

# THIRD FISCAL QUARTER 2019 EXECUTIVE SUMMARY

## VERMONT STATE EMPLOYEES RETIREMENT SYSTEM

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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   |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 1.2%  | -11.7   | -27 bps   | 13.6%   | 10.0%   | 9.9%   | 2.9%  | 7.3%  | 7.0%  | 33.3%   | 0.8%  | 16.7%   |

**Global equities rallied during the quarter as sentiment improved from easing US-China trade tensions and a dovish pivot by the Fed**

**The spread between the 10-year Treasury Note and 3-month Treasury Bill temporarily inverted after the Fed held interest rates constant and announced adjustments to their balance sheet normalization process**

**Spot crude oil prices rose significantly due to geopolitical concerns in major oil-producing regions**

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).



# MACRO PERFORMANCE OVERVIEW

## Q1 Macro Market Summary

**The global growth outlook was revised downward – reflecting slowing growth in most major developed economies**

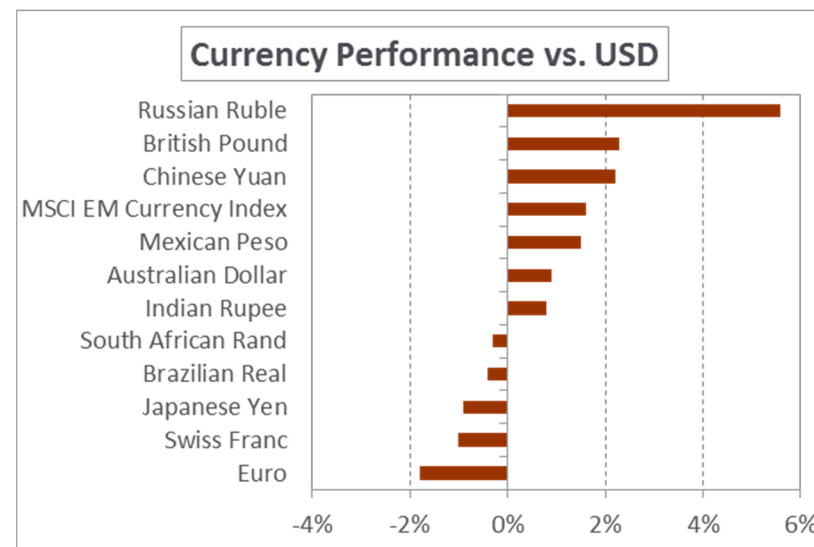
**The Fed pivoted toward a more dovish policy stance signaling no additional rate hikes this year**

**Global bond yields declined with the 10-year German and Japanese yields ending in negative territory**

|               | Yield 12/31/18 | Yield 3/31/19 | Δ      |
|---------------|----------------|---------------|--------|
| US 10-Yr      | 2.68%          | 2.42%         | -0.27% |
| US 30-Yr      | 3.01%          | 2.82%         | -0.19% |
| US Real 10-Yr | 0.97%          | 0.53%         | -0.44% |
| German 10-Yr  | 0.24%          | -0.07%        | -0.31% |
| Japan 10-Yr   | -0.01%         | -0.09%        | -0.09% |
| China 10-Yr   | 3.31%          | 3.07%         | -0.24% |
| EM Local Debt | 6.46%          | 6.16%         | -0.30% |

Source: Bloomberg

| Central Banks         | Current Rate  | CPI YOY | Notes from the Quarter  |
|-----------------------|---------------|---------|---|
| Federal Reserve       | 2.25% - 2.50% | 2.2%    | The Fed held its benchmark interest rate at 2.25% - 2.50% in March and signaled no additional rate hikes are likely in 2019 |
| European Central Bank | 0.0%          | 1.4%    | The ECB maintained its current benchmark interest rate and announced plans to boost commercial lending                      |
| Bank of Japan         | -0.1%         | 0.8%    | The BoJ will continue its ultra-easy QE program with inflation remaining well below target                                  |



Source: Bloomberg



# EQUITY PERFORMANCE OVERVIEW

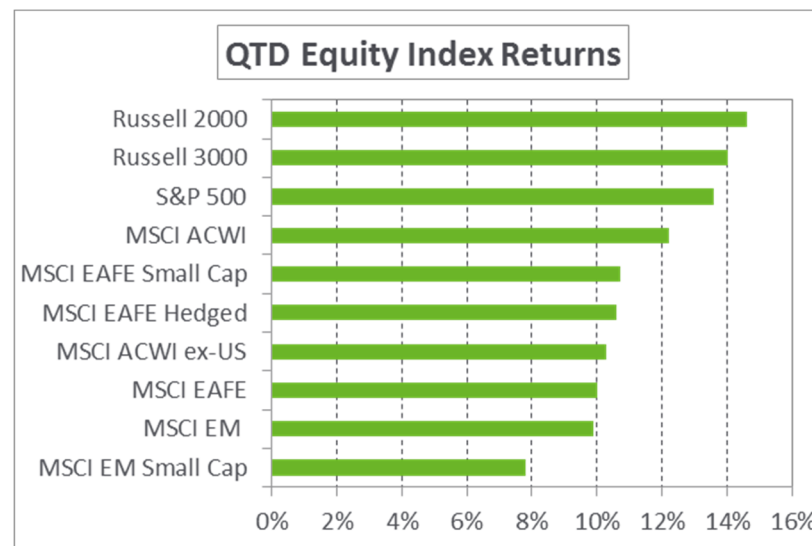
## Q1 Equity Market Summary

**Global equities made a strong comeback this quarter following a dovish pivot from the Fed**

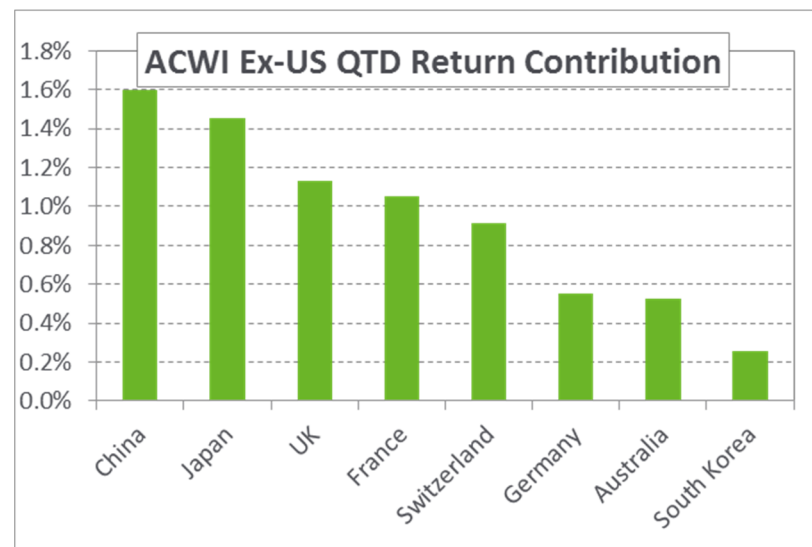
**US and Chinese equities led the way as hopes for a trade deal provided a tailwind for local equity markets**

| Russell 3000 QTD Sector Return Contribution |      |
|---|------|
| Information Technology                      | 3.6% |
| Consumer Discretionary                      | 2.6% |
| Financials                                  | 1.6% |
| Industrials                                 | 0.8% |
| Consumer Staples                            | 1.1% |
| Energy                                      | 0.7% |
| Materials                                   | 0.4% |
| Health Care                                 | 1.3% |
| Real Estate                                 | 0.6% |
| Communication Services                      | 1.9% |
| Utilities                                   | 0.3% |

Source: Russell, Bloomberg



Source: MSCI, Russell, S&P, Bloomberg



Source: MSCI, Bloomberg. QTD top country contributors to index return



# CREDIT PERFORMANCE OVERVIEW

## Q1 Credit Market Summary

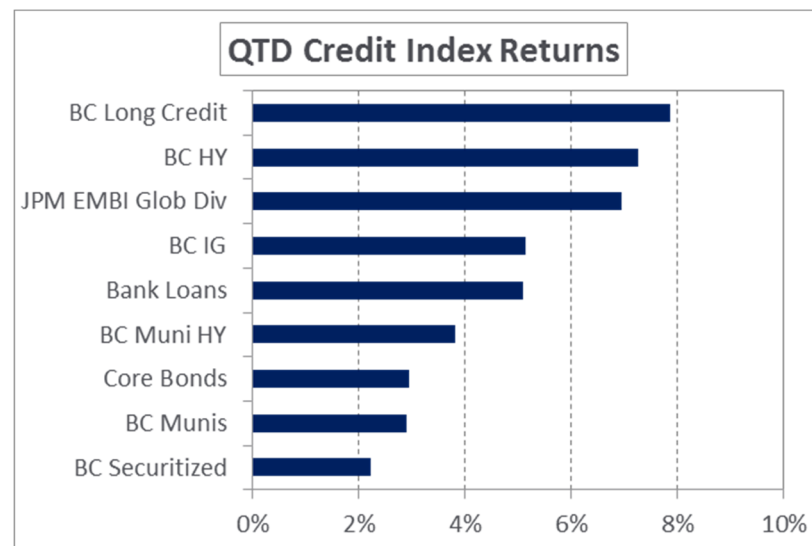
**Global yields declined significantly – reflecting concerns over the global growth outlook**

**Credit spreads broadly declined off of highs at the end of 2018**

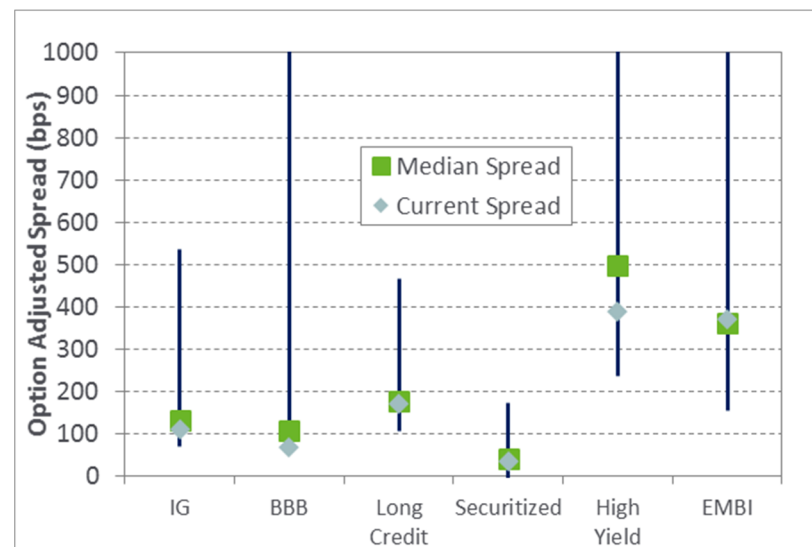
US high yield spreads experienced one of the largest movements – falling 135 basis points, supporting a return of 7.3%

| Credit Spread (Basis Points) | 12/31/18 | 3/31/19 | \Delta |
|------------------------------|----------|---------|--------|
| BC IG Credit                 | 153      | 119     | -34    |
| BC Long Credit               | 200      | 172     | -28    |
| BC Securitized               | 35       | 35      | 0      |
| BC High Yield                | 526      | 391     | -135   |
| Muni HY                      | 236      | 230     | -6     |
| JPM EMBI                     | 435      | 373     | -62    |
| Bank Loans - Libor           | 414      | 354     | -60    |

Source: Barclays, Merrill Lynch, JPM, Bloomberg, NEPC



Source: Barclays, JPM, S&P, Bloomberg



Source: Barclays, JPM, S&P, Bloomberg; Calculated since 01/31/2000



# REAL ASSETS PERFORMANCE OVERVIEW

## Q1 Real Assets Market Summary

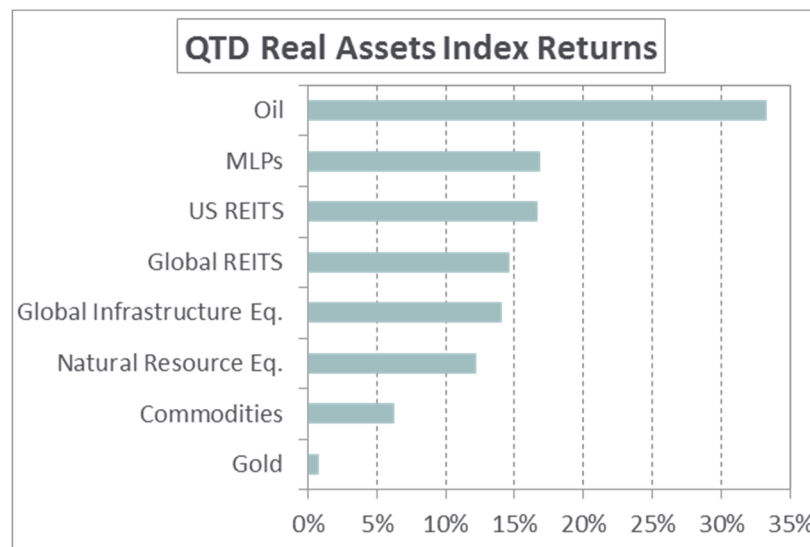
**WTI crude oil increased 33.3% as a result of OPEC production cuts and concerns surrounding Venezuela**

**Midstream energy increased 22.2% following strong earnings and a tailwind from higher oil prices**

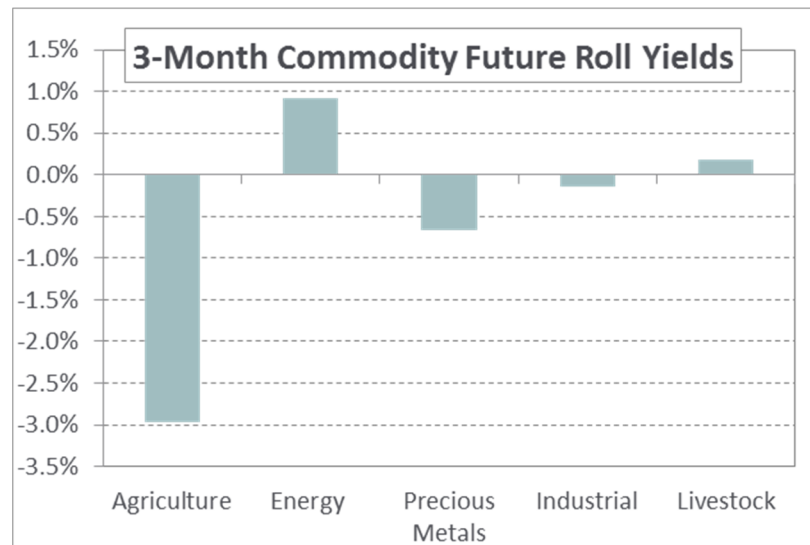
**US REITs increased 16.3% during the quarter with the Fed signaling a pause to monetary policy**

| Real Asset Yields              | 12/31/18 | 3/31/19 |
|--------------------------------|----------|---------|
| MLPs                           | 8.9%     | 8.0%    |
| Core Real Estate               | 4.5%     | 4.5%    |
| US REITs                       | 4.6%     | 4.1%    |
| Global REITs                   | 3.9%     | 3.4%    |
| Global Infrastructure Equities | 4.6%     | 4.4%    |
| Natural Resource Equities      | 4.5%     | 4.2%    |
| US 10-Yr Breakeven Inflation   | 1.7%     | 1.9%    |
| Commodity Index Roll Yield     | -2.7%    | -2.7%   |

Source: NCREIF, Alerian, NAREIT, S&P, Bloomberg



Source: S&P, NAREIT, Alerian, Bloomberg



Source: Bloomberg, NEPC Calculated as of 09/28/2018



# CALENDAR YEAR INDEX PERFORMANCE

|                              | 2009   | 2010  | 2011   | 2012  | 2013   | 2014   | 2015   | 2016  | 2017  | 2018   | Jan   | Feb   | Mar   | Q1    | YTD   |
|------------------------------|--------|-------|--------|-------|--------|--------|--------|-------|-------|--------|-------|-------|-------|-------|-------|
| <b>S&amp;P 500</b>           | 26.5%  | 15.1% | 2.1%   | 16.0% | 32.4%  | 13.7%  | 1.4%   | 12.0% | 21.8% | -4.4%  | 8.0%  | 3.2%  | 1.9%  | 13.6% | 13.6% |
| <b>Russell 1000</b>          | 28.4%  | 16.1% | 1.5%   | 16.4% | 33.1%  | 13.2%  | 0.9%   | 12.1% | 21.7% | -4.8%  | 8.4%  | 3.4%  | 1.7%  | 14.0% | 14.0% |
| <b>Russell 2000</b>          | 27.2%  | 26.9% | -4.2%  | 16.3% | 38.8%  | 4.9%   | -4.4%  | 21.3% | 14.6% | -11.0% | 11.2% | 5.2%  | -2.1% | 14.6% | 14.6% |
| <b>Russell 2500</b>          | 34.4%  | 26.7% | -2.5%  | 17.9% | 36.8%  | 7.1%   | -2.9%  | 17.6% | 16.8% | -10.0% | 11.5% | 4.7%  | -0.8% | 15.8% | 15.8% |
| <b>MSCI EAFE</b>             | 31.8%  | 7.8%  | -12.1% | 17.3% | 22.8%  | -4.9%  | -0.8%  | 1.0%  | 25.0% | -13.8% | 6.6%  | 2.5%  | 0.6%  | 10.0% | 10.0% |
| <b>MSCI EM</b>               | 78.5%  | 18.9% | -18.4% | 18.2% | -2.6%  | -2.2%  | -14.9% | 11.2% | 37.3% | -14.6% | 8.8%  | 0.2%  | 0.8%  | 9.9%  | 9.9%  |
| <b>MSCI ACWI</b>             | 34.6%  | 12.7% | -7.3%  | 16.1% | 22.8%  | 4.2%   | -2.4%  | 7.9%  | 24.0% | -9.4%  | 7.9%  | 2.7%  | 1.3%  | 12.2% | 12.2% |
| <b>Private Equity*</b>       | 13.7%  | 19.7% | 7.9%   | 12.5% | 20.6%  | 12.7%  | 9.6%   | 8.3%  | 13.7% | -      | -     | -     | -     | -     | -     |
| <b>BC TIPS</b>               | 11.4%  | 6.3%  | 13.6%  | 7.0%  | -8.6%  | 3.6%   | -1.4%  | 4.7%  | 3.0%  | -1.3%  | 1.3%  | 0.0%  | 1.8%  | 3.2%  | 3.2%  |
| <b>BC Municipal Bond</b>     | 12.9%  | 2.4%  | 10.7%  | 6.8%  | -2.6%  | 9.1%   | 3.3%   | 0.2%  | 5.4%  | 1.3%   | 0.8%  | 0.5%  | 1.6%  | 2.9%  | 2.9%  |
| <b>BC Muni High Yield</b>    | 32.7%  | 7.8%  | 9.2%   | 18.1% | -5.5%  | 13.8%  | 1.8%   | 3.0%  | 9.7%  | 4.8%   | 0.7%  | 0.5%  | 2.6%  | 3.8%  | 3.8%  |
| <b>BC US Corp High Yield</b> | 58.2%  | 15.1% | 5.0%   | 15.8% | 7.4%   | 2.5%   | -4.5%  | 17.1% | 7.5%  | -2.1%  | 4.5%  | 1.7%  | 0.9%  | 7.3%  | 7.3%  |
| <b>BC US Aggregate</b>       | 5.9%   | 6.5%  | 7.8%   | 4.2%  | -2.0%  | 6.0%   | 0.5%   | 2.6%  | 3.5%  | 0.0%   | 1.1%  | -0.1% | 1.9%  | 2.9%  | 2.9%  |
| <b>BC Global Aggregate</b>   | 2.6%   | 5.2%  | 6.4%   | 1.6%  | -4.0%  | -0.5%  | -3.6%  | 1.6%  | 7.5%  | -1.2%  | 1.5%  | -0.6% | 1.3%  | 2.2%  | 2.2%  |
| <b>BC Long Treasuries</b>    | -12.9% | 9.4%  | 29.9%  | 3.6%  | -12.7% | 25.1%  | -1.2%  | 1.3%  | 8.5%  | -1.8%  | 0.7%  | -1.2% | 5.3%  | 4.7%  | 4.7%  |
| <b>BC US Long Credit</b>     | 16.8%  | 10.7% | 17.1%  | 12.7% | -6.6%  | 16.4%  | -4.6%  | 10.2% | 12.2% | -6.8%  | 3.5%  | -0.1% | 4.3%  | 7.9%  | 7.9%  |
| <b>BC US STRIPS 20+ Yr</b>   | -36.0% | 10.9% | 58.5%  | 3.0%  | -21.0% | 46.4%  | -3.7%  | 1.4%  | 13.7% | -4.1%  | 0.6%  | -1.9% | 7.7%  | 6.3%  | 6.3%  |
| <b>JPM GBI-EM Glob Div</b>   | 22.0%  | 15.7% | -1.8%  | 16.8% | -9.0%  | -5.7%  | -14.9% | 9.9%  | 15.2% | -6.2%  | 5.5%  | -1.1% | -1.3% | 2.9%  | 2.9%  |
| <b>JPM EMBI Glob Div</b>     | 29.8%  | 12.2% | 7.3%   | 17.4% | -5.3%  | 7.4%   | 1.2%   | 10.2% | 10.1% | -4.3%  | 4.4%  | 1.0%  | 1.4%  | 7.0%  | 7.0%  |
| <b>CS Leveraged Loan</b>     | 44.9%  | 10.0% | 1.8%   | 9.4%  | 6.2%   | 2.1%   | -0.4%  | 9.9%  | 4.2%  | 1.1%   | 2.3%  | 1.6%  | -0.1% | 3.8%  | 3.8%  |
| <b>CS Hedge Fund</b>         | 18.6%  | 10.9% | -2.5%  | 7.7%  | 9.7%   | 4.1%   | -0.7%  | 1.2%  | 7.1%  | -3.2%  | 1.8%  | 1.1%  | -     | -     | 2.9%  |
| <b>BBG Commodity</b>         | 18.9%  | 16.8% | -13.3% | -1.1% | -9.5%  | -17.0% | -24.7% | 11.8% | 1.7%  | -11.2% | 5.4%  | 1.0%  | -0.2% | 6.3%  | 6.3%  |
| <b>Alerian MLP</b>           | 76.4%  | 35.9% | 13.9%  | 4.8%  | 27.6%  | 4.8%   | -32.6% | 18.3% | -6.5% | -12.4% | 12.6% | 0.3%  | 3.4%  | 16.8% | 16.8% |
| <b>FTSE NAREIT Eqy REITs</b> | 28.0%  | 28.0% | 8.3%   | 18.1% | 2.5%   | 30.1%  | 3.2%   | 8.5%  | 5.2%  | -4.6%  | 11.7% | 0.7%  | 3.3%  | 16.3% | 16.3% |

