

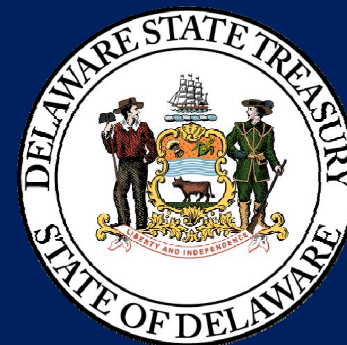
# INVESTMENT PERFORMANCE SUMMARY QUARTER ENDING SEPTEMBER 30, 2018

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

September 30, 2018

John Krimmel, CPA, CFA, Partner

Kevin M. Leonard, Partner



BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

# MARKET ENVIRONMENT

NEPC, LLC

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# MARKET ENVIRONMENT

## Introduction

As we prepare to close the chapter on this year, 2019 is already promising to be a page-turner.

The third quarter combined a triad of market forces that not only dominated 2018, but will also take centerstage in 2019. This trio—the extended winning streak of US equities (the past few weeks notwithstanding), the Federal Reserve’s steady pace of rate hikes, and the intensifying pressures on emerging market assets—leave us with these pressing questions for the year ahead:

1. Where are US equities headed?
2. What is the path of Fed monetary policy?
3. Do emerging markets offer an attractive total-return opportunity?

To evaluate our market outlook today, let’s go back to the beginning of the year. At the time, we expected an accommodative Fed policy and supportive global growth conditions would continue to bolster risk assets, specifically non-US equities. We thought a prolonged US economic expansion could continue to support a rally in US equities despite their elevated valuation levels. We also believed a major shift in US trade policy was not imminent but anticipated the US administration’s rhetoric could be a source of market volatility.

Returning to the present day, emerging market stocks and currencies have been pummeled by trade tensions between the United States and China, a stronger US dollar, and economic concerns in Turkey and Argentina. More pointedly, we underestimated the negative impact of the US-China dispute on investor sentiment. Meanwhile, the Fed raised interest rates for the third time this year in September with a fourth increase expected in December. The impact of tighter than expected Fed monetary policy has drained liquidity from outside the United States, pushing the US dollar higher at the expense of favorable global economic conditions. With domestic equities posting their best quarter since the end of 2013, US stocks have been a positive outlier relative to global equities not only in 2018, but also for over five years now. They have benefited from an extended US economic cycle—currently, on its ninth year—and, most recently, a significant jolt in the form of corporate tax cuts.



# MARKET ENVIRONMENT

## Introduction Continued

As investors, it is vital to critically evaluate the key themes that we believe will define global investment trends and markets. To this end, as we shift to a “late cycle” market environment, we believe US equities are priced for perfection. There is only a narrow path for investors to continue to earn outsized returns, similar to the late 1990s where valuation expansion pushed stock prices to new highs. Currently, the cyclically-adjusted price-to-earnings ratio (CAPE), more commonly known as Shiller P/E, for the S&P 500 is approximately 30 times earnings; in 1999, it was over 40. This era points to one of the few precedents for significant upside for US equities today, requiring a dramatic expansion of current market valuations.

The 25-year average of the S&P 500’s Shiller P/E, the 10-year average, or even the average for the 1990s, indicate a path of negative returns for US equities with valuations leveling off. As a result, we encourage investors to trim any overweight positions in US stocks and consider reducing their overall exposure.

Perhaps more important to global markets than US equities is the potential track of Fed monetary policy. We strongly believe that the expected path of Fed policy over several years is more important than the timing of the next rate hike. In 2018, a meaningful shift occurred in this path as markets started pricing in more rapid rate hikes. The Fed also began to communicate a tighter monetary policy as its forecast for rate hikes over the next 36 months moved above its stated “neutral rate” of 3%. This shift marks the end of one of NEPC’s longstanding key market themes, Federal Reserve gradualism, as the Fed reverts to its more traditional role of balancing economic growth and inflation. More tellingly, the central bank appears less willing to accept excess inflation to repair the deflationary impact of the 2008 financial crisis and is now managing policy to keep inflation close to its target range. Couple this shift in Fed policy with the ongoing reduction of the central bank’s balance sheet, the effects of tightening liquidity are likely to serve as a steadier headwind for global market opportunities in the coming years. We believe this warrants a more cautious stance and, with US interest rates moving materially higher in 2018, we recommend investors increase exposure to safe-haven fixed-income debt.



# MARKET ENVIRONMENT

## Introduction Continued

Moving to emerging markets, the returns in 2018 were disappointing. To be sure, they have taken more than their fair share of punches this year. Yet, we still believe these developing economies are attractive investments as we anticipate the macro forces weighing on them will moderate in 2019. Fed policy is likely to be less of a surprise for investors with further rate hikes largely embedded into market expectations. The biggest threat to investor sentiment is the sparring between the US and China. We believe the fallout from their trade dispute has been largely priced in by markets. Our base line expectation is that tariffs will remain in place for nearly all goods exchanged between the two, with a “trade cold war” being the new normal for relations between them. Looking ahead, pairing improvements in investor sentiment with attractive valuations in equities and currencies, we believe emerging markets offer investors the highest total-return potential. To this end, we recommend maintaining an overweight exposure to emerging equities and positions in local-currency debt. At this time, we would be remiss to not include a note of caution, given the extended timeline of the economic cycles in the US and China. We remind ourselves and investors that designing a well-diversified liquid portfolio is critical to weather market downturns, especially should the cycles of the world’s two largest economies begin to turn.

## Global Equities

Global markets rose in the third quarter, led primarily by the US and, more specifically, growth stocks. The S&P 500 gained 7.7% in the three months ended September 30 while healthcare led sector performance. Japanese equities were also a strong performer, driven by continued reforms and the reelection of its prime minister. Meanwhile, stocks didn’t fare as well in the UK as concerns mounted around Brexit; emerging markets were hurt by a currency crisis in Turkey and tensions related to US-China trade relations.

We maintain our recommendation on international equities and emerging markets with their lower valuations and reasonable growth profiles. Rising US interest rates and high stock market valuations are a concern, especially in large-cap growth equities.



# MARKET ENVIRONMENT

## Global Equities Continued

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Private equity fundraising through the third quarter remains down from the highs reached in 2017, though totals are still significant, with over \$300 billion raised; large funds across buyout and venture continue to dominate. Buyout deal value (in dollars) is on pace for its highest total since 2015, with the number of deals up over prior years as capital continues to flow to smaller add-on deals in addition to ones requiring significant equity checks. In venture, invested capital for the quarter reached \$84 billion, putting this year on pace to exceed \$100 billion; the trend continued of larger checks flowing into fewer deals. Buyout exits on a run-rate basis are on pace to exceed 2017 totals, though they will still fall short of 2014 and 2015, as most sponsors have already exited most of their saleable assets. Venture-backed exit activity continues to be strong, albeit driven by fewer transactions than prior years. Liquidity in the third quarter totaled \$21 billion, with this year expected to overtake 2017.

## Global Fixed Income

US credit was affected by higher interest rates and the ongoing trade war. The rate hike in September pushed the Fed Funds rate to its peak since October 2008. The Bloomberg Barclays High Yield Index finished the quarter up 2.4% and the S&P LSTA Leveraged Loan Index gained 1.3%; loans remained in the lead for the year with gains of 4% compared to 2.6% for high yield. The US Long Credit Index was up 1.3%, and the US Long Treasury lost 2.9% with yield on the 10-year Treasury increasing 20 basis points to close at 3.06%. In emerging markets, US dollar-denominated debt was up 1.5%, according to the JPM EMBI Index, while local currency debt lost 1.8%, according to the JPM GBI-EM Index.



# MARKET ENVIRONMENT

## Real Assets

Commodity prices slid in the third quarter triggered by weakness in mining and agricultural commodities as tariffs weigh on global sentiment. Oil prices remain firm and we are keeping an eye on fundamentals as the futures market is in backwardation, that is, producers are hedging volumes to lock in revenue. Iranian production is scheduled to come offline when new US sanctions go into effect in November, while a strained relationship with Saudi Arabia fuels greater uncertainty. This comes amid a backdrop of continued improvement in the supply/demand dynamics in an industry that has under-invested in new production in recent years as companies have been focused on repairing balance sheets following the crash in oil prices in 2014 and 2015. Midstream energy equities had another strong quarter as the simplification and consolidation in this industry plays out. We still believe in this near-term opportunity as fundamentals further improve.

Energy-related equities remain undervalued relative to where oil is trading. While we still are not big fans of long commodity strategies, that type of allocation could provide a boost to a portfolio with limited inflation-linked assets. We remain constructive on natural resource equities and believe that private equity and credit strategies focused on the energy sector remain attractive.

Returns were robust in the US core market and REITs had a modestly positive quarter. We are beginning to see differentiation in fundamentals between real estate sub-sectors and within sub-sectors. As rates march higher, we are paying close attention to core yield spreads over Treasuries and potential impact on valuations. To this end, we are focused on opportunities with higher expected income growth to potentially offset a change in valuations. We like core funds with an edge in growing net operating income, core-plus funds and debt strategies. In the non-core space, we continue to favor relative-value opportunities and demographically-driven themes and some opportunities to invest outside of the US for total return and portfolio construction benefits.



# MARKET ENVIRONMENT

## **Final Thoughts**

For more than nine years, equity investors have benefited from a prolonged US economic growth cycle. As we approach year 10, many agree we are in the later stages of the cycle. To be clear: late cycle does not mean the end of the cycle as we still see investment opportunities among non-US equities and local-currency emerging market debt. However, our investment outlook is more risk-averse than in prior years, as the Fed shifts to a less accommodative path and liquidity tightens across the globe. To this end, we are encouraging investors to reduce exposure to lower-quality credit as current market pricing does not offer adequate compensation for the potential risks. Furthermore, as US interest rates inch up, we recommend increasing exposure to safe-haven fixed income, including Treasuries and high-quality municipal debt.

We are actively monitoring signals that may indicate a potential end to the current prolonged economic cycle. These signals include an inversion of the US yield curve, coupled with deterioration in key economic indicators. As of today, we do not see these metrics flashing warning signs but we believe investors should stand ready to make rapid and meaningful adjustments to their equity exposure should market conditions warrant. Most of all, we encourage investors to be dynamic in their asset allocation approach with the new year likely bringing greater shifts in market themes and opportunities. We look forward to updating you in 2019 on our market outlook and hope to provide more answers than questions in the new year.





# CALENDAR YEAR INDEX PERFORMANCE

|                             | 2013    | 2014   | 2015   | 2016   | 2017   | Q1     | Q2     | Q3     | Sep    | YTD    | 5yr   | 10yr  |
|-----------------------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|
| Reserve Custom Index        | 0.12%   | 1.1%   | 0.86%  | 1.15%  | 1.00%  | -0.26% | -0.05% | 0.21%  | -0.46% | -0.09% | 0.81% | 1.66% |
| Endowment Custom Index      | 14.46%  | 5.43%  | -0.07% | 5.71%  | 14.52% | -1.28% | 0.98%  | 2.98%  | 0.08%  | 2.65%  | 6.51% | 6.94% |
| Citi 3 Mo Treasury Bill     | 0.05%   | 0.03%  | 0.27%  | 0.84%  | 0.31%  | 0.35%  | 0.40%  | 0.50%  | 0.17%  | 1.29%  | 0.49% | 0.32% |
| BAML 1-3 Yr Govt/Credit A+  | 0.55%   | 0.72%  | 0.66%  | 1.07%  | 0.70%  | -0.17% | 0.30%  | 0.27%  | -0.09% | 0.39%  | 0.74% | 1.49% |
| BAML 1-5 Yr Govt/Credit A+  | 0.10%   | 1.42%  | 1.07%  | 1.30%  | 1.02%  | -0.45% | 0.20%  | 0.19%  | -0.24% | -0.09% | 0.95% | 2.07% |
| BAML 5-10 Yr Govt/Credit A+ | -3.80%  | 6.60%  | 1.90%  | 2.00%  | 3.00%  | -1.80% | -0.20% | -0.13% | -0.90% | -2.07% | 2.06% | 4.35% |
| BBrg Barclays US Aggregate  | -2.02%  | 5.97%  | 0.55%  | 2.65%  | 3.54%  | -1.46% | -0.20% | 0.00%  | -0.60% | -1.60% | 2.16% | 3.77% |
| BC Municipal Bond           | -2.60%  | 9.10%  | 3.30%  | 0.20%  | 5.40%  | -1.10% | 0.90%  | -0.20% | -0.60% | -0.40% | 3.54% | 4.75% |
| BC US Corp High Yield       | 7.40%   | 2.50%  | -4.50% | 17.10% | 7.50%  | -0.90% | 1.00%  | 2.40%  | 0.60%  | 2.60%  | 5.54% | 9.46% |
| BC Long Treasuries          | -12.70% | 25.10% | -1.20% | 1.30%  | 8.50%  | -3.30% | 0.30%  | -2.90% | -3.00% | -5.80% | 4.41% | 5.45% |
| BC US Long Credit           | -6.60%  | 16.40% | -4.60% | 10.20% | 12.20% | -3.80% | -2.70% | 1.30%  | -0.60% | -5.20% | 5.75% | 8.43% |
| MSCI World Index            | 26.68%  | 4.94%  | 0.87%  | 7.51%  | 22.40% | -1.28% | 1.73%  | 4.29%  | 0.56%  | 5.43%  | 9.28% | 8.56% |

