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## Vermont Pension Investment Committee

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### Third Quarter State Employees Investment Performance Analysis

November 24<sup>th</sup>, 2015

Douglas W. Moseley, Partner  
Christopher Levell, ASA, CFA, CAIA, Partner  
Richard M. Charlton, Chairman  
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# NEPC Update



# NEPC Updates

September 30, 2015

## Highlights of Third Quarter Happenings at NEPC

### NEPC Recognitions



- Two of NEPC's Partners were named on the *Chief Investment Officer* magazine's (CIO) annual ranking of the world's most influential investment consultants. NEPC's Chief Investment Officer, **Tim McCusker**, was named **the most influential general consultant on the 2015** list of Knowledge Brokers. **KC Connors**, Head of NEPC's Philanthropic Practice Team, **ranked 10th on the 2015 Knowledge Brokers – Specialist list**. The lists are CIO's annual rankings of the most influential investment consultants worldwide<sup>1</sup>.



### NEPC Client Recognitions

- Two of our clients were recognized for their work in the healthcare industry by *Institutional Investor* on October 7th. Mary O'Reilly, Director, Treasury and Investments at Rochester Health, received the II Investor Intelligence Award for Asset Allocation, and Joshua Rabuck, Executive Director, Investments at Indiana University Health, was accorded the II Investor Intelligence Award for Risk Management.

### NEPC Research

#### Recent White Papers

- Best Practices: Managing Risk in Corporate VEBA and SERP Plans* (October 2015) - Mike Valchine, CAIA, CIPM, Senior Consultant
- NEPC's 2015 Defined Contribution Plan & Fee Survey: What a Difference a Decade Makes* (October 2015) – Ross Bremen, CFA, Partner
- Market Chatter – Has the China Bubble Burst?* (July 2015)
- Market Chatter – China's Devaluation of the Yuan* (August 2015)
- 2015 Third Quarter Market Thoughts*

### Upcoming/Recent Events

- Healthcare Defined Contribution Fee Survey Results** - Tuesday, November 3, 2015, 3:00 to 4:00 p.m. (EST)
- NEPC's 2015 Defined Benefit Plan Trends Webinar** - Wednesday, October 21, 2015, 2:00 - 3:00 p.m. (EST)
- NEPC, Newton Capital Management, and the Centre for Endowment Asset Management are hosting a special event that delves into the influence of British economist John Maynard Keynes on the U.S. Endowment Model on October 15, 2015 in Boston, MA.

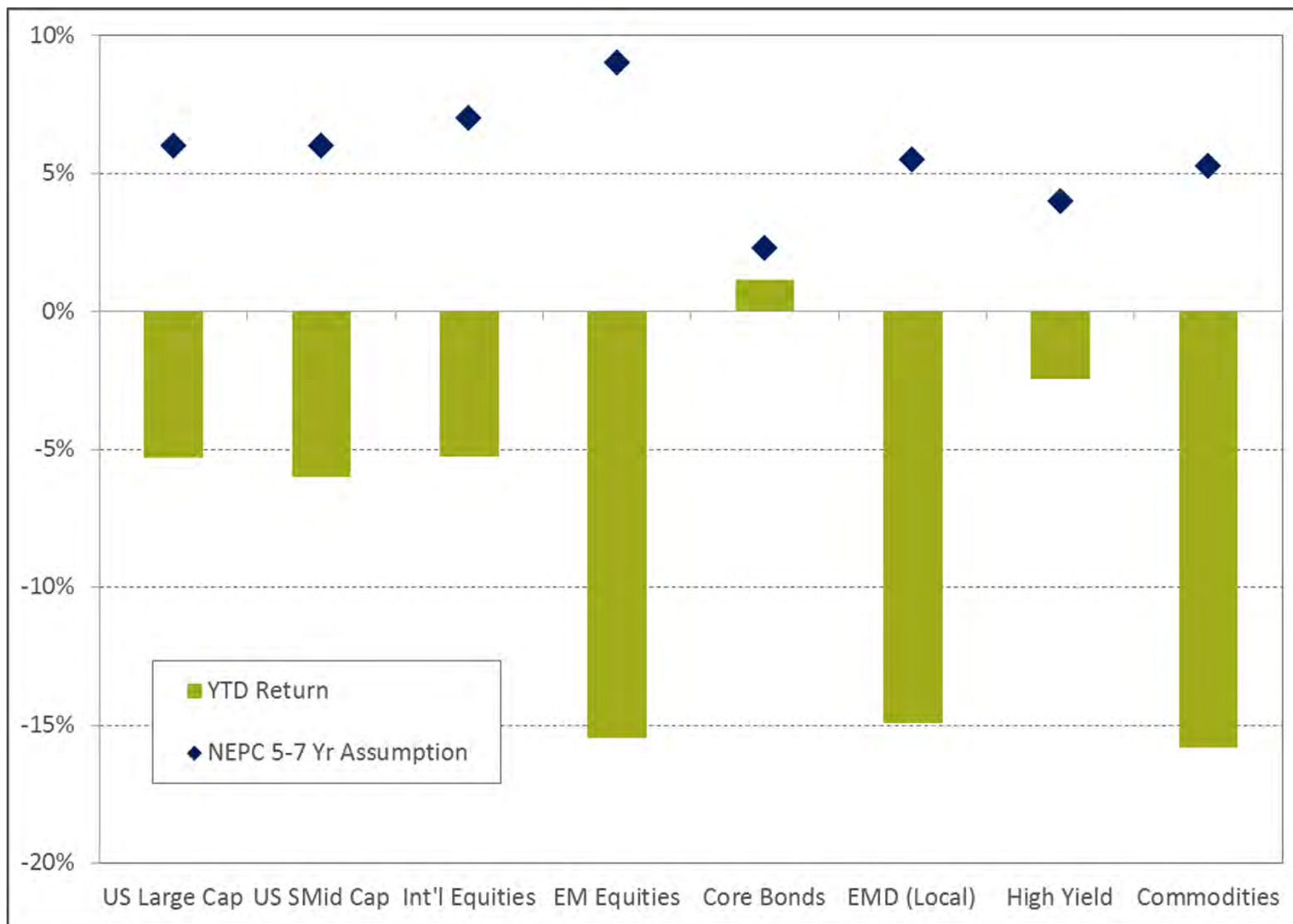
<sup>1</sup>CIO Magazine interviews pension and non-profit CIOs, asset managers and former consultants, to approximate what it calls "the hierarchy of today's institutional consultant industry." The results should not be considered a recommendation of any specific firm or individual consultant. For more information, please visit CIO Magazine's web site at <http://www.ai-cio.com/2015-knowledge-brokers/>. Past performance is no guarantee of future results

# Market Update

- **A wave of volatility spread across global markets during the quarter**
  - Concerns of an economic slowdown in China sparked a rapid decline in global risk assets with commodities and emerging markets suffering the most
  - A severe global growth downturn remains a low probability tail-risk for capital markets
- **US economy continues to expand albeit at a slow pace**
  - Overall conditions are supportive for growth but a strong US dollar creates challenges
  - Benefits of low oil prices slowly compound for US consumers
- **Fed Funds rate increase...**
  - Timing is less relevant, of importance is the path of Fed policy tightening relative to expectations and long-term policy (L-T policy rate of 2% or 4%)
  - Current Fed willingness to tighten monetary policy balanced between disruptive effects of a stronger dollar and inflation conditions of US economy
- **Accommodative global monetary policies flow through to markets**
  - QE continues to support improving economic conditions in Europe and Japan
  - China policy responses broadly simulative with plenty of dry powder for further easing
- **Cyclical weak growth is not a financial crisis for the emerging markets**
  - Negative returns in EM reflect the economic rebalances and adjustments necessary to generate sustainable growth and economic success
  - Political and economic reform initiatives drive the outlook for improved economic and earnings growth for countries willing to reform

- **Risk-return profile of US high yield is attractive relative to US equities**
  - High yield credit spreads now exceed long-term averages with yields near 2012 levels
  - Make use of dynamic credit strategies as disruptions in credit markets move rapidly
  - Dollar strength is a headwind for equity earnings growth and profit margin expansion
- **Recommend an overweight exposure to developed market equities**
  - Suggest investors opportunistically exploit potential volatility to add to the overweight
  - Long-term opportunity remains as earnings improve off cyclical lows in Europe/Japan
  - Offers a more favorable return outlook with superior valuations relative to US equities
- **Recommend at minimum a market weight exposure to EM equities**
  - Reasonable equity valuations, depressed currencies, and the attractiveness of long-term fundamentals represent a solid investment foundation
  - Volatility likely to continue as falling commodity prices, trade linkages to China, and external debt levels pose idiosyncratic country risks
  - Encourage the use of benchmark agnostic strategies with a bias towards small-cap and consumer focused strategies
- **Inflation expectations at historical lows but value opportunities can be found in inflation-sensitive assets**
  - Encourage patience as volatility and opportunities evolve in commodity markets
  - Private strategies are evolving but provide compelling return opportunities

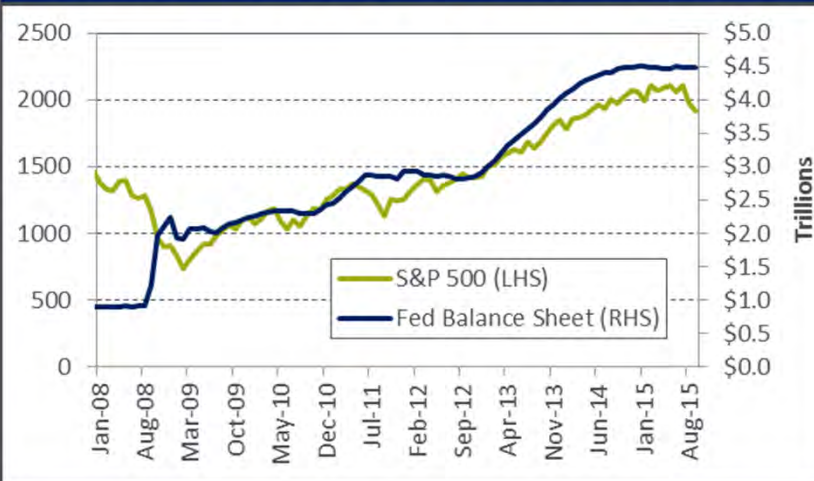
## Year to Date Performance – Few Places to Hide



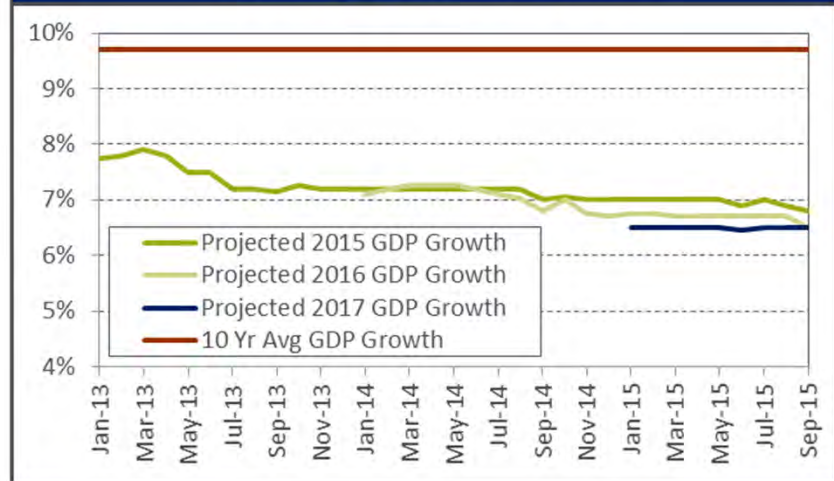
Source: Morningstar Direct, NEPC

## Global Risks are Diverse and Unique

### Equities have struggled since end of QE3



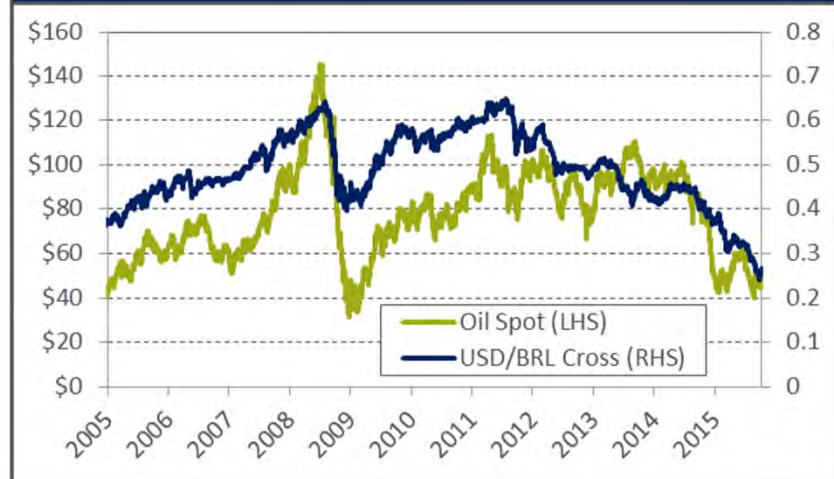
### Slowing growth in China



### ECB and BoJ in the midst of sizeable easing programs



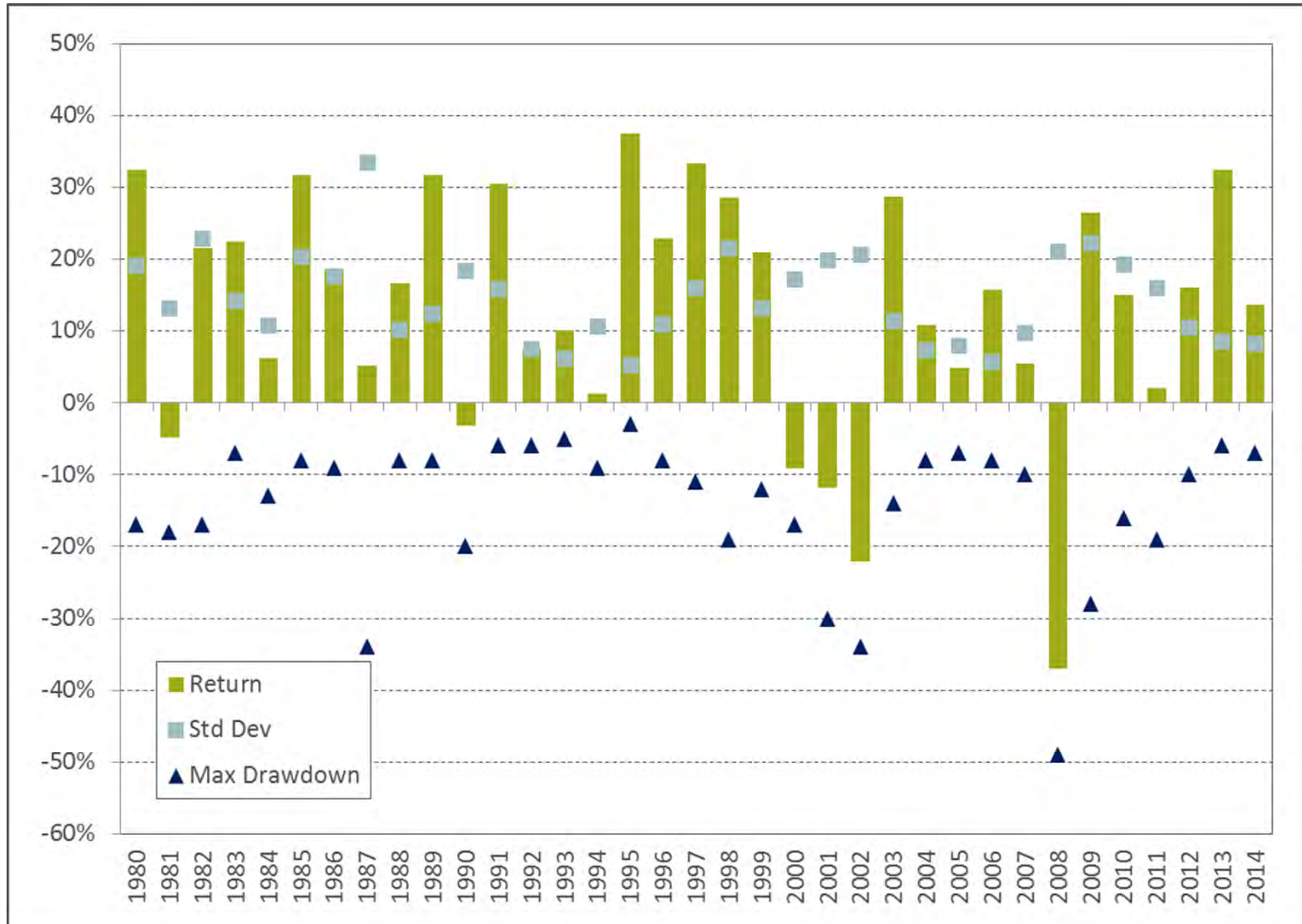
### Commodity glut threatening export reliant Lat Am countries



Sources: Standard & Poors, The Federal Reserve, ECB, BoJ, Bloomberg Energy, Bloomberg

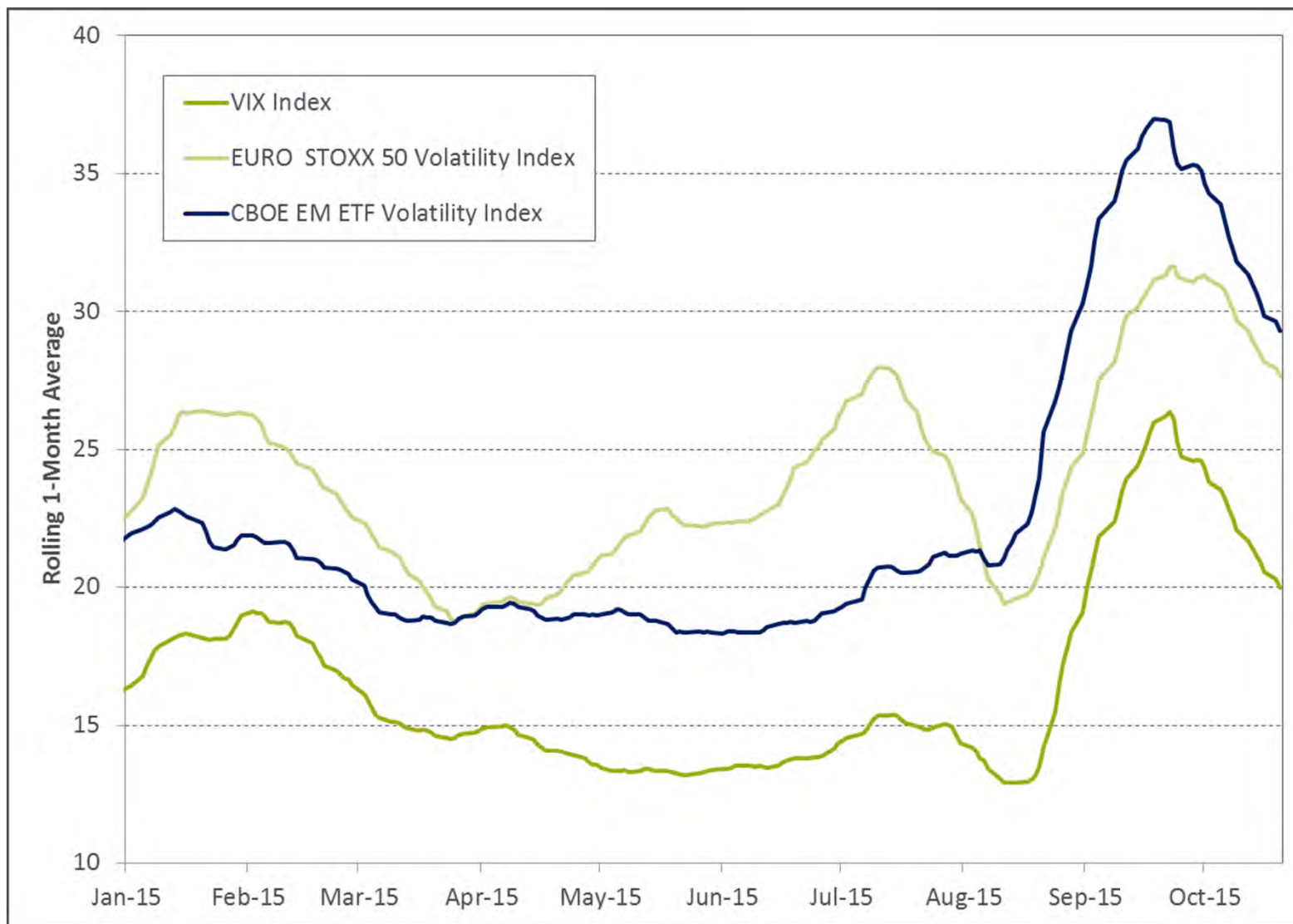


## S&P 500 Intra-Year Drawdowns of Current Magnitude Relatively Common



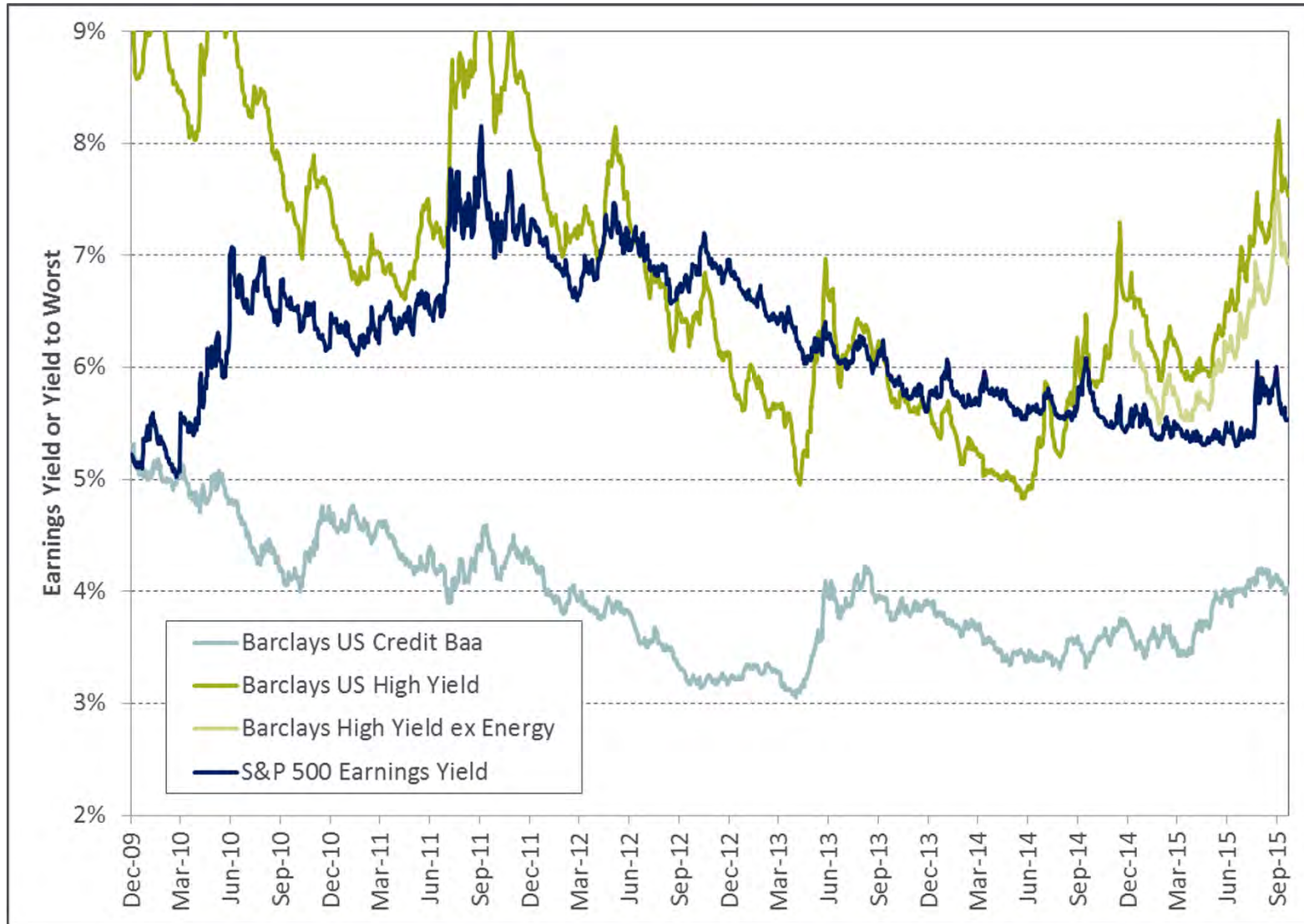
Source: Standard & Poors, Bloomberg

## Increase in Global Volatility Finally Caught Up with Equities



Source: Deutsche Borse, Goldman Sachs, CBOE, Bloomberg

## High Yield Issues Now Yielding >7% in Otherwise Low Yield World

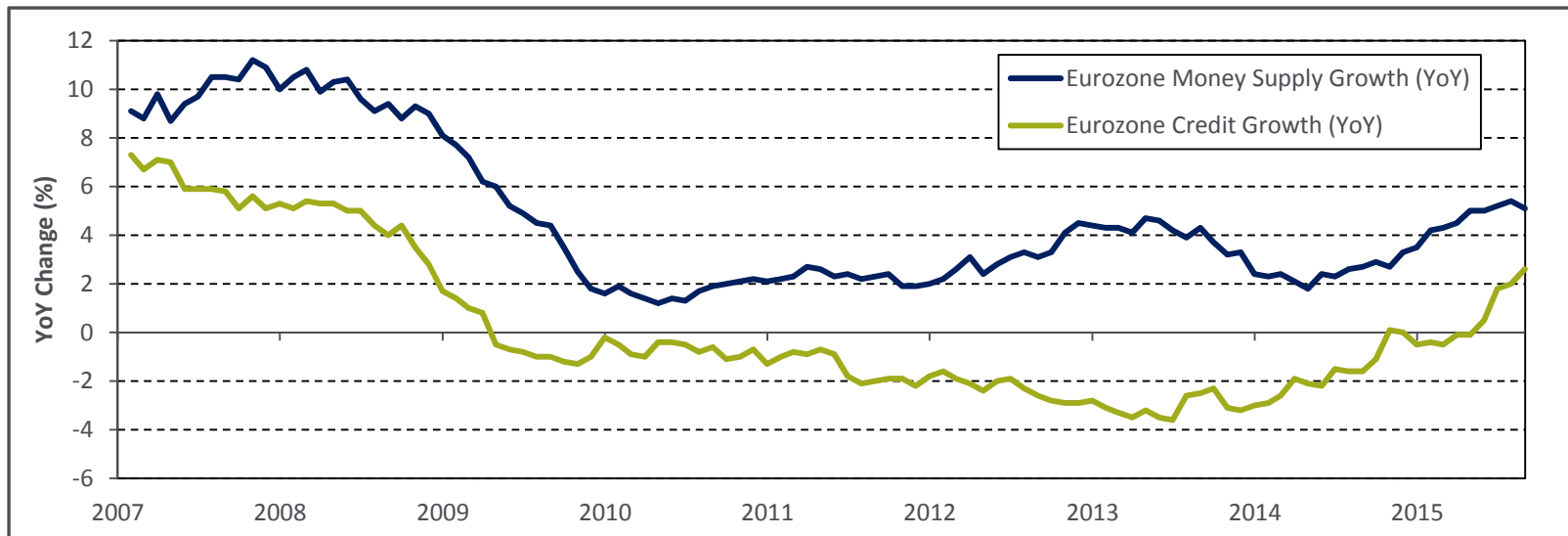
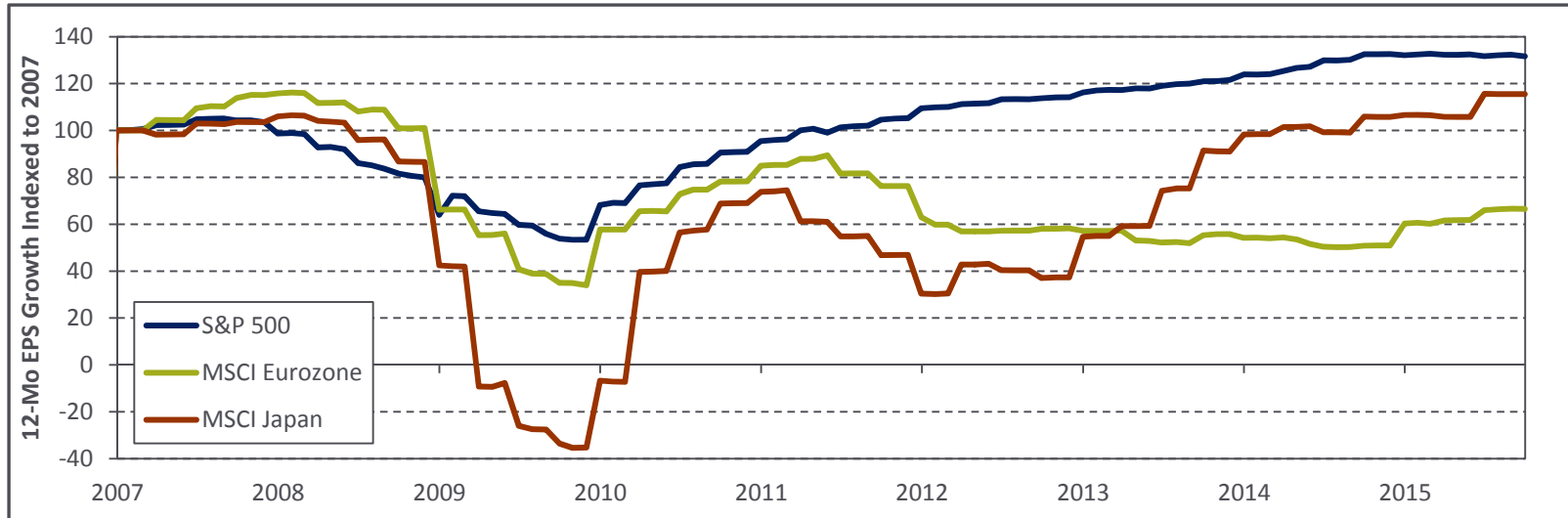


Source: Barclays, Standard & Poors, Bloomberg



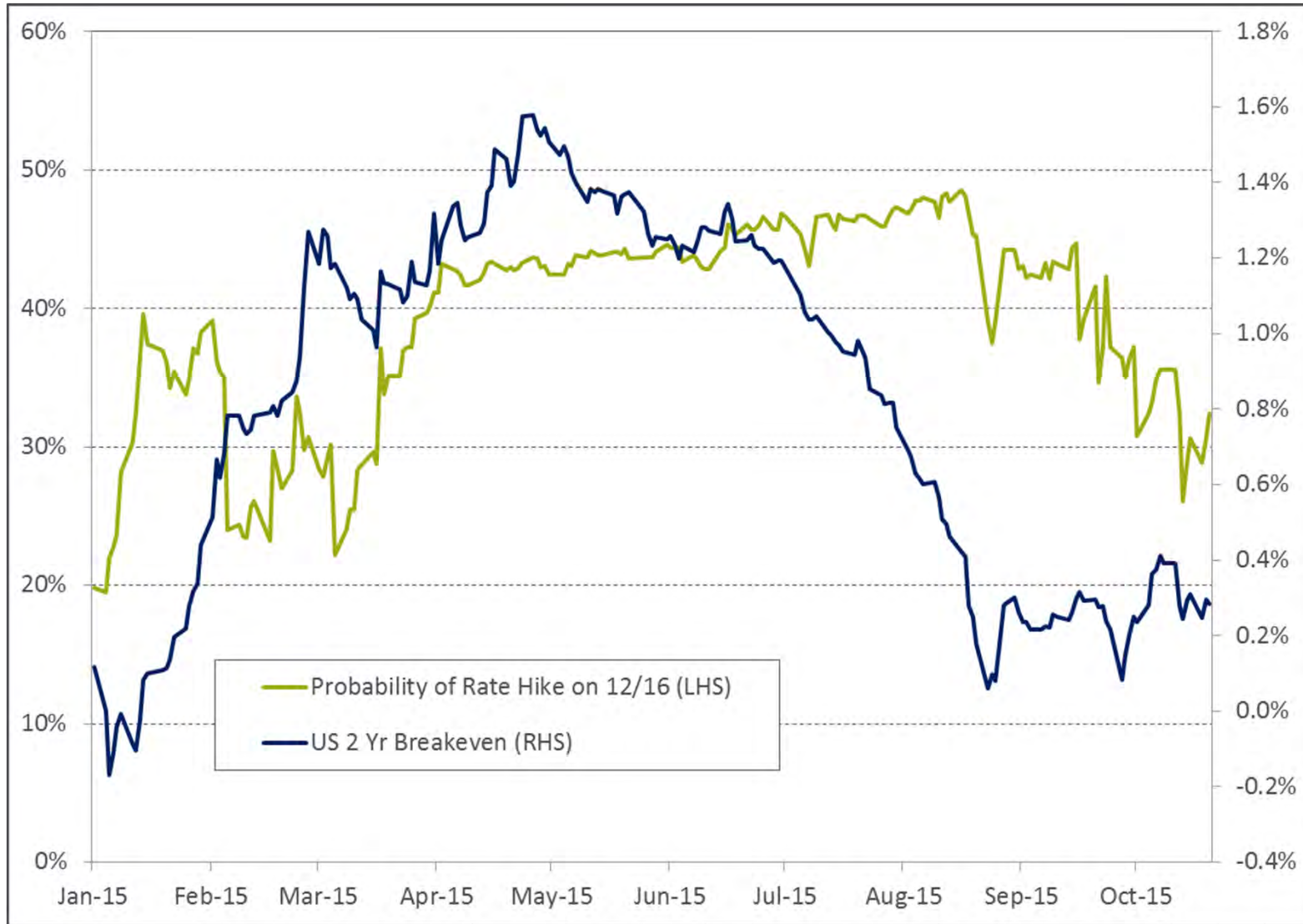
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## Japan Earnings Recovery is Well Underway, Conditions Supportive for Improvement in Europe



