



NEPC, LLC

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## Mo8 CH & Patrol Employees Retirement System

**Investment Summary**  
**Quarter Ending June 30, 2012**

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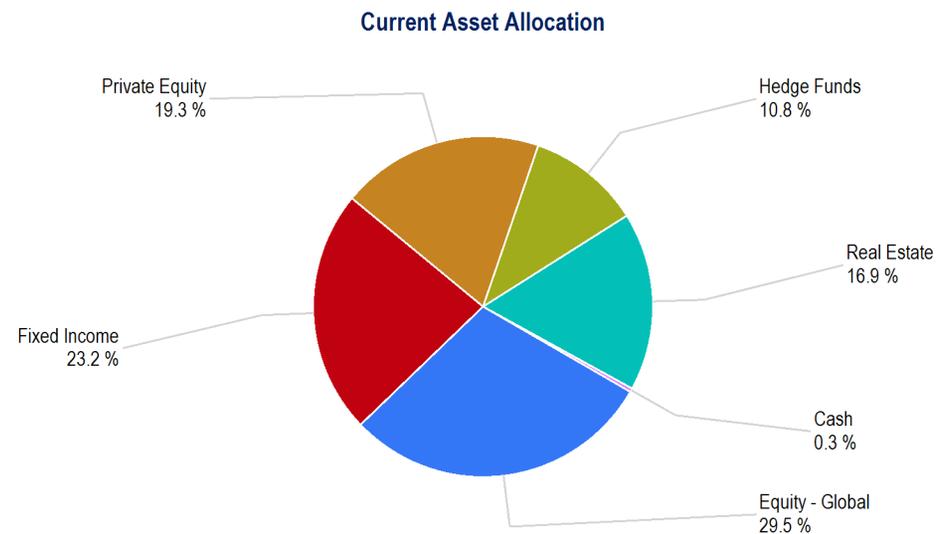
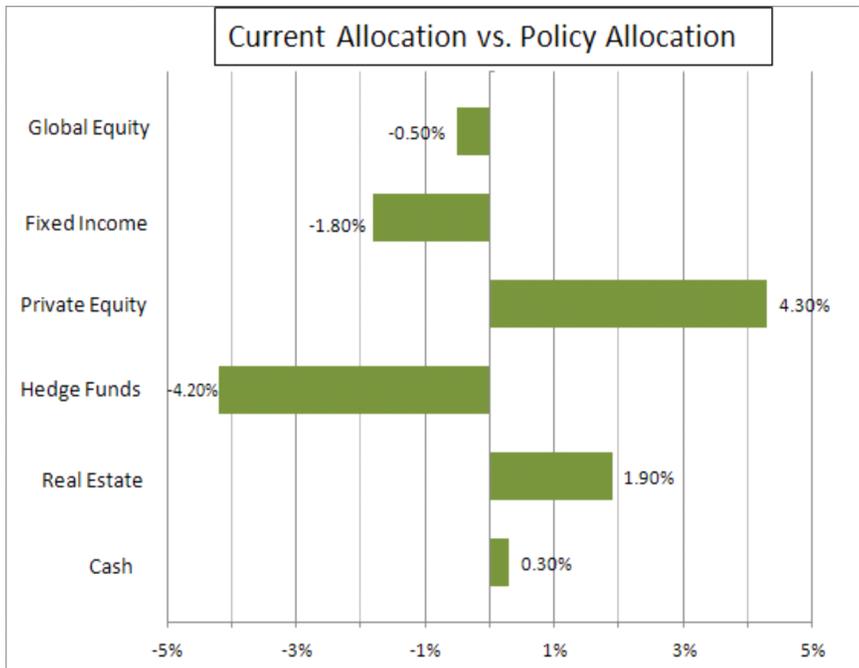
CAMBRIDGE | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | SAN FRANCISCO



|                          | <u>Tab</u> |
|--------------------------|------------|
| <b>Executive Summary</b> | <b>1</b>   |
| <b>Performance</b>       | <b>2</b>   |
| <b>Appendix</b>          | <b>3</b>   |

# Executive Summary

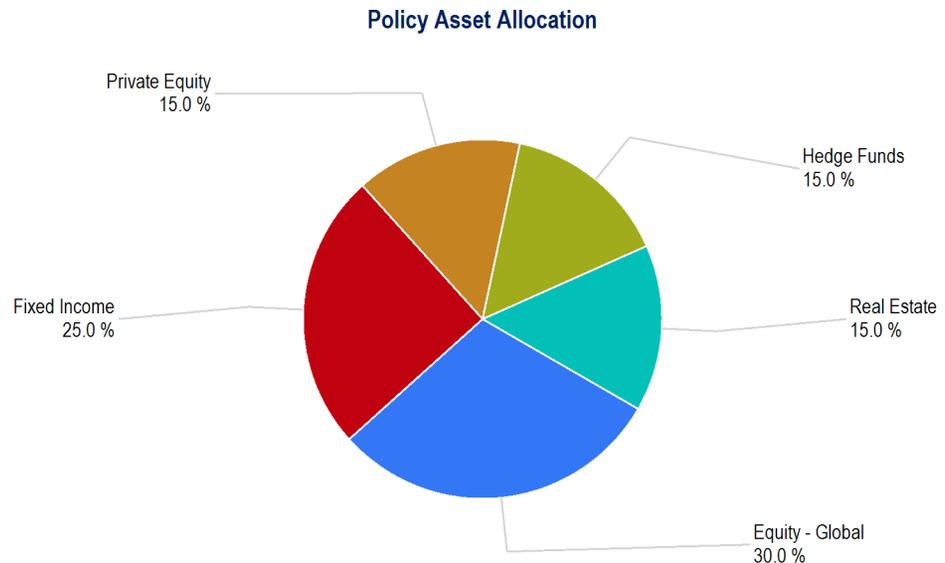
Total Fund Asset Allocation vs. Current Allocation



Current Asset Allocation vs. Policy Asset Allocation

|                 | Current                | Policy        | Current       | Difference * |
|-----------------|------------------------|---------------|---------------|--------------|
| Equity - Global | \$450,436,718          | 30.0%         | 29.5%         | -0.5%        |
| Fixed Income    | \$353,816,568          | 25.0%         | 23.2%         | -1.8%        |
| Private Equity  | \$294,861,218          | 15.0%         | 19.3%         | 4.3%         |
| Hedge Funds     | \$164,647,784          | 15.0%         | 10.8%         | -4.2%        |
| Real Estate     | \$258,989,107          | 15.0%         | 16.9%         | 1.9%         |
| Cash            | \$5,313,839            | 0.0%          | 0.3%          | 0.3%         |
| <b>Total</b>    | <b>\$1,528,065,234</b> | <b>100.0%</b> | <b>100.0%</b> |              |

\*Difference between Policy and Current Allocation

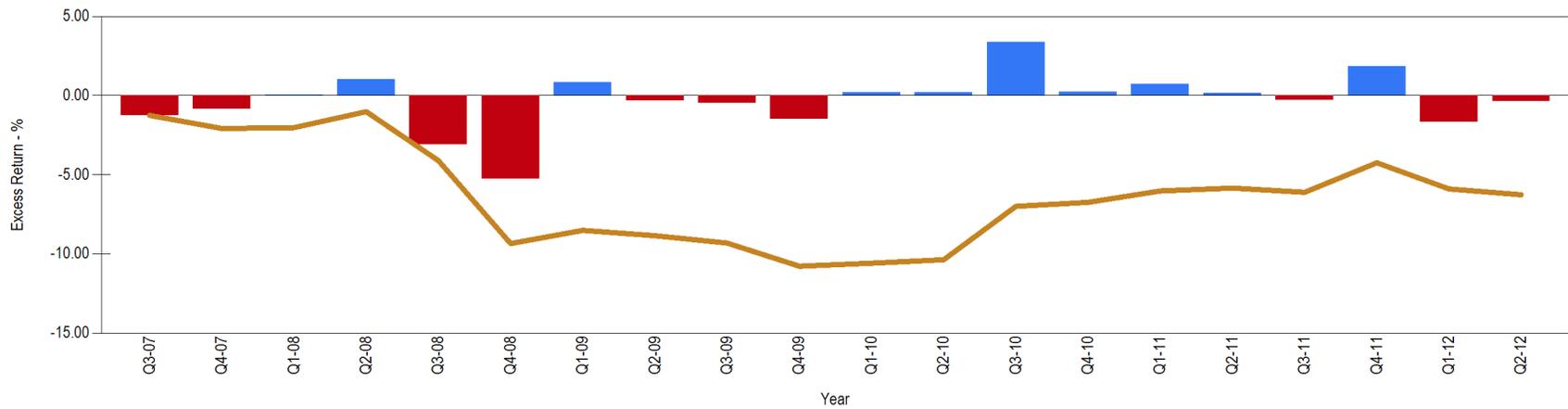


Allocations may not add to 100% due to rounding.