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



# RETURNS FOR KEY INDICES RANKED IN ORDER OF PERFORMANCE

| 2006                           | 2007                           | 2008                            | 2009                           | 2010                           | 2011                            | 2012                           | 2013                           | 2014                           | 2015                            | 2016                           | 2017                           |
|--------------------------------|--------------------------------|---------------------------------|--------------------------------|--------------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|--------------------------------|--------------------------------|
| MSCI EMERGING MARKETS<br>32.17 | MSCI EMERGING MARKETS<br>39.39 | BC AGGREGATE<br>5.24            | MSCI EMERGING MARKETS<br>78.51 | RUSSELL 2000 GROWTH<br>29.09   | BC AGGREGATE<br>7.84            | MSCI EMERGING MARKETS<br>18.22 | RUSSELL 2000 GROWTH<br>43.30   | S&P 500<br>13.69               | RUSSELL 1000 GROWTH<br>5.67     | RUSSELL 2000 VALUE<br>31.74    | MSCI EMERGING MARKETS<br>37.28 |
| MSCI EAFE<br>26.34             | RUSSELL 1000 GROWTH<br>11.81   | RUSSELL 2000 VALUE<br>-28.92    | RUSSELL 1000 GROWTH<br>37.21   | RUSSELL 2000<br>26.85          | RUSSELL 1000 GROWTH<br>2.64     | RUSSELL 2000 VALUE<br>18.05    | RUSSELL 2000<br>38.82          | RUSSELL 1000 VALUE<br>13.45    | S&P 500<br>1.38                 | RUSSELL 2000<br>21.31          | RUSSELL 1000 GROWTH<br>30.21   |
| RUSSELL 1000 VALUE<br>22.25    | MSCI EAFE<br>11.17             | RUSSELL 2000<br>-33.79          | RUSSELL 2000 GROWTH<br>34.47   | RUSSELL 2000 VALUE<br>24.5     | S&P 500<br>2.11                 | RUSSELL 1000 VALUE<br>17.51    | RUSSELL 2000 VALUE<br>34.52    | RUSSELL 1000<br>13.24          | RUSSELL 1000<br>0.92            | RUSSELL 1000 VALUE<br>17.34    | MSCI EAFE<br>25.03             |
| RUSSELL 2000 VALUE<br>23.48    | RUSSELL 2000 GROWTH<br>7.06    | RUSSELL 1000 VALUE<br>-36.85    | MSCI EAFE<br>31.78             | MSCI EMERGING MARKETS<br>18.88 | RUSSELL 1000<br>1.50            | MSCI EAFE<br>17.32             | RUSSELL 1000 GROWTH<br>33.48   | RUSSELL 1000 GROWTH<br>13.05   | BC AGGREGATE<br>0.55            | RUSSELL 1000<br>12.05          | RUSSELL 2000 GROWTH<br>22.17   |
| RUSSELL 2000<br>18.37          | BC AGGREGATE<br>6.97           | S&P 500<br>-37.0                | RUSSELL 1000<br>28.43          | RUSSELL 1000 GROWTH<br>16.71   | RUSSELL 1000 VALUE<br>0.39      | RUSSELL 1000<br>16.42          | RUSSELL 1000<br>33.11          | BC AGGREGATE<br>5.97           | MSCI EAFE<br>-0.81              | S&P 500<br>11.96               | S&P 500<br>21.83               |
| S&P 500<br>15.8                | RUSSELL 1000<br>5.77           | RUSSELL 1000<br>-37.6           | RUSSELL 2000<br>27.16          | RUSSELL 1000<br>16.10          | RUSSELL 2000 GROWTH<br>-2.91    | RUSSELL 2000<br>16.35          | RUSSELL 1000 VALUE<br>32.53    | RUSSELL 2000 GROWTH<br>5.60    | RUSSELL 2000 GROWTH<br>-1.38    | RUSSELL 2000 GROWTH<br>11.32   | RUSSELL 1000<br>21.69          |
| RUSSELL 1000<br>15.46          | S&P 500<br>5.49                | RUSSELL 1000 GROWTH<br>-38.44   | S&P 500<br>26.46               | RUSSELL 1000 VALUE<br>15.51    | RUSSELL 2000<br>-4.18           | S&P 500<br>16.00               | S&P 500<br>32.39               | RUSSELL 2000<br>4.89           | RUSSELL 1000 VALUE<br>-3.83     | MSCI EMERGING MARKETS<br>11.19 | RUSSELL 2000<br>14.65          |
| RUSSELL 2000 GROWTH<br>13.35   | RUSSELL 1000 VALUE<br>-0.17    | RUSSELL 2000 GROWTH<br>-38.54   | RUSSELL 2000 VALUE<br>20.58    | S&P 500<br>15.06               | RUSSELL 2000 VALUE<br>-5.50     | RUSSELL 1000 GROWTH<br>15.26   | MSCI EAFE<br>22.78             | RUSSELL 2000 VALUE<br>4.22     | RUSSELL 2000<br>-4.41           | RUSSELL 1000 GROWTH<br>7.08    | RUSSELL 1000 VALUE<br>13.66    |
| RUSSELL 1000 GROWTH<br>9.07    | RUSSELL 2000<br>-1.56          | MSCI EAFE<br>-43.38             | RUSSELL 1000 VALUE<br>19.69    | MSCI EAFE<br>7.75              | MSCI EAFE<br>-12.14             | RUSSELL 2000 GROWTH<br>14.59   | BC AGGREGATE<br>-2.02          | MSCI EMERGING MARKETS<br>-2.19 | RUSSELL 2000 VALUE<br>-7.46     | BC AGGREGATE<br>2.65           | RUSSELL 2000 VALUE<br>7.84     |
| BC AGGREGATE<br>4.33           | RUSSELL 2000 VALUE<br>-9.78    | MSCI EMERGING MARKETS<br>-53.33 | BC AGGREGATE<br>5.93           | BC AGGREGATE<br>6.54           | MSCI EMERGING MARKETS<br>-18.42 | BC AGGREGATE<br>4.21           | MSCI EMERGING MARKETS<br>-2.60 | MSCI EAFE<br>-4.90             | MSCI EMERGING MARKETS<br>-14.93 | MSCI EAFE<br>1.00              | BC AGGREGATE<br>3.54           |

| QTD                            | 1 Year                         | 3 year                         | 5 Year                        | 10 Year                       |
|--------------------------------|--------------------------------|--------------------------------|-------------------------------|-------------------------------|
| RUSSELL 1000 GROWTH<br>9.17    | RUSSELL 1000 GROWTH<br>26.30   | RUSSELL 1000 GROWTH<br>20.55   | RUSSELL 1000 GROWTH<br>16.58  | RUSSELL 1000 GROWTH<br>14.31  |
| S&P 500<br>7.71                | RUSSELL 2000 GROWTH<br>21.06   | RUSSELL 2000 GROWTH<br>17.98   | S&P 500<br>13.95              | RUSSELL 2000 GROWTH<br>12.65  |
| RUSSELL 1000<br>7.42           | S&P 500<br>17.91               | S&P 500<br>17.31               | RUSSELL 1000<br>13.67         | RUSSELL 1000<br>12.09         |
| RUSSELL 1000 VALUE<br>5.70     | RUSSELL 1000<br>17.76          | RUSSELL 2000<br>17.12          | RUSSELL 2000 GROWTH<br>12.14  | S&P 500<br>11.97              |
| RUSSELL 2000 GROWTH<br>5.52    | RUSSELL 2000<br>15.24          | RUSSELL 1000<br>17.07          | RUSSELL 2000<br>11.07         | RUSSELL 2000<br>11.11         |
| RUSSELL 2000<br>3.58           | RUSSELL 1000 VALUE<br>9.45     | RUSSELL 2000 VALUE<br>16.12    | RUSSELL 1000 VALUE<br>10.72   | RUSSELL 1000 VALUE<br>9.79    |
| RUSSELL 2000 VALUE<br>1.60     | RUSSELL 2000 VALUE<br>9.33     | RUSSELL 1000 VALUE<br>13.55    | RUSSELL 2000 VALUE<br>9.92    | RUSSELL 2000 VALUE<br>9.52    |
| MSCI EAFE<br>1.35              | MSCI EAFE<br>2.74              | MSCI EMERGING MARKETS<br>12.36 | MSCI EAFE<br>4.42             | MSCI EMERGING MARKETS<br>5.40 |
| BC AGGREGATE<br>0.02           | MSCI EMERGING MARKETS<br>-0.81 | MSCI EAFE<br>9.23              | MSCI EMERGING MARKETS<br>3.61 | MSCI EAFE<br>5.38             |
| MSCI EMERGING MARKETS<br>-1.09 | BC AGGREGATE<br>-1.22          | BC AGGREGATE<br>1.31           | BC AGGREGATE<br>2.16          | BC AGGREGATE<br>3.77          |



# EXECUTIVE SUMMARY

NEPC, LLC

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Delaware Office of the State Treasurer

# TOTAL FUND PERFORMANCE SUMMARY

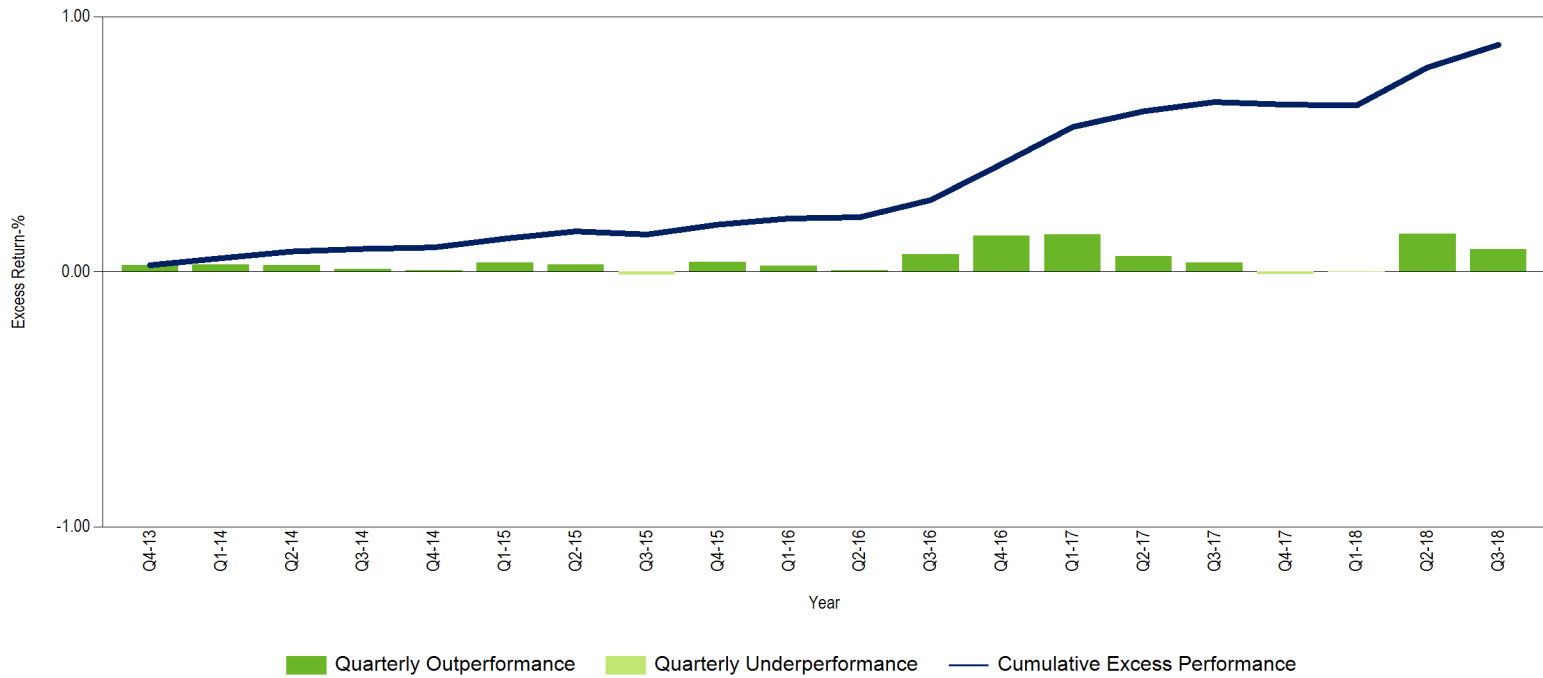
|   | Market Value           | 3 Mo         | YTD           | 1 Yr          | 3 Yrs        | 5 Yrs        | Inception    | Inception Date |
|---|------------------------|--------------|---------------|---------------|--------------|--------------|--------------|----------------|
| <b>Delaware Total Consolidation</b>               | <b>\$1,984,216,138</b> | <b>0.33%</b> | <b>0.60%</b>  | <b>0.76%</b>  | <b>1.14%</b> | <b>1.03%</b> | <b>1.87%</b> | <b>Jan-05</b>  |
| <b>Total Liquidity &amp; Reserve</b>              | <b>\$1,913,409,642</b> | <b>0.27%</b> | <b>0.58%</b>  | <b>0.59%</b>  | <b>--</b>    | <b>--</b>    | <b>0.92%</b> | <b>Jan-16</b>  |
| <b>Total Liquidity</b>                            | <b>\$696,791,511</b>   | <b>0.54%</b> | <b>1.31%</b>  | <b>1.46%</b>  | <b>1.13%</b> | <b>0.86%</b> | <b>1.74%</b> | <b>Jan-05</b>  |
| <i>eV US Cash Management Net Median</i>           |                        | <i>0.52%</i> | <i>1.34%</i>  | <i>1.64%</i>  | <i>0.99%</i> | <i>0.67%</i> | <i>1.47%</i> | <i>Jan-05</i>  |
| <b>Total Reserve</b>                              | <b>\$1,216,618,131</b> | <b>0.11%</b> | <b>0.09%</b>  | <b>-0.02%</b> | <b>0.83%</b> | <b>0.98%</b> | <b>2.11%</b> | <b>Jan-05</b>  |
| <i>Reserve Custom Index</i>                       |                        | <i>0.21%</i> | <i>-0.09%</i> | <i>-0.26%</i> | <i>0.54%</i> | <i>0.81%</i> | <i>2.31%</i> | <i>Jan-05</i>  |
| <i>eV US Interm Duration Fixed Inc Net Median</i> |                        | <i>0.32%</i> | <i>-0.66%</i> | <i>-0.72%</i> | <i>1.11%</i> | <i>1.62%</i> | <i>3.53%</i> | <i>Jan-05</i>  |
| <b>Total Endowment</b>                            | <b>\$70,806,496</b>    | <b>2.19%</b> | <b>1.16%</b>  | <b>4.84%</b>  | <b>8.76%</b> | <b>--</b>    | <b>6.02%</b> | <b>Aug-15</b>  |
| <i>Endowment Custom Index</i>                     |                        | <i>2.98%</i> | <i>2.65%</i>  | <i>6.18%</i>  | <i>8.61%</i> | <i>6.51%</i> | <i>6.09%</i> | <i>Aug-15</i>  |
| <i>eV Global Balanced Net Median</i>              |                        | <i>1.72%</i> | <i>0.80%</i>  | <i>4.13%</i>  | <i>9.05%</i> | <i>6.47%</i> | <i>5.49%</i> | <i>Aug-15</i>  |

Fiscal year ends June 30.