Sources: Standard & Poors, MSCI, Bloomberg

## Near Term Inflation Expectations Have Declined as a Rate Hike Has Been Pushed Further Out



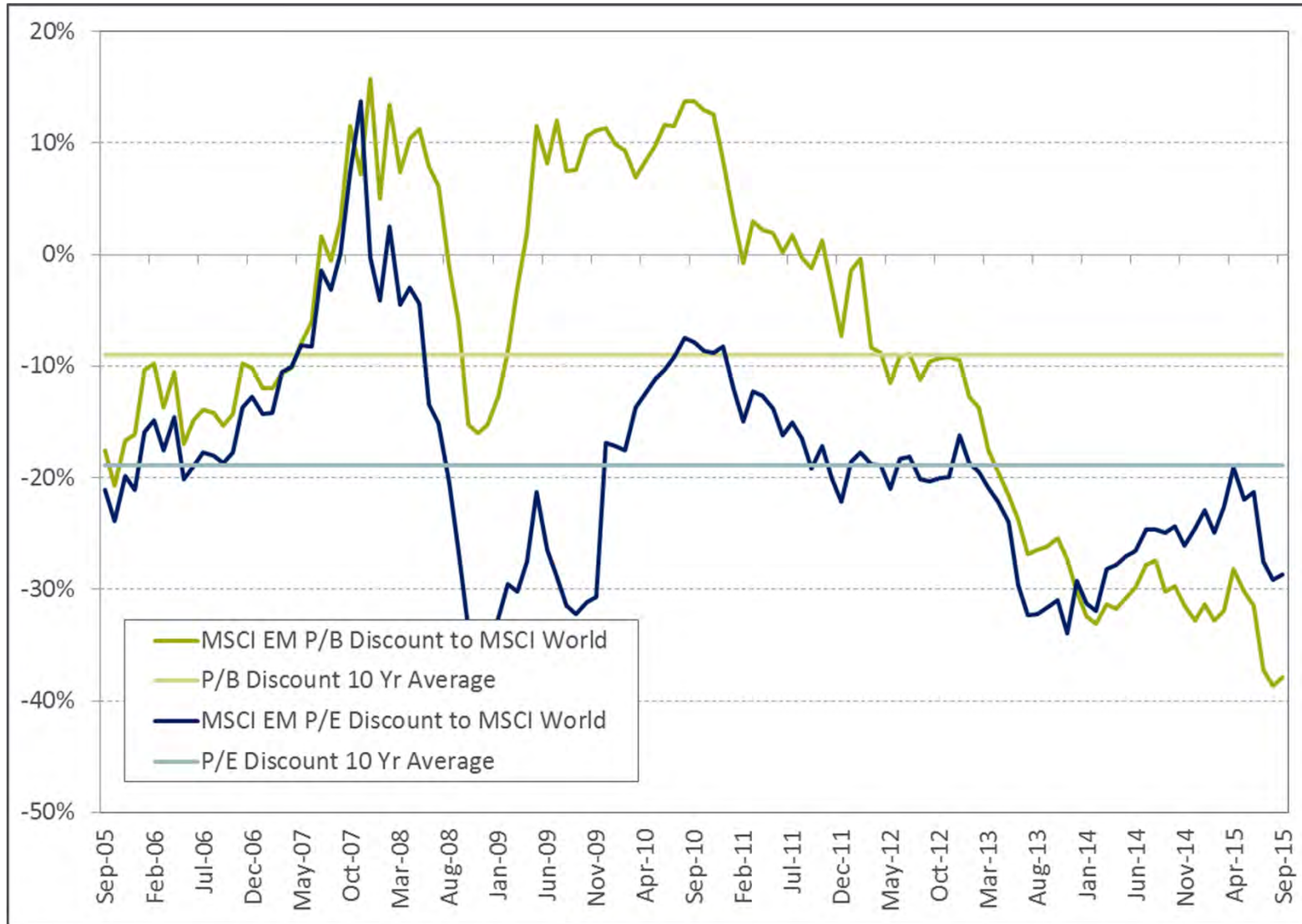
Source: Bloomberg

## Commodity Price Weakness Has Been Challenging for EM Currencies



Source: MSCI, Bloomberg

## EM Equities Trading at Large Discounts Relative to Developed Equities



Source: MSCI, Bloomberg

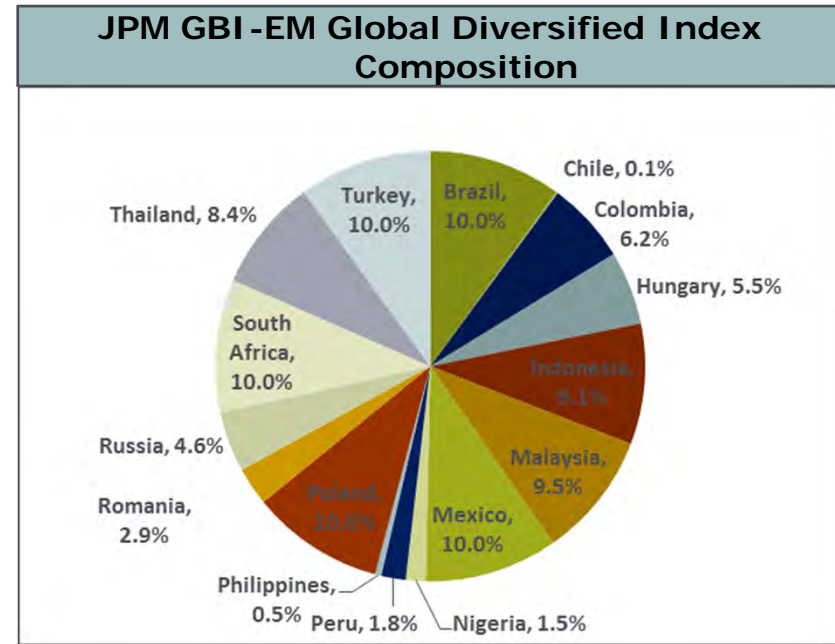
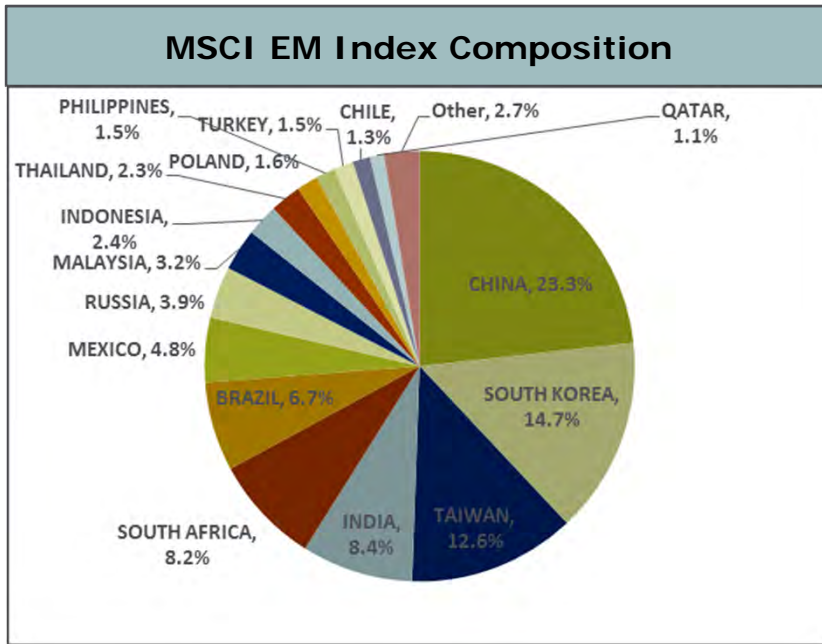


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# Market Focus: Emerging Market Currencies

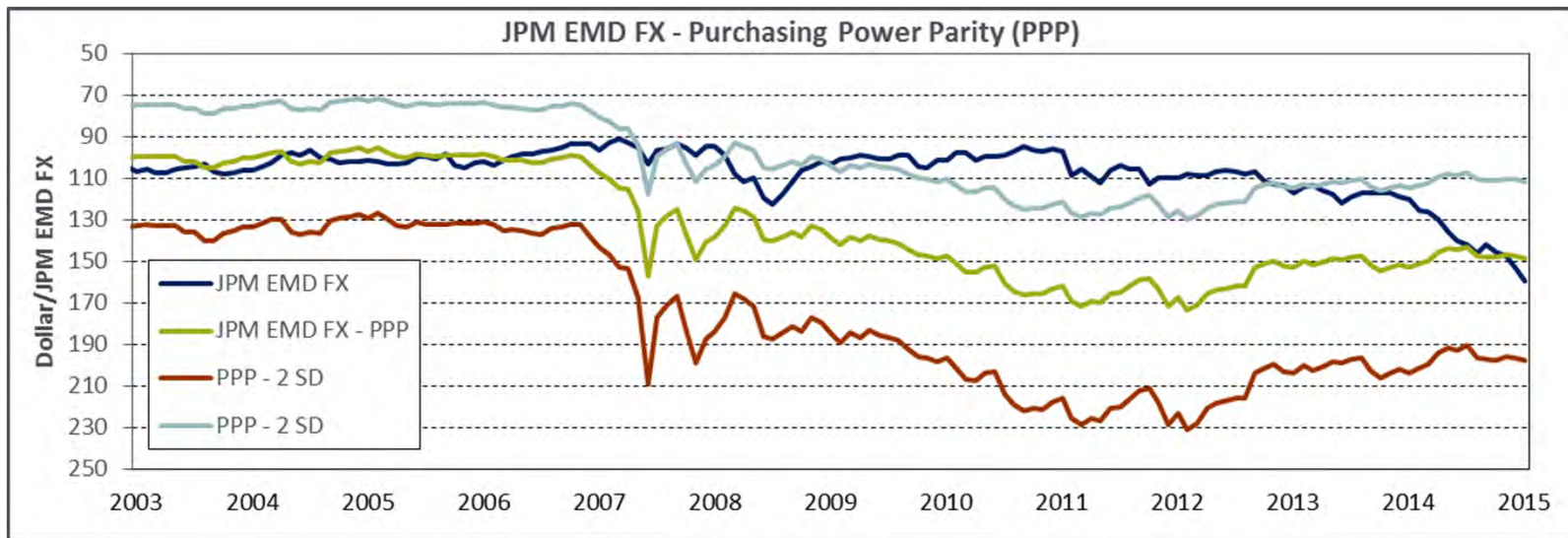
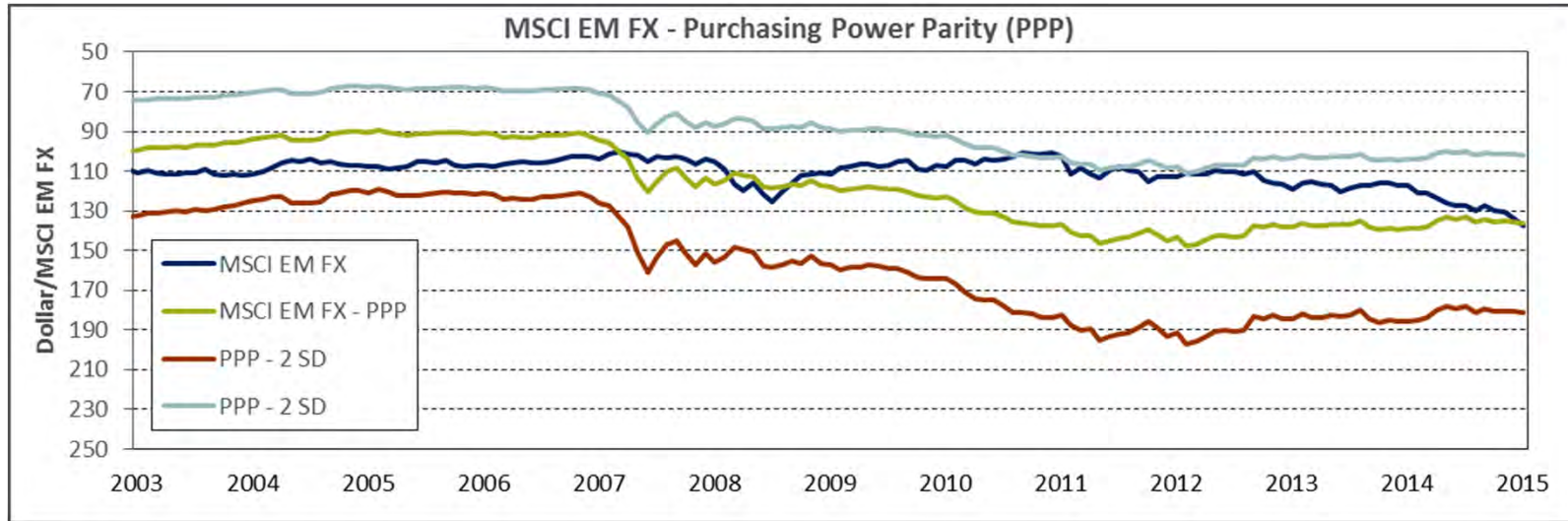


## Currency Risks are Not Only Unique by Country but also Vary Across Indices



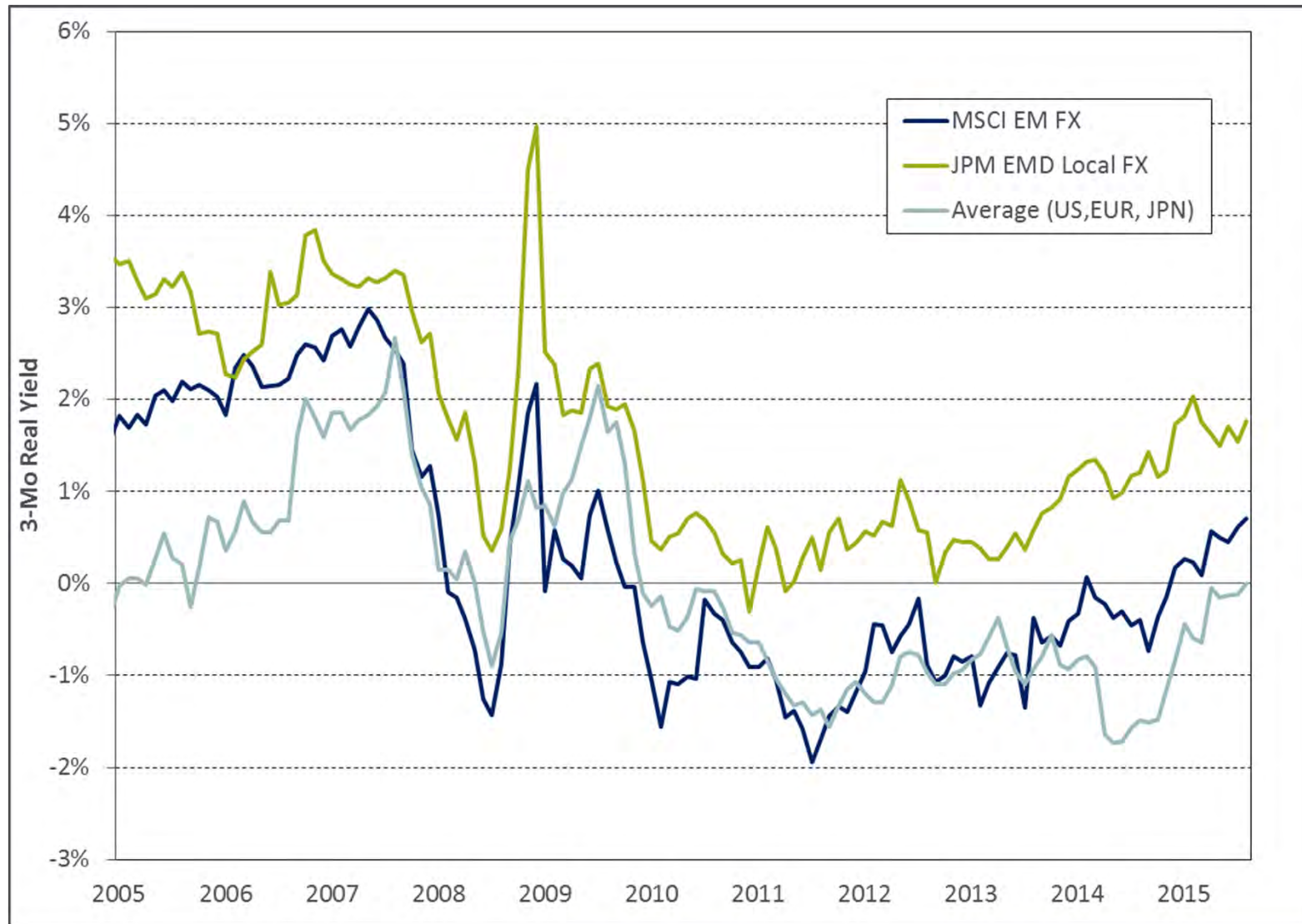
- MSCI EM Index dominated by Asia**
  - Lots of countries with sensitivity to Chinese growth and competitiveness
  - Despite possibility for further depreciation, most currencies appear cheap or reasonably valued
- Debt indices more concentrated in Latin/South America with exposure to balance of payments challenged countries**
  - Currencies of major commodity exporters are sensitive to oil and other commodity price weakness – but also stand to benefit from a rebound
  - Structural issues in Turkey and Brazil pose significant challenges but with less contagion risk

## Local Currency FX Valuation at Cheapest Levels in Over 10 Years



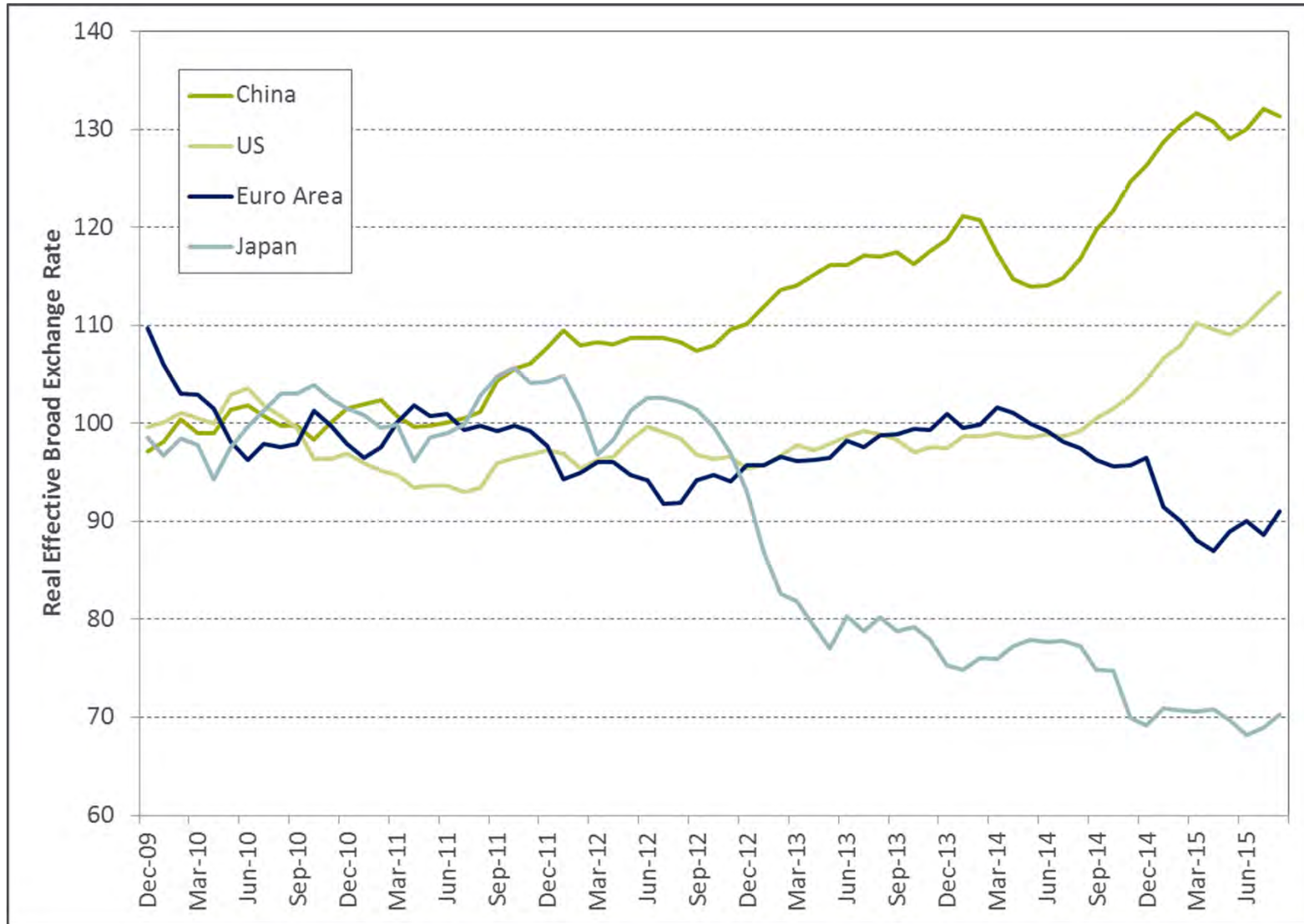
Source: MSCI, JP Morgan, Bloomberg

## Higher Real Rates Provide a Foundation for Currency Returns



Source: MSCI, JP Morgan, Bloomberg

## Risk of Further Devaluation of Chinese Yuan Remains



Source: Bank for International Settlements, Bloomberg

## Index Performance Summary as of 10/31/2015

	2008	2009	2010	2011	2012	2013	2014	Q1	Q2	Q3	OCT	YTD
<b>S&amp;P 500</b>	-37.0%	26.5%	15.1%	2.1%	16.0%	32.4%	13.7%	1.0%	0.3%	-6.4%	8.4%	2.7%
<b>JPM EMBI Glob Div</b>	-12.0%	29.8%	12.2%	7.4%	17.4%	-5.3%	7.4%	2.0%	-0.3%	-1.7%	2.7%	2.7%
<b>Russell 1000</b>	-37.6%	28.4%	16.1%	1.5%	16.4%	33.1%	13.2%	1.6%	0.1%	-6.8%	8.1%	2.4%
<b>Barclays Municipal</b>	-2.5%	12.9%	2.4%	10.7%	6.8%	-2.6%	9.1%	1.0%	-0.9%	1.7%	0.4%	2.2%
<b>MSCI EAFE</b>	-43.4%	31.8%	7.8%	-12.1%	17.3%	22.8%	-4.9%	4.9%	0.6%	-10.2%	7.8%	2.1%
<b>FTSE NAREIT Equity REITs</b>	-37.7%	28.0%	28.0%	8.3%	18.1%	2.5%	30.1%	4.8%	-10.0%	2.0%	5.9%	1.9%
<b>Barclays US Agg Interm</b>	4.9%	6.5%	6.2%	6.0%	3.6%	-1.0%	4.1%	1.3%	-0.7%	1.1%	-0.1%	1.7%
<b>Credit Suisse Lev Loan</b>	-28.8%	44.9%	10.0%	1.8%	9.4%	6.2%	2.1%	2.1%	0.8%	-1.2%	-0.1%	1.5%
<b>Barclays US Agg Bond</b>	5.2%	5.9%	6.5%	7.8%	4.2%	-2.0%	6.0%	1.6%	-1.7%	1.2%	0.0%	1.1%
<b>Barclays US Gov/Cred 1-3Yr</b>	5.0%	3.8%	2.8%	1.6%	1.3%	0.6%	0.8%	0.6%	0.1%	0.3%	0.0%	1.0%
<b>MSCI ACWI</b>	-42.2%	34.6%	12.7%	-7.4%	16.1%	22.8%	4.2%	2.3%	0.4%	-9.5%	7.9%	0.3%
<b>Barclays US Corp High Yield</b>	-26.2%	58.2%	15.1%	5.0%	15.8%	7.4%	2.5%	2.5%	0.0%	-4.9%	2.8%	0.2%
<b>Credit Suisse Hedge Fund</b>	-19.1%	18.6%	11.0%	-2.5%	7.7%	9.7%	4.1%	2.5%	-0.5%	-2.5%	N/A	-0.6%
<b>Russell 2500</b>	-36.8%	34.4%	26.7%	-2.5%	17.9%	36.8%	7.1%	5.2%	-0.3%	-10.3%	5.6%	-0.7%
<b>Barclays US Gov/Cred Long</b>	8.4%	1.9%	10.2%	22.5%	8.8%	-8.8%	19.3%	3.4%	-7.6%	2.2%	0.4%	-2.0%
<b>Citi WGBI</b>	10.9%	2.6%	5.2%	6.4%	1.7%	-4.0%	-0.5%	-2.5%	-1.6%	1.7%	0.0%	-2.4%
<b>Russell 2000</b>	-33.8%	27.2%	26.9%	-4.2%	16.4%	38.8%	4.9%	4.3%	0.4%	-11.9%	5.6%	-2.5%
<b>Barclays US Long Credit</b>	-3.9%	16.8%	10.7%	17.1%	12.7%	-6.6%	16.4%	3.1%	-7.3%	0.5%	1.0%	-3.0%
<b>Barclays US Strips 20+ Yr</b>	59.5%	-36.0%	10.9%	58.5%	3.0%	-21.0%	46.4%	5.5%	-14.3%	7.6%	-0.3%	-3.0%
<b>MSCI EM</b>	-53.3%	78.5%	18.9%	-18.4%	18.2%	-2.6%	-2.2%	2.2%	0.7%	-17.9%	7.1%	-9.5%
<b>JPM GBI-EM Glob Div</b>	-5.2%	22.0%	15.7%	-1.8%	16.8%	-9.0%	-5.7%	-4.0%	-1.0%	-10.5%	4.5%	-11.1%
<b>Bloomberg Commodity</b>	-35.7%	18.9%	16.8%	-13.3%	-1.1%	-9.5%	-17.0%	-5.9%	4.7%	-14.5%	-0.5%	-16.2%
<b>Alerian MLP</b>	-36.9%	76.4%	35.9%	13.9%	4.8%	27.6%	4.8%	-5.2%	-6.1%	-22.1%	9.7%	-24.0%

*Source: Morningstar Direct*

# State Employees' Retirement System

# Vermont State Employees

## Total Fund Performance Summary

	Market Value	3 Mo	Rank	YTD	Rank	1 Yr	Rank	3 Yrs	Rank	5 Yrs	Rank
<b>Employees Composite</b>	<b>\$1,523,737,201</b>	<b>-5.3%</b>	<b>61</b>	<b>-3.1%</b>	<b>64</b>	<b>-3.2%</b>	<b>91</b>	<b>4.0%</b>	<b>94</b>	<b>5.9%</b>	<b>90</b>
<i>Policy Index</i>		-4.5%	31	-2.7%	53	-2.4%	82	3.9%	95	5.1%	95
<i>Allocation Index</i>		-4.9%	44	-3.2%	68	-2.8%	85	3.8%	95	5.1%	95
<i>InvestorForce Public DB Gross Median</i>		-5.0%		-2.6%		-0.6%		6.9%		7.5%	

### 3 Years Ending September 30, 2015

	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Sharpe Ratio	Rank	Sortino Ratio RF	Rank
Employees Composite	3.97%	94	5.74%	38	0.69	95	1.14	93
Policy Index	3.89%	95	5.13%	11	0.75	92	1.31	89
Allocation Index	3.81%	95	5.27%	17	0.72	93	1.19	92

### 5 Years Ending September 30, 2015

	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Sharpe Ratio	Rank	Sortino Ratio RF	Rank
Employees Composite	5.91%	90	6.86%	32	0.86	85	1.32	73
Policy Index	5.15%	95	6.54%	23	0.78	92	1.19	87
Allocation Index	5.07%	95	6.65%	24	0.76	93	1.12	90

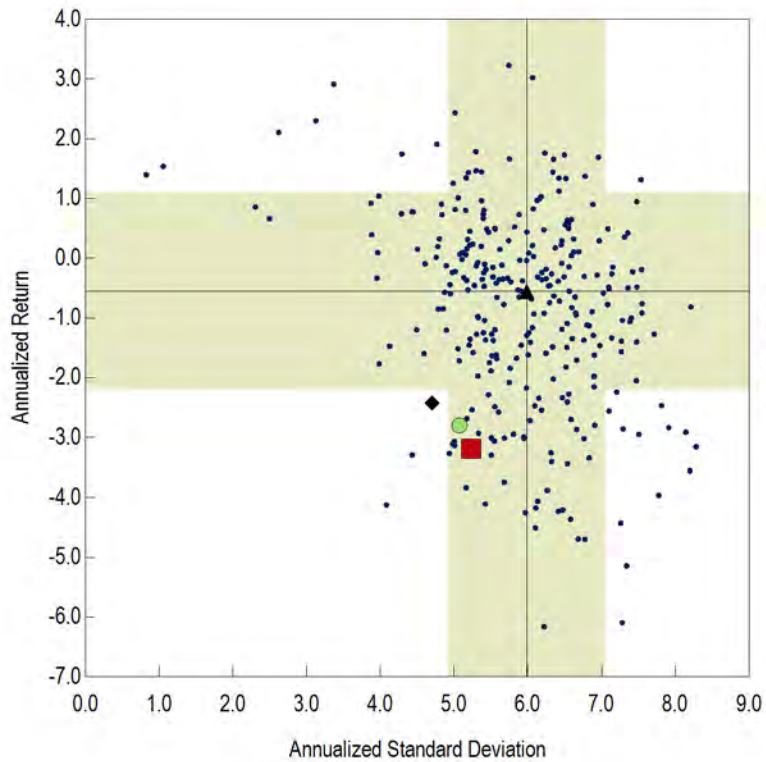
### Actual vs Target Allocation (%)



# Vermont State Employees

## Total Fund Risk/Return

1 Year Ending September 30, 2015



- Employees Composite
- ◆ Policy Index
- Allocation Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB Gross

1 Year Ending September 30, 2015

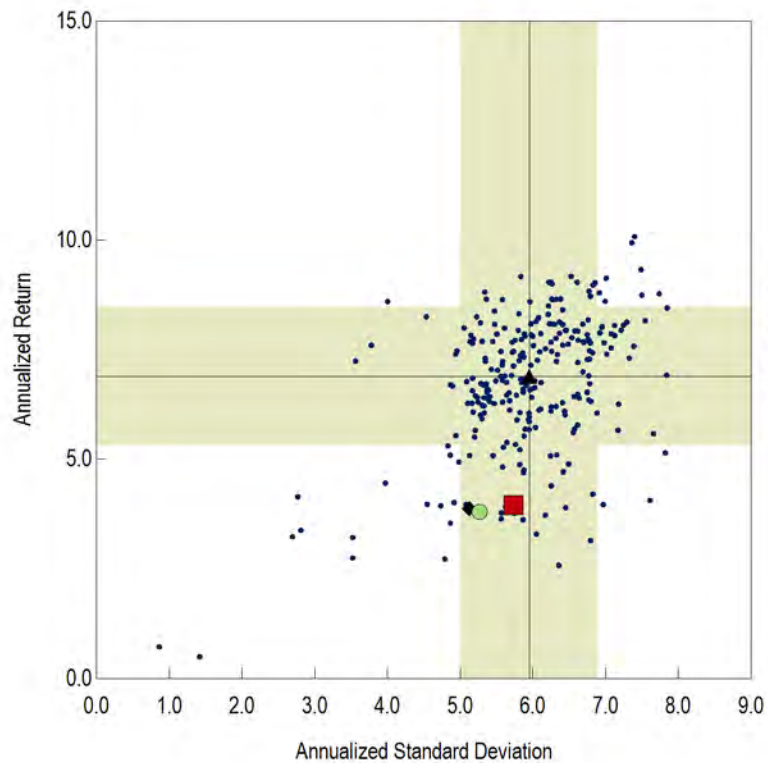
	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank
Employees Composite	-3.19%	91	5.23%	23	-0.61	93
Policy Index	-2.43%	82	4.70%	8	-0.52	90
S&P 500	-0.61%	52	11.01%	99	-0.06	42
60% MSCI ACWI (Net)/40% CITI WGBI	-5.37%	99	6.54%	74	-0.82	99
Citi WGBI	-3.83%	94	3.30%	2	-1.16	99
MSCI ACWI	-6.66%	99	11.17%	99	-0.60	92
MSCI ACWI ex USA	-12.16%	99	12.76%	99	-0.95	99
InvestorForce Public DB Gross Median	-0.55%	--	5.99%	--	-0.10	--



# Vermont State Employees

## Total Fund Risk/Return

3 Years Ending September 30, 2015



- Employees Composite
- ◆ Policy Index
- Allocation Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB Gross

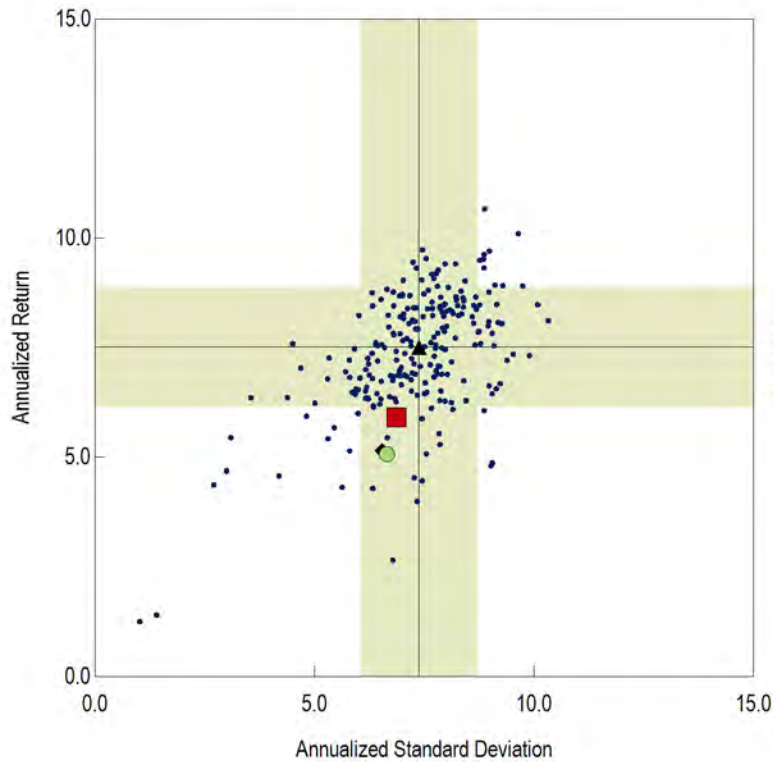
3 Years Ending September 30, 2015

	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank
Employees Composite	3.97%	94	5.74%	38	0.69	95
Policy Index	3.89%	95	5.13%	11	0.75	92
S&P 500	12.40%	1	9.74%	99	1.27	28
60% MSCI ACWI (Net)/40% CITI WGBI	3.04%	99	6.68%	80	0.45	99
Citi WGBI	-2.85%	99	4.29%	4	-0.67	99
MSCI ACWI	6.95%	49	10.03%	99	0.69	95
MSCI ACWI ex USA	2.34%	99	11.61%	99	0.20	99
InvestorForce Public DB Gross Median	6.90%	--	5.95%	--	1.16	--