# Total Fund Performance Summary

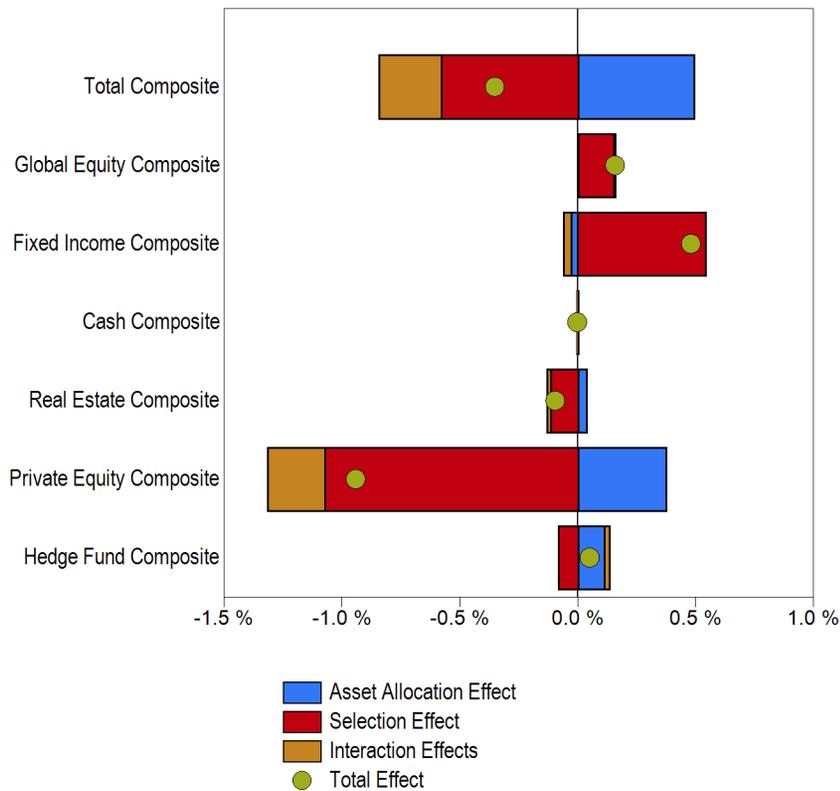
|                             | Market Value           | 3 Mo         | 1 Yr         | 3 Yrs         | 5 Yrs        |
|-----------------------------|------------------------|--------------|--------------|---------------|--------------|
| <b>Total Composite</b>      | <b>\$1,528,065,234</b> | <b>0.53%</b> | <b>2.75%</b> | <b>12.20%</b> | <b>0.75%</b> |
| <i>Policy Index</i>         |                        | 0.90%        | 3.13%        | 11.28%        | 2.25%        |
| <i>ICC Public DB Median</i> |                        | -1.82%       | 1.16%        | 11.51%        | 1.99%        |

Quarterly and Cumulative Excess Performance



# Total Fund Attribution Analysis

Attribution Effects Relative to Policy Index  
3 Months Ending June 30, 2012



Attribution Summary  
3 Months Ending June 30, 2012

|                          | Actual Return | Target Return | Relative Return | Selection Effect | Asset Allocation Effect | Interaction Effects | Total Effects |
|--------------------------|---------------|---------------|-----------------|------------------|-------------------------|---------------------|---------------|
| Global Equity Composite  | -5.1%         | -5.6%         | 0.5%            | 0.2%             | 0.0%                    | 0.0%                | 0.2%          |
| Fixed Income Composite   | 4.2%          | 2.0%          | 2.2%            | 0.5%             | 0.0%                    | 0.0%                | 0.5%          |
| Cash Composite           | 0.0%          | 0.0%          | 0.0%            | 0.0%             | 0.0%                    | 0.0%                | 0.0%          |
| Real Estate Composite    | 1.9%          | 2.7%          | -0.8%           | -0.1%            | 0.0%                    | 0.0%                | -0.1%         |
| Private Equity Composite | 5.8%          | 13.4%         | -7.6%           | -1.1%            | 0.4%                    | -0.2%               | -0.9%         |
| Hedge Fund Composite     | -2.8%         | -2.3%         | -0.5%           | -0.1%            | 0.1%                    | 0.0%                | 0.1%          |
| <b>Total</b>             | <b>0.5%</b>   | <b>0.9%</b>   | <b>-0.4%</b>    | <b>-0.6%</b>     | <b>0.5%</b>             | <b>-0.3%</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 return shown on the performance summary.

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 return.

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 due to rounding

MPERS

Total Composite

|   | Policy % % of Portfolio |               | Market Value (\$)    | 3 Mo (%)     | Rank      | 1 Yr (%)     | Rank      | 3 Yrs (%)    | Rank      | 5 Yrs (%)    | Rank      |
|---|-------------------------|---------------|----------------------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|
| <b>Total Composite</b>                    | <b>100.00</b>           | <b>100.00</b> | <b>1,528,065,234</b> | <b>0.53</b>  | <b>1</b>  | <b>2.75</b>  | <b>20</b> | <b>12.20</b> | <b>29</b> | <b>0.75</b>  | <b>85</b> |
| <i>Policy Index</i>                       |                         |               |                      | 0.90         | 1         | 3.13         | 12        | 11.28        | 56        | 2.25         | 42        |
| <b>Global Equity Composite</b>            | <b>30.00</b>            | <b>29.48</b>  | <b>450,436,718</b>   | <b>-5.05</b> | <b>38</b> | <b>-5.05</b> | <b>44</b> | <b>13.29</b> | <b>19</b> | <b>-2.78</b> | <b>65</b> |
| <i>MSCI ACWI</i>                          |                         |               |                      | -5.56        | 51        | -6.49        | 57        | 10.80        | 54        | -2.70        | 65        |
| <b>Fixed Income Composite</b>             | <b>25.00</b>            | <b>23.15</b>  | <b>353,816,568</b>   | <b>4.18</b>  | <b>1</b>  | <b>9.26</b>  | <b>6</b>  | <b>13.38</b> | <b>12</b> | <b>5.99</b>  | <b>74</b> |
| <i>Barclays U.S. Universal</i>            |                         |               |                      | 2.00         | 11        | 7.36         | 24        | 7.55         | 57        | 6.76         | 66        |
| <b>Cash Composite</b>                     | <b>0.00</b>             | <b>0.35</b>   | <b>5,313,839</b>     | <b>0.01</b>  | <b>--</b> | <b>0.04</b>  | <b>--</b> | <b>0.02</b>  | <b>--</b> | <b>1.02</b>  | <b>--</b> |
| <i>91 Day T-Bills</i>                     |                         |               |                      | 0.02         | --        | 0.04         | --        | 0.09         | --        | 0.72         | --        |
| <b>Real Estate Composite</b>              | <b>15.00</b>            | <b>16.95</b>  | <b>258,989,107</b>   | <b>1.91</b>  | <b>--</b> | <b>5.15</b>  | <b>--</b> | <b>5.27</b>  | <b>--</b> | <b>-2.64</b> | <b>--</b> |
| <i>NCREIF Property Index</i>              |                         |               |                      | 2.68         | --        | 12.04        | --        | 8.81         | --        | 2.50         | --        |
| <b>Private Equity Composite</b>           | <b>15.00</b>            | <b>19.30</b>  | <b>294,861,218</b>   | <b>5.80</b>  | <b>--</b> | <b>7.40</b>  | <b>--</b> | <b>10.77</b> | <b>--</b> | <b>0.03</b>  | <b>--</b> |
| <i>MO Hwy Priv. Equ. Index - Lagged</i>   |                         |               |                      | 13.39        | --        | 11.78        | --        | 27.46        | --        | 5.69         | --        |
| <b>Hedge Fund Composite</b>               | <b>15.00</b>            | <b>10.77</b>  | <b>164,647,784</b>   | <b>-2.84</b> | <b>--</b> | <b>0.70</b>  | <b>--</b> | <b>7.07</b>  | <b>--</b> | <b>2.69</b>  | <b>--</b> |
| <i>HFRI Fund of Funds Composite Index</i> |                         |               |                      | -2.30        | --        | -4.50        | --        | 2.17         | --        | -2.04        | --        |

