

# SECOND FISCAL QUARTER 2018 INVESTMENT PERFORMANCE ANALYSIS

## VERMONT STATE TEACHERS

February 28, 2018



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BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

# MARKET ENVIRONMENT

NEPC, LLC

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# QUARTERLY MARKET PERFORMANCE - EQUITIES

- **Domestic equity markets had yet another positive quarter, supported by generally positive macroeconomic data and bolstered by the prospect of corporate tax cuts; S&P 500 gained 6.6% for the three months ending December 31, hitting new highs in its ninth straight year in the black**
  - On a style basis, growth outperformed value across the market cap spectrum – continuing the trend from the beginning of the year and representing a notable reversal from 2016
  - On a size basis, larger cap stocks outperformed their smaller cap counterparts
  - On a sector basis, healthcare and consumer discretionary were the best performing sectors while utilities and telecommunication services lagged in the fourth quarter
- **Non-U.S. equity markets moved in line with the U.S. markets with emerging market small cap stocks taking the lead within the group during the quarter**
  - Developed market equities, measured by MSCI EAFE index, was up by 4.2% for the quarter
  - Emerging market equities, measured by MSCI EM index, was up by 7.4% for the quarter















# QUARTERLY MARKET PERFORMANCE – FIXED INCOME

- **Fixed Income categories posted low single-digit returns for the quarter. The U.S. yield curve flattened as short rates rose but longer-dated bond yields declined. Outside the U.S., the rally continued within emerging markets.**
  - The Barclays US Aggregate index gained 0.4% in the fourth quarter
  - Treasury Inflation-Protected Securities (TIPS) were among the highest performers with the Barclays TIPS up 1.3%
  - Long Treasuries maintained their upward trajectory, returning 2.4%
  - Emerging market local debt , largely helped by currencies, returned 0.8%



# PERFORMANCE OVERVIEW

## Q4 Market Summary

Macro			Equity			Credit			Real Assets		
US Dollar	VIX	US 10-Yr	S&P 500	MSCI EAFE	MSCI EM	US Agg.	High Yield	Dollar EMD	Oil	Gold	REITS
											
-1.0%	1.5	7 bps	6.6%	4.2%	7.4%	0.4%	0.5%	0.5%	16.9%	1.8%	2.3%

- **Equities ended the year on a high note with another strong quarter of returns on the back of accelerating global growth, a robust earnings season, and continued accommodative monetary policy**
  - Emerging markets continued their outperformance with a weaker dollar, rebounding earnings, and a significant rally in tech shares
- **Long-term US Treasury yields increased, but an additional Fed rate hike pushed up short-term yields even more, causing the curve to flatten**
- **Reflecting the pro-risk environment, volatility remained subdued and the US dollar continued to decline – ending the year down nearly 10%**

Market segment (index representation) as follows: US Dollar (DXY Index), VIX (CBOE Volatility Index), US 10-Year (US 10-Year Treasury Yield), S&P 500 (US Equity), MSCI EAFE Index (International Developed Equity), MSCI Emerging Markets (Emerging Markets Equity), US Agg (Barclays US Aggregate Bond Index), High Yield (Barclays US High Yield Index), Dollar EMD (JPM Emerging Market Bond Index), Crude Oil (WTI Crude Oil Spot), Gold (Gold Price Spot), and REITs (NAREIT Composite Index).



# KEY MARKET THEMES

**Extended US Economic Cycle**

**Synchronized Economic Resurgence**

**Federal Reserve Gradualism**

**China Transitions**

**Globalization Backlash**



# **STATE TEACHERS' RETIREMENT SYSTEM**

NEPC, LLC

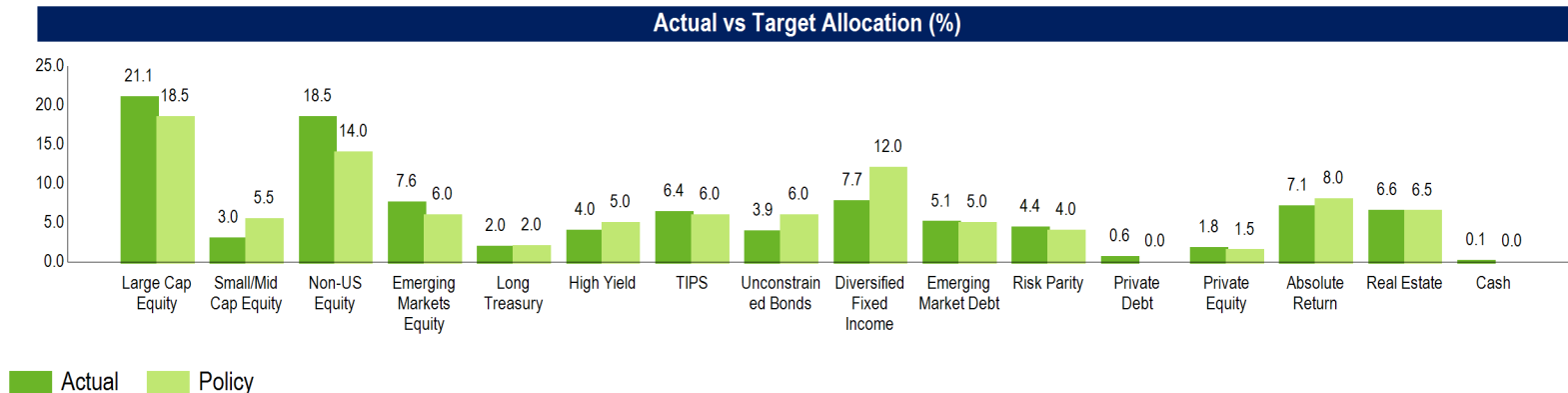
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# TOTAL FUND PERFORMANCE SUMMARY - NET

	Market Value	3 Mo	Rank	Fiscal YTD	Rank	1 Yr	Rank	3 Yrs	Rank	5 Yrs	Rank	7 Yrs	Rank	10 Yrs	Rank
<b>Total Teachers Composite</b>	<b>\$1,851,643,124</b>	<b>3.3%</b>	<b>63</b>	<b>6.4%</b>	<b>75</b>	<b>13.7%</b>	<b>74</b>	<b>6.8%</b>	<b>63</b>	<b>6.4%</b>	<b>95</b>	<b>6.6%</b>	<b>86</b>	<b>4.6%</b>	<b>88</b>
<i>Policy Index</i>		3.1%	80	6.5%	72	13.3%	82	6.6%	72	6.5%	94	6.3%	92	4.4%	91
<i>Allocation Index</i>		3.6%	48	7.1%	43	14.4%	57	6.7%	68	6.5%	94	6.3%	92	4.6%	88
<i>InvestorForce Public DB Net Median</i>		3.5%		6.9%		14.7%		7.1%		8.4%		7.6%		5.6%	

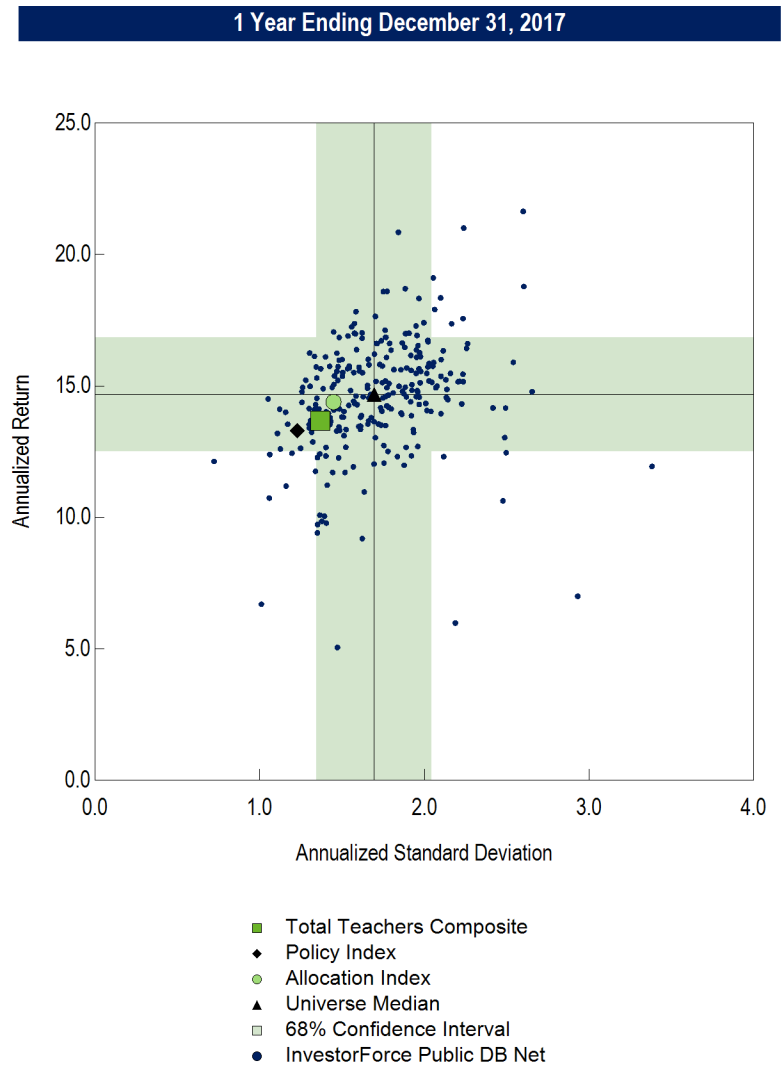
3 Years Ending December 31, 2017								
	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Sharpe Ratio	Rank	Sortino Ratio RF	Rank
Total Teachers Composite	6.80%	63	5.01%	15	1.27	20	2.04	5
Policy Index	6.58%	72	4.91%	10	1.26	23	2.00	6
Allocation Index	6.68%	68	5.09%	17	1.23	29	1.88	14

5 Years Ending December 31, 2017								
	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Sharpe Ratio	Rank	Sortino Ratio RF	Rank
Total Teachers Composite	6.42%	95	5.31%	27	1.16	85	2.06	70
Policy Index	6.53%	94	5.01%	13	1.25	76	2.21	54
Allocation Index	6.53%	94	5.08%	16	1.23	78	2.12	62





