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## MoDOT & Patrol Employees Retirement System

Investment Summary Quarter  
Ending June 30, 2015

### Board Report

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# Market Thoughts & Education





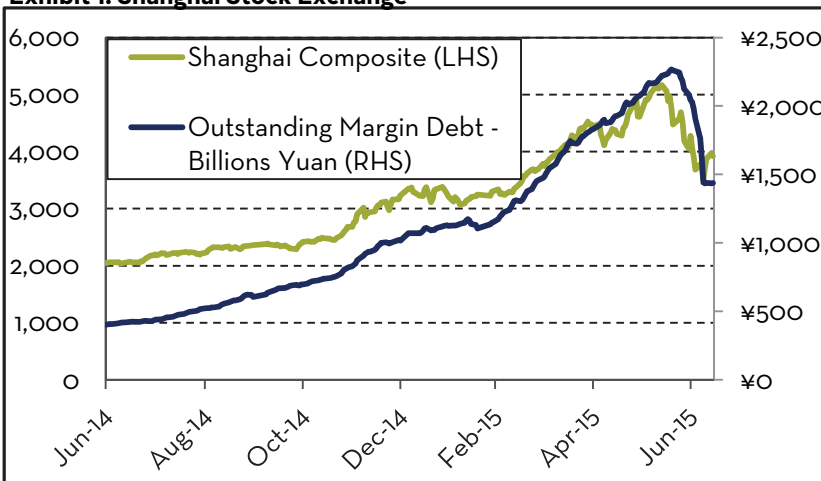
NEPC is an independent, full service investment consulting firm, providing asset allocation, traditional and alternative asset manager search, performance evaluation and investment policy services to institutional investment programs. We offer our market letters to provide insight into recent market conditions, and to assist your interpretation of investment results. We encourage your comments and feedback, as well as any inquiries you may have about our firm or our consulting services.

## A TALE OF TWO BAILOUTS: GREECE AND CHINA

### Introduction

Markets the world over sputtered as Greece and China—two economies dissimilar in every way—shared in the fallout from their individual and distinct debt drama that played out publicly across continents. US stocks ended the second quarter flat as optimism over the economy at home was tempered by concerns around the ongoing Greek debt crisis and a steep stock market sell-off in China; international equities were mixed as Europe posted its worst three months since 2012 while Japan continued its stellar run.

**Exhibit 1: Shanghai Stock Exchange**



Source: Bloomberg

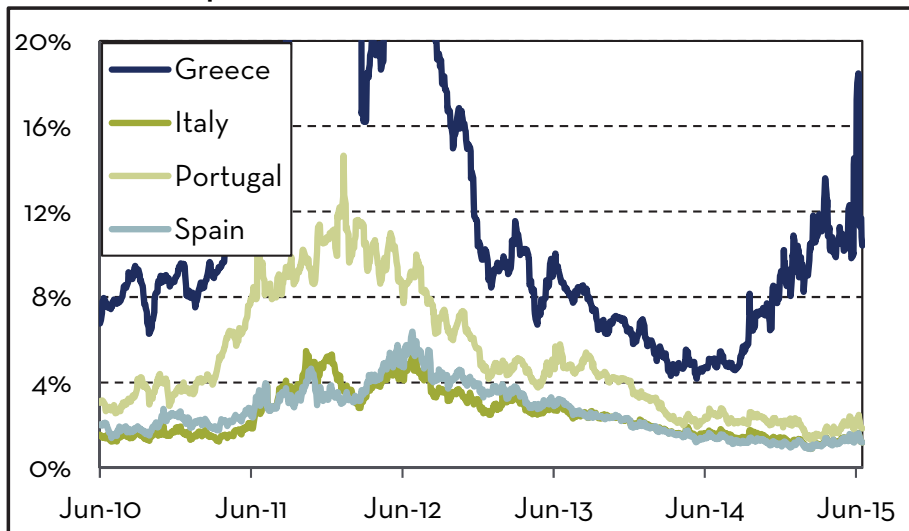
Greece's unsustainable debt level—currently 177% of GDP—served as a backdrop for drawn out and contentious negotiations with its creditors, which spanned the quarter and extended into July. Elsewhere, China's stock markets made headlines after plummeting over 30% within a span of weeks, pressured from ever increasing margin calls for levered investors. At the peak in mid-June, China's largest local stock exchanges, Shanghai and Shenzhen, had increased nearly 150% over a 12-month period, bolstered by copious amounts of margin debt used to finance the purchase of stocks (Exhibit 1). While the targeted responses to the fall in Chinese equities and Greece's unsustainable government debt load varied widely, in both instances the measures adopted by China and the Eurozone were bold and unique.

The possibility of Greece's exit from the Eurozone escalated during the quarter as it failed to make a €2 billion payment to the International Monetary Fund and instituted capital controls to slow a collapse of its banking system. Following Greece's hastily held national referendum rejecting the bailout terms offered by creditors, the response from Eurozone members was daring and unprecedented. Led by Germany, Eurozone members broke with a long-held doctrine and broached the notion of a nation leaving the euro. The Eurozone's terms for Greece to secure a €86 billion bailout were extraordinary: capitulate to nearly all demands from creditors or abandon the euro. Confronted with the collapse of the country and its banking system, Greek officials had little alternative but to accept the new bailout terms.

For investors in Europe, the risk of contagion and a domino of nations exiting the euro has been a lingering worry. That said, market anxiety over government debt levels and the economic competitiveness of peripheral European economies has

largely waned despite the crisis in Greece (Exhibit 2). For nearly five years, the Eurozone has looked to address concerns around the stability of the euro and over the last several weeks a degree of ambiguity has been removed. Clear lines have been drawn regarding membership in the Eurozone: enact reforms to improve economic competitiveness or exit the currency union with a 25% smaller economy, a banking system in shambles, and a broad turnover in elected leaders. To be sure, risks remain, but the recent events should give investors greater confidence in the continued implementation of economic reforms in Italy, Spain and Portugal. Accordingly, we recommend an overweight exposure to developed market equities and suggest investors opportunistically exploit future volatility to add to the over-

**Exhibit 2: Yield Spread to 10-Year German Government Bonds**



Source: Bloomberg

weight. Signs of improvement are already visible in Europe as credit growth, consumer confidence and inflation tick up. In addition, the equity outlook in Europe appears favorable aided by an accommodative monetary policy from the European Central Bank and a rebound in earnings growth off cyclical lows. Not to be outdone, Japan appears to be experiencing a robust earnings recovery and an improved outlook for corporate profitability and growth as shareholder-friendly reforms take hold. The culmination of developments in Europe and Japan encourage us to favor developed market equities over US stocks. That said, we are aware of currency volatility and recommend a 50% hedge for developed market currency exposure.

In China, with trading suspended on over half the local equities, the government and central bank are taking extraordinary measures to address the decline from the mid-June highs. The central bank cut interest rates by 25 basis points and is providing liquidity support for a state-owned company (CSFC) that finances margin loans for brokerage houses. In addition, the government has banned major shareholders and executives from selling any stock holdings for six months, announced a suspension of IPOs, and encouraged local sovereign wealth and pension funds to purchase mainland equities. On the surface, the threat of global contagion from China's capital markets appears muted as its fixed-income and equity markets are largely inaccessible to foreign investors. Still, a 30% decline in equities is not to be taken lightly as a sell-off of that magnitude has the potential to filter into the general economy and impede economic growth. The government of China is clearly of a similar view and its aggressive response underscores these concerns.

While the Chinese economy hit its GDP growth target of 7% in the second quarter, worries around growth linger as industrial production and fixed-asset investment growth continue to slow. The direct impact on global investors is less tangible but a slowdown in the world's second-largest economy has broad implications for many emerging market economies. Global commodity producers and regional exporters in Asia are likely to feel the effects of slowing demand from China, aggravating fiscal and balance of payment concerns. While a dramatic economic slowdown in China is not widely expected, the risk of further equity market declines harming economic growth cannot be ignored. Significant levels of margin debt from official and unofficial sources remain in its financial system and, coupled with the government's intervention in equity markets, volatility is likely to remain elevated. To this end, we recommend investors maintain a benchmark neutral weight in emerging market equities. In addition, we encourage the use of benchmark-agnostic investment strategies with a bias towards emerging market countries undertaking economic and political reforms.

## Global Equities

Global equities had a modest second quarter on the heels of a strong first quarter. After clocking gains of 7.7% in April, emerging markets equities sold off significantly in May and June. Similarly, the MSCI EAFE Index posted robust returns in April but gave up gains in June. While the US is lagging the MSCI All Country World Index so far this year, the S&P 500 has not experienced the same level of volatility. Japanese equities continue to perform well with gains of 3%, while Indonesia was down a hefty 14%.

In the US, small cap stocks posted gains of 0.4% in the second quarter, according to the Russell 2000 Index. So far this year, smaller capitalization companies have trumped large-cap equities and growth has outpaced value across the capitalization spectrum.

Equity Index Returns as of 6/30/2015				
Global Equity	Quarter	1 Year	3 Yrs	5 Yrs
MSCI World	-0.3%	-0.4%	12.0%	10.8%
US Equity	Quarter	1 Year	3 Yrs	5 Yrs
S&P 500	0.3%	7.4%	17.3%	17.3%
Dow Jones Industrial Average	-0.9%	4.7%	11.0%	12.5%
NASDAQ Composite	1.8%	13.1%	19.3%	18.8%
Russell 1000 Growth	0.1%	10.6%	18.0%	18.6%
Russell 1000 Value	0.1%	4.1%	17.3%	16.5%
Russell 2000	0.4%	6.5%	17.8%	17.1%
Russell 2000 Growth	2.0%	12.3%	20.1%	19.3%
Russell 2000 Value	-1.2%	0.8%	15.5%	14.8%
International Equity	Quarter	1 Year	3 Yrs	5 Yrs
MSCI EAFE	0.6%	-4.2%	12.0%	9.5%
MSCI Emerging Markets	0.7%	-5.1%	3.7%	3.7%
MSCI Europe	0.4%	-7.7%	12.4%	10.0%
MSCI UK	3.0%	-8.2%	9.1%	10.7%
MSCI Japan	3.1%	8.3%	13.3%	8.8%
MSCI Far East	3.2%	8.1%	13.1%	9.0%

## Global Fixed Income

Reversing course from a strong first quarter, most fixed-income securities were in the red for the three months ended June 30. Eurozone bonds gave back gains from the first quarter as Greece's debt crisis rattled investors. The Federal Reserve has hinted that barring any economic setbacks, the first rate increase will be slated for the later part of the year. Given this expected hike and a pickup in economic activity during the second quarter, the US yield curve experienced a bear-steepening, which occurs when long-term rates rise faster than short-term rates. The 30-year Treasury ended 57 basis points higher at 3.11% in the second quarter, while the two-year Treasury was up seven basis points to 0.63%; this dynamic typically occurs in anticipation of a more hawkish monetary policy to combat an expected increase in inflation.