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

\*Private Equity return represents calendar year pooled IRR and is subject to a one quarter lag





# RETURNS FOR KEY INDICES RANKED IN ORDER OF PERFORMANCE

| 2006                           | 2007                           | 2008                            | 2009                           | 2010                           | 2011                            | 2012                           | 2013                           | 2014                           | 2015                            | 2016                           | 2017                           | 2018                            |
|--------------------------------|--------------------------------|---------------------------------|--------------------------------|--------------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|--------------------------------|--------------------------------|---------------------------------|
| 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 | BC AGGREGATE<br>0.01            |
| 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 GROWTH<br>26.85   | RUSSELL 1000 GROWTH<br>2.64     | RUSSELL 2000 VALUE<br>18.05    | RUSSELL 2000 GROWTH<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 GROWTH<br>-1.51    |
| 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             | S&P 500<br>-4.38                |
| 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 1000<br>-4.78           |
| 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               | RUSSELL 1000 VALUE<br>-8.27     |
| 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 2000 GROWTH<br>-9.31    |
| 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<br>-11.01          |
| 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 2000 VALUE<br>-12.86    |
| 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     | MSCI EAFE<br>-13.79             |
| 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           | MSCI EMERGING MARKETS<br>-14.58 |

| QTD                           | 1 Year                         | 3 year                         | 5 Year                        | 10 Year                       |
|-------------------------------|--------------------------------|--------------------------------|-------------------------------|-------------------------------|
| RUSSELL 2000 GROWTH<br>17.14  | RUSSELL 1000 GROWTH<br>12.75   | RUSSELL 1000 GROWTH<br>16.53   | RUSSELL 1000 GROWTH<br>13.50  | RUSSELL 1000 GROWTH<br>17.52  |
| RUSSELL 1000 GROWTH<br>16.10  | S&P 500<br>9.50                | RUSSELL 2000 GROWTH<br>14.87   | S&P 500<br>10.91              | RUSSELL 2000 GROWTH<br>16.52  |
| RUSSELL 2000<br>14.58         | RUSSELL 1000<br>9.30           | RUSSELL 1000<br>13.52          | RUSSELL 1000<br>10.63         | RUSSELL 1000<br>16.05         |
| RUSSELL 1000<br>14.0          | RUSSELL 1000 VALUE<br>5.67     | S&P 500<br>13.51               | RUSSELL 2000 GROWTH<br>8.41   | S&P 500<br>15.92              |
| S&P 500<br>13.65              | BC AGGREGATE<br>4.48           | RUSSELL 2000<br>12.92          | RUSSELL 1000 VALUE<br>7.72    | RUSSELL 2000<br>15.36         |
| RUSSELL 1000 VALUE<br>11.93   | RUSSELL 2000 GROWTH<br>3.85    | RUSSELL 2000 VALUE<br>10.86    | RUSSELL 2000<br>7.05          | RUSSELL 1000 VALUE<br>14.52   |
| RUSSELL 2000 VALUE<br>11.93   | RUSSELL 2000<br>2.05           | MSCI EMERGING MARKETS<br>10.68 | RUSSELL 2000 VALUE<br>5.59    | RUSSELL 2000 VALUE<br>14.12   |
| MSCI EAFE<br>9.98             | RUSSELL 2000 VALUE<br>0.17     | RUSSELL 1000 VALUE<br>10.45    | MSCI EMERGING MARKETS<br>3.68 | MSCI EAFE<br>8.96             |
| MSCI EMERGING MARKETS<br>9.93 | MSCI EAFE<br>-3.71             | MSCI EAFE<br>7.27              | BC AGGREGATE<br>2.74          | MSCI EMERGING MARKETS<br>8.94 |
| BC AGGREGATE<br>2.94          | MSCI EMERGING MARKETS<br>-7.41 | BC AGGREGATE<br>2.03           | MSCI EAFE<br>2.33             | BC AGGREGATE<br>3.77          |



# TOTAL FUND PERFORMANCE

NEPC, LLC

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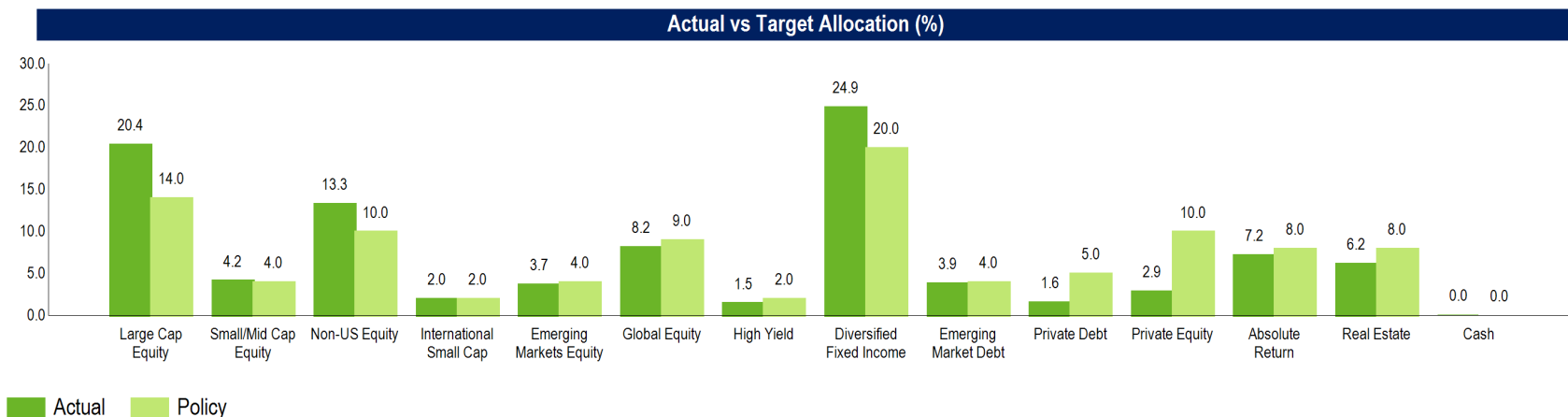
## Vermont State Teachers

# TOTAL FUND PERFORMANCE SUMMARY - NET

|   | Market Value           | 3 Mo        | Rank      | Fiscal YTD  | Rank      | 1 Yr        | Rank      | 3 Yrs       | Rank      | 5 Yrs       | Rank      | 7 Yrs       | Rank      | 10 Yrs      | Rank      |
|---|------------------------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|
| <b>Total Teachers Composite</b>               | <b>\$1,872,335,332</b> | <b>7.7%</b> | <b>78</b> | <b>3.1%</b> | <b>41</b> | <b>3.6%</b> | <b>67</b> | <b>8.2%</b> | <b>50</b> | <b>5.2%</b> | <b>81</b> | <b>6.1%</b> | <b>92</b> | <b>9.8%</b> | <b>38</b> |
| Allocation Index                              |                        | 7.8%        | 76        | 2.8%        | 57        | 3.3%        | 75        | 7.5%        | 80        | 4.8%        | 91        | 5.7%        | 96        | 8.7%        | 80        |
| Policy Index                                  |                        | 7.4%        | 85        | 3.4%        | 31        | 3.9%        | 57        | 7.6%        | 78        | 5.0%        | 86        | 5.9%        | 94        | 8.5%        | 84        |
| InvMetrics Public DB < \$5 Billion Net Median |                        | 8.8%        |           | 2.9%        |           | 4.2%        |           | 8.2%        |           | 5.9%        |           | 7.2%        |           | 9.6%        |           |

| 3 Years Ending March 31, 2019 |           |      |               |      |              |      |               |      |    |
|-------------------------------|-----------|------|---------------|------|--------------|------|---------------|------|----|
|                               | Anlzd Ret | Rank | Anlzd Std Dev | Rank | Sharpe Ratio | Rank | Sortino Ratio | Rank |    |
| Total Teachers Composite      | 8.19%     | 50   | 5.62%         | 17   | 1.24         | 15   | 1.42          |      | 13 |
| Allocation Index              | 7.53%     | 80   | 5.74%         | 20   | 1.10         | 44   | 1.26          |      | 31 |
| Policy Index                  | 7.58%     | 78   | 5.09%         | 7    | 1.25         | 14   | 1.45          |      | 11 |

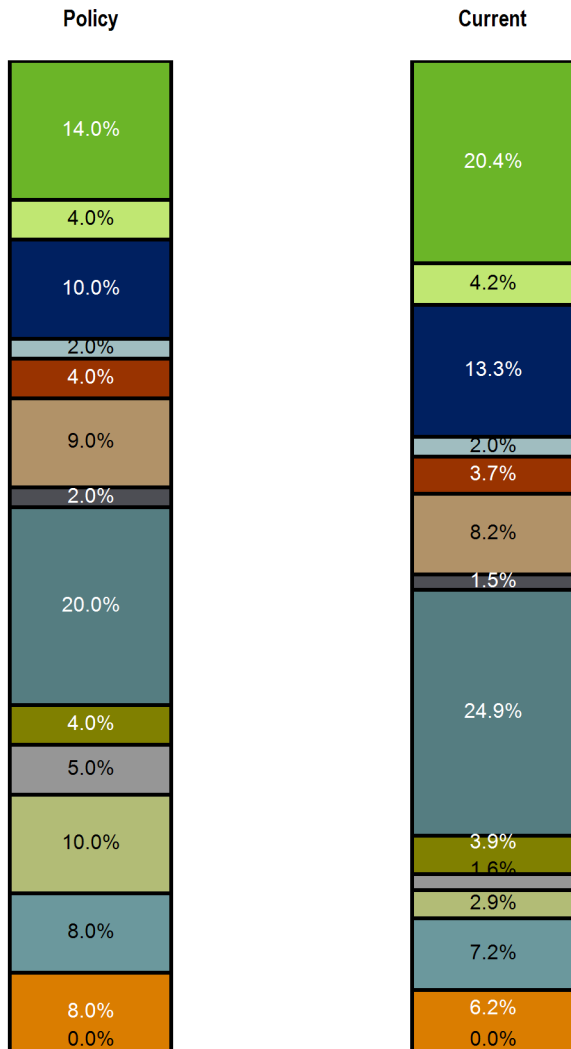
| 5 Years Ending March 31, 2019 |           |      |               |      |              |      |               |      |    |
|-------------------------------|-----------|------|---------------|------|--------------|------|---------------|------|----|
|                               | Anlzd Ret | Rank | Anlzd Std Dev | Rank | Sharpe Ratio | Rank | Sortino Ratio | Rank |    |
| Total Teachers Composite      | 5.23%     | 81   | 5.93%         | 16   | 0.75         | 51   | 1.23          |      | 23 |
| Allocation Index              | 4.83%     | 91   | 5.93%         | 16   | 0.69         | 74   | 1.10          |      | 50 |
| Policy Index                  | 5.02%     | 86   | 5.48%         | 6    | 0.78         | 44   | 1.28          |      | 17 |



Asset class weights may not add up to 100% due to rounding



# TOTAL FUND ASSET ALLOCATION VS. POLICY TARGETS



| Asset Allocation vs. Target |                        |               |               |             |
|-----------------------------|------------------------|---------------|---------------|-------------|
|                             | Current                | Policy        | Current       | Difference* |
| Large Cap Equity            | \$381,821,939          | 14.0%         | 20.4%         | 6.4%        |
| Small/Mid Cap Equity        | \$77,982,313           | 4.0%          | 4.2%          | 0.2%        |
| Non-US Equity               | \$249,654,934          | 10.0%         | 13.3%         | 3.3%        |
| International Small Cap     | \$38,045,716           | 2.0%          | 2.0%          | 0.0%        |
| Emerging Markets Equity     | \$69,768,522           | 4.0%          | 3.7%          | -0.3%       |
| Global Equity               | \$153,022,269          | 9.0%          | 8.2%          | -0.8%       |
| High Yield                  | \$27,859,316           | 2.0%          | 1.5%          | -0.5%       |
| Diversified Fixed Income    | \$465,395,358          | 20.0%         | 24.9%         | 4.9%        |
| Emerging Market Debt        | \$72,755,890           | 4.0%          | 3.9%          | -0.1%       |
| Private Debt                | \$29,496,829           | 5.0%          | 1.6%          | -3.4%       |
| Private Equity              | \$53,595,097           | 10.0%         | 2.9%          | -7.1%       |
| Absolute Return             | \$135,677,116          | 8.0%          | 7.2%          | -0.8%       |
| Real Estate                 | \$116,340,958          | 8.0%          | 6.2%          | -1.8%       |
| Cash                        | \$917,686              | 0.0%          | 0.0%          | 0.0%        |
| <b>Total</b>                | <b>\$1,872,335,332</b> | <b>100.0%</b> | <b>100.0%</b> |             |

\*Difference between Policy and Current Allocation

Absolute Return includes Grosvenor, Pinnacle Natural Resources, L.P., and Allianz Structured Alpha



## Vermont State Teachers

# TOTAL FUND PERFORMANCE DETAIL - NET

|   | Market Value (\$)    | % of Portfolio | Policy %     | 3 Mo (%)    | Rank      | Fiscal YTD (%) | Rank      | 1 Yr (%)    | Rank      | 3 Yrs (%)   | Rank      | 5 Yrs (%)   | Rank      | 10 Yrs (%)  | Rank      | Inception Date |
|---|----------------------|----------------|--------------|-------------|-----------|----------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|----------------|
| <b>Total Teachers Composite</b>               | <b>1,872,335,332</b> | <b>100.0</b>   | <b>100.0</b> | <b>7.7</b>  | <b>78</b> | <b>3.1</b>     | <b>41</b> | <b>3.6</b>  | <b>67</b> | <b>8.2</b>  | <b>50</b> | <b>5.2</b>  | <b>81</b> | <b>9.8</b>  | <b>38</b> | <b>Mar-92</b>  |
| Allocation Index                              |                      |                |              | 7.8         | 76        | 2.8            | 57        | 3.3         | 75        | 7.5         | 80        | 4.8         | 91        | 8.7         | 80        | Mar-92         |
| Policy Index                                  |                      |                |              | 7.4         | 85        | 3.4            | 31        | 3.9         | 57        | 7.6         | 78        | 5.0         | 86        | 8.5         | 84        | Mar-92         |
| InvMetrics Public DB < \$5 Billion Net Median |                      |                |              | 8.8         |           | 2.9            |           | 4.2         |           | 8.2         |           | 5.9         |           | 9.6         |           | Mar-92         |
| <b>Total Domestic Equity</b>                  | <b>459,805,642</b>   | <b>24.6</b>    | <b>18.0</b>  | <b>14.2</b> | <b>45</b> | <b>5.4</b>     | <b>27</b> | <b>9.5</b>  | <b>28</b> | <b>13.4</b> | <b>33</b> | <b>10.3</b> | <b>25</b> | <b>--</b>   | <b>--</b> | <b>Dec-10</b>  |
| Russell 3000                                  |                      |                |              | 14.0        | 47        | 4.7            | 31        | 8.8         | 32        | 13.5        | 31        | 10.4        | 25        | 16.0        | 39        | Dec-10         |
| eV All US Equity Net Median                   |                      |                |              | 13.8        |           | 1.7            |           | 5.3         |           | 11.6        |           | 8.3         |           | 15.4        |           | Dec-10         |
| <b>Total Large Cap Equities</b>               | <b>381,823,329</b>   | <b>20.4</b>    | <b>14.0</b>  | <b>13.9</b> | <b>39</b> | <b>5.5</b>     | <b>36</b> | <b>9.0</b>  | <b>38</b> | <b>13.2</b> | <b>35</b> | <b>10.5</b> | <b>32</b> | <b>17.0</b> | <b>13</b> | <b>Apr-01</b>  |
| S&P 500                                       |                      |                |              | 13.6        | 41        | 5.9            | 34        | 9.5         | 34        | 13.5        | 31        | 10.9        | 28        | 15.9        | 28        | Apr-01         |
| eV US Large Cap Equity Net Median             |                      |                |              | 13.0        |           | 4.1            |           | 7.0         |           | 11.9        |           | 9.3         |           | 14.9        |           | Apr-01         |
| SSgA S&P 500 Cap-Wgt                          | 304,796,851          | 16.3           | 10.0         | 13.6        | 41        | 5.8            | 34        | 9.4         | 34        | 13.5        | 31        | 10.9        | 28        | --          | --        | Sep-10         |
| SSgA S&P 500 Equal-Wgt                        | 77,025,088           | 4.1            | 4.0          | 14.9        | 29        | 4.2            | 49        | 7.2         | 49        | 12.1        | 49        | 9.5         | 46        | 17.7        | 7         | Dec-05         |
| S&P 500 Equal Weighted                        |                      |                |              | 14.9        | 29        | 4.3            | 48        | 7.2         | 49        | 12.0        | 49        | 9.5         | 46        | 17.8        | 7         | Dec-05         |
| <b>Total Small/Mid Cap Equities</b>           | <b>77,982,313</b>    | <b>4.2</b>     | <b>4.0</b>   | <b>16.0</b> | <b>42</b> | <b>4.8</b>     | <b>14</b> | <b>12.7</b> | <b>11</b> | <b>14.5</b> | <b>22</b> | <b>10.4</b> | <b>13</b> | <b>17.5</b> | <b>13</b> | <b>Apr-01</b>  |
| Russell 2500                                  |                      |                |              | 15.8        | 43        | -1.2           | 49        | 4.5         | 40        | 12.6        | 41        | 7.8         | 42        | 16.2        | 32        | Apr-01         |
| eV US Small-Mid Cap Equity Net Median         |                      |                |              | 15.0        |           | -1.6           |           | 2.6         |           | 11.4        |           | 7.1         |           | 15.5        |           | Apr-01         |
| Champlain                                     | 77,982,313           | 4.2            | 4.0          | 16.0        | 42        | 4.8            | 14        | 12.7        | 11        | 16.7        | 16        | 12.1        | 5         | --          | --        | Oct-09         |
| Custom SMID Cap Equity Index                  |                      |                |              | 15.2        | 48        | -3.2           | 63        | 3.3         | 46        | 12.9        | 36        | 7.7         | 43        | 16.2        | 33        | Oct-09         |

Custom SMID Cap Equity Index is 50% Russell 2500 and 50% Russell 2000 starting 10/1/2017, and 100% Russell 2500 prior, corresponding to the change in strategy

Long term policy consists of: 14% S&P 500 / 4% Russell 2500 / 10% MSCI EAFE / 4% MSCI Emerging Markets / 9% MSCI ACWI / 2% BBgBarc US High Yield TR / 2% MSCI EAFE Small Cap / 20% BBgBarc US Aggregate TR / 4% JP Morgan EMBI Global Index / 5% S&P/LSTA Leveraged Loan TR / 10 % Cambridge Associates US All PE / 8% HFRI Fund of Funds Composite Index / 8% NCREIF Property Index