Total Composite is ranked in the ICC Public DB (peer) Universe

Global Equity Composite is ranked in the eA Global All Cap Equity Net Universe

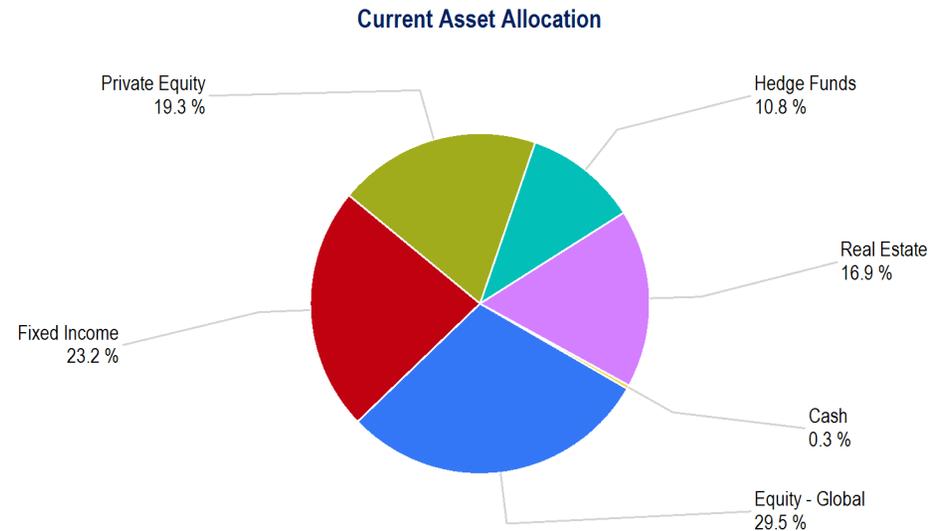
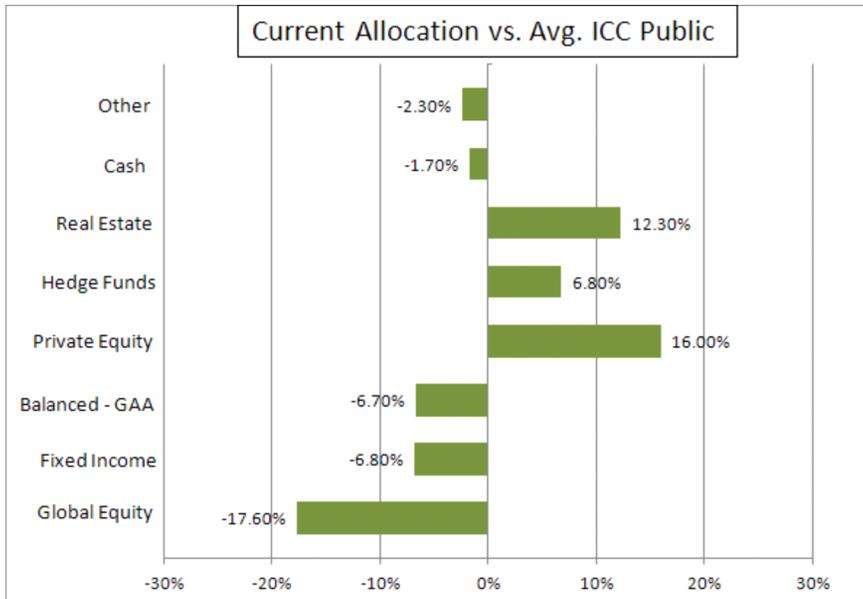
Fixed Income Composite is ranked in the eA All Global Fixed Inc Net Universe

- **Quarter-end Investment Highlights**
  - At the end of the quarter Plan assets totaled \$1.528 billion up from \$1.480 billion since the beginning of the year
  - The plan gained +0.53% bYh of fee for the quarter, ranked in the 1st percentile in the ICC Total Public DB Fund Universe, and outperformed the median public fund in the ICC universe by 2.35%
    - Manager selection for fixed income managers and an overweight to private equity helped drive the outperformance
  - The Plan is currently overweight Real Estate and Private Equity...and underweight Hedge Funds, Fixed Income and Global Equity
    - Performance for the quarter was mixed as Global Equities struggled as increased fears of a European melt down drove a massive sell of risky assets. As equities sold off, Fixed Income securities saw positive gains.
    - Opportunistic strategies produced mixed results as the Hedge Fund composite underperformed the benchmark by -0.54%
- **Equity markets sell-off**
  - Mcgch of first quarter gains k YfY YfUgYX VmigYWtbX ei UfhYf cggYg
  - Non-US developed and emerging markets decline more precipitously
- **Treasury yields drop to record lows and dollar rises in flight to safety**
- **Credit markets generally hold their ground, benefiting from position in cap structure and declining Treasury yields**
- **A “tale of two quarters” for commodities as gold, oil, and metals drop due to slowing economic growth while grains rise due to US drought**

## Looking Forward – What To Do in a Low Return, “Risk On/Risk Off” World?

- **Diversify broadly – many global risks remain**
  - Risk balanced → risk parity
  - Hedge known liabilities and uncompensated risks
  
- **Allocate to attractive segments of risky assets**
  - Emerging markets, particularly small cap stocks and local currency debt
  - Credit, particularly less liquid and more complex segments
  - European and other distressed markets
  
- **Be prepared to be dynamic**
  
- **Use active strategies to enhance returns**

# Total Fund Current Asset Allocation vs. Average ICC Public Plan



Asset Allocation vs. Average ICC Universe Public DB Plan (as of 3/31/2012)

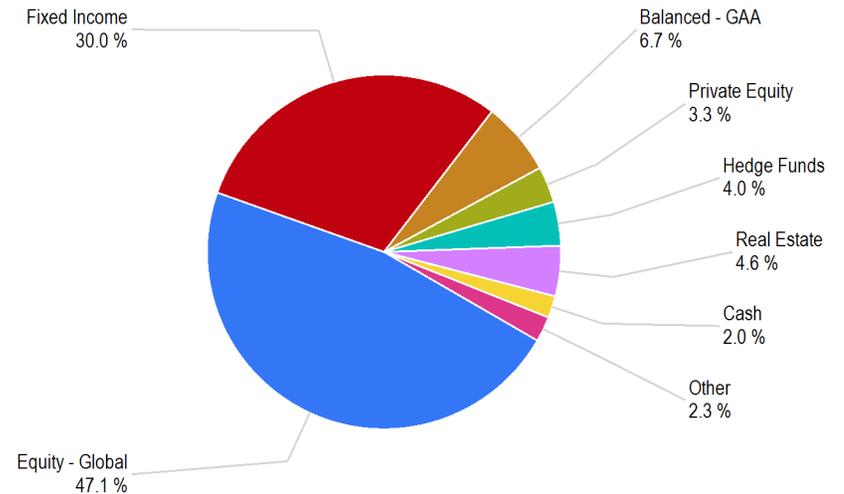
|                 | Current                | Current       | ICC Average Allocation | Difference* |
|-----------------|------------------------|---------------|------------------------|-------------|
| Equity - Global | \$450,436,718          | 29.5%         | 47.1%                  | -17.6%      |
| Fixed Income    | \$353,816,568          | 23.2%         | 30.0%                  | -6.8%       |
| Balanced - GAA  | --                     | --            | 6.7%                   | -6.7%       |
| Private Equity  | \$294,861,218          | 19.3%         | 3.3%                   | 16.0%       |
| Hedge Funds     | \$164,647,784          | 10.8%         | 4.0%                   | 6.8%        |
| Real Estate     | \$258,989,107          | 16.9%         | 4.6%                   | 12.3%       |
| Cash            | \$5,313,839            | 0.3%          | 2.0%                   | -1.7%       |
| Other           | --                     | --            | 2.3%                   | -2.3%       |
| <b>Total</b>    | <b>\$1,528,065,234</b> | <b>100.0%</b> | <b>100.0%</b>          |             |

\*Difference between Custom and Current Allocation

Allocations may not add to 100% due to rounding.