# Vermont State Employees

## Total Fund Risk/Return

5 Years Ending September 30, 2015



- Employees Composite
- ◆ Policy Index
- Allocation Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB Gross

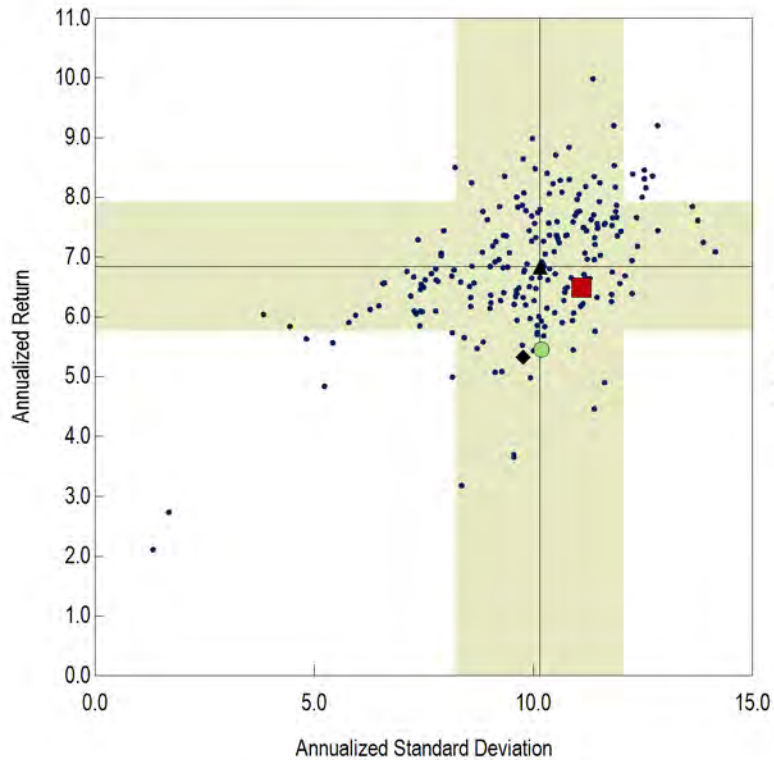
5 Years Ending September 30, 2015

	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank
Employees Composite	5.91%	90	6.86%	32	0.86	85
Policy Index	5.15%	95	6.54%	23	0.78	92
S&P 500	13.34%	1	11.51%	99	1.16	22
60% MSCI ACWI (Net)/40% CITI WGBI	4.16%	99	8.65%	85	0.48	99
Citi WGBI	-0.19%	99	4.96%	5	-0.05	99
MSCI ACWI	6.82%	70	13.08%	99	0.52	99
MSCI ACWI ex USA	1.82%	99	15.13%	99	0.12	99
InvestorForce Public DB Gross Median	7.51%	--	7.38%	--	1.02	--

# Vermont State Employees

## Total Fund Risk/Return

7 Years Ending September 30, 2015



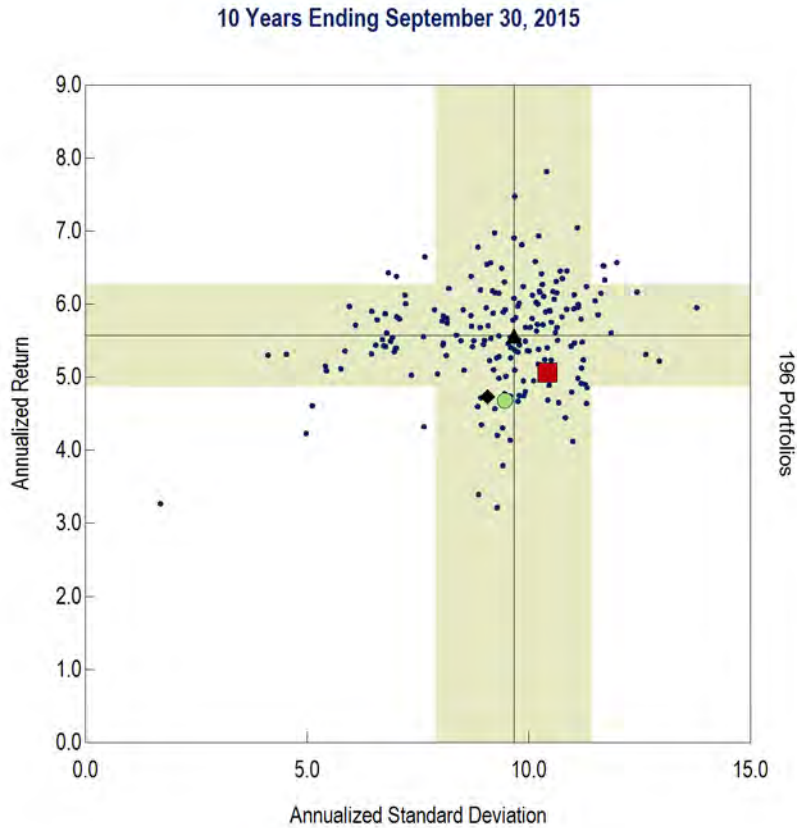
- Employees Composite
- ◆ Policy Index
- Allocation Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB Gross

7 Years Ending September 30, 2015

	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank
Employees Composite	6.49%	67	11.09%	73	0.58	84
Policy Index	5.33%	95	9.76%	39	0.54	94
S&P 500	9.75%	1	16.16%	99	0.60	78
60% MSCI ACWI (Net)/40% CITI WGBI	4.93%	97	12.04%	93	0.40	99
Citi WGBI	2.43%	99	6.67%	6	0.35	99
MSCI ACWI	6.03%	84	17.92%	99	0.33	99
MSCI ACWI ex USA	3.20%	99	20.07%	99	0.16	99
InvestorForce Public DB Gross Median	6.84%	--	10.15%	--	0.68	--

# Vermont State Employees

## Total Fund Risk/Return

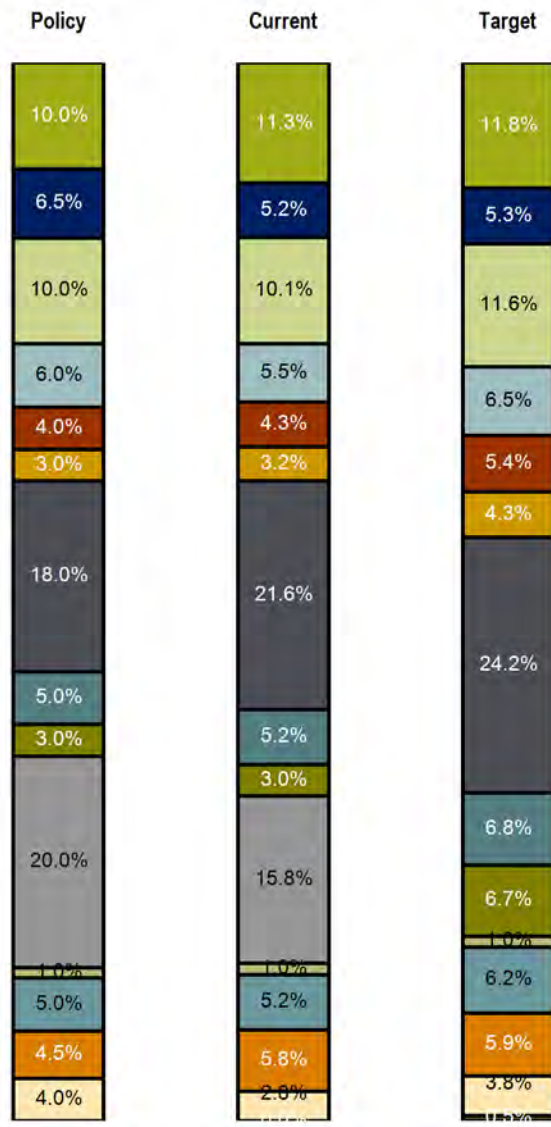


- Employees Composite
- ◆ Policy Index
- Allocation Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB Gross

### 10 Years Ending September 30, 2015

	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank
Employees Composite	5.06%	81	10.42%	74	0.37	85
Policy Index	4.73%	90	9.06%	34	0.39	79
S&P 500	6.80%	4	14.90%	99	0.38	83
60% MSCI ACWI (Net)/40% CITI WGBI	4.44%	95	11.04%	88	0.29	99
Citi WGBI	3.37%	99	6.54%	7	0.33	93
MSCI ACWI	4.58%	94	16.75%	99	0.20	99
MSCI ACWI ex USA	3.03%	99	19.03%	99	0.10	99
InvestorForce Public DB Gross Median	5.57%	--	9.66%	--	0.47	--

**Total Fund Asset Allocation vs. Policy Targets**



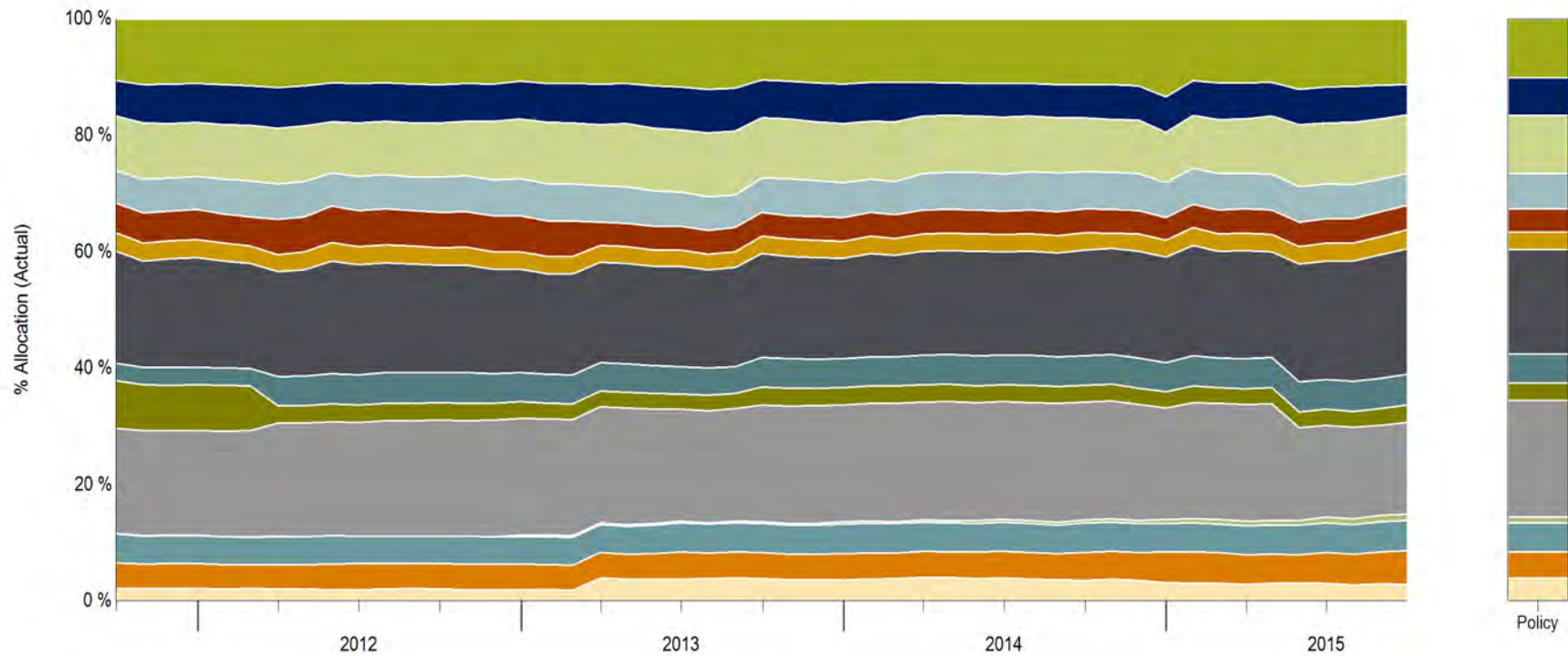
**Asset Allocation vs. Target**

	Current	Policy	Current	Difference*
Large Cap Equity	\$171,798,378	10.0%	11.3%	1.3%
Small/Mid Cap Equity	\$79,222,073	6.5%	5.2%	-1.3%
International Equity	\$153,232,231	10.0%	10.1%	0.1%
Emerging Markets Equity	\$83,704,057	6.0%	5.5%	-0.5%
High Yield	\$64,875,623	4.0%	4.3%	0.3%
TIPS	\$48,791,089	3.0%	3.2%	0.2%
Diversified Bond	\$329,594,373	18.0%	21.6%	3.6%
Emerging Market Debt	\$79,443,009	5.0%	5.2%	0.2%
Global Bonds	\$45,362,895	3.0%	3.0%	0.0%
Balanced - GAA	\$240,978,946	20.0%	15.8%	-4.2%
Private Equity	\$15,824,642	1.0%	1.0%	0.0%
Hedge Funds	\$79,970,971	5.0%	5.2%	0.2%
Real Estate	\$88,452,644	4.5%	5.8%	1.3%
Commodities	\$42,077,871	4.0%	2.8%	-1.2%
Cash	\$408,400	--	0.0%	0.0%
<b>Total</b>	<b>\$1,523,737,201</b>	<b>100.0%</b>	<b>100.0%</b>	

\*Difference between Policy and Current Allocation

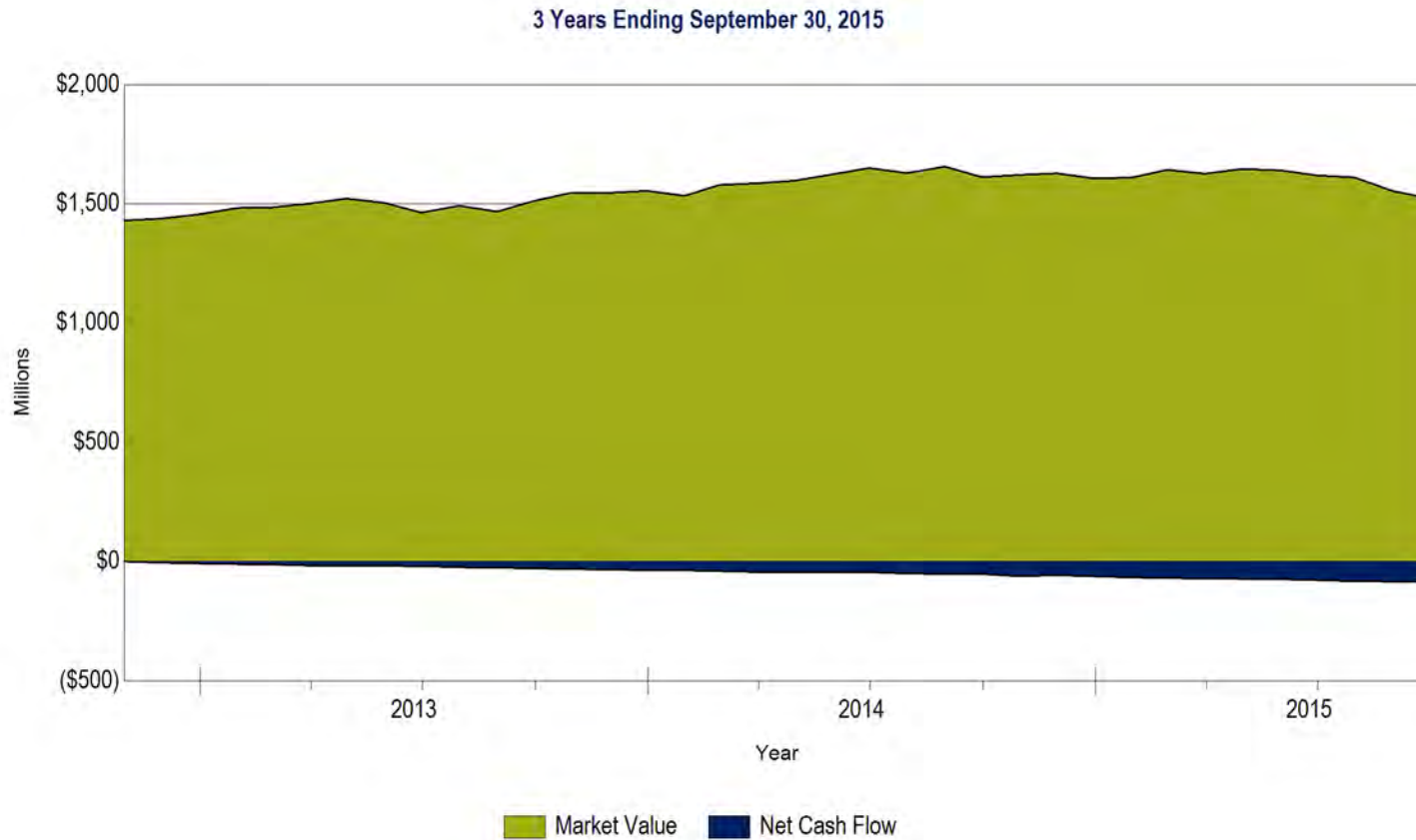
Total Fund Asset Allocation History

Asset Allocation History



- |   |  |   |   |  |
|---|--|---|---|--|
| <span style="color: #8ebf00;">■</span> Large Cap Equity     | <span style="color: #a6c9e0;">■</span> Emerging Markets Equity | <span style="color: #333333;">■</span> Diversified Bond     | <span style="color: #808080;">■</span> Balanced - GAA | <span style="color: #e67e22;">■</span> Real Estate |
| <span style="color: #002060;">■</span> Small/Mid Cap Equity | <span style="color: #800000;">■</span> High Yield              | <span style="color: #3498db;">■</span> Emerging Market Debt | <span style="color: #c4c480;">■</span> Private Equity | <span style="color: #f1c40f;">■</span> Commodities |
| <span style="color: #c4c480;">■</span> International Equity | <span style="color: #f1c40f;">■</span> TIPS                    | <span style="color: #666666;">■</span> Global Bonds         | <span style="color: #3498db;">■</span> Hedge Funds    | <span style="color: #555555;">■</span> Cash        |

Total Fund Asset Growth Summary



	Last Three Months	Year-To-Date	One Year	Three Years
Beginning Market Value	\$1,619,610,646	\$1,606,602,018	\$1,611,661,732	\$1,434,364,031
- Withdrawals	-\$26,991,427	-\$253,166,770	-\$324,214,771	-\$581,431,638
+ Contributions	\$17,970,572	\$228,215,478	\$289,421,130	\$494,202,351
= Net Cash Flow	-\$9,020,855	-\$24,951,292	-\$34,793,641	-\$87,229,287
+ Net Investment Change	-\$86,852,590	-\$57,913,525	-\$53,130,890	\$176,602,457
= Ending Market Value	\$1,523,737,201	\$1,523,737,201	\$1,523,737,201	\$1,523,737,201

## Vermont State Employees

### Total Fund Asset Growth Summary by Manager

	Quarter Ending September 30, 2015					Ending Market Value
	Beginning Market Value	Withdrawals	Contributions	Net Cash Flow	Net Investment Change	
Aberdeen	\$98,209,908	-\$188,176	\$188,176	\$0	-\$14,505,850	\$83,704,057
Acadian	\$65,193,418	-\$1,580,502	\$80,502	-\$1,500,000	-\$5,059,042	\$58,634,377
Allianz Structured Alpha	\$43,963,310	-\$158,915	\$0	-\$158,915	\$714,476	\$44,518,871
AQR Global Risk Premium	\$125,620,071	-\$125,620	\$125,620	\$0	-\$9,548,032	\$116,072,039
BlackRock TIPS	\$49,391,664	-\$9,510	\$9,510	\$0	-\$600,575	\$48,791,089
Champlain	\$33,085,959	-\$67,132	\$67,132	\$0	-\$3,102,331	\$29,983,628
GAM	\$168,553	\$0	\$41,891	\$41,891	-\$12,153	\$198,291
GAM Unconstrained Bond	\$64,673,367	-\$9,604	\$6,009,604	\$6,000,000	-\$1,551,404	\$69,121,963
Grosvenor	\$81,844,703	\$0	\$0	\$0	-\$2,072,024	\$79,772,679
Guggenheim	\$51,001,754	-\$62,510	\$62,510	\$0	-\$1,900,126	\$49,101,628
Harbourvest Dover VIII Fund	\$6,879,397	\$0	\$0	\$0	-\$286,344	\$6,593,054
Harbourvest Partners IX Buyout Fund	\$4,219,357	\$0	\$241,839	\$241,839	-\$189,366	\$4,271,830
Harbourvest Partners IX Credit Opportunities	\$590,740	-\$61,935	\$0	-\$61,935	-\$4,085	\$524,720
Harbourvest Partners IX Venture Fund	\$3,588,011	\$0	\$218,028	\$218,028	-\$104,366	\$3,701,673
HIPEP VII	\$551,541	\$0	\$183,184	\$183,184	-\$1,359	\$733,365
KDP	\$16,488,396	-\$25,722	\$25,722	\$0	-\$714,401	\$15,773,995
Mellon Dynamic Growth	\$36,590,074	-\$59,216	\$59,216	\$0	-\$2,383,615	\$34,206,458
Mondrian	\$64,307,065	-\$60,927	\$1,560,927	\$1,500,000	-\$6,536,751	\$59,270,313
Mondrian GFI	\$44,957,058	-\$36,038	\$36,038	\$0	\$405,837	\$45,362,895
Morgan Stanley Prime Property	\$38,957,125	-\$126,435	\$0	-\$126,435	\$1,521,912	\$40,352,602
PIMCO All Asset	\$93,733,490	-\$201,398	\$5,000,000	\$4,798,602	-\$7,831,779	\$90,700,312
PIMCO Core Plus	\$88,487,215	-\$7,065,117	\$65,117	-\$7,000,000	\$364,040	\$81,851,255
PIMCO Unconstrained	\$41,038,614	-\$128,775	\$128,775	\$0	-\$1,300,246	\$39,738,368
RREEF America REIT III	\$6,955,595	-\$2,111,808	\$0	-\$2,111,808	-\$244,841	\$4,598,946
Schroder	\$48,740,226	\$0	\$0	\$0	-\$6,662,355	\$42,077,871



## Vermont State Employees

### Total Fund Asset Growth Summary by Manager

	Quarter Ending September 30, 2015					Ending Market Value
	Beginning Market Value	Withdrawals	Contributions	Net Cash Flow	Net Investment Change	
Siguler Guff	\$6,805,248	\$0	\$2,525,548	\$2,525,548	-\$53,951	\$9,276,845
SSgA ACWI Ex US	\$40,199,685	-\$5,945	\$5,945	\$0	-\$4,872,144	\$35,327,541
SSgA Barclays Aggregate Index	\$49,198,661	-\$4,261	\$4,261	\$0	\$606,743	\$49,805,405
SSgA Russell 2000 Growth	\$21,708,463	-\$10,105,461	\$5,461	-\$10,100,000	-\$2,736,419	\$8,872,044
SSgA S&P 400	\$8,791,631	-\$1,760	\$1,760	\$0	-\$744,611	\$8,047,020
SSgA S&P 500 Cap-Wgt	\$140,455,879	-\$4,410,606	\$10,606	-\$4,400,000	-\$8,840,715	\$127,215,164
SSgA S&P 500 Equal-Wgt	\$48,908,867	-\$6,876	\$1,006,876	\$1,000,000	-\$5,328,648	\$44,580,219
T. Rowe	\$2,996	\$0	\$0	\$0	\$0	\$2,996
Transwestern / Aslan III	\$336,073	-\$215,870	\$0	-\$215,870	\$2,515	\$122,717
UBS Trumbull	\$32,970,531	-\$90,394	\$90,394	\$0	\$1,131,002	\$34,101,533
Vermont Cash	\$263,384	\$0	\$145,016	\$145,016	\$0	\$408,400
Wellington	\$36,009,378	-\$70,915	\$70,915	\$0	-\$3,689,997	\$32,319,382
Wellington DAS	\$42,438,121	\$0	\$0	\$0	\$2,120,391	\$44,558,512
Wellington OIF	\$136	\$0	\$0	\$0	\$0	\$136
Wellington Opportunistic EMD	\$82,284,986	\$0	\$0	\$0	-\$2,841,977	\$79,443,009
<b>Total</b>	<b>\$1,619,610,646</b>	<b>-\$26,991,427</b>	<b>\$17,970,572</b>	<b>-\$9,020,855</b>	<b>-\$86,852,590</b>	<b>\$1,523,737,201</b>

# Vermont State Employees

## Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	Rank	YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank
<b>Employees Composite</b>	<b>1,523,737,201</b>	<b>100.0</b>	<b>100.0</b>	<b>-5.3</b>	<b>61</b>	<b>-3.1</b>	<b>64</b>	<b>-3.2</b>	<b>91</b>	<b>4.0</b>	<b>94</b>	<b>5.9</b>	<b>90</b>
<i>Policy Index</i>				-4.5	31	-2.7	53	-2.4	82	3.9	95	5.1	95
<i>Allocation Index</i>				-4.9	44	-3.2	68	-2.8	85	3.8	95	5.1	95
<i>InvestorForce Public DB Gross Median</i>				-5.0		-2.6		-0.6		6.9		7.5	
<b>US Equity</b>	<b>251,020,451</b>	<b>16.5</b>	<b>15.0</b>	<b>-7.9</b>	<b>48</b>	<b>-5.2</b>	<b>51</b>	<b>0.8</b>	<b>48</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
<i>Russell 3000</i>				-7.2	37	-5.4	55	-0.5	59	12.5	56	13.3	51
<i>eA All US Equity Gross Median</i>				-8.2		-5.2		0.5		12.9		13.3	
<b>Large Cap Comp</b>	<b>171,798,378</b>	<b>11.3</b>	<b>11.0</b>	<b>-6.8</b>	<b>44</b>	<b>-5.7</b>	<b>57</b>	<b>-0.8</b>	<b>54</b>	<b>13.1</b>	<b>48</b>	<b>13.6</b>	<b>43</b>
<i>S&amp;P 500</i>				-6.4	39	-5.3	53	-0.6	52	12.4	56	13.3	47
<i>eA US Large Cap Equity Gross Median</i>				-7.1		-5.1		-0.4		12.9		13.2	
SSgA S&P 500 Cap-Wgt	127,215,164	8.3	8.0	-6.4	38	-5.2	52	-0.5	52	12.5	56	13.4	47
<i>S&amp;P 500</i>				-6.4	39	-5.3	53	-0.6	52	12.4	56	13.3	47
SSgA S&P 500 Equal-Wgt	44,580,219	2.9	3.0	-7.8	64	-7.2	73	-1.6	58	14.2	27	13.7	40
<i>S&amp;P 500 Equal Weighted</i>				-7.5	59	-6.9	70	-1.2	56	14.3	26	13.8	38
T. Rowe	2,996	0.0	0.0										
<b>Small/Mid Cap Comp</b>	<b>79,222,073</b>	<b>5.2</b>	<b>5.0</b>	<b>-10.2</b>	<b>54</b>	<b>-4.3</b>	<b>42</b>	<b>3.9</b>	<b>27</b>	<b>13.5</b>	<b>42</b>	<b>13.9</b>	<b>36</b>
<i>Russell 2000</i>				-11.9	75	-7.7	77	1.2	50	11.0	73	11.7	74
<i>eA US Small-Mid Cap Equity Gross Median</i>				-10.0		-4.8		1.1		13.1		13.3	
SSgA S&P 400	8,047,020	0.5	0.5	-8.5	52	-4.6	56	1.4	51	13.2	62	--	--
<i>S&amp;P 400 MidCap</i>				-8.5	53	-4.7	56	1.4	51	13.1	63	12.9	60
<i>eA US Mid Cap Equity Gross Median</i>				-8.2		-4.0		1.6		13.8		13.4	
Champlain	29,983,628	2.0	2.0	-9.4	64	-3.1	41	1.8	47	14.2	44	14.1	39
<i>Russell 2500</i>				-10.3	80	-6.0	70	0.4	60	12.4	74	12.7	67
<i>eA US Mid Cap Equity Gross Median</i>				-8.2		-4.0		1.6		13.8		13.4	
Wellington	32,319,382	2.1	2.0	-10.2	58	-5.3	29	6.1	6	12.8	43	13.8	29
<i>Russell 2000 Value</i>				-10.7	67	-10.1	77	-1.6	64	9.2	83	10.2	83
<i>eA US Small Cap Value Equity Gross Median</i>				-9.8		-6.7		0.5		12.2		12.5	
SSgA Russell 2000 Growth	8,872,044	0.6	0.5	-13.0	67	-5.4	60	4.1	50	12.8	55	13.3	67
<i>Russell 2000 Growth</i>				-13.1	68	-5.5	60	4.0	51	12.8	55	13.3	67
<i>eA US Small Cap Growth Equity Gross Median</i>				-11.7		-3.8		4.1		13.4		14.3	

Fiscal Year End is 6/30

Report is Gross of manager fees, except where otherwise noted

# Vermont State Employees

## Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	Rank	YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank
<b>Int'l Equity Comp</b>	<b>153,232,231</b>	<b>10.1</b>	<b>10.0</b>	<b>-9.7</b>	<b>60</b>	<b>-5.0</b>	<b>73</b>	<b>-8.4</b>	<b>77</b>	<b>6.3</b>	<b>62</b>	<b>4.8</b>	<b>69</b>
MSCI EAFE				-10.2	72	-5.3	77	-8.7	79	5.6	72	4.0	83
eA All EAFE Equity Gross Median				-9.2		-2.7		-5.2		7.1		5.9	
Acadian	58,634,377	3.8	4.0	-7.8	26	-2.6	47	-5.3	53	8.3	36	6.0	49
Mondrian	59,270,313	3.9	4.0	-10.2	70	-5.3	77	-9.5	84	6.1	66	4.9	69
MSCI EAFE				-10.2	72	-5.3	77	-8.7	79	5.6	72	4.0	83
SSgA ACWI Ex US	35,327,541	2.3	2.0	-12.1	83	-8.5	88	-12.0	89	2.6	86	2.1	93
MSCI ACWI ex USA				-12.2	83	-8.6	89	-12.2	90	2.3	89	1.8	97
eA ACWI ex-US All Cap Equity Gross Median				-10.7		-4.9		-6.1		5.7		5.2	
<b>Emerging Market Comp</b>	<b>83,704,057</b>	<b>5.5</b>	<b>6.0</b>	<b>-14.8</b>	<b>27</b>	<b>-13.8</b>	<b>47</b>	<b>-18.3</b>	<b>69</b>	<b>-5.1</b>	<b>79</b>	<b>--</b>	<b>--</b>
Aberdeen	83,704,057	5.5	6.0	-14.8	27	-13.8	47	-18.3	69	-5.1	79	-0.8	40
MSCI Emerging Markets				-17.9	81	-15.5	69	-19.3	73	-5.3	81	-3.6	83
eA Emg Mkts Equity Gross Median				-16.3		-14.0		-16.8		-2.6		-1.8	
<b>US Fixed Income</b>	<b>443,261,085</b>	<b>29.1</b>	<b>24.0</b>	<b>-0.6</b>	<b>80</b>	<b>0.7</b>	<b>62</b>	<b>2.0</b>	<b>52</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
Barclays Aggregate				1.2	23	1.1	50	2.9	26	1.7	66	3.1	62
eA All US Fixed Inc Gross Median				0.6		1.1		2.1		2.1		3.6	
<b>Diversified Fixed</b>	<b>329,594,373</b>	<b>21.6</b>	<b>20.0</b>	<b>0.2</b>	<b>65</b>	<b>1.2</b>	<b>48</b>	<b>3.2</b>	<b>18</b>	<b>2.3</b>	<b>43</b>	<b>4.1</b>	<b>41</b>
Barclays Aggregate				1.2	23	1.1	50	2.9	26	1.7	66	3.1	62
eA All US Fixed Inc Gross Median				0.6		1.1		2.1		2.1		3.6	
Allianz Structured Alpha	44,518,871	2.9	2.0	1.6	6	5.3	1	10.7	1	7.4	1	8.4	1
Citigroup 10 Year Treasury				2.9	1	2.4	3	6.0	1	1.4	95	3.8	39
PIMCO Core Plus	81,851,255	5.4	5.0	0.1	97	1.0	75	2.6	73	1.4	95	3.4	68
Barclays Aggregate				1.2	37	1.1	66	2.9	54	1.7	79	3.1	82
PIMCO Unconstrained	39,738,368	2.6	2.5	-3.1	99	-2.7	99	-2.8	99	-0.3	99	--	--
25% HY, 25% EMD, 50% BC Agg				-1.1	99	-0.1	99	0.1	99	1.9	65	4.2	12
3-Month Libor Total Return USD				0.1	97	0.2	98	0.3	99	0.3	99	0.3	99
Wellington DAS	44,558,512	2.9	3.0	5.0	1	5.3	1	11.1	1	5.6	1	8.1	1
Wellington Custom Benchmark				3.6	1	3.3	1	7.7	1	2.5	20	6.0	1
SSgA Barclays Aggregate Index	49,805,405	3.3	3.0	1.2	37	--	--	--	--	--	--	--	--
Barclays Aggregate				1.2	37	1.1	66	2.9	54	1.7	79	3.1	82
3-Month Libor Total Return USD				0.1	97	0.2	98	0.3	99	0.3	99	0.3	99
eA US Core Fixed Inc Gross Median				1.1		1.3		3.0		2.0		3.6	
GAM Unconstrained Bond	69,121,963	4.5	4.5	-2.3	99	--	--	--	--	--	--	--	--
3-Month LIBOR + 3%				0.8	77	2.5	2	3.3	32	3.3	5	3.3	71
eA US Core Fixed Inc Gross Median				1.1		1.3		3.0		2.0		3.6	

Wellington DAS is Net of Fees. Allianz is net of fees from inception to Q3 2012, and grossed up quarterly since GAM Unconstrained Bond was funded in June 2015