# TOTAL FUND RISK/RETURN - NET



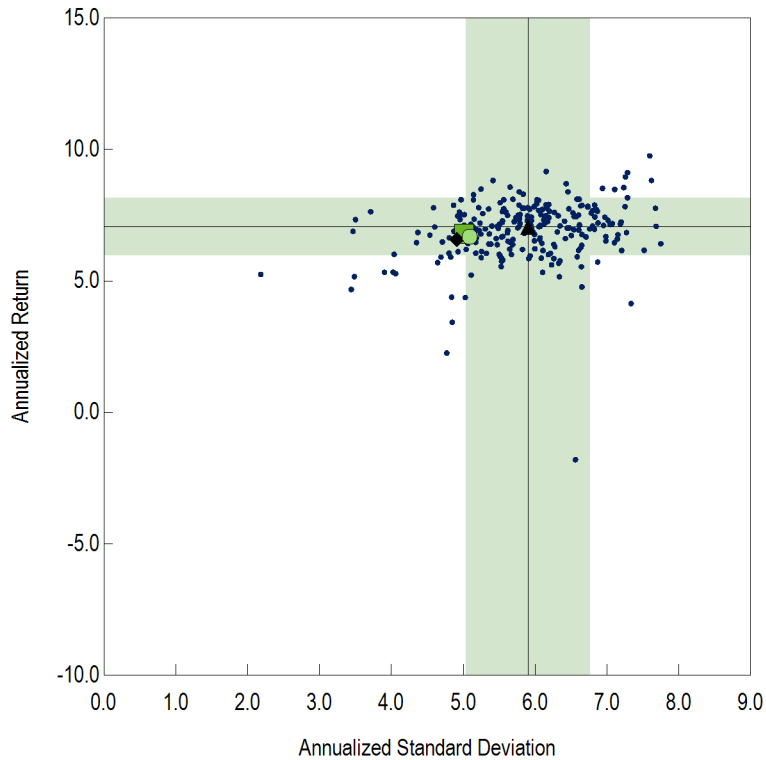
1 Year Ending December 31, 2017

	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank
Total Teachers Composite	13.68%	74	1.37%	16	9.34	25
Policy Index	13.29%	82	1.23%	5	10.07	13
S&P 500	21.83%	1	3.94%	99	5.31	97
Citi WGBI	7.49%	99	3.30%	99	1.99	99
MSCI ACWI	23.97%	1	2.84%	99	8.12	52
MSCI ACWI ex USA	27.19%	1	3.88%	99	6.78	83
InvestorForce Public DB Net Median	14.68%	--	1.69%	--	8.17	--



# Total Fund Risk/Return - Net

3 Years Ending December 31, 2017



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

3 Years Ending December 31, 2017

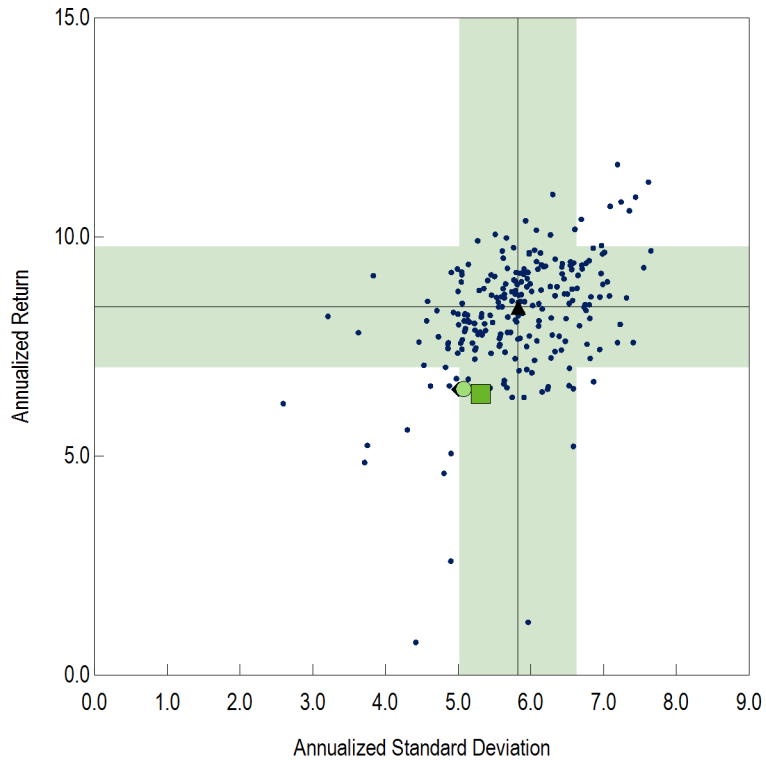
	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank
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Total Teachers Composite	6.80%	63	5.01%	15	1.27	20
Policy Index	6.58%	72	4.91%	10	1.26	23
S&P 500	11.41%	1	10.07%	99	1.09	62
Citi WGBI	1.74%	99	5.83%	47	0.23	99
MSCI ACWI	9.30%	1	10.51%	99	0.84	94
MSCI ACWI ex USA	7.83%	14	12.04%	99	0.62	99
InvestorForce Public DB Net Median	7.05%	--	5.90%	--	1.13	--



# TOTAL FUND RISK/RETURN - NET

5 Years Ending December 31, 2017



5 Years Ending December 31, 2017

	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank
Total Teachers Composite	6.42%	95	5.31%	27	1.16	85
Policy Index	6.53%	94	5.01%	13	1.25	76
S&P 500	15.79%	1	9.49%	99	1.64	10
Citi WGBI	0.12%	99	5.41%	30	-0.03	99
MSCI ACWI	10.80%	2	9.93%	99	1.06	93
MSCI ACWI ex USA	6.80%	89	11.50%	99	0.57	99
InvestorForce Public DB Net Median	8.40%	--	5.83%	--	1.40	--



# TOTAL FUND RISK/RETURN - NET

7 Years Ending December 31, 2017



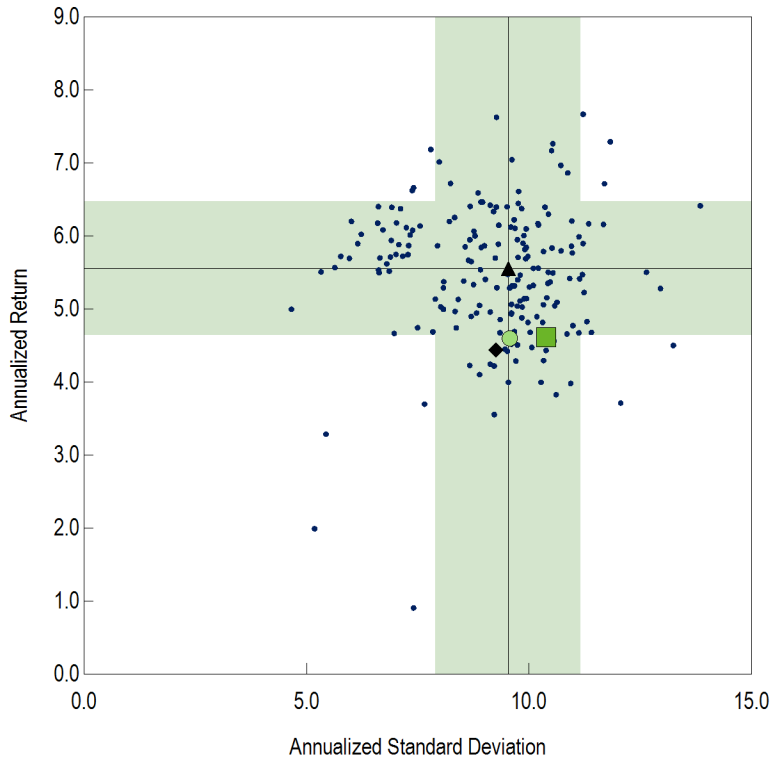
7 Years Ending December 31, 2017

	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank
Total Teachers Composite	6.62%	86	6.10%	29	1.05	65
Policy Index	6.28%	92	5.88%	21	1.03	71
S&P 500	13.76%	1	10.67%	99	1.27	21
Citi WGBI	1.21%	99	5.12%	7	0.20	99
MSCI ACWI	8.73%	12	11.89%	99	0.72	98
MSCI ACWI ex USA	4.93%	99	13.78%	99	0.34	99
InvestorForce Public DB Net Median	7.58%	--	6.76%	--	1.11	--



# TOTAL FUND RISK/RETURN - NET

10 Years Ending December 31, 2017



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

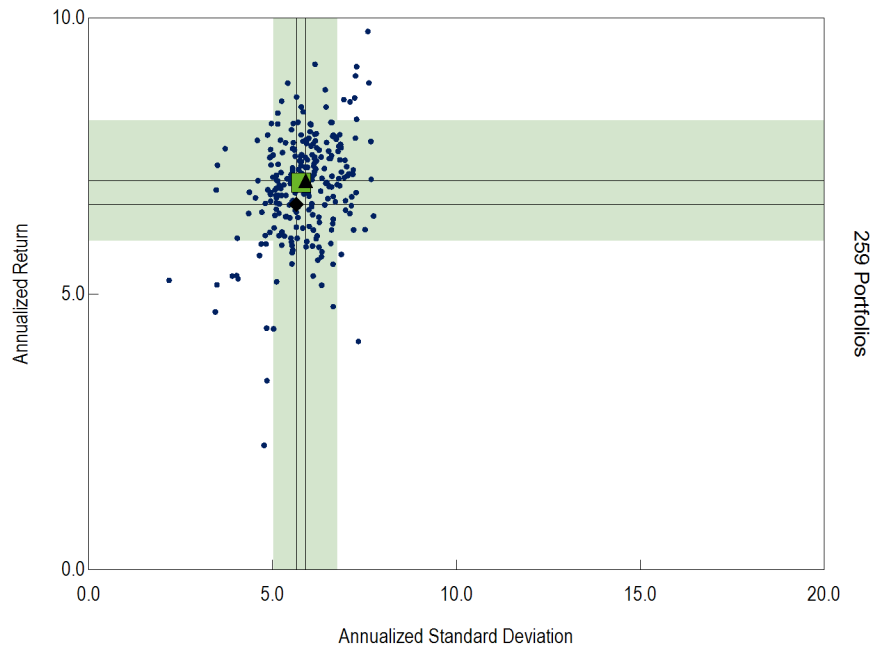
10 Years Ending December 31, 2017

	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank
Total Teachers Composite	4.61%	88	10.38%	79	0.41	90
Policy Index	4.44%	91	9.26%	44	0.45	82
S&P 500	8.50%	1	15.08%	99	0.54	54
Citi WGBI	2.67%	99	6.68%	8	0.35	97
MSCI ACWI	4.65%	87	16.79%	99	0.26	99
MSCI ACWI ex USA	1.84%	99	18.94%	99	0.08	99
InvestorForce Public DB Net Median	5.56%	--	9.53%	--	0.56	--