Higher-yielding and shorter-duration securities were able to hold on to and, in some instances, even add to their gains from the first quarter. The Barclays 1-3 year Government/ Credit Index returned 0.1% and US high-yield bonds were flat. Meanwhile, long Treasuries fell 8.3% and investment-grade corporate debt lost 2.9%. Despite strong earnings and credit fundamentals, the overall performance of US high-grade corporate bonds was hindered by record new issuance, which contributed to 16 basis points of spread widening in the quarter. Issuance has totaled almost \$650 billion year-to-date (with a record issuance of \$155 billion in May). This issuance is over 20% higher than in the first half of 2014. High-yield spreads tightened by five basis points to 535 basis points. New issue volume for high-yield bonds is up 3% from the first half of 2014 with \$185 billion in issuance so far this year.

Moving to emerging markets, external and local currency debt lost ground in the second quarter as yields increased globally. Emerging market currencies—in particular, the Mexican peso, Thai baht and Turkish lira—weakens against the US dollar. US dollar-denominated debt, as measured by the JP Morgan EMBI Index, fell 34 basis points; local currency debt fell 96 basis points, according to the JP Morgan GBI-EM Index.

Fixed Income Index Returns as of 6/30/2015				
Global Fixed Income	Quarter	1 Year	3 Yrs	5 Yrs
Citi WGBI	-1.6%	-9.0%	-2.5%	1.1%
JPM EMBI Plus	-0.9%	-2.1%	2.8%	6.2%
Domestic Fixed Income	Quarter	1 Year	3 Yrs	5 Yrs
BC Aggregate Bond	-1.7%	1.9%	1.8%	3.4%
BC US Agg. Treasury	-1.6%	2.3%	0.9%	2.7%
BC US Credit	-2.9%	0.9%	3.0%	4.9%
BC Mortgage Backed	-0.7%	2.3%	1.9%	2.9%
BC Intern. Gov't/Credit	-0.6%	1.7%	1.6%	2.8%
BC 1-10 Yr TIPS	-0.2%	-2.0%	-0.5%	2.4%
BC High Yield	0.0%	-0.4%	6.8%	8.6%
S&P LSTA Lev. Loan	0.7%	1.8%	4.9%	5.5%
3 Month T-Bills	0.0%	0.0%	0.1%	0.1%
10-Year Bond Yields	Jun-15	Mar-15	Jun-14	Jun-14
US	2.4%	1.9%	2.5%	2.5%
Germany	0.8%	0.2%	1.2%	1.7%
UK	2.0%	1.6%	2.7%	2.4%
Japan	0.5%	0.4%	0.6%	0.9%

## Currency Markets

Core currency market trends reversed briefly in the second quarter, stalling a rally that began in mid-2014 in the US dollar relative to the euro, UK pound and the Japanese yen. Muted economic data in the US and signs that the ECB's monetary easing may be taking hold led to the euro appreciating. The rally was short-lived as speculators took profits and markets shifted attention back to a potential rate hike by the Fed in 2015. In addition, volatility remained elevated in the latter half of the quarter as risk-taking declined amid the Greek debt talks and falling commodity prices.

## Commodity Markets

The Bloomberg Commodity Index rebounded 4.7% in the second quarter, outperforming US large cap equities, bonds and the US dollar.

Energy and agriculture led the way, while industrial metals, precious metals and livestock declined. The Bloomberg WTI Crude Oil Index gained 17.5% for the quarter amid continued declines in rig counts and announced project deferrals, expectations of demand rebounding and lower US output. The agriculture sector gained 8.3% as warm, wet weather in the Midwest, coupled with dry weather elsewhere, adversely affected corn and soybean planting, creating concerns around yield production. Industrial metals traded down 5.3% on the back of slowing growth in China and ongoing economic woes. Precious metals lost 2.6%, hurt by a strengthening US dollar and a potential rate hike by the Fed.

## Pension Liability

The Citigroup Pension Liability Index (CPLI) rose to 4.44% on June 30 from 3.75% in the first quarter with Treasury rates rising 57 basis points on the long end of the curve. As a result, pension liabilities dropped by an estimated 11.1% in the second quarter, according to the CPLI, bringing the decrease in pension liabilities to 6.8% so far this year. This is good news for plan sponsors who likely saw an increase in plan funded status over the quarter.

As plans' funded status rise, we expect to see an uptick in pension risk transfer activity. The RP-2014 mortality tables have yet to be mandated under PPA for funding liabilities. This offers plan sponsors an opportunity to cash out some terminated participants prior to the implementation of these new mortality tables.

However, the IRS recently announced it will halt approval for lump sum payments to retirees, leaving annuity purchases and risk transfers to insurance companies as the pension risk transfer options available to this group of plan participants. NEPC is an important partner in any risk transfer activity, working closely with insurance companies, actuaries and plan sponsors to provide liquidity for lump sum payments or to reallocate plan assets into a portfolio most desirable for an insurance company.

## Hedge Funds

Hedge fund performance was mixed in the second quarter with funds broadly underperforming US equities. The Credit Suisse Hedge Fund Index lost 0.5%, trailing the 0.3% return of the S&P 500. The underperformance can be attributed primarily to volatility spurred by the Greece-Eurozone debt negotiations, the downturn in China's equity market and the reversal in commodities.

Hedge Fund Industry Performance Overview as of 6/30/2015				
Composite	Quarter	1 Year	3 Yrs	5 Yrs
DJCS Hedge Fund Composite	-0.5%	3.3%	7.1%	6.2%
Relative Value	Quarter	1 Year	3 Yrs	5 Yrs
DJCS Convertible Arbitrage	2.5%	-1.0%	3.6%	4.8%
DJCS Fixed Income Arbitrage	0.9%	1.7%	5.0%	6.2%
DJCS Equity Market Neutral	2.1%	-1.1%	3.2%	3.3%
DJCS Multi-Strategy	0.2%	6.5%	9.0%	8.5%
Event Driven	Quarter	1 Year	3 Yrs	5 Yrs
DJCS Event Driven	0.4%	-2.0%	8.6%	5.9%
DJCS Event Driven - Distressed	-0.4%	-3.7%	8.3%	6.4%
DJCS Event Driven - Risk Arbitrage	1.7%	-2.0%	2.7%	2.6%
DJCS Event Driven - Multi-Strategy	0.7%	-1.3%	8.7%	5.7%
Equity Hedge	Quarter	1 Year	3 Yrs	5 Yrs
DJCS Long-Short Equity	1.7%	6.0%	10.8%	7.8%
DJCS Emerging Markets	1.4%	4.5%	7.1%	5.6%
DJCS Dedicated Short Bias	-4.8%	-8.1%	-17.0%	-15.7%
Tactical	Quarter	1 Year	3 Yrs	5 Yrs
DJCS Global Macro	-1.8%	4.8%	4.8%	6.0%
DJCS Managed Futures	Quarter	1 Year	3 Yrs	5 Yrs
DJCS Managed Futures	-10.6%	12.9%	2.9%	2.9%
Traditional Markets	Quarter	1 Year	3 Yrs	5 Yrs
BC Aggregate Bond	-1.7%	1.9%	1.8%	3.3%
S&P 500	0.3%	7.4%	17.3%	17.3%

Tactical trading strategies lagged the broad hedge fund universe for the quarter. The Credit Suisse Managed Futures and the Credit Suisse Global Macro indexes were down 10.6% and 1.8%, respectively. Managed futures strategies performed poorly amidst sharp risk reversals that occurred throughout the period. Specifically, popular trends in the euro/ US dollar, oil and European interest rates reversed over the quarter leading to underperformance in CTA strategies broadly.

Event-driven strategies continued to benefit from robust mergers and acquisitions activity through the first half of 2015. The Credit Suisse Event Driven Index returned 0.5% in the period, driven by a strong quarter for risk arbitrage-focused strategies which gained 1.7%. Concerns in Greece created mark-to-market volatility for event-driven managers, but the real impact is muted as most funds have limited exposure. In addition, renewed concerns around Puerto Rico's ability to repay its debt led to heightened volatility in its bonds, fueling underperformance in distressed strategies focused on the opportunity.

Performance of credit funds was supported by fundamentals and oil price stability earlier in the quarter, but these gains eroded as macro-related risks fueled a technical selloff in risky assets.

Equity strategies were mixed over the second quarter. The Credit Suisse Equity Market Neutral and Credit Suisse Long-Short Equity indexes gained 1.7% and 2.1%, respectively, while short-biased strategies fell 4.8%, according to the Credit Suisse Dedicated Short Bias Index. Strategies favoring biotech benefited from higher mergers and acquisitions activity. Energy-focused strategies grappled with oscillating oil prices in the second quarter which hurt managers with bullish views on the energy market.

## Private Markets

Private equity fundraising has totaled a hefty \$185 billion so far this year, including \$102 billion raised in the second quarter. On an annualized basis, 2015 is closely tracking the \$350 billion raised last year. While uncertainties around economic growth and reform plague several key Asian countries, recent market volatility and lower private capital allocations could enhance the attractiveness of Asian deal flow for long-term private equity investors. Buyout and growth equity funds remain the anchor in most investors' portfolios, accounting for over 50% of capital. Energy funds raised 16% of total capital as managers and investors make tactical allocations to benefit from oil-related price dislocations.