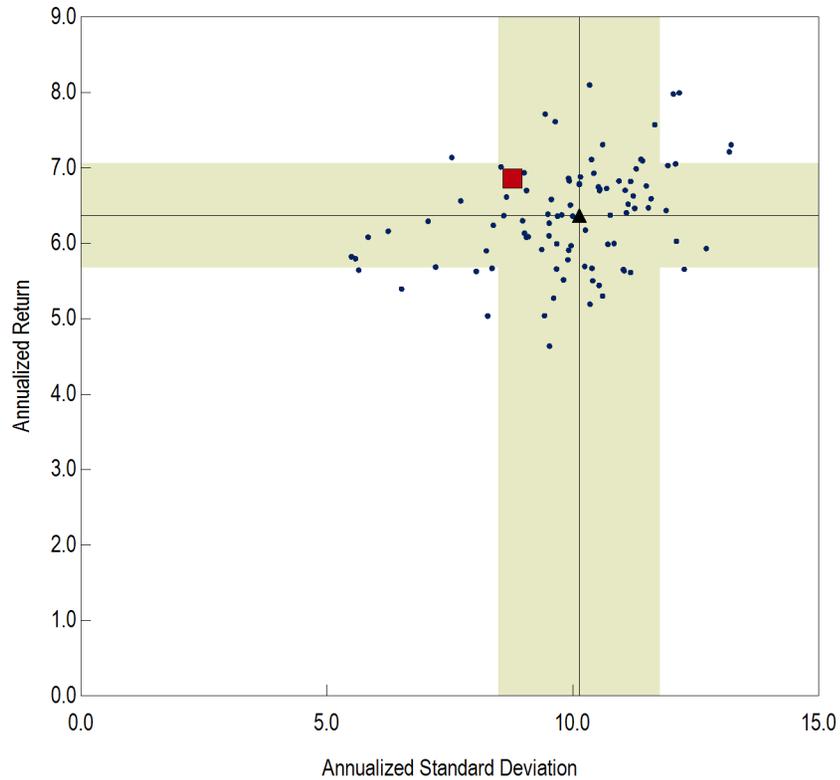
Average asset allocations shown include all portfolios to the ICC Universe for period ending 3/31/2012.

Average ICC Universe Public Plan Asset Allocation



Total Fund Risk/Return - 10 Years

10 Years Ending June 30, 2012



- Total Composite
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- ICC Public DB

Total Composite

**Statistics Summary**  
10 Years Ending June 30, 2012

| Anlzd Ret | Rank | Anlzd Std Dev | Rank |
|-----------|------|---------------|------|
| 6.86%     | 22   | 8.77%         | 19   |

**Statistics Summary**  
10 Years Ending June 30, 2012

| Sharpe Ratio | Rank | Sortino Ratio<br>RF | Rank |
|--------------|------|---------------------|------|
| 0.58         | 14   | 0.65                | 22   |

Total Composite

# Performance

MPERS

Total Fund Performance Detail

|                                       | Market Value<br>(\$) | % of Portfolio | Policy %      | 3 Mo<br>(%)  | 1 Yr<br>(%)   | 3 Yrs<br>(%) | 5 Yrs<br>(%) |
|---------------------------------------|----------------------|----------------|---------------|--------------|---------------|--------------|--------------|
| <b>Total Composite</b>                | <b>1,528,065,234</b> | <b>100.00</b>  | <b>100.00</b> | <b>0.53</b>  | <b>2.75</b>   | <b>12.20</b> | <b>0.75</b>  |
| <i>Policy Index</i>                   |                      |                |               | 0.90         | 3.13          | 11.28        | 2.25         |
| <b>Global Equity Composite</b>        | <b>450,436,718</b>   | <b>29.48</b>   | <b>30.00</b>  | <b>-5.05</b> | <b>-5.05</b>  | <b>13.29</b> | <b>-2.78</b> |
| <i>MSCI ACWI</i>                      |                      |                |               | -5.56        | -6.49         | 10.80        | -2.70        |
| <b>Domestic Equity Composite</b>      | <b>203,119,016</b>   | <b>13.29</b>   | <b>--</b>     | <b>-3.53</b> | <b>2.51</b>   | <b>18.51</b> | <b>-0.61</b> |
| <i>Russell 3000</i>                   |                      |                |               | -3.15        | 3.84          | 16.73        | 0.39         |
| <b>Large Cap Composite</b>            | <b>119,899,496</b>   | <b>7.85</b>    | <b>--</b>     | <b>-2.29</b> | <b>6.88</b>   | <b>17.51</b> | <b>1.55</b>  |
| Cash/S&P Futures                      | 20,639,930           | 1.35           |               |              |               |              |              |
| Intech                                | 99,259,566           | 6.50           |               | -1.98        | 4.75          | 16.66        | 1.11         |
| <i>S&amp;P 500</i>                    |                      |                |               | -2.75        | 5.45          | 16.40        | 0.22         |
| <b>Small/Mid Cap Composite</b>        | <b>83,219,521</b>    | <b>5.45</b>    | <b>--</b>     | <b>-5.76</b> | <b>-3.41</b>  | <b>19.03</b> | <b>0.32</b>  |
| Pinnacle                              | 40,315,857           | 2.64           |               | -7.26        | -6.38         | 20.26        | 1.21         |
| Rothschild                            | 42,903,664           | 2.81           |               | -4.30        | -0.47         | 18.45        | 0.41         |
| <i>Russell 2500</i>                   |                      |                |               | -4.14        | -2.29         | 19.06        | 1.18         |
| <b>International Equity Composite</b> | <b>194,430,792</b>   | <b>12.72</b>   | <b>--</b>     | <b>-6.78</b> | <b>-13.80</b> | <b>8.13</b>  | <b>-4.95</b> |
| <i>MSCI ACWI ex USA</i>               |                      |                |               | -7.61        | -14.56        | 6.97         | -4.62        |
| Transition Account                    | 46,823               | 0.00           |               |              |               |              |              |
| Acadian 130/30                        | 60,122,914           | 3.93           |               | -6.81        | -14.75        | 10.79        | -5.68        |
| Artio                                 | 33,547,684           | 2.20           |               | -6.63        | -18.73        | 3.30         | --           |
| <i>MSCI ACWI ex USA</i>               |                      |                |               | -7.61        | -14.56        | 6.97         | -4.62        |
| Silchester                            | 71,442,164           | 4.68           |               | -6.33        | -9.37         | 9.23         | 0.98         |
| <i>MSCI EAFE</i>                      |                      |                |               | -7.13        | -13.83        | 5.96         | -6.10        |
| Acadian Emerging Markets              | 29,271,208           | 1.92           |               | -8.09        | -13.84        | 11.77        | -0.53        |
| <i>MSCI Emerging Markets</i>          |                      |                |               | -8.89        | -15.94        | 9.78         | -0.09        |
| Tortoise                              | 52,886,910           | 3.46           |               | -3.65        | 10.41         | --           | --           |
| <i>Alerian MLP Index</i>              |                      |                |               | -2.29        | 7.84          | 27.03        | 9.87         |