Fiscal Year End is 6/30



## Vermont State Teachers

# TOTAL FUND PERFORMANCE DETAIL - NET

|   | Market Value (\$)  | % of Portfolio | Policy %    | 3 Mo (%)    | Rank      | Fiscal YTD (%) | Rank      | 1 Yr (%)    | Rank      | 3 Yrs (%)  | Rank      | 5 Yrs (%)  | Rank      | 10 Yrs (%)  | Rank      | Inception Date |
|---|--------------------|----------------|-------------|-------------|-----------|----------------|-----------|-------------|-----------|------------|-----------|------------|-----------|-------------|-----------|----------------|
| <b>Total Non US Equity</b>                  | <b>510,491,441</b> | <b>27.3</b>    | <b>25.0</b> | <b>11.2</b> | <b>50</b> | <b>-0.7</b>    | <b>15</b> | <b>-4.3</b> | <b>32</b> | <b>8.7</b> | <b>35</b> | <b>3.4</b> | <b>48</b> | <b>--</b>   | <b>--</b> | <b>Apr-01</b>  |
| MSCI ACWI ex USA                            |                    |                |             | 10.3        | 66        | -1.6           | 26        | -4.2        | 31        | 8.1        | 43        | 2.6        | 66        | 8.8         | 76        | Apr-01         |
| eV All ACWI ex-US Equity Net Median         |                    |                |             | 11.1        |           | -3.7           |           | -5.9        |           | 7.7        |           | 3.3        |           | 10.6        |           | Apr-01         |
| <b>Total Core Non US Equity</b>             | <b>249,654,934</b> | <b>13.3</b>    | <b>10.0</b> | <b>9.7</b>  | <b>63</b> | <b>-2.1</b>    | <b>29</b> | <b>-4.3</b> | <b>40</b> | <b>8.7</b> | <b>20</b> | <b>3.5</b> | <b>36</b> | <b>9.6</b>  | <b>60</b> | <b>Apr-01</b>  |
| MSCI EAFE                                   |                    |                |             | 10.0        | 53        | -2.5           | 32        | -3.7        | 33        | 7.3        | 43        | 2.3        | 67        | 9.0         | 74        | Apr-01         |
| eV All EAFE Equity Net Median               |                    |                |             | 10.1        |           | -4.5           |           | -5.6        |           | 6.9        |           | 3.0        |           | 9.9         |           | Apr-01         |
| SSgA ACWI Ex US                             | 129,136,291        | 6.9            | 3.0         | 10.4        | 67        | -1.5           | 25        | -4.0        | 33        | 8.3        | 38        | 2.8        | 62        | --          | --        | Sep-10         |
| MSCI ACWI ex USA                            |                    |                |             | 10.3        | 67        | -1.6           | 25        | -4.2        | 37        | 8.1        | 43        | 2.6        | 66        | 8.8         | 74        | Sep-10         |
| eV ACWI ex-US All Cap Equity Net Median     |                    |                |             | 11.0        |           | -3.6           |           | -5.5        |           | 7.7        |           | 3.2        |           | 10.6        |           | Sep-10         |
| Acadian                                     | 58,125,394         | 3.1            | 3.5         | 9.2         | 76        | -5.7           | 62        | -6.8        | 58        | 10.7       | 7         | 5.1        | 18        | 11.2        | 31        | Nov-05         |
| Mondrian                                    | 62,393,249         | 3.3            | 3.5         | 8.7         | 80        | 0.1            | 10        | -2.2        | 21        | 6.8        | 55        | 2.3        | 68        | 8.6         | 82        | Jan-93         |
| MSCI EAFE                                   |                    |                |             | 10.0        | 53        | -2.5           | 32        | -3.7        | 33        | 7.3        | 43        | 2.3        | 67        | 9.0         | 74        | Jan-93         |
| <b>Total Global Equity</b>                  | <b>153,022,269</b> | <b>8.2</b>     | <b>9.0</b>  | <b>14.0</b> | <b>34</b> | <b>-0.5</b>    | <b>66</b> | <b>-3.2</b> | <b>82</b> | <b>--</b>  | <b>--</b> | <b>--</b>  | <b>--</b> | <b>--</b>   | <b>--</b> | <b>Feb-18</b>  |
| MSCI ACWI IMI Net USD                       |                    |                |             | 12.3        | 53        | 1.2            | 52        | 1.9         | 57        | 10.6       | 38        | 6.3        | 52        | 12.3        | 52        | Feb-18         |
| eV All Global Equity Net Median             |                    |                |             | 12.4        |           | 1.5            |           | 2.7         |           | 9.5        |           | 6.4        |           | 12.5        |           | Feb-18         |
| Artisan Global Opportunities                | 81,683,205         | 4.4            | 4.5         | 16.5        | 11        | 2.1            | 45        | --          | --        | --         | --        | --         | --        | --          | --        | Jul-18         |
| Hosking Global Equity                       | 71,339,064         | 3.8            | 4.5         | 11.2        | 67        | -3.3           | 83        | -6.0        | 91        | --         | --        | --         | --        | --          | --        | Feb-18         |
| MSCI ACWI                                   |                    |                |             | 12.2        | 54        | 2.1            | 45        | 2.6         | 52        | 10.7       | 37        | 6.5        | 50        | 12.0        | 57        | Feb-18         |
| <b>Total International Small Cap Equity</b> | <b>38,045,716</b>  | <b>2.0</b>     | <b>2.0</b>  | <b>11.2</b> | <b>34</b> | <b>--</b>      | <b>--</b> | <b>--</b>   | <b>--</b> | <b>--</b>  | <b>--</b> | <b>--</b>  | <b>--</b> | <b>--</b>   | <b>--</b> | <b>Oct-18</b>  |
| MSCI EAFE Small Cap                         |                    |                |             | 10.7        | 43        | -7.9           | 29        | -9.4        | 29        | 7.5        | 48        | 4.5        | 53        | 12.8        | 68        | Oct-18         |
| eV EAFE Small Cap Equity Net Median         |                    |                |             | 10.1        |           | -9.4           |           | -11.9       |           | 7.3        |           | 4.7        |           | 13.9        |           | Oct-18         |
| SGA International Small Cap Equity          | 38,045,716         | 2.0            | 2.0         | 11.2        | 34        | --             | --        | --          | --        | --         | --        | --         | --        | --          | --        | Nov-18         |
| MSCI EAFE Small Cap                         |                    |                |             | 10.7        | 43        | -7.9           | 29        | -9.4        | 29        | 7.5        | 48        | 4.5        | 53        | 12.8        | 68        | Nov-18         |
| <b>Total Emerging Market Equity</b>         | <b>69,768,522</b>  | <b>3.7</b>     | <b>4.0</b>  | <b>10.7</b> | <b>45</b> | <b>6.4</b>     | <b>2</b>  | <b>-4.5</b> | <b>13</b> | <b>8.7</b> | <b>67</b> | <b>3.0</b> | <b>65</b> | <b>11.3</b> | <b>18</b> | <b>Feb-08</b>  |
| MSCI Emerging Markets                       |                    |                |             | 9.9         | 57        | 0.6            | 38        | -7.4        | 36        | 10.7       | 40        | 3.7        | 51        | 8.9         | 72        | Feb-08         |
| eV Emg Mkts Equity Net Median               |                    |                |             | 10.3        |           | -0.3           |           | -8.6        |           | 9.9        |           | 3.7        |           | 9.8         |           | Feb-08         |
| Aberdeen                                    | 69,768,522         | 3.7            | 4.0         | 10.7        | 45        | 6.4            | 2         | -4.5        | 13        | 8.7        | 67        | 3.0        | 65        | 11.3        | 18        | Feb-08         |
| MSCI Emerging Markets                       |                    |                |             | 9.9         | 57        | 0.6            | 38        | -7.4        | 36        | 10.7       | 40        | 3.7        | 51        | 8.9         | 72        | Feb-08         |



## Vermont State Teachers

# TOTAL FUND PERFORMANCE DETAIL - NET

|   | Market Value (\$)  | % of Portfolio | Policy %    | 3 Mo (%)   | Rank      | Fiscal YTD (%) | Rank      | 1 Yr (%)   | Rank      | 3 Yrs (%)  | Rank      | 5 Yrs (%)  | Rank      | 10 Yrs (%) | Rank      | Inception Date |
|---|--------------------|----------------|-------------|------------|-----------|----------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|----------------|
| <b>Total Fixed Income</b>                           | <b>566,010,563</b> | <b>30.2</b>    | <b>26.0</b> | <b>3.5</b> | <b>39</b> | <b>3.9</b>     | <b>54</b> | <b>3.7</b> | <b>66</b> | <b>4.1</b> | <b>30</b> | <b>3.6</b> | <b>31</b> | <b>--</b>  | <b>--</b> | <b>Dec-10</b>  |
| <i>BBgBarc US Aggregate TR</i>                      |                    |                |             | 2.9        | 54        | 4.6            | 30        | 4.5        | 37        | 2.0        | 63        | 2.7        | 53        | 3.8        | 60        | Dec-10         |
| <i>eV All US Fixed Inc Net Median</i>               |                    |                |             | 3.1        |           | 4.0            |           | 4.2        |           | 2.5        |           | 2.8        |           | 4.4        |           | Dec-10         |
| <b>Total Diversified Fixed Income</b>               | <b>465,395,358</b> | <b>24.9</b>    | <b>20.0</b> | <b>2.9</b> | <b>54</b> | <b>3.7</b>     | <b>59</b> | <b>4.0</b> | <b>58</b> | <b>2.9</b> | <b>45</b> | <b>3.3</b> | <b>38</b> | <b>5.7</b> | <b>38</b> | <b>Jul-03</b>  |
| <i>BBgBarc US Aggregate TR</i>                      |                    |                |             | 2.9        | 54        | 4.6            | 30        | 4.5        | 37        | 2.0        | 63        | 2.7        | 53        | 3.8        | 60        | Jul-03         |
| <i>eV All US Fixed Inc Net Median</i>               |                    |                |             | 3.1        |           | 4.0            |           | 4.2        |           | 2.5        |           | 2.8        |           | 4.4        |           | Jul-03         |
| SSgA Barclays Aggregate Index                       | 209,975,510        | 11.2           | 8.0         | 2.9        | 72        | 4.7            | 43        | 4.5        | 42        | 2.0        | 66        | --         | --        | --         | --        | Feb-15         |
| PIMCO Core Plus                                     | 114,515,846        | 6.1            | 4.0         | 3.0        | 91        | 4.5            | 72        | 4.5        | 42        | 2.7        | 80        | 2.9        | 65        | --         | --        | Nov-09         |
| <i>BBgBarc US Aggregate TR</i>                      |                    |                |             | 2.9        | 93        | 4.6            | 53        | 4.5        | 43        | 2.0        | 97        | 2.7        | 78        | 3.8        | 99        | Nov-09         |
| <i>eV US Core Plus Fixed Inc Net Median</i>         |                    |                |             | 3.6        |           | 4.7            |           | 4.4        |           | 3.1        |           | 3.1        |           | 5.8        |           | Nov-09         |
| GAM Unconstrained Bond                              | 10,696,232         | 0.6            | 0.0         | 1.2        | 87        | 1.9            | 64        | 1.7        | 54        | 4.5        | 55        | --         | --        | --         | --        | Jun-15         |
| PIMCO Unconstrained                                 | 19,088,778         | 1.0            | 2.0         | 2.1        | 68        | 3.3            | 35        | 3.8        | 14        | 4.8        | 52        | 2.5        | 57        | --         | --        | Jul-11         |
| <i>PIMCO Unconstrained Custom Index</i>             |                    |                |             | 4.9        | 16        | 5.4            | 4         | 4.7        | 9         | 4.5        | 56        | --         | --        | --         | --        | Jul-11         |
| <i>3-Month Libor Total Return USD</i>               |                    |                |             | 0.7        | 94        | 2.0            | 63        | 2.6        | 39        | 1.7        | 89        | 1.1        | 88        | 0.7        | 99        | Jul-11         |
| <i>eV Global Unconstrained Fixed Inc Net Median</i> |                    |                |             | 2.8        |           | 2.7            |           | 1.8        |           | 4.8        |           | 2.7        |           | 5.5        |           | Jul-11         |
| BlackRock TIPS                                      | 111,118,991        | 5.9            | 6.0         | 3.2        | 61        | 1.8            | 41        | 2.6        | 36        | 1.7        | 44        | 1.9        | 28        | --         | --        | Dec-09         |
| <i>BBgBarc US TIPS TR</i>                           |                    |                |             | 3.2        | 61        | 1.9            | 36        | 2.7        | 22        | 1.7        | 41        | 1.9        | 18        | 3.4        | 46        | Dec-09         |
| <b>Total High Yield Bonds</b>                       | <b>27,859,316</b>  | <b>1.5</b>     | <b>2.0</b>  | <b>4.9</b> | <b>86</b> | <b>0.5</b>     | <b>98</b> | <b>1.3</b> | <b>98</b> | <b>6.5</b> | <b>74</b> | <b>3.5</b> | <b>75</b> | <b>8.8</b> | <b>84</b> | <b>May-06</b>  |
| <i>BBgBarc US High Yield TR</i>                     |                    |                |             | 7.3        | 34        | 4.9            | 33        | 5.9        | 20        | 8.6        | 17        | 4.7        | 22        | 11.3       | 13        | May-06         |
| <i>eV US High Yield Fixed Inc Net Median</i>        |                    |                |             | 6.9        |           | 4.2            |           | 5.0        |           | 7.4        |           | 4.1        |           | 10.0       |           | May-06         |
| PIMCO High Yield                                    | 27,859,316         | 1.5            | 2.0         | 4.9        | 86        | --             | --        | --         | --        | --         | --        | --         | --        | --         | --        | Aug-18         |
| <i>BBgBarc US High Yield TR</i>                     |                    |                |             | 7.3        | 34        | 4.9            | 33        | 5.9        | 20        | 8.6        | 17        | 4.7        | 22        | 11.3       | 13        | Aug-18         |

PIMCO Unconstrained Custom Index is 25% HY, 25% EMD, 50% BC Agg

BlackRock TIPS Universe - eV US TIPS / Inflation Fixed Inc Net

Fiscal Year End is 6/30

## Vermont State Teachers

# TOTAL FUND PERFORMANCE DETAIL - NET

|  | Market Value (\$)  | % of Portfolio | Policy %   | 3 Mo (%)    | Rank      | Fiscal YTD (%) | Rank      | 1 Yr (%)   | Rank      | 3 Yrs (%)   | Rank      | 5 Yrs (%)  | Rank      | 10 Yrs (%) | Rank      | Inception Date |
|--|--------------------|----------------|------------|-------------|-----------|----------------|-----------|------------|-----------|-------------|-----------|------------|-----------|------------|-----------|----------------|
| <b>Total Emerging Market Debt</b>                    | <b>72,755,890</b>  | <b>3.9</b>     | <b>4.0</b> | <b>6.9</b>  | <b>20</b> | <b>6.4</b>     | <b>42</b> | <b>2.3</b> | <b>33</b> | <b>6.3</b>  | <b>28</b> | <b>5.0</b> | <b>15</b> | --         | --        | <b>Nov-09</b>  |
| <i>JP Morgan EMBI Global Index</i>                   |                    |                |            | 6.6         | 24        | 7.3            | 15        | 3.5        | 20        | 5.2         | 54        | 4.8        | 19        | 8.1        | 44        | Nov-09         |
| <i>eV All Emg Mkts Fixed Inc Net Median</i>          |                    |                |            | 5.4         |           | 5.7            |           | 0.1        |           | 5.3         |           | 3.4        |           | 7.8        |           | Nov-09         |
| <i>Wellington Opportunistic EMD</i>                  | 72,755,890         | 3.9            | 4.0        | 6.9         | 20        | 6.4            | 42        | 2.3        | 33        | 6.3         | 28        | 5.0        | 15        | --         | --        | Jan-10         |
| <i>JP Morgan EMBI Global Index</i>                   |                    |                |            | 6.6         | 24        | 7.3            | 15        | 3.5        | 20        | 5.2         | 54        | 4.8        | 19        | 8.1        | 44        | Jan-10         |
| <b>Total Private Debt</b>                            | <b>29,496,829</b>  | <b>1.6</b>     | <b>5.0</b> | <b>3.4</b>  | <b>--</b> | <b>3.8</b>     | <b>--</b> | <b>5.4</b> | <b>--</b> | <b>--</b>   | <b>--</b> | <b>--</b>  | <b>--</b> | <b>--</b>  | <b>--</b> | <b>Jan-18</b>  |
| <i>S&amp;P/LSTA Leveraged Loan TR</i>                |                    |                |            | 4.0         | --        | 2.3            | --        | 3.0        | --        | 5.7         | --        | 3.6        | --        | 8.0        | --        | Jan-18         |
| <i>BlueBay Direct Lending Fund III</i>               | 4,521,558          | 0.2            | 2.5        | 2.3         | --        | 5.7            | --        | --         | --        | --          | --        | --         | --        | --         | --        | Jun-18         |
| <i>Benefit Street Partners</i>                       | 24,975,271         | 1.3            | 2.5        | 3.6         | --        | 3.1            | --        | 4.8        | --        | --          | --        | --         | --        | --         | --        | Jan-18         |
| <i>S&amp;P/LSTA Leveraged Loan TR</i>                |                    |                |            | 4.0         | --        | 2.3            | --        | 3.0        | --        | 5.7         | --        | 3.6        | --        | 8.0        | --        | Jan-18         |
| <b>Total Real Estate</b>                             | <b>116,285,631</b> | <b>6.2</b>     | <b>8.0</b> | <b>0.4</b>  | <b>--</b> | <b>3.7</b>     | <b>--</b> | <b>5.2</b> | <b>--</b> | <b>7.0</b>  | <b>--</b> | <b>9.4</b> | <b>--</b> | <b>--</b>  | <b>--</b> | <b>Dec-10</b>  |
| <i>NCREIF Property Index</i>                         |                    |                |            | 1.8         | --        | 4.9            | --        | 6.8        | --        | 7.1         | --        | 9.1        | --        | 8.5        | --        | Dec-10         |
| <b>Total Real Estate Core</b>                        | <b>96,444,109</b>  | <b>5.2</b>     | <b>4.5</b> | <b>0.5</b>  | <b>--</b> | <b>3.3</b>     | <b>--</b> | <b>4.9</b> | <b>--</b> | <b>5.9</b>  | <b>--</b> | <b>8.9</b> | <b>--</b> | <b>--</b>  | <b>--</b> | <b>May-12</b>  |
| <i>UBS Trumbull</i>                                  | 96,315,662         | 5.1            | 4.5        | 0.5         | --        | 3.3            | --        | 5.0        | --        | 5.4         | --        | 7.9        | --        | 7.3        | --        | Oct-96         |
| <b>Total Real Estate Non-Core</b>                    | <b>19,841,522</b>  | <b>1.1</b>     | <b>3.5</b> | <b>-0.2</b> | <b>--</b> | <b>5.7</b>     | <b>--</b> | <b>6.8</b> | <b>--</b> | <b>13.3</b> | <b>--</b> | <b>--</b>  | <b>--</b> | <b>--</b>  | <b>--</b> | <b>May-12</b>  |
| <i>Siguler Guff DREOF II</i>                         | 13,021,320         | 0.7            | 1.0        | -2.0        | --        | 2.6            | --        | 3.9        | --        | 13.5        | --        | --         | --        | --         | --        | Jun-14         |
| <i>Siguler Guff DREOF II Co-Investment</i>           | 6,820,202          | 0.4            | 0.5        | 3.1         | --        | 12.4           | --        | 12.9       | --        | --          | --        | --         | --        | --         | --        | Nov-16         |
| <i>Brookfield Strategic Real Estate Partners III</i> | 0                  | 0.0            | 2.0        | 0.0         | --        | 0.0            | --        | --         | --        | --          | --        | --         | --        | --         | --        | Jun-18         |
| <i>NCREIF Property Index</i>                         |                    |                |            | 1.8         | --        | 4.9            | --        | 6.8        | --        | 7.1         | --        | 9.1        | --        | 8.5        | --        | Jun-18         |

Market values are final as of Q1 2019 capital statement for Benefit Street Partners, BlueBay Direct Lending Fund III, Siguler Guff DREOF II, Siguler Guff DREOF II Co-Investment and UBS Trumbull

Transwestern/Aslan III residual market value of \$128,447 is included in the Total Real Estate composite

Fiscal Year End is 6/30





## Vermont State Teachers

# TOTAL FUND PERFORMANCE DETAIL - NET

|   | Market Value<br>(\$) | % of<br>Portfolio | Policy %    | 3 Mo<br>(%) | Rank      | Fiscal<br>YTD<br>(%) | Rank      | 1 Yr<br>(%) | Rank      | 3 Yrs<br>(%) | Rank      | 5 Yrs<br>(%) | Rank      | 10 Yrs<br>(%) | Rank      | Inception<br>Date |
|---|----------------------|-------------------|-------------|-------------|-----------|----------------------|-----------|-------------|-----------|--------------|-----------|--------------|-----------|---------------|-----------|-------------------|
| <b>Total Absolute Return</b>                        | <b>135,677,116</b>   | <b>7.2</b>        | <b>8.0</b>  | <b>2.8</b>  | <b>70</b> | <b>-0.4</b>          | <b>59</b> | <b>2.6</b>  | <b>33</b> | <b>4.5</b>   | <b>59</b> | <b>1.9</b>   | <b>71</b> | <b>--</b>     | <b>--</b> | <b>Dec-10</b>     |
| <i>HFRI Fund of Funds Composite Index</i>           |                      |                   |             | 4.6         | 46        | -0.3                 | 57        | 0.1         | 67        | 3.9          | 66        | 2.2          | 66        | 3.5           | 88        | Dec-10            |
| <i>eV Alt Fund of Funds - Multi-Strategy Median</i> |                      |                   |             | 4.3         |           | 0.0                  |           | 1.4         |           | 4.9          |           | 3.0          |           | 5.6           |           | Dec-10            |
| Pinnacle Natural Resources, L.P.                    | 46,786,051           | 2.5               | 3.0         | 2.3         | 78        | -0.8                 | 47        | 3.8         | 37        | --           | --        | --           | --        | --            | --        | Jul-16            |
| <i>Bloomberg Commodity Index</i>                    |                      |                   |             | 6.3         | 66        | -5.6                 | 73        | -5.3        | 94        | 2.2          | 93        | -8.9         | 78        | -2.6          | 99        | Jul-16            |
| Grosvenor   | 55,034,339           | 2.9               | 3.0         | 2.6         | 75        | -1.9                 | 79        | -0.4        | 73        | 4.8          | 54        | 2.4          | 64        | --            | --        | Dec-10            |
| Allianz Structured Alpha                            | 33,856,726           | 1.8               | 2.0         | 3.9         | 56        | 2.5                  | 15        | 6.0         | 10        | 4.2          | 61        | 6.9          | 14        | 8.5           | 15        | Apr-08            |
| <i>91 Day T-Bills</i>                               |                      |                   |             | 0.6         | 95        | 1.7                  | 24        | 2.1         | 37        | 1.2          | 95        | 0.8          | 91        | 0.4           | 99        | Apr-08            |
| <i>eV Alt Fund of Funds - Multi-Strategy Median</i> |                      |                   |             | 4.3         |           | 0.0                  |           | 1.4         |           | 4.9          |           | 3.0          |           | 5.6           |           | Apr-08            |
| <b>Total Private Equity</b>                         | <b>53,595,097</b>    | <b>2.9</b>        | <b>10.0</b> | <b>5.2</b>  | <b>--</b> | <b>11.7</b>          | <b>--</b> | <b>19.9</b> | <b>--</b> | <b>18.4</b>  | <b>--</b> | <b>18.3</b>  | <b>--</b> | <b>--</b>     | <b>--</b> | <b>Dec-12</b>     |
| <i>Cambridge Associates US All PE</i>               |                      |                   |             | 6.5         | --        | 8.7                  | --        | 14.5        | --        | 16.0         | --        | 12.2         | --        | 14.8          | --        | Dec-12            |
| <b>Total Cash</b>                                   | <b>917,686</b>       | <b>0.0</b>        | <b>0.0</b>  |             |           |                      |           |             |           |              |           |              |           |               |           |                   |
| Vermont Cash  | 917,686              | 0.0               | 0.0         |             |           |                      |           |             |           |              |           |              |           |               |           |                   |