## Vermont State Employees

### Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	Rank	YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank
<b>High Yield Comp</b>	<b>64,875,623</b>	<b>4.3</b>	<b>4.0</b>	<b>-3.9</b>	<b>47</b>	<b>-0.5</b>	<b>37</b>	<b>-1.7</b>	<b>47</b>	<b>4.3</b>	<b>38</b>	<b>6.7</b>	<b>40</b>
Barclays High Yield				-4.9	71	-2.5	77	-3.4	73	3.5	67	6.1	64
eA US High Yield Fixed Inc Gross Median				-4.0		-0.9		-2.0		4.1		6.5	
KDP	15,773,995	1.0	1.0	-4.3	58	-1.7	63	-2.0	51	3.0	86	5.5	84
Barclays High Yield				-4.9	71	-2.5	77	-3.4	73	3.5	67	6.1	64
BofA Merrill Lynch US High Yield BB-B Rated				-4.3	58	-1.7	64	-2.1	52	3.7	62	6.0	68
Guggenheim	49,101,628	3.2	3.0	-3.7	45	-0.1	27	-1.6	47	--	--	--	--
Barclays High Yield				-4.9	71	-2.5	77	-3.4	73	3.5	67	6.1	64
eA US High Yield Fixed Inc Gross Median				-4.0		-0.9		-2.0		4.1		6.5	
<b>TIPS</b>	<b>48,791,089</b>	<b>3.2</b>	<b>3.0</b>										
BlackRock TIPS	48,791,089	3.2	3.0	-1.2	--	-0.8	--	-0.9	--	-1.9	--	2.5	--
Barclays US TIPS				-1.1	--	-0.8	--	-0.8	--	-1.8	--	2.5	--
<b>Global Fixed Income Comp</b>	<b>45,362,895</b>	<b>3.0</b>	<b>3.0</b>	<b>0.9</b>	<b>16</b>	<b>-1.3</b>	<b>42</b>	<b>-3.0</b>	<b>56</b>	<b>-3.7</b>	<b>96</b>	<b>0.3</b>	<b>91</b>
Citi WGBI				1.7	6	-2.4	63	-3.8	67	-2.9	92	-0.2	95
eA All Global Fixed Inc Gross Median				-0.9		-1.9		-2.7		1.7		3.0	
Mondrian GFI	45,362,895	3.0	3.0	0.9	16	-1.3	42	-3.0	56	-3.7	96	-0.3	96
Citi WGBI				1.7	6	-2.4	63	-3.8	67	-2.9	92	-0.2	95
<b>Emerging Market Debt</b>	<b>79,443,009</b>	<b>5.2</b>	<b>5.0</b>										
Wellington Opportunistic EMD	79,443,009	5.2	5.0	-3.5	32	-2.8	47	-3.7	37	0.5	38	4.5	30
JP Morgan EMBI Global TR				-2.0	12	-0.3	17	-2.0	22	0.5	36	4.4	33
eA All Emg Mkts Fixed Inc Gross Median				-4.9		-3.5		-6.9		-0.8		3.1	
<b>Total Real Estate</b>	<b>88,452,644</b>	<b>5.8</b>	<b>6.0</b>	<b>2.8</b>	<b>--</b>	<b>11.4</b>	<b>--</b>	<b>15.3</b>	<b>--</b>	<b>14.6</b>	<b>--</b>	<b>--</b>	<b>--</b>
NCREIF Property Index				3.1	--	10.1	--	13.5	--	11.9	--	12.5	--
NCREIF ODCE				3.7	--	11.3	--	14.9	--	13.4	--	14.0	--
Morgan Stanley Prime Property	40,352,602	2.6	2.0	3.9	--	13.0	--	18.0	--	16.4	--	16.1	--
UBS Trumbull	34,101,533	2.2	2.0	3.4	--	10.4	--	13.8	--	11.5	--	11.9	--
RREEF America REIT III	4,598,946	0.3	0.5	-5.0	--	11.2	--	14.0	--	19.2	--	26.1	--
Transwestern / Aslan III	122,717	0.0	0.5	2.1	--	6.8	--	16.3	--	26.0	--	7.8	--
Siguler Guff	9,276,845	0.6	1.0	-0.6	--	6.8	--	6.6	--	--	--	--	--

Wellington Opportunistic EMD is Net of manager fees

Real Estate is as of Q3 2015. Siguler Guff is based on preliminary data

# Vermont State Employees

## Total Fund Performance Detail

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	Rank	YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank
<b>Hedge Fund Comp</b>	<b>79,970,971</b>	<b>5.2</b>	<b>5.0</b>	<b>-2.5</b>	<b>38</b>	<b>-0.6</b>	<b>43</b>	<b>-0.9</b>	<b>54</b>	<b>6.0</b>	<b>34</b>	<b>--</b>	<b>--</b>
<i>eV Alt Fund of Funds - Multi-Strategy Median</i>				-3.3		-1.1		-0.4		5.0		3.9	
Grosvenor	79,772,679	5.2	5.0	-2.5	38	-0.1	36	0.4	41	6.8	23	--	--
GAM	198,291	0.0	0.0										
<b>GAA Comp</b>	<b>240,978,946</b>	<b>15.8</b>	<b>16.0</b>	<b>-7.7</b>	<b>85</b>	<b>-5.9</b>	<b>77</b>	<b>-6.9</b>	<b>78</b>	<b>1.3</b>	<b>86</b>	<b>4.3</b>	<b>64</b>
<i>eA Global TAA Gross Median</i>				-5.4		-4.3		-3.3		3.6		5.1	
Mellon Dynamic Growth	34,206,458	2.2	2.0	-6.5	68	-1.0	13	4.3	2	6.1	15	7.1	18
<i>Mellon Dynamic Growth Benchmark</i>				-5.5	54	-5.1	60	-5.1	64	3.4	58	4.6	62
AQR Global Risk Premium	116,072,039	7.6	8.0	-7.6	82	-6.4	79	-8.0	84	0.4	90	5.1	51
<i>60% MSCI World / 40% CITI WGBI</i>				-4.4	35	-4.2	49	-4.1	59	4.3	42	5.4	49
PIMCO All Asset	90,700,312	6.0	6.0	-8.4	89	-8.1	91	-10.5	96	-0.7	92	3.0	77
<i>PIMCO All Asset Index</i>				-1.0	9	-0.2	10	0.5	15	1.9	77	4.2	65
<i>CPI + 5% (Seasonally Adjusted)</i>				1.1	1	4.3	1	5.0	1	6.0	15	6.8	19
Wellington OIF	136	0.0	0.0	0.0	1	6.7	1	5.7	1	7.6	6	5.3	49
<i>65% MSCI ACWI (Net) / 35% BC Agg</i>				-5.8	58	-4.1	49	-3.2	50	5.2	28	5.7	33
<b>Commodities</b>	<b>42,077,871</b>	<b>2.8</b>	<b>3.0</b>										
Schroder	42,077,871	2.8	3.0	-13.7	--	-17.4	--	-33.2	--	-18.4	--	-8.9	--
<i>Bloomberg Commodity Index</i>				-14.5	--	-15.8	--	-26.0	--	-16.0	--	-8.9	--
<b>Cash</b>	<b>408,400</b>	<b>0.0</b>	<b>0.0</b>										
Vermont Cash	408,400	0.0		0.0	--	0.0	--	0.0	--	0.0	--	0.1	--
<i>91 Day T-Bills</i>				0.0	--	0.0	--	0.0	--	0.0	--	0.0	--
<b>Private Equity</b>	<b>15,824,642</b>	<b>1.0</b>	<b>3.0</b>	<b>-3.6</b>	<b>--</b>	<b>8.2</b>	<b>--</b>	<b>21.1</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
<i>Cambridge Associates US All PE</i>				0.0	--	6.5	--	7.4	--	14.2	--	14.5	--
Harbourvest Partners IX Credit Opportunities	524,720	0.0											
Harbourvest Partners IX Venture Fund	3,701,673	0.2											
Harbourvest Partners IX Buyout Fund	4,271,830	0.3											
Harbourvest Dover VIII Fund	6,593,054	0.4											
HIPEP VII	733,365	0.0											

Harbourvest is based on estimated Capital Account Statements for Q3 2015

PIMCO All Asset Index: 40% BC Agg / 30% TIPS / 10% S&P500 / 10% BC HY / 10% JPM EMBI+

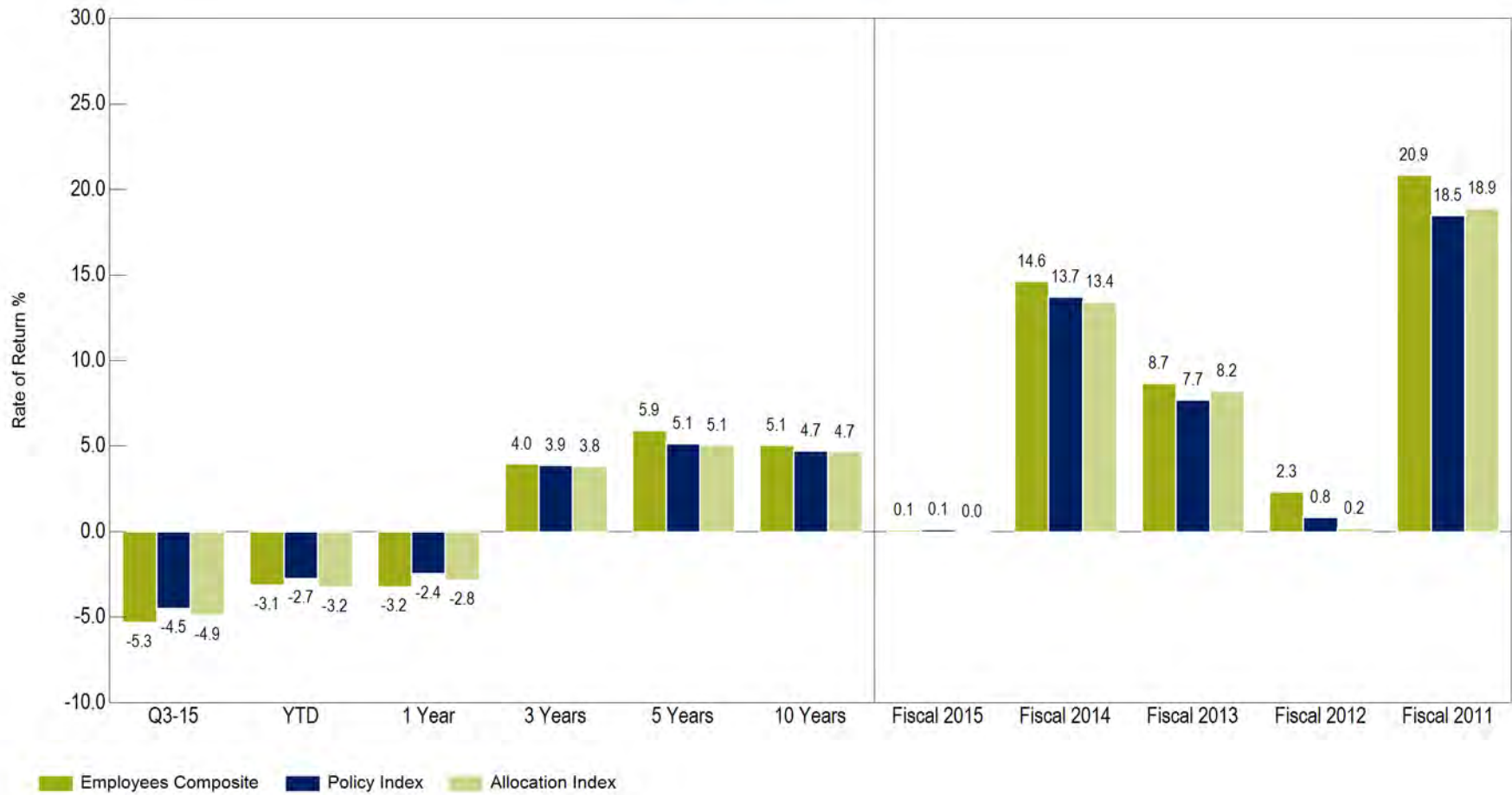
Mellon Dynamic Growth Benchmark: 60% MSCI All Country World Index IMI/ 40% Citigroup GDP Weighted

Hedge Fund Comp and Commodities are Net of Manager Fees

Wellington OIF is Net of Manager Fees

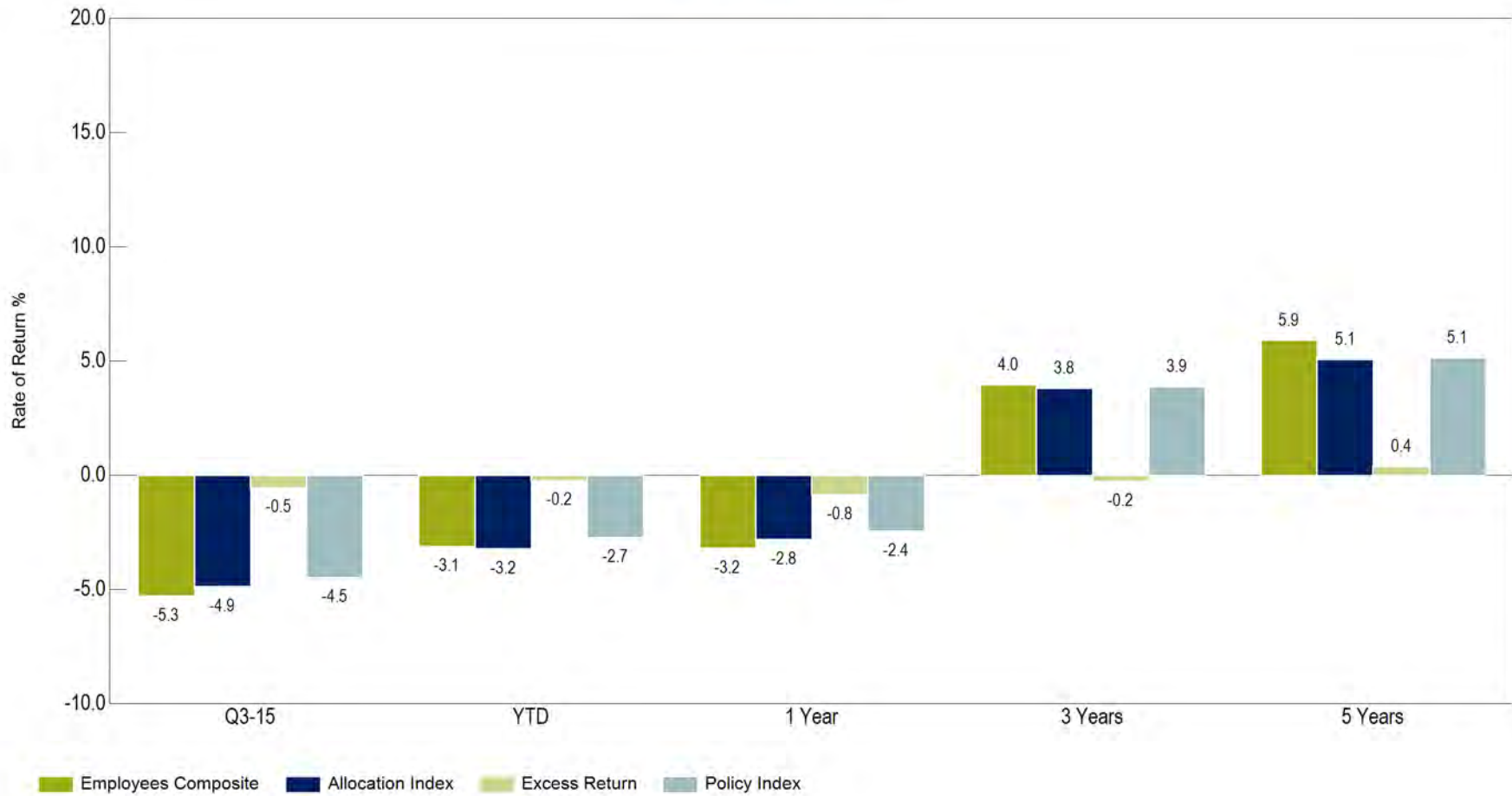
Total Fund Return Summary

Return Summary Gross

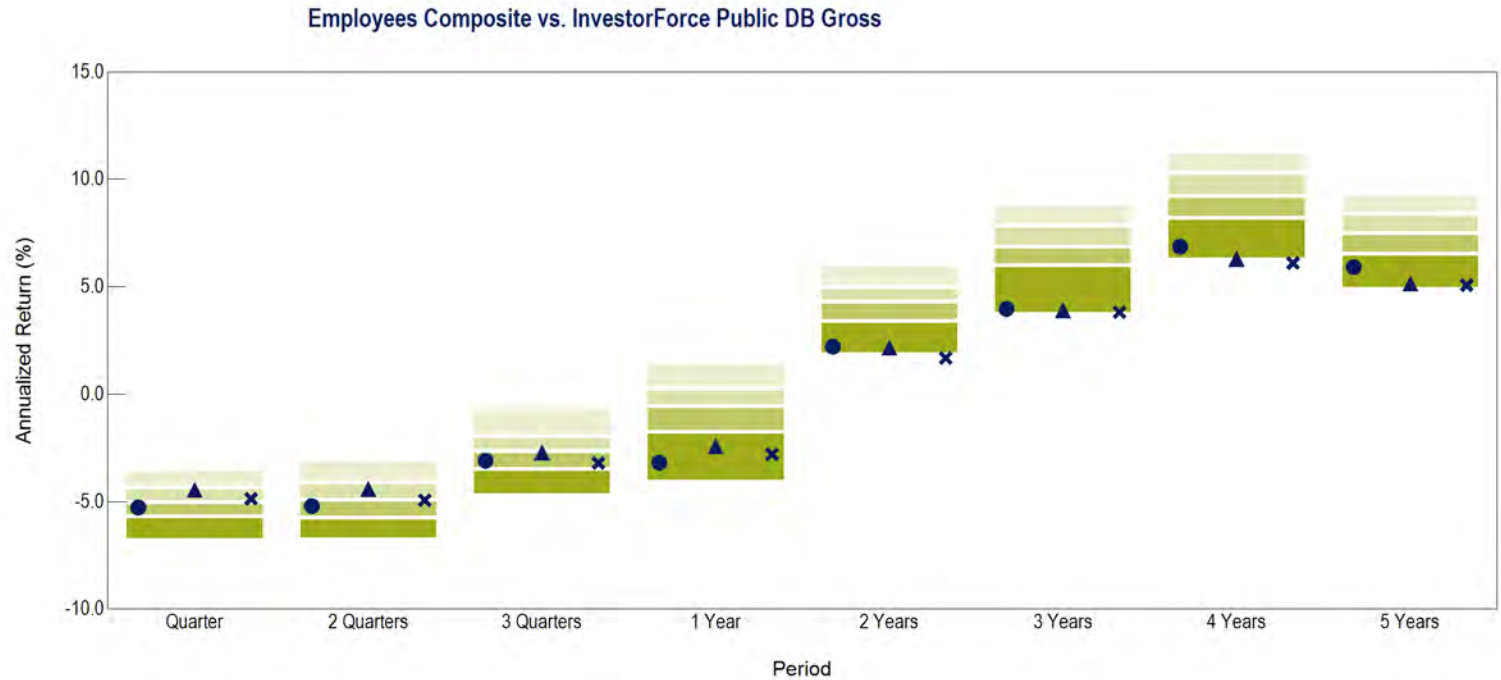


Total Fund Return Summary

Return Summary Gross



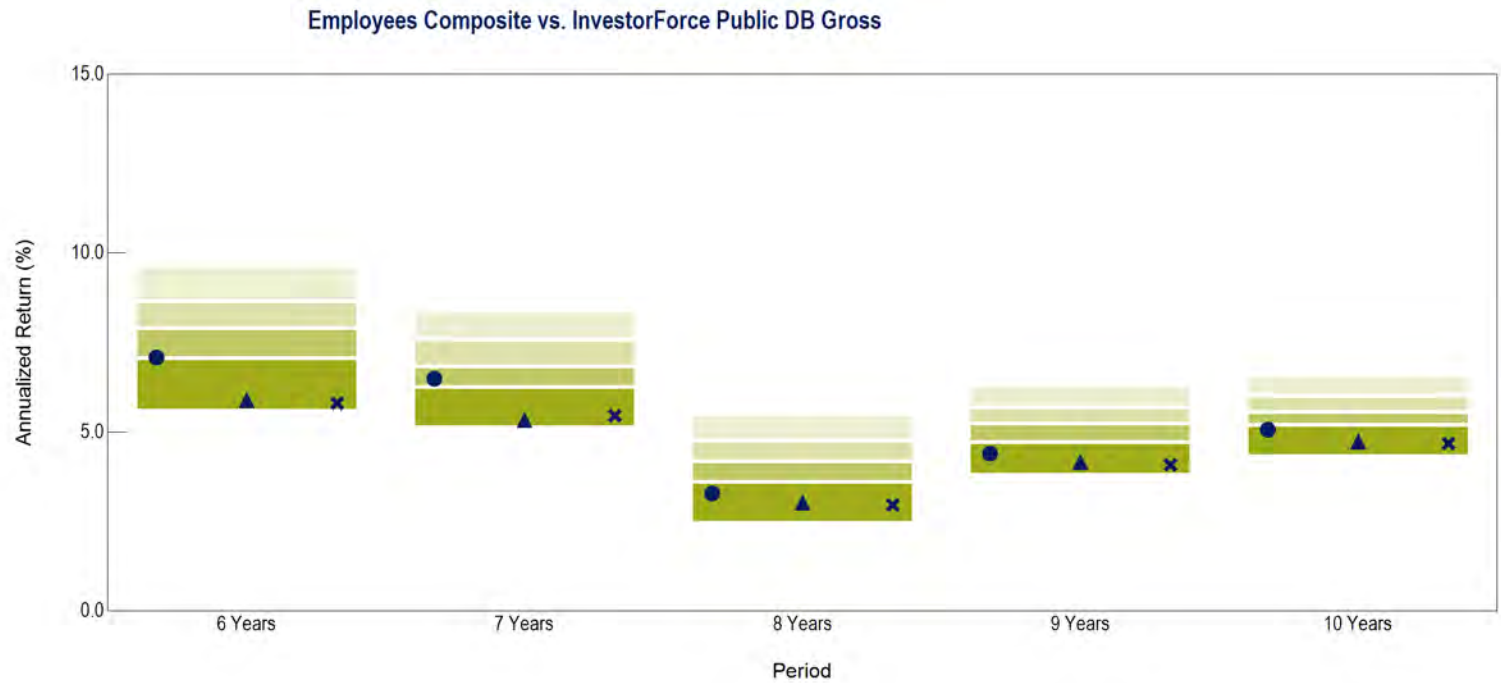
Total Fund Return Summary vs. Peer Universe



	Return (Rank)															
	Quarter		2 Quarters		3 Quarters		1 Year		2 Years		3 Years		4 Years		5 Years	
5th Percentile	-3.5	(61)	-3.0	(61)	-0.6	(64)	1.5	(91)	6.0	(92)	8.8	(94)	11.3	(92)	9.3	(90)
25th Percentile	-4.3	(31)	-4.1	(34)	-1.9	(53)	0.3	(82)	5.0	(92)	7.9	(95)	10.3	(96)	8.4	(95)
Median	-5.0	(44)	-4.9	(52)	-2.6	(68)	-0.6	(85)	4.3	(96)	6.9	(95)	9.2	(96)	7.5	(95)
75th Percentile	-5.7		-5.7		-3.5		-1.7		3.4		6.0		8.2		6.6	
95th Percentile	-6.8		-6.8		-4.7		-4.1		1.9		3.8		6.3		4.9	
# of Portfolios	311		311		303		300		281		270		257		246	
● Employees Composite	-5.3	(61)	-5.2	(61)	-3.1	(64)	-3.2	(91)	2.2	(92)	4.0	(94)	6.9	(92)	5.9	(90)
▲ Policy Index	-4.5	(31)	-4.4	(34)	-2.7	(53)	-2.4	(82)	2.2	(92)	3.9	(95)	6.3	(96)	5.1	(95)
× Allocation Index	-4.9	(44)	-4.9	(52)	-3.2	(68)	-2.8	(85)	1.7	(96)	3.8	(95)	6.1	(96)	5.1	(95)

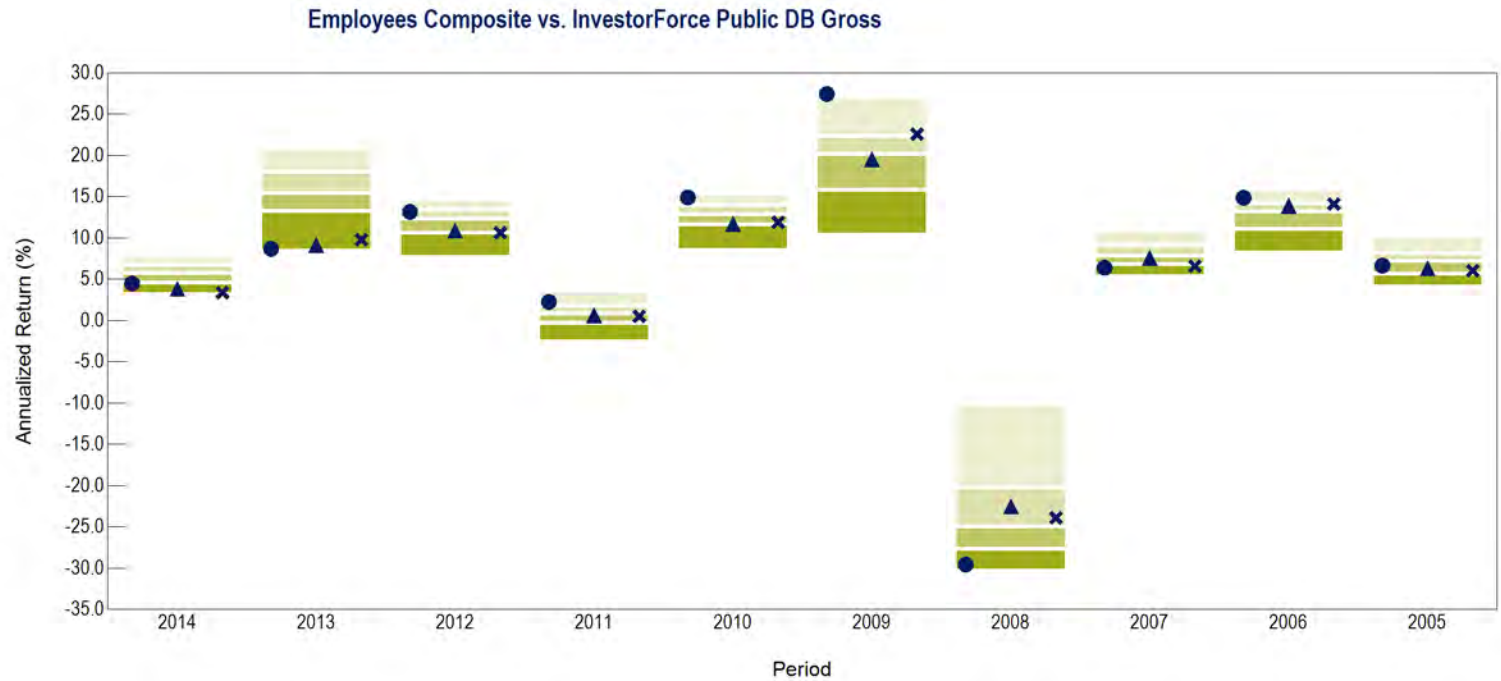


Total Fund Return Summary vs. Peer Universe



	Return (Rank)									
5th Percentile	9.6		8.4		5.5		6.3		6.6	
25th Percentile	8.7		7.6		4.8		5.7		6.0	
Median	7.9		6.8		4.2		5.3		5.6	
75th Percentile	7.1		6.3		3.6		4.7		5.2	
95th Percentile	5.6		5.1		2.5		3.8		4.3	
# of Portfolios	226		224		211		203		196	
● Employees Composite	7.1	(75)	6.5	(67)	3.3	(83)	4.4	(88)	5.1	(81)
▲ Policy Index	5.9	(95)	5.3	(95)	3.0	(88)	4.2	(91)	4.7	(90)
× Allocation Index	5.8	(95)	5.5	(95)	3.0	(89)	4.1	(92)	4.7	(92)

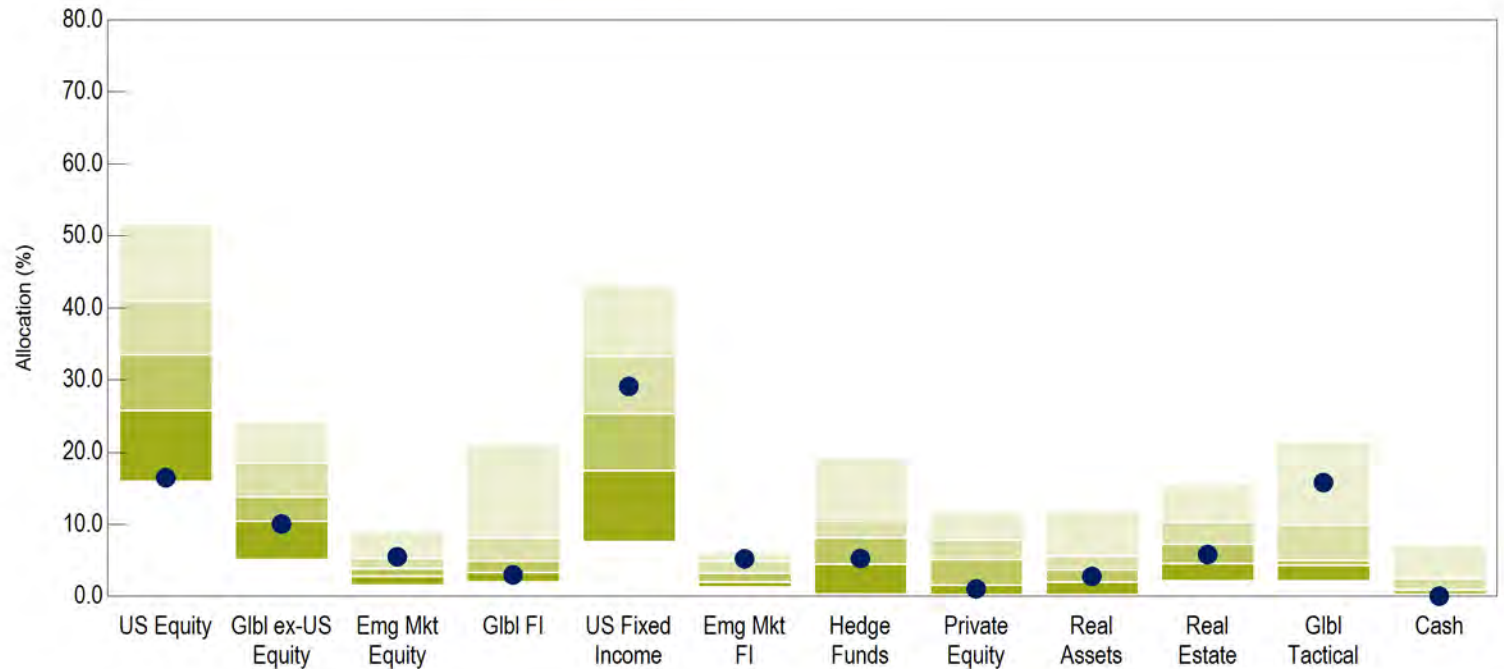
Total Fund Return Summary vs. Peer Universe



	Return (Rank)													
5th Percentile	8.0	20.8	14.6	3.6	15.4	27.0	-10.1	11.0	15.9	10.2				
25th Percentile	6.8	18.0	13.4	1.9	14.0	22.4	-20.1	9.1	14.2	8.2				
Median	5.8	15.5	12.4	0.9	12.9	20.2	-24.9	7.9	13.2	7.3				
75th Percentile	4.6	13.3	10.7	-0.3	11.7	15.9	-27.6	6.9	11.2	5.7				
95th Percentile	3.2	8.5	7.8	-2.5	8.6	10.5	-30.3	5.4	8.3	4.2				
# of Portfolios	248	231	236	206	188	184	181	177	171	158				
● Employees Composite	4.5 (79)	8.7 (95)	13.1 (29)	2.2 (17)	14.9 (12)	27.4 (5)	-29.6 (90)	6.4 (83)	14.9 (17)	6.6 (60)				
▲ Policy Index	3.8 (91)	9.1 (93)	10.9 (73)	0.6 (60)	11.7 (75)	19.5 (54)	-22.5 (34)	7.6 (54)	13.9 (31)	6.3 (63)				
× Allocation Index	3.4 (94)	9.8 (92)	10.6 (76)	0.5 (61)	11.9 (71)	22.6 (24)	-23.9 (42)	6.6 (81)	14.1 (28)	6.0 (70)				

Total Fund Allocation vs. Peer Universe

Total Plan Allocation vs. InvestorForce Public DB Gross  
As of September 30, 2015



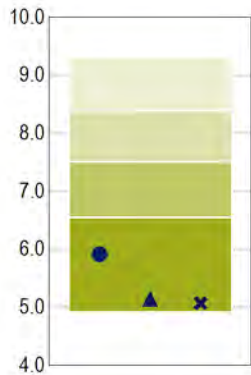
	Allocation (Rank)												
5th Percentile	51.7	24.1	9.1	21.1	42.9	6.2	19.4	11.8	12.0	15.4	21.5	7.1	--
25th Percentile	41.0	18.6	5.4	8.2	33.4	5.0	10.6	7.9	5.6	10.5	10.1	2.5	--
Median	33.6	13.9	3.9	5.1	25.4	3.4	8.2	5.2	3.8	7.4	5.1	1.0	--
75th Percentile	25.8	10.5	2.8	3.4	17.6	2.1	4.6	1.7	2.1	4.7	4.4	0.3	--
95th Percentile	16.0	5.2	1.7	2.1	7.7	1.3	0.4	0.3	0.3	2.2	2.3	0.0	--
# of Portfolios	271	264	108	43	225	43	83	81	64	192	69	252	--
● Employees Composite	16.5 (95)	10.1 (81)	5.5 (23)	3.0 (84)	29.1 (38)	5.2 (17)	5.2 (63)	1.0 (87)	2.8 (65)	5.8 (64)	15.8 (11)	0.0 (91)	--

Employees Composite vs. IFx Public DB Gross  
3 Years



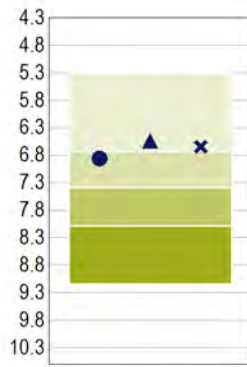
Employees Composite vs. IFx Public DB Gross  
5 Years

Anlzd Return



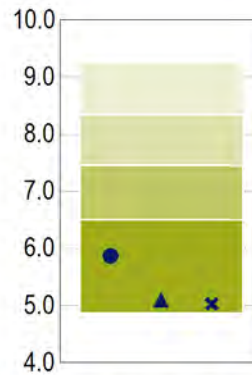
● Employees Composite	
Value	5.91
%tile	90
▲ Policy Index	
Value	5.15
%tile	95
✕ Allocation Index	
Value	5.07
%tile	95
Universe	
5th %tile	9.31
25th %tile	8.40
Median	7.51
75th %tile	6.56
95th %tile	4.92

