



NEPC, LLC

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MoDOT & Patrol Employees Retirement System

Investment Summary

Quarter Ending June 30, 2016

Board Report

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NEPC Update



NEPC Updates

June 30, 2016

Highlights of Second Quarter Happenings at NEPC

NEPC Research

Recent White Papers

- "Thinking Ahead to Stay Ahead: Strategic Private Equity Investing in Healthcare" (April 2016)
- Market Chatter: "Implications of Brexit" (June 2016)
- Market Chatter: "Brexit... What Now?" (June 2016)
- "The Disease of Doubt" (July 2016)

Webinar

- "Brexit - A Vote for Volatility" (June 2016); Panel provides perspectives on the EU Referendum.



NEPC's 21st Annual Investment Conference

"Excellent breadth of materials, plenty of concurrent sessions, and the speakers were vibrant and humorous!" is just one of many positive reviews from attendees. The conference attracted more than 200 people to the Hynes Convention Center in Boston on May 10-11, 2016.

News from NEPC

We are excited to announce NEPC's active presence on five social media channels: Facebook, Google+, LinkedIn, Twitter and YouTube, and we will continue to post on the Endowments and Foundations Twitter. We will be using these online channels to share company news, information and articles throughout the industry. Those interested in keeping up with the latest news from NEPC can follow our accounts. Company news and industry insights will continue to be available on our website, which has been updated with a new optimized search feature.



Upcoming Events

NEPC's 22nd Annual Investment Conference will be held on May 9-10, 2017 at the InterContinental Hotel in Boston, MA.

MARK YOUR CALENDAR!

NEPC Client Recognitions

We are pleased to announce that three of NEPC's public fund clients won Institutional Investor (II) Awards.

- **Arn Andrews**, CIO of San Jose Police & Fire, won the award for Chief Investment Officer of the Year.
- **Sam Masoudi**, CIO of Wyoming Retirement System, won the award for Opportunistic Investment Strategies Award.
- **Bob Jacksha**, CIO of New Mexico Employees Retirement Board, won the award for Portfolio Construction.

We are also pleased to announce that two NEPC clients, **San Bernardino County Employees' Retirement System** and **Arizona Public Safety Personnel Retirement System**, were nominated for Institutional Investor magazine's 14th Annual Hedge Fund Industry Awards in the "Public Plan of the Year, Small" category.

Market Thoughts & Education





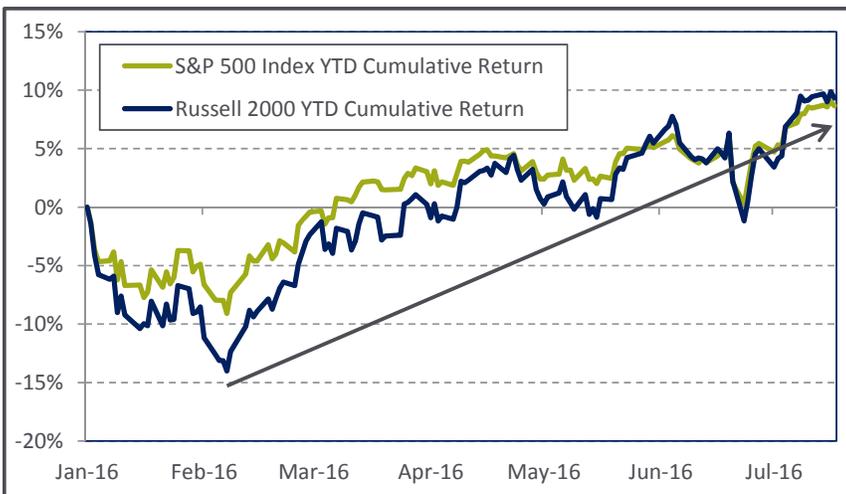
NEPC is an independent, full service investment consulting firm, providing asset allocation, traditional and alternative asset manager search, performance evaluation and investment policy services to institutional investment programs. We offer our market letters to provide insight into recent market 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.

THE BREXIT CLUB: THOUGHTS ON POLITICAL RISK AND THE MARKET RALLY

Introduction

Markets witnessed quite a surprise in the second quarter as the United Kingdom voted to leave the European Union. Concerns of increased political risk in the UK and Europe briefly jolted equity and currency markets across the globe. Risk assets sharply sold off but quickly reversed as market concerns abated. US markets followed suit and ultimately continued their rally as the S&P 500 ended the quarter up 2.5% and US high yield bonds rose 5.5% (Exhibit 1). Outside the US, emerging markets demonstrated resiliency to finish the quarter in positive territory. Developed market equities modestly recovered with the MSCI EAFE down only 1.5%. Meanwhile, developed market government bond yields marched lower to record levels: 10-year UK yields declined 60 basis points and the US Treasury yield fell below 1.5%. While in Germany and Japan, yield curves extended further into negative terrain.

Exhibit 1: 2016 US Equity Performance



Source: Bloomberg

While the ramifications of greater political dissent are unknown, political risk is likely to remain an ongoing concern for financial markets.

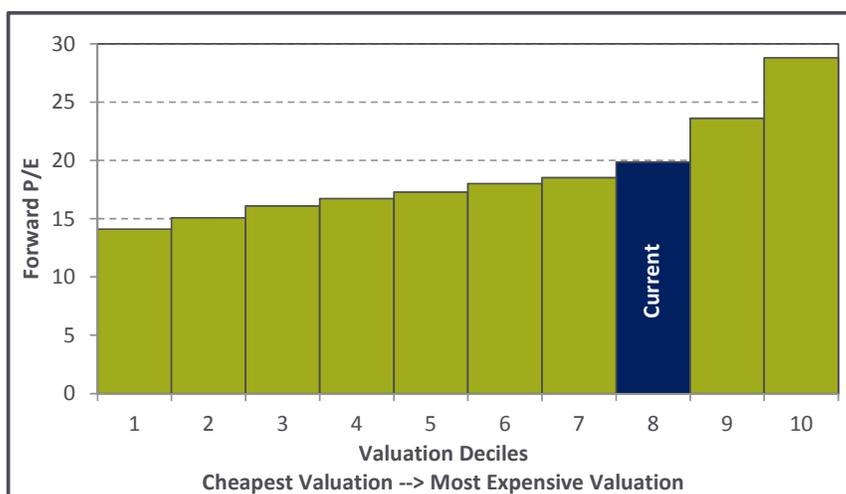
The fleeting shock of the United Kingdom's EU referendum vote has now passed with equities in the US and UK pushing beyond record highs. Yet a lingering question remains following the Brexit vote. What would motivate voters in the United Kingdom to walk away from over 40 years of economic and political orthodoxy? Political scientists will dissect the outcome for years to come but for many UK voters the culmination of low growth and limited wage gains manifested itself as a populist fervor against the "establishment." This voter psychology in the UK likely resonates broadly among the developed world. In the years following the 2008 Global Financial Crisis, subdued economic growth and economic uncertainty have given rise to increased political dissent. Irrespective of political orientation, the fault lines of secular low wage gains and income inequality has eroded the established political order across the developed world.

In contrast to the emerging markets, investors are generally unfamiliar with material political risk in developed markets. Nevertheless, the course of action is the same for the two markets during times of elevated stress. We encourage investors to look past the political risk with a focus on long-term fundamentals and objectively assess the valuation opportunities offered by a market. To this end, we believe equity markets in Europe and Japan provide a favorable return outlook with attractive valuations relative to the US. The unprecedented central bank support in Europe and Japan provides a positive backdrop of improved corporate earnings and elevated risk premia, supporting an overweight equity position. For investors implementing a partial strategic currency hedge, we recommend a larger overweight as developed market currency risk is largely an uncompensated one. While

in the emerging markets, recent strength in equities and currencies reinforces the commitment to both equity and fixed income allocations. These markets continue to offer reasonable equity valuations, undervalued currencies, and high real interest rates relative to the developed world. We encourage investors to maintain current targets as we believe future return expectations in the emerging markets adequately compensate investors relative to long-term risks.

In the US, equity and credit markets have rallied considerably from the lows seen in February. At that time, domestic stocks and high-yield bonds offered a compelling entry point for investors. Subsequently, high yield credit spreads have fallen to long-term averages while the rapid ascension of US equity prices has pushed valuation multiples to their upper ranges relative to history (Exhibit 2). In light of this, we believe the risk-return profile of high yield remains attractive but we recommend investors trim their exposure to US equity. NEPC has long advocated the benefits of a disciplined rebalancing approach. This holds true today for US stocks, as a process of reducing exposure to assets that have outperformed expectations and increasing exposure to assets that have underperformed are fundamental to our investment philosophy.

Exhibit 2: Historical Distribution of S&P 500 Forward P/E



Source: Bloomberg

Rebalancing opportunities can also be found in developed market government bond exposure. Japan and many European yield curves are deeply negative with 30 year rates hovering near zero. As such, we recommend investors review their exposure to benchmark focused global bond strategies and look to eliminate Citigroup World Government Bond Index (WGBI) based strategies. While US interest rates have rallied significantly in 2016, US duration continues to hold a vital place in a diversified risk balanced portfolio. That being said, we encourage investors to reaffirm their duration exposure. For liability driven investors, this includes rebalancing both long Treasuries and long credit while reviewing hedge ratio targets. Similarly, we encourage total return investors to trim long Treasuries and risk parity exposure following recent outsized gains. Furthermore, with long-term inflation expectations near historical lows, we recommend investors preserve US duration exposure with a strong bias towards TIPS over US core bonds.