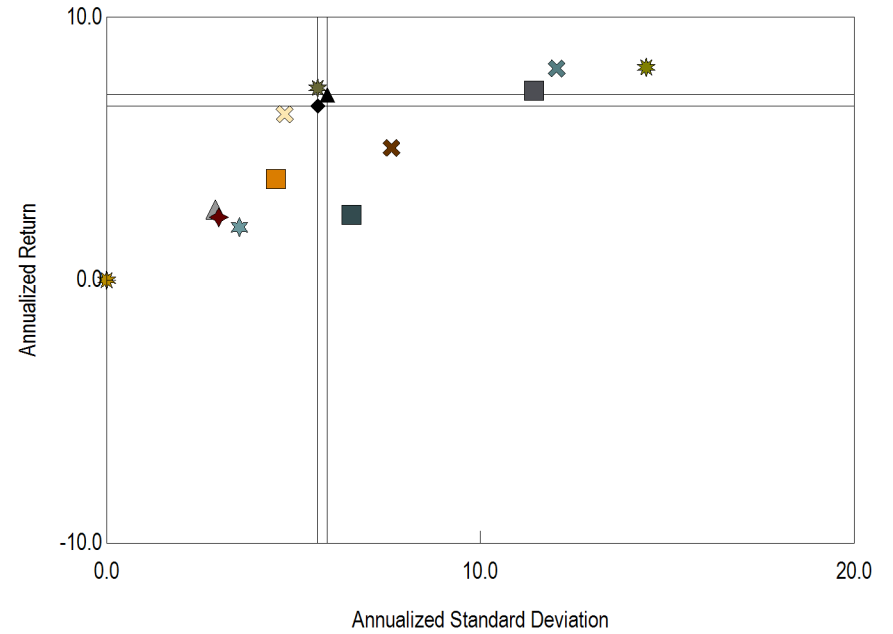
# TOTAL MARKETABLE ASSETS - NET

Annualized Return vs. Annualized Standard Deviation  
3 Years Ending December 31, 2017



- Total Marketable Assets
- ◆ Total Marketable Assets Custom Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB Net

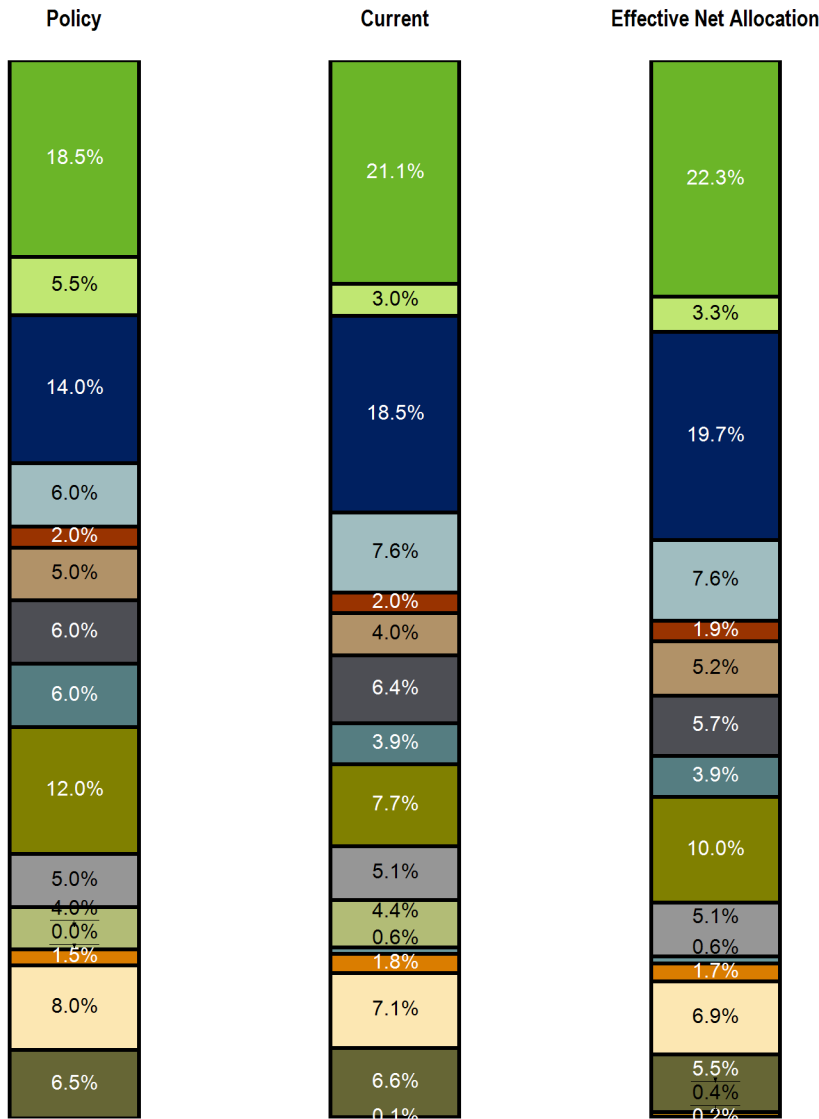
Annualized Return vs. Annualized Standard Deviation  
3 Years Ending December 31, 2017



- SSgA S&P 500 Cap-Wgt
- ⊗ SSgA S&P 500 Equal-Wgt
- ★ T. Rowe
- △ Champlain
- ◆ Wellington
- ✱ Acadian
- Mondrian
- ✱ SSgA ACWI Ex US
- ✱ Aberdeen
- △ PIMCO Core Plus
- ✱ BlackRock TIPS
- KDP
- ⊗ Guggenheim
- ✱ Wellington Opportunistic EMD
- ◆ PIMCO Unconstrained
- Mellon Dynamic Growth
- ✱ AQR Global Risk Premium
- ✱ Vermont Cash
- ◆ Total Marketable Assets Custom Index
- ▲ Universe Median
- 68% Confidence Interval



# TOTAL FUND ASSET ALLOCATION VS. POLICY TARGETS

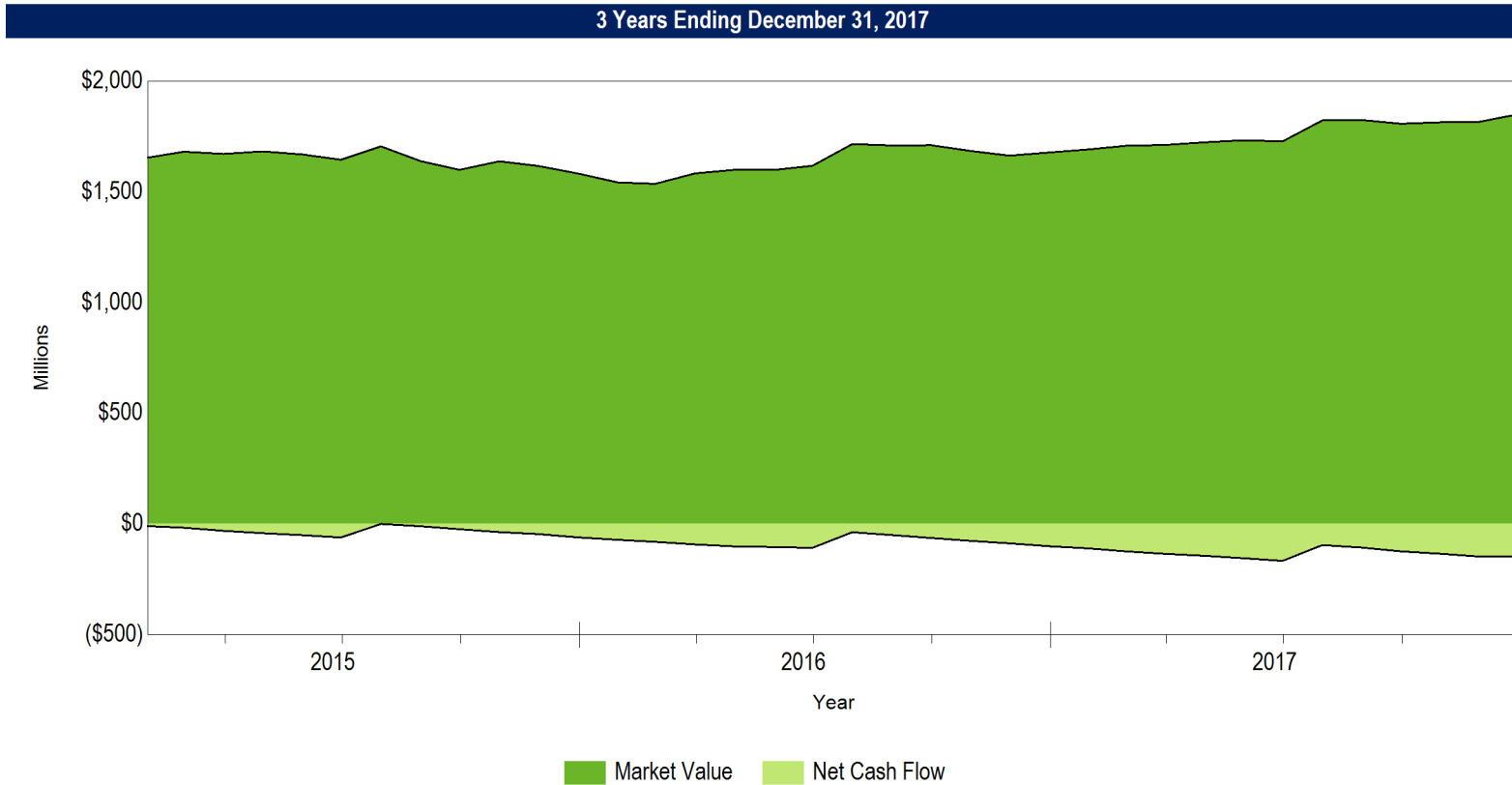


Asset Allocation vs. Target			
	Policy	Current	Effective Net Allocation
Large Cap Equity	18.5%	21.1%	22.3%
Small/Mid Cap Equity	5.5%	3.0%	3.3%
Non-US Equity	14.0%	18.5%	19.7%
Emerging Markets Equity	6.0%	7.6%	7.6%
Long Treasury	2.0%	2.0%	1.9%
High Yield	5.0%	4.0%	5.2%
TIPS	6.0%	6.4%	5.7%
Unconstrained Bonds	6.0%	3.9%	3.9%
Diversified Fixed Income	12.0%	7.7%	10.0%
Emerging Market Debt	5.0%	5.1%	5.1%
Risk Parity	4.0%	4.4%	--
Private Debt	0.0%	0.6%	0.6%
Private Equity	1.5%	1.8%	1.7%
Absolute Return	8.0%	7.1%	6.9%
Real Estate	6.5%	6.6%	5.5%
Commodities	--	--	0.4%
Cash	--	0.1%	0.2%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Effective Net Allocation breaks out the exposure of AQR Global Risk Premium. Absolute Return includes Grosvenor, Pinnacle Natural Resources, L.P., and Allianz Structured Alpha.