On the new deal side, mergers and acquisitions activity hit its highest level since 2007. With competition intensifying and easy debt financing, buyout valuations remain elevated, especially in the US. Global buyout activity in the second quarter totaled 755 deals worth \$96.1 billion. The quarter saw 373 exits worth \$114 billion as mature private equity funds profited from the high levels of mergers and acquisitions and new deal activity. In the US, venture capital continued its strong streak with \$17.5 billion of investments in 1,189 deals in the second quarter, representing the highest quarterly total since 2000.

Looking ahead, we advise clients to balance their commitments between opportunities likely to benefit from long-term economic recovery and those that can capitalize on near-term volatility in public equity and debt markets. We favor managers with demonstrated price discipline, strong value orientation and those possessing operational capabilities to enhance portfolio company performance.

Moving to real estate, NEPC maintains its neutral view on US private core real estate and real estate investment trusts (REITs). Private core real estate generated robust returns in the second quarter. Real estate fundamentals remain strong and assets are priced at attractive income yields relative to interest rates, though absolute yields are low based on historical averages. Our main longer-term concerns for US core real estate are large inflows of capital that have driven up pricing, low relative absolute yields, the impact of higher interest rates on capitalization rates and asset values, and signs of new construction. We remain neutral on real estate debt. Yields have generally remained low and lenders continue to loosen credit standards. NEPC remains positive on value-add and opportunistic real estate. We still view Europe as the best candidate for a marginal dollar of real estate investment. For non-core real estate in the US, we continue to favor niche-focused and historically conservative managers with a proven ability to understand local markets and avoid overheated markets.

In real assets, we are positive on energy and neutral on agriculture, infrastructure, metals and mining, and timber. NEPC continues to evaluate the spectrum of liquid and illiquid energy-related investment opportunities given the dislocation in oil prices. Oil prices have been volatile in the first half of 2015 and the market remains oversupplied. The recent nuclear agreement with Iran introduces more uncertainty into the market as the country's reserves are massive, but its capacity to increase production in the near term is unclear. Investors generally expect oil prices to settle around \$70 in 2016 and NEPC shares this view. The energy sector has shown an ability to adapt through greater efficiency and reduced service cost, allowing for new production but at a lower growth rate. Capital markets have generally been accommodative to energy companies but bank borrowing bases will be reset in the fall redetermination period, putting increased stress on the sector if oil prices remain low and hedges roll off. This will likely result in decreasing cash flows and companies will require capital, generating a variety of investment opportunities. This has already started to occur with a handful of companies and is expected to grow this year and into 2016.

## Final Thoughts

Financial markets typically provide spells of uncertainty and volatility in a dynamic global environment. To this end, our goal at NEPC is to identify potential investment opportunities arising out of these times. As such, we favor international developed equities over US stocks and recommend a 50% strategic currency hedge for developed market currencies. We endorse the use of benchmark-agnostic emerging market mandates and dynamic strategies, for instance, global macro and global asset allocation, to navigate macroeconomic and currency risks. In addition, we encourage investors to shift from benchmark-focused global bond strategies to US duration exposures, as low global yields reduce their diversification benefit relative to US yields. While opportunities and stresses will undoubtedly arise, we hold firm in our belief that a diversified risk-balanced portfolio best serves investors' ability to withstand a multitude of economic environments over the long term.



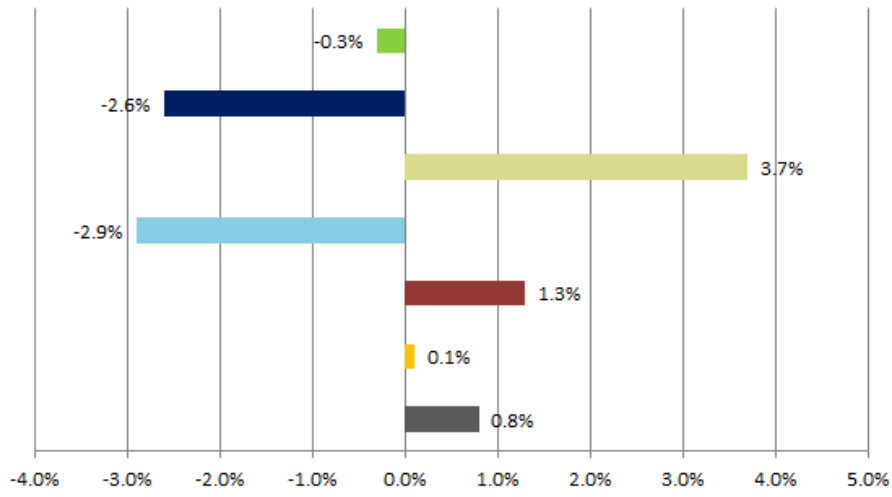
## **Disclaimers and Disclosures**

- Past performance is no guarantee of future results.
- All investments carry some level of risk. Diversification and other asset allocation techniques do not ensure profit or protect against losses.
- The information in this report has been obtained from sources NEPC believes to be reliable. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.
- The opinions presented herein represent the good faith views of NEPC as of the date of this report and are subject to change at any time.
- This report contains summary information regarding the investment management approaches described herein but is not a complete description of the investment objectives, portfolio management and research that supports these approaches. This analysis does not constitute a recommendation to implement any of the aforementioned approaches.

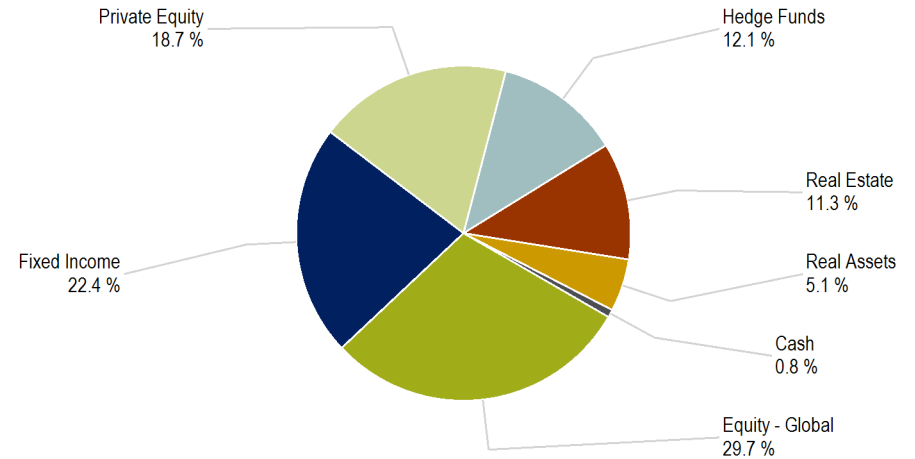
# Executive Summary

# Total Fund Asset Allocation vs. Current Allocation

**Current Allocation vs. Policy Allocation**



**Current Asset Allocation**

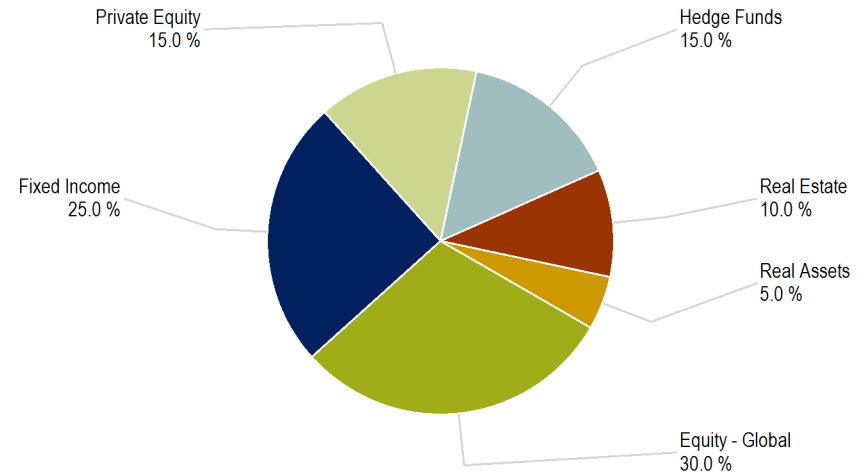


**Current Asset Allocation vs. Policy Asset Allocation**

	Current	Policy	Current	Current Difference*
Equity - Global	\$594,235,669	30.0%	29.7%	-0.3%
Fixed Income	\$447,873,258	25.0%	22.4%	-2.6%
Private Equity	\$375,442,842	15.0%	18.7%	3.7%
Hedge Funds	\$243,219,419	15.0%	12.1%	-2.9%
Real Estate	\$226,447,261	10.0%	11.3%	1.3%
Real Assets	\$101,481,658	5.0%	5.1%	0.1%
Cash	\$15,103,031	--	0.8%	0.8%
<b>Total</b>	<b>\$2,003,803,138</b>	<b>100.0%</b>	<b>100.0%</b>	

\*Difference between Policy and Current Allocation

**Policy Asset Allocation**

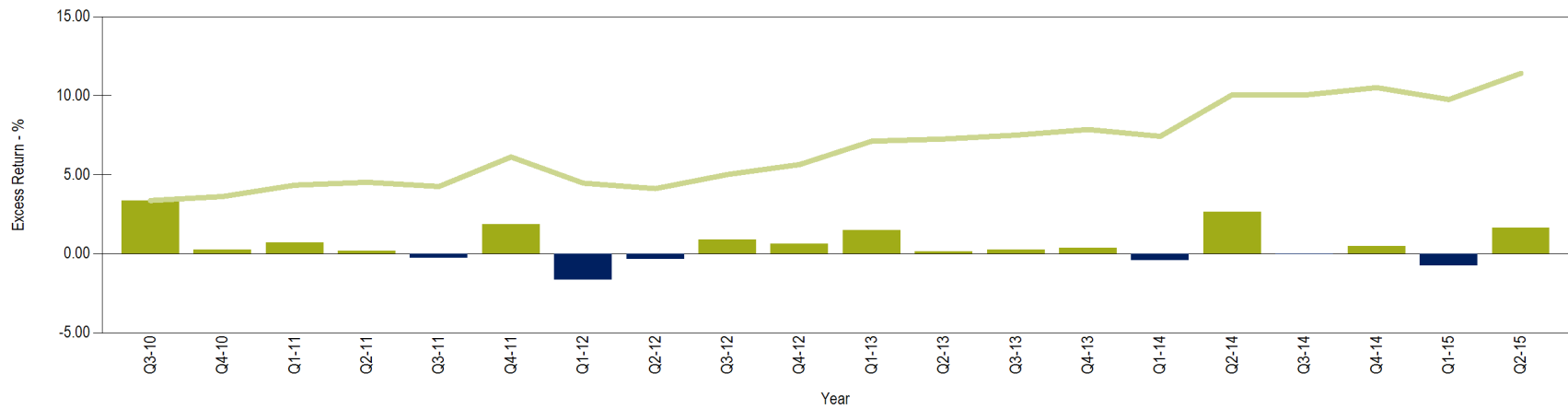


Allocations may not add to 100% due to rounding.