Global Equity

The S&P 500 managed to end June modestly positive and returned 2.5% in the second quarter. The Russell 2000 had a strong quarter as 9 out of the 10 economic sectors registered positive returns. From a sector basis, the more defensive sectors led the market higher with Energy, Telecommunications, Utilities and Health Care. Sectors lagging in the quarter were Consumer Discretionary, Information Technology, and Industrials.

Equity Index Returns as of 6/30/2016				
Global Equity	Quarter	1 Year	3 Yrs	5 Yrs
MSCI World	0.3%	-4.7%	4.9%	4.4%
US Equity	Quarter	1 Year	3 Yrs	5 Yrs
S&P 500	2.5%	4.0%	11.7%	12.1%
Dow Jones Industrial Average	1.4%	1.8%	6.3%	7.6%
NASDAQ Composite	-0.6%	-2.9%	12.5%	11.8%
Russell 1000 Growth	0.6%	3.0%	13.1%	12.3%
Russell 1000 Value	4.6%	2.9%	9.9%	11.4%
Russell 2000	3.8%	-6.7%	7.1%	8.4%
Russell 2000 Growth	3.2%	-10.8%	7.7%	8.5%
Russell 2000 Value	4.3%	-2.6%	6.4%	8.1%
International Equity	Quarter	1 Year	3 Yrs	5 Yrs
MSCI EAFE	-1.5%	-10.2%	2.1%	1.7%
MSCI Emerging Markets	0.7%	-12.1%	-1.6%	-3.8%
MSCI Europe	-2.7%	-11.2%	2.0%	1.0%
MSCI UK	-0.7%	-12.1%	0.7%	1.7%
MSCI Japan	1.0%	-8.9%	2.7%	4.2%
MSCI Far East	1.0%	-9.3%	2.8%	4.0%

Across the developed world, equity markets declined following the UK’s decision to leave the EU before rallying in the final days of the quarter. Ireland and Italy led developed markets lower, selling off 9.9% and 9.7% respectively. In local terms, Japanese equity markets declined nearly 7%. While, for US dollar investors, Japan equities returned a positive 1% as the Yen approached a 2 year high against the dollar. The Yen has rallied considerably for the year and continues to benefit from its perceived safe-haven status. Similar to the US, energy was the top sector in developed markets, returning roughly 11.5% while consumer discretionary stocks were one of the weakest returning -8.2% for the quarter.

Within emerging markets, investors looked past the Brexit fears and recognized ongoing positive developments. Latin America was a particular focus, where favorable election results in Peru and further progress in the impeachment process in Brazil led to those markets returning 16.9% and 13.3%, respectively. In contrast, China equi-

ty markets continued to waver, trailing the broader benchmark with a return of -1.7%. From a sector perspective, consumer staples stocks performed the best, returning 4.2% for the quarter.

Global Fixed Income

The second quarter illustrated the current dichotomy within fixed income: safe-haven assets rallied significantly, while risky assets also outperformed as investors continued to search for yield. Globally, the 10 year German bund broke into negative territory, falling 28 bps to -0.13%. In Japan, 10-year bond yields continued to move lower, settling at -0.22%. At home, the U.S. 10 year Treasury yield compressed 29 bps, nearing its all-time low at 1.49%.

The Barclays Aggregate returned 2.2%, while US High Yield returned 5.5% for the quarter. Overall, credit was broadly supported by lower quality sectors. Non-credit risk assets also performed well, as emerging market local debt returned 2.7% in the quarter with a strong rebound in June of 5.9%. For the year, emerging local debt remains one of the best performing risk assets in fixed income, returning over 14%.

Currency Markets

Leading up to the UK referendum in late June, currency movements were mixed as the likelihood of a “remain” vote was expected. Following the surprise Brexit decision, currency pairs were extremely volatile as the US dollar and Japanese yen rallied substantially. Demand flowed into “safe haven” currencies as the British pound depreciated heavily with double digit percentage declines on the day following the UK referendum. Emerging market currency returns were mixed in the second quarter with many currencies benefiting from higher commodity prices and positive political developments. As stated in previous Market Thoughts, currency markets are likely to exhibit heightened volatility and we encourage investors to strategically hedge a portion of their developed market currency exposure.

Fixed Income Index Returns as of 6/30/2016				
Global Fixed Income	Quarter	1 Year	3 Yrs	5 Yrs
Citi WGBI	3.4%	11.3%	2.6%	1.2%
JPM EMBI Plus	6.0%	13.2%	7.1%	6.4%
Domestic Fixed Income	Quarter	1 Year	3 Yrs	5 Yrs
BC Aggregate Bond	2.2%	6.0%	4.1%	3.8%
BC US Agg. Treasury	2.1%	6.2%	3.5%	3.5%
BC US Credit	3.5%	7.6%	5.3%	5.2%
BC Mortgage Backed	1.1%	4.3%	3.8%	3.0%
BC Interm. Govt/Credit	1.6%	4.3%	3.0%	2.9%
BC 1-10 Yr TIPS	1.3%	3.3%	1.6%	1.6%
BC High Yield	5.5%	1.6%	4.2%	5.8%
S&P LSTA Lev. Loan	2.9%	0.9%	2.8%	3.8%
3 Month T-Bills	0.1%	0.1%	0.1%	0.1%
10-Year Bond Yields	Mar-16	Dec-15	Mar-15	Mar-14
US	1.5%	1.8%	2.4%	2.5%
Germany	-0.1%	0.2%	0.8%	1.2%
UK	0.9%	1.4%	2.0%	2.7%
Japan	-0.2%	0.0%	0.5%	0.6%

Commodity Markets

Commodities posted another strong quarter as the Bloomberg Commodity Index’s 12.8% return represented the best quarterly return for the index since 2010. In the energy sector, oil prices continued to recover breaching \$50 despite an overhang in US inventories. Among precious metals, gold prices benefited from a demand for safe haven assets and expectations the Federal Reserve would hold policy rates at current levels. Industrial metals also rallied, benefiting from low inventories and higher demand expectations due to stimulus in China. Furthermore, in the agriculture sector, soybean prices reached a 2 year high as flooding in Argentina raised concerns of tighter global supplies.

Pension Liability

Pension discount rates declined to 3.6% as of June 30, nearly 30 basis points (bps) lower than first quarter levels according to the Citigroup indices. Supporting this decline was a 31 bps decline in 30-year Treasury yields and a modest decline in credit spreads according to the Barclays Capital Long Credit Index.

The decline in interest rates had a negative impact on the liabilities of our clients’ pension plans, which are estimated to have increased 7.2% in the quarter and 17.1% for year. Clients who have implemented LDI strategies have most likely seen gains during the quarter from their long-duration assets but the funded status of most pension plans has likely declined in the quarter. However, this primarily impacts economic and accounting results rather than IRS contribution determinations due to the various legislative funding relief acts (MAP-21, HATFA, and the BBA of 2013 and 2015) that allow for higher discount rates to be utilized.

Hedge Funds

The second quarter began on a positive note as distressed oriented and activist strategies recovered losses following a difficult first quarter. However, the shock of the Brexit vote at the end of quarter resulted in turmoil across many sub-strategies. Among the major sub-strategies, credit-linked approaches led the way in positive performance. Credit strategies broadly benefited from tightening high yield spreads associated with lower credit quality sectors. Structured credit continued to perform well in the second quarter as mortgage-backed and consumer-backed securities produced positive returns. Event-Driven strategies produced mixed result for the quarter. The early gains in merger arbitrage were muted by volatility surrounding the Brexit vote but the recent uptick in merger and acquisition activity is likely to be a positive tailwind. Results for macro strategies were also mixed as

Hedge Fund Industry Performance Overview as of 6/30/2016				
Composite	Quarter	1 Year	3 Yrs	5 Yrs
DJCS Hedge Fund Composite	0.6%	-4.2%	2.5%	2.9%
Relative Value	Quarter	1 Year	3 Yrs	5 Yrs
DJCS Convertible Arbitrage	2.6%	0.1%	1.2%	2.5%
DJCS Fixed Income Arbitrage	1.0%	-0.4%	2.4%	4.1%
DJCS Equity Market Neutral	-3.2%	-1.5%	1.0%	1.1%
DJCS Multi-Strategy	1.2%	1.2%	5.9%	6.0%
Event Driven	Quarter	1 Year	3 Yrs	5 Yrs
DJCS Event Driven	2.1%	-10.4%	0.1%	1.3%
DJCS Event Driven - Distressed	1.9%	-5.2%	1.4%	3.2%
DJCS Event Driven - Risk Arbitrage	0.6%	0.7%	1.6%	1.5%
DJCS Event Driven - Multi-Strategy	2.2%	-12.4%	-0.5%	0.3%
Equity Hedge	Quarter	1 Year	3 Yrs	5 Yrs
DJCS Long-Short Equity	-1.2%	-5.0%	4.5%	4.0%
DJCS Emerging Markets	1.8%	-2.4%	2.4%	2.2%
DJCS Dedicated Short Bias	-6.3%	4.3%	-8.4%	-10.2%
Tactical	Quarter	1 Year	3 Yrs	5 Yrs
DJCS Global Macro	0.7%	-3.9%	1.5%	3.1%
DJCS Managed Futures	-2.2%	5.4%	6.5%	2.3%
Traditional Markets	Quarter	1 Year	3 Yrs	5 Yrs
BC Aggregate Bond	2.2%	6.0%	4.1%	3.8%
S&P 500	2.5%	4.0%	11.7%	12.1%

some trend strategies struggled with the sharp market movements. In the equity space, volatile price reversals within industries continue to pose challenges for long-short equity. However, yield related equity sectors performed well benefiting some long biased strategies.