# TOTAL FUND ASSET GROWTH SUMMARY



	Last Three Months	Fiscal Year-To-Date	One Year	Three Years
Beginning Market Value	\$1,807,680,703	\$1,727,857,427	\$1,677,902,518	\$1,653,682,205
Contributions	\$181,963,117	\$367,088,570	\$572,161,791	\$1,313,235,848
Withdrawals	-\$204,381,426	-\$346,448,961	-\$617,579,306	-\$1,459,246,971
Net Cash Flow	-\$22,418,309	\$20,639,609	-\$45,417,515	-\$146,011,122
Net Investment Change	\$66,380,730	\$103,146,088	\$219,158,121	\$343,972,041
Ending Market Value	\$1,851,643,124	\$1,851,643,124	\$1,851,643,124	\$1,851,643,124





## TOTAL FUND ASSET GROWTH SUMMARY BY MANAGER

	Quarter Ending December 31, 2017					Ending Market Value
	Beginning Market Value	Contributions	Withdrawals	Net Cash Flow	Net Investment Change	
Aberdeen	\$133,611,025	\$252,406	-\$252,406	\$0	\$7,144,949	\$140,755,974
Acadian	\$65,522,543	\$98,818	-\$98,818	\$0	\$3,392,604	\$68,915,147
Allianz Structured Alpha	\$32,178,367	\$0	-\$137,061	-\$137,061	\$612,204	\$32,653,510
AQR Global Risk Premium	\$78,433,565	\$78,050	-\$78,050	\$0	\$3,781,580	\$82,215,145
Benefit Street Partners	--	\$23,823,269	\$0	\$23,823,269	-\$11,911,634	\$11,911,634
BlackRock TIPS	\$124,114,306	\$17,589	-\$7,517,589	-\$7,500,000	\$1,557,897	\$118,172,203
Champlain	\$53,906,746	\$101,126	-\$101,126	\$0	\$2,254,674	\$56,161,419
GAM	\$176,740	\$0	\$0	\$0	\$20,743	\$197,484
GAM Unconstrained Bond	\$61,398,824	\$0	-\$25,059,785	-\$25,059,785	-\$238,357	\$36,100,683
Grosvenor	\$53,051,976	\$0	\$0	\$0	\$1,288,297	\$54,340,273
Guggenheim	\$66,314,090	\$81,875	-\$12,081,875	-\$12,000,000	\$680,650	\$54,994,740
Harbourvest Dover IX Fund	\$3,270,436	\$872,439	-\$566,162	\$306,276	\$166,619	\$3,743,331
Harbourvest Dover VIII Fund	\$7,609,439	\$0	-\$922,985	-\$922,985	\$312,184	\$6,998,638
Harbourvest Partners IX Buyout Fund	\$6,729,220	\$415,234	-\$674,539	-\$259,305	\$529,749	\$6,999,665
Harbourvest Partners IX Credit Opportunities	\$1,139,523	\$40,392	-\$84,576	-\$44,184	-\$72,364	\$1,022,975
Harbourvest Partners IX Venture Fund	\$4,786,430	\$181,899	-\$188,221	-\$6,322	\$293,180	\$5,073,289
Harbourvest Partners X Buyout Fund	\$2,684,473	\$720,183	\$0	\$720,183	\$360,324	\$3,764,980
Harbourvest Partners X Venture Fund	\$1,798,950	\$623,959	\$0	\$623,959	\$27,562	\$2,450,471
HIPEP VII	\$2,555,619	\$235,134	\$0	\$235,134	\$341,016	\$3,131,769
KDP	\$18,773,948	\$29,485	-\$29,485	\$0	\$49,412	\$18,823,360
Mellon Dynamic Growth	\$51,459	\$0	\$0	\$0	\$103	\$51,563
Mondrian	\$62,736,081	\$72,848	-\$72,848	\$0	\$1,901,478	\$64,637,559
PIMCO Core Plus	\$95,428,647	\$30,071,328	-\$71,328	\$30,000,000	\$511,499	\$125,940,146
PIMCO Unconstrained	\$42,517,294	\$67,903	-\$6,567,903	-\$6,500,000	\$177,622	\$36,194,916
Pinnacle Natural Resources, L.P.	\$42,863,256	\$0	\$0	\$0	\$974,556	\$43,837,812



## TOTAL FUND ASSET GROWTH SUMMARY BY MANAGER

	Quarter Ending December 31, 2017					Ending Market Value
	Beginning Market Value	Contributions	Withdrawals	Net Cash Flow	Net Investment Change	
RREEF America REIT III	\$208,437	\$0	\$0	\$0	\$0	\$208,437
Siguler Guff DREOF II	\$13,244,520	\$8,906	-\$367,176	-\$358,270	\$0	\$12,886,250
Siguler Guff DREOF II Co-Investment	\$4,230,934	\$870,215	\$0	\$870,215	-\$1	\$5,101,147
SSgA ACWI Ex US	\$130,155,511	\$71,018,487	-\$18,487	\$71,000,000	\$8,700,786	\$209,856,297
SSgA Barclays Aggregate Index	\$115,671,021	\$13,231	-\$98,013,611	-\$98,000,380	-\$126,360	\$17,544,281
SSgA S&P 500 Cap-Wgt	\$258,614,461	\$50,022,268	-\$11,548,698	\$38,473,569	\$19,335,943	\$316,423,974
SSgA S&P 500 Equal-Wgt	\$74,705,177	\$7,681	-\$5,507,681	-\$5,500,000	\$4,728,838	\$73,934,015
State Street Long U.S. Treasury Index	\$35,445,519	\$3,865	-\$3,865	\$0	\$840,339	\$36,285,858
T. Rowe	\$2,468	\$0	\$0	\$0	-\$1,079	\$1,390
Transwestern / Aslan III	\$128,447	\$0	\$0	\$0	\$0	\$128,447
UBS Trumbull	\$85,481,531	\$191,011	-\$191,011	\$0	\$17,954,654	\$103,436,184
Vermont Cash	\$293,144	\$2,043,517	-\$224,019	\$1,819,498	\$0	\$2,112,642
Wellington	\$34,006,156	\$0	-\$34,002,119	-\$34,002,119	\$25,633	\$29,670
Wellington Opportunistic EMD	\$93,840,419	\$0	\$0	\$0	\$765,429	\$94,605,848
<b>Total</b>	<b>\$1,807,680,703</b>	<b>\$181,963,117</b>	<b>-\$204,381,426</b>	<b>-\$22,418,309</b>	<b>\$66,380,730</b>	<b>\$1,851,643,124</b>



Vermont State Teachers

# TOTAL FUND PERFORMANCE DETAIL - NET

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
<b>Total Teachers Composite</b>	<b>1,851,643,124</b>	<b>100.0</b>	<b>100.0</b>	<b>3.3</b>	<b>63</b>	<b>6.4</b>	<b>75</b>	<b>13.7</b>	<b>74</b>	<b>6.8</b>	<b>63</b>	<b>6.4</b>	<b>95</b>	<b>4.6</b>	<b>88</b>
<i>Policy Index</i>				3.1	80	6.5	72	13.3	82	6.6	72	6.5	94	4.4	91
<i>Allocation Index</i>				3.6	48	7.1	43	14.4	57	6.7	68	6.5	94	4.6	88
<i>InvestorForce Public DB Net Median</i>				3.5		6.9		14.7		7.1		8.4		5.6	
<b>Total Marketable Assets</b>	<b>1,553,756,831</b>	<b>83.9</b>	<b>84.0</b>	<b>3.6</b>	<b>47</b>	<b>6.8</b>	<b>54</b>	<b>15.4</b>	<b>36</b>	<b>7.0</b>	<b>52</b>	<b>6.3</b>	<b>96</b>	<b>--</b>	<b>--</b>
<i>Total Marketable Assets Custom Index</i>				3.4	61	7.0	48	14.5	55	6.6	71	6.6	92	--	--
<i>InvestorForce Public DB Net Median</i>				3.5		6.9		14.7		7.1		8.4		5.6	
<b>Total Domestic Equity</b>	<b>446,550,468</b>	<b>24.1</b>	<b>24.0</b>	<b>6.1</b>	<b>42</b>	<b>9.9</b>	<b>56</b>	<b>18.5</b>	<b>51</b>	<b>11.0</b>	<b>32</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
<i>Russell 3000</i>				6.3	36	11.2	40	21.1	38	11.1	30	15.6	30	8.6	49
<i>eV All US Equity Net Median</i>				5.6		10.4		18.7		9.8		14.5		8.5	
<b>Total Large Cap Equities</b>	<b>390,359,379</b>	<b>21.1</b>	<b>18.5</b>	<b>6.5</b>	<b>51</b>	<b>11.1</b>	<b>54</b>	<b>21.0</b>	<b>51</b>	<b>11.1</b>	<b>29</b>	<b>15.8</b>	<b>31</b>	<b>9.2</b>	<b>24</b>
<i>S&amp;P 500</i>				6.6	47	11.4	49	21.8	45	11.4	25	15.8	31	8.5	42
<i>eV US Large Cap Equity Net Median</i>				6.5		11.3		21.1		10.0		14.8		8.3	
<i>SSgA S&amp;P 500 Cap-Wgt</i>	316,423,974	17.1	14.0	6.6	47	11.4	49	21.8	45	11.4	24	15.8	31	--	--
<i>S&amp;P 500</i>				6.6	47	11.4	49	21.8	45	11.4	25	15.8	31	8.5	42
<i>SSgA S&amp;P 500 Equal-Wgt</i>	73,934,015	4.0	4.5	6.3	54	10.2	69	18.9	65	10.1	49	15.8	32	10.0	12
<i>S&amp;P 500 Equal Weighted</i>				6.2	57	10.0	71	18.9	66	10.1	49	15.8	31	10.2	11
<i>T. Rowe</i>	1,390	0.0	0.0												
<b>Total Small/Mid Cap Equities</b>	<b>56,191,089</b>	<b>3.0</b>	<b>5.5</b>	<b>3.5</b>	<b>82</b>	<b>4.9</b>	<b>91</b>	<b>9.6</b>	<b>90</b>	<b>9.9</b>	<b>40</b>	<b>14.4</b>	<b>37</b>	<b>9.5</b>	<b>39</b>
<i>Russell 2000</i>				3.3	85	9.2	56	14.6	65	10.0	40	14.1	43	8.7	59
<i>eV US Small-Mid Cap Equity Net Median</i>				5.5		9.6		17.1		9.3		13.7		9.1	
<i>Champlain</i>	56,161,419	3.0	2.8	4.0	88	6.1	92	17.4	58	12.4	13	16.3	14	--	--
<i>Custom SMID Cap Equity Index</i>				4.3	85	9.2	61	15.8	65	9.7	46	14.1	56	9.1	44
<i>eV US Mid Cap Equity Net Median</i>				5.7		9.8		19.6		9.5		14.4		8.9	
<i>Wellington</i>	29,670	0.0	2.8												

Fiscal Year End is 6/30.