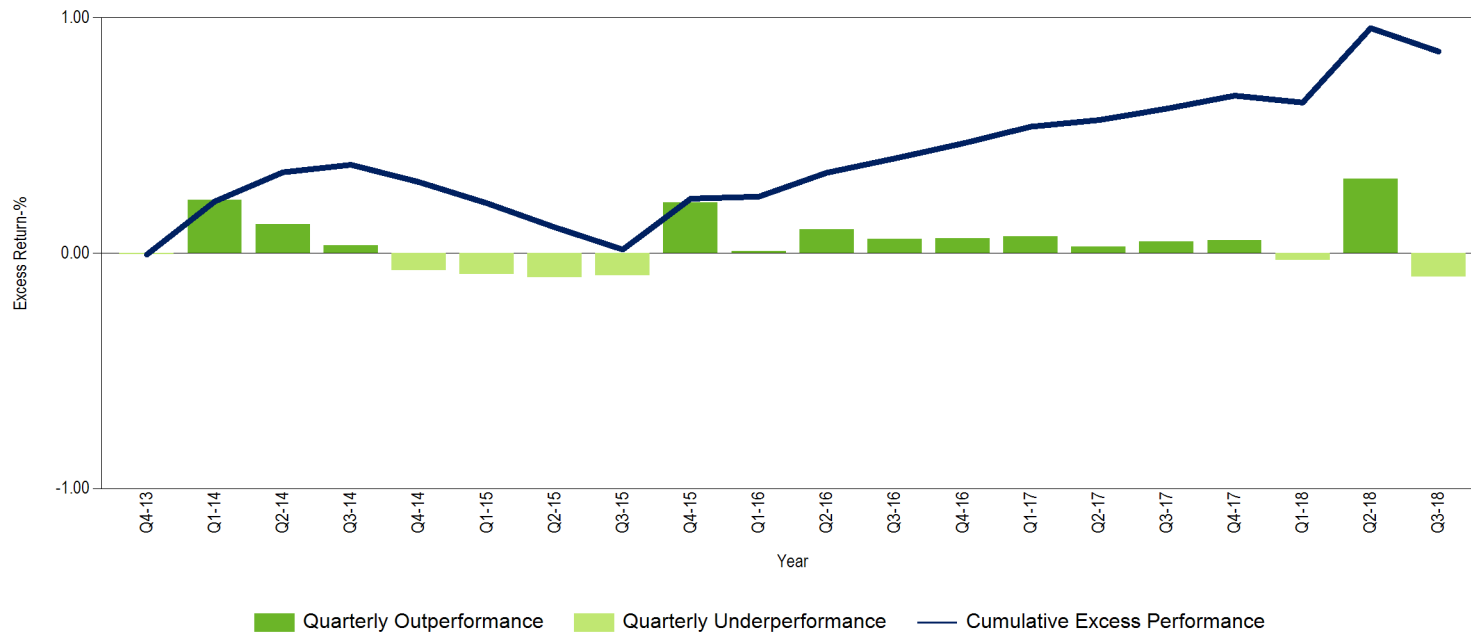
# TOTAL FUND PERFORMANCE SUMMARY

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



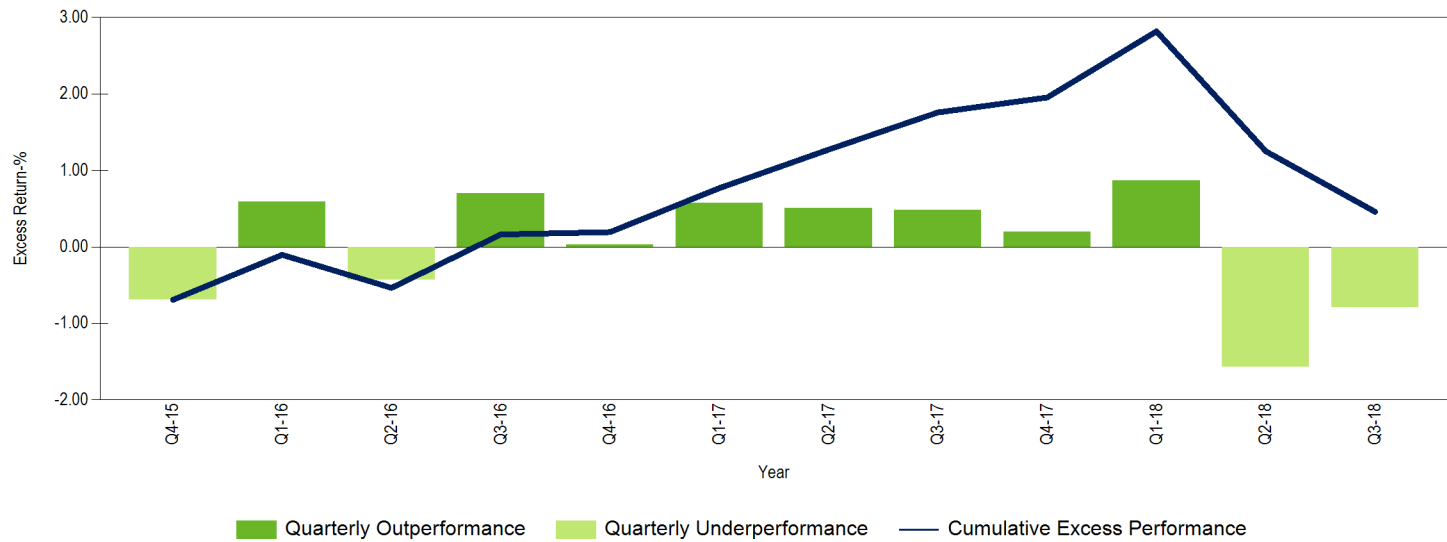
# TOTAL FUND PERFORMANCE SUMMARY

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



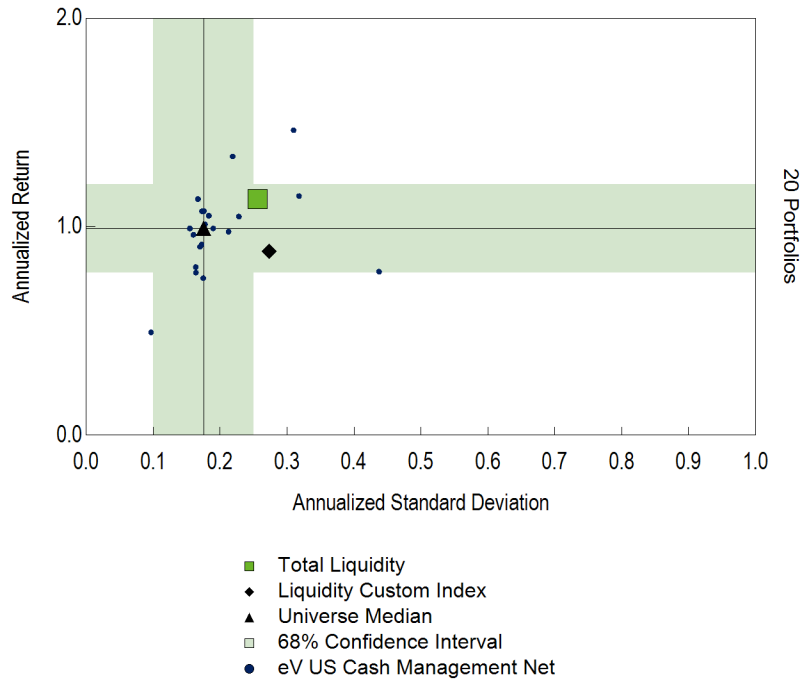
# TOTAL FUND PERFORMANCE SUMMARY

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

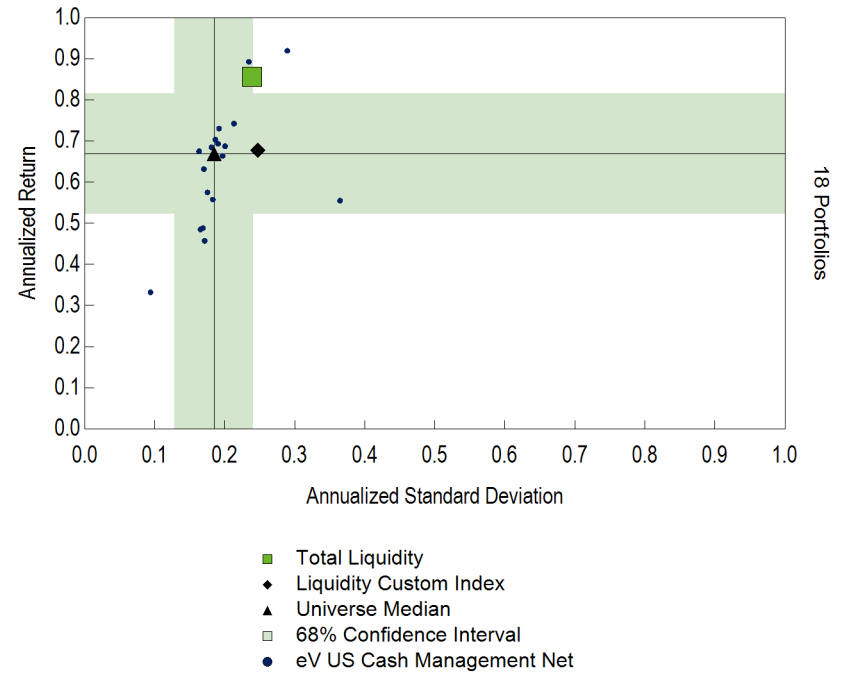


# LIQUIDITY RISK/RETURN - 3 & 5 YEARS

3 Years Ending September 30, 2018



5 Years Ending September 30, 2018



| 3 Years Ending September 30, 2018 |           |               |              |
|-----------------------------------|-----------|---------------|--------------|
|                                   | Anlzd Ret | Anlzd Std Dev | Sharpe Ratio |
| Total Liquidity                   | 1.13%     | 0.26%         | 1.06         |
| Liquidity Custom Index            | 0.88%     | 0.27%         | 0.07         |

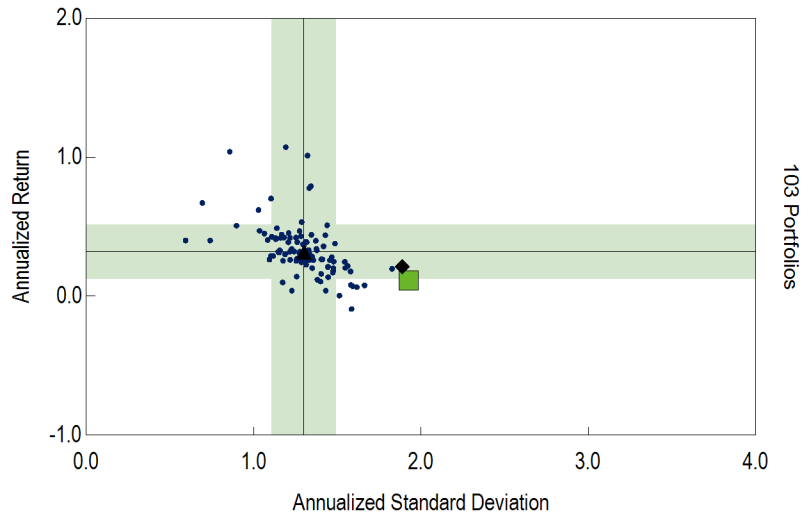
| 5 Years Ending September 30, 2018 |           |               |              |
|-----------------------------------|-----------|---------------|--------------|
|                                   | Anlzd Ret | Anlzd Std Dev | Sharpe Ratio |
| Total Liquidity                   | 0.86%     | 0.24%         | 1.38         |
| Liquidity Custom Index            | 0.68%     | 0.25%         | 0.61         |





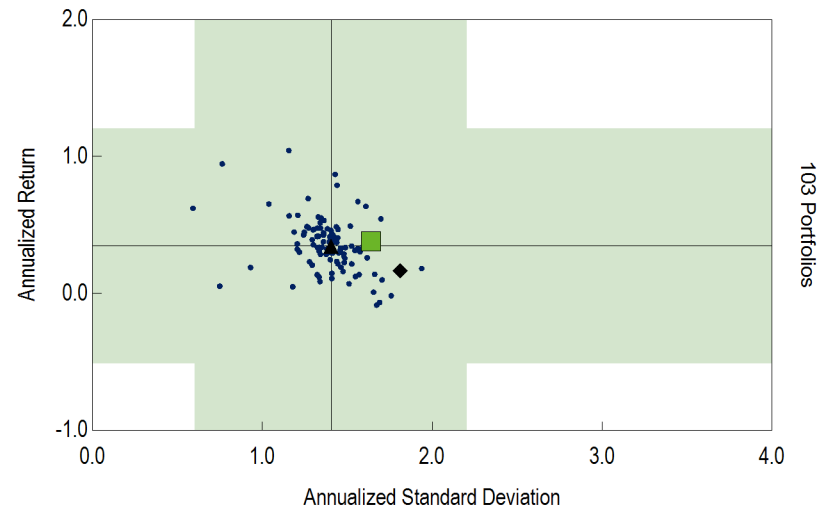
# RESERVE RISK/RETURN - 3 & 6 MONTHS

3 Months Ending September 30, 2018



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

6 Months Ending September 30, 2018



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

3 Months Ending September 30, 2018

|                      | Anlzd Ret | Anlzd Std Dev | Sharpe Ratio |
|----------------------|-----------|---------------|--------------|
| Total Reserve        | 0.11%     | 1.93%         | -0.19        |
| Reserve Custom Index | 0.21%     | 1.89%         | -0.14        |

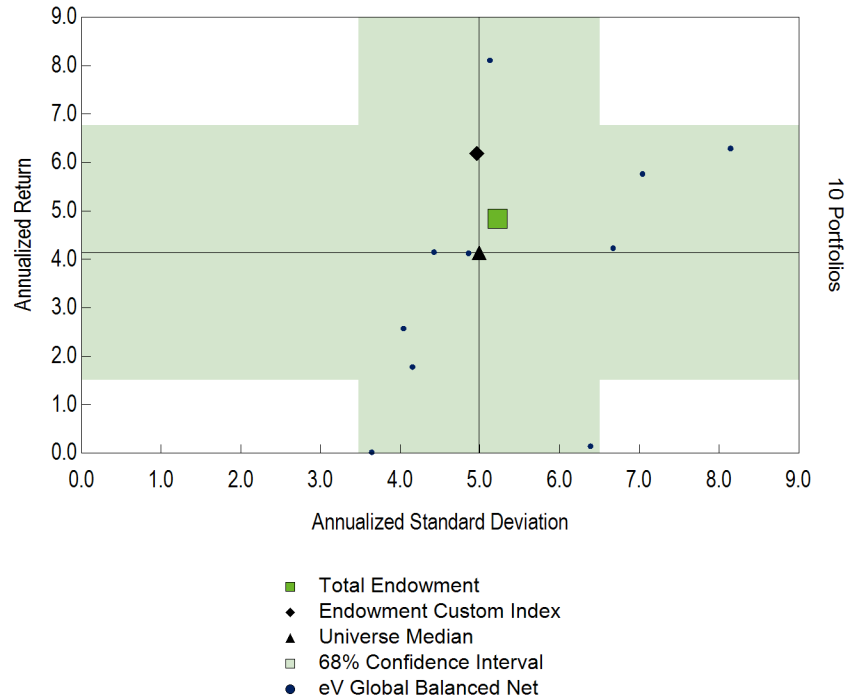
6 Months Ending September 30, 2018

|                      | Anlzd Ret | Anlzd Std Dev | Sharpe Ratio |
|----------------------|-----------|---------------|--------------|
| Total Reserve        | 0.38%     | 1.64%         | -0.32        |
| Reserve Custom Index | 0.16%     | 1.81%         | -0.41        |

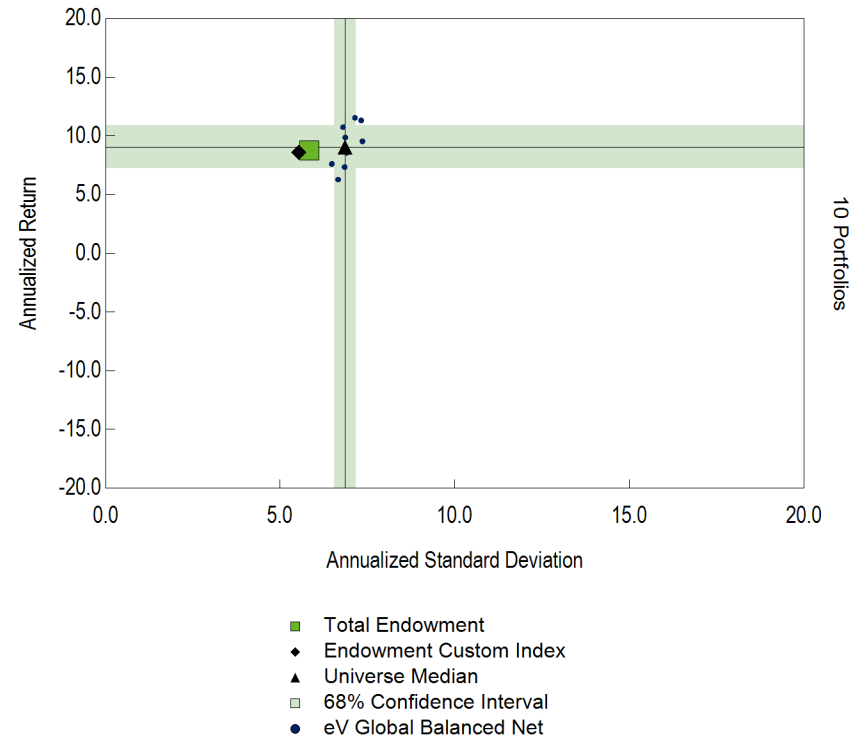


# ENDOWMENT RISK/RETURN - 1 YEAR & 3 YEAR

1 Year Ending September 30, 2018



3 Years Ending September 30, 2018



1 Year Ending September 30, 2018

|                        | Anlzd Ret | Anlzd Std Dev | Sharpe Ratio |
|------------------------|-----------|---------------|--------------|
| Total Endowment        | 4.84%     | 5.22%         | 0.61         |
| Endowment Custom Index | 6.18%     | 4.96%         | 0.92         |

3 Years Ending September 30, 2018

|                        | Anlzd Ret | Anlzd Std Dev | Sharpe Ratio |
|------------------------|-----------|---------------|--------------|
| Total Endowment        | 8.76%     | 5.84%         | 1.35         |
| Endowment Custom Index | 8.61%     | 5.53%         | 1.40         |