Private Markets

Global private buyout deal value was \$88 billion, more than twice of what was transacted in the first quarter. Exit volume also increased over the first quarter but totals for 2016 are down nearly 33% from the prior year period as IPO activity continues to be subdued. The private debt space remains attractive as direct lending spreads have increased across the capital structure in 2016. The increase in credit spreads is partially attributed to Business Development Companies (“BDCs”) exiting the lending market due to significant stock under-performance. NEPC continues to advocate allocations to direct lending and for investors to embrace the illiquidity premium in private credit strategies.

In real assets, we are positive on energy, negative on timber, and neutral on agriculture, infrastructure, and metals and mining. NEPC continues to evaluate energy-

related investment opportunities, although the stress on company balance sheets has alleviated as commodity prices have rallied off their lows. Our highest conviction remains in private equity, as these managers appear best-equipped to invest and manage assets amidst a volatile commodity recovery.

In real estate, we remain neutral on US private core real estate and REITS. While valuations in primary markets are well above past peak levels, fundamentals are strong and pricing remains attractive on a relative basis to US Treasuries. We are positive on value-add and opportunistic real estate and believe select European strategies remain attractive. For non-core real estate in the US, we favor cash flow-driven, niche-focused managers who are disciplined and attentive to the current stage of the expansion.

Final Thoughts

As witnessed in the second quarter, political risk does not simply reside in the ether but at times can have a profound and volatile influence on financial markets. NEPC firmly believes a risk-aware and diversified portfolio best serves investors’ ability to weather such events and a multitude of economic environments over the long term. Even so, a risk balanced portfolio is a starting point and we encourage investors to trim assets that have recently outperformed expectations, such as US equities and developed market government bonds. Furthermore, we recommend investors continue to overweight non-US developed market equities as risk premia remain elevated. Additionally, a risk balanced approach is the foundation of our investment philosophy; to this end, we recommend investors maintain an appropriate level of US duration exposure with a strong bias towards TIPS over nominal government bonds.

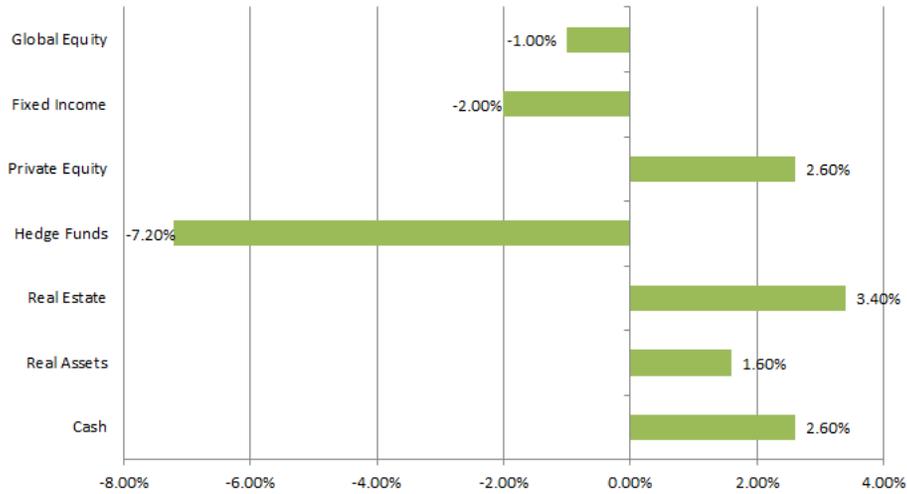
Disclaimers and Disclosures

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

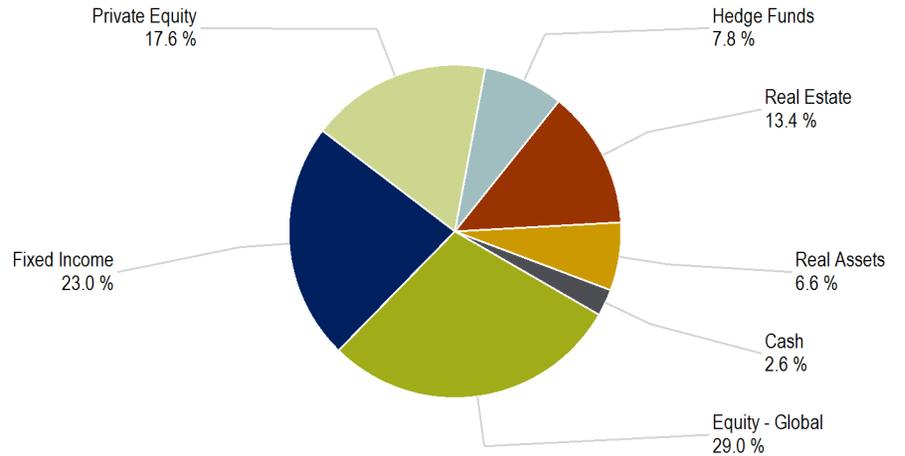
Executive Summary

Total Fund Asset Allocation vs. Current Allocation

Current Allocation vs. Policy Allocation



Current Asset Allocation

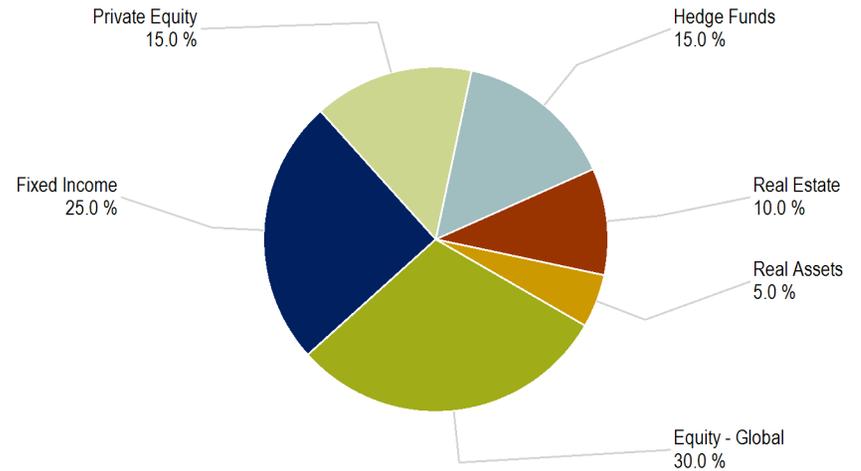


Current Asset Allocation vs. Policy Asset Allocation

	Current	Policy	Current	Current Difference*
Equity - Global	\$575,532,020	30.0%	29.0%	-1.0%
Fixed Income	\$456,656,836	25.0%	23.0%	-2.0%
Private Equity	\$348,785,990	15.0%	17.6%	2.6%
Hedge Funds	\$155,481,103	15.0%	7.8%	-7.2%
Real Estate	\$265,921,632	10.0%	13.4%	3.4%
Real Assets	\$131,524,178	5.0%	6.6%	1.6%
Cash	\$51,087,298	--	2.6%	2.6%
Total	\$1,984,989,058	100.0%	100.0%	

*Difference between Policy and Current Allocation

Policy Asset Allocation

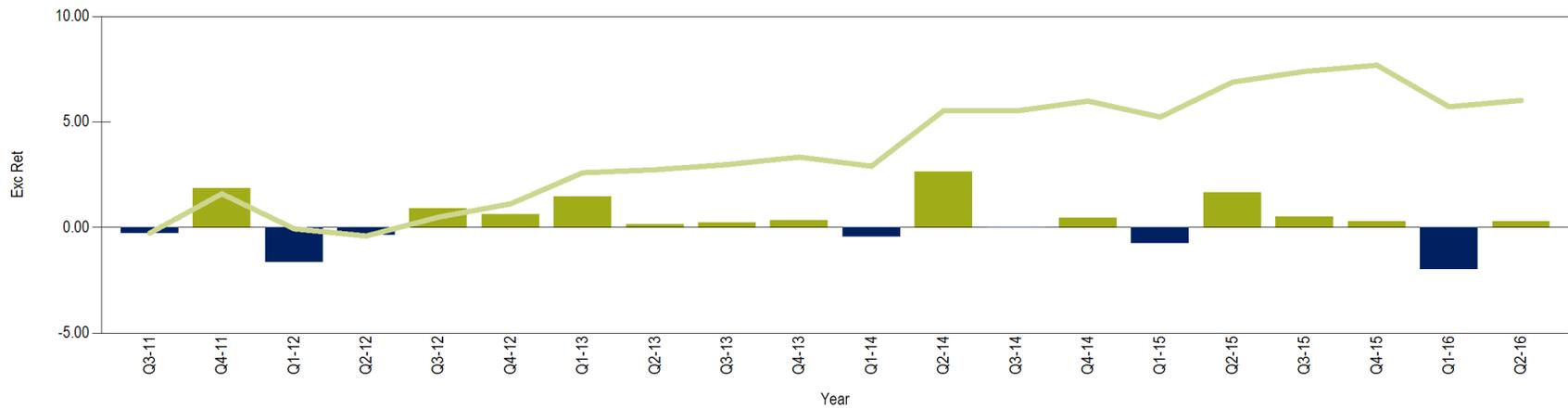


Allocations may not add to 100% due to rounding.