Harbourvest is based on final capital account statements for Q1 2019

As of 04/01/2016, Absolute Return includes Allianz Structured Alpha and was formerly included in the Diversified Fixed Income composite

Fiscal Year End is 6/30



# ACTIVE MANAGER RELATIVE PERFORMANCE

|         | Positive  | Negative  |
|---------|---|---|
| QUARTER | <p><b><u>U.S. Equity</u></b></p> <ul style="list-style-type: none"> <li>Champlain (+80 bps)</li> </ul> <p><b><u>International Equity</u></b></p> <ul style="list-style-type: none"> <li>Artisan (+410 bps)</li> <li>Strategic Global Advisors (+30 bps)</li> <li>Aberdeen (+80 bps)</li> </ul> <p><b><u>Fixed Income</u></b></p> <ul style="list-style-type: none"> <li>PIMCO Core Plus (+10 bps)</li> <li>Wellington EMD (+30 bps)</li> <li>GAM Unconstrained (+50 bps)</li> </ul> <p><b><u>Absolute Return</u></b></p> <ul style="list-style-type: none"> <li>Allianz (+290 bps)</li> </ul> | <p><b><u>International Equity</u></b></p> <ul style="list-style-type: none"> <li>Acadian (-80 bps)</li> <li>Mondrian (-130 bps)</li> <li>Hosking (-110 bps)</li> </ul> <p><b><u>Fixed Income</u></b></p> <ul style="list-style-type: none"> <li>PIMCO Unconstrained (-280 bps)</li> <li>PIMCO High Yield (-240 bps)</li> </ul> <p><b><u>Absolute Return</u></b></p> <ul style="list-style-type: none"> <li>Pinnacle (-400 bps)</li> <li>Grosvenor (-200 bps)</li> </ul> |
| 1 YEAR  | <p><b><u>US Equity</u></b></p> <ul style="list-style-type: none"> <li>Champlain (+940 bps)</li> </ul> <p><b><u>International Equity</u></b></p> <ul style="list-style-type: none"> <li>Mondrian (+150 bps)</li> <li>Aberdeen (+290 bps)</li> </ul> <p><b><u>Absolute Return</u></b></p> <ul style="list-style-type: none"> <li>Pinnacle (+870 bps)</li> <li>Allianz (+220 bps)</li> </ul>   | <p><b><u>International Equity</u></b></p> <ul style="list-style-type: none"> <li>Acadian (-310 bps)</li> <li>Hosking (-880 bps)</li> </ul> <p><b><u>Fixed Income</u></b></p> <ul style="list-style-type: none"> <li>PIMCO Unconstrained (-90 bps)</li> <li>GAM Unconstrained (-90 bps)</li> <li>Wellington EMD (-120 bps)</li> </ul> <p><b><u>Absolute Return</u></b></p> <ul style="list-style-type: none"> <li>Grosvenor (-60 bps)</li> </ul>                         |

Reflects public markets and active management only  
**GREEN** indicates the managers had outperformed their respective benchmarks  
**RED** indicates the managers had underperformed their respective benchmarks  
**(+/-)** is the over/under performance relative to respective benchmarks in basis points



# NEPC'S DUE DILIGENCE MONITOR

| Firm Investment Product                 | Manager Changes/ Announcements (Recent Quarter)   | NEPC Due Diligence Committee Recommendations            |
|---|---|---|
| BlackRock                               | <p>Blackrock announced a broad array of leadership realignment in what the firm termed final in a series of such changes, outlined below:</p> <ul style="list-style-type: none"> <li>• Geraldine Buckingham was named the head of Asia-Pacific, succeeding Ryan Stork, who becomes deputy chief operating office.</li> <li>• Mark Wiedman was named Head of International and of Corporate Strategy with Salim Ramji succeeding Mark as Global Head of ETF &amp; Index Investments</li> <li>• Mark McCombe becomes Chief Client Officer</li> <li>• Sarah Melvin returns to London as Head of the UK</li> <li>• Zach Buchwald succeeds Sarah as Head of US &amp; Canada Institutional Client Business</li> <li>• Edwin Conway becomes Global Head of BlackRock Alternative Investors (BAI)</li> <li>• Jim Barry becomes Chief Investment Officer for BAI</li> <li>• David Blumer will become a senior advisor to the firm</li> <li>• Richie Prager has decided to retire as of July 1, Supurna VedBrat will become Head of Global Trading</li> <li>• Patrick Olson will become Chief Product Officer</li> <li>• Claude Wade, as Global Head of Client Experience and Head of the Atlanta office</li> </ul> | No Action   |
| BlueBay Asset Management Direct Lending | <p>On June 5, 2019, the Private Debt business of BlueBay Asset Management ("BlueBay" or the "Firm") announced that it has agreed to spinout from the Firm. The spinout was supported by Dyal Capital Partners ("Dyal"). The new entity will be independently owned; 60% by Private Debt management and 40% by Dyal. The Private Debt business has approximately \$14.8 billion in assets undermanagement.</p>   | No Action<br><i>(see NEPC memo in appendix)</i>         |
| PIMCO Core Plus Unconstrained           | <p>PIMCO and Stacy Schaus have settled their litigation out of court. PIMCO continues to believe that Ms. Schaus was treated fairly in her employment at PIMCO; both sides are bound by confidentiality.</p>  | Due diligence status changed from Watch to<br>No Action |



# NEPC DUE DILIGENCE LEGEND KEY

## Due Diligence Ratings (Investment Product only)

|           |   |
|-----------|---|
| 1         | A high conviction investment product with a clear and economically-grounded investment thesis, and is managed by an investment team that is sufficiently resourced and incented to execute on the thesis. A 1 rating represents NEPC Research’s best ideas. Not all 1 rated products are suitable for all clients.                      |
| 2         | NEPC has a positive view of the strategy. Strategy has a compelling and sound investment thesis. The manager is sufficiently resourced and incented to execute on the thesis. Strengths outweigh the weaknesses, but the strategy does not meet all requirements for a 1 rating.  |
| 3         | A satisfactory investment product. The strategy lacks a compelling investment thesis, however there are no significant concerns around the manager’s viability.   |
| 4         | The strategy may have an unclear or ambiguous investment thesis or the manager may lack the ability to execute on the stated thesis. The strategy likely has strengths and weaknesses and the weaknesses may outweigh the strengths.  |
| 5         | A strategy that lacks an investment thesis or NEPC has no confidence in the manager’s ability to execute on the thesis, and/or the investment firm may not be viable. Serious issues have been identified with an investment manager or product. This rating aligns with a Due Diligence status of Terminate for client-owned products. |
| Not Rated | Due diligence has not been sufficiently completed on the product or manager.  |

## Due Diligence Status (Firm and Product)

|               |  |
|---------------|--|
| No Action     | Informational items have surfaced; no action is recommended.   |
| Watch         | Issues have surfaced which may require increased monitoring, but which are not considered serious in the near-term. Close monitoring is appropriate until the issues are resolved.   |
| Hold          | Serious issues have surfaced which require increased monitoring. These issues could have long-term implications on the investment team’s ability to effectively execute the investment strategy.   |
| Client Review | Very serious issues have surfaced with an investment manager. For products that have been fully vetted, the issues may be significant enough to violate the original investment thesis. Clients are advised to review their relationship with the manager.                     |
| Terminate     | We have lost all confidence in the product; manager would not be recommended for searches and clients would be discouraged from using. The manager cannot be in future searches unless a client specifically requests. Current clients must be advised to replace the manager. |



# INVESTMENT MANAGER – Q3 FISCAL 2019 COMMENTARY

## POSITIVE CONTRIBUTORS

|   | Commentary  | Due Diligence Rating |
|---|---|----------------------|
| <b>Champlain</b><br><i>Small/Mid Cap Equity</i>                     | <p><b>Returned 16.0%, outperforming the custom benchmark, 50% R2000/50% R2500 by 80bps</b></p> <p><i>Contributors:</i> Strong stock selection in the consumer staples, industrial and health care sectors provided the biggest relative contributions for the quarter. Health care rebounded from the significant sell-off in the 4<sup>th</sup> quarter of 2018 and was the strongest performing sector. Veeva and Waters were the strategy’s largest relative contributors in the health care sector during the quarter. Industrial holding, Welbilt, was this sector’s largest contributor as new senior management reset expectations on margin improvement. Technology, specifically software overweight, led to modest outperformance.</p> <p><i>Detractors:</i> From an asset allocation standpoint, the biggest lag on performance for the quarter was an underweight to real estate and utilities. Stock selection in consumer discretionary was also a detractor for the quarter. In addition, the strategy’s financials lagged the benchmark due to underperformance from insurance holdings. One of the names that caused some of the underperformance was John Wiley, which had been under pressure due to transition in their educational print book publishing business.</p> <p><i>Positioning:</i> They remain consistent with the execution of their investment process which is focused on reliable, growing, and high returning businesses. As a result, they exclude what they believe to be the most risky and cyclical companies. They remain confident the majority of their holdings represent better quality and present better reward to risk. Portfolio had 116 positions.</p> | 1                    |
| <b>Artisan</b><br><b>Global Opportunity</b><br><i>Global Equity</i> | <p><b>Returned 16.3%, outperforming the MSCI ACWI by 410bps</b></p> <p><i>Contributors:</i> For the quarter, the portfolio benefited from strong stock selection in technology, financials, consumer discretionary and health care holdings. From an individual holdings perspective, Worldpay (Financials), Techtronic (IT) and Fevertree (Consumer) were among the top Q1 contributors. Worldpay, a credit-card merchant, posted strong returns because of its exposure to digital payments and the expectation its global footprint would allow it to grow market share. Techtronic’s shares were pressured in Q4 by global trade concerns, but rebounded in Q1 with increasing visibility into a potential resolution.</p> <p><i>Detractors:</i> Lack of exposure to the real estate sector modestly detracted. Energy and materials were lags on performance due to underweights in both sectors. Among the bottom contributors in Q1 were Booking Holdings (online travel) pressured by slowing European tourist travel among Brexit concerns, and Activision Blizzard (gaming) as they undertake a reorg and rebuilding period.</p> <p><i>Positioning:</i> During the quarter, as valuations rose, they pared exposure to holdings that neared their targets. As of March 31, 2019, the portfolio had a 3-5 year forecasted weighted average earnings growth rate of 18%. The portfolio held 45 companies with 36% of portfolio capital committed to the top 10 holdings and 61% of capital committed to the top 20 positions. The portfolio’s weighted average market capitalization was \$122.7 billion.</p>   | 1                    |



# INVESTMENT MANAGER – Q3 FISCAL 2019 COMMENTARY

## POSITIVE CONTRIBUTORS

|   | Commentary   | Due Diligence Rating  |
|---|--|---|
| <b>Strategic Global Advisor</b><br><i>International Small Cap</i> | <p><b>Returned 11.0%, outperforming the MSCI EAFE Small Cap index by 30bps</b></p> <p><i>Contributors:</i> The SGA Alpha Model performed well for the quarter among non-U.S. small cap developed equities. Within the model, the growth category was the strongest contributor, followed by the quality and sentiment categories, which were modestly positive. The outperformance during the quarter was driven by stock selection, led by in materials, real estate and consumer discretionary. U.K. based steel producer and miner, Evraz PLC was the top contributor within the Materials sector. Evraz outperformed relative to peers due to its vertical integration and its exposure to vanadium, which has experienced recent price rallies. Canadian Granite Real Estate Investment Trust was a top contributor in real estate as its share price continued to benefit from share buybacks and efforts to diversify its customer base. From a country perspective stock selection was strong across a number of countries, particularly the U.K. and Japan. In Japan, indoor entertainment venue operator Round One was a strong contributor as expansion in the U.S. and same store sales growth buoyed performance.</p> <p><i>Detractors:</i> Canada was a detractor for the quarter due to an overweight to the country and currency exposure. Stock selection in the Italy was also detractors for the quarter. The valuation category was mixed, performing well in January before sharply reversing during the last two months of the quarter.</p> <p><i>Positioning:</i> For the quarter, the portfolio was overweight to the Americas due to a large overweight to Canadian securities. The portfolio continued to be underweight to Asia (specifically Japan) and utilities. The strategy held 181 holdings.</p> | <p><b>1</b></p>   |
| <b>Aberdeen</b><br><i>Emerging Market Equities</i>                | <p><b>Returned 10.7%, outperforming the MSCI Emerging Markets by 80bps</b></p> <p><i>Contributors:</i> From a sector allocation perspective, communication services and financials led performance. Regionally, stock selection in China was the largest contributor to performance. Ping An Insurance had a good run throughout the quarter as market confidence in its growth and earnings outlook continued to grow. Huazhu Group, one of the largest domestic operators of mid to low-end hotels, rose on decent results and upbeat quarterly and annual forecast. Online car business, Autohome shrugged off rumors that a dealership had terminated its partnership in January to end the quarter as one of the fund's top contributors. Also aiding performance was the underweight to Korea.</p> <p><i>Detractors:</i> Despite being one of the best-performing markets in March, India was a laggard over the quarter, with Housing Development Finance Corp, Hero Motocorp and Ultratech Cement detracting from performance. Performance in Latin America was sub-par, largely due to holdings in Brazil. Shares in Vale were hit by the Brumadinho dam disaster in January. Ultrapar retreated on poor results and concerns on intensifying competitive pressure in fuel retailer Ipiranga, its core business. Stock selection in South Africa was negative, with retailers Massmart and Truworths continuing to lag amid ongoing tepid consumer sentiment.</p> <p><i>Positioning:</i> The portfolio is currently overweight to large cap names, financials and real estate and has an underweight to energy, industrials, utilities and health care. Geographically, the portfolio is overweight to Hong Kong, India, Brazil, Indonesia and Mexico.</p>  | <p><b>2</b><br/>           Rating Changed from "1" to "2" in January 2018</p> |



Returns presented are net of investment management fees

# INVESTMENT MANAGER – Q3 FISCAL 2019 COMMENTARY

## POSITIVE CONTRIBUTORS

|   | Commentary  | Due Diligence Rating |
|---|---|----------------------|
| <b>Wellington</b><br><i>Fixed Income</i>                            | <p><b>Returned 6.9%, outperforming the JPM EMBI Global Index by 30bps</b></p> <p><i>Contributors:</i> During the quarter, country allocation drove relative outperformance, with security selection, local rates positioning and currency positioning also contributing. The portfolio benefited from an underweight country allocation to China, as valuations are unattractive and tend to benefit from strong domestic support, aided performance. Positive stock selection in Mexico, specifically an underweight exposure to long-dated external sovereign debt and an overweight exposure to external quasi-sovereign debt in the oil and gas industry, enhanced performance. Positive security selection in Brazil from a lack of exposure to external sovereign debt contributed to results. An allocation to local rates in Brazil, given benign policy rate expectations and an expected fall in the real rate premia, also helped. Positioning within external quasi-sovereign debt PDVSA in Venezuela contributed to performance. An out-of-index allocation to Greece, due to their commitment to fiscal reform and EMU support, benefited results.</p> <p><i>Detractors:</i> The portfolio was hurt by underweights to credit spread duration and Costa Rica and developed market duration positioning. Overweight country allocations to Qatar, United Arab Emirates (UAE) and Morocco were also negative contributors to performance. They favor Qatar due to attractive valuations, low fiscal break-even oil prices, and large sovereign buffers. Underweight country allocation to Costa Rica hurt results. They remain underweight due to financing and liquidity problems and the passage of a fiscal reform that is unlikely to stabilize the debt-to-GDP ratio.</p> <p><i>Positioning:</i> Maintain pro-risk stance but balancing stable EM fundamentals and attractive valuations. Favor issuers in Eastern Europe and the Middle East over Asia and Latin America. Favor local market allocations primarily via currencies in Brazil and South Africa. Corporate debt more attractive as fundamentals remain healthy in Brazil and China. Average quality of portfolio was Ba1 versus the benchmark at Baa3. Yield of 6.25% versus the benchmark at 5.24%.</p> | 1                    |
| <b>Allianz</b><br><b>Structured Alpha</b><br><i>Absolute Return</i> | <p><b>Returned 3.5%, outperforming the 91 Day T-Bill Index by 290bps</b></p> <p><i>Contributors:</i> Structured Alpha 500 benefited from realized gains on both range-bound spreads and upside directional positions, as well as from mark-to-market recovery as marked-down positions cycled through expiration. The other benefit of the strong equity market and accompanying VIX decline is that the portfolio was able to close out a number of longer-dated positions and restore the portfolio to its typical weighted-average duration of approximately six to eight weeks.</p> <p><i>Detractors:</i> The portfolio had entered the year with a slightly longer-duration profile, the result of diagonal restructuring undertaken during the severe late-December correction to manage risk as cost-effectively as possible. During this period we had extended the range-bound zones to the downside by approximately 15%, with expirations dates pushed several weeks further out in time. This restructuring had improved the portfolio's resilience in the event of further equity market declines.</p> <p><i>Positioning:</i> With some of the strikes now 20% to 25% below the post-rally index levels, the portfolio team took the opportunity to cover range-bound positions several months prior to expiration and were able to pocket 90% or more of their expected value.</p>  | 1                    |



# INVESTMENT MANAGER – Q3 FISCAL 2019 COMMENTARY

## POSITIVE CONTRIBUTORS

|  | Commentary  | Due Diligence Rating |
|--|---|----------------------|
| <p><b>PIMCO Core Plus</b><br/>Fixed Income</p> | <p><b>Returned 3.0%, outperforming the Barclay’s Aggregate Index by 10bps</b></p> <p><i>Contributors:</i> Selection within corporate credit, particularly a preference for financials. U.S. rate strategies including duration, curve positioning, and security selection. Tactical exposure to select currencies, particularly the British pound.</p> <p><i>Detractors:</i> Non-U.S. duration strategies, including short exposure to duration in select markets and country selection in the eurozone. Positions in non-Agency MBS</p> <p><i>Positioning:</i> Underweight duration overall and have a preference for US duration over developed regions. Within credit, they find attractive opportunities in specific credits that benefit from US growth and a resurgent housing sector. Currency positioning remains tactical particularly given less conviction in the overall direction of the dollar. They remain on the intermediate portion of the curve as it continues to offer attractive characteristics while longer-term rates may rise as less accommodation from central banks and the possibility of higher inflation expectations could cause the yield curve to steepen. Effective duration was 4.56 years with a YTM of 3.32%. Average quality was AA-</p> <p>PIMCO expects world GDP growth to slow to 2.5%–3% this year from 3.3% in 2018. However, with China increasing stimulus and a trade deal between the U.S. and China in the making, we think there is a good chance that global growth will stabilize or even pick up moderately later this year. We expect inflation globally to fall to 1.5%–2% from 2.2% in 2018 due to continued below-target inflation in the U.S., Europe and Japan. Central banks have also struck more accommodative tones, with the Fed’s pivot to patience reducing the risk of monetary overkill and raising the odds that U.S. short-term rates will broadly flat-line within PIMCO’s New Neutral range of 2-3% for the foreseeable future.</p> | <p><b>1</b></p>      |





# INVESTMENT MANAGER – Q3 FISCAL 2019 COMMENTARY

## NEGATIVE CONTRIBUTORS

|  | Commentary   | Due Diligence Rating |
|--|--|----------------------|
| <b>Acadian</b><br><i>International Equity</i>  | <p><b>Returned 9.2%, trailing the MSCI EAFE by 80bps</b></p> <p><i>Detractors:</i> Over the quarter, they experienced headwinds primarily from risk factors. Their small-cap tilt detracted as did top-down positioning and stock selection. Key sources of negative active return included a combination of stock selection and underweight positions in the U.K. and France, along with an opportunistic exposure to Korea. Lufthansa declined after the German air carrier issued a cautious full-year outlook, dampened by rising operational costs. A lack of exposure to SoftBank proved costly. Pearson fell after the U.K. publishing and education company reported a drop in U.S. revenue and issued a cautious full-year outlook. Shares of French digital marketing company Criteo tumbled after U.S. tech giant Alphabet revealed plans to restrict third-party advertisements on its platforms.</p> <p><i>Contributors:</i> Stock selection in Finland was more successful, as was an opportunistic exposure to China. Neste rose after the Finnish refiner reported fourth-quarter earnings that topped consensus estimates. OMV rallied after the Austrian natural gas producer reported better-than expected Q4 earnings and announced plans to boost its 2018 dividend payout. Shares of GN Store Nord climbed after the Danish hearing aid manufacturer reported generally favorable Q4 and full-year results. Fortescue advanced after the Australian iron ore producer posted an increase in half-year revenue and issued a special dividend.</p> <p><i>Positioning:</i> The portfolio had an overweight to emerging markets, North America, Australia/New Zealand, and Middle East. Underweight to Hong Kong/Singapore, Japan, UK, and Continental Europe. By sector, they have an overweight to health care, communication services, energy, IT, and financials. Underweight to real estate, consumer discretionary, industrials, and consumer staples.</p> | 1                    |
| <b>Mondrian</b><br><i>International Equity</i> | <p><b>Returned 8.7%, trailing the MSCI EAFE by 130bps</b></p> <p><i>Detractors:</i> Weakened European manufacturing were negative contributors for German market while uncertainty ahead of the general election in April weighed on the Spanish market. After strong performance in Q4, Telia, the Swedish telecommunications group, lagged due to the weak Swedish krona and the company's anticipation of a more challenging competitive environment. Société Générale, the French bank, declined after full year results indicated weakness in the investment banking division in Q4. The portfolios underweight position in strong materials sectors also held back relative returns.</p> <p><i>Contributors:</i> The portfolio benefited from an overweight to Italy and Hong Kong, along with strong stock selection in Japan and the UK. An overweight to the British pound was also additive for the quarter. In Asia Pacific, portfolio absolute and relative returns benefited from the strong returns of stocks in Japan, including Takeda Pharmaceutical, Fujifilm, and Mitsubishi Electric. Additionally, WH Group, the Hong Kong based meat and packaged food group, rose 39% supported by increased optimism over US-China trade negotiations.</p> <p><i>Positioning:</i> Selective overweight positions in Europe markets and Singapore. Underweight in Australia and France. Overweight sector positioning in communication services, utilities, and energy. Underweight positioning in materials and consumer staples. Portfolio contains between 35 and 55 securities.</p>   | 1                    |