# TOTAL FUND PERFORMANCE DETAIL

|   | Market Value<br>(\$) | % of<br>Portfolio | 3 Mo<br>(%) | Rank      | YTD<br>(%)  | Rank      | 1 Yr<br>(%)  | Rank      | 3 Yrs<br>(%) | Rank      | 5 Yrs<br>(%) | Rank      | Inception<br>(%) | Inception<br>Date |
|---|----------------------|-------------------|-------------|-----------|-------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|------------------|-------------------|
| <b>Delaware Total Consolidation</b>               | <b>1,984,216,138</b> | <b>100.00</b>     | <b>0.33</b> | <b>--</b> | <b>0.60</b> | <b>--</b> | <b>0.76</b>  | <b>--</b> | <b>1.14</b>  | <b>--</b> | <b>1.03</b>  | <b>--</b> | <b>1.87</b>      | <b>Jan-05</b>     |
| <b>Total Liquidity &amp; Reserve</b>              | <b>1,913,409,642</b> | <b>96.43</b>      | <b>0.27</b> | <b>--</b> | <b>0.58</b> | <b>--</b> | <b>0.59</b>  | <b>--</b> | <b>--</b>    | <b>--</b> | <b>--</b>    | <b>--</b> | <b>0.92</b>      | <b>Jan-16</b>     |
| <b>Total Liquidity</b>                            | <b>696,791,511</b>   | <b>35.12</b>      | <b>0.54</b> | <b>34</b> | <b>1.31</b> | <b>63</b> | <b>1.46</b>  | <b>86</b> | <b>1.13</b>  | <b>16</b> | <b>0.86</b>  | <b>8</b>  | <b>1.74</b>      | <b>Jan-05</b>     |
| <i>eV US Cash Management Net Median</i>           |                      |                   | 0.52        |           | 1.34        |           | 1.64         |           | 0.99         |           | 0.67         |           | 1.47             | Jan-05            |
| PFM Asset Management                              | 349,936,081          | 17.64             | 0.52        | 56        | 1.42        | 36        | 1.58         | 66        | 1.24         | 9         | 0.97         | 1         | 0.94             | Jun-13            |
| Wilmington Liquidity                              | 346,855,430          | 17.48             | 0.56        | 22        | 1.22        | 81        | 1.29         | 91        | 0.99         | 48        | 0.77         | 11        | 4.21             | Jan-85            |
| <b>Total Reserve</b>                              | <b>1,216,618,131</b> | <b>61.31</b>      | <b>0.11</b> | <b>91</b> | <b>0.09</b> | <b>--</b> | <b>-0.02</b> | <b>--</b> | <b>0.83</b>  | <b>80</b> | <b>0.98</b>  | <b>99</b> | <b>2.11</b>      | <b>Jan-05</b>     |
| <i>Reserve Custom Index</i>                       |                      |                   | 0.21        | 79        | -0.09       |           | -0.26        |           | 0.54         |           | 0.81         |           | 2.31             | Jan-05            |
| <i>eV US Interm Duration Fixed Inc Net Median</i> |                      |                   | 0.32        |           | -0.66       |           | -0.72        |           | 1.11         |           | 1.62         |           | 3.53             | Jan-05            |
| JPM Intermediate                                  | 303,884,495          | 15.32             | 0.43        | 54        | 0.45        |           | 0.34         |           | 0.92         |           | 0.98         |           | 0.95             | Jun-13            |
| <i>J.P. Morgan Custom Index</i>                   |                      |                   | 0.30        | 86        | 0.32        |           | 0.15         |           | 0.68         |           | 0.89         |           | 0.85             | Jun-13            |
| Blackrock Financial Mangement                     | 304,992,518          | 15.37             | 0.27        | 88        | --          |           | --           |           | --           |           | --           |           | 0.84             | Mar-18            |
| <i>Blackrock Custom Index</i>                     |                      |                   | 0.20        | 97        | 0.11        |           | -0.06        |           | 0.61         |           | 0.85         |           | 0.60             | Mar-18            |
| Chandler Asset Management                         | 306,657,053          | 15.45             | 0.02        | 51        | 0.02        |           | -0.21        |           | 0.78         |           | 1.11         |           | 0.92             | Jun-13            |
| Lazard Financial Management                       | 301,084,065          | 15.17             | -0.26       | 57        | --          |           | --           |           | --           |           | --           |           | 0.16             | Mar-18            |
| <i>Lazard Custom Index</i>                        |                      |                   | -0.13       | 54        | -0.57       |           | -0.74        |           | 0.38         | 99        | 0.71         | 99        | -0.09            | Mar-18            |
| <b>Total Endowment</b>                            | <b>70,806,496</b>    | <b>3.57</b>       | <b>2.19</b> | <b>38</b> | <b>1.16</b> | <b>40</b> | <b>4.84</b>  | <b>29</b> | <b>8.76</b>  | <b>54</b> | <b>--</b>    | <b>--</b> | <b>6.02</b>      | <b>Aug-15</b>     |
| <i>Endowment Custom Index</i>                     |                      |                   | 2.98        | 19        | 2.65        | 12        | 6.18         | 14        | 8.61         | 55        | 6.51         | 50        | 6.09             | Aug-15            |
| <i>eV Global Balanced Net Median</i>              |                      |                   | 1.72        |           | 0.80        |           | 4.13         |           | 9.05         |           | 6.47         |           | 5.49             | Aug-15            |
| SEI Funds   | 23,256,178           | 1.17              | 2.51        | 22        | 1.66        | 31        | 5.60         | 24        | 9.93         | 33        | --           | --        | 7.37             | Aug-15            |
| MSIFT Global Strategist                           | 21,661,536           | 1.09              | 1.68        | 57        | 0.50        | 61        | 3.98         | 57        | 8.06         | 62        | --           | --        | 5.18             | Aug-15            |
| JP Morgan Diversified                             | 22,406,223           | 1.13              | 2.65        | 21        | 1.29        | 38        | 5.43         | 25        | 9.33         | 47        | --           | --        | 6.45             | Aug-15            |
| Cash Account                                      | 3,482,559            | 0.18              | 0.44        | 96        | 1.11        | 91        | 1.32         | 90        | 0.66         | 97        | --           | --        | 0.63             | 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.

Endowment Custom Index is comprised of 60% MSCI World Index/40% Barclays Capital Aggregate.

Post 3/1/2018 Reserve Custom Index is comprised of 25% BBgBarc US Govt/Credit 1-3 Yr, BBgBarc US Govt/Credit 1-5 Yr, and BBgBarc US Govt/Credit 5-10 Yr.

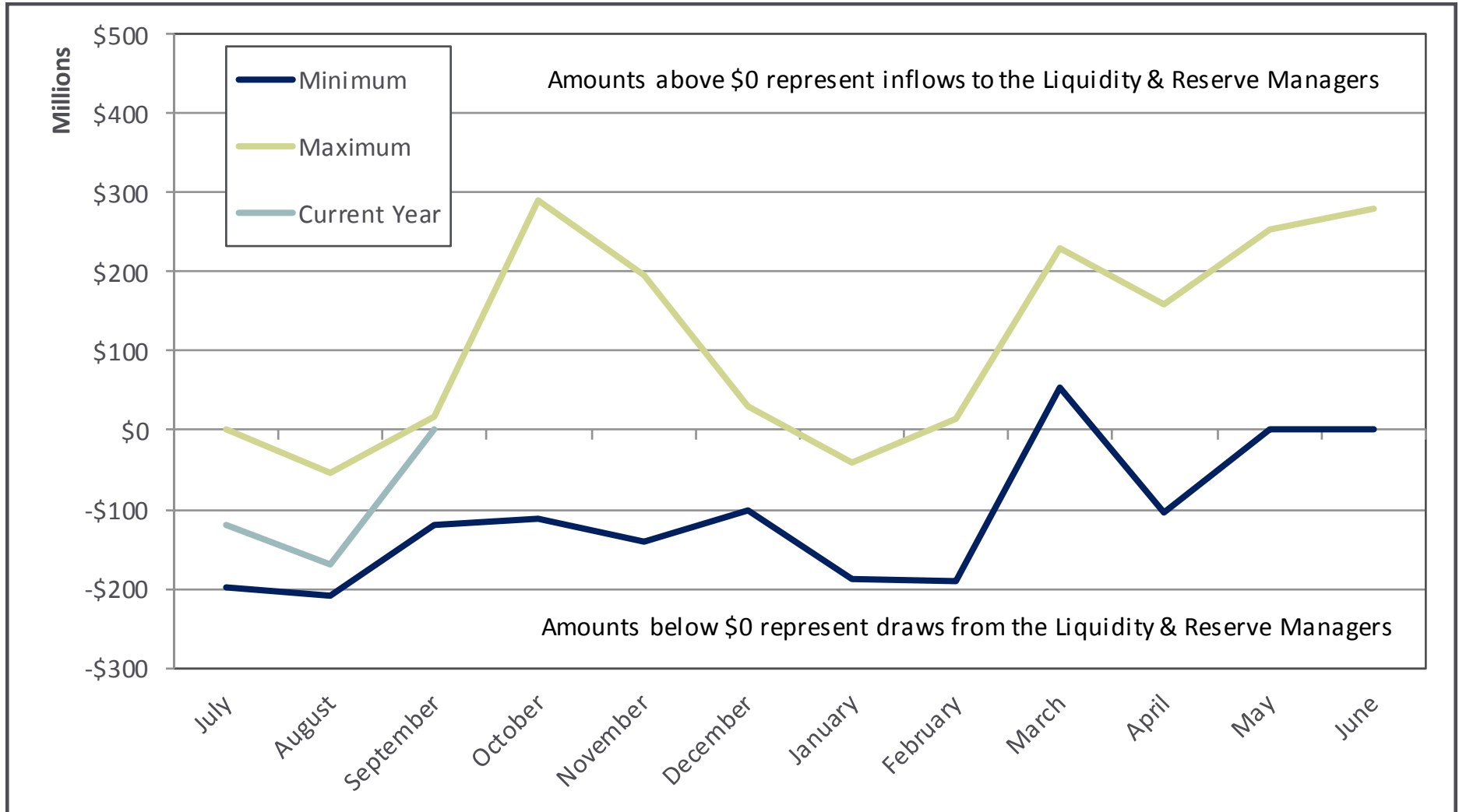
Blackrock Custom Index consists of 100% BofA Merrill Lynch 1-5 year Corporate/Gov A+ or Better and 75% BofA Merrill Lynch 1-5 year Govt/Corporate A+ or Better/ 25% 6 Month Treasury Bill prior to 4/1/2018.

J.P Morgan Custom Index consists of 100% BofA Merrill Lynch 1-3 year Corporate/Gov A+ or Better and 75% BofA Merrill Lynch 1-5 year Govt/Corporate A+ or Better/ 25% 6 Month Treasury Bill prior to 4/1/2018.

Chandler/Lazard Custom Index consists of 100% BofA Merrill Lynch 5-10 year Gov/Credit A+ or Better and 75% BofA Merrill Lynch 1-5 year Govt/Corporate A+ or Better/ 25% 6 Month Treasury Bill prior to 4/1/2018.



# CASH FLOWS – FISCAL YEAR 2019



The minimum and maximum bands are the historical high and low amounts over the preceding 10 fiscal years.



# MONTH ENDED SEPTEMBER 30, 2018

| Change in Market Value<br>Month Ending September 30, 2018 |                           |               |                   |             |                     |                           |                         |                             |                         |  |
|---|---------------------------|---------------|-------------------|-------------|---------------------|---------------------------|-------------------------|-----------------------------|-------------------------|--|
|   | Beginning<br>Market Value | Contributions | Withdrawals       | Fees        | Income              | Unrealized Gain<br>(Loss) | Realized Gain<br>(Loss) | Amortization /<br>Accretion | Ending Market<br>Value  |  |
| <b>Liquidity Managers</b>                                 |                           |               |                   |             |                     |                           |                         |                             |                         |  |
| PFM Asset Management                                      | \$ 349,337,442            | \$ -          | \$ -              | \$ -        | \$ 481,994          | \$ (41,899)               | \$ (405)                | \$ 158,950                  | \$ 349,936,081          |  |
| Wilmington Liquidity                                      | \$ 346,466,174            | \$ -          | \$ -              | \$ -        | \$ 547,185          | \$ (256,927)              | \$ -                    | \$ 98,999                   | \$ 346,855,430          |  |
| <b>Total Liquidity Managers</b>                           | <b>\$ 695,803,616</b>     | <b>\$ -</b>   | <b>\$ -</b>       | <b>\$ -</b> | <b>\$ 1,029,179</b> | <b>\$ (298,826)</b>       | <b>\$ (405)</b>         | <b>\$ 257,948</b>           | <b>\$ 696,791,511</b>   |  |
| <b>Reserve Managers</b>                                   |                           |               |                   |             |                     |                           |                         |                             |                         |  |
| BlackRock Financial Management                            | \$ 305,634,305            | \$ -          | \$ -              | \$ -        | \$ 566,576          | \$ (992,141)              | \$ (254,716)            | \$ 38,494                   | \$ 304,992,518          |  |
| Chandler Asset Management                                 | \$ 309,120,163            | \$ -          | \$ -              | \$ -        | \$ 663,400          | \$ (3,151,564)            | \$ (70,742)             | \$ 95,796                   | \$ 306,657,053          |  |
| JPM Intermediate  | \$ 303,909,330            | \$ -          | \$ -              | \$ -        | \$ 556,616          | \$ (391,679)              | \$ (236,916)            | \$ 47,144                   | \$ 303,884,495          |  |
| Lazard Asset Management                                   | \$ 303,804,831            | \$ -          | \$ -              | \$ -        | \$ 656,009          | \$ (3,353,328)            | \$ (131,301)            | \$ 107,855                  | \$ 301,084,065          |  |
| <b>Total Reserve Managers</b>                             | <b>\$ 1,222,468,629</b>   | <b>\$ -</b>   | <b>\$ -</b>       | <b>\$ -</b> | <b>\$ 2,442,601</b> | <b>\$ (7,888,712)</b>     | <b>\$ (693,675)</b>     | <b>\$ 289,288</b>           | <b>\$ 1,216,618,132</b> |  |
| <b>Land &amp; Water Endowment</b>                         |                           |               |                   |             |                     |                           |                         |                             |                         |  |
| SEI Funds   | \$ 23,259,695             | \$ -          | \$ (3,333)        | \$ -        | \$ 22,796           | \$ (149,645)              | \$ 126,665              | \$ -                        | \$ 23,256,178           |  |
| MSIFT Global Strategist                                   | \$ 21,626,310             | \$ -          | \$ (3,333)        | \$ -        | \$ 470              | \$ 37,834                 | \$ 255                  | \$ -                        | \$ 21,661,536           |  |
| JP Morgan Diversified                                     | \$ 22,449,740             | \$ -          | \$ (3,333)        | \$ -        | \$ 73,329           | \$ (113,663)              | \$ 151                  | \$ -                        | \$ 22,406,223           |  |
| Cash Account  | \$ 3,477,441              | \$ -          | \$ -              | \$ -        | \$ 5,119            | \$ -                      | \$ -                    | \$ -                        | \$ 3,482,559            |  |
| <b>Total Land &amp; Water Endowment</b>                   | <b>\$ 70,813,186</b>      | <b>\$ -</b>   | <b>\$ (9,999)</b> | <b>\$ -</b> | <b>\$ 101,714</b>   | <b>\$ (225,475)</b>       | <b>\$ 127,071</b>       | <b>\$ -</b>                 | <b>\$ 70,806,496</b>    |  |
| <b>Total</b>  | <b>\$ 1,989,085,431</b>   | <b>\$ -</b>   | <b>\$ (9,999)</b> | <b>\$ -</b> | <b>\$ 3,573,494</b> | <b>\$ (8,413,013)</b>     | <b>\$ (567,010)</b>     | <b>\$ 547,236</b>           | <b>\$ 1,984,216,138</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<br>Fiscal Year-to-Date<br>Through September 30, 2018 |                      |                         |                     |                      |                           |                         |                             |                         |
|---|---|----------------------|-------------------------|---------------------|----------------------|---------------------------|-------------------------|-----------------------------|-------------------------|
|   | Beginning<br>Market Value   | Contributions        | Withdrawals             | Fees                | Income               | Unrealized Gain<br>(Loss) | Realized Gain<br>(Loss) | Amortization /<br>Accretion | Ending Market<br>Value  |
| <b>Liquidity Managers</b>                     |   |                      |                         |                     |                      |                           |                         |                             |                         |
| PFM Asset Management                          | \$ 492,906,444  | \$ -                 | \$ (145,000,000)        | \$ (75,212)         | \$ 1,468,972         | \$ 177,405                | \$ 16,971               | \$ 441,500                  | \$ 349,936,081          |
| Wilmington Liquidity                          | \$ 489,669,700  | \$ 66,550,000        | \$ (211,550,000)        | \$ (75,272)         | \$ 1,879,188         | \$ 28,669                 | \$ 15,201               | \$ 337,943                  | \$ 346,855,430          |
| <b>Total Liquidity Managers</b>               | <b>\$ 982,576,144</b>   | <b>\$ 66,550,000</b> | <b>\$ (356,550,000)</b> | <b>\$ (150,484)</b> | <b>\$ 3,348,160</b>  | <b>\$ 206,075</b>         | <b>\$ 32,172</b>        | <b>\$ 779,443</b>           | <b>\$ 696,791,511</b>   |
| <b>Reserve Managers</b>                       |   |                      |                         |                     |                      |                           |                         |                             |                         |
| BlackRock Financial Management                | \$ 304,178,445  | \$ -                 | \$ -                    | \$ (57,818)         | \$ 1,655,121         | \$ (205,667)              | \$ (690,394)            | \$ 112,831                  | \$ 304,992,518          |
| Chandler Asset Management                     | \$ 306,602,083  | \$ -                 | \$ -                    | \$ (58,132)         | \$ 1,988,745         | \$ (2,083,241)            | \$ (70,636)             | \$ 278,236                  | \$ 306,657,053          |
| JPM Intermediate                              | \$ 302,598,195  | \$ -                 | \$ -                    | \$ (115,864)        | \$ 1,622,333         | \$ 1,128,189              | \$ (1,489,249)          | \$ 140,892                  | \$ 303,884,495          |
| Lazard Asset Management                       | \$ 301,883,237  | \$ -                 | \$ -                    | \$ (89,729)         | \$ 1,991,322         | \$ (2,835,753)            | \$ (188,990)            | \$ 323,979                  | \$ 301,084,065          |
| <b>Total Reserve Managers</b>                 | <b>\$ 1,215,261,960</b>   | <b>\$ -</b>          | <b>\$ -</b>             | <b>\$ (321,543)</b> | <b>\$ 7,257,521</b>  | <b>\$ (3,996,471)</b>     | <b>\$ (2,439,269)</b>   | <b>\$ 855,937</b>           | <b>\$ 1,216,618,131</b> |
| <b>Total Liquidity &amp; Reserve Managers</b> | <b>\$ 2,197,838,104</b>   | <b>\$ 66,550,000</b> | <b>\$ (356,550,000)</b> | <b>\$ (472,027)</b> | <b>\$ 10,605,681</b> | <b>\$ (3,790,397)</b>     | <b>\$ (2,407,097)</b>   | <b>\$ 1,635,381</b>         | <b>\$ 1,913,409,642</b> |
| <b>Land &amp; Water Endowment</b>             |   |                      |                         |                     |                      |                           |                         |                             |                         |
| SEI Funds                                     | \$ 22,673,974   | \$ 32,535            | \$ (18,666)             | \$ (19,920)         | \$ 109,433           | \$ 348,561                | \$ 130,262              | \$ -                        | \$ 23,256,178           |
| MSIFT Global Strategist                       | \$ 21,282,497   | \$ 40,979            | \$ (18,666)             | \$ -                | \$ 1,397             | \$ 353,808                | \$ 1,521                | \$ -                        | \$ 21,661,536           |
| JP Morgan Diversified                         | \$ 21,816,446   | \$ 30,844            | \$ (18,666)             | \$ -                | \$ 73,336            | \$ 503,473                | \$ 790                  | \$ -                        | \$ 22,406,223           |
| Cash Account                                  | \$ 3,571,583  | \$ 46,000            | \$ (150,358)            | \$ -                | \$ 15,335            | \$ -                      | \$ -                    | \$ -                        | \$ 3,482,559            |
| <b>Total Land &amp; Water Endowment</b>       | <b>\$ 69,344,500</b>  | <b>\$ 150,358</b>    | <b>\$ (206,356)</b>     | <b>\$ (19,920)</b>  | <b>\$ 199,501</b>    | <b>\$ 1,205,842</b>       | <b>\$ 132,573</b>       | <b>\$ -</b>                 | <b>\$ 70,806,496</b>    |
| <b>Total</b>                                  | <b>\$ 2,267,182,604</b>   | <b>\$ 66,700,358</b> | <b>\$ (356,756,356)</b> | <b>\$ (491,947)</b> | <b>\$ 10,805,182</b> | <b>\$ (2,584,555)</b>     | <b>\$ (2,274,523)</b>   | <b>\$ 1,635,381</b>         | <b>\$ 1,984,216,138</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.