Total Fund Performance Summary

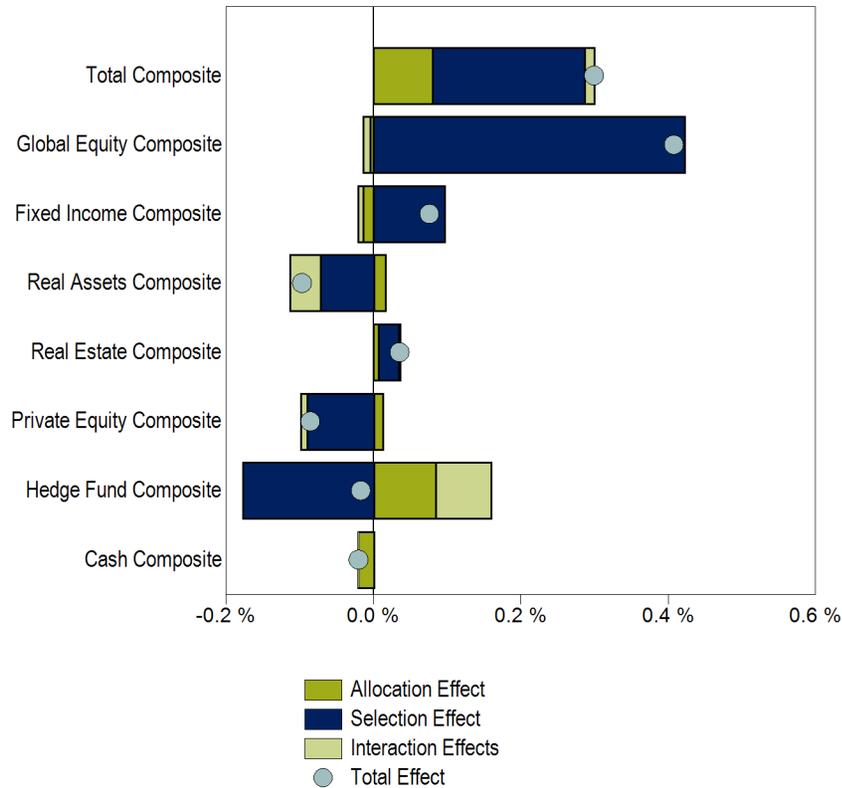
	Market Value	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs
Total Composite	\$1,984,989,058	1.98%	1.00%	8.19%	8.09%	5.82%
<i>Policy Index</i>		1.68%	1.85%	7.05%	6.83%	5.86%
<i>InvestorForce Public DB Net Median</i>		1.80%	0.43%	5.98%	6.01%	5.32%

Quarterly and Cumulative Excess Performance



Total Fund Attribution Analysis

Attribution Effects Relative to Policy Index
3 Months Ending June 30, 2016



Attribution Summary
3 Months Ending June 30, 2016

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Global Equity Composite	2.4%	1.0%	1.4%	0.4%	0.0%	0.0%	0.4%
Fixed Income Composite	2.9%	2.5%	0.4%	0.1%	0.0%	0.0%	0.1%
Real Assets Composite	0.8%	2.2%	-1.5%	-0.1%	0.0%	0.0%	-0.1%
Real Estate Composite	2.3%	2.0%	0.3%	0.0%	0.0%	0.0%	0.0%
Private Equity Composite	1.8%	2.1%	-0.3%	-0.1%	0.0%	0.0%	-0.1%
Hedge Fund Composite	-0.7%	0.5%	-1.2%	-0.2%	0.1%	0.1%	0.0%
Cash Composite	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	2.0%	1.7%	0.3%	0.2%	0.1%	0.0%	0.3%

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

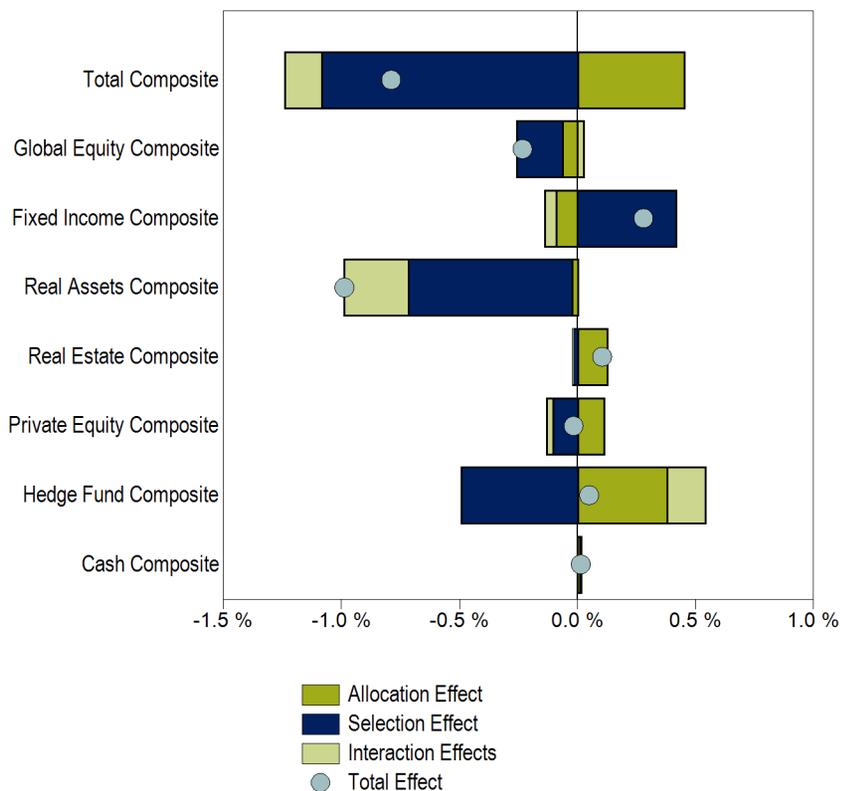
Allocation Effect - The return attributable to the asset allocation of the portfolio

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

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

Total Fund Attribution Analysis

Attribution Effects Relative to Policy Index
1 Year Ending June 30, 2016



Attribution Summary
1 Year Ending June 30, 2016

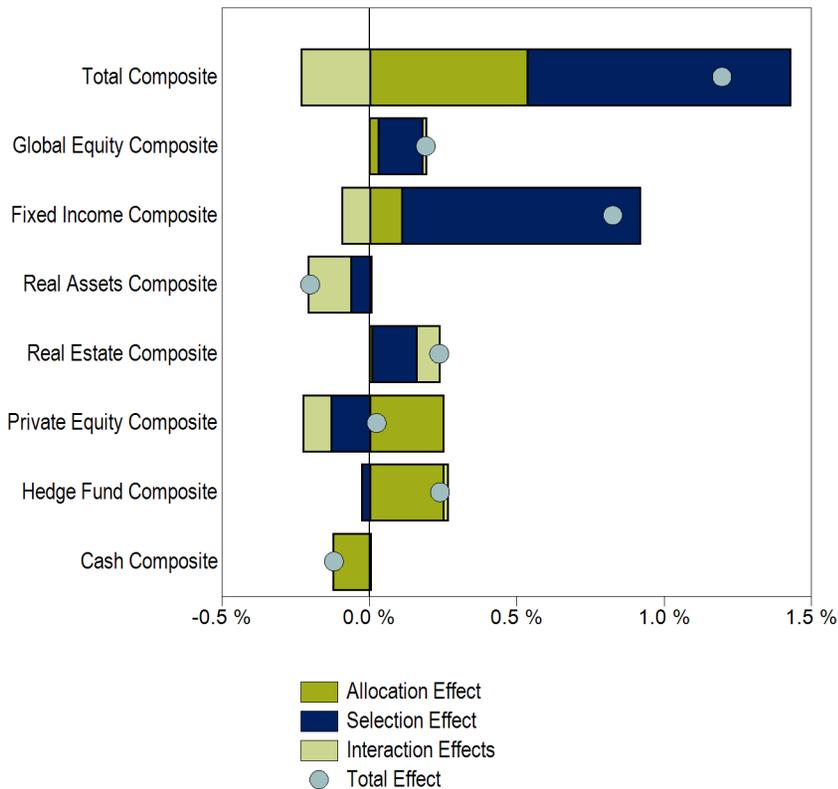
	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Global Equity Composite	-4.3%	-3.7%	-0.6%	-0.2%	-0.1%	0.0%	-0.2%
Fixed Income Composite	7.6%	5.8%	1.7%	0.4%	-0.1%	0.0%	0.3%
Real Assets Composite	-8.7%	5.0%	-13.7%	-0.7%	0.0%	-0.3%	-1.0%
Real Estate Composite	11.1%	11.2%	-0.1%	0.0%	0.1%	0.0%	0.1%
Private Equity Composite	4.9%	4.8%	0.0%	-0.1%	0.1%	0.0%	0.0%
Hedge Fund Composite	-8.5%	-5.4%	-3.0%	-0.5%	0.4%	0.2%	0.0%
Cash Composite	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
Total	1.1%	1.9%	-0.8%	-1.1%	0.5%	-0.2%	-0.8%

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

Total Fund Attribution Analysis

**Attribution Effects Relative to Policy Index
3 Years Ending June 30, 2016**



**Attribution Summary
3 Years Ending June 30, 2016**

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Global Equity Composite	6.6%	6.0%	0.5%	0.1%	0.0%	0.0%	0.2%
Fixed Income Composite	7.4%	4.2%	3.2%	0.8%	0.1%	-0.1%	0.8%
Real Assets Composite	3.5%	5.1%	-1.6%	-0.1%	0.0%	-0.1%	-0.2%
Real Estate Composite	13.7%	12.1%	1.7%	0.2%	0.0%	0.1%	0.2%
Private Equity Composite	14.6%	15.1%	-0.6%	-0.1%	0.2%	-0.1%	0.0%
Hedge Fund Composite	1.7%	1.9%	-0.2%	0.0%	0.3%	0.0%	0.2%
Cash Composite	0.1%	0.1%	0.1%	0.0%	-0.1%	0.0%	-0.1%
Total	8.2%	7.0%	1.2%	0.9%	0.5%	-0.2%	1.2%