Returns presented are net of investment management fees

# INVESTMENT MANAGER – Q3 FISCAL 2019 COMMENTARY

## NEGATIVE CONTRIBUTORS

|   | Commentary  | Due Diligence Rating |
|---|---|----------------------|
| <b>Hosking</b><br><i>International Equity</i>               | <p><b>Returned 11.1%, trailing the MSCI ACWI Index by 110bps</b></p> <p><i>Detractors:</i> The quarter began well for the portfolio, with a relative gain of close to 200 bps by the last days of January with “value” areas of the markets leading the way. It was short lived as market sentiment went into reverse gear, with the portfolio ending up behind the benchmark. The majority of the portfolio’s relative underperformance came from the country allocation which overshadowed the portfolio’s strong stock selection. Specifically, an underweight to North America proved costly, as did the portfolio’s overweight to emerging markets. Overweight to financials detracted as many of the names held were some of their biggest losses in the portfolio. Underweight healthcare and IT also detracted. The portfolio had an overweight to emerging markets (23% versus 12% in the index) which also detracted.</p> <p><i>Contributors:</i> For the quarter, materials and financials were additive. Within materials, the portfolio benefited from stock selection led by Johannesburg based platinum miner , Sibanye Gold which posted above estimate returns and favorable momentum after reducing its debt levels. The portfolio also benefited from an overweight to materials and an overweight to the Australian dollar.</p> <p><i>Positioning:</i> Portfolio activity remained below long-term average with turnover of less than 2% in the quarter. Notable sales include the Brazilian car rental company, Localiza, which was trimmed following strong gains and a surprising announcement that the business was going through a rights issue to fund organic growth. Other sales included Toyota Industries and in the context of strong recent performance, the platinum miner Sibanye. Portfolio held 496 securities.</p>   | 1                    |
| <b>PIMCO</b><br><b>Unconstrained</b><br><i>Fixed Income</i> | <p><b>Returned 2.1%, trailing the PIMCO Custom Index by 280bps</b></p> <p><i>Detractors:</i> The portfolio was hurt by falling yields in the developed markets. Despite modestly increasing intra-quarter – developed market yields broadly fell, spurred by more accommodative central banks and concerns over decelerating global growth. In the U.S., the 10-year yield declined 28bps to 2.41% – retracing the shift higher during 2018 – and the yield curve partially inverted. German, U.K., and Japanese yields also declined over the quarter. Exposures to the Euro and the Japanese Yen were also detractors for the quarter. In Europe, continued weakness in economic data and dovish ECB rhetoric pushed the euro 2.2% weaker versus the dollar.</p> <p><i>Contributors:</i> Exposures to high yield and external IG EMD was beneficial for the quarter. Global investment grade (IG) credit spreads ended the quarter 26 bps tighter at 115 bps, and the sector returned 4.35% (USD hedged), outperforming relative to like-duration global government bonds by 2.13%. Credit spreads rebounded amid expectations for more accommodative central banks and positive sentiment surrounding perceived progress on US/China trade.</p> <p><i>Positioning:</i> Maintain a defensive overall position on duration with a focus on relative value. They see value in holding U.S. duration given the attractive level of yields and potential downside protection, whilst remaining short duration in Japan, U.K., and the Eurozone. They are looking to selectively invest in corporate credit with a focus on high quality positions. They continue to diversify spread exposures, seeing value in Agency and non-Agency MBS as well as select relative value positions in EM debt. They are long a basket of higher yielding EM currencies, such as the Russian ruble and Argentine peso, while short a basket of lower yielding Asian currencies, such as the Taiwan and Singapore dollars. We are also long the U.S. dollar versus developed market currencies. Effective duration was at 0.65 years with a YTM of 4.25% and average quality of A+.</p> | 1                    |



Returns presented are net of investment management fees

# INVESTMENT MANAGER – Q3 FISCAL 2019 COMMENTARY

## NEGATIVE CONTRIBUTORS

|  | Commentary  | Due Diligence Rating |
|--|---|----------------------|
| <p><b>Grosvenor</b><br/><i>Absolute Return</i></p> | <p><b>Returned 2.6%, trailing the HFRI Fund of Fund Index by 200bps</b></p> <p><i>Detractors:</i> The Fund’s limited directional exposure to broader equity and fixed income markets restricted first quarter gains, as equity markets sharply reversed course. Underperformance within the fund’s relative value allocation was attributable to dedicated fixed income and currency volatility investments (hedging component), as volatility across asset classes collapsed, ultimately reaching historical low levels.</p> <p><i>Contributors:</i> The portfolio experienced positive returns across the majority of its strategies. The equity strategy allocation was the portfolio’s largest contributor, with the Fund’s longer-biased investments performing particularly well. Positive gains were also realized within the Fund’s macro, multi-strategy, credit, and quantitative allocations. Equity strategy gains were driven primarily by regional and sector-specific investments. The outliers in this area included a long-biased healthcare and biotechnology investor, a generalist directional equity manager with an emphasis on technology investments, a long/short specialist focused on Chinese equities, and a European activist fund investment focused on small- and mid-cap stocks. A core investment with a diversified macro manager significantly contributed to first quarter returns. The allocation to the diversified Grosvenor Macro Strategies Fund also contributed. An event-oriented fundamental credit manager was the strategy’s largest contributor. The Fund’s core investment with a fundamental corporate and structured credit manager further contributed to performance. Within the quantitative strategy, the Fund’s investment with GCM Grosvenor’s Quantitative Strategies Fund contributed profits, due to its non-directional quantitative exposure.</p> <p><i>Positioning:</i> GCM believes that current market factors are likely to result in continued and elevated dispersion, which is a primary facet of an improved environment and opportunity set for hedge fund strategies broadly. As a result, the team is prioritizing “difficult-to-access” hedge fund strategies which rely on unique effort and skill on the part of the investment managers, including complex situational investing, process and distressed driven strategies, relative value approaches, and fundamental and quantitative long/short strategies. This also includes strategies and sub-strategies concentrated in sectors and/or geographies which typically require niche and specific expertise in order to source high-quality investments. Moreover, they are holding larger cash positions and investing in liquid strategies in seeking to: i) allow portfolios to capitalize on opportunities that may arise due to dislocations, ii) reduce directional risk in the portfolio.</p> | <p><b>1</b></p>      |



# INVESTMENT MANAGER – Q3 FISCAL 2019 COMMENTARY

## NEGATIVE CONTRIBUTORS

|  | Commentary   | Due Diligence Rating |
|--|--|----------------------|
| <p><b>Pinnacle Natural Resources</b><br/>Absolute Return</p> | <p><b>Returned 3.5%, trailing the Bloomberg Commodity Index by 400bps</b></p> <p><i>Detractors:</i> PNR’s agriculturals/meats exposure experienced losses. PNR’s meats exposure saw gains, which was led by the lean hogs sector. The lean hog market was lower in the first half of the quarter due to higher-than-expected levels of U.S. pork production and ongoing market access restrictions for U.S. pork in key export markets. The grains sector remained in the crosshairs of the trade dispute between the U.S. and China. Corn and soybean prices sharply fell at the end of the quarter after the USDA pegged 2019 U.S. corn plantings to be greater than market expectations and soybean stocks to be at record levels amid uncertainty caused by the U.S.-China trade war. Exposure to softs were slightly negative. Arabica and Robusta coffee prices declined due to a combination of excess global supplies, and favorable weather and currency weakness in Brazil.8 Cocoa prices posted a quarterly loss amid favorable weather conditions and signs of ample supplies as a result of higher-than-expected cocoa arrivals recorded in Ivorian ports.</p> <p><i>Contributors:</i> In Q1, the fund generated a positive net return of 2.30%, where exposure to natural gas/power strategies contributed the most to performance. Exposure to crude oil markets, base metals, and precious metals markets also benefited the Fund. Crude oil prices recovered from worries about a global oversupply in 2018 and the market posted its strongest quarterly price gain since 2009. U.S. sanctions against Iran and Venezuela as well as OPEC-led supply cuts overshadowed concerns over a slowing global economy. PNR’s natural gas/power exposure experienced gains. Henry Hub natural gas prices fell each month of Q1 2019 as the U.S. natural gas market continued to face oversupply. In the EU, gains were driven by power/coal/carbon markets. The base metals market advanced in Q1, as hopes of progress in U.S./China trade talks, low inventories and the outlook for production deficits in some metals lent support. Copper recorded its first quarterly gain since Q4 2017. By the end of the quarter, base metals gains were capped by global recession worries. Gold posted slight gains in the first quarter. The metal initially climbed as the USD retreated following a statement from the Federal Reserve that it would be pausing its monetary tightening cycle and put further interest rate rises on hold as it pointed to rising uncertainty about the economic outlook. By quarter-end, gains were offset by a stronger U.S. Dollar, lower bond yields, and a general rise in investors’ risk appetite. In PGMs, palladium continued its rally due to an ongoing supply deficit and increased demand. Platinum prices were supported by the speculation that its discount price to palladium may incentivize auto makers to start looking to replace palladium in catalytic converters with platinum.</p> | <p><b>1</b></p>      |



# CORRELATION MATRIX

|                          | VPIC Investment Managers |          |         |          |           |          |                  | Indices    |                 |                 |                         |                 |               |                 |                |                   |
|--------------------------|--------------------------|----------|---------|----------|-----------|----------|------------------|------------|-----------------|-----------------|-------------------------|-----------------|---------------|-----------------|----------------|-------------------|
| Manager/<br>Index        | Acadian                  | Aberdeen | Artisan | Hoskings | Champlain | Mondrian | SGA Int'l<br>SCC | S&P<br>500 | Russell<br>3000 | Russell<br>1000 | 60% S&P500<br>40% BCAgg | Russell<br>2000 | LIBOR<br>3Mos | Russell<br>2500 | BBAgg<br>Index | GSCI<br>Commodity |
| Acadian                  | 1.000                    |          |         |          |           |          |                  |            |                 |                 |                         |                 |               |                 |                |                   |
| Aberdeen                 | 0.738                    | 1.000    |         |          |           |          |                  |            |                 |                 |                         |                 |               |                 |                |                   |
| Artisan                  | 0.867                    | 0.652    | 1.000   |          |           |          |                  |            |                 |                 |                         |                 |               |                 |                |                   |
| Hoskings                 | 0.903                    | 0.676    | 0.879   | 1.000    |           |          |                  |            |                 |                 |                         |                 |               |                 |                |                   |
| Champlain                | 0.740                    | 0.565    | 0.812   | 0.822    | 1.000     |          |                  |            |                 |                 |                         |                 |               |                 |                |                   |
| Mondrian                 | 0.887                    | 0.736    | 0.761   | 0.835    | 0.647     | 1.000    |                  |            |                 |                 |                         |                 |               |                 |                |                   |
| SGA Int'l SCC            | 0.939                    | 0.649    | 0.880   | 0.874    | 0.731     | 0.806    | 1.000            |            |                 |                 |                         |                 |               |                 |                |                   |
| S&P 500                  | 0.786                    | 0.574    | 0.835   | 0.892    | 0.903     | 0.742    | 0.747            | 1.000      |                 |                 |                         |                 |               |                 |                |                   |
| Russell 3000             | 0.782                    | 0.551    | 0.841   | 0.888    | 0.927     | 0.719    | 0.752            | 0.995      | 1.000           |                 |                         |                 |               |                 |                |                   |
| Russell 1000             | 0.790                    | 0.569    | 0.843   | 0.894    | 0.917     | 0.736    | 0.754            | 0.999      | 0.998           | 1.000           |                         |                 |               |                 |                |                   |
| 60% S&P 500<br>40% BCAgg | 0.800                    | 0.622    | 0.839   | 0.879    | 0.885     | 0.749    | 0.750            | 0.985      | 0.980           | 0.985           | 1.000                   |                 |               |                 |                |                   |
| Russell 2000             | 0.594                    | 0.314    | 0.697   | 0.712    | 0.875     | 0.463    | 0.618            | 0.816      | 0.868           | 0.838           | 0.793                   | 1.000           |               |                 |                |                   |
| LIBOR 3Mos               | -0.108                   | -0.019   | -0.118  | -0.154   | -0.041    | -0.061   | -0.207           | -0.094     | -0.094          | -0.094          | -0.096                  | -0.088          | 1.000         |                 |                |                   |
| Russell 2500             | 0.675                    | 0.402    | 0.762   | 0.778    | 0.919     | 0.551    | 0.681            | 0.878      | 0.922           | 0.899           | 0.865                   | 0.985           | -0.097        | 1.000           |                |                   |
| BCAgg Index              | 0.034                    | 0.244    | -0.025  | -0.131   | -0.162    | -0.005   | -0.027           | -0.145     | -0.142          | -0.136          | 0.027                   | -0.180          | -0.006        | -0.130          | 1.000          |                   |
| GSCI<br>Commodity        | 0.409                    | 0.255    | 0.308   | 0.331    | 0.413     | 0.397    | 0.395            | 0.318      | 0.326           | 0.324           | 0.276                   | 0.297           | 0.138         | 0.321           | -0.260         | 1.000             |

**Time Period: 5.17 Years (Most Common Period as of 12/31/18)**

Notes:

Correlation data provided by eVestment and is not independently verified by NEPC  
Correlation data is based on fund composite and not VPIC specific



# **ANALYTICS DEFINITIONS**

Asset Allocation Effect - Measures VPIC's ability to effectively allocate their portfolio's assets to various asset classes. The allocation effect determines whether the overweighting or underweighting of asset classes relative to a benchmark contributes positively or negatively to the overall portfolio return. Positive allocation occurs when the portfolio is overweighted in an asset class that outperforms the benchmark. Negative allocation occurs when the portfolio is overweighted in an asset class that underperforms the benchmark and underweighted in an asset class that outperforms the benchmark.

Selection Effect - Measures VPIC's ability to select managers within a given asset class relative to a benchmark. The over or underperformance of the portfolio is weighted by the benchmark weight, therefore, selection is not affected by VPIC's allocation to the asset class. The weight of the manager in the portfolio determines the size of the effect -- the larger the manager, the larger the effect is, positive or negative.

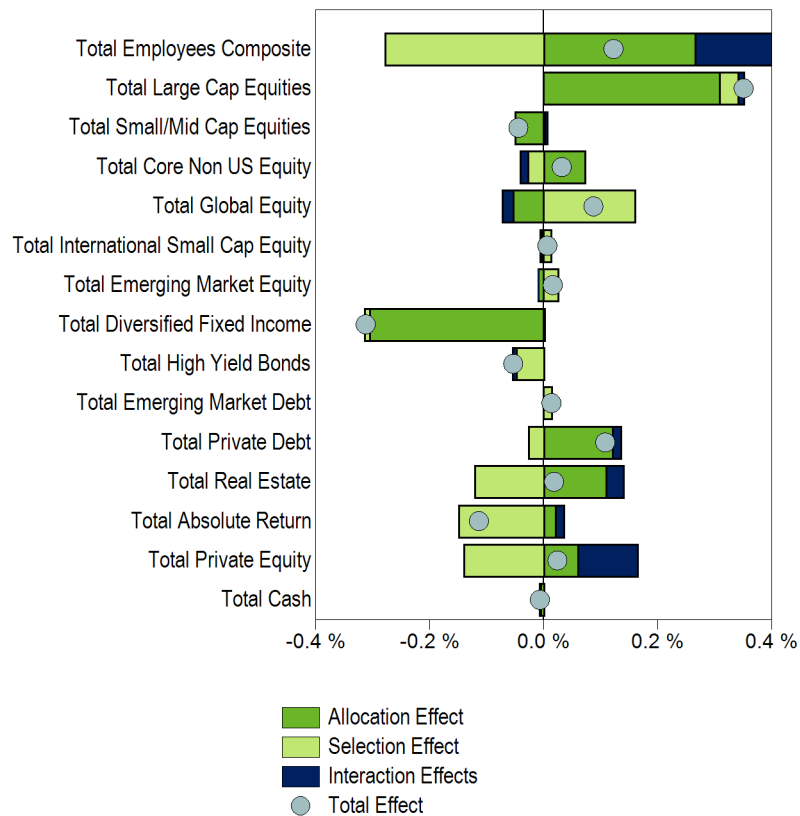
Interaction Effect - The interaction effect measures the combined impact of VPIC's manager selection and manager allocation decisions within an asset class. For example, if VPIC had superior manager selection and overweighted that particular asset class, the interaction effect is positive. If VPIC had superior manager selection, but underweighted that asset class, the interaction effect is negative. In this case, VPIC did not take advantage of the superior manager selection by allocating more assets to that asset class.



## Vermont State Teachers

# TOTAL FUND ATTRIBUTION ANALYSIS - NET

### Attribution Effects Relative to Allocation Index 3 Months Ending March 31, 2019



| Attribution Summary<br>3 Months Ending March 31, 2019 |                    |                   |               |                  |                   |                     |               |
|---|--------------------|-------------------|---------------|------------------|-------------------|---------------------|---------------|
|   | Wtd. Actual Return | Wtd. Index Return | Excess Return | Selection Effect | Allocation Effect | Interaction Effects | Total Effects |
| Total Large Cap Equities                              | 13.9%              | 13.6%             | 0.2%          | 0.0%             | 0.3%              | 0.0%                | 0.4%          |
| Total Small/Mid Cap Equities                          | 16.0%              | 15.8%             | 0.1%          | 0.0%             | 0.0%              | 0.0%                | 0.0%          |
| Total Core Non US Equity                              | 9.7%               | 10.0%             | -0.3%         | 0.0%             | 0.1%              | 0.0%                | 0.0%          |
| Total Global Equity                                   | 14.0%              | 12.2%             | 1.8%          | 0.2%             | -0.1%             | 0.0%                | 0.1%          |
| Total International Small Cap Equity                  | 11.2%              | 10.7%             | 0.5%          | 0.0%             | 0.0%              | 0.0%                | 0.0%          |
| Total Emerging Market Equity                          | 10.7%              | 9.9%              | 0.7%          | 0.0%             | 0.0%              | 0.0%                | 0.0%          |
| Total Diversified Fixed Income                        | 2.9%               | 2.9%              | 0.0%          | 0.0%             | -0.3%             | 0.0%                | -0.3%         |
| Total High Yield Bonds                                | 4.9%               | 7.3%              | -2.4%         | 0.0%             | 0.0%              | 0.0%                | -0.1%         |
| Total Emerging Market Debt                            | 6.9%               | 6.6%              | 0.3%          | 0.0%             | 0.0%              | 0.0%                | 0.0%          |
| Total Private Debt                                    | 3.4%               | 4.0%              | -0.6%         | 0.0%             | 0.1%              | 0.0%                | 0.1%          |
| Total Real Estate                                     | 0.4%               | 1.8%              | -1.4%         | -0.1%            | 0.1%              | 0.0%                | 0.0%          |
| Total Absolute Return                                 | 2.8%               | 4.6%              | -1.8%         | -0.1%            | 0.0%              | 0.0%                | -0.1%         |
| Total Private Equity                                  | 5.2%               | 6.5%              | -1.3%         | -0.1%            | 0.1%              | 0.1%                | 0.0%          |
| Total Cash  | 0.0%               | 0.6%              | -0.6%         | 0.0%             | 0.0%              | 0.0%                | 0.0%          |
| <b>Total</b>  | <b>7.7%</b>        | <b>7.3%</b>       | <b>0.4%</b>   | <b>0.0%</b>      | <b>0.4%</b>       | <b>0.1%</b>         | <b>0.4%</b>   |

Note: Plan attribution calculations are returns based and the results shown reflect the composites shown. As a result, the total returns shown may vary from the calculated returns shown on the performance report

The target return shown for each composite is a custom index, based on aggregated policy indices. This policy index asset weights the underlying policy indices of each option in the plan and the respective benchmark

The allocation, selection, and interaction effects are calculated using the custom index described above along with the policy or target weight of each composite

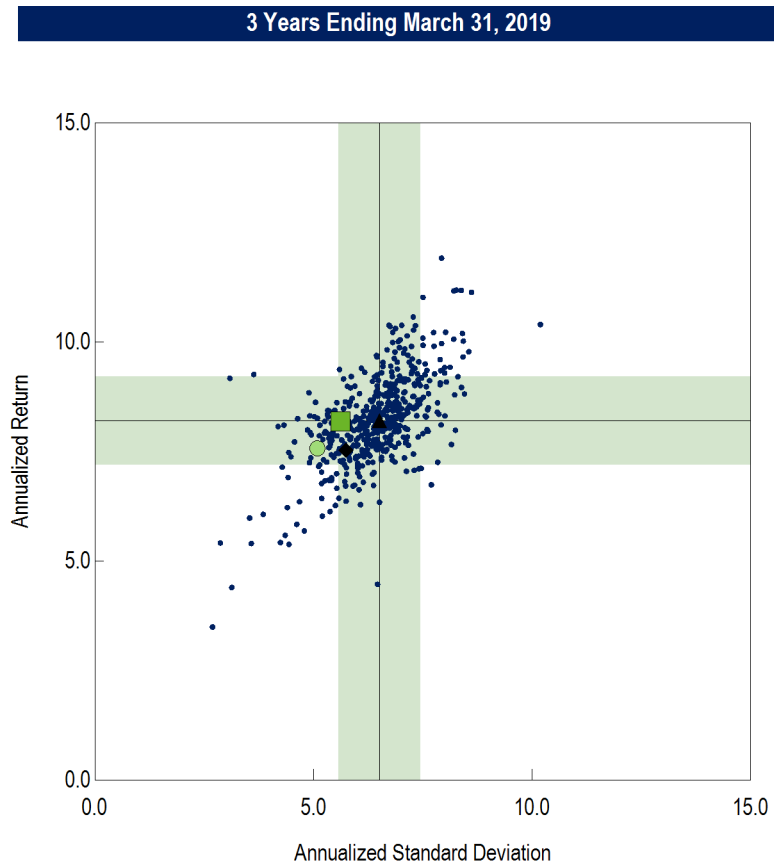
May not add up due to rounding

Absolute Return's Wtd. index Return is calculated using a weighting of the respective benchmarks for each underlying strategy part of the composite