Anlzd Standard Deviation



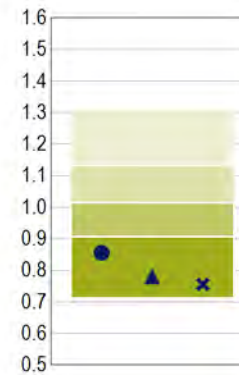
● Employees Composite	
Value	6.86
%tile	32
▲ Policy Index	
Value	6.54
%tile	23
✕ Allocation Index	
Value	6.65
%tile	24
Universe	
5th %tile	5.30
25th %tile	6.71
Median	7.38
75th %tile	8.07
95th %tile	9.13

Ann Excess RF Return



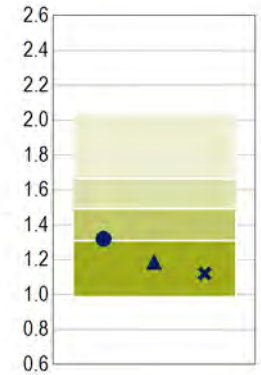
● Employees Composite	
Value	5.86
%tile	90
▲ Policy Index	
Value	5.10
%tile	95
✕ Allocation Index	
Value	5.02
%tile	95
Universe	
5th %tile	9.26
25th %tile	8.35
Median	7.47
75th %tile	6.51
95th %tile	4.87

Sharpe Ratio



● Employees Composite	
Value	0.86
%tile	85
▲ Policy Index	
Value	0.78
%tile	92
✕ Allocation Index	
Value	0.76
%tile	93
Universe	
5th %tile	1.31
25th %tile	1.13
Median	1.02
75th %tile	0.91
95th %tile	0.71

Sortino Ratio RF

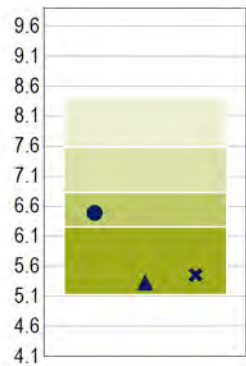


● Employees Composite	
Value	1.32
%tile	73
▲ Policy Index	
Value	1.19
%tile	87
✕ Allocation Index	
Value	1.12
%tile	90
Universe	
5th %tile	2.04
25th %tile	1.67
Median	1.50
75th %tile	1.31
95th %tile	0.99

Total Fund Risk Statistics vs. Peer Universe

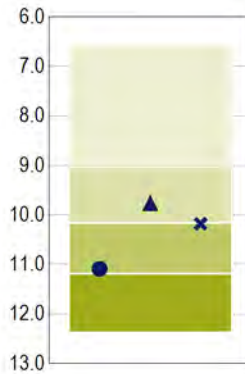
Employees Composite vs. IFx Public DB Gross  
7 Years

Anlzd Return



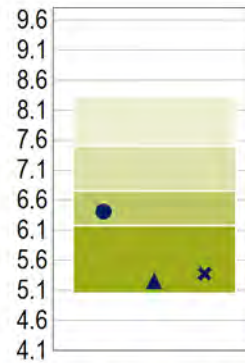
● Employees Composite	
Value	6.49
%tile	67
▲ Policy Index	
Value	5.33
%tile	95
✕ Allocation Index	
Value	5.45
%tile	95
Universe	
5th %tile	8.40
25th %tile	7.59
Median	6.84
75th %tile	6.27
95th %tile	5.14

Anlzd Standard Deviation



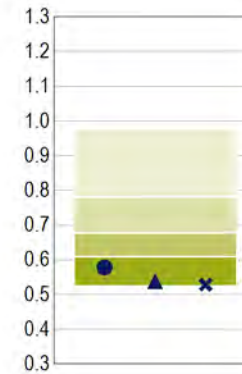
● Employees Composite	
Value	11.09
%tile	73
▲ Policy Index	
Value	9.76
%tile	39
✕ Allocation Index	
Value	10.18
%tile	51
Universe	
5th %tile	6.57
25th %tile	9.03
Median	10.15
75th %tile	11.18
95th %tile	12.37

Ann Excess RF Return



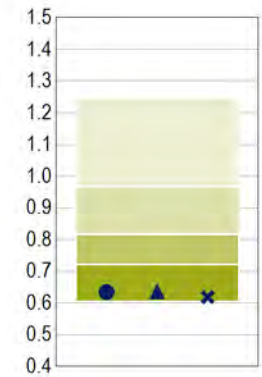
● Employees Composite	
Value	6.41
%tile	67
▲ Policy Index	
Value	5.25
%tile	95
✕ Allocation Index	
Value	5.38
%tile	95
Universe	
5th %tile	8.33
25th %tile	7.52
Median	6.76
75th %tile	6.19
95th %tile	5.06

Sharpe Ratio



● Employees Composite	
Value	0.58
%tile	84
▲ Policy Index	
Value	0.54
%tile	94
✕ Allocation Index	
Value	0.53
%tile	95
Universe	
5th %tile	0.98
25th %tile	0.78
Median	0.68
75th %tile	0.61
95th %tile	0.53

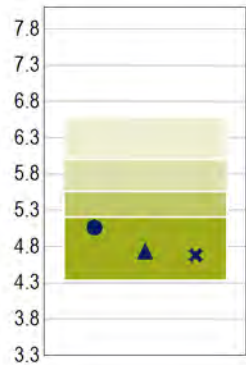
Sortino Ratio RF



● Employees Composite	
Value	0.63
%tile	91
▲ Policy Index	
Value	0.64
%tile	91
✕ Allocation Index	
Value	0.62
%tile	95
Universe	
5th %tile	1.25
25th %tile	0.97
Median	0.82
75th %tile	0.72
95th %tile	0.61

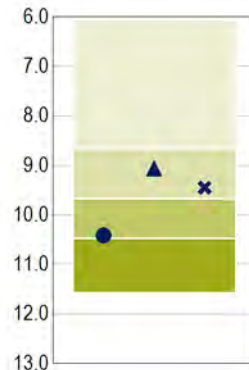
Employees Composite vs. IFx Public DB Gross  
10 Years

Anlzd Return



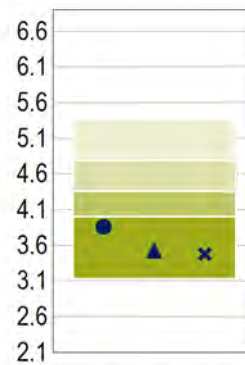
● Employees Composite	
Value	5.06
%tile	81
▲ Policy Index	
Value	4.73
%tile	90
✕ Allocation Index	
Value	4.68
%tile	92
Universe	
5th %tile	6.57
25th %tile	6.01
Median	5.57
75th %tile	5.21
95th %tile	4.34

Anlzd Standard Deviation



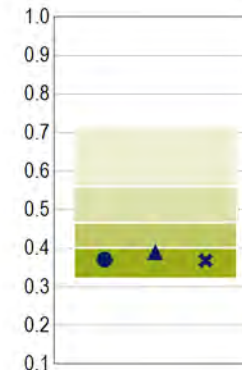
● Employees Composite	
Value	10.42
%tile	74
▲ Policy Index	
Value	9.06
%tile	34
✕ Allocation Index	
Value	9.45
%tile	45
Universe	
5th %tile	6.05
25th %tile	8.65
Median	9.66
75th %tile	10.46
95th %tile	11.57

Ann Excess RF Return



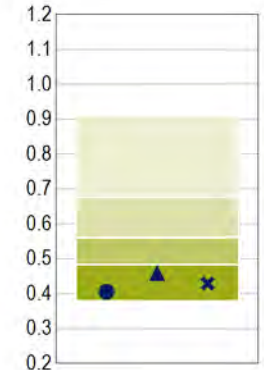
● Employees Composite	
Value	3.86
%tile	81
▲ Policy Index	
Value	3.53
%tile	90
✕ Allocation Index	
Value	3.48
%tile	92
Universe	
5th %tile	5.37
25th %tile	4.81
Median	4.37
75th %tile	4.01
95th %tile	3.14

Sharpe Ratio



● Employees Composite	
Value	0.37
%tile	85
▲ Policy Index	
Value	0.39
%tile	79
✕ Allocation Index	
Value	0.37
%tile	85
Universe	
5th %tile	0.71
25th %tile	0.56
Median	0.47
75th %tile	0.40
95th %tile	0.32

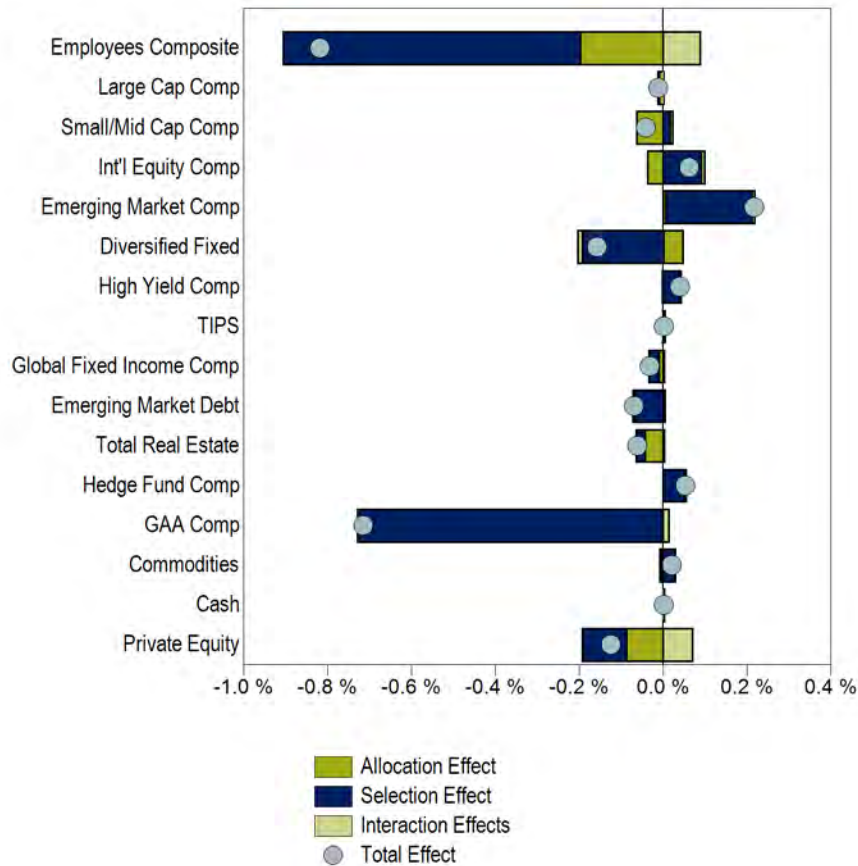
Sortino Ratio RF



● Employees Composite	
Value	0.41
%tile	92
▲ Policy Index	
Value	0.46
%tile	81
✕ Allocation Index	
Value	0.43
%tile	85
Universe	
5th %tile	0.91
25th %tile	0.68
Median	0.56
75th %tile	0.49
95th %tile	0.38

Total Fund Attribution Analysis

Attribution Effects Relative to Policy Index  
3 Months Ending September 30, 2015



Attribution Summary  
3 Months Ending September 30, 2015

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Large Cap Comp	-6.8%	-6.7%	0.0%	0.0%	0.0%	0.0%	0.0%
Small/Mid Cap Comp	-10.2%	-10.6%	0.3%	0.0%	-0.1%	0.0%	0.0%
Int'l Equity Comp	-9.7%	-10.6%	0.9%	0.1%	0.0%	0.0%	0.1%
Emerging Market Comp	-14.8%	-17.9%	3.1%	0.2%	0.0%	0.0%	0.2%
Diversified Fixed	0.2%	1.2%	-1.0%	-0.2%	0.0%	0.0%	-0.2%
High Yield Comp	-3.9%	-4.9%	1.0%	0.0%	0.0%	0.0%	0.0%
TIPS	-1.2%	-1.1%	-0.1%	0.0%	0.0%	0.0%	0.0%
Global Fixed Income Comp	0.9%	1.7%	-0.8%	0.0%	0.0%	0.0%	0.0%
Emerging Market Debt	-3.5%	-2.0%	-1.4%	-0.1%	0.0%	0.0%	-0.1%
Total Real Estate	2.8%	3.1%	-0.3%	0.0%	0.0%	0.0%	-0.1%
Hedge Fund Comp	-2.5%	-3.6%	1.0%	0.1%	0.0%	0.0%	0.1%
GAA Comp	-7.7%	-3.2%	-4.5%	-0.7%	0.0%	0.0%	-0.7%
Commodities	-13.7%	-14.5%	0.8%	0.0%	0.0%	0.0%	0.0%
Cash	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Private Equity	-3.6%	0.0%	-3.6%	-0.1%	-0.1%	0.1%	-0.1%
<b>Total</b>	<b>-5.3%</b>	<b>-4.5%</b>	<b>-0.8%</b>	<b>-0.7%</b>	<b>-0.2%</b>	<b>0.1%</b>	<b>-0.8%</b>

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

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

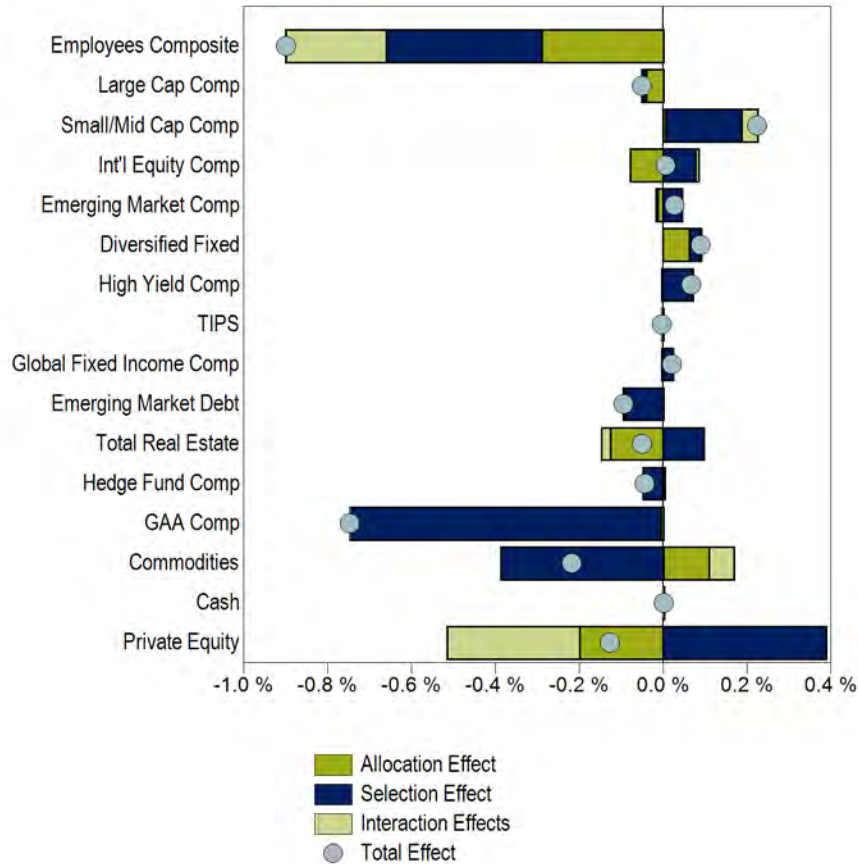
The allocation, selection, and interaction effects are calculated using the custom index described above along with the policy or target weight of each composite.

May not add up due to rounding.



Total Fund Attribution Analysis

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



Attribution Summary  
1 Year Ending September 30, 2015

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Large Cap Comp	-0.8%	-0.7%	-0.1%	0.0%	0.0%	0.0%	-0.1%
Small/Mid Cap Comp	3.9%	0.1%	3.8%	0.2%	0.0%	0.0%	0.2%
Int'l Equity Comp	-8.4%	-9.2%	0.8%	0.1%	-0.1%	0.0%	0.0%
Emerging Market Comp	-18.3%	-19.3%	1.0%	0.0%	0.0%	0.0%	0.0%
Diversified Fixed	3.2%	2.9%	0.3%	0.0%	0.1%	0.0%	0.1%
High Yield Comp	-1.7%	-3.4%	1.7%	0.1%	0.0%	0.0%	0.1%
TIPS	-0.9%	-0.8%	0.0%	0.0%	0.0%	0.0%	0.0%
Global Fixed Income Comp	-3.0%	-3.8%	0.8%	0.0%	0.0%	0.0%	0.0%
Emerging Market Debt	-3.7%	-2.0%	-1.8%	-0.1%	0.0%	0.0%	-0.1%
Total Real Estate	15.3%	13.5%	1.8%	0.1%	-0.1%	0.0%	-0.1%
Hedge Fund Comp	-0.9%	0.0%	-0.9%	0.0%	0.0%	0.0%	0.0%
GAA Comp	-6.9%	-2.2%	-4.8%	-0.7%	0.0%	0.0%	-0.7%
Commodities	-33.2%	-26.0%	-7.2%	-0.4%	0.1%	0.1%	-0.2%
Cash	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Private Equity	21.1%	7.4%	13.7%	0.4%	-0.2%	-0.3%	-0.1%
<b>Total</b>	<b>-3.3%</b>	<b>-2.4%</b>	<b>-0.9%</b>	<b>-0.4%</b>	<b>-0.3%</b>	<b>-0.2%</b>	<b>-0.9%</b>

Note: Plan attribution calculations are returns based and the results shown reflect the composites shown. As a result, the total returns shown may vary from the calculated returns shown on the performance report. The target return shown for each composite is a custom index, based on aggregated policy indices. This policy index asset weights the underlying policy indices of each option in the plan and the respective benchmark. The allocation, selection, and interaction effects are calculated using the custom index described above along with the policy or target weight of each composite. May not add up due to rounding.

# Vermont State Employees

## Total Fund Risk Statistics

3 Years Ending September 30, 2015

	% of Tot	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Anlzd AJ	Rank	Sharpe Ratio	Rank	Sortino Ratio RF	Rank	Tracking Error	Rank
Employees Composite	100.00%	3.97%	94	5.74%	38	-0.35%	80	0.69	95	1.14	93	0.89%	36
Policy Index	--	3.89%	95	5.13%	11	0.00%	61	0.75	92	1.31	89	0.00%	1
US Equity	16.47%	--	--	--	--	--	--	--	--	--	--	--	--
Russell 3000	--	12.53%	56	9.93%	19	0.00%	52	1.26	35	2.42	33	0.00%	1
Large Cap Comp	11.27%	13.05%	48	9.83%	27	0.56%	46	1.32	34	2.62	25	0.72%	1
S&P 500	--	12.40%	56	9.74%	23	0.00%	58	1.27	45	2.43	37	0.00%	1
Small/Mid Cap Comp	5.20%	13.45%	42	11.93%	45	3.94%	47	1.12	39	2.58	18	2.91%	1
Russell 2000	--	11.02%	73	13.59%	82	0.00%	85	0.81	82	1.52	79	0.00%	1
Int'l Equity Comp	10.06%	6.33%	62	11.68%	66	0.90%	66	0.54	65	1.09	53	1.98%	9
MSCI EAFE	--	5.63%	72	11.94%	79	0.00%	78	0.47	75	0.84	74	0.00%	1
Emerging Market Comp	5.49%	-5.06%	79	13.74%	61	-0.20%	82	-0.37	78	-0.56	80	5.31%	70
MSCI Emerging Markets	--	-5.27%	81	13.75%	62	0.00%	79	-0.39	82	-0.58	81	0.00%	1
US Fixed Income	29.09%	--	--	--	--	--	--	--	--	--	--	--	--
Barclays Aggregate	--	1.71%	66	2.90%	58	0.00%	83	0.58	81	0.95	75	0.00%	1
Diversified Fixed	21.63%	2.33%	43	3.37%	69	0.45%	64	0.68	70	1.07	64	1.09%	25
Barclays Aggregate	--	1.71%	66	2.90%	58	0.00%	83	0.58	81	0.95	75	0.00%	1
High Yield Comp	4.26%	4.33%	38	3.92%	19	1.49%	30	1.10	27	1.70	35	1.21%	56
Barclays High Yield	--	3.51%	67	4.75%	64	0.00%	75	0.73	73	1.29	68	0.00%	1
TIPS	3.20%	-1.87%	80	5.15%	81	-0.02%	65	-0.37	64	-0.48	68	0.18%	9
Barclays US TIPS	--	-1.83%	77	5.11%	78	0.00%	58	-0.37	55	-0.48	65	0.00%	1
Global Fixed Income Comp	2.98%	-3.70%	96	4.34%	53	-1.03%	96	-0.86	99	-1.30	99	1.63%	11
Citi WGBI	--	-2.85%	92	4.29%	51	0.00%	91	-0.67	95	-0.91	95	0.00%	1
Emerging Market Debt	5.21%	0.45%	38	6.58%	28	-0.03%	37	0.06	37	0.09	37	1.35%	12
JP Morgan EMBI Global TR	--	0.51%	36	6.87%	37	0.00%	36	0.07	36	0.10	36	0.00%	1
Total Real Estate	5.80%	14.62%	--	5.99%	--	0.24%	--	2.43	--	1,928.31	--	1.93%	--
NCREIF Property Index	--	11.90%	--	4.76%	--	0.00%	--	2.49	--	1,568.72	--	0.00%	--
Hedge Fund Comp	5.25%	6.01%	34	3.66%	41	1.95%	34	1.63	27	3.56	18	1.44%	7
HFRI Fund of Funds Composite Index	--	4.17%	67	3.47%	31	0.00%	65	1.19	52	2.01	49	0.00%	1
GAA Comp	15.81%	1.34%	86	7.55%	61	-1.71%	87	0.17	86	0.24	89	3.47%	34
60% MSCI ACWI (Net)/40% CITI WGBI	--	3.04%	63	6.68%	41	0.00%	66	0.45	60	0.95	50	0.00%	1
Commodities	2.76%	-18.35%	--	14.06%	--	-1.02%	--	-1.31	--	-1.87	--	4.66%	--

# Vermont State Employees

## Total Fund Risk Statistics

### 5 Years Ending September 30, 2015

	% of Tot	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Anlzd AJ	Rank	Sharpe Ratio	Rank	Sortino Ratio RF	Rank	Tracking Error	Rank
Employees Composite	100.00%	5.91%	90	6.86%	32	0.55%	24	0.86	85	1.32	73	0.81%	12
Policy Index	--	5.15%	95	6.54%	23	0.00%	58	0.78	92	1.19	87	0.00%	1
US Equity	16.47%	--	--	--	--	--	--	--	--	--	--	--	--
Russell 3000	--	13.28%	51	11.94%	24	0.00%	42	1.11	30	1.77	29	0.00%	1
Large Cap Comp	11.27%	13.56%	43	12.04%	43	-0.37%	50	1.12	41	1.81	38	0.98%	1
S&P 500	--	13.34%	47	11.51%	25	0.00%	43	1.16	35	1.91	29	0.00%	1
Small/Mid Cap Comp	5.20%	13.89%	36	14.27%	34	3.51%	39	0.97	32	1.61	25	2.75%	1
Russell 2000	--	11.73%	74	15.96%	77	0.00%	86	0.73	80	1.18	72	0.00%	1
Int'l Equity Comp	10.06%	4.85%	69	14.30%	23	1.14%	67	0.34	65	0.51	62	2.08%	9
MSCI EAFE	--	3.98%	83	15.23%	65	0.00%	86	0.26	85	0.39	82	0.00%	1
Emerging Market Comp	5.49%	--	--	--	--	--	--	--	--	--	--	--	--
MSCI Emerging Markets	--	-3.57%	83	17.78%	61	0.00%	83	-0.20	84	-0.30	86	0.00%	1
US Fixed Income	29.09%	--	--	--	--	--	--	--	--	--	--	--	--
Barclays Aggregate	--	3.10%	62	2.77%	51	0.00%	85	1.10	74	1.84	66	0.00%	1
Diversified Fixed	21.63%	4.10%	41	3.21%	64	0.90%	48	1.26	54	2.12	46	1.43%	31
Barclays Aggregate	--	3.10%	62	2.77%	51	0.00%	85	1.10	74	1.84	66	0.00%	1
High Yield Comp	4.26%	6.66%	40	5.10%	22	1.53%	25	1.30	23	2.03	39	1.32%	50
Barclays High Yield	--	6.15%	64	6.04%	67	0.00%	74	1.01	71	1.72	67	0.00%	1
TIPS	3.20%	--	--	--	--	--	--	--	--	--	--	--	--
Barclays US TIPS	--	2.55%	52	5.20%	77	0.00%	71	0.48	66	0.70	49	0.00%	1
Global Fixed Income Comp	2.98%	0.25%	91	5.18%	54	0.44%	90	0.04	90	0.06	90	1.85%	12
Citi WGBI	--	-0.19%	95	4.96%	44	0.00%	96	-0.05	96	-0.06	96	0.00%	1
Emerging Market Debt	5.21%	--	--	--	--	--	--	--	--	--	--	--	--
JP Morgan EMBI Global TR	--	4.40%	33	7.11%	20	0.00%	30	0.61	26	0.89	23	0.00%	1
Total Real Estate	5.80%	--	--	--	--	--	--	--	--	--	--	--	--
NCREIF Property Index	--	12.55%	--	5.06%	--	0.00%	--	2.47	--	1,111.45	--	0.00%	--
Hedge Fund Comp	5.25%	--	--	--	--	--	--	--	--	--	--	--	--
HFRI Fund of Funds Composite Index	--	2.69%	76	3.94%	39	0.00%	77	0.67	70	0.98	63	0.00%	1
GAA Comp	15.81%	4.29%	64	8.41%	54	0.55%	70	0.50	67	0.74	69	3.31%	16
60% MSCI ACWI (Net)/40% CITI WGBI	--	4.16%	65	8.65%	57	0.00%	72	0.48	69	0.73	69	0.00%	1
Commodities	2.76%	--	--	--	--	--	--	--	--	--	--	--	--

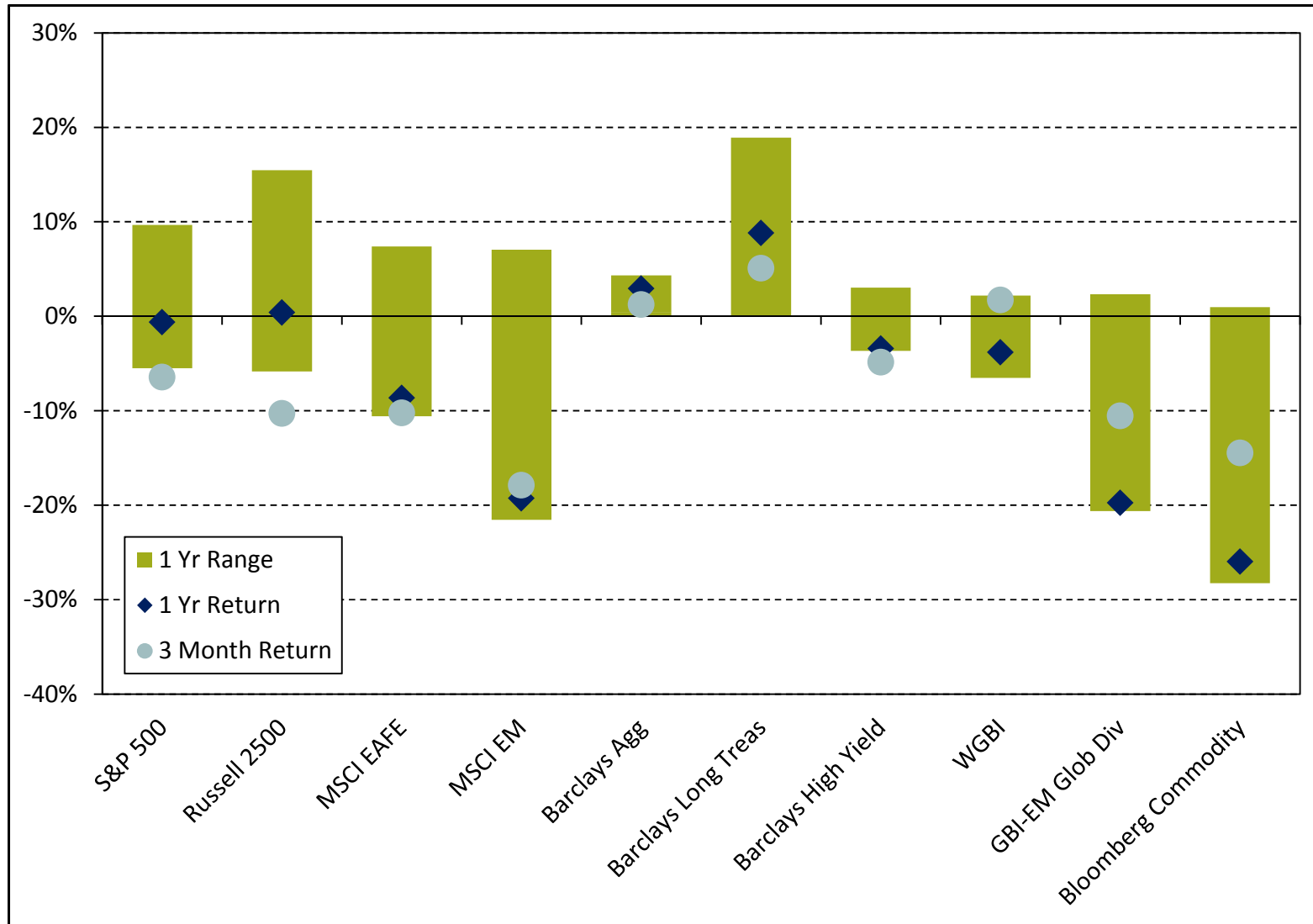
# Appendix

## Index Performance Summary as of 9/30/2015

	2008	2009	2010	2011	2012	2013	2014	Q1	Q2	JUL	AUG	SEPT	Q3	YTD
<b>Barclays Municipal</b>	-2.5%	12.9%	2.4%	10.7%	6.8%	-2.6%	9.1%	1.0%	-0.9%	0.7%	0.2%	0.7%	1.7%	1.8%
<b>Barclays US Agg Interm</b>	4.9%	6.5%	6.1%	6.0%	3.6%	-1.0%	4.1%	1.3%	-0.7%	0.5%	0.0%	0.7%	1.1%	1.7%
<b>Credit Suisse Lev Loan</b>	-28.8%	44.9%	10.0%	1.8%	9.4%	6.2%	2.1%	2.1%	0.8%	0.1%	-0.7%	-0.7%	-1.2%	1.6%
<b>Barclays US Agg Bond</b>	5.2%	5.9%	6.5%	7.8%	4.2%	-2.0%	6.0%	1.6%	-1.7%	0.7%	-0.1%	0.7%	1.2%	1.1%
<b>Barclays US Gov/Cred 1-3Yr</b>	5.0%	3.8%	2.8%	1.6%	1.3%	0.6%	0.8%	0.6%	0.1%	0.1%	-0.1%	0.3%	0.3%	1.0%
<b>Credit Suisse Hedge Fund</b>	-19.1%	18.6%	10.9%	-2.5%	7.7%	9.7%	4.1%	2.5%	-0.5%	0.9%	-2.0%	-1.4%	-2.5%	-0.6%
<b>JPM EMBI Glob Div</b>	-12.0%	29.8%	12.2%	7.3%	17.4%	-5.3%	7.4%	2.0%	-0.3%	0.5%	-0.9%	-1.3%	-1.7%	-0.1%
<b>Citi WGBI</b>	10.9%	2.6%	5.2%	6.4%	1.6%	-4.0%	-0.5%	-2.5%	-1.5%	0.5%	0.5%	0.8%	1.7%	-2.4%
<b>Barclays US Gov/Cred Long</b>	8.4%	1.9%	10.2%	22.5%	8.8%	-8.8%	19.3%	3.4%	-7.6%	2.2%	-0.8%	0.8%	2.2%	-2.4%
<b>Barclays US Corp High Yield</b>	-26.2%	58.2%	15.1%	5.0%	15.8%	7.4%	2.5%	2.5%	0.0%	-0.6%	-1.7%	-2.6%	-4.9%	-2.5%
<b>Barclays US Strips 20+ Yr</b>	59.5%	-36.0%	10.9%	58.5%	3.0%	-21.0%	46.4%	5.5%	-14.3%	5.9%	0.1%	1.5%	7.6%	-2.7%
<b>FTSE NAREIT Equity REITs</b>	-37.7%	28.0%	28.0%	8.3%	18.1%	2.5%	30.1%	4.8%	-10.0%	5.6%	-6.2%	2.9%	2.0%	-3.8%
<b>Barclays US Long Credit</b>	-3.9%	16.8%	10.7%	17.1%	12.7%	-6.6%	16.4%	3.1%	-7.3%	1.5%	-1.3%	0.4%	0.5%	-3.9%
<b>Russell 1000</b>	-37.6%	28.4%	16.1%	1.5%	16.4%	33.1%	13.2%	1.6%	0.1%	1.9%	-6.0%	-2.7%	-6.8%	-5.2%
<b>MSCI EAFE</b>	-43.4%	31.8%	7.8%	-12.1%	17.3%	22.8%	-4.9%	4.9%	0.6%	2.1%	-7.4%	-5.1%	-10.2%	-5.3%
<b>S&amp;P 500</b>	-37.0%	26.5%	15.1%	2.1%	16.0%	32.4%	13.7%	1.0%	0.3%	2.1%	-6.0%	-2.5%	-6.4%	-5.3%
<b>Russell 2500</b>	-36.8%	34.4%	26.7%	-2.5%	17.9%	36.8%	7.1%	5.2%	-0.3%	-0.2%	-5.9%	-4.5%	-10.3%	-6.0%
<b>MSCI ACWI</b>	-42.2%	34.6%	12.7%	-7.3%	16.1%	22.8%	4.2%	2.3%	0.3%	0.9%	-6.9%	-3.6%	-9.5%	-7.0%
<b>Russell 2000</b>	-33.8%	27.2%	26.9%	-4.2%	16.3%	38.8%	4.9%	4.3%	0.4%	-1.2%	-6.3%	-4.9%	-11.9%	-7.7%
<b>JPM GBI-EM Glob Div</b>	-5.2%	22.0%	15.7%	-1.8%	16.8%	-9.0%	-5.7%	-4.0%	-1.0%	-2.6%	-5.4%	-3.0%	-10.5%	-14.9%
<b>MSCI EM</b>	-53.3%	78.5%	18.9%	-18.4%	18.2%	-2.6%	-2.2%	2.2%	0.7%	-6.9%	-9.0%	-3.0%	-17.9%	-15.5%
<b>Bloomberg Commodity</b>	-35.6%	18.9%	16.8%	-13.3%	-1.1%	-9.5%	-17.0%	-5.9%	4.7%	-10.6%	-0.9%	-3.4%	-14.5%	-15.8%
<b>Alerian MLP</b>	-36.9%	76.4%	35.9%	13.9%	4.8%	27.6%	4.8%	-5.2%	-6.1%	-3.2%	-5.0%	-15.3%	-22.1%	-30.7%