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

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Total Composite

	Policy %	% of Portfolio	Market Value (\$)	3 Mo (%)	Rank	YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
Total Composite	100.00	100.00	1,984,989,058	1.98	38	1.98	85	1.00	34	8.19	1	8.09	2	5.82	27
<i>Policy Index</i>				1.68	64	3.68	21	1.85	15	7.05	14	6.83	23	5.86	24
Global Equity Composite	30.00	28.99	575,532,020	2.38	18	1.40	37	-4.34	49	6.58	47	7.06	32	4.99	44
<i>MSCI ACWI</i>				0.99	36	1.23	38	-3.73	45	6.03	57	5.38	66	4.26	68
Fixed Income Composite	25.00	23.01	456,656,836	2.93	34	5.59	58	7.56	14	7.37	1	7.37	1	6.49	20
<i>Barclays U.S. Universal</i>				2.53	44	5.68	58	5.82	29	4.20	23	4.01	37	5.30	43
Real Assets Composite	5.00	7.48	148,461,085	0.76	--	-5.44	--	-8.65	--	3.51	--	--	--	--	--
<i>CPI + 4% (Unadjusted)</i>				2.21	--	3.92	--	5.04	--	5.10	--	5.37	--	5.80	--
Real Estate Composite	10.00	12.54	248,984,725	2.25	--	5.77	--	11.10	--	13.74	--	12.75	--	5.74	--
<i>NFI-ODCE Eq Wtd Net Non Lag</i>				1.97	--	4.23	--	11.24	--	12.08	--	11.70	--	4.97	--
Private Equity Composite	15.00	17.57	348,785,990	1.81	--	2.12	--	4.88	--	14.57	--	12.29	--	6.98	--
<i>MO Hwy Priv. Equ. Index - Lagged</i>				2.10	--	10.08	--	4.83	--	15.15	--	14.90	--	10.63	--
Hedge Fund Composite	15.00	7.83	155,481,103	-0.67	--	-3.88	--	-8.50	--	1.71	--	2.87	--	--	--
<i>HFRI Fund of Funds Composite Index</i>				0.51	--	-2.63	--	-5.45	--	1.90	--	1.62	--	1.58	--
Cash Composite	0.00	2.57	51,087,298	0.06	--	0.20	--	0.24	--	0.14	--	0.10	--	1.08	--
<i>91 Day T-Bills</i>				0.06	--	0.13	--	0.16	--	0.07	--	0.06	--	0.89	--

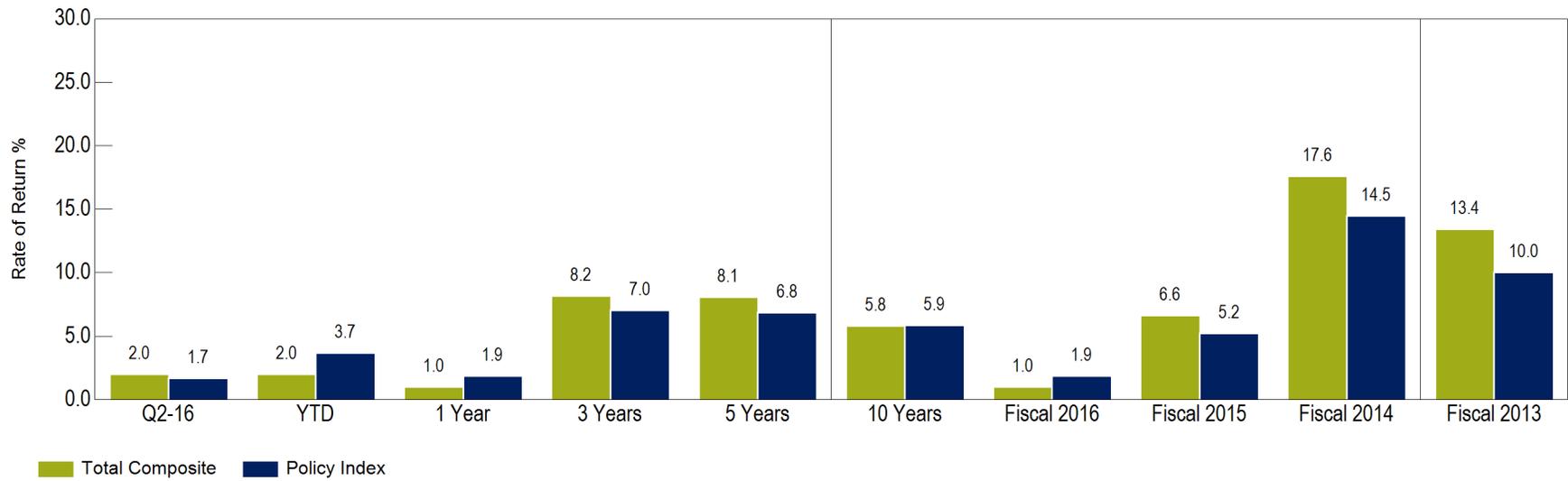
Total Composite is ranked in the IFx Public DB (peer) Net + Universe

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

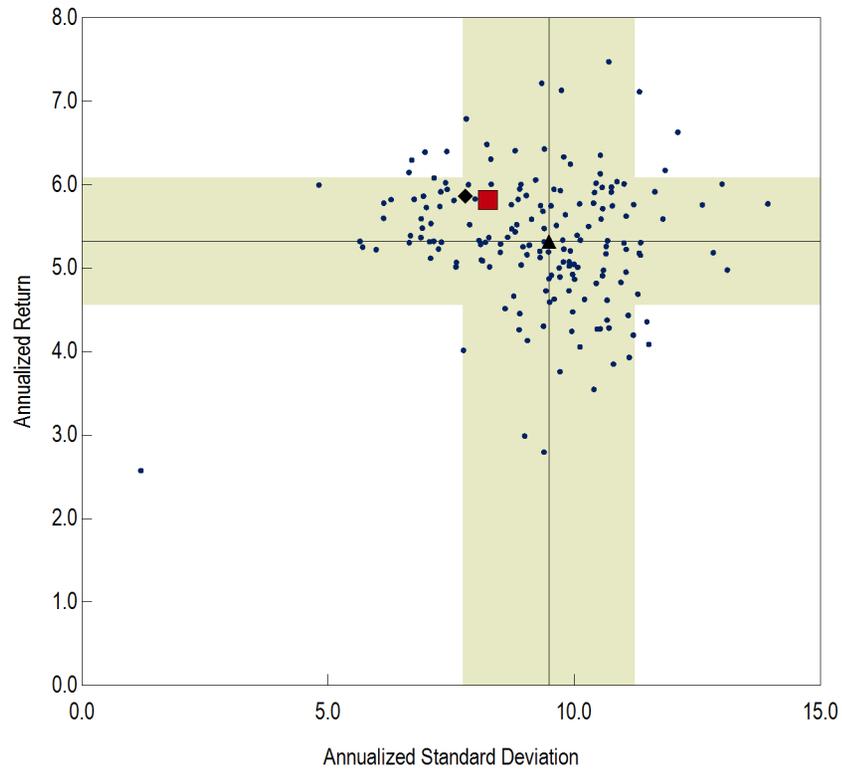
Total Fund Return Summary

Return Summary Net



Total Fund Risk/Return - 10 Years

10 Years Ending June 30, 2016



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

Statistics Summary
10 Years Ending June 30, 2016

	Anlzd Ret	Rank	Anlzd Std Dev	Rank
Total Composite	5.82%	27	8.25%	26
Policy Index	5.86%	24	7.79%	21

Statistics Summary
10 Years Ending June 30, 2016

	Sharpe Ratio	Rank	Sortino Ratio RF	Rank
Total Composite	0.60	24	0.59	49
Policy Index	0.64	19	0.69	30

Total Fund Performance

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Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	1 Mo (%)	3 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Total Composite	1,984,989,058	100.00	100.00	0.23	1.98	1.98	1.00	8.19	8.09	5.82
<i>Policy Index</i>				1.47	1.69	3.69	1.86	7.05	6.84	5.86
Global Equity Composite	575,532,020	28.99	30.00	-0.55	2.38	1.40	-4.34	6.58	7.06	4.99
<i>MSCI ACWI</i>				-0.61	0.99	1.23	-3.73	6.03	5.38	4.26
Tortoise	66,457,167	3.35		5.22	16.36	8.26	-15.29	-0.03	8.36	--
<i>Alerian MLP Index</i>				5.13	19.70	14.71	-13.11	-5.39	3.24	9.48
Domestic Equity Composite	286,882,748	14.45	--	-0.17	2.45	1.92	-0.76	10.91	11.28	6.93
<i>Russell 3000</i>				0.21	2.63	3.62	2.14	11.13	11.60	7.40
Large Cap Composite	231,733,184	11.67	--	0.25	2.84	2.90	2.45	11.50	11.93	7.69
Cash/S&P Futures	194,852,163	9.82		0.09	2.89	3.33	2.58	9.89	--	--
Intech	36,881,021	1.86		1.08	2.66	3.20	3.10	12.30	12.07	7.72
<i>S&P 500</i>				0.26	2.46	3.84	3.99	11.66	12.10	7.42
Small/Mid Cap Composite	55,149,564	2.78	--	-1.59	1.13	-0.85	-8.31	8.26	9.24	7.50
Kennedy Capital	21,667,493	1.09		0.27	2.91	2.13	-3.26	--	--	--
Pinnacle	33,481,650	1.69		-3.31	-2.54	-7.88	-13.06	6.35	7.77	8.12
<i>Russell 2500</i>				-0.04	3.57	3.98	-3.67	8.61	9.48	7.32
International Equity Composite	222,192,105	11.19	--	-2.63	-1.26	-1.42	-8.08	2.74	2.03	2.70
<i>MSCI ACWI ex USA</i>				-1.53	-0.64	-1.02	-10.24	1.16	0.10	1.87
Silchester	105,388,960	5.31		-3.21	-1.92	-1.48	-7.99	5.06	5.97	6.79
Acadian Int'l Small Cap	31,480,237	1.59		-3.81	-1.13	-1.27	0.82	--	--	--
<i>MSCI EAFE</i>				-3.36	-1.46	-4.42	-10.16	2.06	1.68	1.58
Gryphon	45,006,799	2.27		-5.75	-2.94	-6.82	-10.76	--	--	--
<i>MSCI EAFE Growth</i>				-1.77	-0.15	-2.22	-4.80	4.17	3.24	2.88
Acadian Emerging Markets	20,072,844	1.01		4.16	0.63	5.18	-13.25	-2.16	-3.06	3.28
GMO EM	19,830,383	1.00		3.63	4.31	5.87	-5.44	--	--	--
<i>MSCI Emerging Markets</i>				4.00	0.66	6.41	-12.05	-1.56	-3.78	3.54
Transition Account	412,882	0.02								