## Total Fund Performance Detail

|  | Market Value<br>(\$) | % of Portfolio | Policy %     | 3 Mo<br>(%) | 1 Yr<br>(%)  | 3 Yrs<br>(%) | 5 Yrs<br>(%) |
|--|----------------------|----------------|--------------|-------------|--------------|--------------|--------------|
| <b>Fixed Income Composite</b>                    | <b>353,816,568</b>   | <b>23.15</b>   | <b>25.00</b> | <b>4.18</b> | <b>9.26</b>  | <b>13.38</b> | <b>5.99</b>  |
| <i>Barclays U.S. Universal</i>                   |                      |                |              | 2.00        | 7.36         | 7.55         | 6.76         |
| <b>Core Fixed Income Composite</b>               | <b>162,075,510</b>   | <b>10.61</b>   | <b>10.00</b> | <b>2.87</b> | <b>6.84</b>  | <b>12.48</b> | <b>4.40</b>  |
| Western Asset Mgmt                               | 32,155,782           | 2.10           |              | 0.81        | 3.05         | 9.63         | 5.32         |
| Aberdeen Asset Mgmt                              | 23,883,723           | 1.56           |              | 1.88        | 12.13        | 11.73        | 5.34         |
| <i>Barclays Aggregate</i>                        |                      |                |              | 2.06        | 7.47         | 6.93         | 6.79         |
| Barclay's Index                                  | 85,142,741           | 5.57           |              | 4.10        | --           | --           | --           |
| NTGI Government/Credit                           | 20,893,264           | 1.37           |              | 2.54        | --           | --           | --           |
| <i>Barclays Govt/Credit</i>                      |                      |                |              | 2.56        | 8.78         | 7.34         | 6.90         |
| <b>Long Duration Composite</b>                   | <b>72,256,532</b>    | <b>4.73</b>    | <b>5.00</b>  | <b>6.17</b> | <b>13.63</b> | <b>--</b>    | <b>--</b>    |
| Internal Fixed Income                            | 72,256,532           | 4.73           |              | 6.17        | 14.31        | 11.60        | --           |
| <i>Barclays Aggregate</i>                        |                      |                |              | 2.06        | 7.47         | 6.93         | 6.79         |
| <b>Opportunistic Debt Composite</b>              | <b>83,307,993</b>    | <b>5.45</b>    | <b>5.00</b>  | <b>5.51</b> | <b>8.62</b>  | <b>--</b>    | <b>--</b>    |
| ABRY ASF   | 7,580,682            | 0.50           |              | 18.99       | 9.60         | 26.83        | --           |
| Anchorage Capital                                | 7,121,678            | 0.47           |              | 1.46        | 4.93         | --           | --           |
| Anchorage Capital III                            | 2,294,933            | 0.15           |              | 1.26        | --           | --           | --           |
| Audax Mezzanine II                               | 4,451,946            | 0.29           |              | 3.60        | 15.14        | 13.96        | 8.85         |
| CVI Credit Value                                 | 11,416,086           | 0.75           |              | 6.95        | 13.47        | --           | --           |
| CVI Global Value                                 | 23,424,098           | 1.53           |              | 2.92        | 5.78         | 16.32        | 6.15         |
| GOLUB Capital                                    | 13,136,907           | 0.86           |              | 1.86        | 7.87         | --           | --           |
| GSO Capital Opp II                               | 1,925,915            | 0.13           |              | 6.93        | --           | --           | --           |
| GSO Capital Opp                                  | 11,955,748           | 0.78           |              | 9.37        | 17.77        | 19.56        | --           |
| <i>Barclays High Yield</i>                       |                      |                |              | 1.83        | 7.27         | 16.28        | 8.45         |
| <b>Inflation Protection Securities Composite</b> | <b>36,176,533</b>    | <b>2.37</b>    | <b>5.00</b>  | <b>3.46</b> | <b>13.20</b> | <b>--</b>    | <b>--</b>    |
| Internal US TIPS                                 | 36,176,533           | 2.37           |              | 3.46        | 13.20        | --           | --           |
| <i>Barclays US TIPS</i>                          |                      |                |              | 3.15        | 11.66        | 9.63         | 8.44         |
| <b>Cash Composite</b>                            | <b>5,313,839</b>     | <b>0.35</b>    | <b>0.00</b>  | <b>0.01</b> | <b>0.04</b>  | <b>0.02</b>  | <b>1.02</b>  |
| Cash Account                                     | 5,313,839            | 0.35           |              | 0.01        | 0.04         | 0.02         | 1.02         |
| 91 Day T-Bills                                   |                      |                |              | 0.02        | 0.04         | 0.09         | 0.72         |

## Total Fund Performance Detail

|   | Market Value<br>(\$) | % of Portfolio | Policy %     | 3 Mo<br>(%) | 1 Yr<br>(%)  | 3 Yrs<br>(%) | 5 Yrs<br>(%) |
|---|----------------------|----------------|--------------|-------------|--------------|--------------|--------------|
| <b>Real Estate Composite</b>            | <b>258,989,107</b>   | <b>16.95</b>   | <b>15.00</b> | <b>1.91</b> | <b>5.15</b>  | <b>5.27</b>  | <b>-2.64</b> |
| <i>NCREIF Property Index</i>            |                      |                |              | 2.68        | 12.04        | 8.81         | 2.50         |
| <b>Core Real Estate Composite</b>       | <b>168,210,253</b>   | <b>11.01</b>   | <b>--</b>    | <b>1.85</b> | <b>6.80</b>  | <b>7.13</b>  | <b>-4.16</b> |
| <i>NCREIF Property Index</i>            |                      |                |              | 2.68        | 12.04        | 8.81         | 2.50         |
| CBRE Capital Partners                   | 23,019,747           | 1.51           |              | -0.41       | 7.35         | --           | --           |
| Principal CMBS                          | 47,343,147           | 3.10           |              | 0.01        | -4.20        | 35.33        | --           |
| Principal Enhanced Property             | 32,292,640           | 2.11           |              | 3.65        | 16.79        | 3.37         | -7.32        |
| <i>NCREIF Property Index</i>            |                      |                |              | 2.68        | 12.04        | 8.81         | 2.50         |
| ING Clarion Lion Properties             | 51,022,787           | 3.34           |              | 2.63        | 12.20        | 6.91         | -4.05        |
| Principal US Property                   | 14,531,933           | 0.95           |              | 3.63        | 12.49        | 7.40         | -2.06        |
| <i>NCREIF ODCE</i>                      |                      |                |              | 2.58        | 12.42        | 8.39         | -0.90        |
| <b>Non-Core Real Estate Composite</b>   | <b>65,109,305</b>    | <b>4.26</b>    | <b>--</b>    | <b>1.43</b> | <b>3.46</b>  | <b>-0.71</b> | <b>-4.32</b> |
| AEW EISPO                               | 8,998,715            | 0.59           |              | -5.56       | -7.53        | 10.38        | --           |
| AEW Partners V                          | 5,182,648            | 0.34           |              | 7.65        | 23.66        | -7.37        | -8.99        |
| Apollo European III                     | 7,542,622            | 0.49           |              | -4.43       | -6.96        | 2.35         | --           |
| Apollo Real Estate                      | 6,873,101            | 0.45           |              | 0.98        | 16.51        | -7.56        | -10.36       |
| Colony Capital VIII                     | 2,876,523            | 0.19           |              | 12.55       | -25.65       | 2.69         | --           |
| ING Lion Mexico Fund                    | 8,271,163            | 0.54           |              | 0.41        | -3.40        | -0.54        | -1.62        |
| Och-Ziff                                | 8,944,643            | 0.59           |              | 6.16        | 12.93        | 12.26        | 9.65         |
| Urdang Value Added Fund II              | 7,326,838            | 0.48           |              | 2.70        | 18.78        | 1.28         | -2.01        |
| Urdang Value Added Fund                 | 9,093,051            | 0.60           |              | 2.51        | 3.83         | -7.84        | -2.96        |
| <i>NCREIF Property Index</i>            |                      |                |              | 2.68        | 12.04        | 8.81         | 2.50         |
| <b>Timber Composite</b>                 | <b>14,088,919</b>    | <b>0.92</b>    | <b>--</b>    | <b>6.11</b> | <b>2.59</b>  | <b>-3.00</b> | <b>-3.29</b> |
| RMK-Timberland                          | 14,088,919           | 0.92           |              | 6.11        | 2.59         | -3.00        | -3.29        |
| <i>NCREIF Timberland 1 Qtr Lag</i>      |                      |                |              | 0.36        | 1.18         | -1.27        | 4.30         |
| <b>REITS Composite</b>                  | <b>11,580,629</b>    | <b>0.76</b>    | <b>--</b>    | <b>0.55</b> | <b>-5.94</b> | <b>13.05</b> | <b>--</b>    |
| CBRE Investors                          | 11,580,629           | 0.76           |              | 0.55        | -5.94        | 13.05        | --           |
| <i>FTSE EPRA/NAREIT Developed Index</i> |                      |                |              | 2.12        | 2.36         | 19.51        | -2.54        |