Source: Morningstar Direct

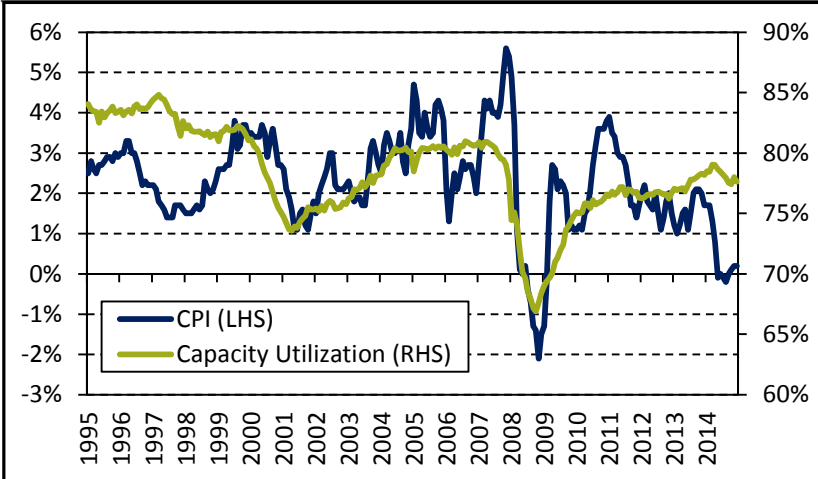
## Broad Market Performance Summary as of 9/30/2015



Source: Bloomberg, Standard and Poors, Russell, MSCI, Barclays, Citigroup, JP Morgan  
 \*1 Yr Range: Represents range of cumulative high/low daily index returns for an investment made one year ago

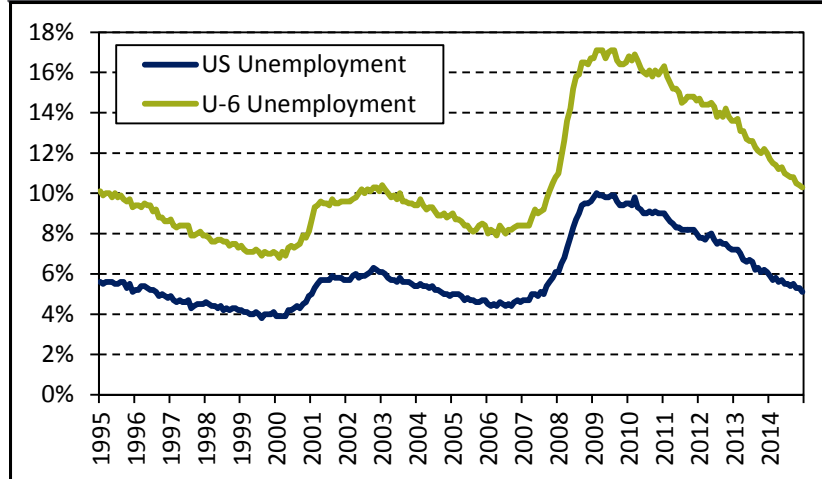
# US Economic Indicators

## Inflation has stayed low



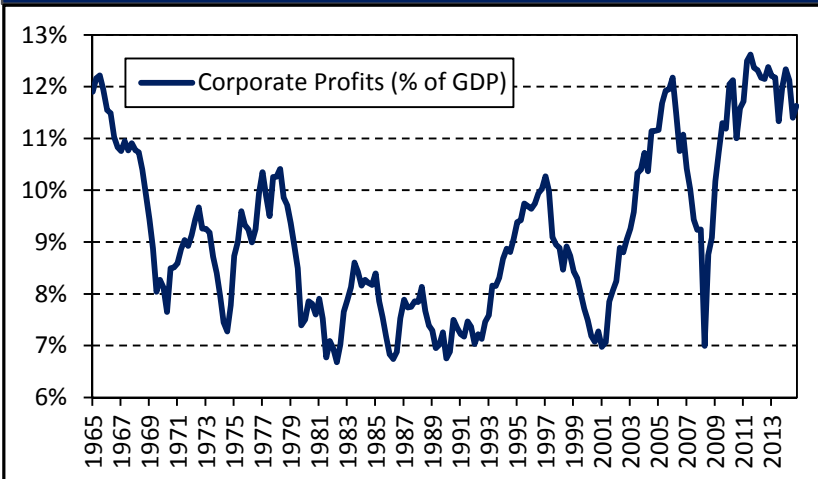
Source: Bloomberg, Federal Reserve, Bureau of Labor Statistics

## Unemployment steadily improving



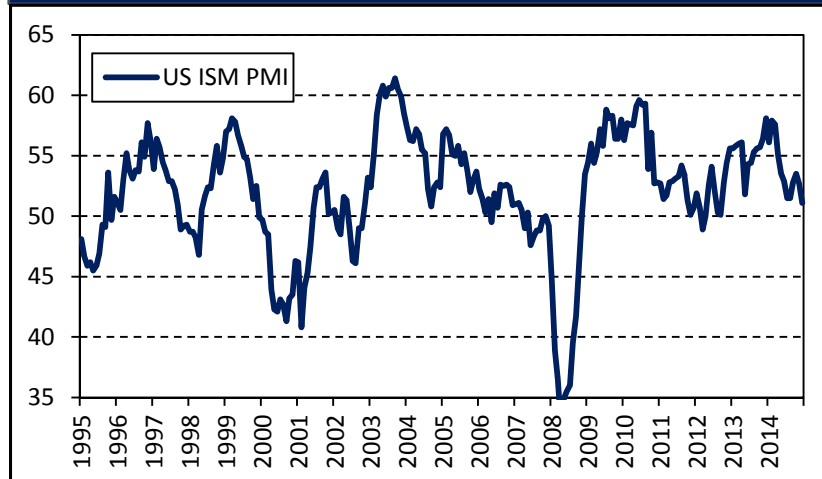
Source: Bloomberg, Bureau of Labor Statistics

## Corporate profits at secular highs



Source: Bloomberg, Bureau of Economic Analysis

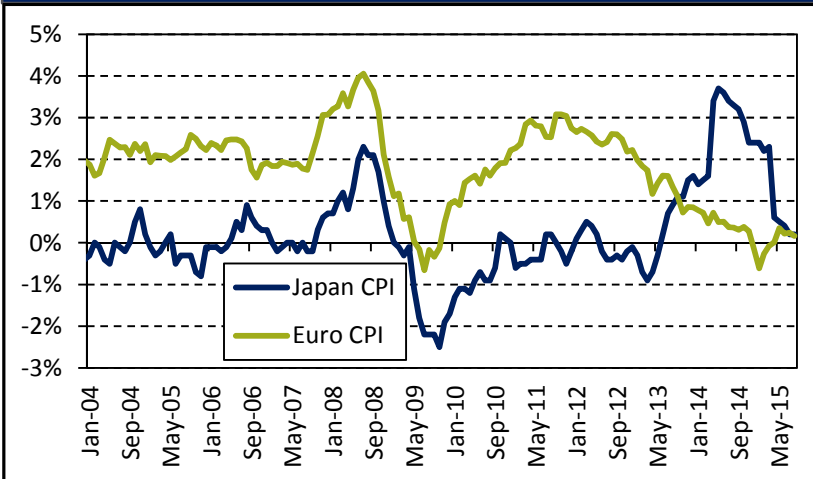
## Manufacturing above average but trending lower



Source: Bloomberg, Institute for Supply Management

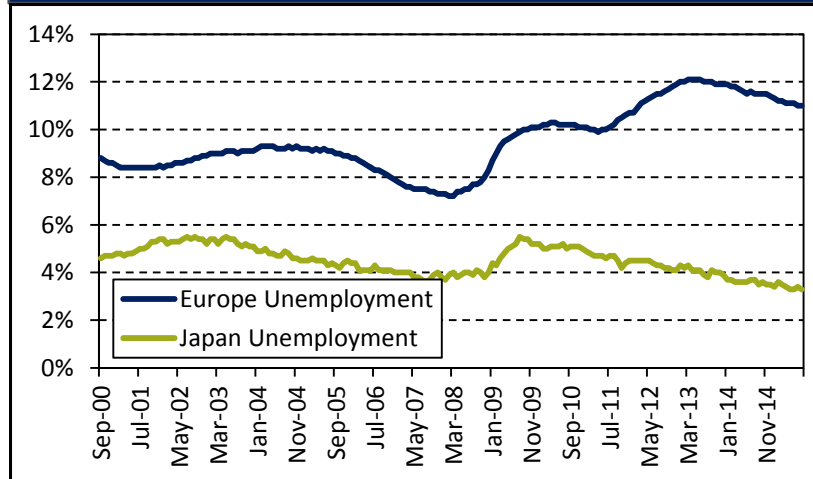
## International Economic Indicators

### Inflation remains muted



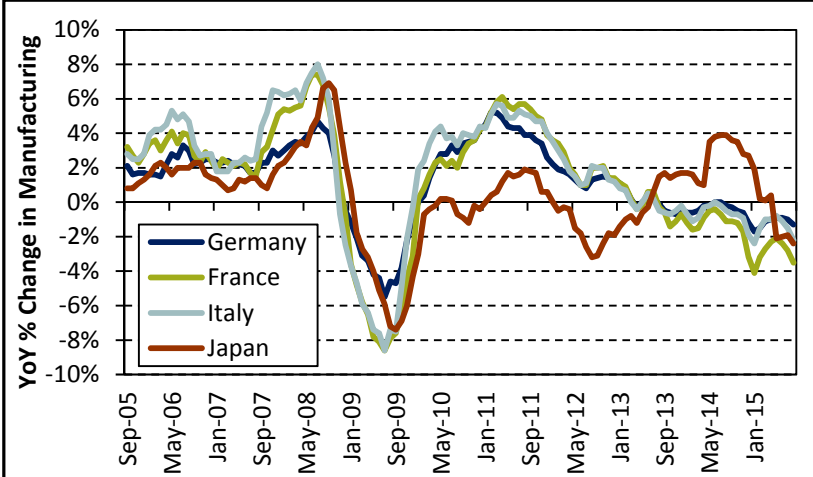
Source: Bloomberg, Japan Ministry of Internal Affairs and Communications, Eurostat

### Europe employment recovery lagging



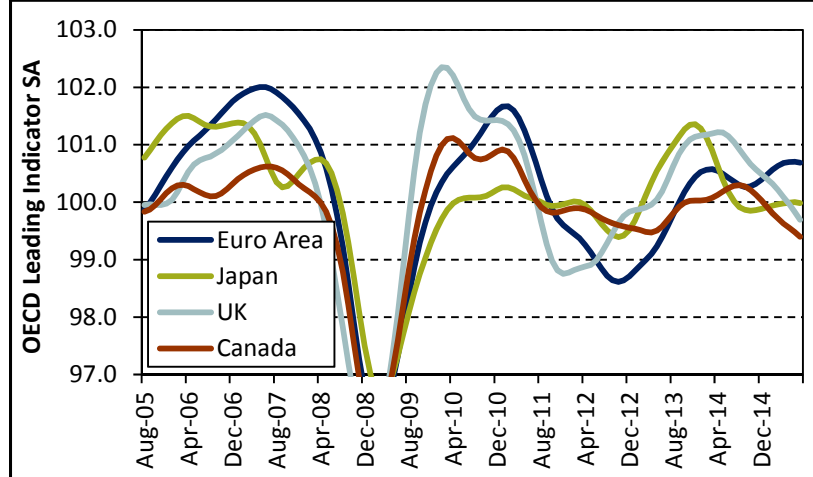
Source: Bloomberg, Japan Ministry of Internal Affairs and Communications, Eurostat

### Manufacturing in developed economies has lagged



Source: Bloomberg, OECD, Eurostat

### Leading indicators mostly neutral

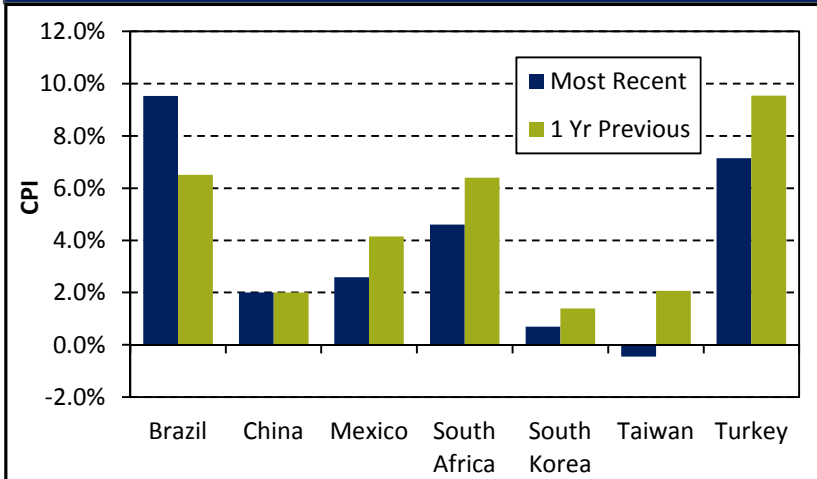


Source: Bloomberg, OECD



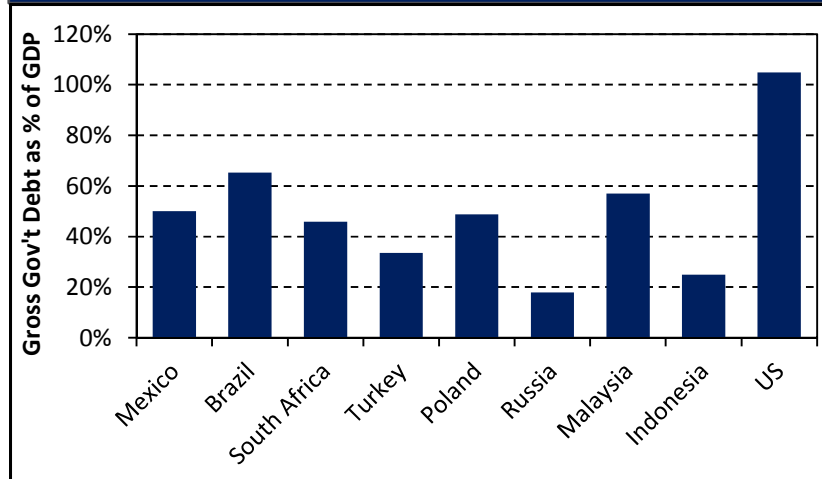
## Emerging Market Economic Indicators

### EM inflation is varied by country



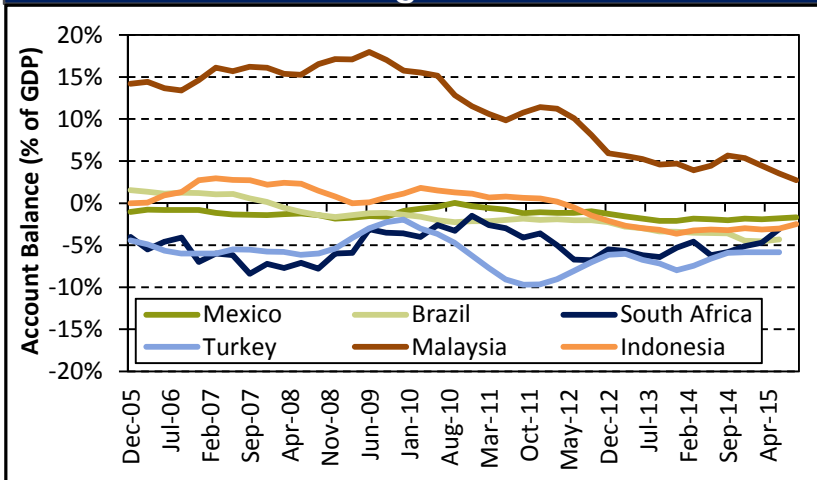
Source: Bloomberg

### Relatively healthy Debt/GDP ratios



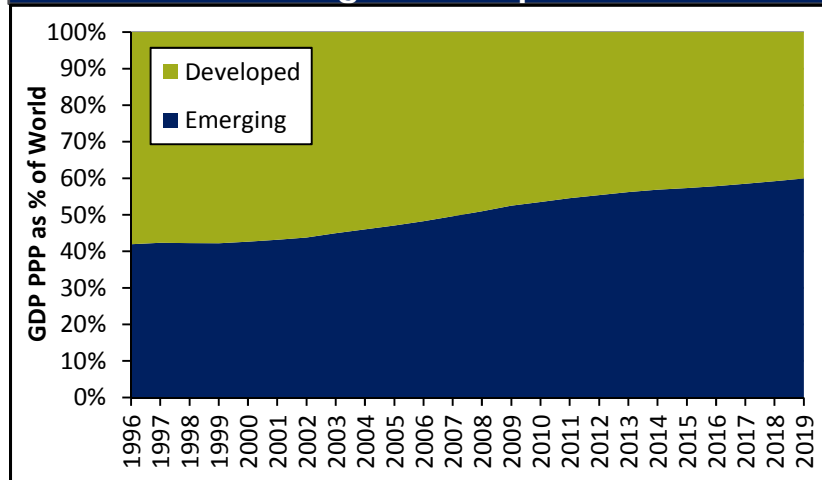
Source: Bloomberg, IMF

### Some improvement in account balance challenged countries



Source: Bloomberg

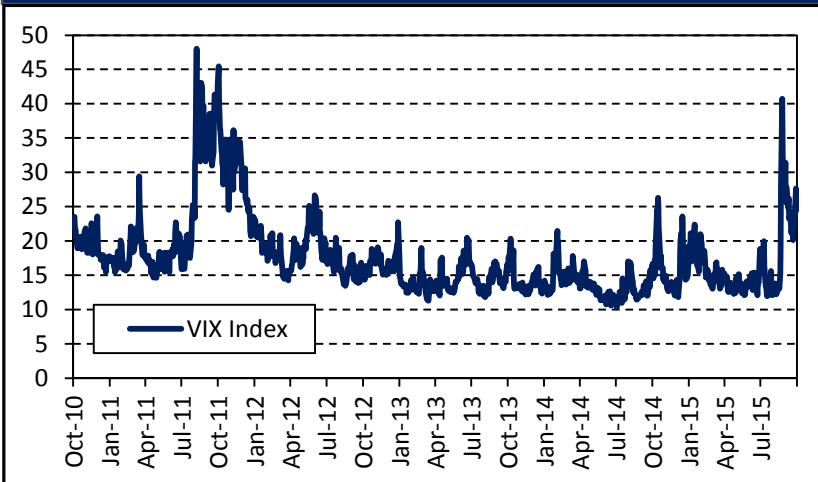
### Emerging economies make up >50% of global output



Source: Bloomberg, IMF

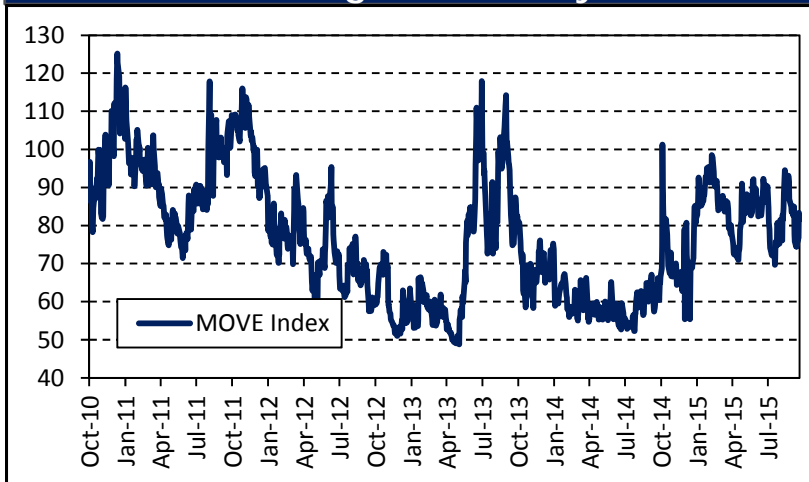
# Volatility

## Equity volatility has seen recent spike



Source: Bloomberg, CBOE

## Treasury rates experiencing periods of higher volatility



Source: Bloomberg, Merrill Lynch

## Sustained uptick in currency volatilities



Source: Bloomberg, Deutsche Bank

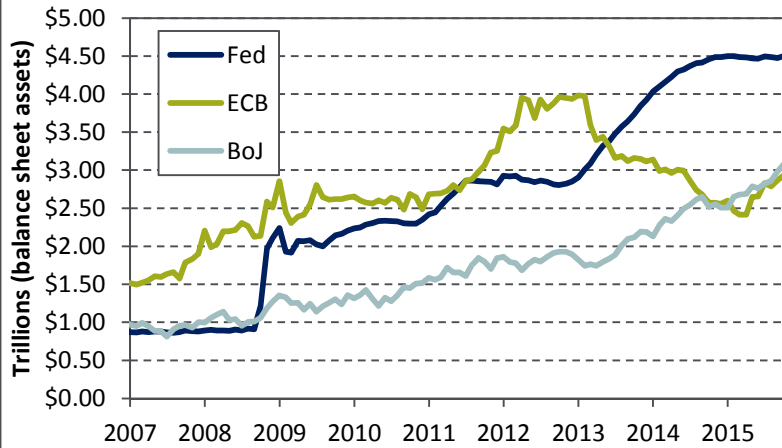
## Commodity pricing volatility has increased



Source: Bloomberg, Merrill Lynch

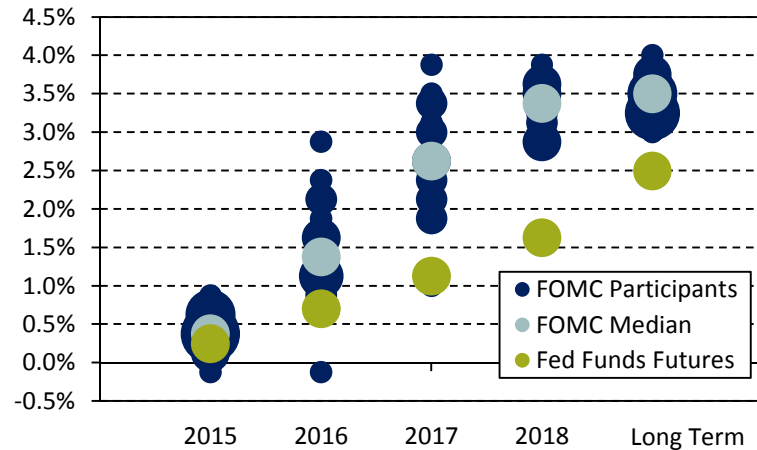
# Central Banks

## Major central bank policy divergence



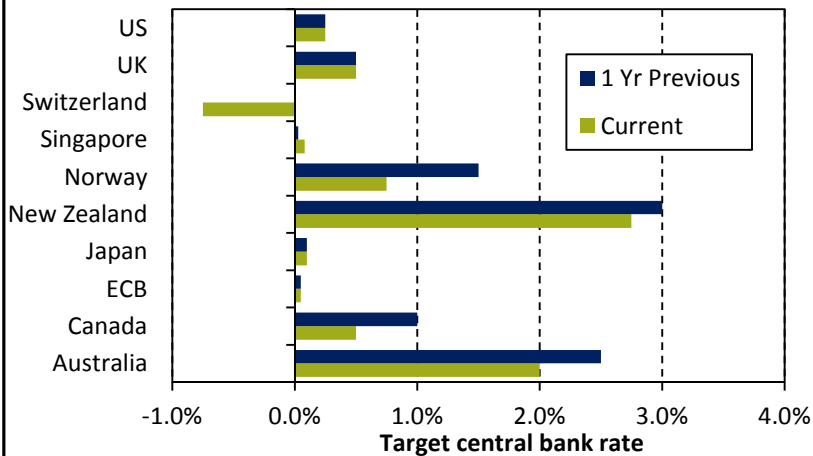
Source: Bloomberg, Federal Reserve, Bank of Japan, ECB, NEPC

## Fed's ideal rate of policy firming above market expectations



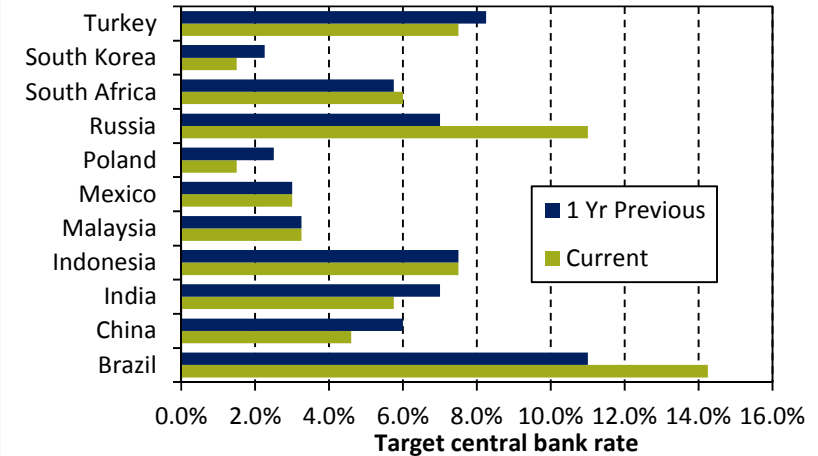
Source: Bloomberg, Federal Reserve, NEPC

## Many developed central banks have maintained low interest rates



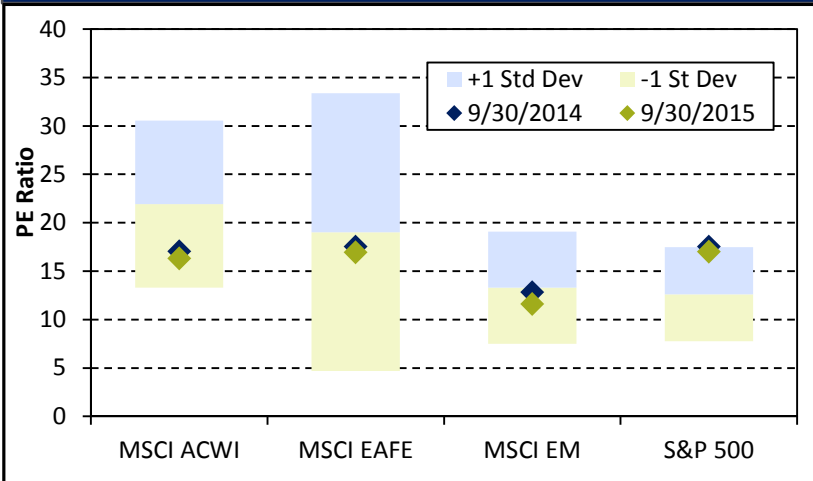
Source: Bloomberg

## EM central bank policies have varied by circumstance



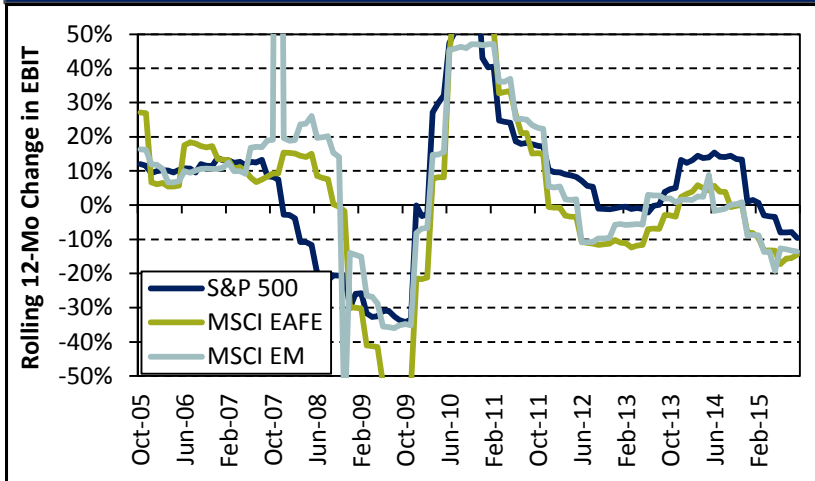
Source: Bloomberg

Global valuations are mixed



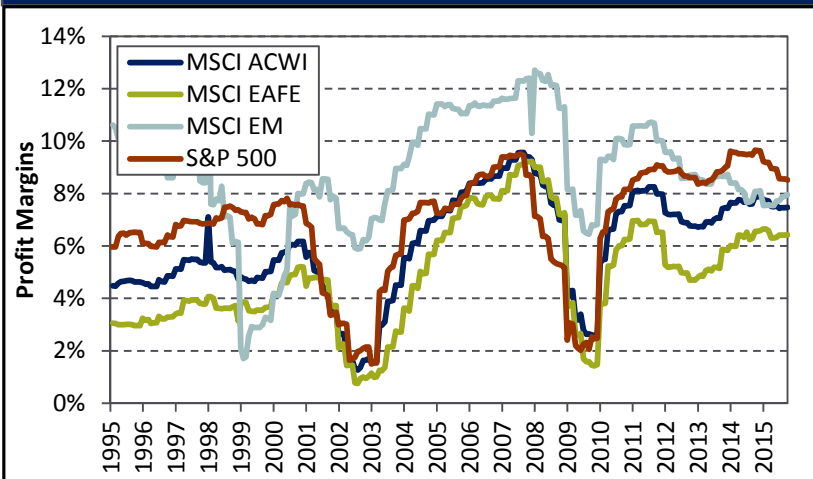
Source: Bloomberg, Standard and Poors, MSCI \*MSCI EAFE is ex UK Telecom

Earnings growth trending lower



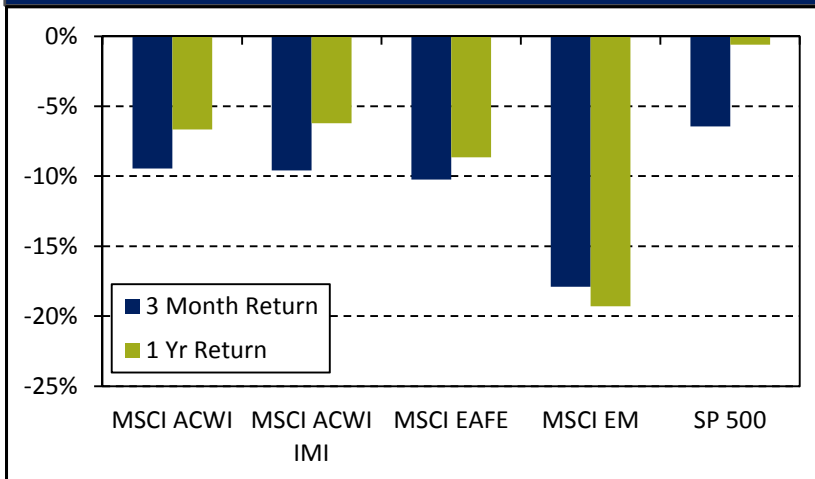
Source: Bloomberg, Standard and Poors, MSCI

Margins elevated, but largely a US story



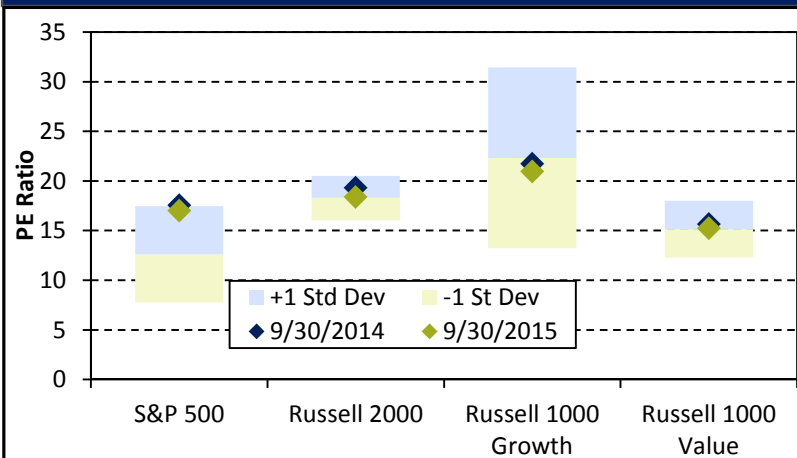
Source: Bloomberg, MSCI

Global equity returns mostly negative



Source: Bloomberg, MSCI

Valuations near or above historical norms



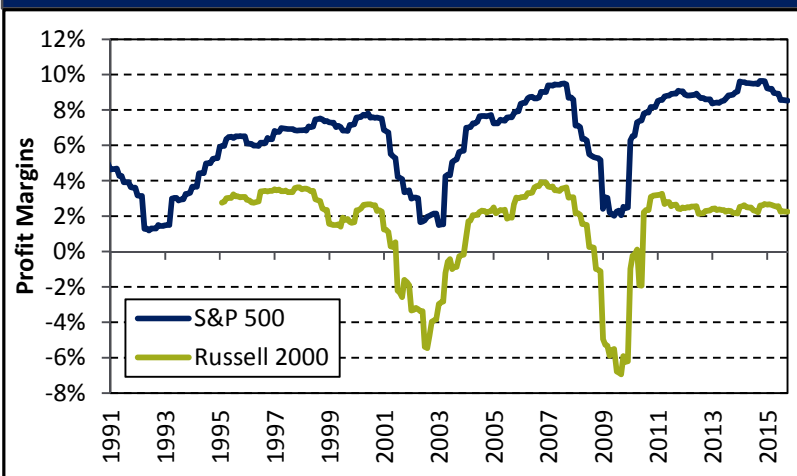
Source: Bloomberg, Standard and Poors, Russell \*Russell 2000 PE is index adjusted positive