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Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	1 Mo (%)	3 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Fixed Income Composite	456,656,836	23.01	25.00	1.33	2.93	5.59	7.56	7.37	7.37	6.49
<i>Barclays U.S. Universal</i>				1.76	2.53	5.68	5.82	4.20	4.01	5.30
Core Fixed Income Composite	168,289,946	8.48	10.00	0.99	2.07	4.64	6.75	5.31	4.90	4.56
Aberdeen	22,410,479	1.13		0.56	1.23	0.70	2.99	4.66	6.65	5.44
<i>Barclays Aggregate</i>				1.80	2.21	5.31	6.00	4.06	3.76	5.13
Internal Fixed - Core	105,611,662	5.32		1.19	2.18	5.79	8.18	5.89	--	--
<i>Barclays Govt/Credit</i>				2.20	2.67	6.23	6.70	4.20	4.11	5.22
Octagon Senior Debt	19,929,833	1.00		-0.08	1.80	2.25	--	--	--	--
<i>Barclays Aggregate</i>				1.80	2.21	5.31	6.00	4.06	3.76	5.13
Principal CMBS Fixed	20,337,972	1.02		1.29	2.63	3.04	3.70	3.83	--	--
<i>Barclays CMBS ERISA Eligible</i>				1.72	2.24	5.93	6.22	4.10	4.53	5.87
Long Duration Composite	95,969,301	4.83	5.00	3.45	4.69	10.26	14.22	9.21	7.77	--
Internal Fixed - Long Duration	95,969,301	4.83		3.45	4.69	10.26	14.22	9.21	7.90	--
<i>Barclays LT Govt/Credit</i>				4.92	6.55	14.33	15.72	9.33	9.18	8.42
Opportunistic Debt Composite	166,134,367	8.37	5.00	0.31	3.04	3.72	4.87	11.02	13.15	--
ABRY ASF	130,815	0.01		0.00	3.43	0.61	9.73	22.37	21.45	--
Anchorage Capital II	1,007,558	0.05		0.00	0.00	-1.63	-1.46	14.15	13.82	--
Anchorage Capital III	6,139,772	0.31		0.00	0.00	-1.55	4.98	13.46	--	--
Anchorage Illiquid Opps	764,707	0.04		0.00	0.00	2.26	--	--	--	--
Audax Mezzanine II	348,134	0.02		0.00	-1.89	-1.73	3.41	12.15	11.19	7.55
CVI Credit Value	9,836,061	0.50		1.08	4.69	7.28	9.83	18.46	21.94	--
CVI Credit Value Fund III	5,724,592	0.29		1.25	4.85	6.97	8.26	--	--	--
CVI Global Value	5,247,538	0.26		0.89	-6.53	3.62	3.63	8.60	11.16	--
GOLUB Capital	27,059,967	1.36		0.00	2.49	5.60	8.29	6.31	6.58	--
GSO Capital Opp II	5,237,029	0.26		0.00	1.70	-8.12	-6.25	9.51	--	--
GSO Credit Alpha Fund	16,419,861	0.83		4.93	14.66	4.75	-9.23	--	--	--
GSO Capital Opp	1,951,316	0.10		0.00	-0.42	-0.99	4.38	9.53	17.22	--
GSO Energy Select Opps	848,801	0.04		0.00	10.63	8.64	--	--	--	--
Internal Fixed - Nonrated	2,146,881	0.11		1.36	3.28	6.46	10.11	--	--	--
M&G III	6,464,207	0.33		-8.16	-5.19	-6.42	-9.59	--	--	--
Northern Shipping II	14,733,596	0.74		0.37	3.79	4.40	6.50	--	--	--
Northern Shipping III	3,555,202	0.18		1.29	2.69	0.56	--	--	--	--
Och-Ziff II	5,953,860	0.30		0.00	2.25	-0.88	-5.11	6.23	--	--
OCP Asia	12,617,521	0.64		0.47	3.72	8.12	13.74	--	--	--
Octagon Opportunistic	32,065,675	1.62		-0.04	3.18	3.24	--	--	--	--

MPERS

Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	1 Mo (%)	3 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Riverstone Credit Partners	7,881,274	0.40		1.03	5.03	5.03	--	--	--	--
<i>Barclays High Yield</i>				0.92	5.52	9.06	1.62	4.18	5.84	7.56
Inflation Protection Securities Composite	26,263,222	1.32	5.00	1.81	1.57	5.78	4.06	2.59	3.16	--
Internal US TIPS	26,263,222	1.32		1.81	1.57	5.78	4.06	2.59	3.16	--
<i>Barclays US TIPS</i>				2.08	1.71	6.24	4.35	2.31	2.63	4.75
Real Assets Composite	148,461,085	7.48	5.00	0.64	0.76	-5.44	-8.65	3.51	--	--
<i>CPI + 4% (Unadjusted)</i>				0.66	2.21	3.92	5.04	5.10	5.37	5.80
American Infrastructure I MLP	17,068,747	0.86		0.20	-0.87	-1.60	2.92	0.18	-2.59	--
American Infrastructure II MLP	8,125,776	0.41		1.64	0.18	4.85	6.51	--	--	--
Apollo Aviation III	3,778,360	0.19		0.00	-1.21	-5.53	-8.42	--	--	--
Blue Road	5,322,900	0.27		0.00	10.46	9.82	--	--	--	--
EIF - US Power III	9,404,003	0.47		0.00	0.81	2.91	4.17	13.45	10.09	--
EMG Fund IV	11,614,007	0.59		-0.72	-0.66	-0.52	--	--	--	--
Energy & Mineral Group III	14,055,067	0.71		-0.22	10.04	-11.44	-8.06	--	--	--
Energy & Mineral Group II	11,596,649	0.58		0.00	1.51	-10.57	-7.79	18.39	--	--
Midstream & Resources I	7,523,599	0.38		-0.39	-4.34	-22.93	-41.52	-0.31	12.50	--
NGP IX	2,429,817	0.12		0.00	-15.21	-28.71	-37.76	-8.00	-1.52	--
NGP X	6,649,598	0.33		-0.66	-7.09	-9.17	-18.39	-1.63	--	--
NGP XI	2,331,484	0.12		0.00	-2.08	-5.21	-15.59	--	--	--
Orion Mine Finance Fund I	10,012,572	0.50		0.00	5.02	1.19	31.49	--	--	--
Ridgewood Energy	7,344,068	0.37		-0.80	1.66	-2.52	9.37	--	--	--
Ridgewood III	385,126	0.02		-21.31	-24.85	-40.69	-50.40	--	--	--
Sciens Marine Investments	2,108,851	0.11		0.00	-28.65	-53.47	-62.05	--	--	--
<i>CPI + 4% (Unadjusted)</i>				0.66	2.21	3.92	5.04	5.10	5.37	5.80
RMK - Timberland	4,816,735	0.24		0.00	1.15	-2.30	-5.10	-0.61	6.98	1.87
MP Timber	23,893,726	1.20		4.30	4.15	--	--	--	--	--
<i>NCREIF Timberland 1 Qtr Lag</i>				-0.26	-0.26	1.60	2.90	7.72	6.63	6.65