# Total Fund Performance Summary

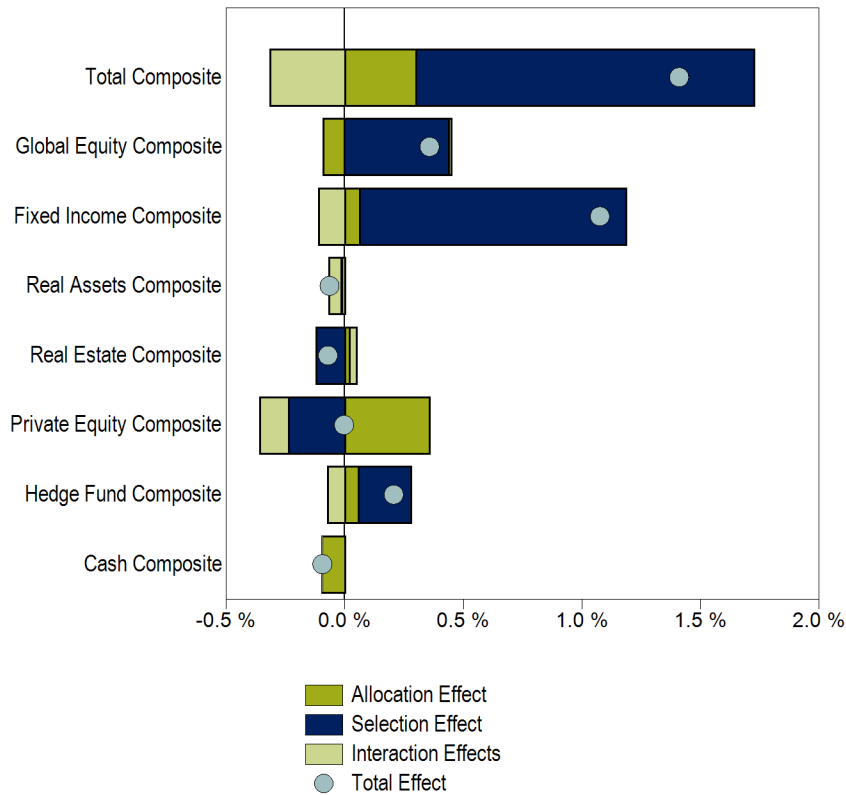
	Market Value	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs
<b>Total Composite</b>	<b>\$2,003,769,229</b>	<b>2.20%</b>	<b>6.61%</b>	<b>12.45%</b>	<b>12.21%</b>	<b>7.20%</b>
<i>Policy Index</i>		0.55%	5.20%	9.84%	9.77%	6.91%
<i>InvestorForce Public DB Net Median</i>		-0.09%	2.82%	9.66%	9.74%	6.21%

Quarterly and Cumulative Excess Performance



# Total Fund Attribution Analysis

Attribution Effects Relative to Policy Index  
1 Year Ending June 30, 2015



Attribution Summary  
1 Year Ending June 30, 2015

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Global Equity Composite	2.2%	0.7%	1.5%	0.4%	-0.1%	0.0%	0.4%
Fixed Income Composite	6.0%	1.6%	4.4%	1.1%	0.1%	-0.1%	1.1%
Real Assets Composite	3.7%	4.1%	-0.4%	0.0%	0.0%	0.0%	-0.1%
Real Estate Composite	12.5%	13.6%	-1.2%	-0.1%	0.0%	0.0%	-0.1%
Private Equity Composite	14.4%	16.1%	-1.7%	-0.2%	0.4%	-0.1%	0.0%
Hedge Fund Composite	5.3%	3.9%	1.4%	0.2%	0.1%	-0.1%	0.2%
Cash Composite	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%	-0.1%
<b>Total</b>	<b>6.6%</b>	<b>5.2%</b>	<b>1.4%</b>	<b>1.4%</b>	<b>0.3%</b>	<b>-0.3%</b>	<b>1.4%</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.

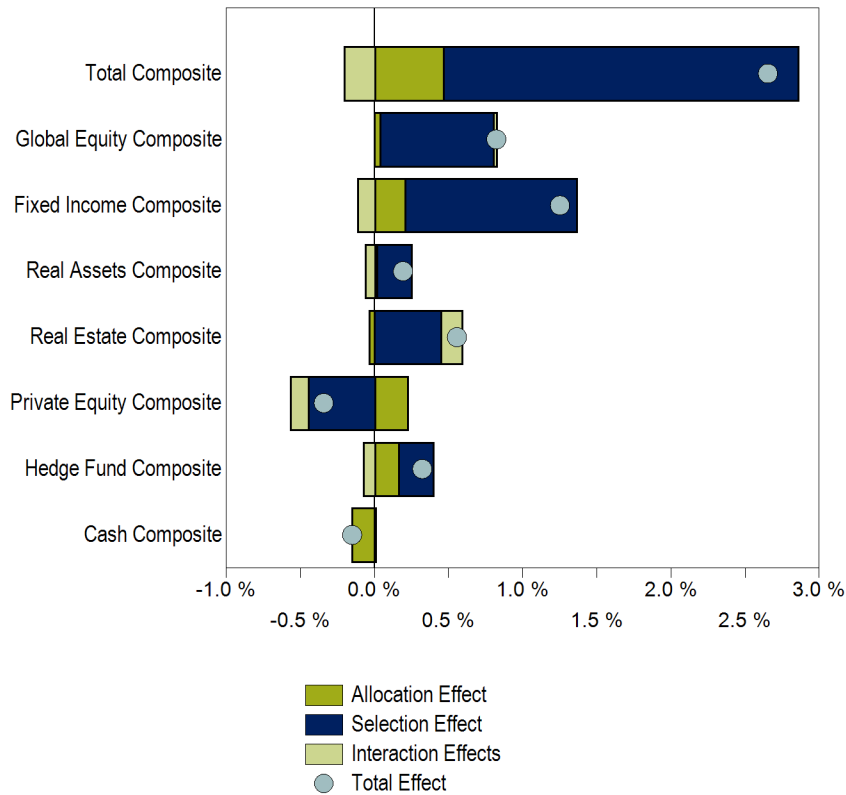
Allocation Effect - The return attributable to the asset allocation of the portfolio

Selection Effect - The return attributable to the managers' security selection

Interaction Effect - The return attributable to the interaction between the Allocation and Selection Effects

# Total Fund Attribution Analysis

**Attribution Effects Relative to Policy Index  
3 Years Ending June 30, 2015**



**Attribution Summary  
3 Years Ending June 30, 2015**

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Global Equity Composite	15.7%	13.0%	2.7%	0.8%	0.0%	0.0%	0.8%
Fixed Income Composite	6.7%	2.3%	4.4%	1.2%	0.2%	-0.1%	1.3%
Real Assets Composite	9.1%	4.7%	4.4%	0.2%	0.0%	-0.1%	0.2%
Real Estate Composite	16.0%	11.8%	4.1%	0.5%	0.0%	0.1%	0.6%
Private Equity Composite	16.6%	19.6%	-2.9%	-0.4%	0.2%	-0.1%	-0.3%
Hedge Fund Composite	7.7%	6.3%	1.5%	0.2%	0.2%	-0.1%	0.3%
Cash Composite	0.1%	0.0%	0.0%	0.0%	-0.2%	0.0%	-0.2%
<b>Total</b>	<b>12.5%</b>	<b>9.8%</b>	<b>2.7%</b>	<b>2.4%</b>	<b>0.5%</b>	<b>-0.2%</b>	<b>2.7%</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

Allocation Effect - The return attributable to the asset allocation of the portfolio  
 Selection Effect - The return attributable to the managers' security selection  
 Interaction Effect - The return attributable to the interaction between the Allocation and Selection Effects