Total Marketable Assets Custom Index mirrors the Plan Policy Index, while excluding Absolute Return, Real Estate, Private Debt and Private Equity.

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



# TOTAL FUND PERFORMANCE DETAIL - NET

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
<b>Total Non US Equity</b>	<b>484,164,977</b>	<b>26.1</b>	<b>20.0</b>	<b>4.8</b>	<b>58</b>	<b>10.5</b>	<b>69</b>	<b>29.3</b>	<b>56</b>	<b>9.4</b>	<b>48</b>	<b>7.2</b>	<b>79</b>	<b>--</b>	<b>--</b>
MSCI EAFE				4.2	66	9.9	79	25.0	84	7.8	74	7.9	66	1.9	82
MSCI ACWI ex USA				5.0	48	11.5	56	27.2	72	7.8	74	6.8	84	1.8	84
eV All ACWI ex-US Equity Net Median				4.9		12.0		29.9		9.3		8.6		3.5	
<b>Total Core Non US Equity</b>	<b>343,409,004</b>	<b>18.5</b>	<b>14.0</b>	<b>4.6</b>	<b>38</b>	<b>11.2</b>	<b>43</b>	<b>28.9</b>	<b>35</b>	<b>10.3</b>	<b>35</b>	<b>9.9</b>	<b>36</b>	<b>2.6</b>	<b>69</b>
MSCI EAFE				4.2	50	9.9	62	25.0	64	7.8	70	7.9	71	1.9	86
eV All EAFE Equity Net Median				4.2		10.4		26.6		8.9		9.0		3.4	
Acadian	68,915,147	3.7	4.0	5.0	30	12.3	32	36.8	11	14.7	12	13.0	14	3.1	53
Mondrian	64,637,559	3.5	4.0	2.9	84	8.9	75	22.1	83	7.2	82	8.3	64	2.3	74
MSCI EAFE				4.2	50	9.9	62	25.0	64	7.8	70	7.9	71	1.9	86
SSgA ACWI Ex US	209,856,297	11.3	6.0	5.0	43	11.6	54	27.5	68	8.0	72	7.0	83	--	--
MSCI ACWI ex USA				5.0	43	11.5	54	27.2	69	7.8	73	6.8	84	1.8	82
eV ACWI ex-US All Cap Equity Net Median				4.9		11.9		29.6		9.3		9.1		3.4	
<b>Total Emerging Market Equity</b>	<b>140,755,974</b>	<b>7.6</b>	<b>6.0</b>	<b>5.2</b>	<b>84</b>	<b>9.6</b>	<b>93</b>	<b>30.2</b>	<b>81</b>	<b>8.1</b>	<b>69</b>	<b>3.0</b>	<b>89</b>	<b>--</b>	<b>--</b>
Aberdeen	140,755,974	7.6	6.0	5.2	84	9.6	93	30.2	81	8.1	69	3.0	89	--	--
MSCI Emerging Markets				7.4	30	15.9	39	37.3	48	9.1	52	4.3	74	1.7	75
eV Emg Mkts Equity Net Median				6.7		14.9		37.1		9.1		5.4		2.7	
<b>Total Fixed Income</b>	<b>538,662,035</b>	<b>29.1</b>	<b>36.0</b>	<b>0.7</b>	<b>33</b>	<b>2.0</b>	<b>34</b>	<b>5.8</b>	<b>30</b>	<b>4.2</b>	<b>29</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
BBgBarc US Aggregate TR				0.4	52	1.2	57	3.5	57	2.2	59	2.1	57	4.0	56
eV All US Fixed Inc Net Median				0.4		1.4		3.9		2.6		2.4		4.2	
<b>Total Diversified Fixed Income</b>	<b>143,484,427</b>	<b>7.7</b>	<b>12.0</b>	<b>0.4</b>	<b>53</b>	<b>1.4</b>	<b>52</b>	<b>4.5</b>	<b>42</b>	<b>3.3</b>	<b>39</b>	<b>3.2</b>	<b>38</b>	<b>4.2</b>	<b>52</b>
BBgBarc US Aggregate TR				0.4	52	1.2	57	3.5	57	2.2	59	2.1	57	4.0	56
eV All US Fixed Inc Net Median				0.4		1.4		3.9		2.6		2.4		4.2	
PIMCO Core Plus	125,940,146	6.8	6.0	0.4	70	1.5	30	4.8	9	2.7	33	2.1	65	--	--
BBgBarc US Aggregate TR				0.4	66	1.2	60	3.5	66	2.2	69	2.1	62	4.0	77
SSgA Barclays Aggregate Index	17,544,281	0.9	6.0	0.3	76	1.2	60	3.5	70	--	--	--	--	--	--
BBgBarc US Aggregate TR				0.4	66	1.2	60	3.5	66	2.2	69	2.1	62	4.0	77
3-Month Libor Total Return USD				0.4	66	0.7	92	1.3	99	0.8	99	0.6	99	0.8	99
eV US Core Fixed Inc Net Median				0.4		1.3		3.8		2.4		2.3		4.4	



# TOTAL FUND PERFORMANCE DETAIL - NET

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
<b>Total TIPS</b>	<b>118,172,203</b>	<b>6.4</b>	<b>6.0</b>	<b>1.2</b>	<b>68</b>	<b>2.0</b>	<b>79</b>	<b>2.9</b>	<b>67</b>	<b>2.0</b>	<b>39</b>	<b>0.1</b>	<b>52</b>	--	--
BlackRock TIPS	118,172,203	6.4	6.0	1.2	--	2.0	--	2.9	--	2.0	--	0.0	--	--	--
BBgBarc US TIPS TR				1.3	--	2.1	--	3.0	--	2.0	--	0.1	--	3.5	--
<b>Total High Yield Bonds</b>	<b>73,818,101</b>	<b>4.0</b>	<b>5.0</b>	<b>0.7</b>	<b>38</b>	<b>2.3</b>	<b>53</b>	<b>6.1</b>	<b>76</b>	<b>5.8</b>	<b>43</b>	<b>5.5</b>	<b>41</b>	<b>7.3</b>	<b>48</b>
BBgBarc US High Yield TR				0.5	55	2.5	47	7.5	39	6.4	25	5.8	26	8.0	15
eV US High Yield Fixed Inc Net Median				0.5		2.4		7.1		5.6		5.2		7.2	
KDP	18,823,360	1.0	1.0	0.1	89	1.5	89	4.9	89	3.9	95	3.7	96	--	--
BBgBarc US High Yield TR				0.5	55	2.5	47	7.5	39	6.4	25	5.8	26	8.0	15
BofA Merrill Lynch US High Yield BB-B Rated				0.4	69	2.3	53	7.0	53	6.0	34	5.6	35	7.3	47
Guggenheim	54,994,740	3.0	4.0	0.9	28	2.6	39	6.4	66	6.3	26	--	--	--	--
BBgBarc US High Yield TR				0.5	55	2.5	47	7.5	39	6.4	25	5.8	26	8.0	15
eV US High Yield Fixed Inc Net Median				0.5		2.4		7.1		5.6		5.2		7.2	
<b>Total Emerging Market Debt</b>	<b>94,605,848</b>	<b>5.1</b>	<b>5.0</b>	<b>0.8</b>	<b>57</b>	<b>3.5</b>	<b>77</b>	<b>10.6</b>	<b>74</b>	<b>7.3</b>	<b>20</b>	<b>4.5</b>	<b>16</b>	--	--
Wellington Opportunistic EMD	94,605,848	5.1	5.0	0.8	57	3.5	77	10.6	74	7.3	20	4.5	16	--	--
JP Morgan EMBI Global Index				0.5	70	2.9	92	9.3	86	6.8	32	3.8	32	7.1	34
eV All Emg Mkts Fixed Inc Net Median				0.9		4.2		12.5		5.7		2.6		6.3	
<b>Total Long Treasury</b>	<b>36,285,858</b>	<b>2.0</b>	<b>2.0</b>	<b>2.4</b>	<b>--</b>	<b>2.9</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
State Street Long U.S. Treasury Index	36,285,858	2.0	2.0	2.4	--	2.9	--	--	--	--	--	--	--	--	--
BBgBarc US Treasury Long TR				2.4	--	3.0	--	8.5	--	2.8	--	3.5	--	6.6	--



# TOTAL FUND PERFORMANCE DETAIL - NET

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
<b>Total Unconstrained Fixed Income</b>	<b>72,295,599</b>	<b>3.9</b>	<b>6.0</b>	<b>-0.2</b>	<b>88</b>	<b>1.1</b>	<b>85</b>	<b>5.4</b>	<b>72</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
25% HY, 25% EMD, 50% BC Agg				0.4	72	2.0	70	6.0	64	4.4	24	3.5	33	5.9	15
BBgBarc Global Aggregate TR				1.1	30	2.9	41	7.4	41	2.0	88	0.8	93	3.1	84
eV Global Unconstrained Fixed Inc Net Median				0.9		2.5		6.7		2.9		2.4		4.7	
<b>PIMCO Unconstrained</b>	<b>36,194,916</b>	<b>2.0</b>	<b>2.5</b>	<b>0.2</b>	<b>80</b>	<b>1.6</b>	<b>73</b>	<b>4.7</b>	<b>85</b>	<b>2.4</b>	<b>79</b>	<b>1.5</b>	<b>84</b>	<b>--</b>	<b>--</b>
25% HY, 25% EMD, 50% BC Agg				0.4	72	2.0	70	6.0	64	4.4	24	3.5	33	5.9	15
3-Month Libor Total Return USD				0.4	74	0.7	90	1.3	98	0.8	99	0.6	93	0.8	99
<b>GAM Unconstrained Bond</b>	<b>36,100,683</b>	<b>1.9</b>	<b>3.5</b>	<b>-0.6</b>	<b>93</b>	<b>0.7</b>	<b>90</b>	<b>5.8</b>	<b>66</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
3-Month LIBOR + 3%				1.1	25	2.2	61	4.4	86	3.8	30	3.6	32	3.8	61
eV Global Unconstrained Fixed Inc Net Median				0.9		2.5		6.7		2.9		2.4		4.7	
<b>Total Risk Parity/GAA</b>	<b>82,266,708</b>	<b>4.4</b>	<b>4.0</b>	<b>4.7</b>	<b>17</b>	<b>9.3</b>	<b>18</b>	<b>15.2</b>	<b>44</b>	<b>4.9</b>	<b>50</b>	<b>4.3</b>	<b>61</b>	<b>4.7</b>	<b>55</b>
Mellon Dynamic Growth	51,563	0.0	0.0												
<b>Total Risk Parity</b>	<b>82,215,145</b>	<b>4.4</b>	<b>4.0</b>	<b>4.7</b>	<b>16</b>	<b>9.3</b>	<b>18</b>	<b>15.7</b>	<b>40</b>	<b>5.0</b>	<b>49</b>	<b>4.1</b>	<b>62</b>	<b>--</b>	<b>--</b>
eV Global TAA Net Median				3.4		6.7		13.7		4.9		4.9		4.8	
<b>AQR Global Risk Premium</b>	<b>82,215,145</b>	<b>4.4</b>	<b>4.0</b>	<b>4.7</b>	<b>16</b>	<b>9.3</b>	<b>18</b>	<b>15.7</b>	<b>40</b>	<b>5.0</b>	<b>49</b>	<b>4.1</b>	<b>62</b>	<b>--</b>	<b>--</b>
60% MSCI World (Net) / 40% CITI WGBI				3.7	43	7.5	42	16.2	37	6.4	19	7.0	30	4.4	58
<b>Total Cash</b>	<b>2,112,642</b>	<b>0.1</b>	<b>0.0</b>												
Vermont Cash	2,112,642	0.1	0.0												
<b>Total Real Estate</b>	<b>121,760,465</b>	<b>6.6</b>	<b>6.5</b>	<b>1.8</b>	<b>--</b>	<b>3.4</b>	<b>--</b>	<b>5.7</b>	<b>--</b>	<b>9.1</b>	<b>--</b>	<b>10.9</b>	<b>--</b>	<b>--</b>	<b>--</b>
NCREIF Property Index				1.8	--	3.5	--	7.0	--	9.4	--	10.2	--	6.1	--



