed by weighing each bond's maturity by its market value with respect to the portfolio and the likelihood of any of the bonds being called. In a pool of mortgages, this would also account for the likelihood of prepayments on the mortgages.

**Batting Average<sup>1</sup>** - A measurement representing an investment manager's ability to meet or beat an index.

*Formula: Divide the number of days (or months, quarters, etc.) in which the manager beats or matches the index by the total number of days (or months, quarters, etc.) in the period of question and multiply that factor by 100.*

**Brinson Fachler (BF) Attribution<sup>1</sup>** - The BF methodology is a highly accepted industry standard for calculating the allocation, selection, and interaction effects within a portfolio that collectively explains a portfolio's underlying performance. The main advantage of the BF methodology is that rather than using the overall return of the benchmark, it goes a level deeper than BHB and measures whether the benchmark sector, country, etc. outperformed/or underperformed the overall benchmark.

**Brinson Hood Beebower (BHB) Attribution<sup>1</sup>** - The BHB methodology shows that excess return must be equal to the sum of all other factors (i.e., allocation effect, selection effect, interaction effect, etc.). The advantage to using the BHB methodology is that it is a highly accepted industry standard for calculating the allocation, selection, and interaction effects within a portfolio that collectively explains a portfolio's underlying performance.

**Corporate Bond (Corp)<sup>4</sup>** - A debt security issued by a corporation and sold to investors. The backing for the bond is usually the payment ability of the company, which is typically money to be earned from future operations. In some cases, the company's physical assets may be used as collateral for bonds.

**Correlation<sup>1</sup>** - A range of statistical relationships between two or more random variables or observed data values. A correlation is a single number that describes the degree of relationship between variables.

Data Source: <sup>1</sup>InvestorForce, <sup>2</sup>Interaction Effect Performance Attribution, <sup>3</sup>NEPC, LLC, <sup>4</sup>Investopedia, <sup>5</sup>Hedgeco.net



# GLOSSARY OF INVESTMENT TERMINOLOGY

**Coupon<sup>4</sup>** – The interest rate stated on a bond when it is issued. The coupon is typically paid semiannually. This is also referred to as the “coupon rate” or “coupon percent rate.”

**Currency Effect<sup>1</sup>** – Is the effect that changes in currency exchange rates over time affect excess performance.

**Derivative Instrument<sup>2</sup>** – A financial obligation that derives its precise value from the value of one or more other instruments (or assets) at the same point of time. For example, the relationship between the value of an S&P 500 futures contract (the derivative instrument in this case) is determined by the value of the S&P 500 Index and the value of a U.S. Treasury bill that matures at the expiration of the futures contract.

**Downside Deviation<sup>1</sup>** – Equals the standard deviation of negative return or the measure of downside risk focusing on the standard deviation of negative returns.

*Formula:*

*Annualized Standard Deviation (Fund Return - Average Fund Return) where average fund return is greater than individual fund returns, monthly or quarterly.*

**Duration<sup>3</sup>** – Duration is a measure of interest rate risk. The greater the duration of a bond, or a portfolio of bonds, the greater its price volatility will be in response to a change in interest rates. A bond’s duration is inversely related to interest rates and directly related to time to maturity.

**Equity/Debt/Cash Ratio<sup>1</sup>** – The percentage of an investment or portfolio that is in Equity, Debt, and/or Cash (i.e. A 7/89/4 ratio represents an investment that is made up of 7% Equity, 89% Debt, and 4% Cash).

**Foreign Bond<sup>3</sup>** – A bond that is issued in a domestic market by a foreign entity, in the domestic market’s currency. A foreign bond is most often issued by a foreign firm to raise capital in a domestic market that would be most interested in purchasing the firm’s debt. For foreign firms doing a large amount of business in the domestic market, issuing foreign bonds is a common practice.

**Hard Hurdle<sup>5</sup>** – is a hurdle rate that once beaten allows a fund manager to charge a performance fee on only the funds above the specified hurdle rate.

**High-Water Mark<sup>4</sup>** – The highest peak in value that an investment fund/account has reached. This term is often used in the context of fund manager compensation, which is performance based. Some performance-based fees only get paid when fund performance exceeds the high-water mark. The high-water mark ensures that the manager does not get paid large sums for poor performance.

**Hurdle Rate<sup>4</sup>** – The minimum rate of return on an investment required, in order for a manager to collect incentive fees from the investor, which is usually tied to a benchmark.

**Interaction Effects<sup>2</sup>** – The interaction effect measures the combined impact of an investment manager’s selection and allocation decisions within a sector. For example, if an investment manager had superior selection and over weighted that particular sector, the interaction effect is positive. If an investment manager had superior selection, but underweighted that sector, the interaction effect is negative. In this case, the investment manager did not take advantage of the superior selection by allocating more assets to that sector. Since many investment managers consider the interaction effect to be part of the selection or the allocation, it is often combined with the either effect.

**Median<sup>3</sup>** – The value (rate of return, market sensitivity, etc.) that exceeds one-half of the values in the population and that is exceeded by one-half of the values. The median has a percentile rank of 50.