MPERS

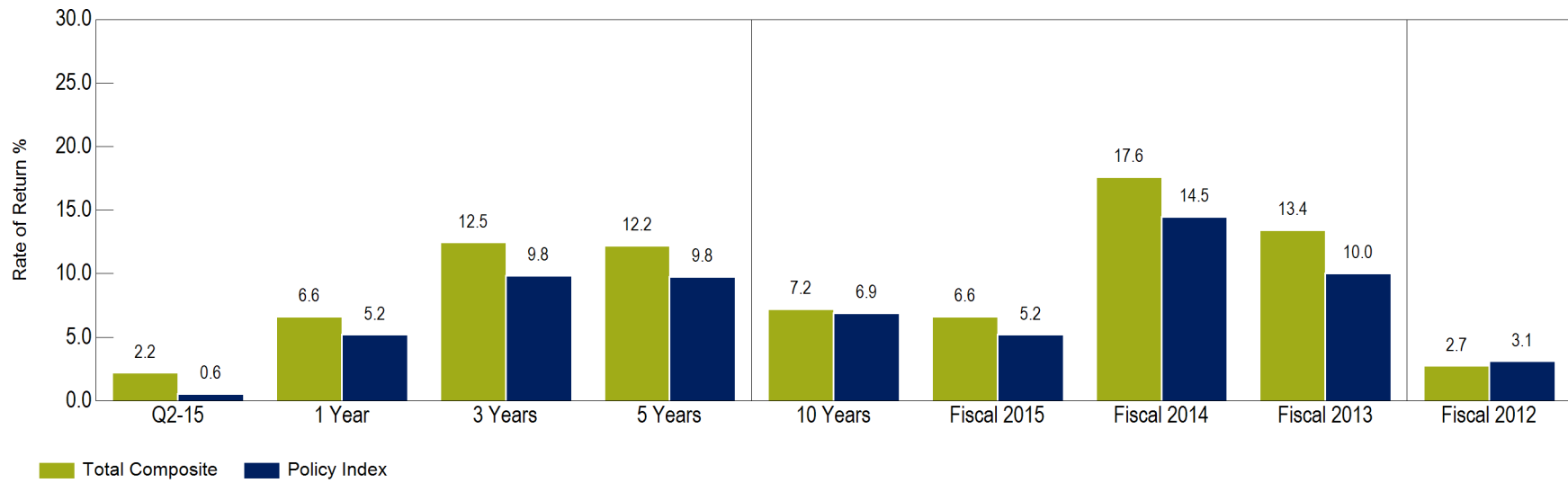
Total Composite

	Policy %	% of Portfolio	Market Value (\$)	3 Mo (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
<b>Total Composite</b>	<b>100.00</b>	<b>100.00</b>	<b>2,003,769,229</b>	<b>2.20</b>	<b>1</b>	<b>6.61</b>	<b>1</b>	<b>12.45</b>	<b>3</b>	<b>12.21</b>	<b>2</b>	<b>7.20</b>	<b>6</b>
<i>Policy Index</i>				0.55	13	5.20	1	9.84	46	9.77	49	6.91	13
<b>Global Equity Composite</b>	<b>30.00</b>	<b>29.66</b>	<b>594,235,478</b>			<b>2.19</b>	<b>47</b>	<b>15.68</b>	<b>31</b>	<b>14.18</b>	<b>29</b>	<b>7.57</b>	<b>38</b>
<i>MSCI ACWI</i>						0.71	57	13.01	59	11.93	64	6.41	71
<b>Fixed Income Composite</b>	<b>25.00</b>	<b>22.35</b>	<b>447,873,258</b>			<b>6.03</b>	<b>1</b>	<b>6.69</b>	<b>15</b>	<b>7.57</b>	<b>16</b>	<b>6.06</b>	<b>24</b>
<i>Barclays U.S. Universal</i>						1.61	18	2.33	54	3.81	63	4.68	47
<b>Real Assets Composite</b>	<b>5.00</b>	<b>5.06</b>	<b>101,447,940</b>			<b>3.69</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
<i>CPI + 4% (Unadjusted)</i>						4.13	--	5.36	--	5.90	--	6.14	--
<b>Real Estate Composite</b>	<b>10.00</b>	<b>11.30</b>	<b>226,447,261</b>			<b>12.49</b>	<b>--</b>	<b>15.98</b>	<b>--</b>	<b>15.84</b>	<b>--</b>	<b>6.34</b>	<b>--</b>
<i>NFI-ODCE Eq Wtd Net Non Lag</i>						13.65	--	11.93	--	13.28	--	5.62	--
<b>Private Equity Composite</b>	<b>15.00</b>	<b>18.74</b>	<b>375,442,842</b>			<b>14.43</b>	<b>--</b>	<b>16.61</b>	<b>--</b>	<b>14.90</b>	<b>--</b>	<b>--</b>	<b>--</b>
<i>MO Hwy Priv. Equ. Index - Lagged</i>						16.08	--	19.56	--	17.87	--	11.77	--
<b>Hedge Fund Composite</b>	<b>15.00</b>	<b>12.14</b>	<b>243,219,419</b>			<b>5.35</b>	<b>--</b>	<b>7.73</b>	<b>--</b>	<b>6.69</b>	<b>--</b>	<b>--</b>	<b>--</b>
<i>HFRI Fund of Funds Composite Index</i>						3.93	--	6.27	--	4.10	--	3.21	--
<b>Cash Composite</b>	<b>0.00</b>	<b>0.75</b>	<b>15,103,031</b>			<b>0.00</b>	<b>--</b>	<b>0.07</b>	<b>--</b>	<b>-0.14</b>	<b>--</b>	<b>1.46</b>	<b>--</b>
<i>91 Day T-Bills</i>						0.01	--	0.04	--	0.05	--	1.29	--

Total Composite is ranked in the IFx Public DB (peer) Net + 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

# Total Fund Return Summary

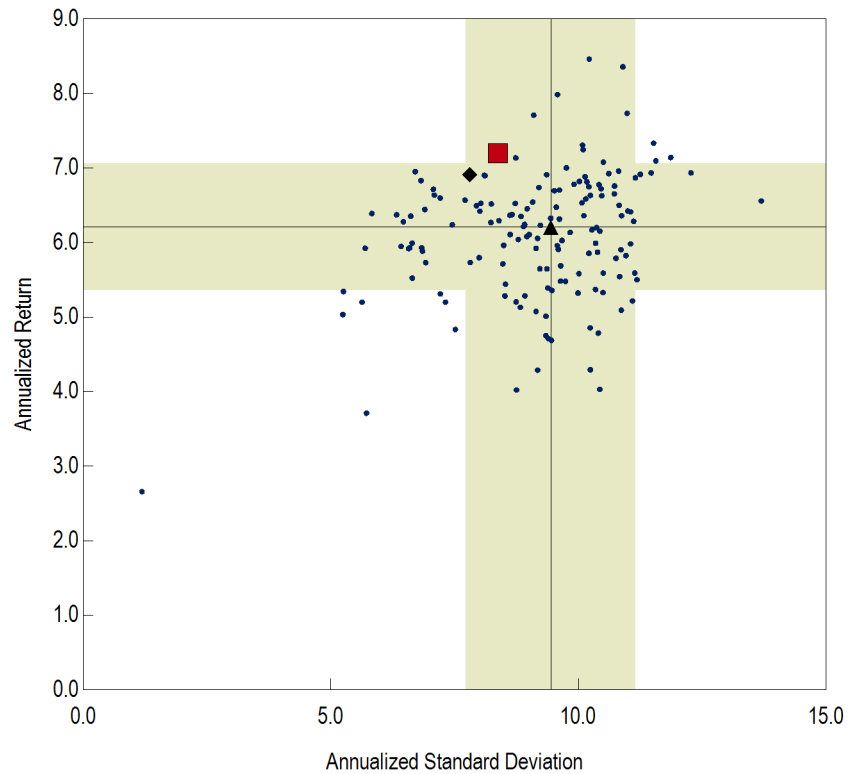
Return Summary Net





Total Fund Risk/Return - 10 Years

10 Years Ending June 30, 2015



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

Statistics Summary  
10 Years Ending June 30, 2015

	Anlzd Ret	Rank	Anlzd Std Dev	Rank
Total Composite	7.20%	6	8.37%	26
Policy Index	6.91%	13	7.80%	20

Statistics Summary  
10 Years Ending June 30, 2015

	Sharpe Ratio	Rank	Sortino Ratio RF	Rank
Total Composite	0.71	11	0.70	32
Policy Index	0.72	10	0.75	23

# Total Fund Performance

MPERS

Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
<b>Total Composite</b>	<b>2,003,769,229</b>	<b>100.00</b>	<b>100.00</b>	<b>4.29</b>	<b>6.61</b>	<b>12.45</b>	<b>12.21</b>	<b>7.20</b>
<i>Policy Index</i>				3.36	5.20	9.84	9.77	6.91
<b>Global Equity Composite</b>	<b>594,235,478</b>	<b>29.66</b>	<b>30.00</b>	<b>3.65</b>	<b>2.19</b>	<b>15.68</b>	<b>14.18</b>	<b>7.57</b>
<i>MSCI ACWI</i>				2.66	0.71	13.01	11.93	6.41
Tortoise	38,081,184	1.90		-5.85	-14.42	16.90	--	--
<i>Alerian MLP Index</i>				-11.01	-19.81	7.76	11.53	11.39
<b>Domestic Equity Composite</b>	<b>294,342,153</b>	<b>14.69</b>	<b>--</b>	<b>2.44</b>	<b>9.01</b>	<b>18.81</b>	<b>18.53</b>	<b>8.03</b>
<i>Russell 3000</i>				1.94	7.29	17.73	17.53	8.15
<b>Large Cap Composite</b>	<b>202,835,943</b>	<b>10.12</b>	<b>--</b>	<b>1.32</b>	<b>8.58</b>	<b>17.06</b>	<b>17.79</b>	<b>8.34</b>
Cash/S&P Futures	108,211,595	5.40		0.41	5.31	15.27	--	--
Intech	94,624,348	4.72		1.62	9.52	17.85	17.75	8.38
<i>S&amp;P 500</i>				1.23	7.42	17.31	17.34	7.89
<b>Small/Mid Cap Composite</b>	<b>91,506,210</b>	<b>4.57</b>	<b>--</b>	<b>5.19</b>	<b>9.66</b>	<b>20.66</b>	<b>19.78</b>	<b>--</b>
Bernzott	31,116,783	1.55		4.69	9.80	--	--	--
Kennedy Capital	22,117,169	1.10		5.45	--	--	--	--
Pinnacle	38,272,258	1.91		5.45	8.56	21.34	20.24	--
<i>Russell 2500</i>				4.81	5.92	18.66	17.85	9.09
<b>International Equity Composite</b>	<b>261,812,332</b>	<b>13.07</b>	<b>--</b>	<b>6.88</b>	<b>-1.12</b>	<b>11.75</b>	<b>9.22</b>	<b>6.70</b>
<i>MSCI ACWI ex USA</i>				4.03	-5.26	9.44	7.76	5.54
Silchester	114,480,784	5.71		8.88	0.40	17.02	12.99	9.63
Acadian Int'l Small Cap	31,222,978	1.56		9.73	-2.77	--	--	--
<i>MSCI EAFE</i>				5.52	-4.22	11.97	9.54	5.12
Gryphon	50,431,379	2.52		8.38	0.17	--	--	--
<i>MSCI EAFE Growth</i>				6.91	-1.33	12.11	10.09	5.80
Acadian Emerging Markets	34,056,098	1.70		1.75	-4.85	4.63	5.21	--
GMO EM	31,181,000	1.56		2.52	-0.92	--	--	--
<i>MSCI Emerging Markets</i>				2.95	-5.12	3.71	3.69	8.11
Transition Account	440,093	0.02						