Growth recovery marked by inconsistency



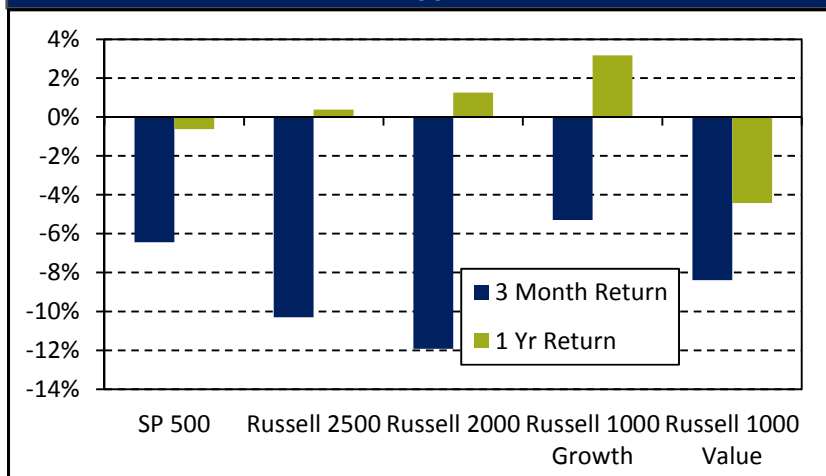
Source: Bloomberg, Bureau of Economic Analysis

Profit margins remain elevated



Source: Bloomberg, Standard and Poors, Russell

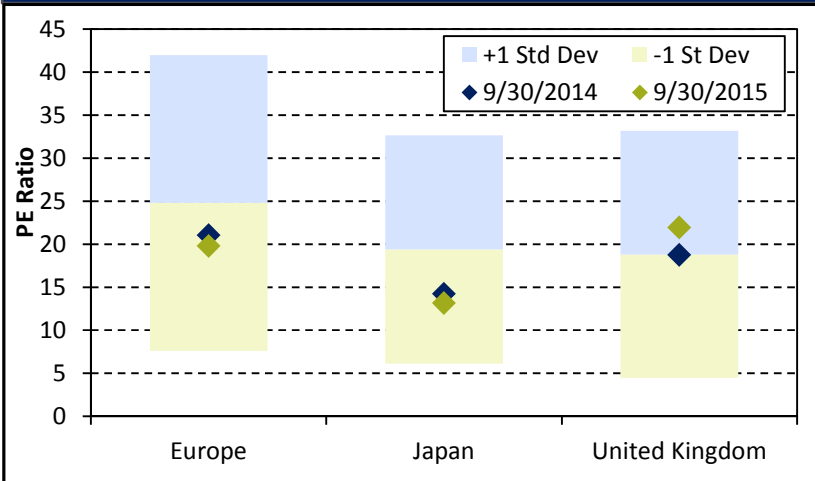
Trailing performance is negative in near term



Source: Bloomberg, Standard and Poors, Russell

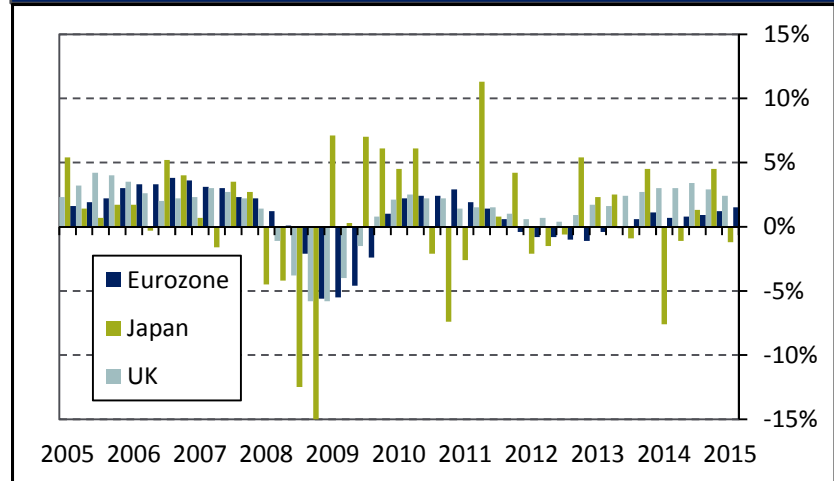
# International Equity

## PEs near historical medians



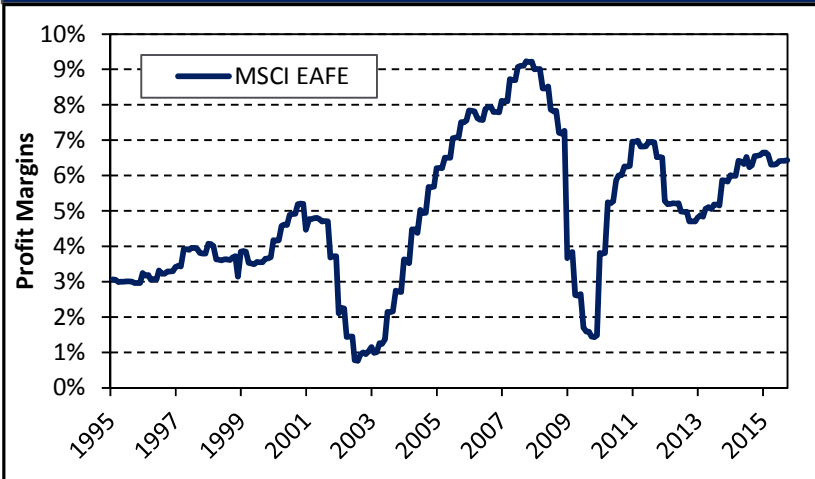
Source: Bloomberg, MSCI, FTSE \*UK represented by FTSE 100 Index

## Slow Global Growth



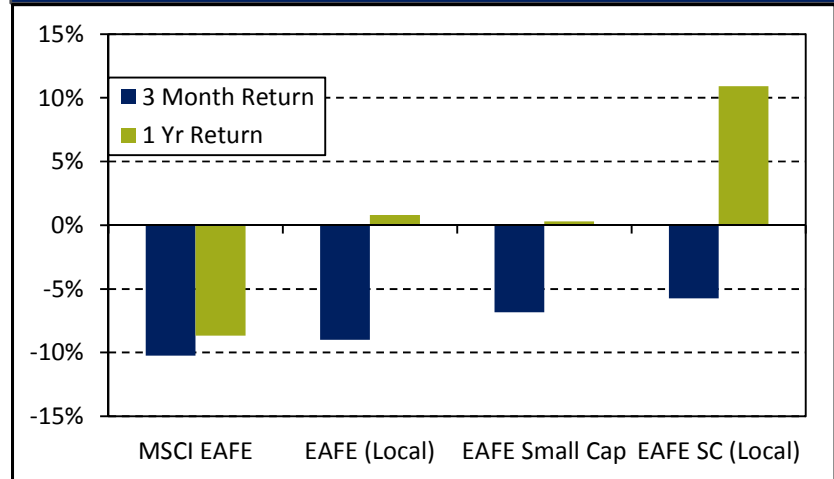
Source: Bloomberg

## Margins elevated but not at extremes



Source: Bloomberg, MSCI

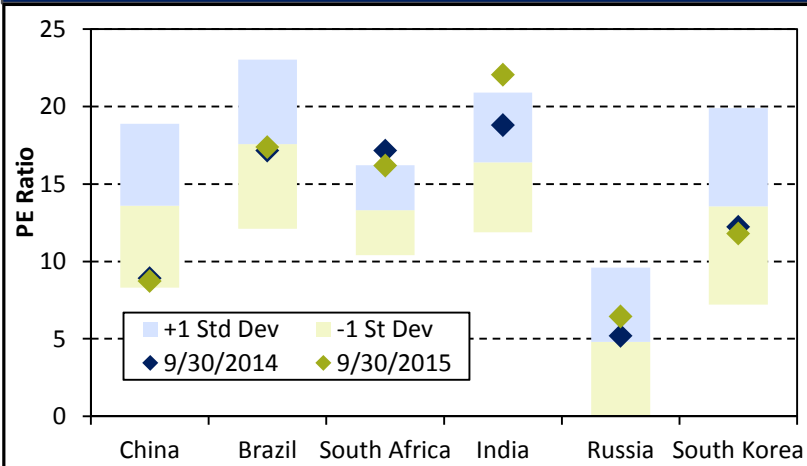
## Returns pulled lower by dollar strength



Source: Bloomberg, MSCI

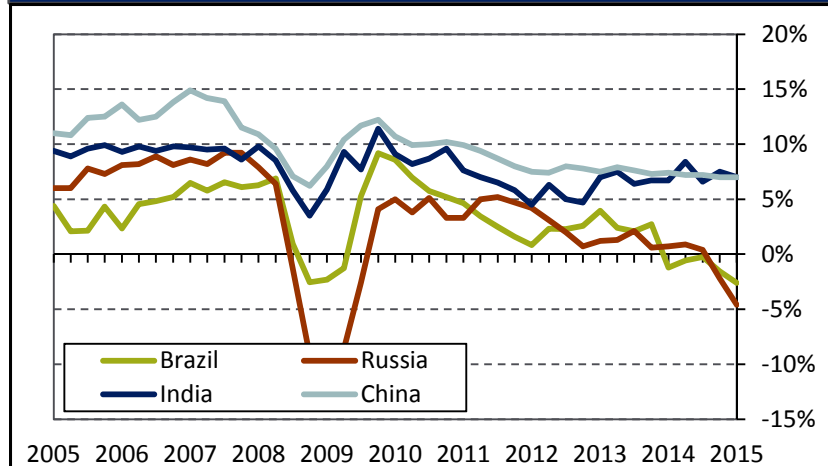
# Emerging Markets Equity

## Regional valuations show divergence



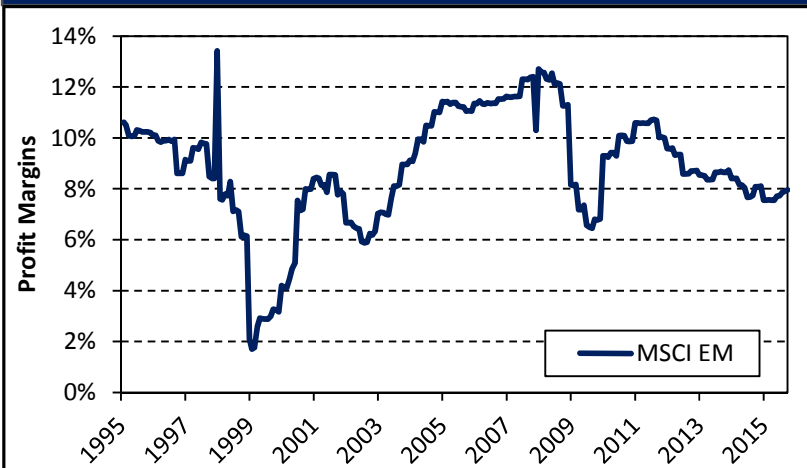
Source: Bloomberg, MSCI

## Slowing growth in major economies



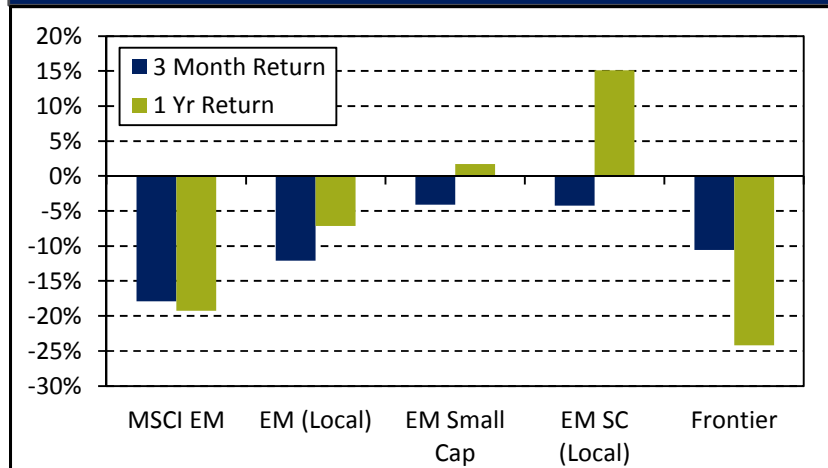
Source: Bloomberg

## Profit margins in line with history



Source: Bloomberg, MSCI

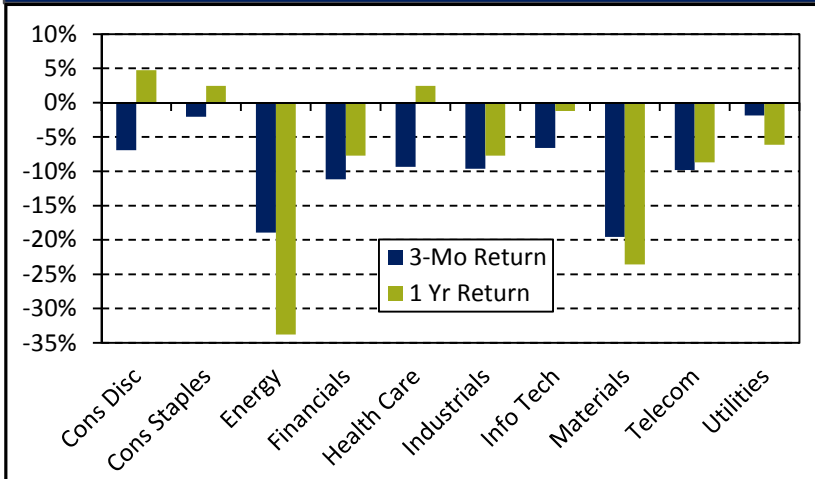
## EM returns especially negative



Source: Bloomberg, MSCI

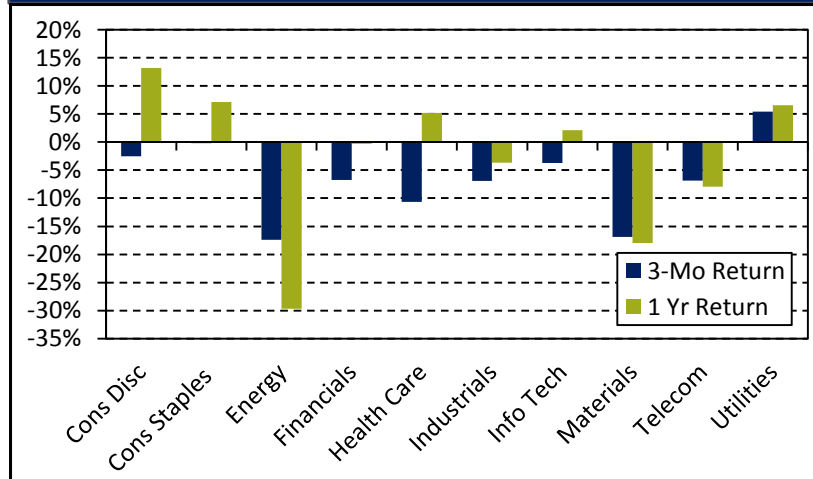
## Global Equity by Sector

### Energy returns sharply negative



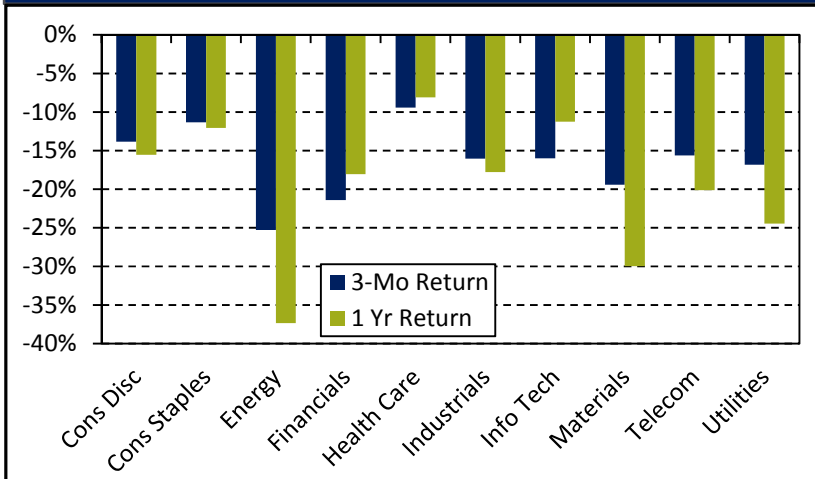
Source: Bloomberg, MSCI

### Divergence among S&P 500 sectors



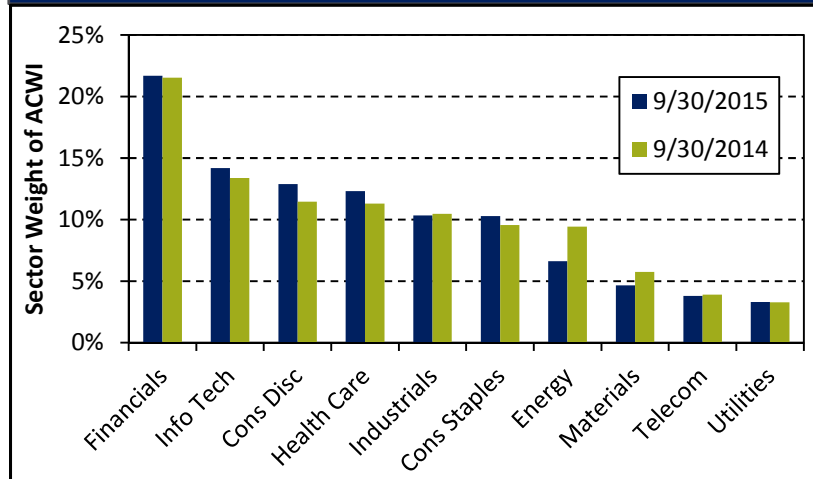
Source: Bloomberg, Standard and Poors

### Energy sensitivity especially pronounced in EM



Source: Bloomberg, MSCI

### Global energy sector weight has fallen

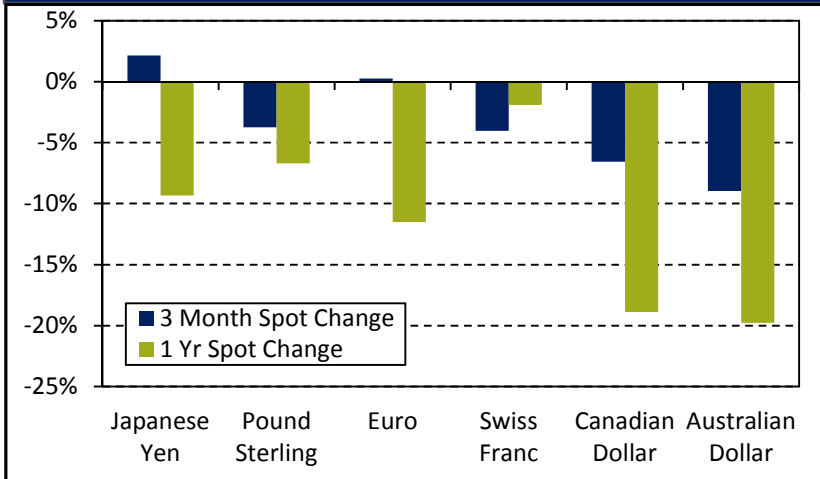


Source: Bloomberg, MSCI



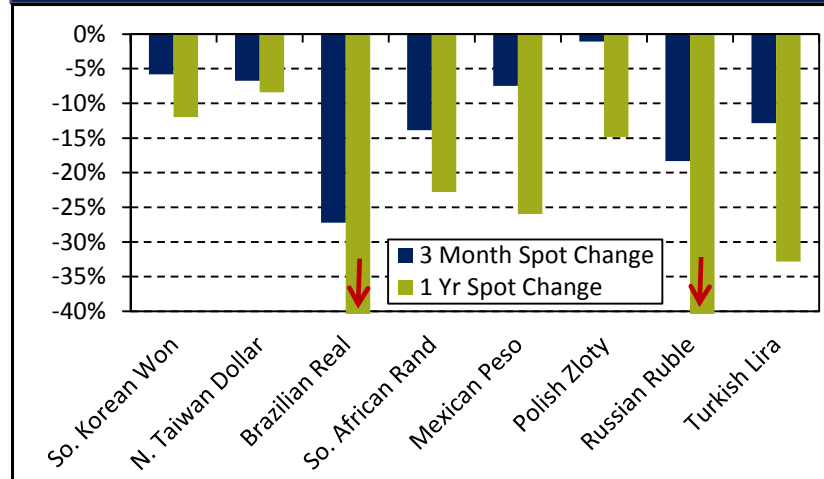
# Currencies

## Developed currencies mostly negative versus the dollar



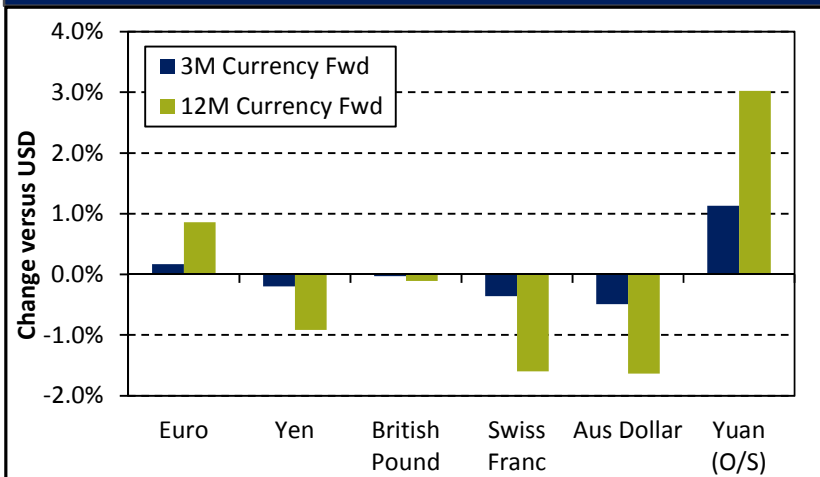
Source: Bloomberg

## EM currencies have suffered in unique fashions



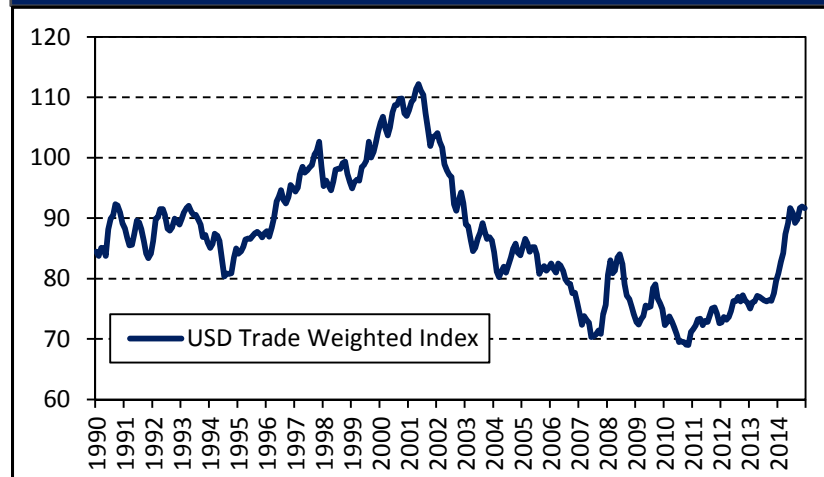
Source: Bloomberg

## Yen and GBP expected to decline versus USD



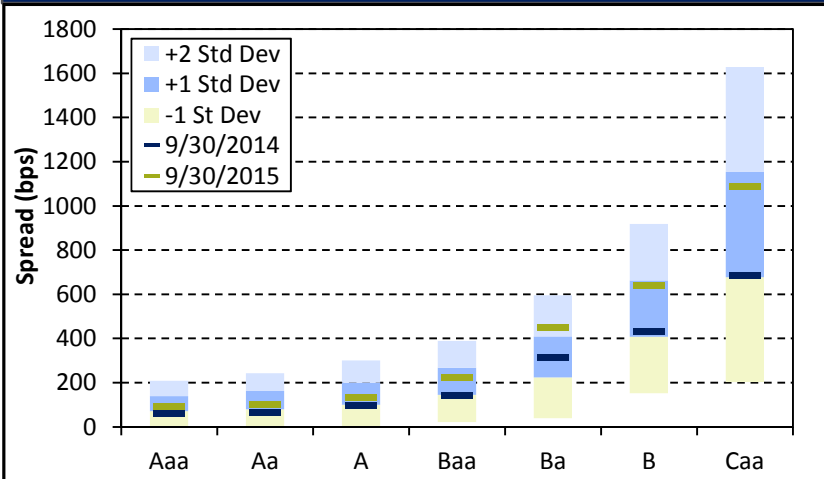
Source: Bloomberg

## Recent dollar strength pronounced



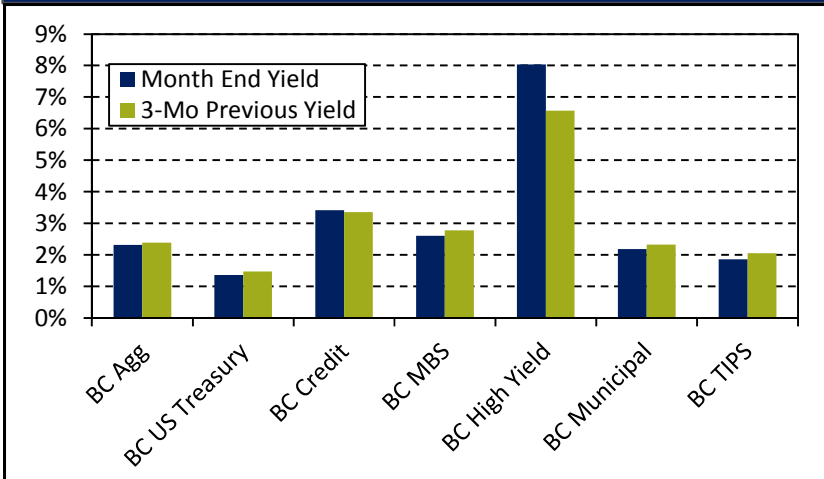
Source: Bloomberg, Federal Reserve

Spread levels drifting above historical medians



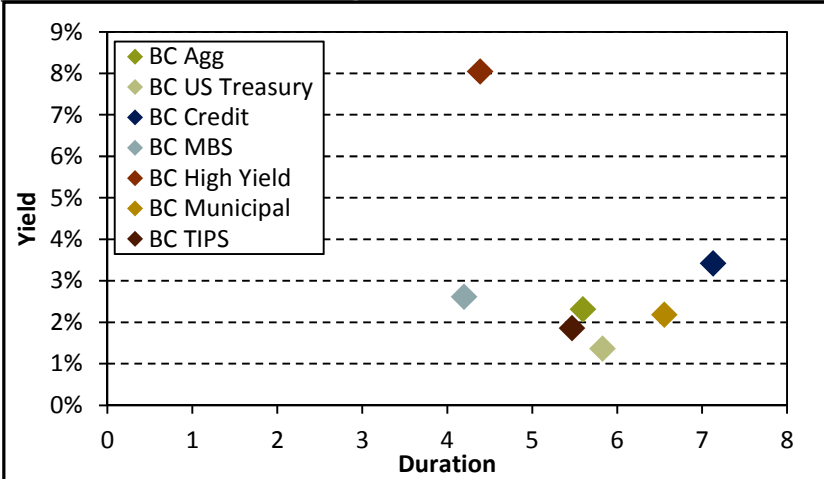
Source: Bloomberg, Barclays

High yield spreads have increased



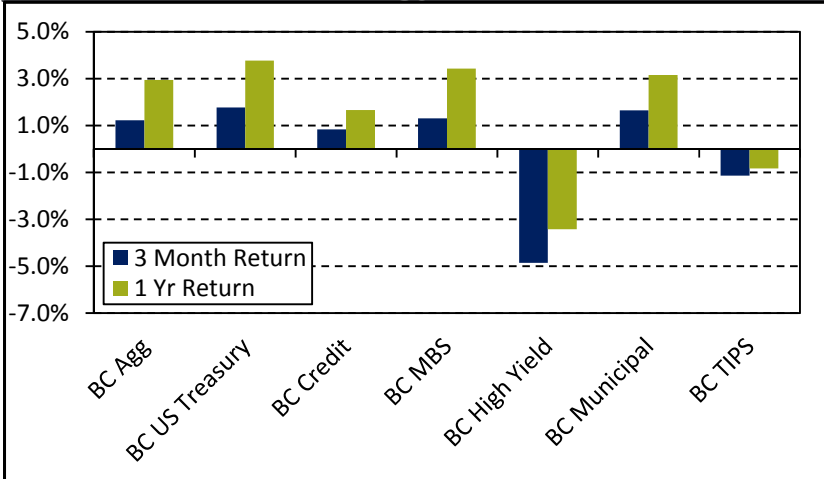
Source: Bloomberg, Barclays

Similar yield/duration tradeoff among major US indices



Source: Bloomberg, Barclays

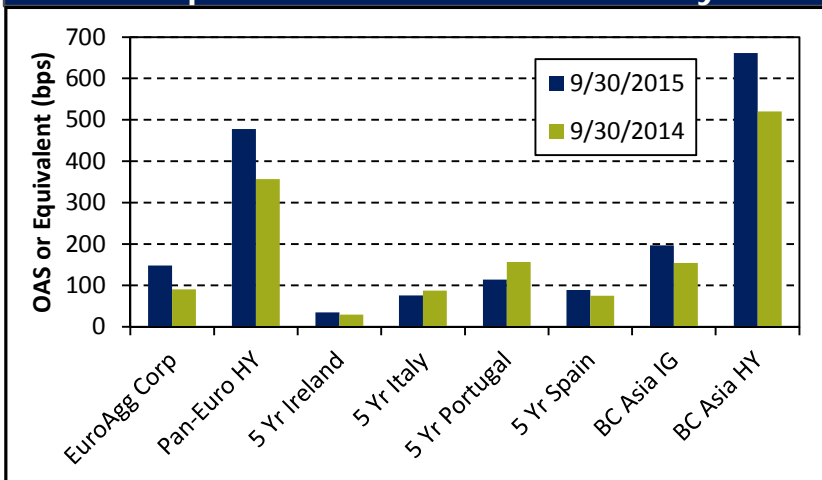
Negative high yield returns driven by energy distress



Source: Bloomberg, Barclays

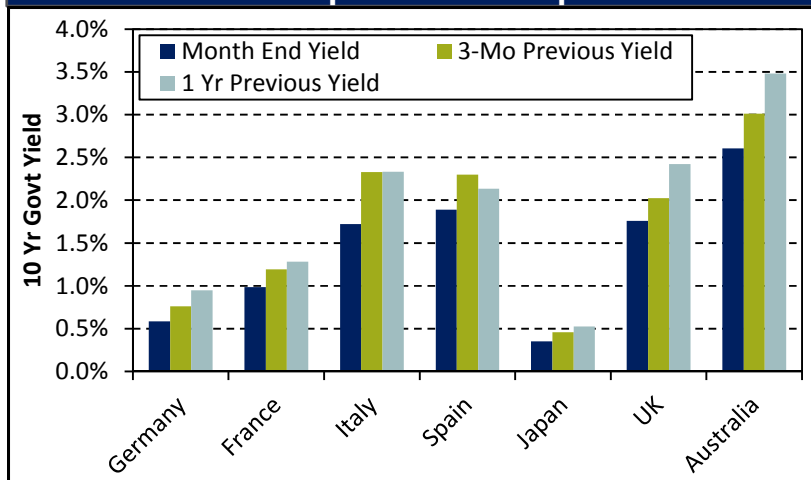
## International Developed Fixed Income

### European periphery yields at small premium relative to Germany



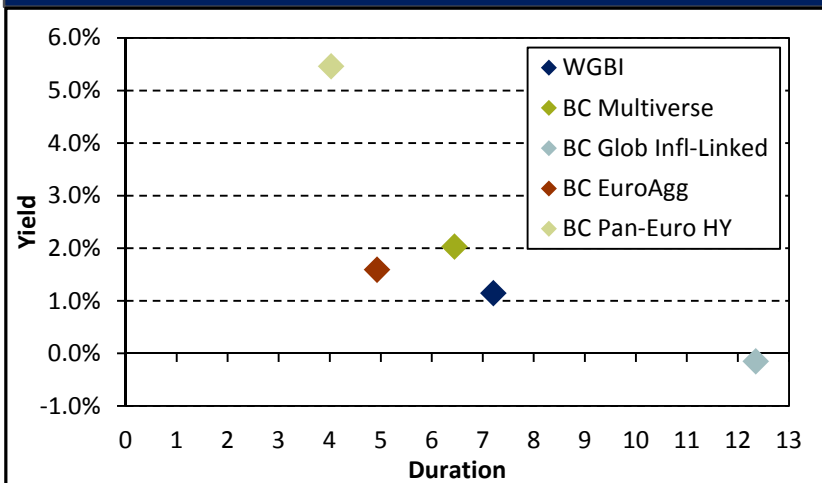
Source: Barclays, Bloomberg, \*European periphery spreads are over equivalent German Bund

### Global yields are at or near historic lows despite recent uptick



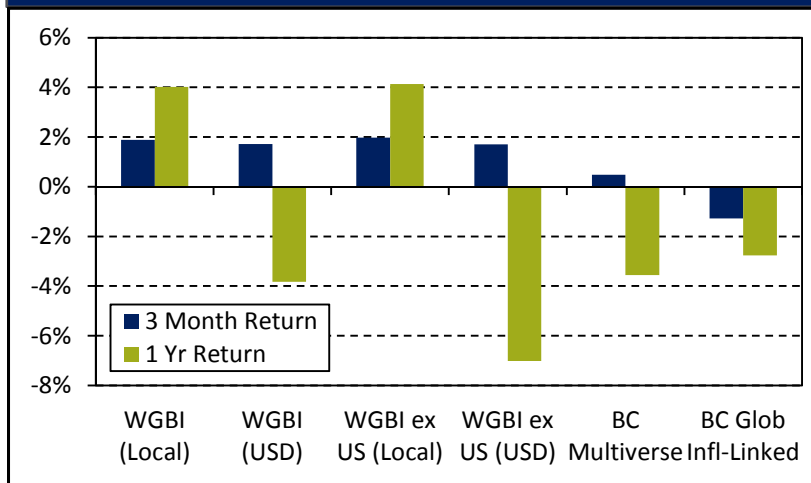
Source: Bloomberg

### Low global yields relative to duration



Source: Bloomberg, Citigroup, Barclays

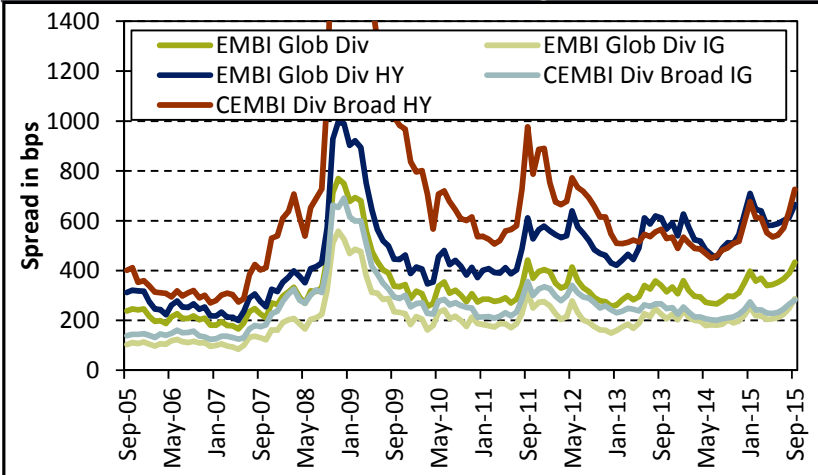
### Global bonds negative over one year in USD terms