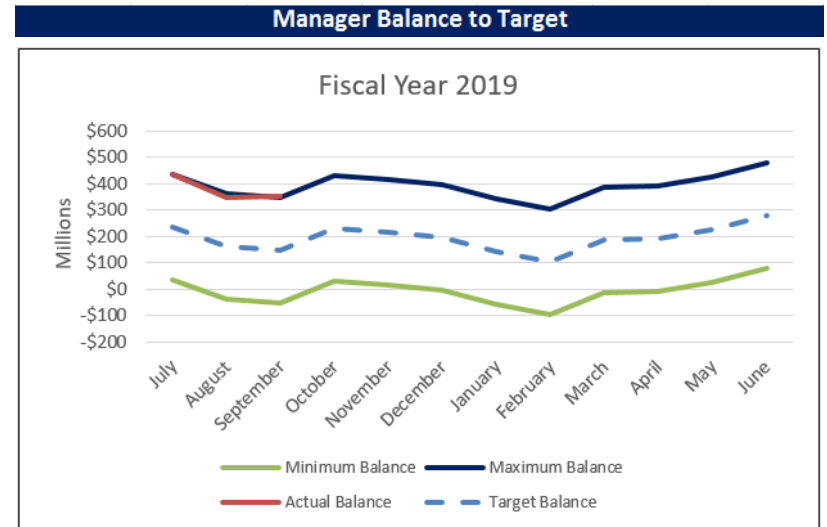
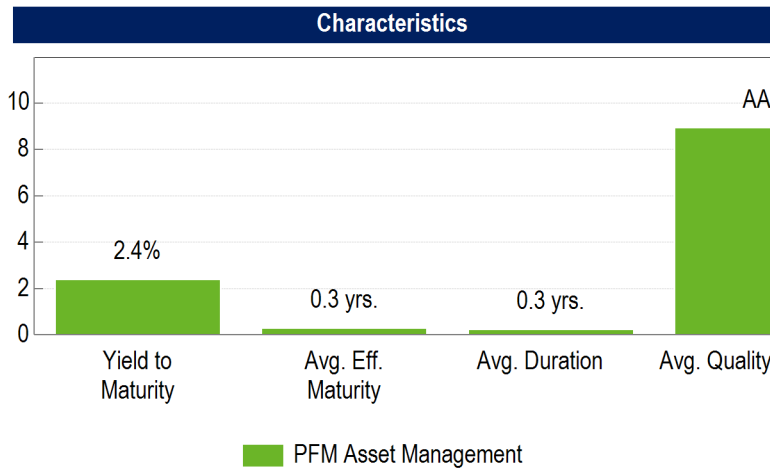
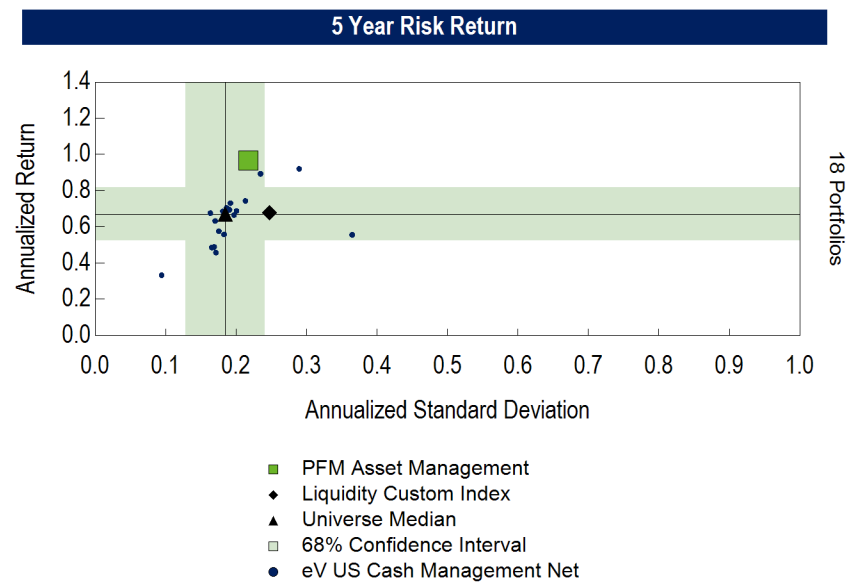
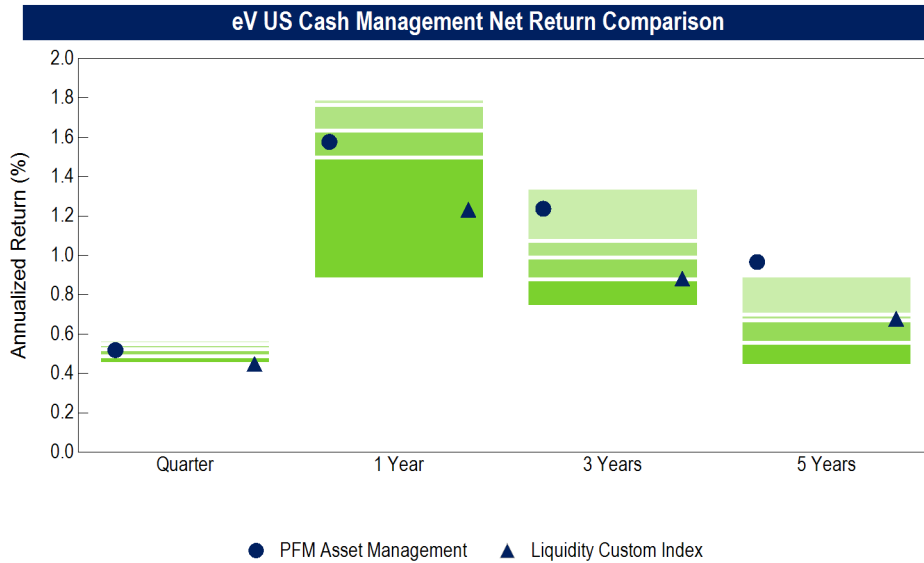
# LIQUIDITY MANAGER REVIEW

NEPC, LLC

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# Delaware Office of the State Treasurer

## PFM ASSET MANAGEMENT



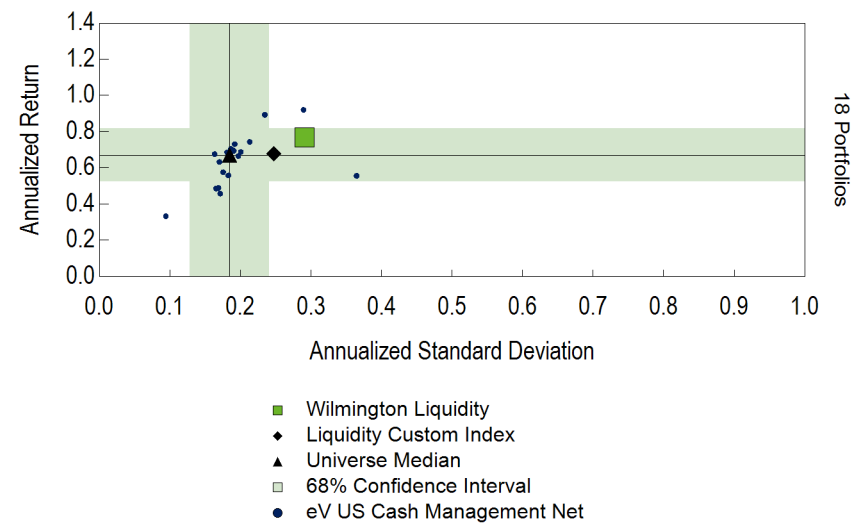


# WILMINGTON LIQUIDITY

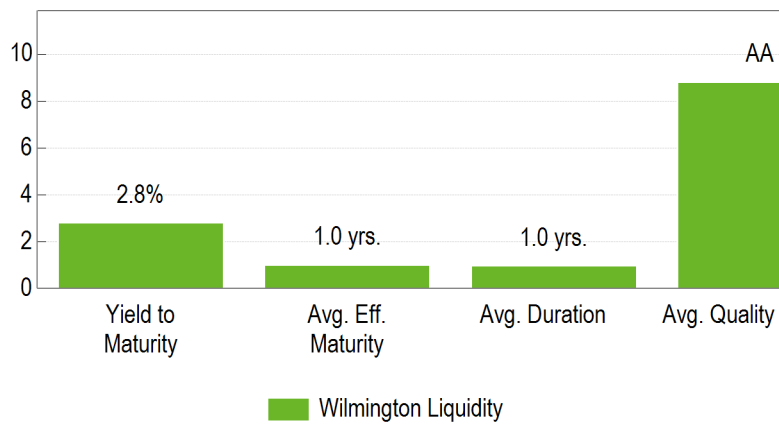
**eV US Cash Management Net Return Comparison**