MPERS

Total Fund Performance Detail

|   | Market Value<br>(\$) | % of Portfolio | Policy %     | 3 Mo<br>(%)  | 1 Yr<br>(%) | 3 Yrs<br>(%) | 5 Yrs<br>(%) |
|---|----------------------|----------------|--------------|--------------|-------------|--------------|--------------|
| <b>Private Equity Composite</b>           | <b>294,861,218</b>   | <b>19.30</b>   | <b>15.00</b> | <b>5.80</b>  | <b>7.40</b> | <b>10.77</b> | <b>0.03</b>  |
| Abry Partners VI                          | 9,064,432            | 0.59           |              | 4.50         | 11.28       | 18.06        | --           |
| Abry VII                                  | 1,117,572            | 0.07           |              | 6.73         | --          | --           | --           |
| American Infrastructure                   | 20,911,096           | 1.37           |              | 0.58         | -18.53      | 19.72        | --           |
| CarVal Specialized Ventures               | 796,598              | 0.05           |              | -0.15        | -2.31       | 3.62         | --           |
| EIF- US Power III                         | 7,209,576            | 0.47           |              | 0.33         | 4.09        | -1.16        | -26.63       |
| Grove Street - MP Ventures                | 165,929,300          | 10.86          |              | 8.35         | 10.52       | 10.52        | 1.95         |
| Grove Street - MP Ventures II             | 48,879,361           | 3.20           |              | 3.55         | -1.33       | 1.83         | --           |
| Natural Gas Partners - IX                 | 11,642,457           | 0.76           |              | -1.08        | 12.69       | 18.08        | --           |
| NGP Midstream & Resources                 | 9,382,223            | 0.61           |              | 1.28         | 59.91       | 32.41        | --           |
| NGP X                                     | 662,764              | 0.04           |              | --           | --          | --           | --           |
| Ospraie                                   | 13,103,458           | 0.86           |              | 5.86         | 5.54        | 9.24         | --           |
| Vectis H & L II                           | 6,162,381            | 0.40           |              | 4.61         | 2.12        | -0.90        | --           |
| <i>MO Hwy Priv. Equ. Index - Lagged</i>   |                      |                |              | 13.39        | 11.78       | 27.46        | 5.69         |
| <b>Hedge Fund Composite</b>               | <b>164,647,784</b>   | <b>10.77</b>   | <b>15.00</b> | <b>-2.84</b> | <b>0.70</b> | <b>7.07</b>  | <b>2.69</b>  |
| AQR Capital                               | 19,660,204           | 1.29           |              | 2.13         | 7.51        | 15.50        | -4.24        |
| BGI Global Ascent                         | 12,706,019           | 0.83           |              | -7.17        | -6.18       | 2.28         | --           |
| Black River                               | 0                    | 0.00           |              | 0.00         | 3.15        | 5.46         | --           |
| Brevan Howard                             | 14,560,138           | 0.95           |              | -3.90        | 5.31        | 4.59         | --           |
| Bridgewater Pure Alpha                    | 14,767,749           | 0.97           |              | -2.67        | 9.68        | 24.19        | 15.95        |
| Cevian                                    | 10,710,300           | 0.70           |              | -8.01        | --          | --           | --           |
| Concordia Asia                            | 399,250              | 0.03           |              | 0.00         | 11.02       | -4.79        | --           |
| Deephaven Capital                         | 312,327              | 0.02           |              | 15.07        | -3.75       | 1.27         | --           |
| Luxor Capital                             | 14,898,856           | 0.98           |              | -4.67        | -6.04       | 9.00         | --           |
| PFM                                       | 8,556,354            | 0.56           |              | -9.26        | -6.20       | --           | --           |
| Shepard International                     | 3,317,846            | 0.22           |              | 1.77         | -0.58       | 6.91         | -2.44        |
| SPM Composite                             | 11,231,524           | 0.74           |              | 4.85         | 10.76       | 33.33        | --           |
| Stelliam Investment                       | 10,940,353           | 0.72           |              | -0.85        | 9.40        | --           | --           |
| Taconic Capital                           | 22,191,457           | 1.45           |              | -0.79        | -0.38       | 4.51         | --           |
| ValueAct                                  | 10,534,528           | 0.69           |              | -5.33        | --          | --           | --           |
| Vicis Capital                             | 1,094,082            | 0.07           |              | -18.97       | -37.79      | -34.57       | -20.43       |
| Walker Smith                              | 8,766,797            | 0.57           |              | -2.72        | -9.39       | --           | --           |
| <i>HFRI Fund of Funds Composite Index</i> |                      |                |              | -2.30        | -4.50       | 2.17         | -2.04        |

Performance shown is net of manager fees.

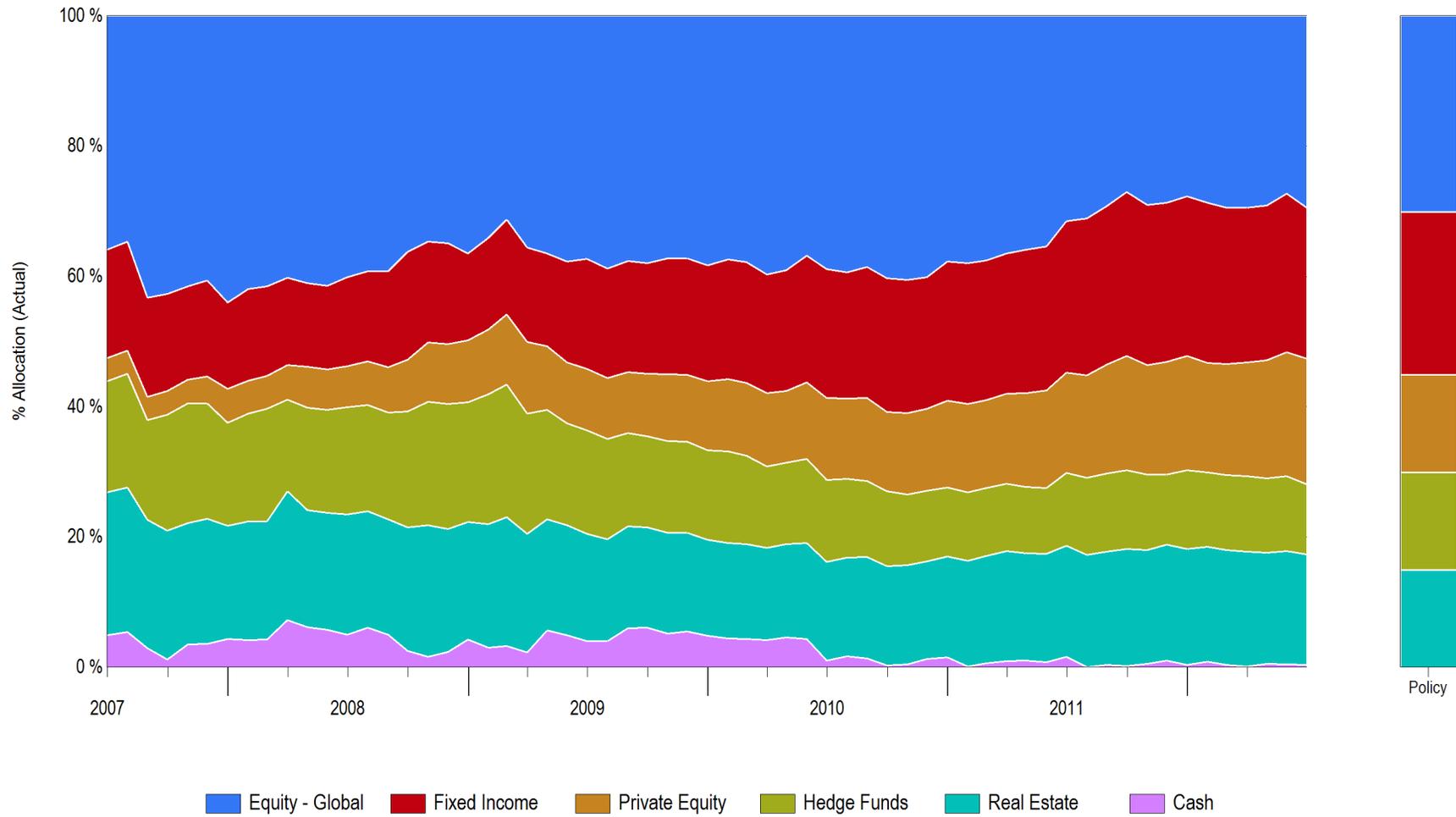
All market values are provided by custodian.