**Modified Duration<sup>3</sup>** – The percentage change in the price of a fixed income security that results from a change in yield.

**Mortgage Backed Securities (MBS)<sup>3</sup>** – Bonds which are a general obligation of the issuing institution but are also collateralized by a pool of mortgages.

**Municipal Bond (Muni)<sup>4</sup>** – A debt security issued by a state, municipality or county to finance its capital expenditures.

**Net Investment Change<sup>1</sup>** – Is the change in an investment after accounting for all Net Cash Flows.

**Performance Fee<sup>4</sup>** – A payment made to a fund manager for generating positive returns. The performance fee is generally calculated as a percentage of investment profits, often both realized and unrealized.

*Data Source: <sup>1</sup>InvestorForce, <sup>2</sup>Interaction Effect Performance Attribution, <sup>3</sup>NEPC, LLC, <sup>4</sup>Investopedia, <sup>5</sup>Hedgeco.net*



# GLOSSARY OF INVESTMENT TERMINOLOGY

**Policy Index<sup>3</sup>** - A custom benchmark designed to indicate the returns that a passive investor would earn by consistently following the asset allocation targets set forth in this investment policy statement.

**Price to Book (P/B)<sup>4</sup>** - A ratio used to compare a stock's market value to its book value. It is calculated by dividing the current closing price of the stock by the latest quarter's book value per share, also known as the "price-equity ratio".

**Price to Earnings (P/E)<sup>3</sup>** - The weighted equity P/E is based on current price and trailing 12 months earnings per share (EPS).

**Price to Sales (P/S)<sup>4</sup>** - A ratio for valuing a stock relative to its own past performance, other companies, or the market itself. Price to sales is calculated by dividing a stock's current price by its revenue per share for the trailing 12 months.

**Return on Equity (ROE)<sup>4</sup>** - The amount of net income returned as a percentage of shareholders equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

**Selection (or Manager) Effect<sup>2</sup>** - Measures the investment manager's ability to select securities within a given sector relative to a benchmark. The over or underperformance of the portfolio is weighted by the benchmark weight, therefore, selection is not affected by the manager's allocation to the sector. The weight of the sector in the portfolio determines the size of the effect—the larger the sector, the larger the effect is, positive or negative.

**Soft Hurdle rate<sup>5</sup>** - is a hurdle rate that once beaten allows a fund manager to charge a performance fee based on the entire annualized return.

**Tiered Fee<sup>1</sup>** - A fee structure that is paid to fund managers based on the size of the investment (i.e. 1.00% fee on the first \$10M invested, 0.90% on the next \$10M, and 0.80% on the remaining balance).

**Total Effects<sup>2</sup>** - The active management (total) effect is the sum of the selection, allocation, and interaction effects. It is also the difference between the total portfolio return and the total benchmark return. You can use the active management effect to determine the amount the investment manager has added to a portfolio's return.

**Total Return<sup>1</sup>** - The actual rate of return of an investment over a specified time period. Total return includes interest, capital gains, dividends, and distributions realized over a defined time period.

**Universe<sup>3</sup>** - The list of all assets eligible for inclusion in a portfolio.

**Upside Deviation<sup>1</sup>** - Standard Deviation of Positive Returns

**Weighted Avg. Market Cap.<sup>4</sup>** - A stock market index weighted by the market capitalization of each stock in the index. In such a weighting scheme, larger companies account for a greater portion of the index. Most indexes are constructed in this manner, with the best example being the S&P 500.

**Yield (%)<sup>3</sup>** - The current yield of a security is the current indicated annual dividend rate divided by current price.

**Yield to Maturity<sup>3</sup>** - The discount rate that equates the present value of cash flows, both principal and interest, to market price.

Data Source: <sup>1</sup>InvestorForce, <sup>2</sup>Interaction Effect Performance Attribution, <sup>3</sup>NEPC, LLC, <sup>4</sup>Investopedia, <sup>5</sup>Hedgeco.net



### **Information Disclaimer**

- Past performance is no guarantee of future results.
- All investments carry some level of risk. Diversification and other asset allocation techniques are not guaranteed to ensure profit or protect against losses.
- NEPC's source for portfolio pricing, calculation of accruals, and transaction information is the plan's custodian bank. Information on market indices and security characteristics is received from other sources external to NEPC. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.
- Some index returns displayed in this report or used in calculation of a policy, allocation or custom benchmark may be preliminary and subject to change.
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### **Reporting Methodology**

- The client's custodian bank is NEPC's preferred data source unless otherwise directed. NEPC generally reconciles custodian data to manager data. If the custodian cannot provide accurate data, manager data may be used.
- Trailing time period returns are determined by geometrically linking the holding period returns, from the first full month after inception to the report date. Rates of return are annualized when the time period is longer than a year. Performance is presented gross and/or net of manager fees as indicated on each page.
- For managers funded in the middle of a month, the "since inception" return will start with the first full month, although actual inception dates and cash flows are taken into account in all Composite calculations.
- This report may contain forward-looking statements that are based on NEPC's estimates, opinions and beliefs, but NEPC cannot guarantee that any plan will achieve its targeted return or meet other goals.