MPERS

Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	1 Mo (%)	3 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Real Estate Composite	248,984,725	12.54	10.00	1.23	2.25	5.77	11.10	13.74	12.75	5.74
<i>NFI-ODCE Eq Wtd Net Non Lag</i>				1.97	1.97	4.23	11.24	12.08	11.70	4.97
Core Real Estate Composite	160,677,498	8.09	--	2.12	2.61	5.94	12.89	14.94	14.43	5.56
<i>NCREIF Property Index</i>				2.03	2.03	4.28	10.64	11.60	11.51	7.40
CBRE Capital Partners	698,990	0.04		0.12	0.11	6.29	10.72	11.03	10.98	--
Clarion Lion	65,825,687	3.32		1.75	1.75	4.84	11.47	11.97	11.77	3.96
Principal CMBS	22,486,580	1.13		1.44	3.48	9.36	8.40	16.50	17.77	--
Principal Enhanced Property	48,543,619	2.45		3.53	3.53	6.53	18.13	16.24	17.12	4.11
<i>NCREIF Property Index</i>				2.03	2.03	4.28	10.64	11.60	11.51	7.40
Principal US Property	23,122,622	1.16		0.91	2.29	4.17	11.30	12.16	12.35	5.07
<i>NCREIF ODCE</i>				2.13	2.13	4.36	11.81	12.99	12.71	6.17
Non-Core Real Estate Composite	72,420,970	3.65	--	-1.10	1.39	5.84	7.56	12.36	10.06	3.62
AEW Partners V	232,202	0.01		-0.03	4.14	29.16	107.62	58.62	41.35	13.08
Apollo European III	1,839,799	0.09		-0.21	-3.51	5.43	3.46	4.84	1.18	--
Apollo Real Estate	7,526,391	0.38		0.00	0.45	9.31	10.86	15.35	14.29	0.16
Centersquare III	11,854,644	0.60		0.00	13.67	--	--	--	--	--
<i>NCREIF Property Index</i>				2.03	2.03	4.28	10.64	11.60	11.51	7.40
Clarion Lion Mexico Fund	2,763,956	0.14		0.00	-0.93	-24.02	-26.01	-12.29	-9.46	--
Colony Capital VIII	1,995,300	0.10		0.00	-11.33	-8.83	-28.70	0.63	-3.75	--
M&G II	8,120,795	0.41		-8.16	-4.75	-5.73	-7.81	--	--	--
Och-Ziff	3,634,052	0.18		0.00	25.95	37.49	53.53	26.37	31.29	23.56
Och-Ziff RE III	2,329,281	0.12		-0.23	3.75	2.59	0.78	--	--	--
Torchlight Debt Opp II	9,598,486	0.48		0.00	0.56	9.19	15.04	--	--	--
Torchlight Debt Opp III	3,542,398	0.18		0.00	0.03	1.16	2.99	--	--	--
Torchlight Debt Opps V	2,198,298	0.11		0.00	-1.60	-2.09	-2.71	--	--	--
Tristan EISPO	5,135,559	0.26		-0.12	-5.17	6.41	18.16	13.36	7.32	--
Tristan EPI30 3	8,566,571	0.43		-0.43	-3.80	2.26	-1.16	--	--	--
Tristan EPI30 4	2,239,270	0.11		-1.42	-3.65	1.17	--	--	--	--
Urdang Value Added Fund II	843,968	0.04		0.00	2.09	2.32	2.26	7.40	11.71	--
<i>NCREIF Property Index</i>				2.03	2.03	4.28	10.64	11.60	11.51	7.40
REITS Composite	15,886,256	0.80	--	2.96	2.58	5.29	7.73	7.11	4.73	--
CBRE Investors	15,886,256	0.80		2.96	2.58	5.29	7.73	7.11	4.73	--
<i>FTSE EPRA/NAREIT Developed</i>				3.61	3.46	8.87	11.58	8.08	7.80	4.25

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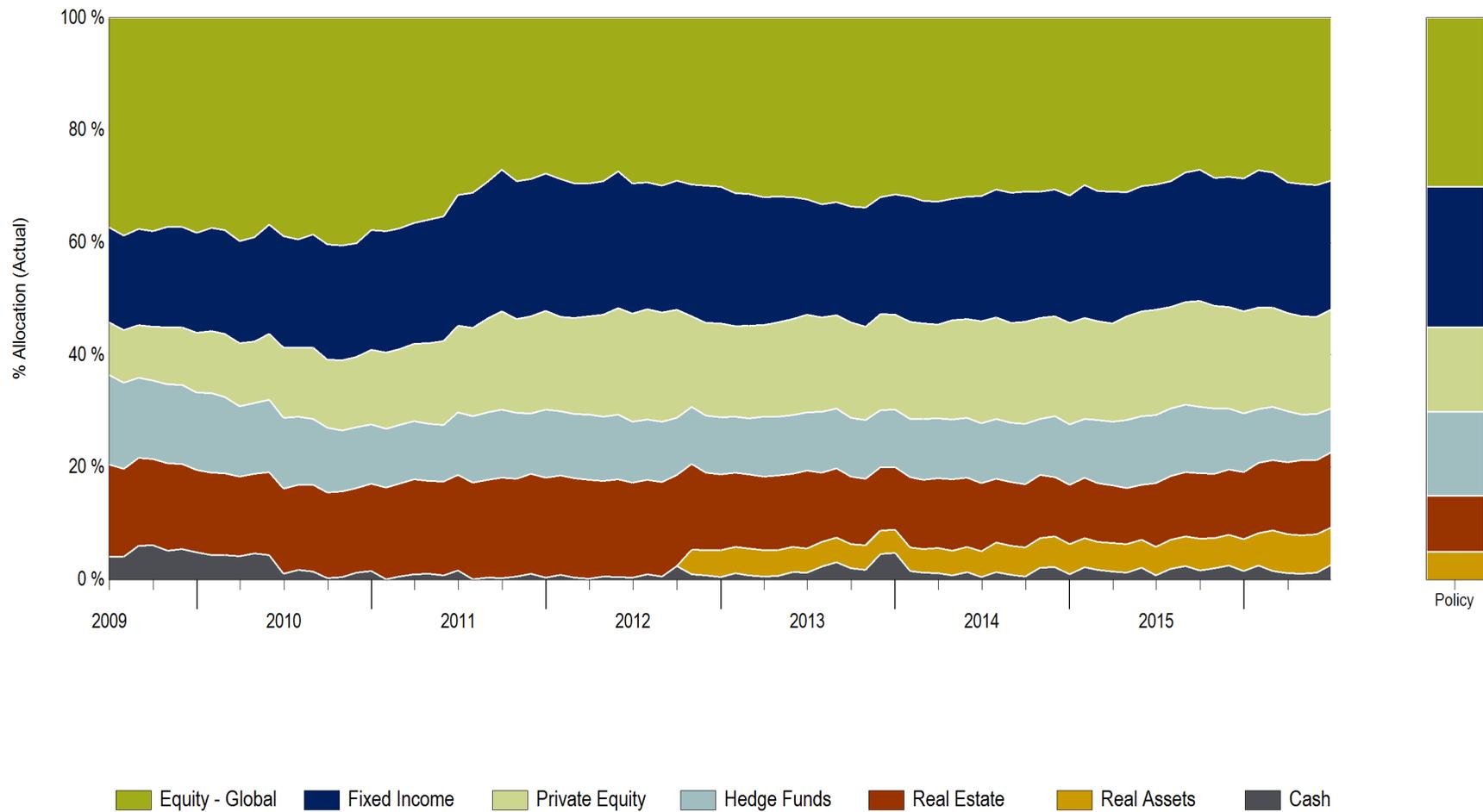
Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	1 Mo (%)	3 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Private Equity Composite	348,785,990	17.57	15.00	-0.04	1.81	2.12	4.93	14.58	12.30	6.98
<i>MO Hwy Priv. Equ. Index - Lagged</i>				7.03	2.10	10.08	4.83	15.15	14.90	10.63
Abry Partners VI	3,898,841	0.20		0.00	6.19	23.85	35.23	32.31	28.41	--
Abry Partners VII	4,970,513	0.25		0.00	2.94	3.88	16.99	15.59	--	--
Capital Partners II	7,905,881	0.40		0.00	-0.42	1.53	9.62	--	--	--
Grove Street - MP Ventures	131,389,776	6.62		0.00	1.90	1.78	2.99	13.40	11.98	4.16
Grove Street - MP Ventures II	170,242,462	8.58		0.00	1.46	1.38	5.20	15.10	10.68	--
KPS IV	484,960	0.02		0.00	-7.82	3.58	1.47	5.36	--	--
Opengate Capital Partners	1,802,572	0.09		-3.75	--	--	--	--	--	--
Ospraie	2,015,969	0.10		0.00	0.00	35.90	21.58	17.36	11.16	--
Shore Capital Partners GP I LP	1,548,395	0.08		-4.30	-7.31	1.59	4.77	--	--	--
Shoreline China Valu III	8,472,995	0.43		0.00	1.49	3.96	15.69	--	--	--
Turnbridge Capital Partners I	3,051,356	0.15		0.00	9.96	-6.15	-31.02	--	--	--
Vectis H & L II	11,994,621	0.60		0.00	8.33	8.33	15.61	16.70	11.75	--
Pfingsten Fund V	1,007,649	0.05								
Hedge Fund Composite	155,481,103	7.83	15.00	-1.38	-0.67	-3.88	-8.50	1.71	2.87	--
<i>HFRI Fund of Funds Composite Index</i>				-0.46	0.56	-2.58	-5.40	1.92	1.63	1.58
Alyeska Fund	14,242,397	0.72		-4.53	-3.24	-8.45	-9.29	--	--	--
BlueTrend	10,572,949	0.53		2.72	-7.02	0.10	6.68	4.85	--	--
Brevan Howard	7,428,062	0.37		0.74	-0.42	-1.06	-4.55	-1.74	2.18	--
Bridgewater Pure Alpha	15,655,289	0.79		-3.04	-5.16	-11.77	-16.30	0.75	3.06	8.24
Cevian	11,208,237	0.56		-8.15	-2.66	-1.52	-12.09	3.74	--	--
Indus Pacific Opp. Fund	11,434,759	0.58		-1.05	1.79	-0.89	-7.67	--	--	--
Koppenburg Commodity Fund	10,177,273	0.51		1.66	9.20	7.13	1.67	--	--	--
Luxor Capital	2,549,724	0.13		-0.97	-2.78	-17.67	-30.48	-11.21	-6.15	--
Metacapital	10,925,108	0.55		1.62	3.65	1.68	-1.98	7.09	--	--
Millenium USA LP	17,556,498	0.88		0.00	2.23	0.78	5.47	--	--	--
Pentwater	8,931,627	0.45		0.42	2.48	-4.48	-10.68	--	--	--
PFM	11,514,953	0.58		-1.61	-0.36	-9.93	-11.79	4.84	4.77	--
RK Capital Management LLP	10,767,728	0.54		-0.77	-1.72	0.54	0.56	--	--	--
Shepard International	487,263	0.02		-0.83	-4.20	-5.01	-2.51	-4.09	-5.13	--
Taconic Capital	928,980	0.05		-0.22	2.37	4.82	1.84	3.44	5.08	--
ValueAct	11,100,257	0.56		-2.94	-2.48	-8.51	-17.59	5.38	--	--
Cash Composite	51,087,298	2.57	0.00	0.02	0.06	0.20	0.24	0.14	0.10	1.08
<i>91 Day T-Bills</i>				0.02	0.06	0.13	0.16	0.07	0.06	0.89