MPERS

Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
<b>Fixed Income Composite</b>	<b>447,873,258</b>	<b>22.35</b>	<b>25.00</b>	<b>2.16</b>	<b>6.03</b>	<b>6.69</b>	<b>7.57</b>	<b>6.06</b>
<i>Barclays U.S. Universal</i>				0.30	1.61	2.33	3.81	4.68
<b>Core Fixed Income Composite</b>	<b>226,431,246</b>	<b>11.30</b>	<b>10.00</b>	<b>1.39</b>	<b>3.58</b>	<b>3.65</b>	<b>4.82</b>	<b>3.98</b>
Aberdeen Asset Mgmt	25,447,001	1.27		1.98	4.53	6.10	7.26	5.07
<i>Barclays Aggregate</i>				-0.10	1.86	1.83	3.35	4.44
Internal Fixed - Core	153,502,253	7.66		1.49	3.72	2.99	--	--
NTGI Government/Credit	11,683,805	0.58		-0.28	1.72	1.78	--	--
<i>Barclays Govt/Credit</i>				-0.30	1.69	1.76	3.52	4.38
Principal CMBS Fixed	35,798,187	1.79		0.94	2.98	--	--	--
<i>Barclays CMBS ERISA Eligible</i>				0.69	1.91	3.28	5.52	5.11
<b>Long Duration Composite</b>	<b>86,664,658</b>	<b>4.33</b>	<b>5.00</b>	<b>-0.57</b>	<b>5.99</b>	<b>3.85</b>	<b>6.08</b>	<b>--</b>
Internal Fixed - Long Duration	86,664,658	4.33		-0.57	5.99	3.85	6.24	--
<i>Barclays LT Govt/Credit</i>				-4.47	1.94	2.48	6.71	6.14
<b>Opportunistic Debt Composite</b>	<b>109,539,235</b>	<b>5.47</b>	<b>5.00</b>	<b>6.31</b>	<b>12.86</b>	<b>17.64</b>	<b>16.16</b>	<b>--</b>
ABRY ASF	160,660	0.01		10.81	16.99	30.01	23.55	--
Anchorage Capital II	2,364,111	0.12		12.51	29.99	22.71	--	--
Anchorage Capital III	8,961,234	0.45		12.70	16.37	14.37	--	--
Audax Mezzanine II	827,180	0.04		16.39	16.66	12.59	12.27	--
CVI Credit Value	13,115,472	0.65		9.35	17.78	29.34	--	--
CVI Credit Value Fund III	1,584,000	0.08		--	--	--	--	--
CVI Global Value	6,699,426	0.33		2.44	9.84	15.68	14.24	--
GOLUB Capital	25,300,549	1.26		1.36	5.31	5.59	--	--
GSO Capital Opp II	4,594,369	0.23		1.07	21.29	21.85	--	--
GSO Credit Alpha Fund	2,666,022	0.13		2.36	--	--	--	--
GSO Capital Opp	3,429,476	0.17		5.13	14.93	21.66	21.13	--
Internal Fixed - Nonrated	945,784	0.05		-0.43	--	--	--	--
M&G III	3,678,906	0.18		2.74	-5.29	--	--	--
Northern Shipping II	13,575,442	0.68		7.85	12.83	--	--	--
Och-Ziff II	9,991,887	0.50		4.87	10.88	--	--	--
OCP Asia	11,644,717	0.58		10.62	16.14	--	--	--
<i>Barclays High Yield</i>				2.53	-0.40	6.81	8.61	7.89
<b>Inflation Protection Securities Composite</b>	<b>25,238,119</b>	<b>1.26</b>	<b>5.00</b>	<b>1.48</b>	<b>-1.10</b>	<b>-0.27</b>	<b>--</b>	<b>--</b>
Internal US TIPS	25,238,119	1.26		1.48	-1.10	-0.27	--	--
<i>Barclays US TIPS</i>				0.34	-1.74	-0.76	3.29	4.13

MPERS

Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
<b>Real Assets Composite</b>	<b>101,447,940</b>	<b>5.06</b>	<b>5.00</b>	<b>-4.25</b>	<b>3.69</b>	<b>--</b>	<b>--</b>	<b>--</b>
<i>CPI + 4% (Unadjusted)</i>				3.64	4.13	5.36	5.90	6.14
American Infrastructure I MLP	19,548,350	0.98		4.73	7.99	1.51	8.09	--
American Infrastructure II MLP	2,800,986	0.14		15.59	7.88	--	--	--
Apollo Aviation III	2,591,573	0.13		--	--	--	--	--
EIF - US Power III	8,398,091	0.42		33.38	33.72	14.25	8.98	--
Energy & Mineral Group III	10,619,965	0.53		2.20	5.94	--	--	--
Energy & Mineral Group II	12,669,465	0.63		0.77	20.38	--	--	--
Midstream & Resources I	13,218,666	0.66		-7.11	7.01	24.45	32.39	--
NGP IX	4,457,928	0.22		-31.81	-2.55	9.72	14.00	--
NGP X	7,669,547	0.38		-10.89	2.54	3.80	--	--
NGP XI	498,547	0.02		-1.94	--	--	--	--
Orion Mine Finance Fund I	1,256,614	0.06		-13.20	--	--	--	--
Ridgewood Energy	3,897,457	0.19		-3.41	-30.28	--	--	--
Ridgewood III	47,329	0.00		--	--	--	--	--
RMK - Timberland	7,585,725	0.38		-7.32	-11.64	12.81	8.33	1.49
<i>NCREIF Timberland 1 Qtr Lag</i>				7.88	10.64	9.81	6.20	8.30
Sciens Marine Investments	6,221,415	0.31		-31.42	-27.78	--	--	--
<i>CPI + 4% (Unadjusted)</i>				3.64	4.13	5.36	5.90	6.14

MPERS

Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
<b>Real Estate Composite</b>	<b>226,447,261</b>	<b>11.30</b>	<b>10.00</b>	<b>6.54</b>	<b>12.49</b>	<b>15.98</b>	<b>15.84</b>	<b>6.34</b>
<i>NFI-ODCE Eq Wtd Net Non Lag</i>				7.00	13.65	11.93	13.28	5.62
<b>Core Real Estate Composite</b>	<b>153,185,019</b>	<b>7.64</b>	<b>--</b>	<b>6.88</b>	<b>15.33</b>	<b>17.62</b>	<b>18.68</b>	<b>6.01</b>
<i>NCREIF Property Index</i>				6.82	12.96	11.63	12.71	8.16
CBRE Capital Partners	4,142,766	0.21		-6.22	-1.55	12.30	10.13	--
Clarion Lion	60,695,927	3.03		6.80	14.72	11.73	14.46	4.57
Principal CMBS	23,357,346	1.17		2.25	11.62	29.69	27.43	--
Principal Enhanced Property	44,214,140	2.21		11.46	20.32	16.90	17.19	4.16
<i>NCREIF Property Index</i>				6.82	12.96	11.63	12.71	8.16
Principal US Property	20,774,839	1.04		6.26	13.97	12.65	14.22	5.59
<i>NCREIF ODCE</i>				7.35	14.43	13.11	14.41	6.85
<b>Non-Core Real Estate Composite</b>	<b>58,589,764</b>	<b>2.92</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
AEW EISPO	5,541,686	0.28		24.72	13.04	9.22	10.91	--
AEW Partners V	2,027,038	0.10		23.34	51.62	30.02	24.62	--
Apollo European III	2,945,992	0.15		-13.36	-16.95	3.28	6.14	--
Apollo Real Estate	7,861,434	0.39		8.96	26.62	14.72	12.23	--
Clarion Lion Mexico Fund	4,266,896	0.21		-6.80	-7.00	-5.23	-2.77	--
Colony Capital VIII	2,798,500	0.14		32.21	6.34	15.93	6.90	--
M&G II	5,132,079	0.26		4.46	-0.71	--	--	--
Och-Ziff	2,947,055	0.15		9.80	11.01	31.03	23.71	17.79
Och-Ziff RE III	1,145,454	0.06		-44.30	-44.30	--	--	--
Torchlight Debt Opp II	11,230,511	0.56		6.79	7.38	--	--	--
Torchlight Debt Opp III	3,439,513	0.17		51.97	124.43	--	--	--
Torchlight Debt Opps V	750,000	0.04		--	--	--	--	--
Tristan EPI30 3	6,973,515	0.35		-7.43	-18.55	--	--	--
Urdang Value Added Fund II	1,530,091	0.08		3.49	8.71	12.72	19.09	--
<i>NCREIF Property Index</i>				6.82	12.96	11.63	12.71	8.16
<b>REITS Composite</b>	<b>14,672,479</b>	<b>0.73</b>	<b>--</b>	<b>-4.23</b>	<b>-3.74</b>	<b>7.53</b>	<b>7.75</b>	<b>--</b>
CBRE Investors	14,672,479	0.73		-4.23	-3.74	7.53	7.75	--
<i>FTSE EPRA/NAREIT Developed</i>				-3.20	-0.36	8.69	11.58	5.49

MPERS

Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
<b>Private Equity Composite</b>	<b>375,442,842</b>	<b>18.74</b>	<b>15.00</b>	<b>10.16</b>	<b>14.43</b>	<b>16.61</b>	<b>14.90</b>	<b>--</b>
<i>MO Hwy Priv. Equ. Index - Lagged</i>				7.49	16.08	19.56	17.87	11.77
Abry Partners VI	3,944,619	0.20		18.11	39.11	32.39	23.14	--
Abry Partners VII	5,221,020	0.26		10.52	16.98	12.09	--	--
Capital Partners II	5,301,439	0.26		3.33	6.40	--	--	--
Grove Street - MP Ventures	174,231,140	8.70		9.74	11.48	15.66	14.37	--
Grove Street - MP Ventures II	168,302,762	8.40		11.64	18.27	16.96	12.77	--
KPS IV	1,027,212	0.05		25.37	16.84	--	--	--
Ospraie	2,050,050	0.10		0.56	2.24	9.78	9.00	--
Shore Capital Partners GP I LP	408,075	0.02		-41.90	--	--	--	--
Shoreline China Valu III	3,080,210	0.15		--	--	--	--	--
Turnbridge Capital Partners I	1,651,623	0.08		-0.91	--	--	--	--
Vectis H & L II	10,224,692	0.51		2.24	16.30	13.86	9.57	--
<i>MO Hwy Priv. Equ. Index - Lagged</i>				7.49	16.08	19.56	17.87	11.77