# TOTAL FUND PERFORMANCE DETAIL - NET

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
<b>Total Real Estate Core</b>	<b>103,773,068</b>	<b>5.6</b>	<b>5.0</b>	<b>2.2</b>	<b>--</b>	<b>3.4</b>	<b>--</b>	<b>5.4</b>	<b>--</b>	<b>8.9</b>	<b>--</b>	<b>10.8</b>	<b>--</b>	<b>--</b>	<b>--</b>
UBS Trumbull	103,436,184	5.6		2.2	--	3.5	--	5.4	--	8.3	--	8.9	--	4.6	--
RREEF America REIT III	208,437	0.0		0.0	--	-0.8	--	-4.8	--	-5.6	--	4.2	--	-6.5	--
Transwestern / Aslan III	128,447	0.0		0.0	--	0.0	--	0.0	--	1.8	--	6.9	--	-23.1	--
<b>Total Real Estate Non-Core</b>	<b>17,987,397</b>	<b>1.0</b>	<b>1.5</b>	<b>0.0</b>	<b>--</b>	<b>3.1</b>	<b>--</b>	<b>7.7</b>	<b>--</b>	<b>10.3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
Siguler Guff DREOF II	12,886,250	0.7		0.0	--	3.8	--	8.1	--	10.7	--	--	--	--	--
Siguler Guff DREOF II Co-Investment	5,101,147	0.3		0.0	--	0.9	--	6.8	--	--	--	--	--	--	--
<b>Total Absolute Return</b>	<b>131,029,078</b>	<b>7.1</b>	<b>8.0</b>	<b>2.2</b>	<b>34</b>	<b>4.2</b>	<b>46</b>	<b>4.0</b>	<b>78</b>	<b>1.7</b>	<b>75</b>	<b>4.2</b>	<b>68</b>	<b>--</b>	<b>--</b>
<i>HFRI Fund of Funds Composite Index</i>				2.0	38	4.3	43	7.7	45	2.6	59	4.0	69	1.1	90
<i>eV Alt Fund of Funds - Multi-Strategy Median</i>				1.7		3.9		7.2		3.0		5.1		3.0	
Grosvenor	54,340,273	2.9	3.0	2.4	31	4.1	47	6.5	57	3.0	53	5.4	45	--	--
Allianz Structured Alpha	32,653,510	1.8	2.0	1.5	58	2.8	76	5.2	67	6.7	14	6.4	31	--	--
<i>91 Day T-Bills</i>				0.3	92	0.6	95	0.9	97	0.4	89	0.3	99	0.3	96
<i>eV Alt Fund of Funds - Multi-Strategy Median</i>				1.7		3.9		7.2		3.0		5.1		3.0	
Pinnacle Natural Resources, L.P.	43,837,812	2.4	3.0	2.3	--	5.2	--	-6.3	--	--	--	--	--	--	--
<i>Bloomberg Commodity Index</i>				4.7	--	7.3	--	1.7	--	-5.0	--	-8.5	--	-6.8	--
GAM	197,484	0.0	0.0												
<b>Total Private Debt</b>	<b>11,911,634</b>	<b>0.6</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
<i>S&amp;P/LSTA Leveraged Loan TR</i>				1.1	--	2.2	--	4.1	--	4.4	--	4.0	--	4.9	--
Benefit Street Partners	11,911,634	0.6	0.0	--	--	--	--	--	--	--	--	--	--	--	--
<b>Total Private Equity</b>	<b>33,185,117</b>	<b>1.8</b>	<b>1.5</b>	<b>1.9</b>	<b>--</b>	<b>7.4</b>	<b>--</b>	<b>14.2</b>	<b>--</b>	<b>14.8</b>	<b>--</b>	<b>14.0</b>	<b>--</b>	<b>--</b>	<b>--</b>
<i>Cambridge Associates US All PE</i>				0.0	--	3.9	--	11.8	--	10.1	--	12.5	--	9.2	--

Real Estate performance reported on a quarterly basis. NCREIF Property is available 25 days after quarter end.

Real Estate values are preliminary as of 09/30/2017.

Absolute Return composite formerly shown as Hedge Funds composite.

As of 04/01/2016, Absolute Return includes Allianz Structured Alpha.

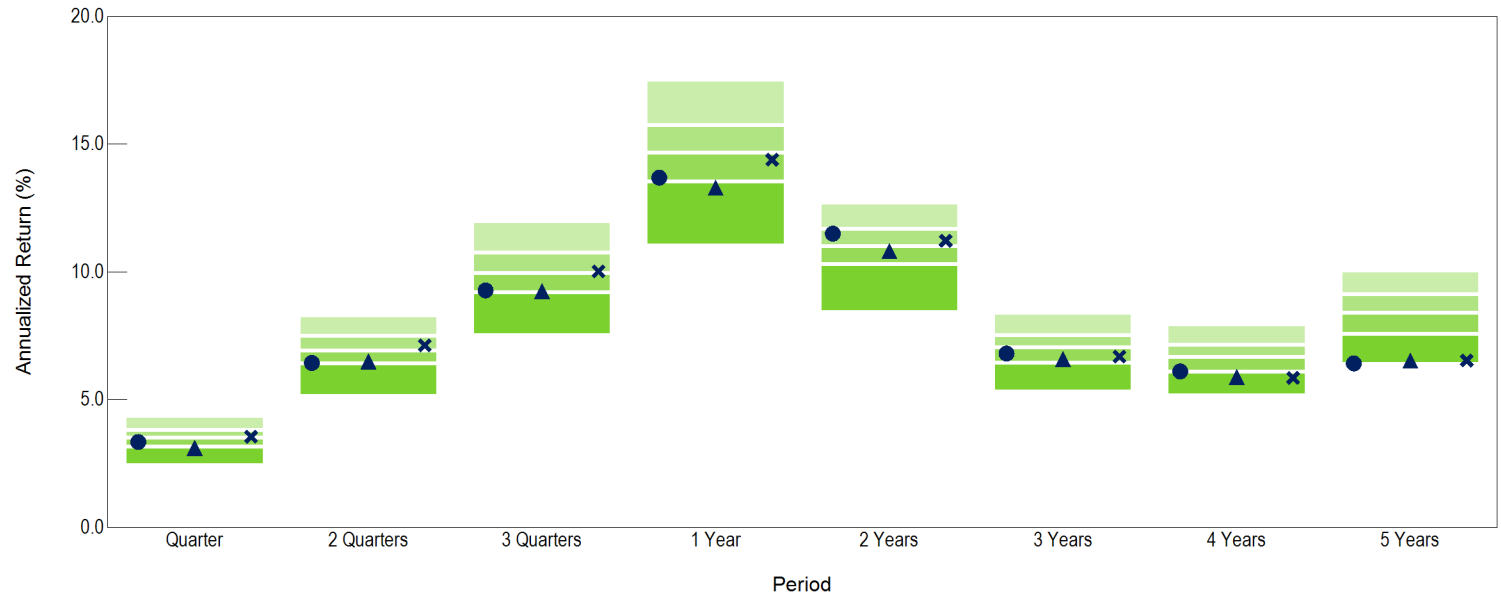
Allianz Structured Alpha was included Diversified Fixed income composite prior to 04/01/2016.

Harbourvest values based on final Capital Account Statements for Q2, and cash adjusted through Q3.