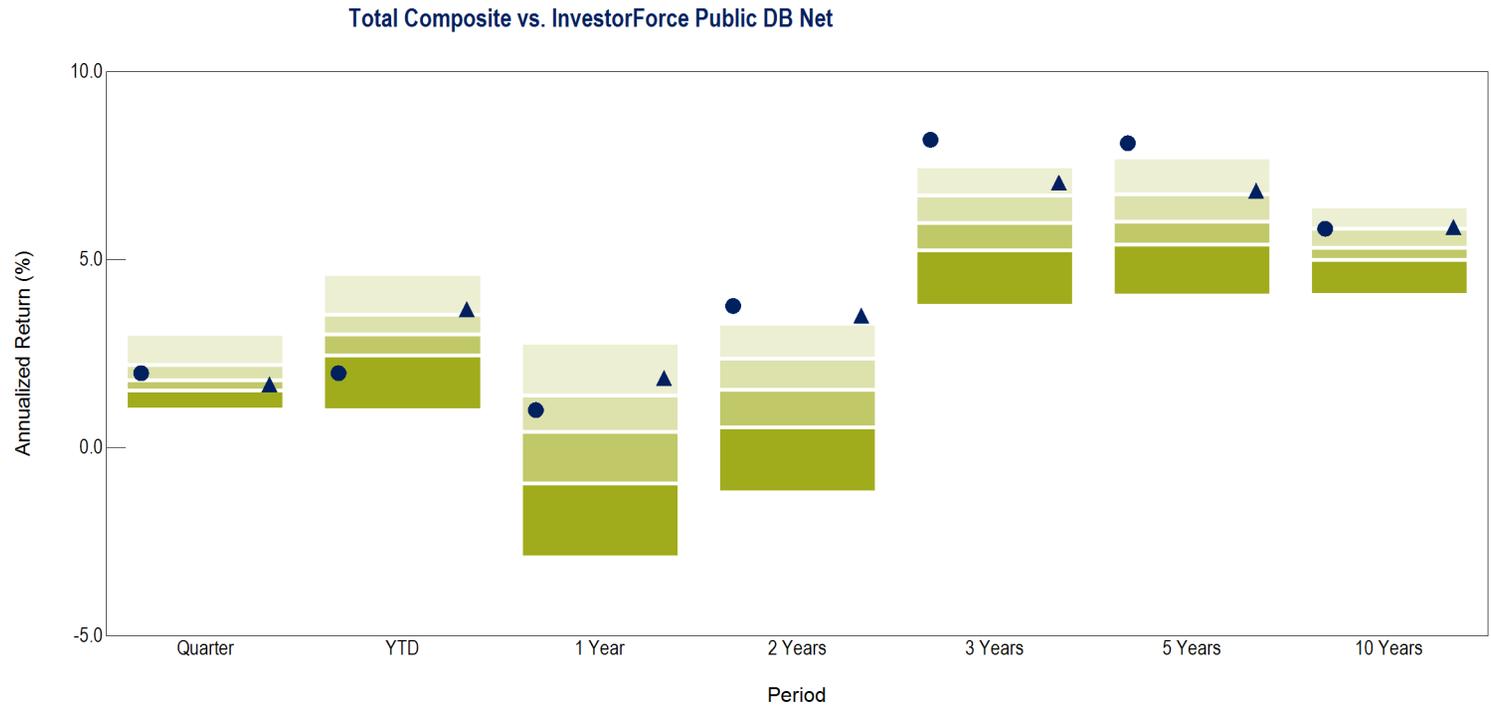
Appendix

Total Fund Asset Allocation History

Asset Allocation History



Total Fund Return Summary vs. Peer Universe



	Return (Rank)													
5th Percentile	3.0	4.6	2.8	3.3	7.5	7.7	6.4							
25th Percentile	2.2	3.5	1.4	2.4	6.7	6.7	5.8							
Median	1.8	3.0	0.4	1.5	6.0	6.0	5.3							
75th Percentile	1.5	2.5	-0.9	0.5	5.2	5.4	5.0							
95th Percentile	1.0	1.0	-2.9	-1.2	3.8	4.1	4.1							
# of Portfolios	260	259	258	251	235	208	173							
● Total Composite	2.0	(38)	2.0	(85)	1.0	(34)	3.8	(3)	8.2	(1)	8.1	(2)	5.8	(27)
▲ Policy Index	1.7	(64)	3.7	(21)	1.9	(15)	3.5	(4)	7.0	(14)	6.8	(23)	5.9	(24)

Total Fund Return Summary vs. Peer Universe

Total Composite vs. InvestorForce Public DB Net



	Return (Rank)														
	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006					
5th Percentile	1.7	7.7	20.4	14.3	3.6	15.3	26.8	-9.8	10.7	15.4					
25th Percentile	0.4	6.4	17.2	12.9	1.6	13.4	22.0	-15.2	9.1	14.0					
Median	-0.4	5.5	14.9	11.8	0.6	12.2	18.6	-24.4	7.8	12.3					
75th Percentile	-1.5	4.4	12.7	10.4	-0.5	10.9	14.5	-27.6	6.7	9.8					
95th Percentile	-3.2	2.7	8.4	7.6	-3.1	7.9	9.9	-30.5	5.2	6.6					
# of Portfolios	262	210	191	159	137	131	128	125	122	115					
● Total Composite	3.3 (1)	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)					
▲ Policy Index	1.5 (7)	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)					

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:
 $(\text{Annualized Return of Portfolio} - \text{Annualized Return of Benchmark}) / \text{Annualized Standard Deviation}(\text{Period Portfolio Return} - \text{Period Benchmark Return})$. 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:
 $\text{Calculation Average } (X-Y) / \text{Downside Deviation } (X-Y) * 2$
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:
 $(\text{Annualized Return of Portfolio} - \text{Annualized Return of Risk Free}) / \text{Annualized Standard Deviation (Portfolio Returns)}$

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:
 $\text{Tracking Error} = \text{Standard Deviation } (X-Y) * \sqrt{(\# \text{ of periods per year})}$
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:
 $(\text{Portfolio Average Return} - \text{Average Return of Risk-Free Rate}) / \text{Portfolio Beta}$

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.

$\text{UpsideCapture} = \text{TotalReturn}(\text{FundReturns}) / \text{TotalReturns}(\text{BMReturn})$ when Period Benchmark Return is $> = 0$

$\text{DownsideCapture} = \text{TotalReturn}(\text{FundReturns}) / \text{TotalReturns}(\text{BMReturn})$ when Benchmark < 0

Data Source: InvestorForce

Glossary of Investment Terminology

Of Portfolios/Observations¹ – The total number of data points that make up a specified universe

Allocation Index³ - 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 Effect² - 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)³ - 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)³ - 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.

Attribution³ - 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 Maturity⁴ - 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 Average¹ - 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) Attribution¹ - 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) Attribution¹ - 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)⁴ - 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.

Correlation¹ - 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: ¹InvestorForce, ²Interaction Effect Performance Attribution, ³NEPC, LLC, ⁴Investopedia, ⁵Hedgeco.net

Glossary of Investment Terminology

Coupon⁴ – 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 Effect¹ - Is the effect that changes in currency exchange rates over time affect excess performance.

Derivative Instrument³ - 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 Deviation¹ - 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.

Duration³ - 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 Ratio¹ – 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 Bond³ - 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 Hurdle⁵ – 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 Mark⁴ - 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 Rate⁴ - 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 Effects² - 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.

Median³ - 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 Duration³ - The percentage change in the price of a fixed income security that results from a change in yield.

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

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

Net Investment Change¹ – Is the change in an investment after accounting for all Net Cash Flows.

Performance Fee⁴ - 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: ¹InvestorForce, ²Interaction Effect Performance Attribution, ³NEPC, LLC, ⁴Investopedia, ⁵Hedgeco.net

Glossary of Investment Terminology

Policy Index³ - 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)⁴ - 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)³ - The weighted equity P/E is based on current price and trailing 12 months earnings per share (EPS).

Price to Sales (P/S)⁴ - 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)⁴ - 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) Effect² - 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 rate⁵ – is a hurdle rate that once beaten allows a fund manager to charge a performance fee based on the entire annualized return.

Tiered Fee¹ – 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 Effects² - 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 Return¹ - 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.

Universe³ - The list of all assets eligible for inclusion in a portfolio.

Upside Deviation¹ – Standard Deviation of Positive Returns

Weighted Avg. Market Cap.⁴ - 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 (%)³ - The current yield of a security is the current indicated annual dividend rate divided by current price.

Yield to Maturity³ -The discount rate that equates the present value of cash flows, both principal and interest, to market price.

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

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