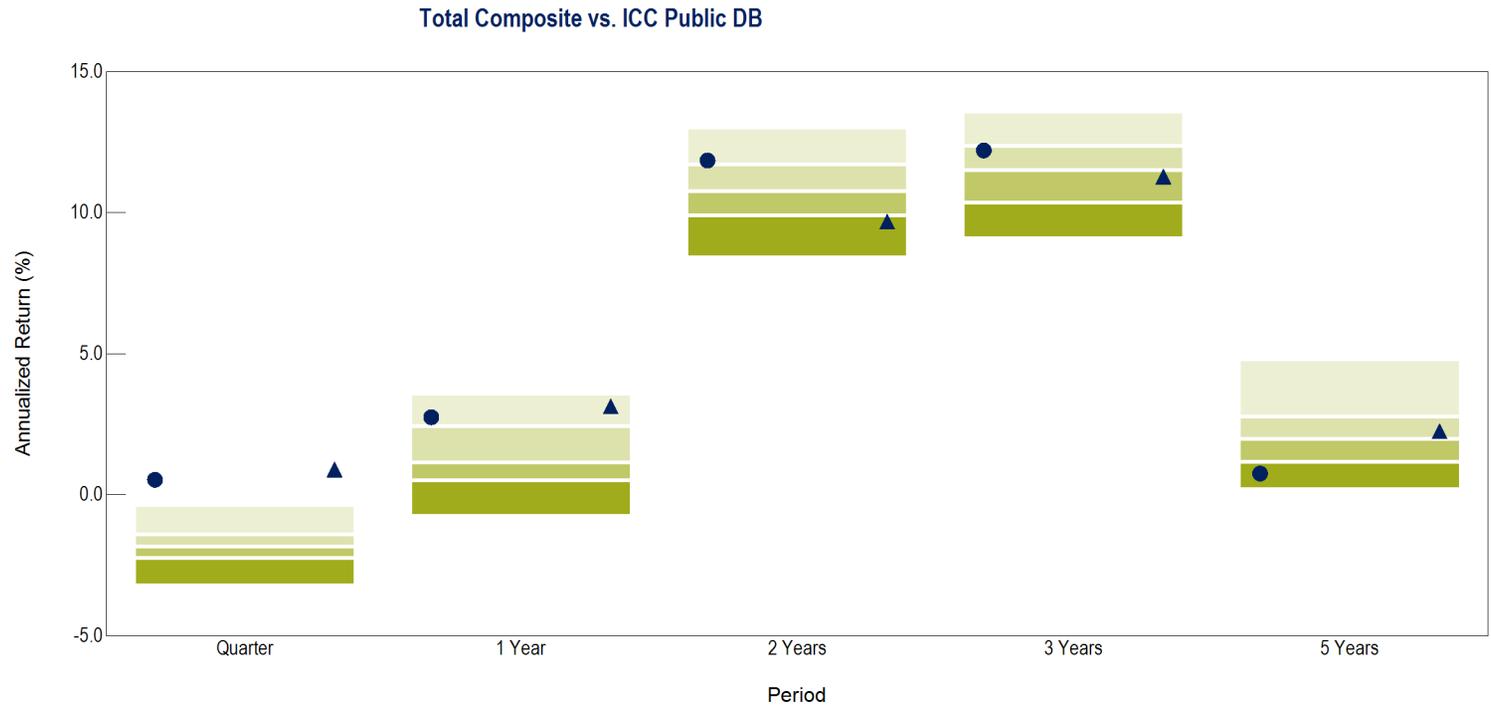
# Appendix

# Total Fund Asset Allocation History

Asset Allocation History

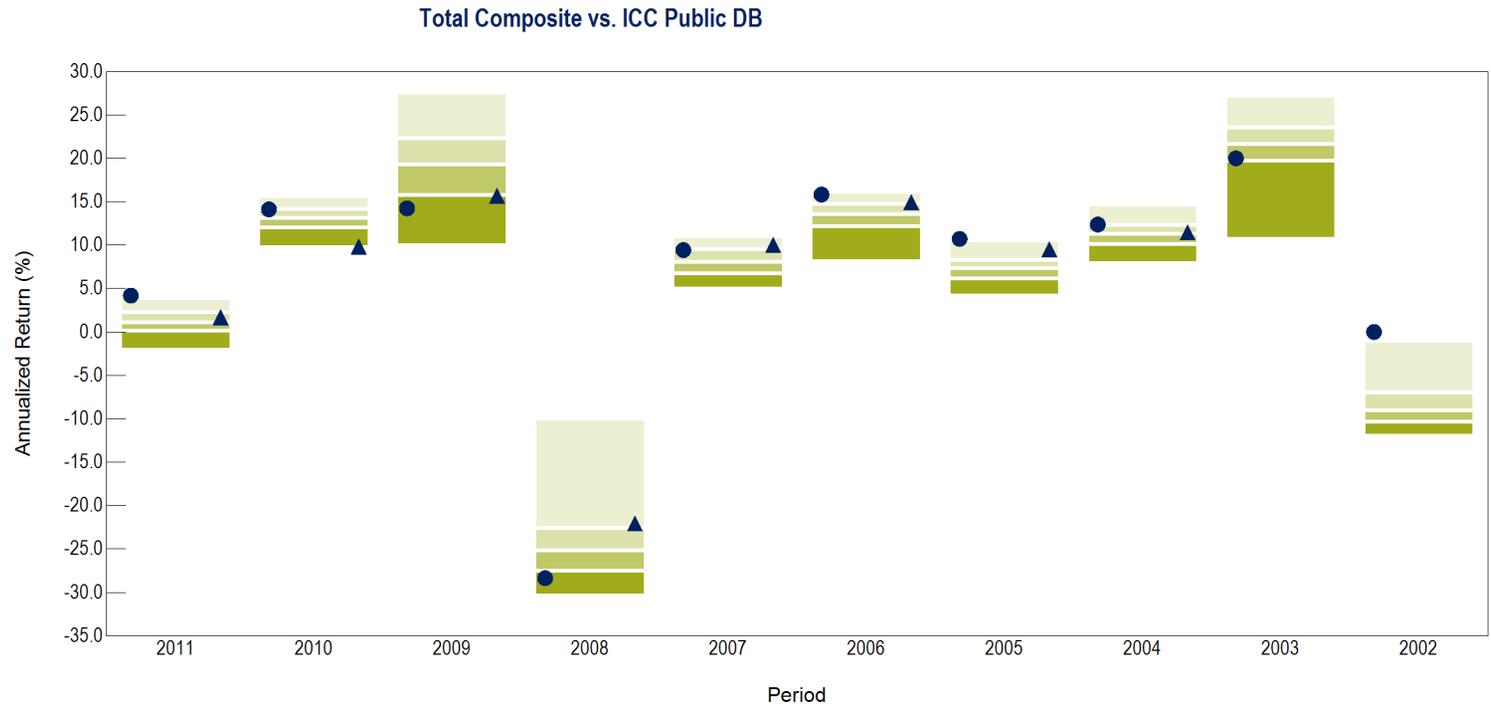


# Total Fund Return Summary vs. Peer Universe



|                   | Return (Rank) |     |      |      |      |      |      |      |     |      |
|-------------------|---------------|-----|------|------|------|------|------|------|-----|------|
| 5th Percentile    | -0.4          |     | 3.6  |      | 13.0 |      | 13.6 |      | 4.8 |      |
| 25th Percentile   | -1.4          |     | 2.4  |      | 11.7 |      | 12.4 |      | 2.8 |      |
| Median            | -1.8          |     | 1.2  |      | 10.8 |      | 11.5 |      | 2.0 |      |
| 75th Percentile   | -2.2          |     | 0.5  |      | 9.9  |      | 10.4 |      | 1.2 |      |
| 95th Percentile   | -3.2          |     | -0.7 |      | 8.4  |      | 9.1  |      | 0.2 |      |
| # of Portfolios   | 113           |     | 112  |      | 109  |      | 108  |      | 104 |      |
| ● Total Composite | 0.5           | (1) | 2.7  | (20) | 11.8 | (22) | 12.2 | (29) | 0.7 | (85) |
| ▲ Policy Index    | 0.9           | (1) | 3.1  | (12) | 9.7  | (80) | 11.3 | (56) | 2.3 | (42) |

# Total Fund Return Summary vs. Peer Universe



|                   | Return (Rank) |           |           |            |           |           |          |           |           |         |  |  |  |  |  |  |
|-------------------|---------------|-----------|-----------|------------|-----------|-----------|----------|-----------|-----------|---------|--|--|--|--|--|--|
| 5th Percentile    | 3.9           | 15.6      | 27.5      | -10.0      | 11.0      | 16.1      | 10.5     | 14.6      | 27.2      | -1.0    |  |  |  |  |  |  |
| 25th Percentile   | 2.3           | 14.2      | 22.3      | -22.6      | 9.6       | 14.8      | 8.4      | 12.4      | 23.6      | -6.9    |  |  |  |  |  |  |
| Median            | 1.1           | 13.2      | 19.4      | -25.1      | 8.1       | 13.6      | 7.4      | 11.4      | 21.7      | -9.0    |  |  |  |  |  |  |
| 75th Percentile   | 0.2           | 12.1      | 15.8      | -27.4      | 6.8       | 12.2      | 6.2      | 10.1      | 19.8      | -10.3   |  |  |  |  |  |  |
| 95th Percentile   | -2.0          | 9.8       | 10.1      | -30.3      | 5.1       | 8.2       | 4.3      | 8.0       | 10.7      | -11.9   |  |  |  |  |  |  |
| # of Portfolios   | 146           | 144       | 144       | 141        | 140       | 139       | 137      | 133       | 132       | 129     |  |  |  |  |  |  |
| ● Total Composite | 4.2 (5)       | 14.1 (26) | 14.2 (83) | -28.4 (85) | 9.4 (27)  | 15.8 (8)  | 10.7 (5) | 12.4 (25) | 20.0 (72) | 0.0 (4) |  |  |  |  |  |  |
| ▲ Policy Index    | 1.7 (40)      | 9.8 (95)  | 15.7 (77) | -22.1 (23) | 10.0 (18) | 14.9 (22) | 9.5 (9)  | 11.5 (44) | -- (--)   | -- (--) |  |  |  |  |  |  |

## Glossary of Investment Terminology—Risk Statistics

**Alpha** - Measures the relationship between the fund performance and the performance of another fund or benchmark index and equals the excess return while the other fund or benchmark index is zero.

**Alpha Jensen** - The average return on a portfolio over and above that predicted by the capital asset pricing model (CAPM), given the portfolio's beta and the average market return. Also known as the abnormal return or the risk adjusted excess return.

**Annualized Excess Return over Benchmark** - Annualized fund return minus the annualized benchmark return for the calculated return.

**Annualized Return** - A statistical technique whereby returns covering periods greater than one year are converted to cover a 12 month time span.

**Beta** - Measures the volatility or systematic risk and is equal to the change in the fund's performance in relation to the change in the assigned index's performance.

**Information Ratio** - A measure of the risk adjusted return of a financial security, asset, or portfolio.

*Formula:*

*(Annualized Return of Portfolio - Annualized Return of Benchmark)/Annualized Standard Deviation(Period Portfolio Return - Period Benchmark Return). To annualize standard deviation, multiply the deviation by the square root of the number of periods per year where monthly returns per year equals 12 and quarterly returns is four periods per year.*