MPERS

Total Composite

	Market Value (\$)	% of Portfolio	Policy %	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
<b>Hedge Fund Composite</b>	<b>243,219,419</b>	<b>12.14</b>	<b>15.00</b>	<b>3.84</b>	<b>5.35</b>	<b>7.73</b>	<b>6.69</b>	<b>--</b>
<i>HFRI Fund of Funds Composite Index</i>				2.68	3.93	6.27	4.10	3.21
Achievement Asset Management	24,918,120	1.24		1.02	-6.37	--	--	--
Alyeska Fund	15,701,726	0.78		--	--	--	--	--
AQR Capital	9,082,163	0.45		-1.21	9.84	6.79	8.38	1.68
BlueTrend	9,910,461	0.49		-2.95	3.01	-0.30	--	--
Brevan Howard	15,576,966	0.78		1.62	5.46	3.47	3.51	--
Bridgewater Pure Alpha	18,704,631	0.93		10.54	6.27	8.20	13.51	11.00
Cevian	12,750,371	0.64		6.08	0.50	13.91	--	--
Indus Pacific Opp. Fund	12,384,910	0.62		18.27	23.85	--	--	--
Koppenburg Commodity Fund	10,010,334	0.50		--	--	--	--	--
Luxor Capital	16,602,329	0.83		-2.24	-6.73	3.67	3.06	--
Metacapital	11,145,953	0.56		2.02	5.30	--	--	--
Millenium USA LP	16,646,749	0.83		8.66	--	--	--	--
PFM	13,053,767	0.65		10.32	13.56	15.12	--	--
RK Capital Management LLP	10,707,687	0.53		1.02	3.82	--	--	--
Shepard International	502,021	0.03		-3.92	-5.53	-7.45	-2.99	--
Stelliam Investment	13,874,753	0.69		-7.26	-5.07	8.24	--	--
Taconic Capital	18,177,434	0.91		3.03	-0.48	8.09	5.59	--
ValueAct	13,469,044	0.67		7.80	14.20	22.56	--	--
<i>HFRI Fund of Funds Composite Index</i>				2.68	3.93	6.27	4.10	3.21
<b>Cash Composite</b>	<b>15,103,031</b>	<b>0.75</b>						
<i>91 Day T-Bills</i>								

Performance shown is net of manager fees. All market value data is provided by the custodian.