Source: Bloomberg, Citigroup, Barclays

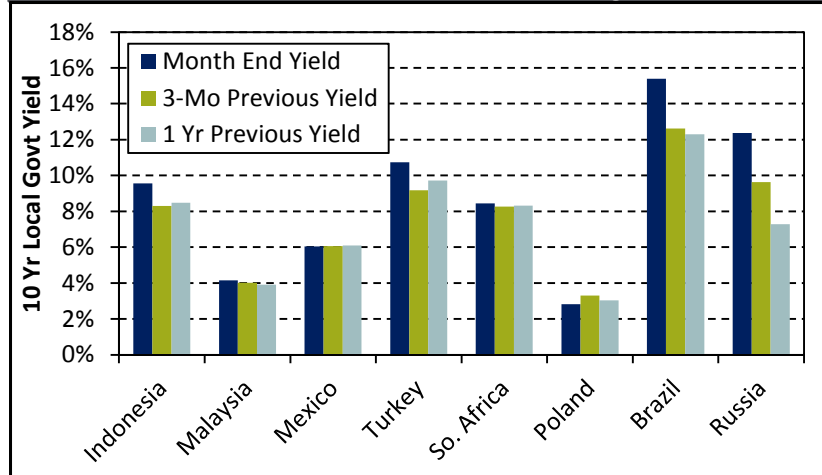
# Emerging Markets Fixed Income

## Spreads have widened slightly, still in line with history



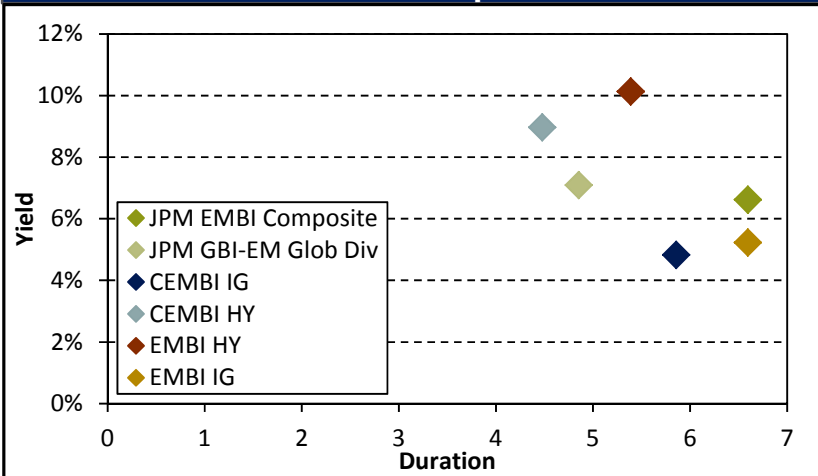
Source: Bloomberg, JP Morgan

## Emerging market bond yield changes have varied directionally



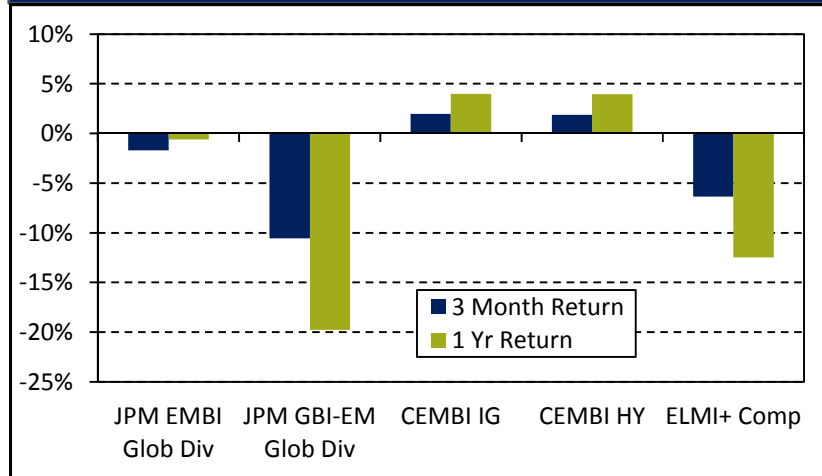
Source: Bloomberg

## EM yields higher versus global counterparts



Source: Bloomberg, JP Morgan

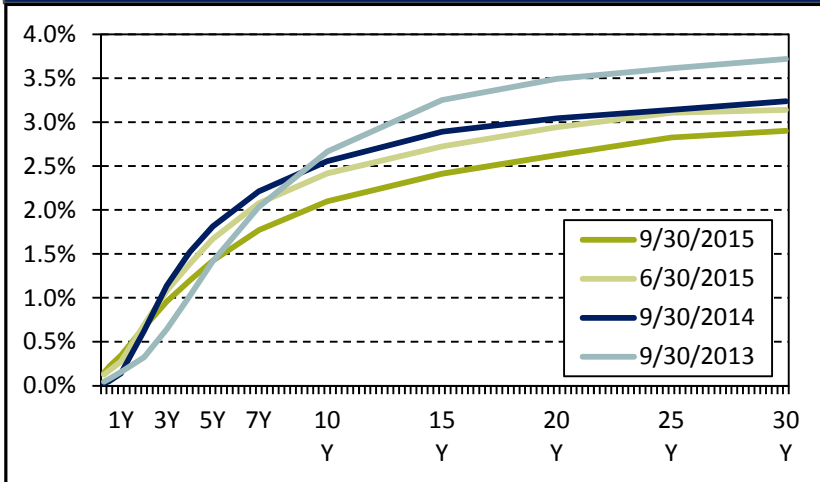
## Currency effect pronounced in EMD returns



Source: Bloomberg, JP Morgan

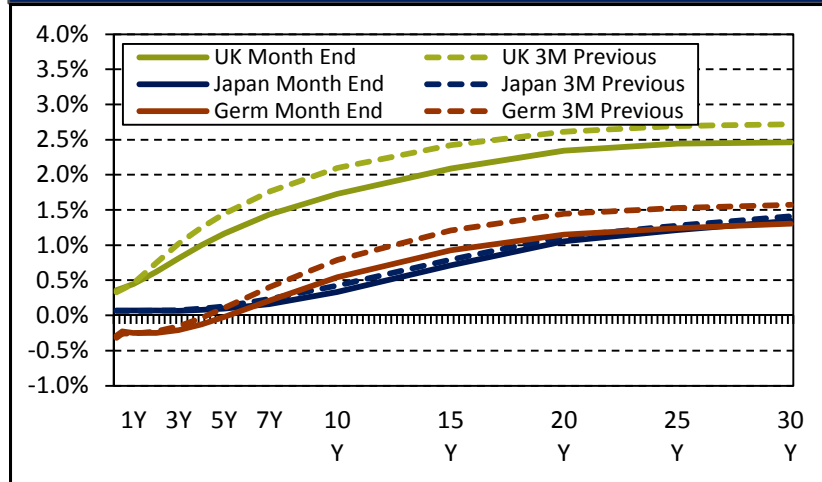
## Rates

### Treasury yield curve moderately lower versus Q2



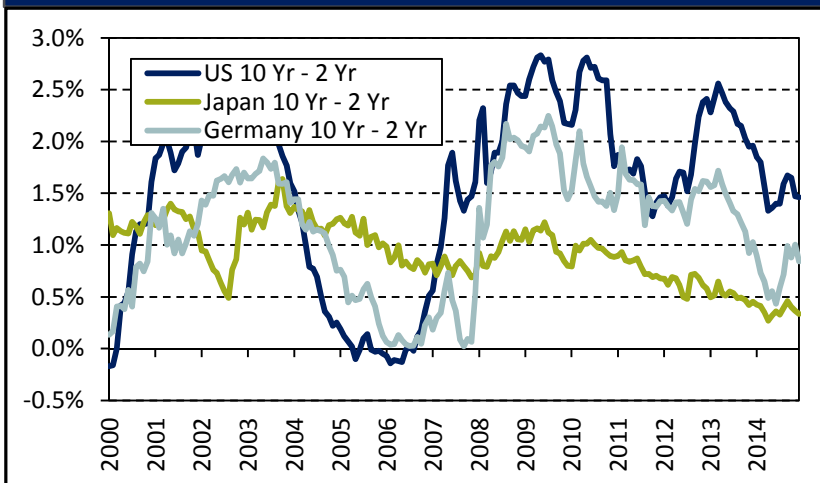
Source: Bloomberg

### German and UK curves have shifted downwards



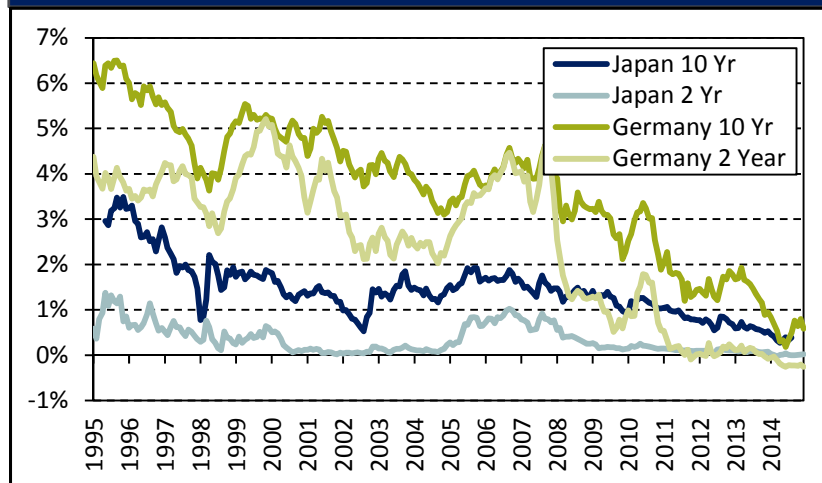
Source: Bloomberg

### Global yield curves have flattened



Source: Bloomberg

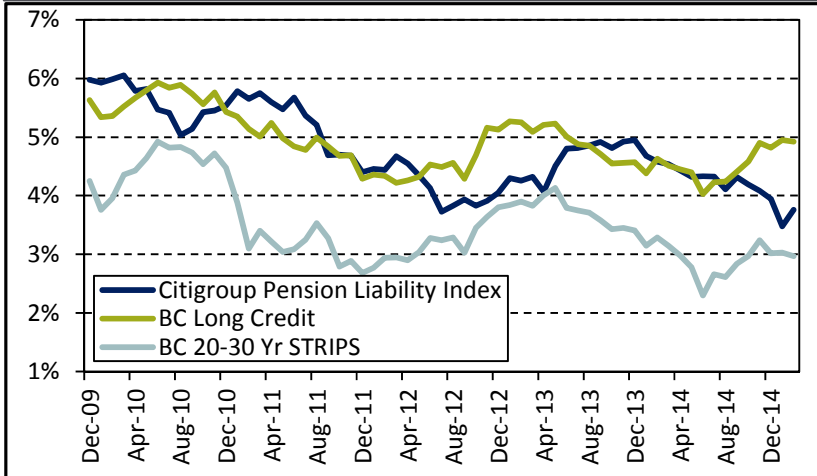
### Global yields have trended lower over long term



Source: Bloomberg

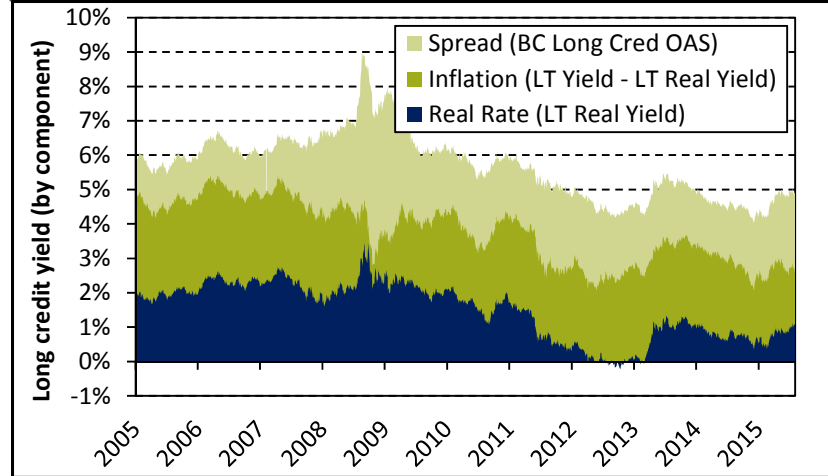
## Long Rates and Liability

### Long duration yields have fallen over last few years even with recent uptick



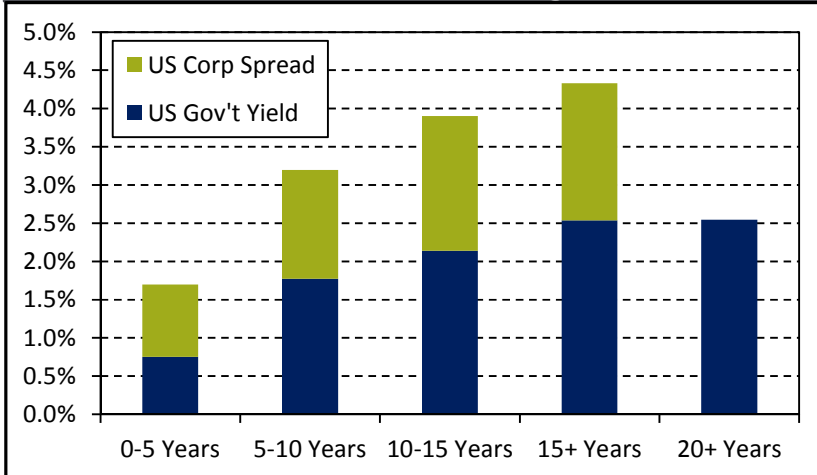
Source: Bloomberg, Citigroup, Barclays

### Lower yields driven by low inflation expectations and real rates



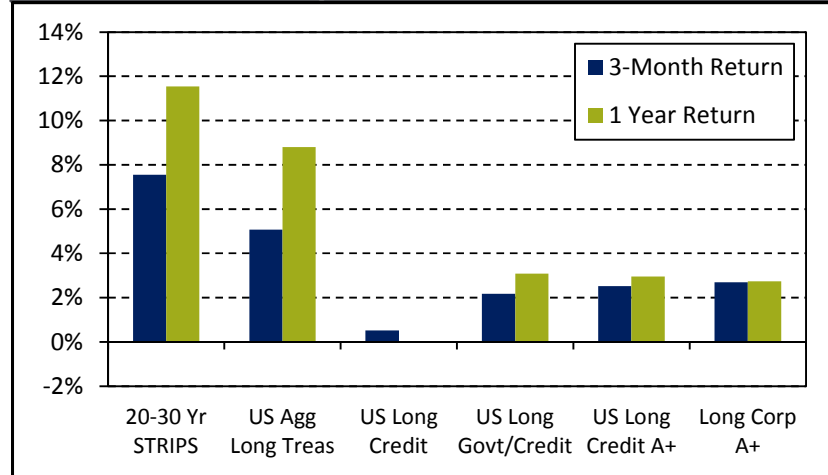
Source: Bloomberg, US Treasury, Barclays, NEPC

### Yields are low but spreads slightly above historic averages



Source: Bloomberg, BofA Merrill Lynch, Barclays \*No index for 20+ year corporate

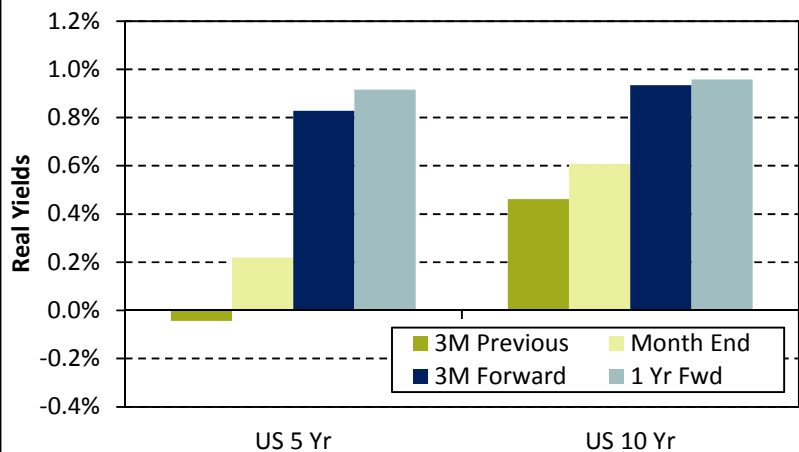
### Recent compression in rates has led to positive returns



Source: Bloomberg, Barclays

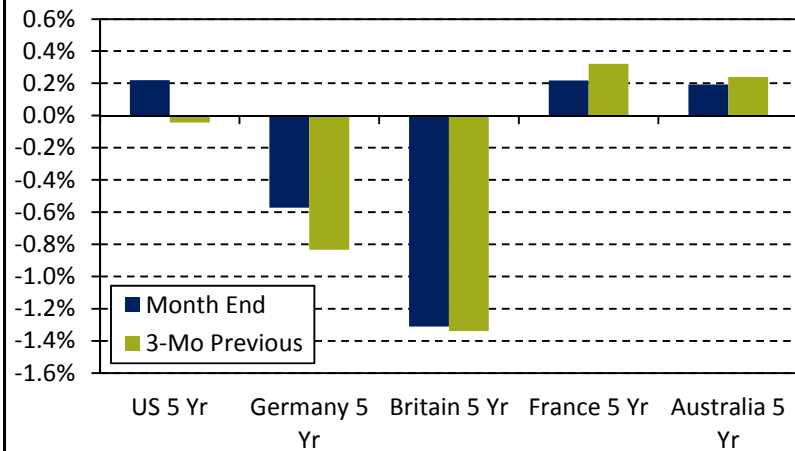
## Inflation and Real Rates

### US real yields have risen slightly



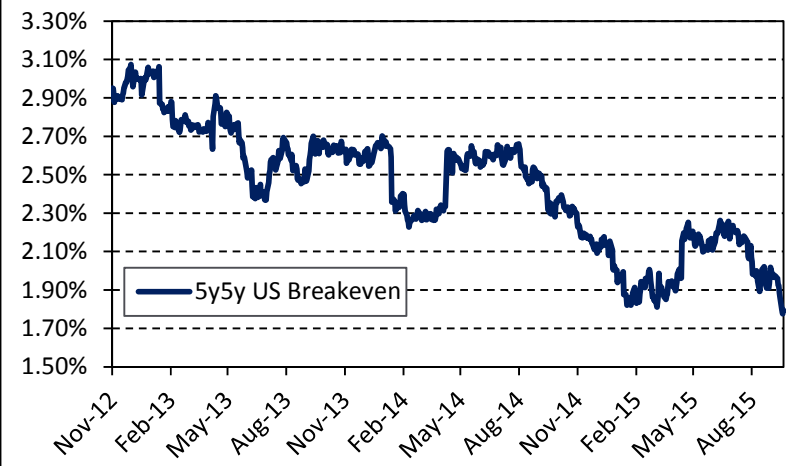
Source: Bloomberg

### Global real yields are flat to negative



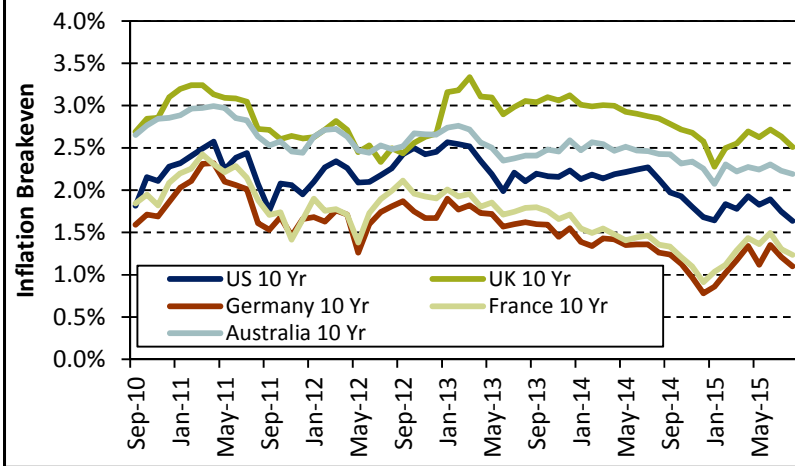
Source: Bloomberg

### US inflation expectations on downward trend



Source: Bloomberg

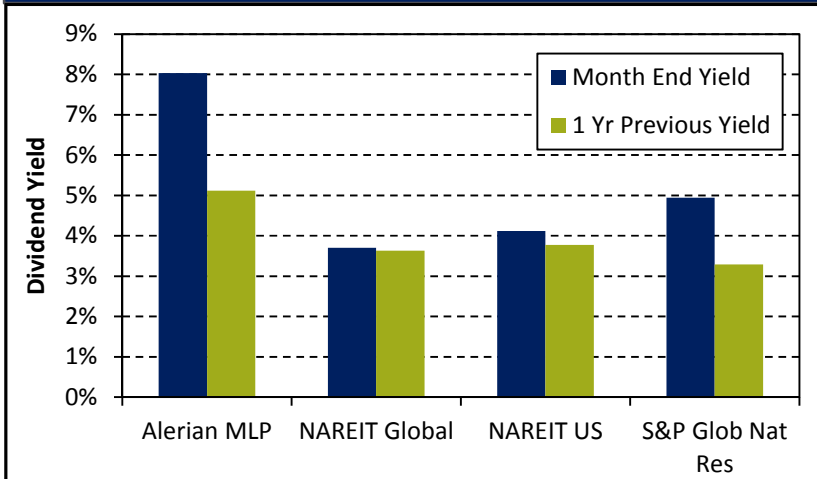
### Global inflation expectations remain subdued



Source: Bloomberg

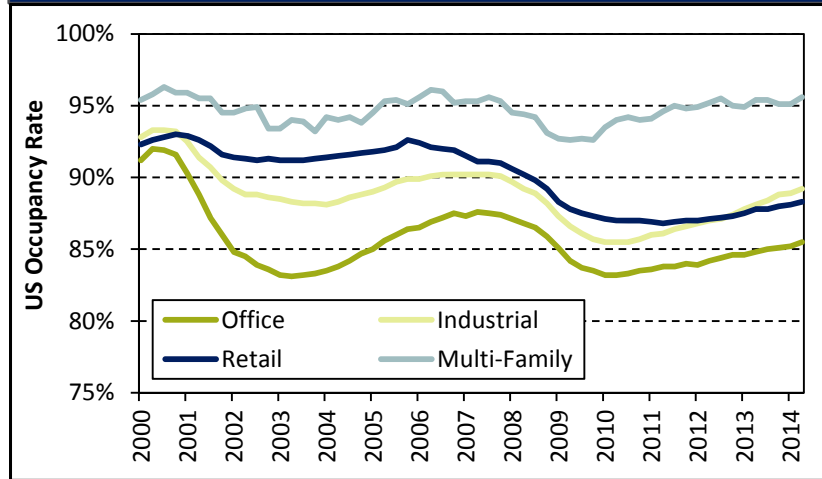
# Inflation Sensitive Growth Assets

## Yields slightly higher relative to last year



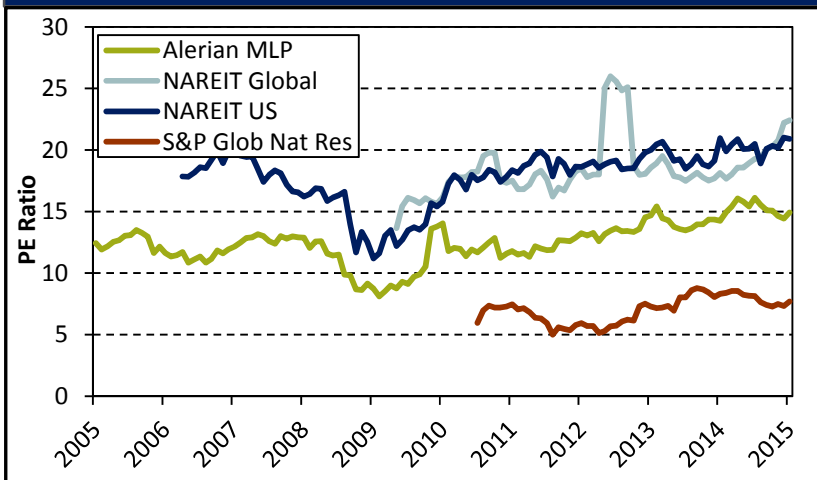
Source: Bloomberg, Alerian, Nareit, Standard and Poors

## Gradual recovery in occupancy rates



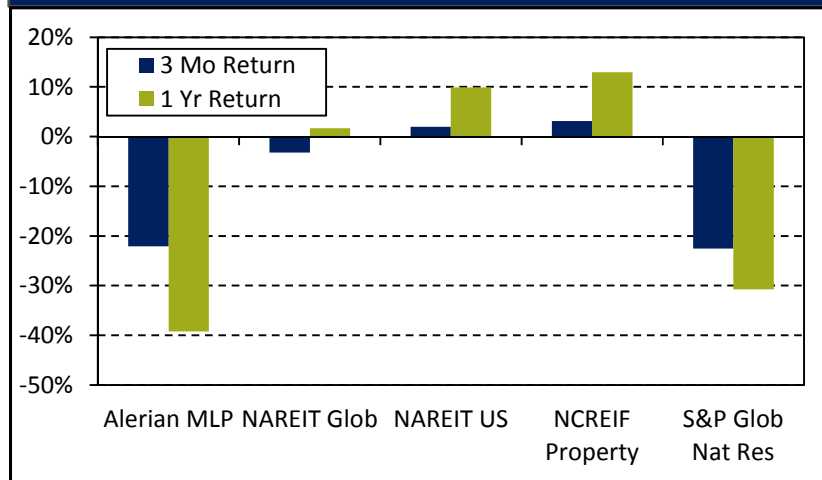
Source: Bloomberg, CB Richard Ellis

## PE Ratios near or above averages



Source: Bloomberg, US Census Bureau

## Recent REIT selloff has cut into long rally

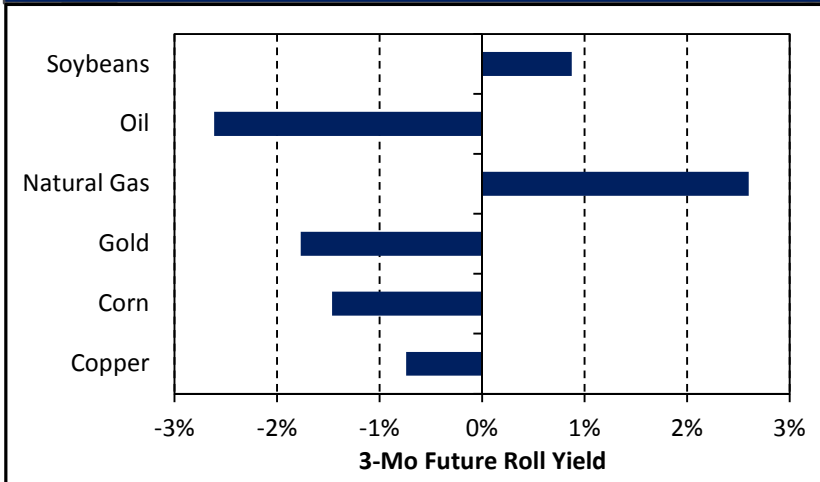


Source: Bloomberg, Alerian, Nareit, Standard and Poors



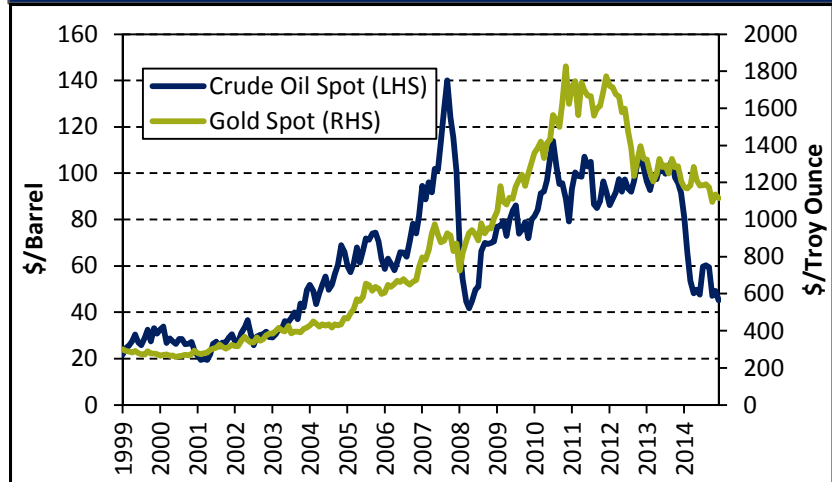
# Commodities

## Negative roll yields in major commodity futures



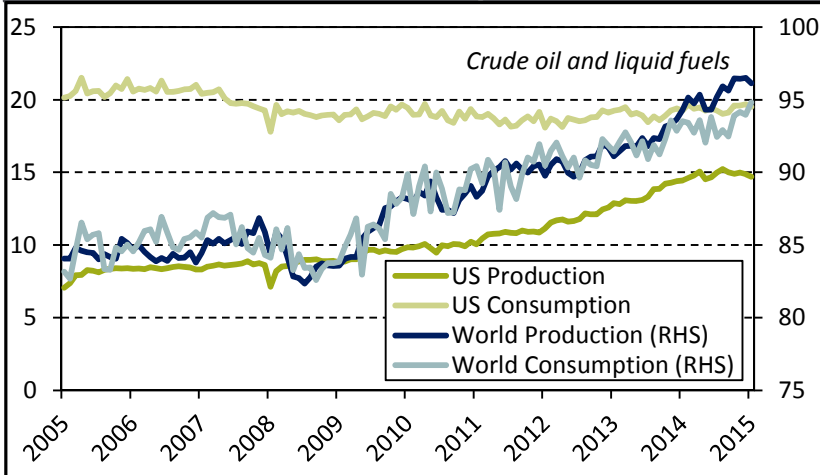
Source: Bloomberg

## Precipitous fall in oil prices



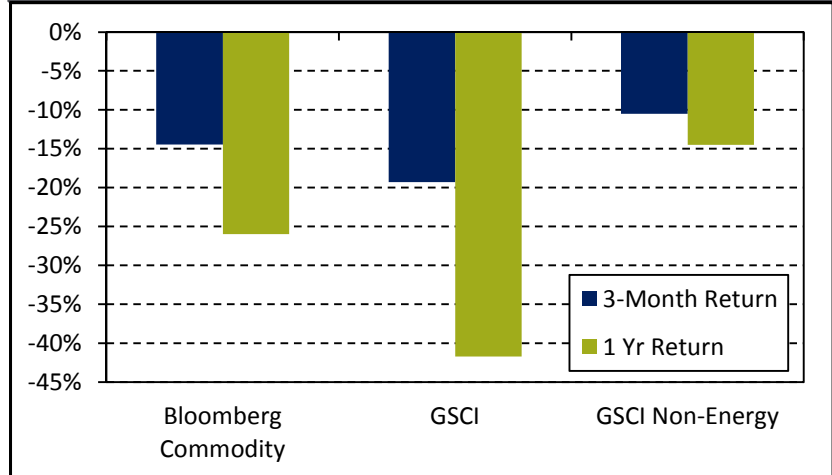
Source: Bloomberg

## US fuel production closing gap with consumption



Source: Bloomberg, US Department of Energy \*Crude oil and liquid fuels

## Commodity indices negative after oil-induced decline



Source: Bloomberg, Standard and Poors

## Glossary of Investment Terminology

The calculation methodology for each measure of performance is outlined below.

Measurement	Description	Equation
<b>Policy Target</b>	Measures policy allocation decisions.	= TARGET ASSET WEIGHTS X INDEX RETURNS
<b>Allocation Index</b>	Measures actual allocation decisions. Deviations from the policy target can be derived. (Allocation Index – Policy Index)	= ACTUAL ASSET WEIGHTS X INDEX RETURNS
<b>Composite (Total Return)</b>	Measures actual performance and can derive active management decisions. (Composite – Allocation Index)	= ACTUAL ASSET WEIGHTS X ACTUAL RETURNS

The calculation methodology for each measure of attribution is outlined below.

Measurement	Description	Equation
<b>Allocation Effect</b>	Measure the effects of overweighting or underweighting managers and asset classes.	= (ACTUAL MANAGER WEIGHT – POLICY TARGET WEIGHT) X POLICY INDEX RETURN
<b>Selection Effect</b>	Measures the managers’ ability to add excess return relative to the policy index.	= (ACTUAL MANAGER RETURN – INDEX RETURN) X POLICY TARGET WEIGHT
<b>Interaction Effect</b>	Measures the cross correlation of both selection and allocation affects and is often referred to as an “error term”.	= (ACTUAL MANAGER RETURN X (ACTUAL MANAGER WEIGHT – POLICY TARGET WEIGHT)) – ((MANAGER WEIGHT – POLICY TARGET WEIGHT) X INDEX RETURN)

## 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

## 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 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.

$\text{Upside Capture} = \text{Total Return}(\text{Fund Returns}) / \text{Total Returns}(\text{BM Return})$  when Period Benchmark Return is  $> = 0$

$\text{Downside Capture} = \text{Total Return}(\text{Fund Returns}) / \text{Total Returns}(\text{BM Return})$  when Benchmark  $< 0$

Data Source: InvestorForce

## 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 generally reconciles custodian data to manager data. If the custodian cannot provide accurate data, manager data may be used.
- Trailing time period returns are determined by geometrically linking the holding period returns, from the first full month after inception to the report date. Rates of return are annualized when the time period is longer than a year. Performance is presented gross and/or net of manager fees as indicated on each page.
- For managers funded in the middle of a month, the "since inception" return will start with the first full month, although actual inception dates and cash flows are taken into account in all Composite calculations.
- This report may contain forward-looking statements that are based on NEPC's estimates, opinions and beliefs, but NEPC cannot guarantee that any plan will achieve its targeted return or meet other goals.