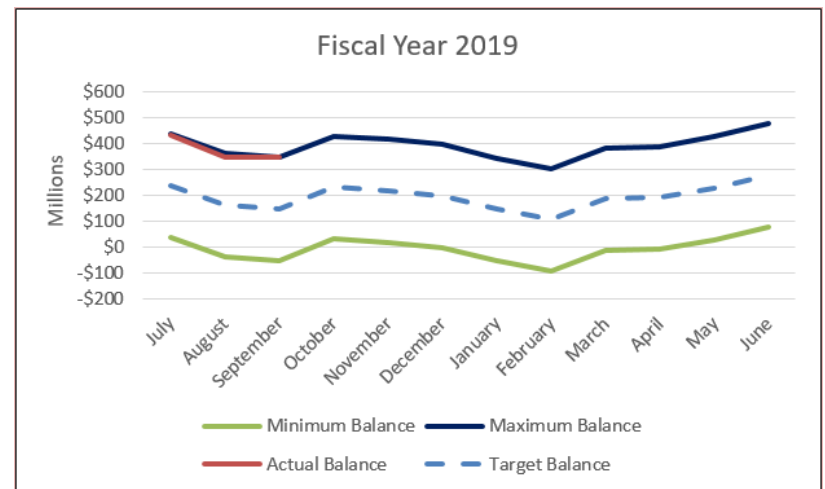
**5 Year Risk Return**



**Characteristics**



**Manager Balance to Target**



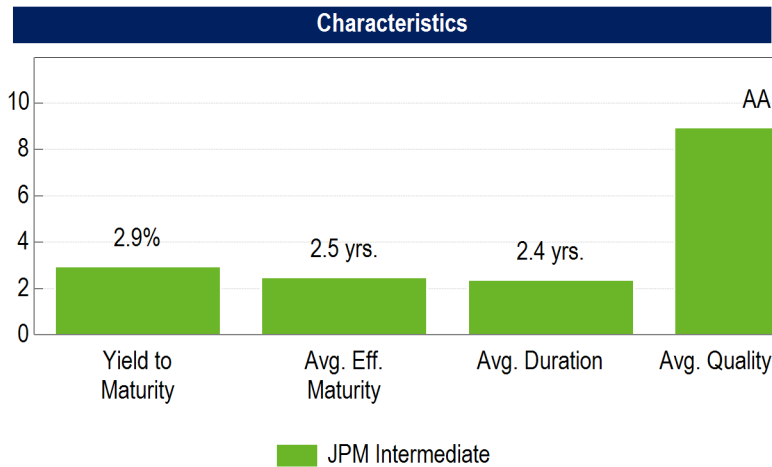
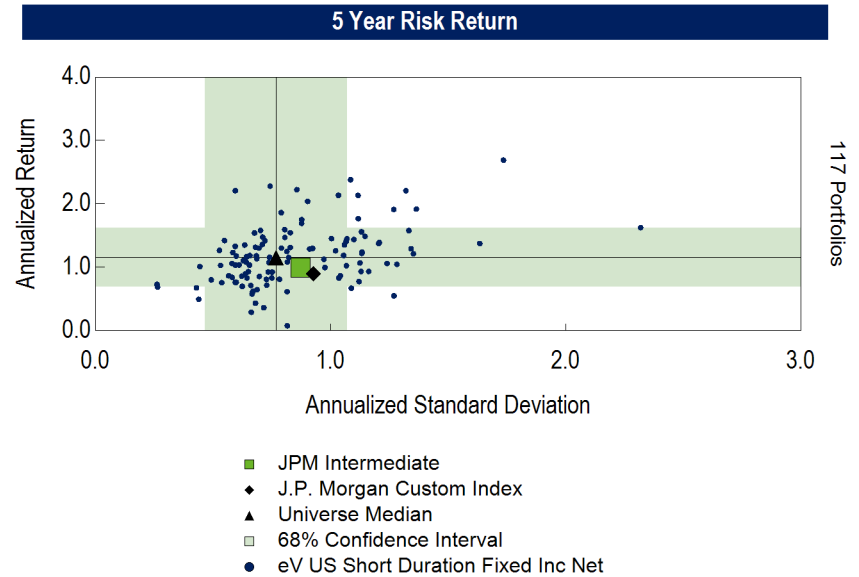
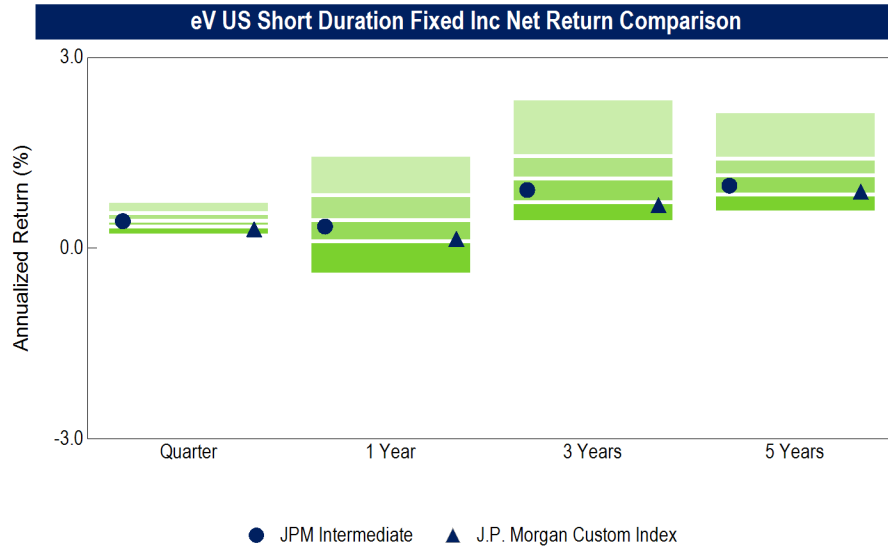
# RESERVE MANAGER REVIEW

NEPC, LLC

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# Delaware Office of the State Treasurer

## JPM INTERMEDIATE



### Qualitative Attribution

**Duration and Yield Positioning** – the portfolio remained marginally short duration with a yield advantage relative to the benchmark. **Result:** Value Added as the front end of the yield curve increased by nearly 30 basis points.

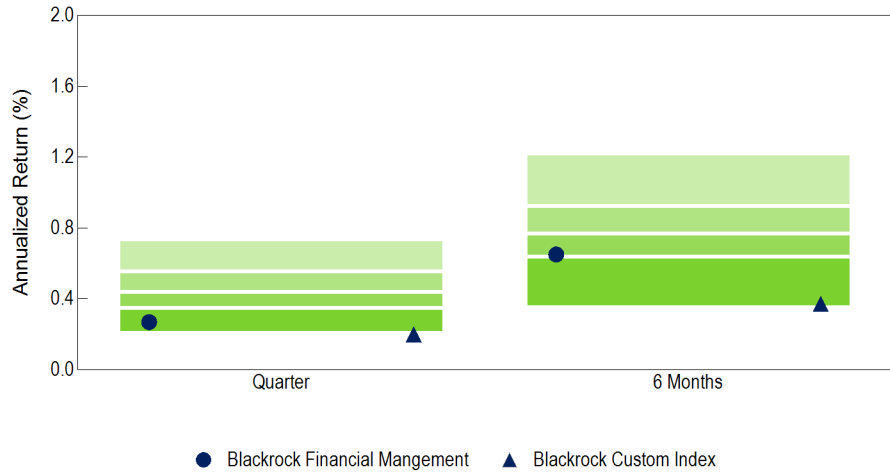
**Credit Positioning** – the portfolio had an overweight to high quality credit names. **Result:** Value Added as the credit curve steepened on the front end and corporate bonds outperformed treasuries by 22 basis points.

**Other Positioning** – the portfolio was de-risked during the end of the quarter, neutralizing the Treasury position as industrial corporate bonds and ABS auto structures became rich during the quarter. The portfolio will look to add mortgage pass-throughs at the expense of ABS autos as they move into the 4<sup>th</sup> quarter.

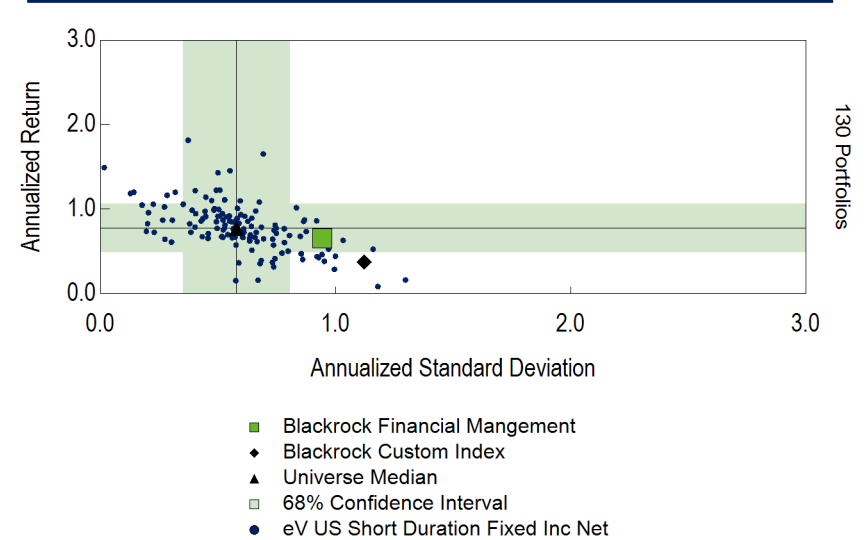


# BLACKROCK FINANCIAL MANAGEMENT

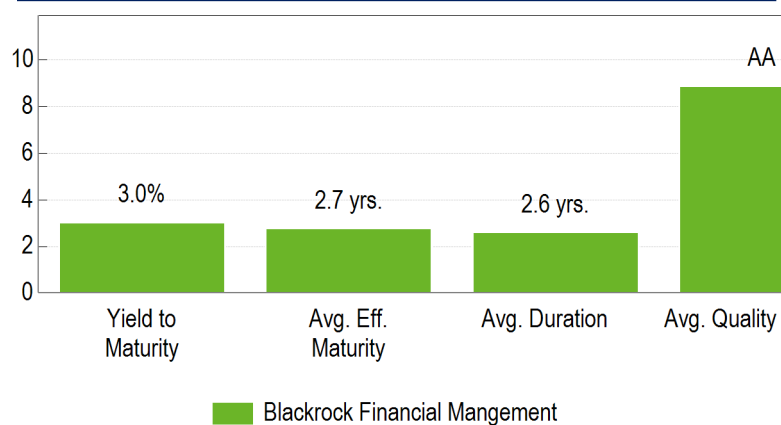
**eV US Short Duration Fixed Inc Net Return Comparison**



**6 Month Risk Return**



**Characteristics**



**Qualitative Attribution**

**Duration Positioning** – the portfolio was positioned short relative to the benchmark during the quarter. **Result:** Value Added as the front end of the curve rose during the quarter.

**Credit Positioning** – the portfolio was underweight Treasuries and sovereign plus issues, overweight corporates, agencies and taxable municipals. The portfolio also held out-of-benchmark positions in mortgages, asset-backed securities and a small TIPS position.

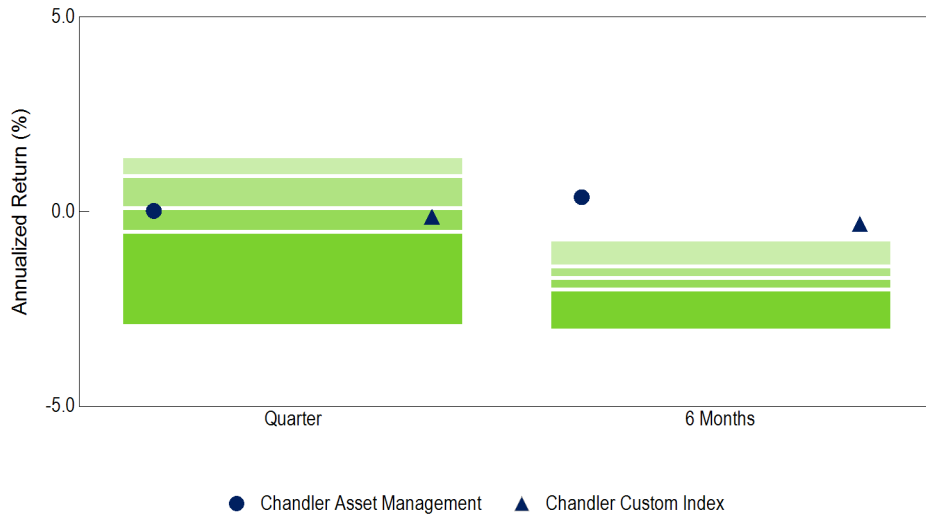
**Result:** Positive as the overweight to corporate credit and individual security selection in the sector was positive. The portfolio's underweight position in sovereign issues marginally detracted from returns.

**Other Positioning** – the portfolio's spread duration was lowered in July in anticipation of higher than expected issuance volume and a significant rally in July. As market technicals changed in September, the portfolio began selectively investing in newly-issued banks and energy issues.

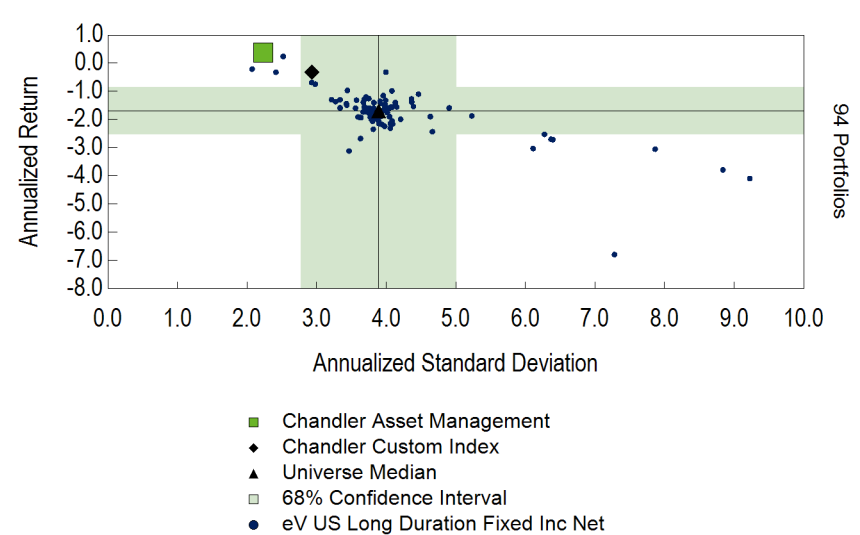


# CHANDLER ASSET MANAGEMENT

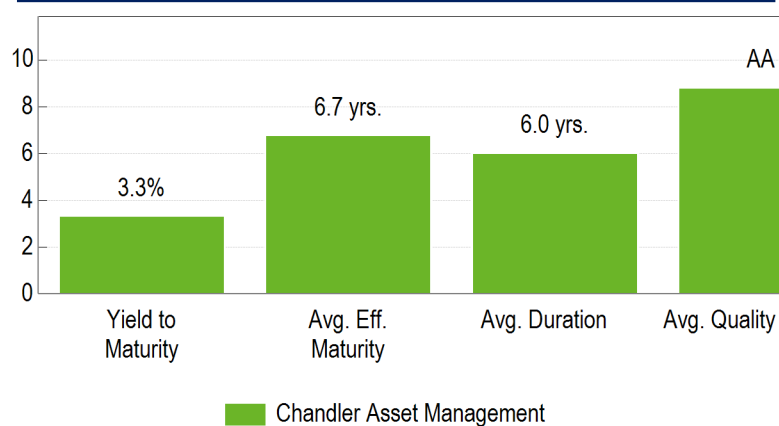
**eV US Long Duration Fixed Inc Net Return Comparison**



**6 Month Risk Return**



**Characteristics**



**Qualitative Attribution**

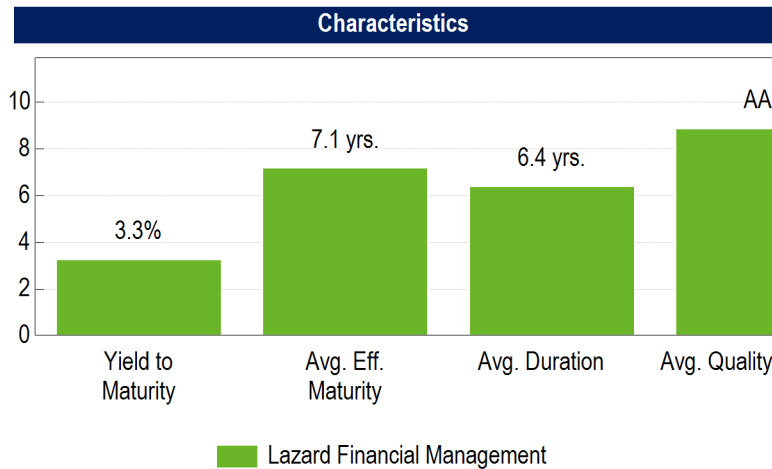
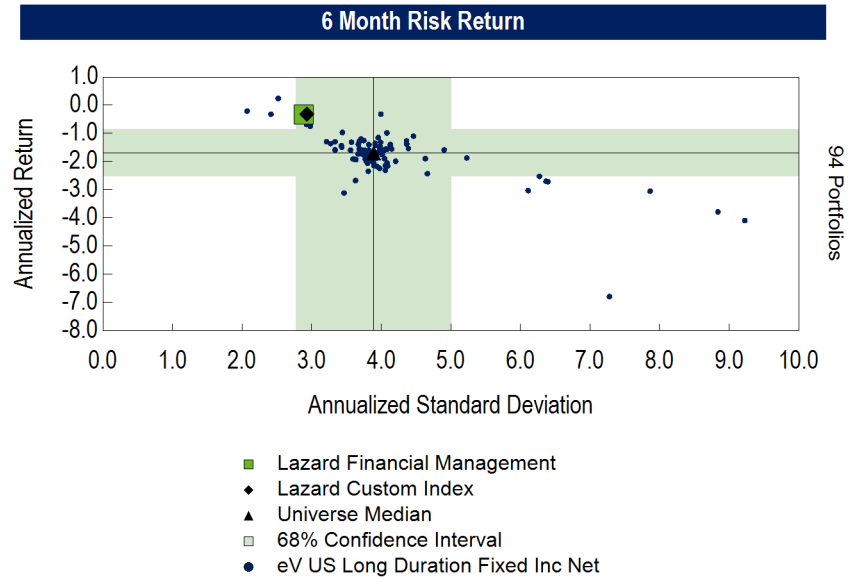
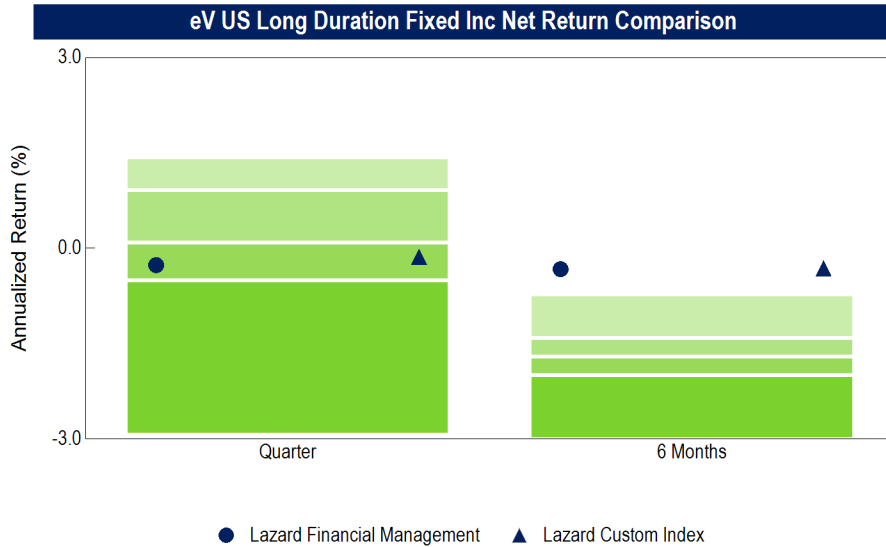
**Duration Positioning** – the portfolio’s duration position remained stable during the quarter, after having been significantly extended during the prior quarter. The portfolio’s duration remained short of the benchmark. **Result:** modestly positive as the back end of the yield curve rose during the quarter.