# TOTAL FUND RETURN SUMMARY VS. PEER UNIVERSE - NET

Total Teachers Composite vs. InvestorForce Public DB Net



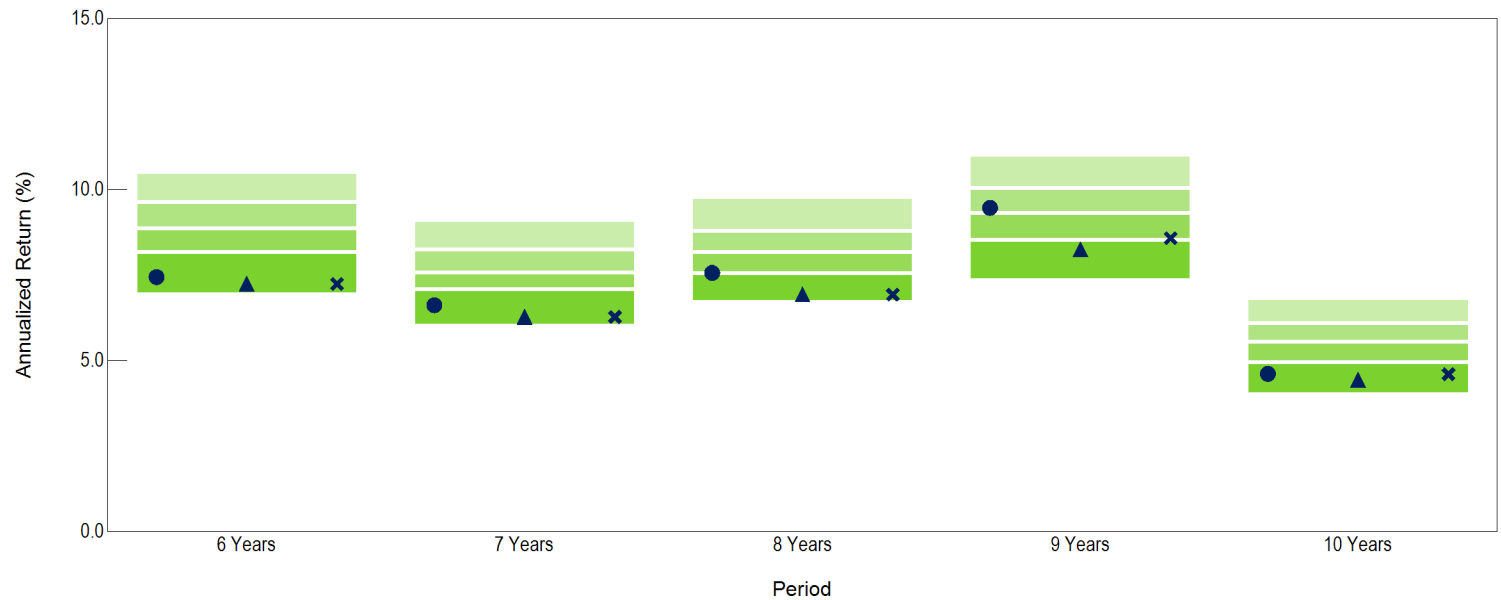
	Return (Rank)							
	Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	4 Years	5 Years
5th Percentile	4.3	8.3	12.0	17.5	12.7	8.4	7.9	10.1
25th Percentile	3.8	7.5	10.8	15.8	11.7	7.5	7.2	9.1
Median	3.5	6.9	10.0	14.7	11.0	7.1	6.7	8.4
75th Percentile	3.2	6.4	9.2	13.6	10.3	6.5	6.1	7.6
95th Percentile	2.4	5.2	7.5	11.1	8.4	5.3	5.2	6.4
# of Portfolios	270	269	269	269	265	259	247	237
● Total Teachers Composite	3.3 (63)	6.4 (75)	9.3 (73)	13.7 (74)	11.5 (33)	6.8 (63)	6.1 (76)	6.4 (95)
▲ Policy Index	3.1 (80)	6.5 (72)	9.2 (75)	13.3 (82)	10.8 (58)	6.6 (72)	5.9 (83)	6.5 (94)
× Allocation Index	3.6 (48)	7.1 (43)	10.0 (49)	14.4 (57)	11.2 (41)	6.7 (68)	5.9 (83)	6.5 (94)





# TOTAL FUND RETURN SUMMARY VS. PEER UNIVERSE - NET

Total Teachers Composite vs. InvestorForce Public DB Net

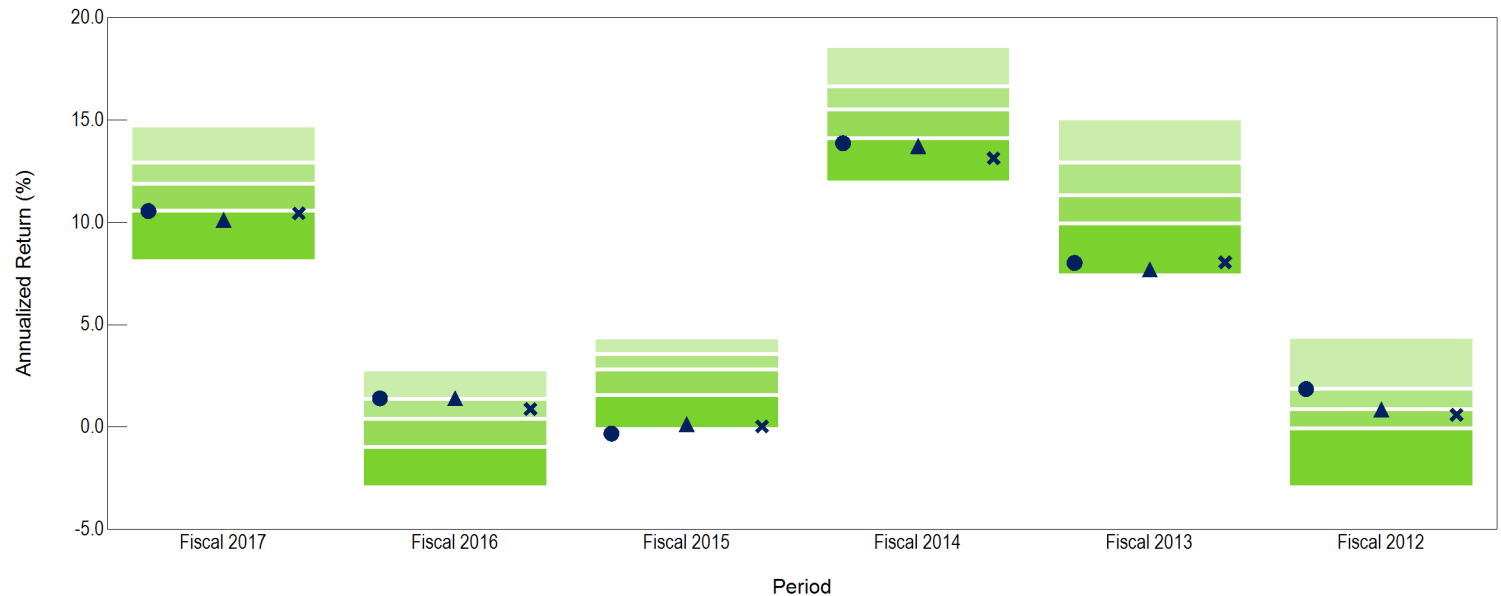


	Return (Rank)									
5th Percentile	10.5		9.1		9.8		11.0		6.8	
25th Percentile	9.6		8.2		8.8		10.1		6.1	
Median	8.9		7.6		8.2		9.3		5.6	
75th Percentile	8.2		7.1		7.6		8.5		5.0	
95th Percentile	7.0		6.0		6.7		7.4		4.0	
# of Portfolios	228		208		197		189		187	
● Total Teachers Composite	7.4	(91)	6.6	(86)	7.6	(75)	9.5	(48)	4.6	(88)
▲ Policy Index	7.3	(95)	6.3	(92)	6.9	(93)	8.3	(82)	4.4	(91)
× Allocation Index	7.2	(95)	6.3	(92)	6.9	(93)	8.6	(74)	4.6	(88)



# TOTAL FUND RETURN SUMMARY VS. PEER UNIVERSE - NET

Total Teachers Composite vs. InvestorForce Public DB Net

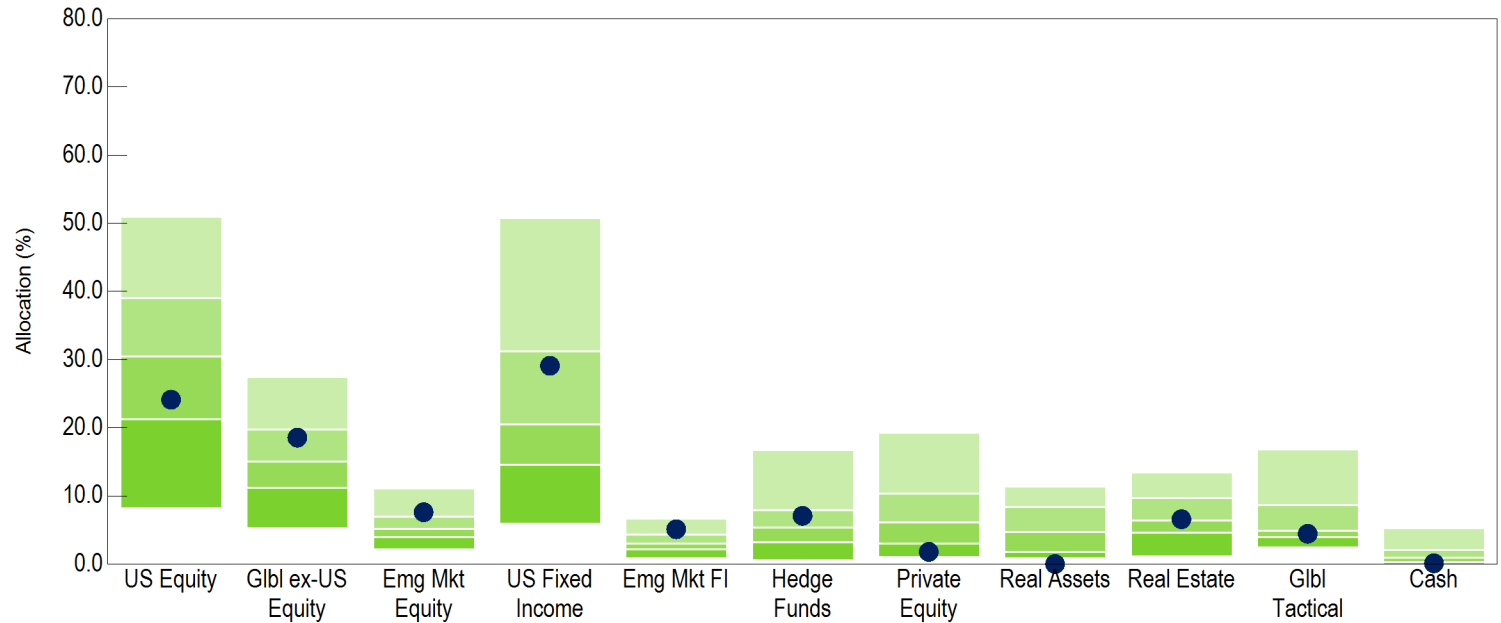


	Return (Rank)					
	Fiscal 2017	Fiscal 2016	Fiscal 2015	Fiscal 2014	Fiscal 2013	Fiscal 2012
5th Percentile	14.7	2.8	4.4	18.6	15.0	4.4
25th Percentile	12.9	1.4	3.6	16.7	12.9	1.9
Median	11.9	0.4	2.8	15.5	11.3	0.9
75th Percentile	10.6	-0.9	1.6	14.1	9.9	0.0
95th Percentile	8.1	-2.9	-0.1	11.9	7.4	-2.9
# of Portfolios	282	258	231	173	192	147
● Total Teachers Composite	10.5 (77)	1.4 (25)	-0.3 (96)	13.9 (83)	8.0 (94)	1.9 (26)
▲ Policy Index	10.1 (82)	1.4 (25)	0.1 (94)	13.7 (84)	7.7 (94)	0.9 (51)
× Allocation Index	10.4 (79)	0.9 (37)	0.0 (95)	13.1 (91)	8.0 (94)	0.6 (59)