## Vermont State Teachers

# TOTAL FUND RISK/RETURN - NET



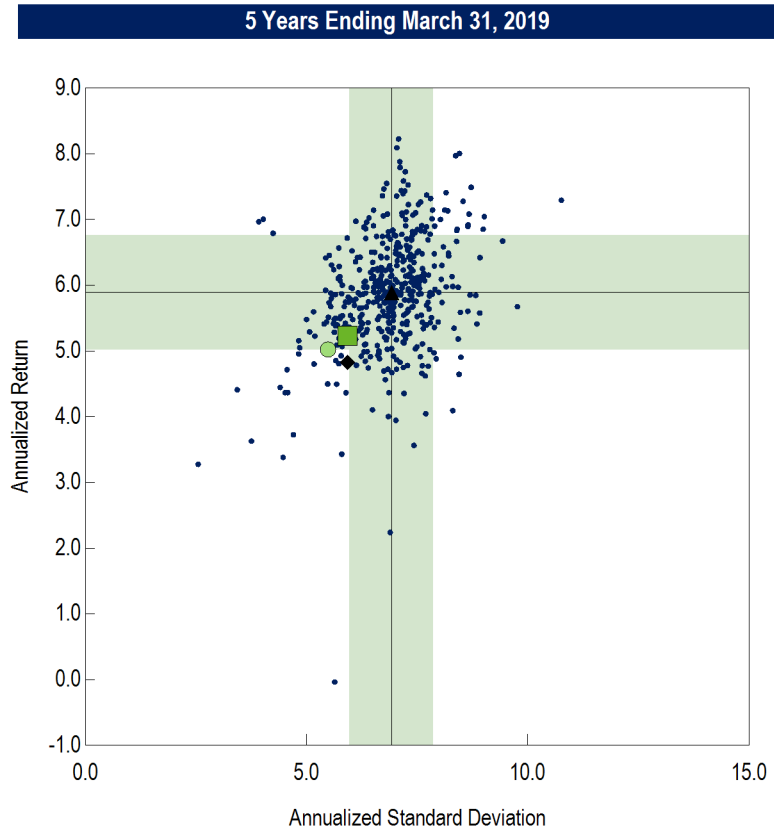
3 Years Ending March 31, 2019

|   | Anlzd Return | Anlzd Return Rank | Anlzd Standard Deviation | Anlzd Standard Deviation Rank | Sharpe Ratio | Sharpe Ratio Rank |
|---|--------------|-------------------|--------------------------|-------------------------------|--------------|-------------------|
| Total Teachers Composite                      | 8.2%         | 50                | 5.6%                     | 17                            | 1.2          | 15                |
| Allocation Index                              | 7.5%         | 80                | 5.7%                     | 20                            | 1.1          | 44                |
| S&P 500                                       | 13.5%        | 1                 | 10.7%                    | 99                            | 1.1          | 29                |
| FTSE WGBI TR                                  | 1.0%         | 99                | 5.6%                     | 16                            | 0.0          | 99                |
| MSCI ACWI                                     | 10.7%        | 1                 | 10.0%                    | 99                            | 0.9          | 90                |
| MSCI ACWI ex USA                              | 8.1%         | 54                | 10.6%                    | 99                            | 0.6          | 99                |
| InvMetrics Public DB < \$5 Billion Net Median | 8.2%         | --                | 6.5%                     | --                            | 1.1          | --                |





# TOTAL FUND RISK/RETURN - NET



- Total Teachers Composite
- ◆ Allocation Index
- Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB < \$5 Billion Net

5 Years Ending March 31, 2019

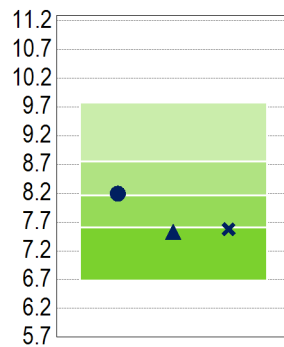
|   | Anlzd Return | Anlzd Return Rank | Anlzd Standard Deviation | Anlzd Standard Deviation Rank | Sharpe Ratio | Sharpe Ratio Rank |
|---|--------------|-------------------|--------------------------|-------------------------------|--------------|-------------------|
| Total Teachers Composite                      | 5.2%         | 81                | 5.9%                     | 16                            | 0.8          | 51                |
| Allocation Index                              | 4.8%         | 91                | 5.9%                     | 16                            | 0.7          | 74                |
| S&P 500                                       | 10.9%        | 1                 | 11.2%                    | 99                            | 0.9          | 11                |
| FTSE WGBI TR                                  | 0.6%         | 99                | 5.3%                     | 5                             | 0.0          | 99                |
| MSCI ACWI                                     | 6.5%         | 23                | 11.1%                    | 99                            | 0.5          | 98                |
| MSCI ACWI ex USA                              | 2.6%         | 99                | 12.0%                    | 99                            | 0.2          | 99                |
| InvMetrics Public DB < \$5 Billion Net Median | 5.9%         | --                | 6.9%                     | --                            | 0.8          | --                |



# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE - NET

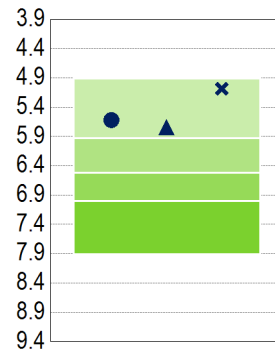
## Teachers Composite vs. InvMetrics Public DB < \$5 Billion Net 3 Years

### Anlzd Return



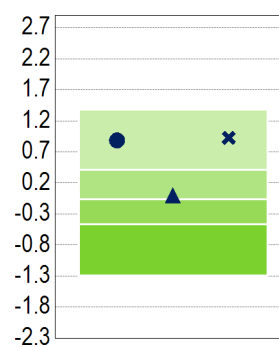
|                            |      |
|----------------------------|------|
| ● Total Teachers Composite |      |
| Value                      | 8.19 |
| Rank                       | 50   |
| ▲ Allocation Index         |      |
| Value                      | 7.53 |
| Rank                       | 80   |
| × Policy Index             |      |
| Value                      | 7.58 |
| Rank                       | 78   |
| Universe                   |      |
| 5th %tile                  | 9.78 |
| 25th %tile                 | 8.77 |
| Median                     | 8.18 |
| 75th %tile                 | 7.62 |
| 95th %tile                 | 6.69 |

### Anlzd Standard Deviation



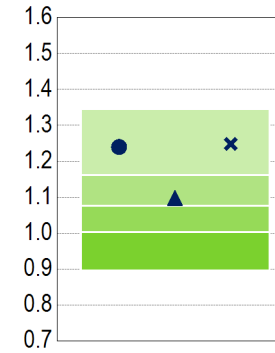
|                            |      |
|----------------------------|------|
| ● Total Teachers Composite |      |
| Value                      | 5.62 |
| Rank                       | 17   |
| ▲ Allocation Index         |      |
| Value                      | 5.74 |
| Rank                       | 20   |
| × Policy Index             |      |
| Value                      | 5.09 |
| Rank                       | 7    |
| Universe                   |      |
| 5th %tile                  | 4.91 |
| 25th %tile                 | 5.92 |
| Median                     | 6.51 |
| 75th %tile                 | 6.99 |
| 95th %tile                 | 7.90 |

### Anlzd Alpha



|                            |       |
|----------------------------|-------|
| ● Total Teachers Composite |       |
| Value                      | 0.88  |
| Rank                       | 16    |
| ▲ Allocation Index         |       |
| Value                      | 0.00  |
| Rank                       | 49    |
| × Policy Index             |       |
| Value                      | 0.93  |
| Rank                       | 15    |
| Universe                   |       |
| 5th %tile                  | 1.38  |
| 25th %tile                 | 0.42  |
| Median                     | -0.06 |
| 75th %tile                 | -0.45 |
| 95th %tile                 | -1.28 |

### Sharpe Ratio



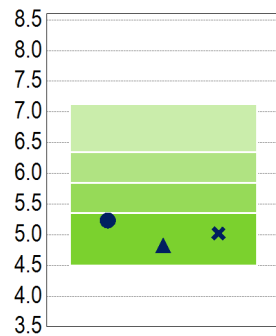
|                            |      |
|----------------------------|------|
| ● Total Teachers Composite |      |
| Value                      | 1.24 |
| Rank                       | 15   |
| ▲ Allocation Index         |      |
| Value                      | 1.10 |
| Rank                       | 44   |
| × Policy Index             |      |
| Value                      | 1.25 |
| Rank                       | 14   |
| Universe                   |      |
| 5th %tile                  | 1.34 |
| 25th %tile                 | 1.16 |
| Median                     | 1.08 |
| 75th %tile                 | 1.01 |
| 95th %tile                 | 0.90 |



# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE - NET

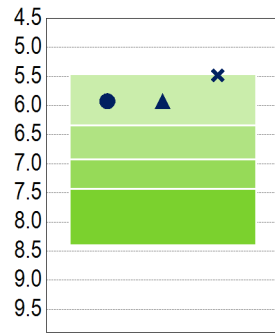
## Teachers Composite vs. InvMetrics Public DB < \$5 Billion Net 5 Years

### Anlzd Return



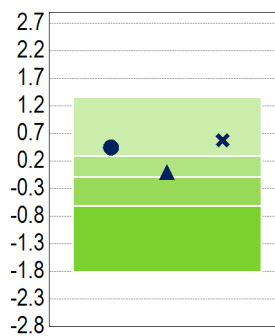
|                            |      |
|----------------------------|------|
| ● Total Teachers Composite |      |
| Value                      | 5.23 |
| Rank                       | 81   |
| ▲ Allocation Index         |      |
| Value                      | 4.83 |
| Rank                       | 91   |
| × Policy Index             |      |
| Value                      | 5.02 |
| Rank                       | 86   |
| Universe                   |      |
| 5th %tile                  | 7.13 |
| 25th %tile                 | 6.36 |
| Median                     | 5.86 |
| 75th %tile                 | 5.36 |
| 95th %tile                 | 4.51 |

### Anlzd Standard Deviation



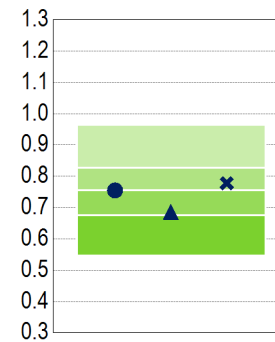
|                            |      |
|----------------------------|------|
| ● Total Teachers Composite |      |
| Value                      | 5.93 |
| Rank                       | 16   |
| ▲ Allocation Index         |      |
| Value                      | 5.93 |
| Rank                       | 16   |
| × Policy Index             |      |
| Value                      | 5.48 |
| Rank                       | 6    |
| Universe                   |      |
| 5th %tile                  | 5.46 |
| 25th %tile                 | 6.33 |
| Median                     | 6.92 |
| 75th %tile                 | 7.42 |
| 95th %tile                 | 8.39 |

### Anlzd Alpha



|                            |       |
|----------------------------|-------|
| ● Total Teachers Composite |       |
| Value                      | 0.45  |
| Rank                       | 20    |
| ▲ Allocation Index         |       |
| Value                      | 0.00  |
| Rank                       | 45    |
| × Policy Index             |       |
| Value                      | 0.58  |
| Rank                       | 17    |
| Universe                   |       |
| 5th %tile                  | 1.36  |
| 25th %tile                 | 0.31  |
| Median                     | -0.08 |
| 75th %tile                 | -0.60 |
| 95th %tile                 | -1.80 |

### Sharpe Ratio



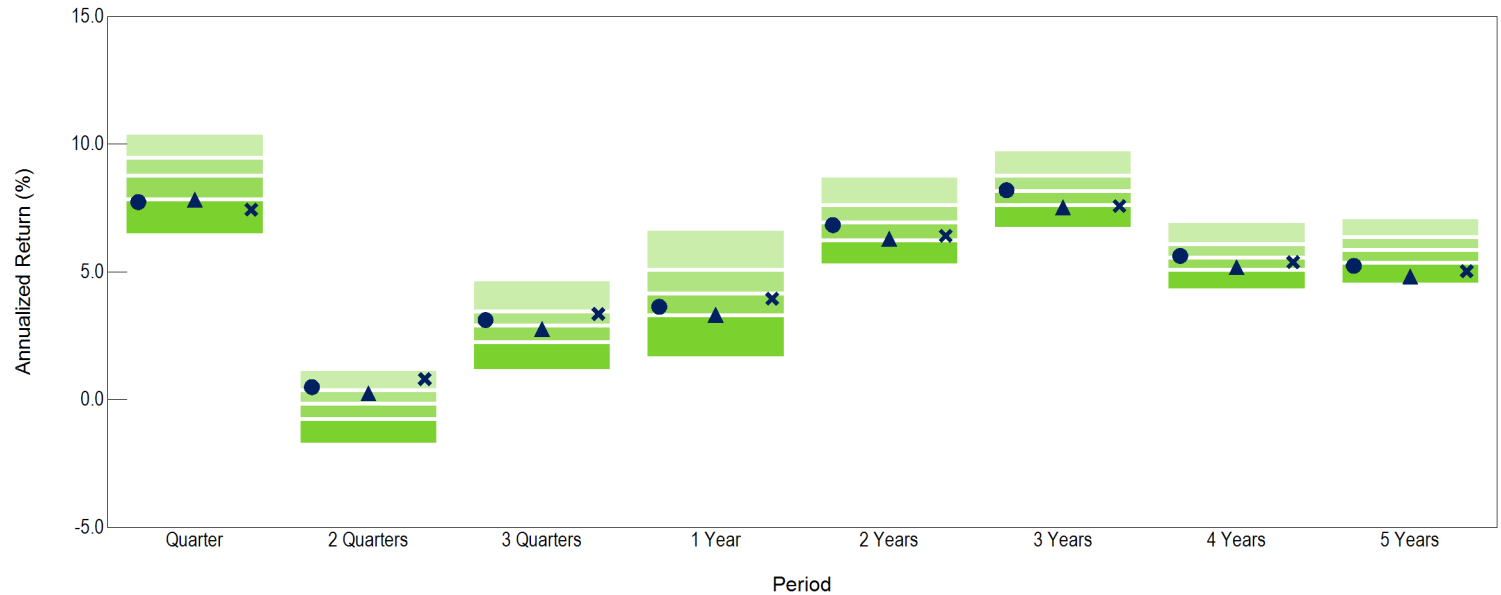
|                            |      |
|----------------------------|------|
| ● Total Teachers Composite |      |
| Value                      | 0.75 |
| Rank                       | 51   |
| ▲ Allocation Index         |      |
| Value                      | 0.69 |
| Rank                       | 74   |
| × Policy Index             |      |
| Value                      | 0.78 |
| Rank                       | 44   |
| Universe                   |      |
| 5th %tile                  | 0.96 |
| 25th %tile                 | 0.83 |
| Median                     | 0.76 |
| 75th %tile                 | 0.68 |
| 95th %tile                 | 0.55 |



Vermont State Teachers

# TOTAL FUND RETURN SUMMARY VS. PEER UNIVERSE - NET

Total Teachers Composite vs. InvMetrics Public DB < \$5 Billion Net



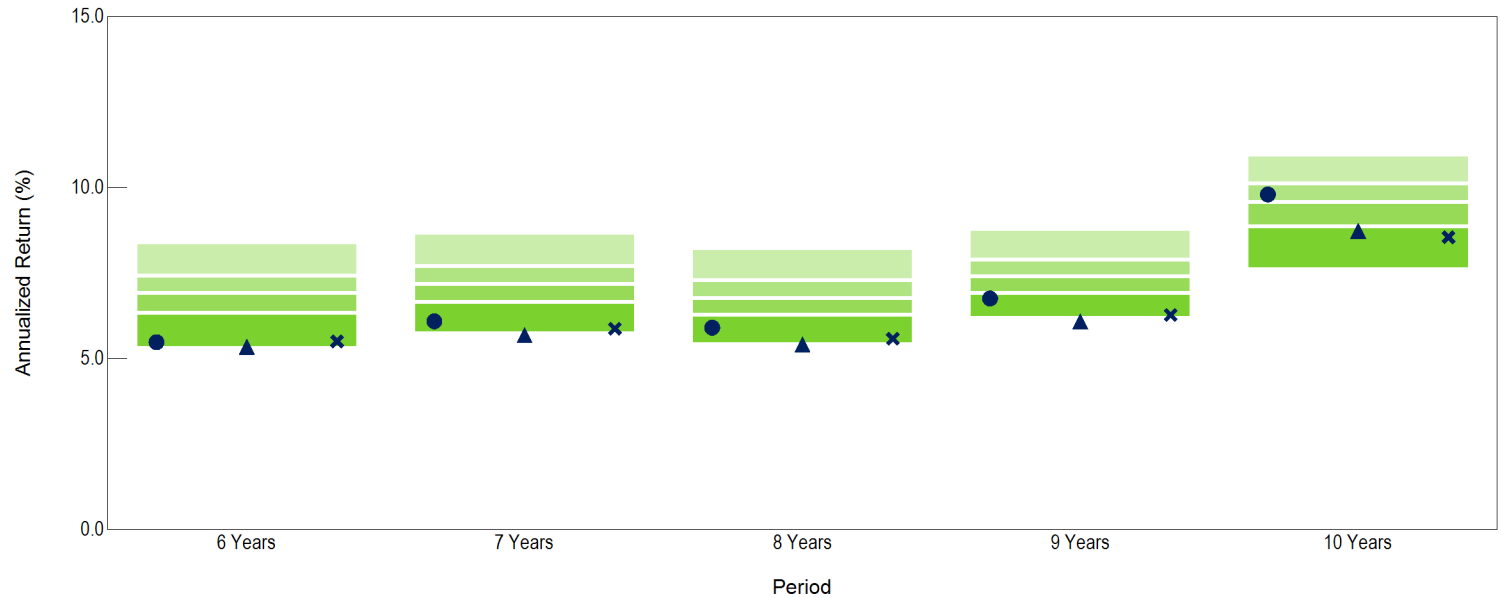
|                            | Return (Rank) |            |            |          |          |          |          |          |  |  |
|----------------------------|---------------|------------|------------|----------|----------|----------|----------|----------|--|--|
|                            | Quarter       | 2 Quarters | 3 Quarters | 1 Year   | 2 Years  | 3 Years  | 4 Years  | 5 Years  |  |  |
| 5th Percentile             | 10.4          | 1.2        | 4.7        | 6.7      | 8.7      | 9.8      | 7.0      | 7.1      |  |  |
| 25th Percentile            | 9.5           | 0.4        | 3.5        | 5.1      | 7.6      | 8.8      | 6.1      | 6.4      |  |  |
| Median                     | 8.8           | -0.1       | 2.9        | 4.2      | 7.0      | 8.2      | 5.6      | 5.9      |  |  |
| 75th Percentile            | 7.8           | -0.7       | 2.3        | 3.3      | 6.3      | 7.6      | 5.1      | 5.4      |  |  |
| 95th Percentile            | 6.4           | -1.8       | 1.1        | 1.6      | 5.3      | 6.7      | 4.3      | 4.5      |  |  |
| # of Portfolios            | 525           | 522        | 522        | 521      | 512      | 507      | 478      | 463      |  |  |
| ● Total Teachers Composite | 7.7 (78)      | 0.5 (23)   | 3.1 (41)   | 3.6 (67) | 6.8 (55) | 8.2 (50) | 5.6 (47) | 5.2 (81) |  |  |
| ▲ Allocation Index         | 7.8 (76)      | 0.2 (30)   | 2.8 (57)   | 3.3 (75) | 6.3 (74) | 7.5 (80) | 5.2 (72) | 4.8 (91) |  |  |
| × Policy Index             | 7.4 (85)      | 0.8 (11)   | 3.4 (31)   | 3.9 (57) | 6.4 (69) | 7.6 (78) | 5.4 (60) | 5.0 (86) |  |  |