**Credit Positioning** – the portfolio remains slightly below its internal targets for corporate securities. Tightening spreads during the quarter led to the decision to maintain the existing exposure and not add higher priced names to the portfolio. The portfolio did see an increase in agency-backed mortgages during the quarter. **Result:** the credit positions within the portfolio added value, including the continued holding securities with maturities of less than five years.

**Other Positioning** – the portfolio continues to hold securities with maturities of below five years. The team believes that these securities will become a source of funds as the portfolio becomes seasoned, and additional rebalancing is required.



# LAZARD FINANCIAL MANAGEMENT



### Qualitative Attribution

**Duration Positioning** – the portfolio remained underweight the 5-year segment of the yield curve and overall neutral to short duration relative to the benchmark. **Result:** Value Added as the front end of the yield curve flattened, with the front end rising more than the back end of the curve.

**Credit Positioning** – the portfolio was defensively positioned with an underweight to credit, specifically BBB rated securities and Non-US Yankees. **Result:** Value Detracted as corporate spreads tightened led by lower quality bonds.

**Other Positioning** – the portfolio has a position in 1.5 to 2.0-year AAA rated asset-backed securities, an out of index position. **Result:** Value Added as high quality, short duration asset backed securities outperformed treasuries during the quarter.



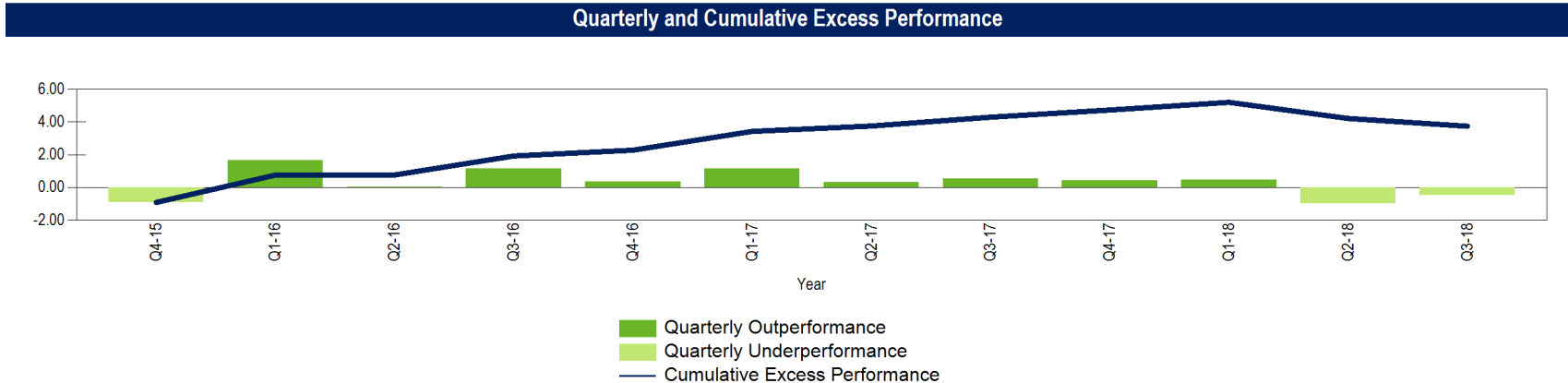
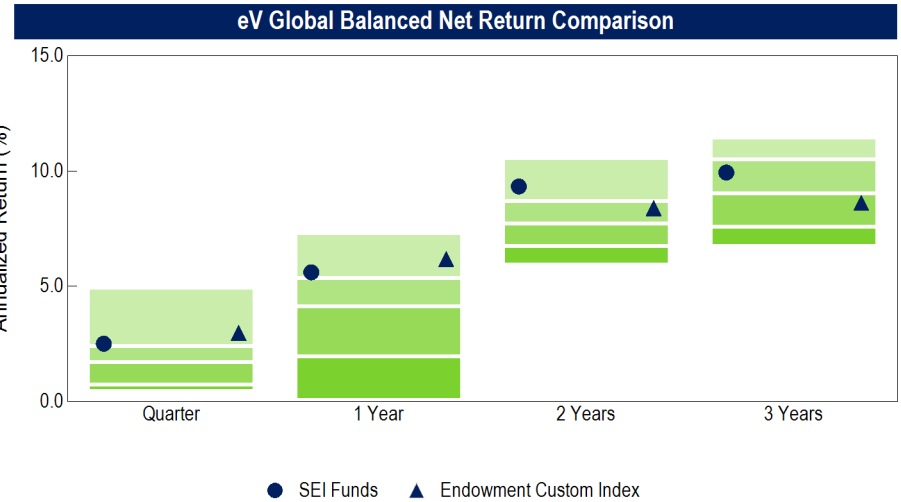
# ENDOWMENT MANAGER REVIEW

NEPC, LLC

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# SEI FUNDS

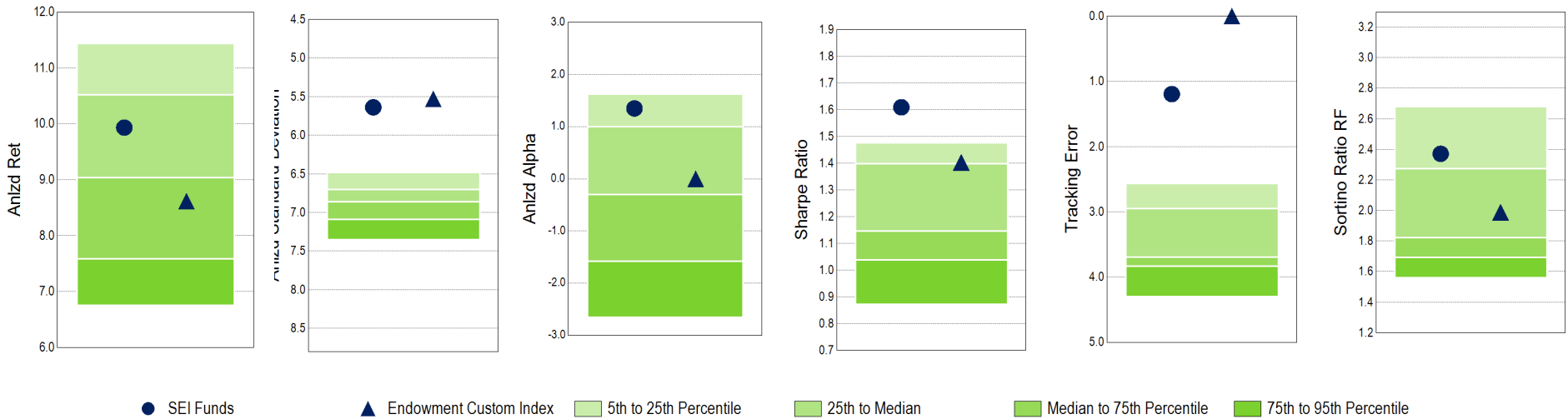
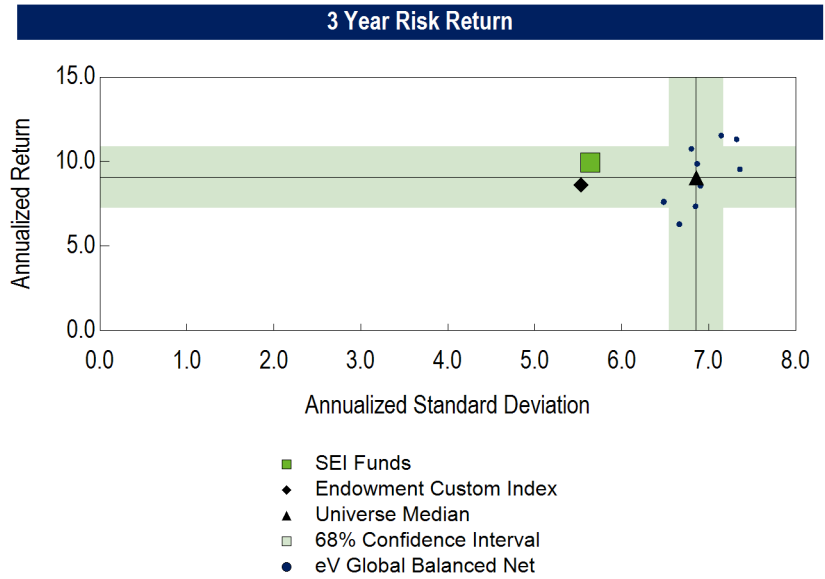
SEI Funds manages a multi-asset class portfolio subject to a 60% target equity allocation which will be held in a range of 45% to 75%, with international equities not to exceed 35% of the equity allocation. A combination of fixed income, alternative investments, and cash will account for the remaining 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.





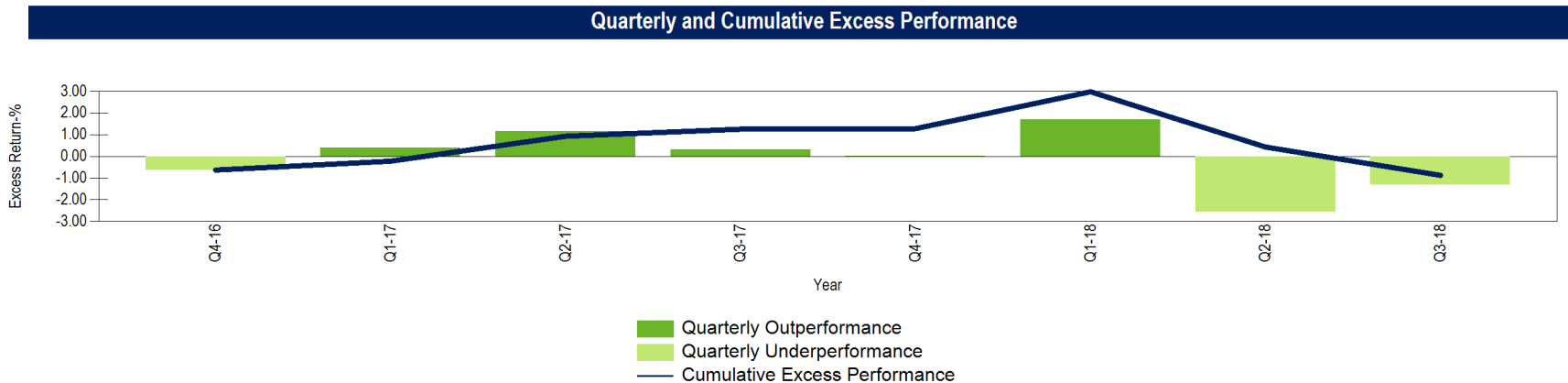
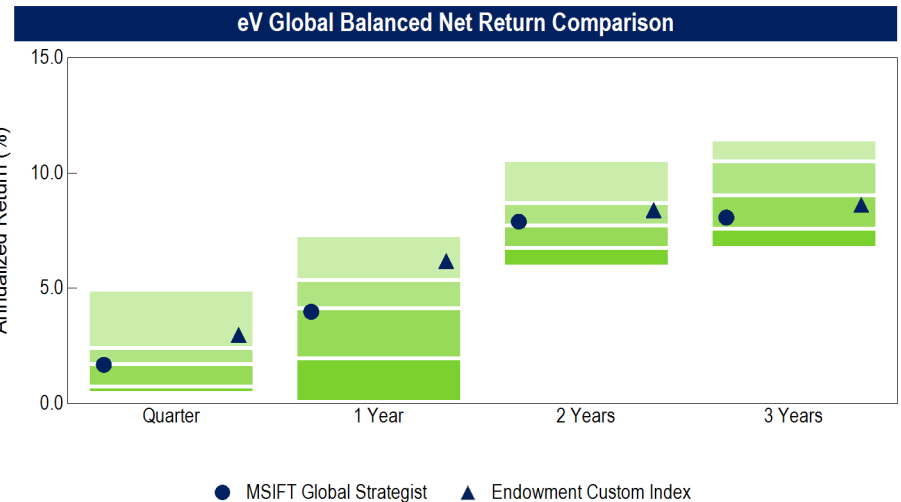
# Delaware Office of the State Treasurer

## SEI FUNDS

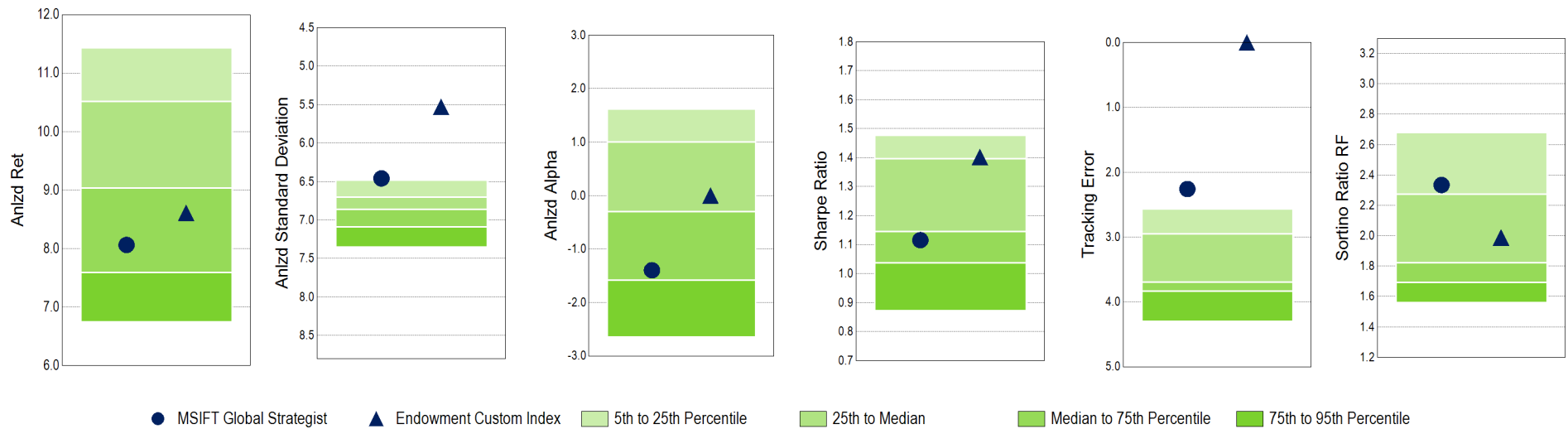
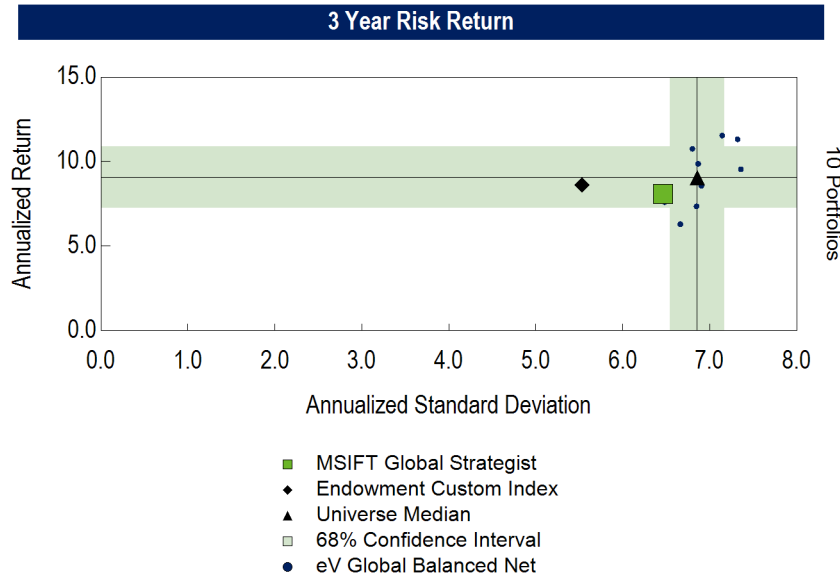


# MSIFT GLOBAL STRATEGIST

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.