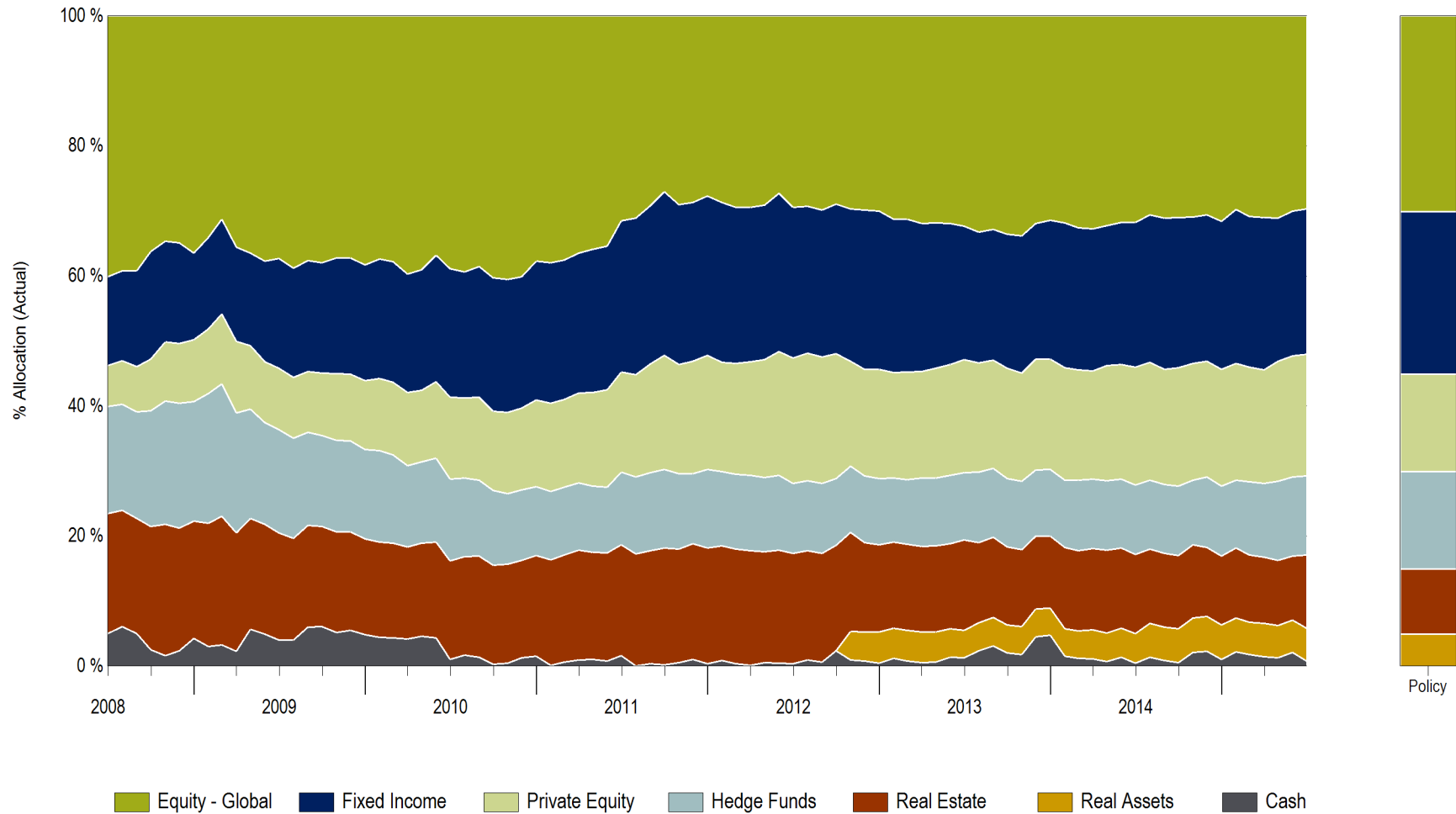


# Appendix

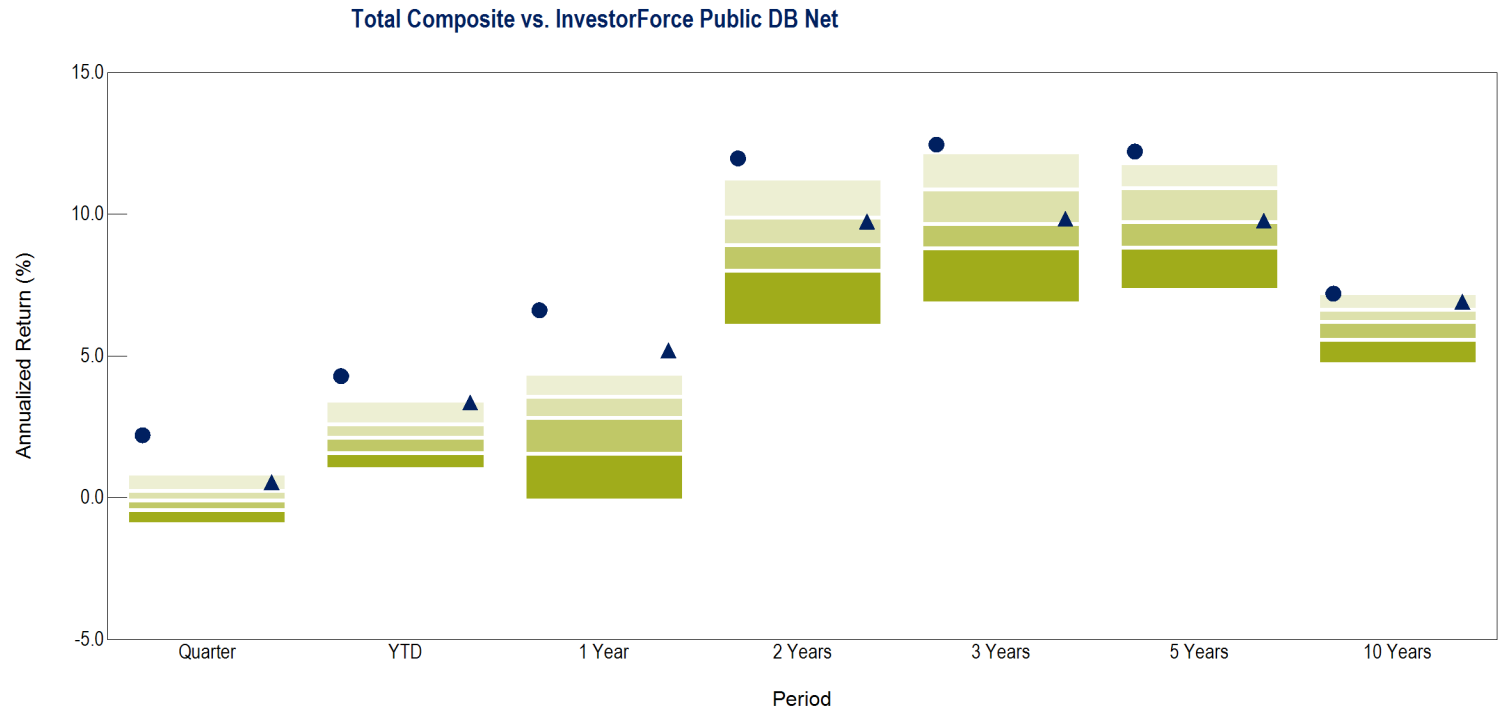


# Total Fund Asset Allocation History

Asset Allocation History



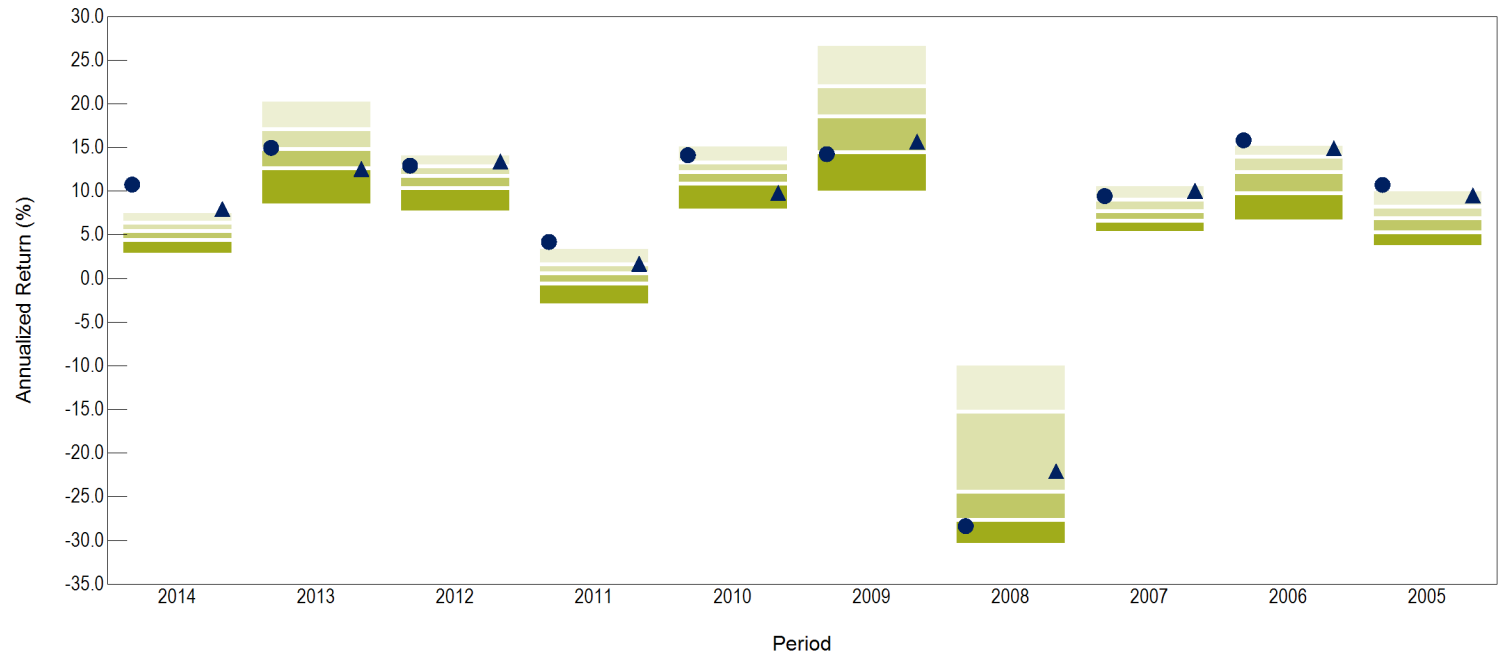
# Total Fund Return Summary vs. Peer Universe



	Return (Rank)													
5th Percentile	0.8		3.4		4.4		11.2		12.2		11.8		7.2	
25th Percentile	0.2		2.6		3.6		9.9		10.9		10.9		6.6	
Median	-0.1		2.1		2.8		8.9		9.7		9.7		6.2	
75th Percentile	-0.4		1.6		1.6		8.0		8.8		8.8		5.6	
95th Percentile	-0.9		1.0		-0.1		6.1		6.9		7.3		4.7	
# of Portfolios	242		237		231		220		209		187		150	
● Total Composite	2.2	(1)	4.3	(1)	6.6	(1)	12.0	(2)	12.5	(3)	12.2	(2)	7.2	(6)
▲ Policy Index	0.6	(13)	3.4	(6)	5.2	(1)	9.7	(30)	9.8	(46)	9.8	(49)	6.9	(13)

# Total Fund Return Summary vs. Peer Universe

Total Composite vs. InvestorForce Public DB Net



	Return (Rank)																			
	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005										
5th Percentile	7.7	20.4	14.3	3.6	15.3	26.8	-9.8	10.7	15.4	10.1										
25th Percentile	6.4	17.2	12.9	1.6	13.4	22.0	-15.2	9.1	14.0	8.2										
Median	5.5	14.9	11.8	0.6	12.2	18.6	-24.4	7.8	12.3	6.9										
75th Percentile	4.4	12.7	10.4	-0.5	10.9	14.5	-27.6	6.7	9.8	5.3										
95th Percentile	2.7	8.4	7.6	-3.1	7.9	9.9	-30.5	5.2	6.6	3.6										
# of Portfolios	210	191	159	137	131	128	125	122	115	107										
● Total Composite	10.8	(1)	15.0	(49)	12.9	(24)	4.2	(3)	14.1	(14)	14.2	(77)	-28.4	(83)	9.4	(20)	15.8	(3)	10.7	(3)
▲ Policy Index	8.0	(4)	12.5	(76)	13.4	(15)	1.7	(24)	9.8	(88)	15.7	(68)	-22.1	(38)	10.0	(12)	14.9	(7)	9.5	(11)

## Index Performance Summary as of 6/30/2015

	2008	2009	2010	2011	2012	2013	2014	Q1	APR	MAY	JUN	Q2	YTD
MSCI EAFE	-43.38%	31.78%	7.75%	-12.14%	17.32%	22.78%	-4.90%	4.88%	4.08%	-0.51%	-2.83%	0.62%	5.52%
Russell 2500	-36.79%	34.39%	26.71%	-2.51%	17.88%	36.80%	7.07%	5.17%	-1.75%	2.14%	-0.69%	-0.34%	4.81%
Russell 2000	-33.79%	27.17%	26.85%	-4.18%	16.35%	38.82%	4.89%	4.32%	-2.55%	2.28%	0.75%	0.42%	4.75%
Credit Suisse Hedge Fund	-19.07%	18.57%	10.95%	-2.52%	7.67%	9.73%	4.13%	2.48%	0.02%	0.83%	N/A	2.48%	3.35%
MSCI EM	-53.33%	78.51%	18.88%	-18.42%	18.22%	-2.60%	-2.19%	2.24%	7.69%	-4.00%	-2.60%	0.69%	2.95%
Credit Suisse Leveraged Loan	-28.75%	44.87%	9.98%	1.82%	9.43%	6.15%	2.06%	2.07%	0.90%	0.20%	-0.31%	0.79%	2.87%
MSCI ACWI	-42.19%	34.63%	12.67%	-7.35%	16.13%	22.80%	4.16%	2.31%	2.90%	-0.13%	-2.35%	0.35%	2.66%
Barclays US Corp High Yield	-26.16%	58.21%	15.12%	4.98%	15.81%	7.44%	2.45%	2.52%	1.21%	0.30%	-1.49%	0.00%	2.53%
Russell 1000	-37.60%	28.43%	16.10%	1.50%	16.42%	33.11%	13.24%	1.59%	0.71%	1.31%	-1.88%	0.11%	1.71%
JPM EMBI Global Diversified	-12.03%	29.82%	12.24%	7.35%	17.44%	-5.25%	7.43%	2.01%	1.63%	-0.39%	-1.56%	-0.34%	1.67%
S&P 500	-37.00%	26.46%	15.06%	2.11%	16.00%	32.39%	13.69%	0.95%	0.96%	1.29%	-1.94%	0.28%	1.23%
Barclays US Govt/Cred 1-3	4.97%	3.82%	2.80%	1.59%	1.26%	0.64%	0.77%	0.59%	0.08%	0.08%	-0.03%	0.13%	0.72%
Barclays US Agg Interm	4.86%	6.46%	6.15%	5.97%	3.56%	-1.02%	4.12%	1.32%	-0.01%	0.00%	-0.66%	-0.67%	0.64%
Barclays Municipal	-2.47%	12.91%	2.38%	10.70%	6.78%	-2.55%	9.05%	1.01%	-0.52%	-0.28%	-0.09%	-0.89%	0.11%
Barclays US Agg Bond	5.24%	5.93%	6.54%	7.84%	4.21%	-2.02%	5.97%	1.61%	-0.36%	-0.24%	-1.09%	-1.68%	-0.10%
Bloomberg Commodity	-35.65%	18.91%	16.83%	-13.32%	-1.06%	-9.52%	-17.01%	-5.94%	5.73%	-2.70%	1.73%	4.66%	-1.56%
Citi WGBI	10.89%	2.55%	5.17%	6.35%	1.65%	-4.00%	-0.48%	-2.51%	1.10%	-2.34%	-0.28%	-1.55%	-4.02%
Barclays US Long Credit	-3.92%	16.80%	10.69%	17.13%	12.73%	-6.62%	16.39%	3.06%	-2.04%	-1.77%	-3.62%	-7.26%	-4.42%
Barclays US Govt/Cred Long	8.44%	1.92%	10.16%	22.49%	8.78%	-8.83%	19.31%	3.36%	-2.41%	-1.68%	-3.68%	-7.57%	-4.47%
JPM GBI EM Glob Div	-5.22%	21.98%	15.68%	-1.75%	16.76%	-8.98%	-5.72%	-3.96%	2.92%	-2.58%	-1.22%	-0.96%	-4.88%
FTSE NAREIT Equity REITs	-37.73%	27.99%	27.96%	8.29%	18.06%	2.47%	30.14%	4.75%	-5.49%	-0.12%	-4.60%	-9.95%	-5.67%
Barclays US Strips 20+ Yr	59.50%	-36.04%	10.88%	58.52%	2.96%	-20.95%	46.38%	5.54%	-5.60%	-3.01%	-6.41%	-14.32%	-9.57%
Alerian MLP	-36.91%	76.41%	35.85%	13.88%	4.80%	27.58%	4.80%	-5.23%	6.18%	-3.58%	-8.28%	-6.09%	-11.00%

Source: Morningstar Direct

## 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

## Information Disclaimer and Reporting Methodology

### 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.
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### Reporting Methodology

- The client's custodian bank is NEPC's preferred data source unless otherwise directed. NEPC 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.