Vermont State Teachers

# TOTAL FUND RETURN SUMMARY VS. PEER UNIVERSE - NET

Total Teachers Composite vs. InvMetrics Public DB < \$5 Billion Net



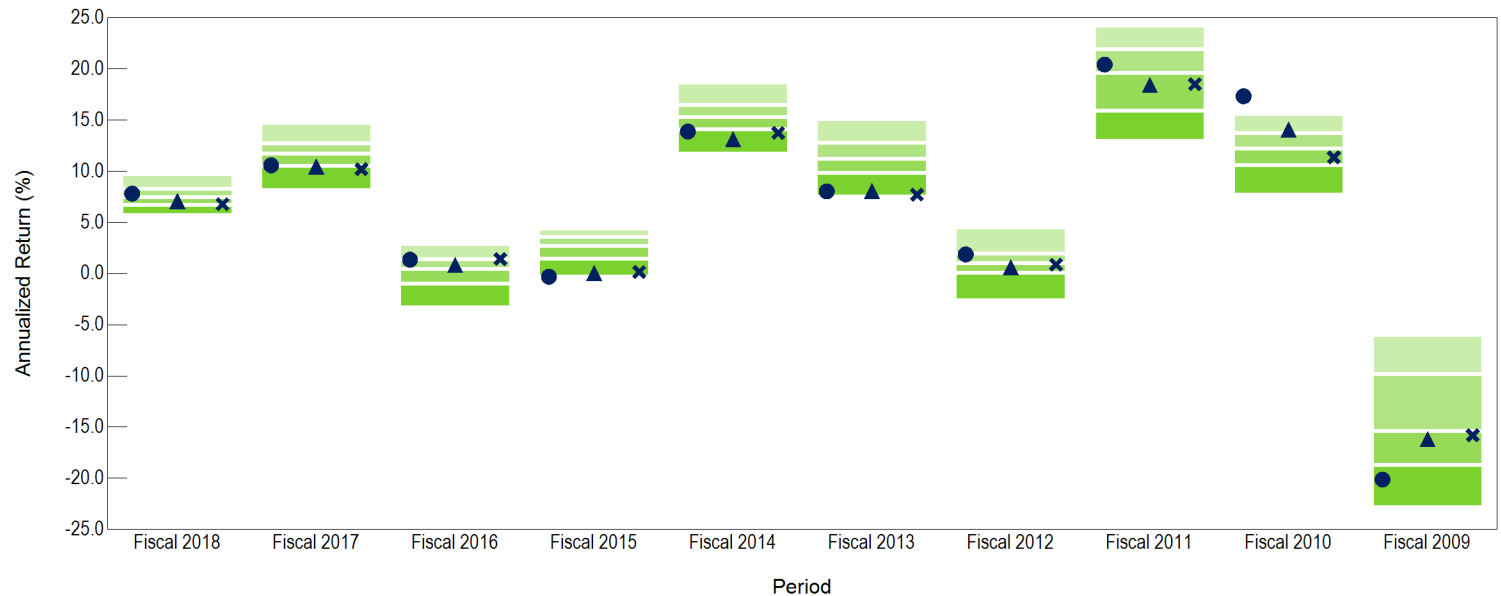
|                            | Return (Rank) |          |          |          |          |
|----------------------------|---------------|----------|----------|----------|----------|
|                            | 6 Years       | 7 Years  | 8 Years  | 9 Years  | 10 Years |
| 5th Percentile             | 8.4           | 8.7      | 8.2      | 8.8      | 11.0     |
| 25th Percentile            | 7.4           | 7.7      | 7.3      | 7.9      | 10.1     |
| Median                     | 6.9           | 7.2      | 6.8      | 7.4      | 9.6      |
| 75th Percentile            | 6.4           | 6.7      | 6.3      | 6.9      | 8.9      |
| 95th Percentile            | 5.3           | 5.7      | 5.4      | 6.2      | 7.6      |
| # of Portfolios            | 450           | 434      | 412      | 399      | 385      |
| ● Total Teachers Composite | 5.5 (94)      | 6.1 (92) | 5.9 (88) | 6.8 (83) | 9.8 (38) |
| ▲ Allocation Index         | 5.3 (95)      | 5.7 (96) | 5.4 (96) | 6.1 (96) | 8.7 (80) |
| × Policy Index             | 5.5 (94)      | 5.9 (94) | 5.6 (94) | 6.3 (95) | 8.5 (84) |



Vermont State Teachers

# TOTAL FUND RETURN SUMMARY VS. PEER UNIVERSE - NET

Total Teachers Composite vs. InvMetrics Public DB < \$5 Billion Net

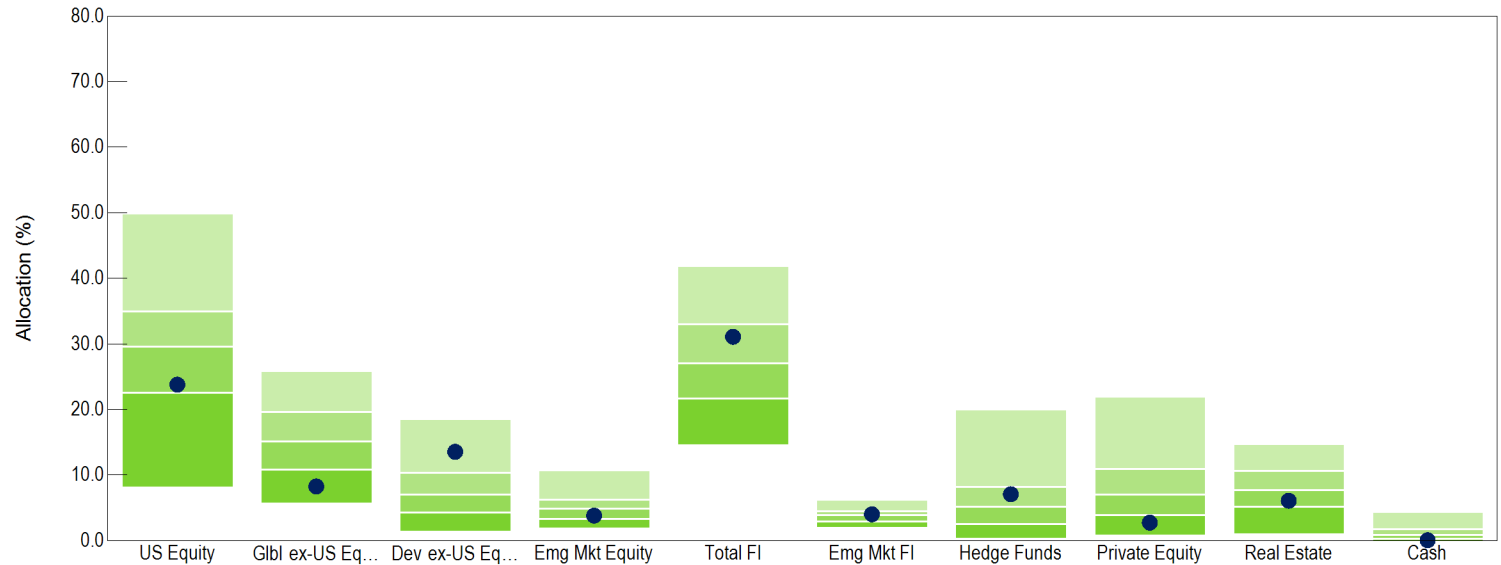


|                            | Return (Rank) |             |             |             |             |             |             |             |             |             |
|----------------------------|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                            | Fiscal 2018   | Fiscal 2017 | Fiscal 2016 | Fiscal 2015 | Fiscal 2014 | Fiscal 2013 | Fiscal 2012 | Fiscal 2011 | Fiscal 2010 | Fiscal 2009 |
| 5th Percentile             | 9.7           | 14.7        | 2.8         | 4.4         | 18.6        | 15.1        | 4.5         | 24.2        | 15.5        | -6.0        |
| 25th Percentile            | 8.3           | 12.8        | 1.4         | 3.6         | 16.5        | 12.8        | 2.0         | 21.9        | 13.7        | -9.8        |
| Median                     | 7.5           | 11.7        | 0.5         | 2.7         | 15.3        | 11.2        | 1.0         | 19.6        | 12.3        | -15.3       |
| 75th Percentile            | 6.7           | 10.6        | -0.9        | 1.5         | 14.1        | 9.9         | 0.1         | 15.9        | 10.6        | -18.7       |
| 95th Percentile            | 5.7           | 8.2         | -3.3        | -0.2        | 11.7        | 7.5         | -2.6        | 13.0        | 7.7         | -22.8       |
| # of Portfolios            | 186           | 259         | 239         | 212         | 156         | 139         | 132         | 124         | 116         | 113         |
| ● Total Teachers Composite | 7.8 (40)      | 10.6 (75)   | 1.3 (27)    | -0.3 (96)   | 13.9 (82)   | 8.0 (95)    | 1.9 (29)    | 20.4 (39)   | 17.3 (1)    | -20.1 (85)  |
| ▲ Allocation Index         | 7.1 (67)      | 10.4 (78)   | 0.8 (38)    | 0.0 (95)    | 13.1 (91)   | 8.0 (95)    | 0.6 (62)    | 18.4 (62)   | 14.0 (18)   | -16.2 (56)  |
| × Policy Index             | 6.8 (75)      | 10.2 (81)   | 1.4 (25)    | 0.1 (94)    | 13.7 (83)   | 7.7 (95)    | 0.9 (55)    | 18.5 (60)   | 11.3 (65)   | -15.8 (54)  |



# TOTAL FUND ALLOCATION VS. PEER UNIVERSE - NET

Total Employees Composite vs. InvMetrics Public DB < \$5 Billion Net  
As of March 31, 2019



|                             | Allocation (Rank) |      |      |      |      |      |      |      |      |      |     |      |     |      |     |      |     |      |     |      |
|-----------------------------|-------------------|------|------|------|------|------|------|------|------|------|-----|------|-----|------|-----|------|-----|------|-----|------|
| 5th Percentile              | 49.9              | 25.9 | 18.5 | 10.8 | 41.9 | 6.3  | 20.0 | 21.9 | 14.7 | 4.4  | -   | -    | -   | -    | -   | -    | -   | -    | -   | -    |
| 25th Percentile             | 35.0              | 19.7 | 10.4 | 6.3  | 33.1 | 4.6  | 8.3  | 11.0 | 10.8 | 1.8  | -   | -    | -   | -    | -   | -    | -   | -    | -   | -    |
| Median                      | 29.7              | 15.2 | 7.1  | 4.9  | 27.2 | 4.0  | 5.3  | 7.1  | 7.9  | 1.0  | -   | -    | -   | -    | -   | -    | -   | -    | -   | -    |
| 75th Percentile             | 22.7              | 11.0 | 4.4  | 3.4  | 21.8 | 3.1  | 2.6  | 4.0  | 5.2  | 0.4  | -   | -    | -   | -    | -   | -    | -   | -    | -   | -    |
| 95th Percentile             | 8.2               | 5.7  | 1.5  | 2.0  | 14.6 | 2.0  | 0.4  | 0.9  | 1.1  | 0.0  | -   | -    | -   | -    | -   | -    | -   | -    | -   | -    |
| # of Portfolios             | 148               | 187  | 94   | 109  | 228  | 32   | 74   | 108  | 149  | 214  | -   | -    | -   | -    | -   | -    | -   | -    | -   | -    |
| • Total Employees Composite | 23.8              | (70) | 8.3  | (90) | 13.5 | (17) | 3.8  | (64) | 31.1 | (36) | 4.0 | (47) | 7.1 | (30) | 2.7 | (85) | 6.1 | (66) | 0.1 | (91) |



# REAL ESTATE PERFORMANCE ANALYSIS (AS OF 12/31/2018)

| Investment Name                                      | Vintage Year | Commitment Amount  | QTD         | YTD          | 1 Year       | 3 Year       | 5 Year | Inception    |
|--|--------------|--------------------|-------------|--------------|--------------|--------------|--------|--------------|
| Brookfield Strategic Real Estate Partners III, L.P.  | 2017         | 100,000,000        |             |              |              |              |        |              |
| Siguler Guff Distressed Real Estate Opportunities II | 2014         | 40,000,000         | 2.36        | 10.41        | 10.41        | 13.72        |        | 11.32        |
| Siguler Guff DREOF II Co-Investment                  | 2016         | 15,000,000         | 6.32        | 10.18        | 10.18        |              |        | 14.47        |
| <b>Total: State of Vermont</b>                       |              | <b>155,000,000</b> | <b>3.61</b> | <b>10.34</b> | <b>10.34</b> | <b>13.86</b> |        | <b>11.78</b> |

| Investment Name  | Fund Type        | Vintage Year | Commitment Amount  | Paid in Capital   | Capital to be Funded | Additional Fees | Cumulative Distributions | Valuation         | Total Value       | Net Benefit       | Call Ratio | DPI Ratio   | TVPI Ratio  | IRR           |
|--|------------------|--------------|--------------------|-------------------|----------------------|-----------------|--------------------------|-------------------|-------------------|-------------------|------------|-------------|-------------|---------------|
| 1 Siguler Guff Distressed Real Estate Opportunities II | RE Opportunistic | 2014         | 40,000,000         | 33,420,000        | 6,580,000            | 0               | 17,510,817               | 29,341,403        | 46,852,220        | 13,432,220        | 84%        | 0.52        | 1.40        | 11.32%        |
| 2 Siguler Guff DREOF II Co-Investment                  | RE Opportunistic | 2016         | 15,000,000         | 12,322,717        | 2,677,283            | 0               | 583,381                  | 15,061,704        | 15,645,085        | 3,322,368         | 82%        | 0.05        | 1.27        | 14.47%        |
| 3 Brookfield Strategic Real Estate Partners III, L.P.  | RE Opportunistic | 2017         | 100,000,000        | 0                 | 100,000,000          | 0               | 0                        |                   | 0                 | 0                 | 0%         | 0.00        | 0.00        | N/A           |
| <b>Total: State of Vermont</b>                         |                  |              | <b>155,000,000</b> | <b>45,742,717</b> | <b>109,257,283</b>   | <b>0</b>        | <b>18,094,198</b>        | <b>44,403,107</b> | <b>62,497,305</b> | <b>16,754,588</b> | <b>30%</b> | <b>0.40</b> | <b>1.37</b> | <b>11.78%</b> |





# REAL ESTATE PERFORMANCE ANALYSIS (AS OF 12/31/2018)

| Investment   | Index Set Name | Cumulative Contributions | Cumulative Distributions | Adjusted Valuation | Valuation ICM     | Valuation Spread | IRR          | IRR ICM     | IRR Spread  |
|--|----------------|--------------------------|--------------------------|--------------------|-------------------|------------------|--------------|-------------|-------------|
| Brookfield Strategic Real Estate Partners III, L.P.  | FTSE NAREIT    |                          | 0                        |                    |                   |                  | 0.00         | 0.00        | 0.00        |
| Siguler Guff Distressed Real Estate Opportunities II | FTSE NAREIT    | 33,420,000               | 17,510,817               | 29,341,403         | 22,579,961        | 6,761,442        | 11.32        | 5.73        | 5.59        |
| Siguler Guff DREOF II Co-Investment                  | FTSE NAREIT    | 12,322,717               | 583,381                  | 15,061,704         | 12,790,408        | 2,271,296        | 14.47        | 3.98        | 10.49       |
| <b>Total: State of Vermont</b>                       |                | <b>45,742,717</b>        | <b>18,094,198</b>        | <b>44,403,107</b>  | <b>35,370,369</b> | <b>9,032,738</b> | <b>11.78</b> | <b>5.45</b> | <b>6.33</b> |



# PRIVATE DEBT PERFORMANCE ANALYSIS (AS OF 12/31/2018)

| Investment Name  | Vintage Year | Commitment Amount  | QTD          | YTD         | 1 Year      | 3 Year | 5 Year | Inception   |
|--|--------------|--------------------|--------------|-------------|-------------|--------|--------|-------------|
| Benefit Street Partners Senior Secured Opportunites Fund, LP | 2017         | 70,000,000         | -2.50        | 1.69        | 1.69        |        |        | 3.17        |
| BlueBay Direct Lending Fund III                              | 2017         | 70,000,000         | 2.58         |             |             |        |        | 3.59        |
| <b>Total: State of Vermont</b>                               |              | <b>140,000,000</b> | <b>-1.52</b> | <b>2.27</b> | <b>2.27</b> |        |        | <b>3.59</b> |

| Investment Name  | Vintage Year | Commitment Amount  | Paid in Capital   | Capital to be Funded | Additional Fees  | Cumulative Distributions | Valuation         | Total Value       | Net Benefit      | Call Ratio | DPI Ratio   | TVPI Ratio  | IRR          |
|--|--------------|--------------------|-------------------|----------------------|------------------|--------------------------|-------------------|-------------------|------------------|------------|-------------|-------------|--------------|
| 1 Benefit Street Partners Senior Secured Opportunites Fund, LP | 2017         | 70,000,000         | 57,824,952        | 12,175,048           | 1,333,567        | 2,927,326                | 57,719,727        | 60,647,053        | 1,488,534        | 83%        | 0.05        | 1.03        | 3.17%        |
| 2 BlueBay Direct Lending Fund III                              | 2017         | 70,000,000         | 14,708,418        | 55,291,582           | 0                | 196,136                  | 14,923,651        | 15,119,787        | 411,369          | 21%        | 0.01        | 1.03        | 3.59%        |
| <b>Total: State of Vermont</b>                                 |              | <b>140,000,000</b> | <b>72,533,370</b> | <b>67,466,630</b>    | <b>1,333,567</b> | <b>3,123,462</b>         | <b>72,643,378</b> | <b>75,766,840</b> | <b>1,899,903</b> | <b>52%</b> | <b>0.04</b> | <b>1.03</b> | <b>3.59%</b> |



# PRIVATE DEBT PERFORMANCE ANALYSIS (AS OF 12/31/2018)

| Investment   | Index Set Name                  | Cumulative Contributions | Cumulative Distributions | Adjusted Valuation | Valuation ICM     | Valuation Spread | IRR         | IRR ICM     | IRR Spread  |
|--|---------------------------------|--------------------------|--------------------------|--------------------|-------------------|------------------|-------------|-------------|-------------|
| Benefit Street Partners Senior Secured Opportunites Fund, LP | BC US Agg Total Return Unhedged | 59,158,519               | 2,927,326                | 57,719,727         | 56,862,110        | 857,617          | 3.17        | 1.34        | 1.83        |
| BlueBay Direct Lending Fund III                              | BC US Agg Total Return Unhedged | 14,708,418               | 196,136                  | 14,923,651         | 14,799,030        | 124,621          | 3.59        | 2.50        | 1.09        |
| <b>Total: State of Vermont</b>                               |                                 | <b>73,866,937</b>        | <b>3,123,462</b>         | <b>72,643,378</b>  | <b>71,661,140</b> | <b>982,238</b>   | <b>3.59</b> | <b>1.73</b> | <b>1.86</b> |



# PRIVATE EQUITY PERFORMANCE ANALYSIS (AS OF 12/31/2018)

| Investment Name                              | Vintage Year | Commitment Amount  | QTD          | YTD          | 1 Year       | 3 Year       | 5 Year       | Inception    |
|--|--------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| HarbourVest Partners Dover Street VIII       | 2012         | 25,000,000         | -5.10        | 8.94         | 8.94         | 12.14        | 16.14        | 20.64        |
| HarbourVest Partners IX-Buyout               | 2012         | 24,000,000         | 0.63         | 16.21        | 16.21        | 18.63        | 17.21        | 17.01        |
| HarbourVest Partners IX-Credit Opportunities | 2012         | 4,000,000          | -0.76        | 7.98         | 7.98         | 13.16        | 12.08        | 13.84        |
| HarbourVest Partners IX-Venture              | 2012         | 12,000,000         | 4.77         | 24.32        | 24.32        | 13.89        | 16.52        | 17.13        |
| HarbourVest HIPEP VII                        | 2014         | 15,000,000         | -4.50        | 8.30         | 8.30         | 12.65        |              | 12.35        |
| HarbourVest Partners X Buyout Fund           | 2015         | 45,500,000         | -1.47        | 13.66        | 13.66        | 22.98        |              | 23.71        |
| HarbourVest Partners X Venture Fund          | 2015         | 19,500,000         | -2.37        | 13.89        | 13.89        | 20.67        |              | 20.20        |
| HarbourVest Partners Dover Street IX         | 2016         | 40,000,000         | -3.12        | 19.19        | 19.19        |              |              | 37.19        |
| HarbourVest HIPEP VIII                       | 2017         | 60,000,000         | -1.70        |              |              |              |              | 26.84        |
| HarbourVest Partners Co-Investment Fund V    | 2018         | 25,000,000         |              |              |              |              |              |              |
| HarbourVest Partners XI Buyout Fund          | 2018         | 75,000,000         |              |              |              |              |              |              |
| HarbourVest Partners XI Micro Buyout         | 2018         | 12,500,000         |              |              |              |              |              |              |
| HarbourVest Partners XI Venture Fund         | 2018         | 37,500,000         |              |              |              |              |              |              |
| <b>Total: State of Vermont</b>               |              | <b>395,000,000</b> | <b>-1.41</b> | <b>16.20</b> | <b>16.20</b> | <b>17.54</b> | <b>17.99</b> | <b>19.26</b> |



# PRIVATE EQUITY PERFORMANCE ANALYSIS (AS OF 12/31/2018)

| Investment Name                                | Vintage Year | Commitment Amount  | Paid in Capital    | Capital to be Funded | Additional Fees | Cumulative Distributions | Valuation          | Total Value        | Net Benefit       | Call Ratio | DPI Ratio   | TVPI Ratio  | IRR           |
|--|--------------|--------------------|--------------------|----------------------|-----------------|--------------------------|--------------------|--------------------|-------------------|------------|-------------|-------------|---------------|
| 1 HarbourVest HIPEP VII                        | 2014         | 15,000,000         | 9,337,500          | 5,662,500            | 0               | 1,398,851                | 10,106,393         | 11,505,244         | 2,167,744         | 62%        | 0.15        | 1.23        | 12.35%        |
| 2 HarbourVest HIPEP VIII                       | 2017         | 60,000,000         | 9,000,000          | 51,000,000           | 0               | 335,610                  | 10,145,704         | 10,481,314         | 1,481,314         | 15%        | 0.04        | 1.16        | 26.84%        |
| 3 HarbourVest Partners Co-Investment Fund V    | 2018         | 25,000,000         | 0                  | 25,000,000           | 0               | 0                        |                    | 0                  | 0                 | 0%         | 0.00        | 0.00        | N/A           |
| 4 HarbourVest Partners Dover Street IX         | 2016         | 40,000,000         | 21,200,000         | 18,800,000           | 0               | 4,854,677                | 21,695,489         | 26,550,166         | 5,350,166         | 53%        | 0.23        | 1.25        | 37.19%        |
| 5 HarbourVest Partners Dover Street VIII       | 2012         | 25,000,000         | 22,500,000         | 2,500,000            | 0               | 24,674,817               | 9,917,872          | 34,592,689         | 12,092,689        | 90%        | 1.10        | 1.54        | 20.64%        |
| 6 HarbourVest Partners IX-Buyout               | 2012         | 24,000,000         | 18,060,000         | 5,940,000            | 47,188          | 12,899,920               | 15,785,192         | 28,685,112         | 10,577,924        | 75%        | 0.71        | 1.58        | 17.01%        |
| 7 HarbourVest Partners IX-Credit Opportunities | 2012         | 4,000,000          | 2,700,000          | 1,300,000            | 10,265          | 1,608,311                | 2,321,738          | 3,930,049          | 1,219,784         | 68%        | 0.59        | 1.45        | 13.84%        |
| 8 HarbourVest Partners IX-Venture              | 2012         | 12,000,000         | 11,400,000         | 600,000              | 37,671          | 5,226,167                | 14,222,649         | 19,448,816         | 8,011,145         | 95%        | 0.46        | 1.70        | 17.13%        |
| 9 HarbourVest Partners X Buyout Fund           | 2015         | 45,500,000         | 14,105,000         | 31,395,000           | 2,787           | 2,856,881                | 15,291,812         | 18,148,693         | 4,040,906         | 31%        | 0.20        | 1.29        | 23.71%        |
| 10 HarbourVest Partners X Venture Fund         | 2015         | 19,500,000         | 9,993,750          | 9,506,250            | 1,672           | 751,439                  | 11,657,491         | 12,408,930         | 2,413,508         | 51%        | 0.08        | 1.24        | 20.20%        |
| 11 HarbourVest Partners XI Buyout Fund         | 2018         | 75,000,000         | 0                  | 75,000,000           | 0               | 0                        |                    | 0                  | 0                 | 0%         | 0.00        | 0.00        | N/A           |
| 12 HarbourVest Partners XI Micro Buyout        | 2018         | 12,500,000         | 0                  | 12,500,000           | 0               | 0                        |                    | 0                  | 0                 | 0%         | 0.00        | 0.00        | N/A           |
| 13 HarbourVest Partners XI Venture Fund        | 2018         | 37,500,000         | 0                  | 37,500,000           | 0               | 0                        |                    | 0                  | 0                 | 0%         | 0.00        | 0.00        | N/A           |
| <b>Total: State of Vermont</b>                 |              | <b>395,000,000</b> | <b>118,296,250</b> | <b>276,703,750</b>   | <b>99,583</b>   | <b>54,606,673</b>        | <b>111,144,340</b> | <b>165,751,013</b> | <b>47,355,180</b> | <b>30%</b> | <b>0.46</b> | <b>1.40</b> | <b>19.26%</b> |