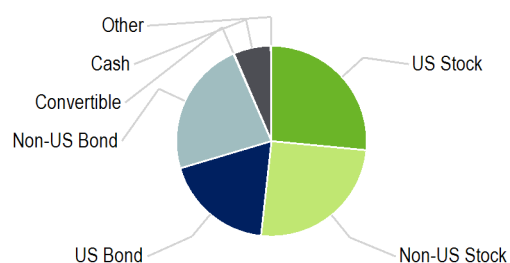


# MSIFT GLOBAL STRATEGIST



# MSIFT GLOBAL STRATEGIST

## Mutual Fund Allocation as of September 30, 2018



## Portfolio Fund Information as of September 30, 2018

|                             |                  |
|-----------------------------|------------------|
| Ticker                      | MPBAX            |
| Morningstar Category        | World Allocation |
| Average Market Cap (\$mm)   | 63,811.52        |
| Net Assets (\$mm)           | 63.03            |
| % Assets in Top 10 Holdings | 55.07            |
| Total Number of Holdings    | 1,466            |
| Manager Name                | Mark A. Bavoso   |
| Manager Tenure              | 8                |
| Expense Ratio               | 0.75%            |

## Fund Characteristics as of September 30, 2018

|                           |           |
|---------------------------|-----------|
| Sharpe Ratio (3 Year)     | 1.11      |
| Average Market Cap (\$mm) | 63,811.52 |
| Price/Earnings            | 15.03     |
| Price/Book                | 2.15      |
| Price/Sales               | 1.71      |
| Price/Cash Flow           | 5.63      |
| Dividend Yield            | 2.64      |
| Number of Equity Holdings | 1,165     |
| R-Squared (3 Year)        | 0.88      |
| Alpha (3 Year)            | -0.11%    |

## Top Holdings as of September 30, 2018

|  |        |
|--|--------|
| S+P500 EMINI FUT DEC18 XCME 20181221                   | 12.38% |
| MS INST. FUND TRUST GLBL STRATEGIST CAYMAN POR LTD     | 8.41%  |
| UNITED STATES TREASURY NOTES 0.5%                      | 6.09%  |
| 1264433 TRS USD P V 03MLIBOR II3546010180122 EQUITYTRS | 5.75%  |
| 1264433 TRS USD R E II3562940180122 EQUITYTRS          | 5.71%  |
| 1264567 TRS USD R E II1027310180206 EQUITYTRS          | 4.42%  |
| 1264567 TRS USD P V 03MLIBOR II1025160180206 EQUITYTRS | 4.26%  |

## Sector Allocation as of September 30, 2018

|                        |        |
|------------------------|--------|
| BASIC MATERIALS        | 4.53%  |
| COMMUNICATION SERVICES | 4.21%  |
| CONSUMER CYCLICAL      | 9.60%  |
| CONSUMER DEFENSIVE     | 9.14%  |
| ENERGY                 | 6.89%  |
| FINANCIAL SERVICES     | 25.10% |
| HEALTHCARE             | 11.48% |
| INDUSTRIALS            | 10.44% |
| REAL ESTATE            | 2.30%  |
| TECHNOLOGY             | 13.36% |
| UTILITIES              | 2.95%  |

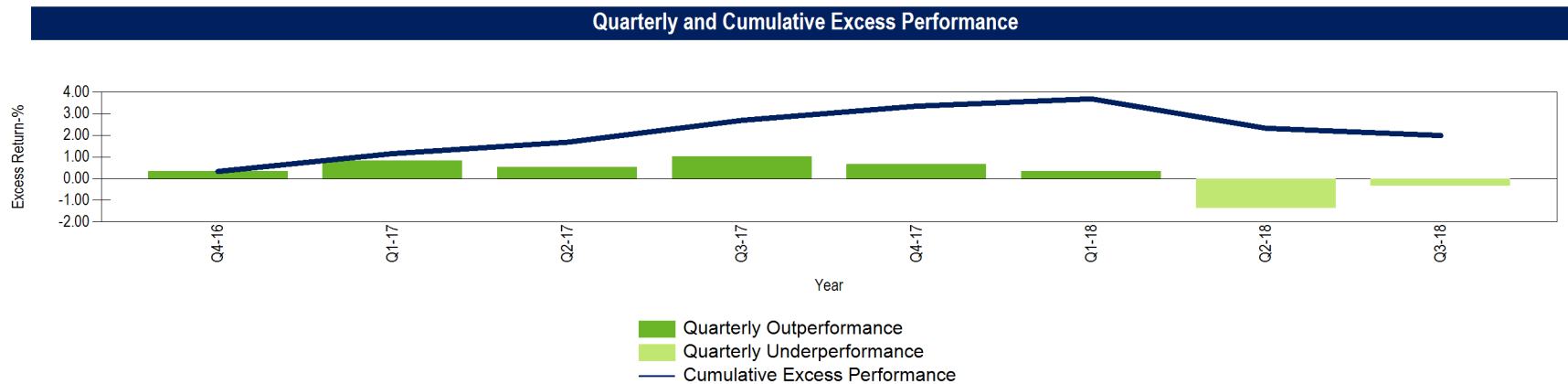
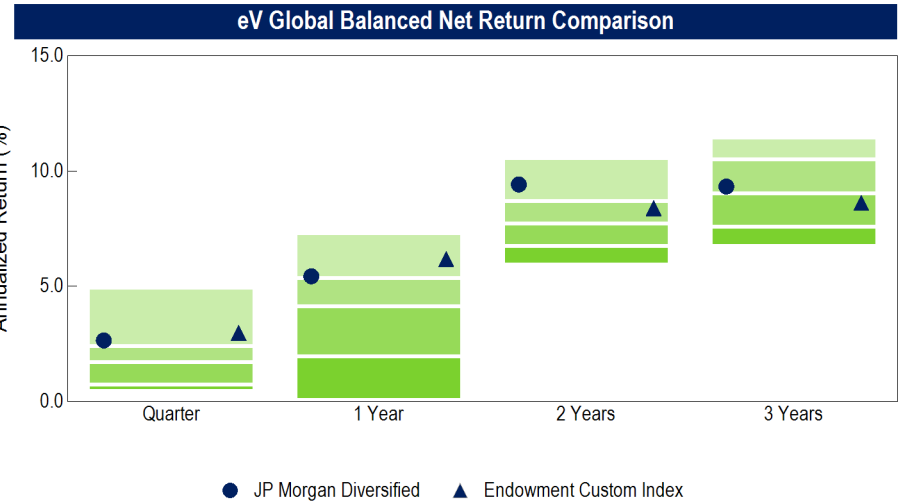
Characteristics have not been released for the fourth quarter.



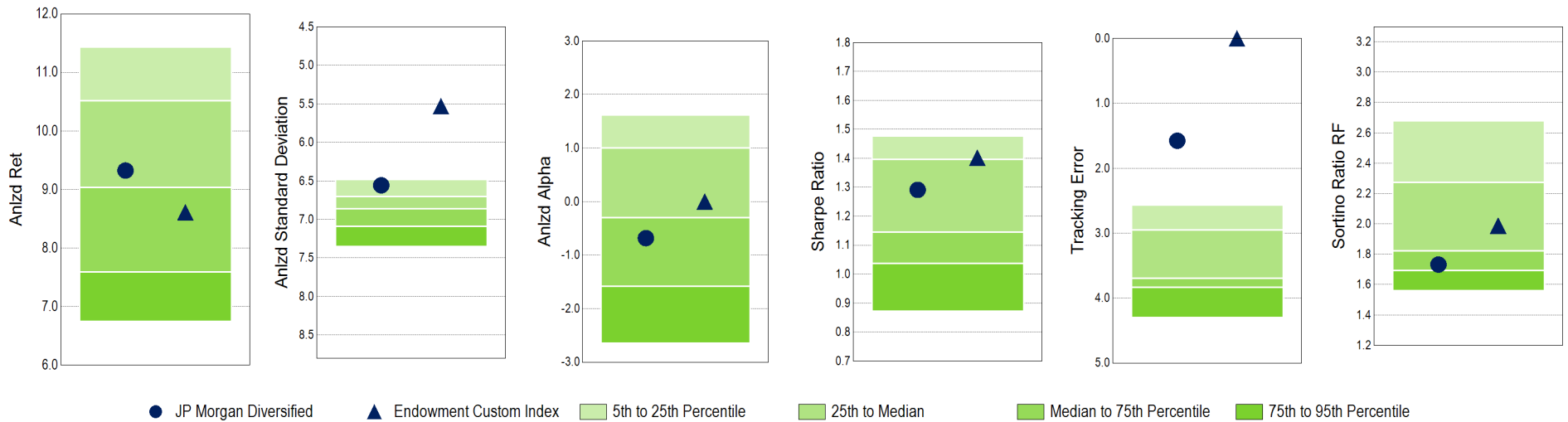
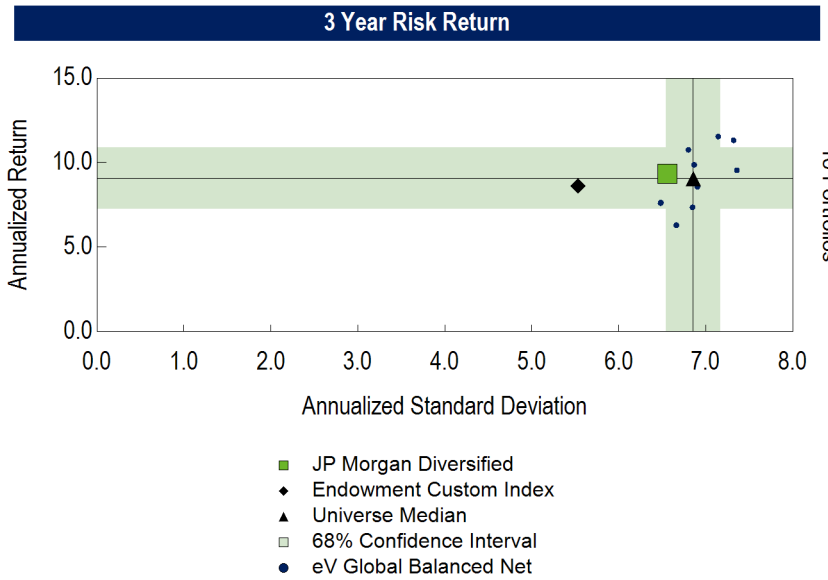
# Delaware Office of the State Treasurer

## JP MORGAN DIVERSIFIED

J.P Morgan manages a diversified multi-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.

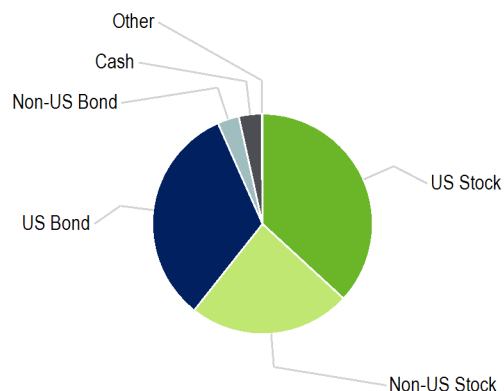


# JP MORGAN DIVERSIFIED



# JP MORGAN DIVERSIFIED

Mutual Fund Allocation as of September 30, 2018



Portfolio Fund Information as of September 30, 2018

|                             |                               |
|-----------------------------|-------------------------------|
| Ticker                      | JPDVX                         |
| Morningstar Category        | Allocation--50% to 70% Equity |
| Average Market Cap (\$mm)   | 46,542.50                     |
| Net Assets (\$mm)           | 286.23                        |
| % Assets in Top 10 Holdings | 22.15                         |
| Total Number of Holdings    | 2,717                         |
| Manager Name                | Michael Schoenhaut            |
| Manager Tenure              | 9                             |
| Expense Ratio               | 0.79%                         |

Fund Characteristics as of September 30, 2018

|                           |           |
|---------------------------|-----------|
| Sharpe Ratio (3 Year)     | 1.29      |
| Average Market Cap (\$mm) | 46,542.50 |
| Price/Earnings            | 16.00     |
| Price/Book                | 2.32      |
| Price/Sales               | 1.77      |
| Price/Cash Flow           | 8.01      |
| Dividend Yield            | 2.24      |
| Number of Equity Holdings | 1,074     |
| R-Squared (3 Year)        | 0.96      |
| Alpha (3 Year)            | -0.05%    |

Top Holdings as of September 30, 2018

|  |       |
|--|-------|
| JPMORGAN CORE PLUS BOND R6             | 7.01% |
| JPMORGAN FLOATING RATE INCOME R6       | 3.53% |
| JPMORGAN EMERGING MARKETS EQUITY R6    | 3.42% |
| JPMORGAN MID CAP EQUITY R6             | 2.38% |
| APPLE INC                              | 1.12% |
| AMAZON.COM INC                         | 1.11% |
| JPMORGAN EMERGING MARKETS STRAT DBT R6 | 1.03% |
| MICROSOFT CORP                         | 1.03% |
| UNITED STATES TREASURY NOTES 1.12%     | 0.90% |
| UNITEDHEALTH GROUP INC                 | 0.64% |

Sector Allocation as of September 30, 2018

|                        |        |
|------------------------|--------|
| BASIC MATERIALS        | 4.42%  |
| COMMUNICATION SERVICES | 2.17%  |
| CONSUMER CYCLICAL      | 13.33% |
| CONSUMER DEFENSIVE     | 6.55%  |
| ENERGY                 | 5.62%  |
| FINANCIAL SERVICES     | 19.05% |
| HEALTHCARE             | 10.54% |
| INDUSTRIALS            | 11.54% |
| REAL ESTATE            | 6.36%  |
| TECHNOLOGY             | 18.20% |
| UTILITIES              | 2.22%  |

Characteristics have not been released for the second quarter.



# APPENDIX

NEPC, LLC

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# 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.
- This report is provided as a management aid for the client's internal use only. Information contained in this report does not constitute a recommendation by NEPC.
- This report may contain confidential or proprietary information and may not be copied or redistributed to any party not legally entitled to receive it.

### **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.