**R-Squared** - Represents the percentage of a fund's movements that can be explained by movements in an index. R-Squared values range from 0 to 100. An R-Squared of 100 denotes that all movements of a fund are completely explained by movements in the index.

**Sharpe Ratio** - A measure of the excess return or risk premium per unit of risk in an investment asset or trading strategy.

**Sortino Ratio** - A method to differentiate between good and bad volatility in the Sharpe Ratio. The differentiation of up and down volatility allows the calculation to provide a risk adjusted measure of a security or fund's performance without upward price change penalties.

*Formula:*

*Calculation Average (X-Y)/Downside Deviation (X-Y) \* 2  
Where X=Return Series X Y = Return Series Y which is the risk free return (91 day T-bills)*

**Standard Deviation** - The standard deviation is a statistical term that describes the distribution of results. It is a commonly used measure of volatility of returns of a portfolio, asset class, or security. The higher the standard deviation the more volatile the returns are.

*Formula:*

*(Annualized Return of Portfolio - Annualized Return of Risk Free) / Annualized Standard Deviation (Portfolio Returns)*

**Tracking Error** - Tracking error, also known as residual risk, is a measure of the degree to which a portfolio tracks its benchmark. It is also a measure of consistency of excess returns. Tracking error is computed as the annualized standard deviation of the difference between a portfolio's return and that of its benchmark.

*Formula:*

*Tracking Error = Standard Deviation (X-Y) \*  $\sqrt{(\# \text{ of periods per year})}$   
Where X = periods portfolio return and Y = the period's benchmark return  
For monthly returns, the periods per year = 12  
For quarterly returns, the periods per year = 4*

**Treynor Ratio** - A risk-adjusted measure of return based on systematic risk. Similar to the Sharpe ratio with the difference being the Treynor ratio uses beta as the measurement of volatility.

*Formula:*

*(Portfolio Average Return - Average Return of Risk-Free Rate)/Portfolio Beta*

**Up/Down Capture Ratio** - A measure of what percentage of a market's returns is "captured" by a portfolio. For example, if the market declines 10% over some period, and the manager declines only 9%, then his or her capture ratio is 90%. In down markets, it is advantageous for a manager to have as low a capture ratio as possible. For up markets, the higher the capture ratio the better. Looking at capture ratios can provide insight into how a manager achieves excess returns. A value manager might typically have a lower capture ratio in both up and down markets, achieving excess returns by protecting on the downside, whereas a growth manager might fall more than the overall market in down markets, but achieve above-market returns in a rising market.

*UpsideCapture = TotalReturn(FundReturns)/TotalReturns(BMReturn) when Period Benchmark Return is  $> = 0$*

*DownsideCapture = TotalReturn(FundReturns)/TotalReturns(BMReturn) when Benchmark  $< 0$*

Data Source: InvestorForce

## Glossary of Investment Terminology

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Glossary of Investment Terminology

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

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

**Derivative Instrument<sup>3</sup>** - A financial obligation that derives its precise value from the value of one or more other instruments (or assets) at the same point of time. For example, the relationship between the value of an S&P 500 futures contract (the derivative instrument in this case) is determined by the value of the S&P 500 Index and the value of a U.S. Treasury bill that matures at the expiration of the futures contract.

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

*Formula:*

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Glossary of Investment Terminology

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

- **Past performance is no guarantee of future results.**
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