# PRIVATE EQUITY PERFORMANCE ANALYSIS (AS OF 12/31/2018)

| Investment                                   | Index Set Name       | Cumulative Contributions | Cumulative Distributions | Adjusted Valuation | Valuation ICM     | Valuation Spread  | IRR          | IRR ICM     | IRR Spread   |
|--|----------------------|--------------------------|--------------------------|--------------------|-------------------|-------------------|--------------|-------------|--------------|
| HarbourVest HIPEP VII                        | S&P 500 Total Return | 9,337,500                | 1,398,851                | 10,106,393         | 9,049,225         | 1,057,168         | 12.35        | 6.64        | 5.71         |
| HarbourVest HIPEP VIII                       | S&P 500 Total Return | 9,000,000                | 335,610                  | 10,145,704         | 8,243,717         | 1,901,987         | 26.84        | -7.54       | 34.38        |
| HarbourVest Partners Co-Investment Fund V    | S&P 500 Total Return |                          | 0                        |                    |                   |                   | 0.00         | 0.00        | 0.00         |
| HarbourVest Partners Dover Street IX         | S&P 500 Total Return | 21,200,000               | 4,854,677                | 21,695,489         | 16,154,418        | 5,541,071         | 37.19        | -1.42       | 38.61        |
| HarbourVest Partners Dover Street VIII       | S&P 500 Total Return | 22,500,000               | 24,674,817               | 9,917,872          | 3,799,018         | 6,118,854         | 20.64        | 12.41       | 8.23         |
| HarbourVest Partners IX-Buyout               | S&P 500 Total Return | 18,107,188               | 12,899,920               | 15,785,192         | 11,588,929        | 4,196,263         | 17.01        | 10.88       | 6.13         |
| HarbourVest Partners IX-Credit Opportunities | S&P 500 Total Return | 2,710,265                | 1,608,311                | 2,321,738          | 1,980,297         | 341,441           | 13.84        | 10.64       | 3.20         |
| HarbourVest Partners IX-Venture              | S&P 500 Total Return | 11,437,671               | 5,226,167                | 14,222,649         | 10,311,502        | 3,911,147         | 17.13        | 10.10       | 7.03         |
| HarbourVest Partners X Buyout Fund           | S&P 500 Total Return | 14,107,787               | 2,856,881                | 15,291,812         | 12,007,317        | 3,284,495         | 23.71        | 4.88        | 18.83        |
| HarbourVest Partners X Venture Fund          | S&P 500 Total Return | 9,995,422                | 751,439                  | 11,657,491         | 9,535,491         | 2,122,000         | 20.20        | 2.61        | 17.59        |
| HarbourVest Partners XI Buyout Fund          | S&P 500 Total Return |                          | 0                        |                    |                   |                   | 0.00         | 0.00        | 0.00         |
| HarbourVest Partners XI Micro Buyout         | S&P 500 Total Return |                          | 0                        |                    |                   |                   | 0.00         | 0.00        | 0.00         |
| HarbourVest Partners XI Venture Fund         | S&P 500 Total Return |                          | 0                        |                    |                   |                   | 0.00         | 0.00        | 0.00         |
| <b>Total: State of Vermont</b>               |                      | <b>118,395,833</b>       | <b>54,606,673</b>        | <b>111,144,340</b> | <b>82,669,914</b> | <b>28,474,426</b> | <b>19.26</b> | <b>8.93</b> | <b>10.33</b> |

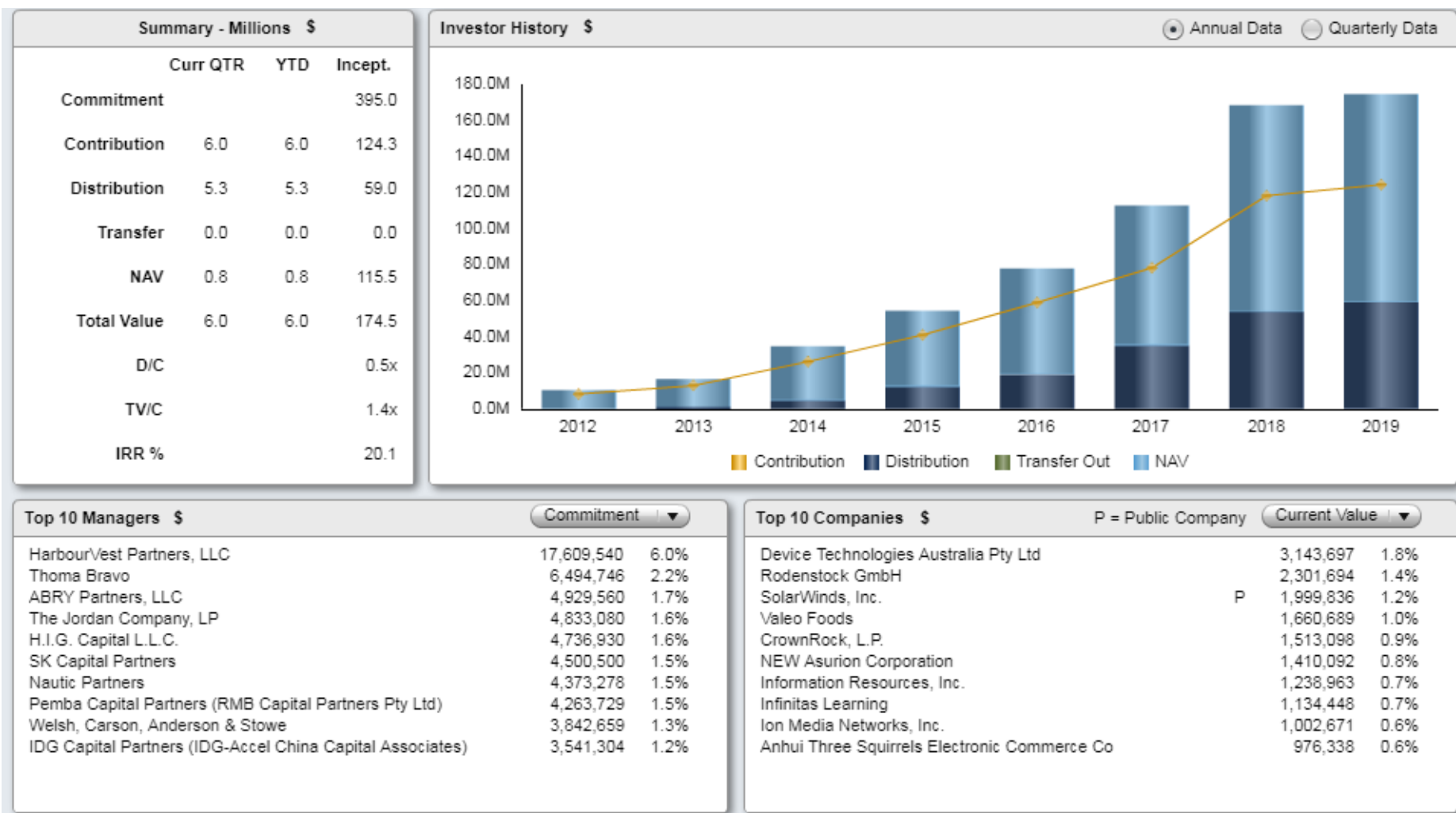


# PRIVATE EQUITY PERFORMANCE ANALYSIS (AS OF 12/31/2018)

| Investment                                   | Index Set Name | Cumulative Contributions | Cumulative Distributions | Adjusted Valuation | Valuation ICM     | Valuation Spread  | IRR          | IRR ICM     | IRR Spread   |
|--|----------------|--------------------------|--------------------------|--------------------|-------------------|-------------------|--------------|-------------|--------------|
| HarbourVest HIPEP VII                        | MSCI ACWI      | 9,337,500                | 1,398,851                | 10,106,393         | 8,155,223         | 1,951,170         | 12.35        | 1.35        | 11.00        |
| HarbourVest HIPEP VIII                       | MSCI ACWI      | 9,000,000                | 335,610                  | 10,145,704         | 7,933,961         | 2,211,743         | 26.84        | -13.06      | 39.90        |
| HarbourVest Partners Co-Investment Fund V    | MSCI ACWI      |                          | 0                        |                    |                   |                   | 0.00         | 0.00        | 0.00         |
| HarbourVest Partners Dover Street IX         | MSCI ACWI      | 21,200,000               | 4,854,677                | 21,695,489         | 15,486,866        | 6,208,623         | 37.19        | -6.46       | 43.65        |
| HarbourVest Partners Dover Street VIII       | MSCI ACWI      | 22,500,000               | 24,674,817               | 9,917,872          | 630,300           | 9,287,572         | 20.64        | 6.70        | 13.94        |
| HarbourVest Partners IX-Buyout               | MSCI ACWI      | 18,107,188               | 12,899,920               | 15,785,192         | 7,808,359         | 7,976,833         | 17.01        | 4.54        | 12.47        |
| HarbourVest Partners IX-Credit Opportunities | MSCI ACWI      | 2,710,265                | 1,608,311                | 2,321,738          | 1,433,238         | 888,500           | 13.84        | 4.55        | 9.29         |
| HarbourVest Partners IX-Venture              | MSCI ACWI      | 11,437,671               | 5,226,167                | 14,222,649         | 7,543,547         | 6,679,102         | 17.13        | 3.73        | 13.40        |
| HarbourVest Partners X Buyout Fund           | MSCI ACWI      | 14,107,787               | 2,856,881                | 15,291,812         | 11,255,204        | 4,036,608         | 23.71        | 0.03        | 23.68        |
| HarbourVest Partners X Venture Fund          | MSCI ACWI      | 9,995,422                | 751,439                  | 11,657,491         | 8,902,623         | 2,754,868         | 20.20        | -3.12       | 23.32        |
| HarbourVest Partners XI Buyout Fund          | MSCI ACWI      |                          | 0                        |                    |                   |                   | 0.00         | 0.00        | 0.00         |
| HarbourVest Partners XI Micro Buyout         | MSCI ACWI      |                          | 0                        |                    |                   |                   | 0.00         | 0.00        | 0.00         |
| HarbourVest Partners XI Venture Fund         | MSCI ACWI      |                          | 0                        |                    |                   |                   | 0.00         | 0.00        | 0.00         |
| <b>Total: State of Vermont</b>               |                | <b>118,395,833</b>       | <b>54,606,673</b>        | <b>111,144,340</b> | <b>69,149,321</b> | <b>41,995,019</b> | <b>19.26</b> | <b>2.65</b> | <b>16.61</b> |



# PRIVATE EQUITY INVESTMENT PORTFOLIO SUMMARY AS OF 3/31/2018

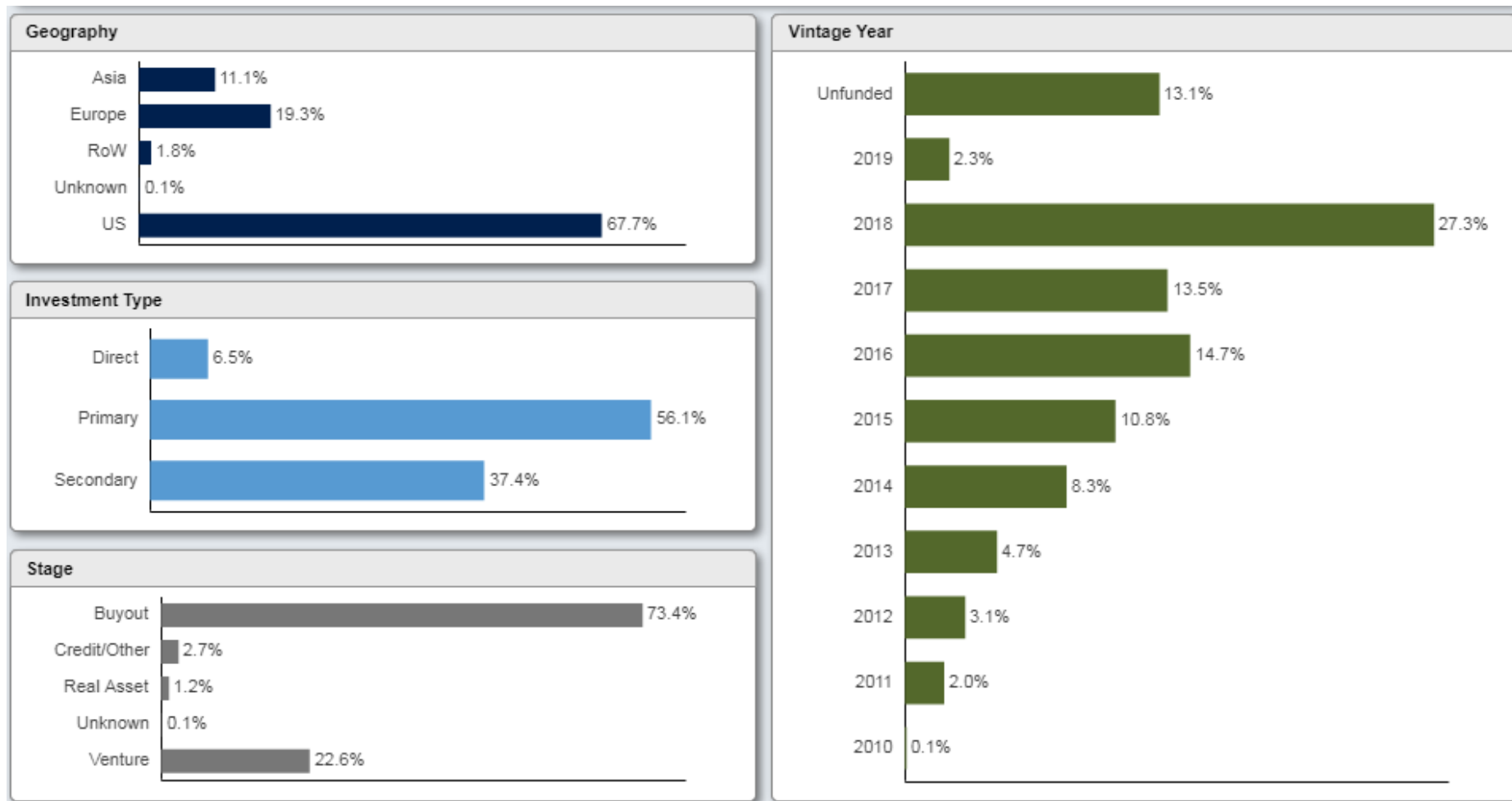


Note:  
Data provided by HarbourVest and has not been independently verified by NEPC





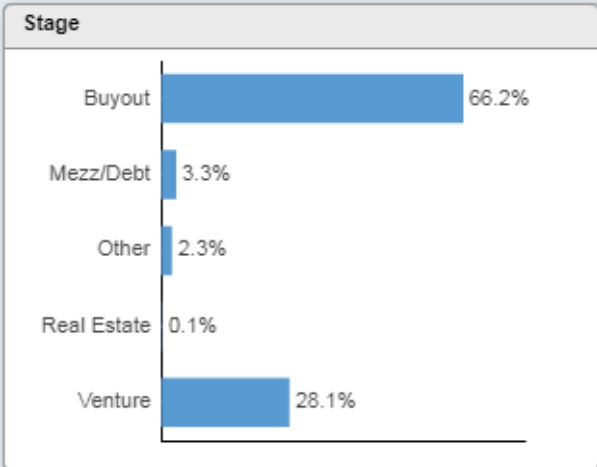
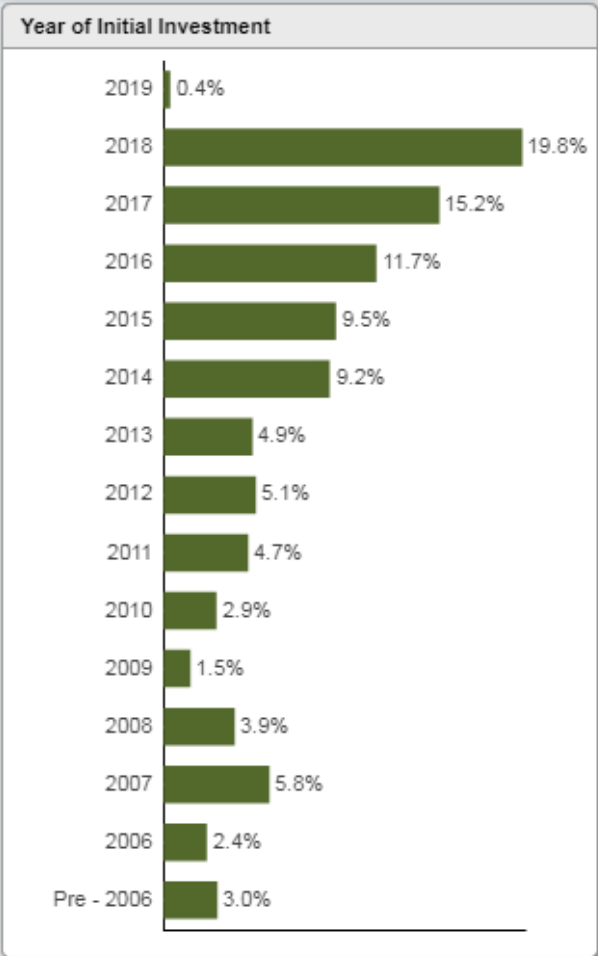
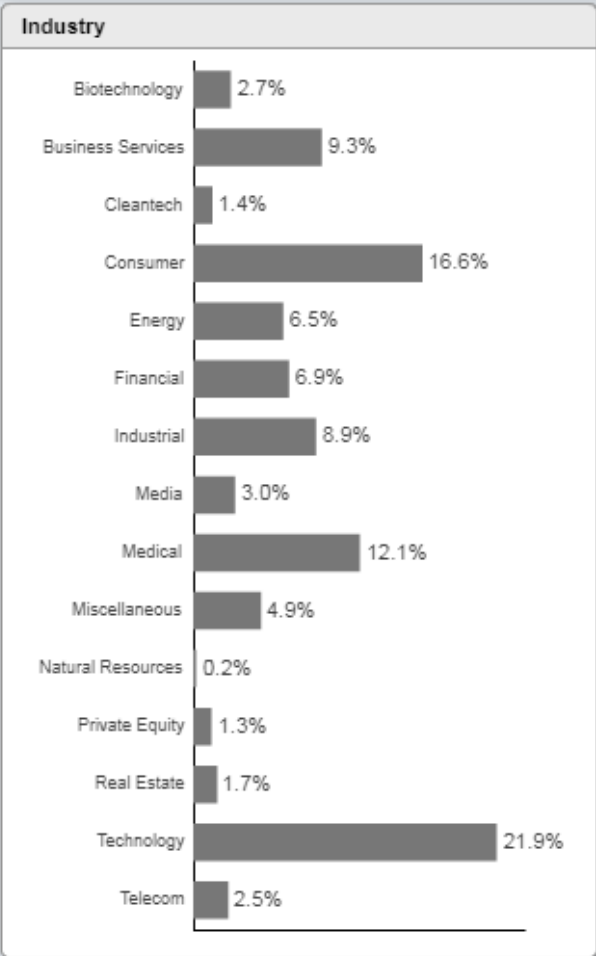
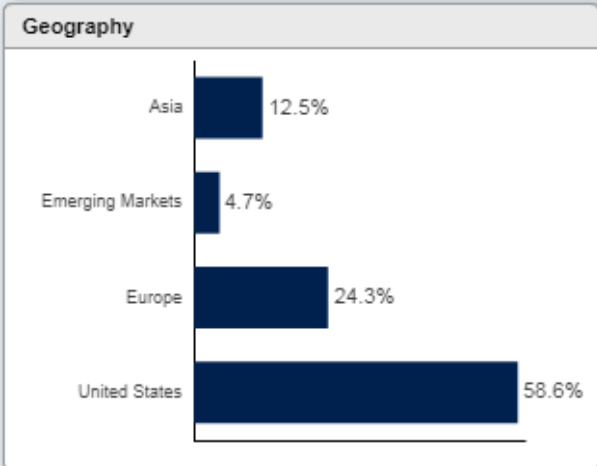
# PRIVATE EQUITY INVESTMENT DIVERSIFICATION AS OF 3/31/2018



Note:  
Data provided by HarbourVest and has not been independently verified by NEPC



# PRIVATE EQUITY COMPANY DIVERSIFICATION AS OF 3/31/2018



Note:  
Data provided by HarbourVest and has not been independently verified by NEPC



# APPENDIX

NEPC, LLC

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### **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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- 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.