# TOTAL FUND ALLOCATION VS. PEER UNIVERSE - NET

**Total Plan Allocation vs. InvestorForce Public DB Net  
As of December 31, 2017**



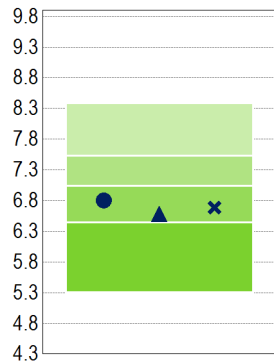
	Allocation (Rank)												
5th Percentile	51.0	27.4	11.1	50.7	6.6	16.7	19.3	11.4	13.5	16.9	5.3	--	--
25th Percentile	39.1	19.9	7.0	31.3	4.4	8.0	10.5	8.5	9.8	8.8	2.1	--	--
Median	30.5	15.1	5.3	20.6	3.1	5.5	6.2	4.8	6.5	5.0	1.1	--	--
75th Percentile	21.3	11.3	4.0	14.7	2.2	3.3	3.1	1.9	4.7	4.0	0.4	--	--
95th Percentile	8.3	5.3	2.2	6.0	1.0	0.7	1.1	0.9	1.2	2.6	0.0	--	--
# of Portfolios	193	215	133	189	44	85	115	71	161	56	238	--	--
● Total Teachers Composite	24.1 (67)	18.5 (33)	7.6 (20)	29.1 (30)	5.1 (17)	7.1 (36)	1.8 (88)	0.0 (99)	6.6 (50)	4.4 (70)	0.1 (88)	--	--



# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE - NET

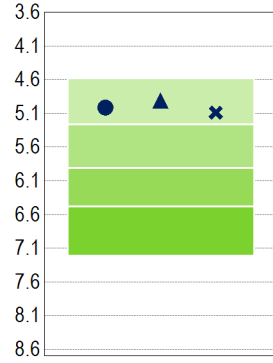
## Teachers Composite vs. IFx Public DB Net 3 Years

### Anlzd Return



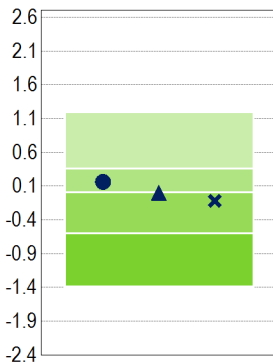
● Total Teachers Composite	
Value	6.80
Rank	63
▲ Policy Index	
Value	6.58
Rank	72
× Allocation Index	
Value	6.68
Rank	68
Universe	
5th %tile	8.39
25th %tile	7.54
Median	7.05
75th %tile	6.46
95th %tile	5.32

### Anlzd Standard Deviation



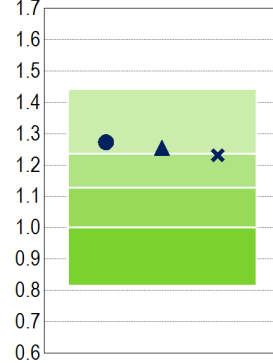
● Total Teachers Composite	
Value	5.01
Rank	15
▲ Policy Index	
Value	4.91
Rank	10
× Allocation Index	
Value	5.09
Rank	17
Universe	
5th %tile	4.58
25th %tile	5.25
Median	5.90
75th %tile	6.47
95th %tile	7.21

### Anlzd Alpha



● Total Teachers Composite	
Value	0.16
Rank	41
▲ Policy Index	
Value	0.00
Rank	53
× Allocation Index	
Value	-0.12
Rank	59
Universe	
5th %tile	1.19
25th %tile	0.37
Median	0.02
75th %tile	-0.59
95th %tile	-1.37

### Sharpe Ratio



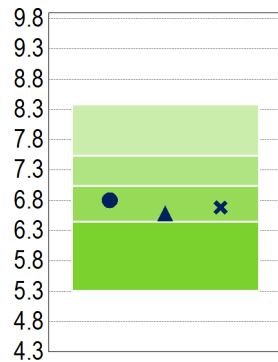
● Total Teachers Composite	
Value	1.27
Rank	20
▲ Policy Index	
Value	1.26
Rank	23
× Allocation Index	
Value	1.23
Rank	29
Universe	
5th %tile	1.44
25th %tile	1.24
Median	1.13
75th %tile	1.00
95th %tile	0.82



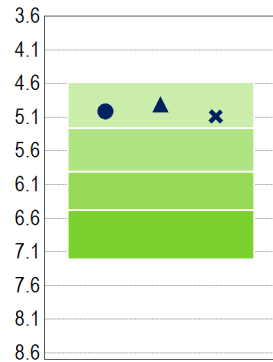
# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE - NET

## Teachers Composite vs. IFx Public DB Net 3 Years

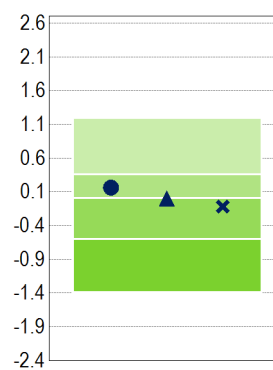
**Anlzd Return**      **Anlzd Standard Deviation**      **Anlzd Alpha**      **Sharpe Ratio**



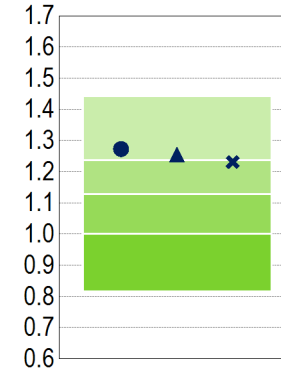
● Total Teachers Composite	
Value	6.80
Rank	63
▲ Policy Index	
Value	6.58
Rank	72
✕ Allocation Index	
Value	6.68
Rank	68
Universe	
5th %tile	8.39
25th %tile	7.54
Median	7.05
75th %tile	6.46
95th %tile	5.32



● Total Teachers Composite	
Value	5.01
Rank	15
▲ Policy Index	
Value	4.91
Rank	10
✕ Allocation Index	
Value	5.09
Rank	17
Universe	
5th %tile	4.58
25th %tile	5.25
Median	5.90
75th %tile	6.47
95th %tile	7.21



● Total Teachers Composite	
Value	0.16
Rank	41
▲ Policy Index	
Value	0.00
Rank	53
✕ Allocation Index	
Value	-0.12
Rank	59
Universe	
5th %tile	1.19
25th %tile	0.37
Median	0.02
75th %tile	-0.59
95th %tile	-1.37



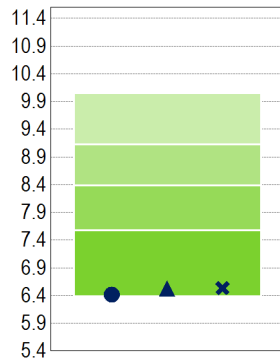
● Total Teachers Composite	
Value	1.27
Rank	20
▲ Policy Index	
Value	1.26
Rank	23
✕ Allocation Index	
Value	1.23
Rank	29
Universe	
5th %tile	1.44
25th %tile	1.24
Median	1.13
75th %tile	1.00
95th %tile	0.82



# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE - NET

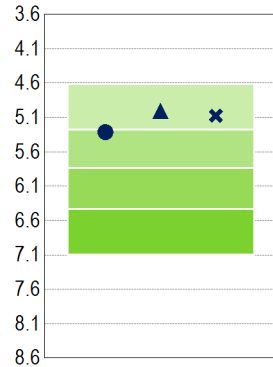
## Teachers Composite vs. IFx Public DB Net 5 Years

### Anlzd Return



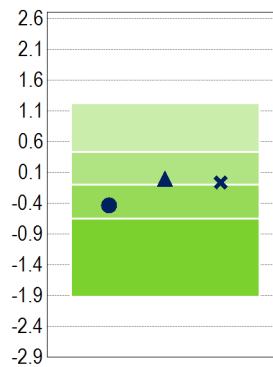
● Total Teachers Composite		
Value	6.42	
Rank	95	
▲ Policy Index		
Value	6.53	
Rank	94	
✕ Allocation Index		
Value	6.53	
Rank	94	
Universe		
5th %tile	10.05	
25th %tile	9.13	
Median	8.40	
75th %tile	7.60	
95th %tile	6.40	

### Anlzd Standard Deviation



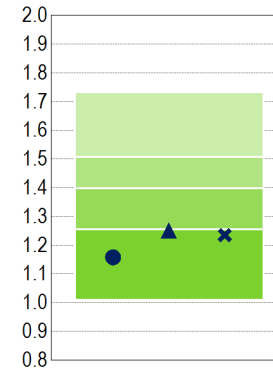
● Total Teachers Composite		
Value	5.31	
Rank	27	
▲ Policy Index		
Value	5.01	
Rank	13	
✕ Allocation Index		
Value	5.08	
Rank	16	
Universe		
5th %tile	4.61	
25th %tile	5.27	
Median	5.83	
75th %tile	6.43	
95th %tile	7.08	

### Anlzd Alpha



● Total Teachers Composite		
Value	-0.44	
Rank	66	
▲ Policy Index		
Value	0.00	
Rank	44	
✕ Allocation Index		
Value	-0.06	
Rank	48	
Universe		
5th %tile	1.23	
25th %tile	0.45	
Median	-0.09	
75th %tile	-0.64	
95th %tile	-1.91	

### Sharpe Ratio



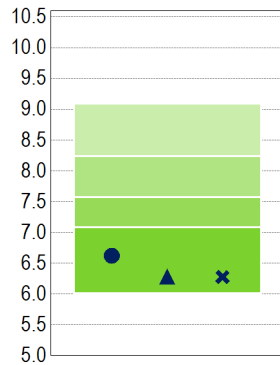
● Total Teachers Composite		
Value	1.16	
Rank	85	
▲ Policy Index		
Value	1.25	
Rank	76	
✕ Allocation Index		
Value	1.23	
Rank	78	
Universe		
5th %tile	1.73	
25th %tile	1.51	
Median	1.40	
75th %tile	1.26	
95th %tile	1.01	



# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE - NET

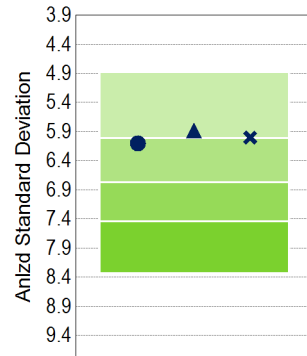
## Teachers Composite vs. IFx Public DB Net 7 Years

**Anlzd Return**



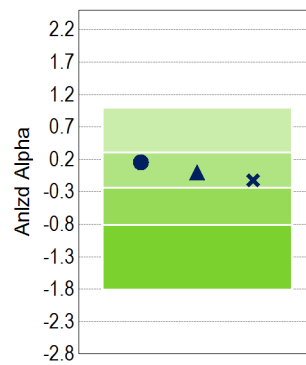
● Total Teachers Composite	
Value	6.62
Rank	86
▲ Policy Index	
Value	6.28
Rank	92
✖ Allocation Index	
Value	6.27
Rank	92
Universe	
5th %tile	9.09
25th %tile	8.25
Median	7.58
75th %tile	7.09
95th %tile	6.02

**Anlzd Standard Deviation**



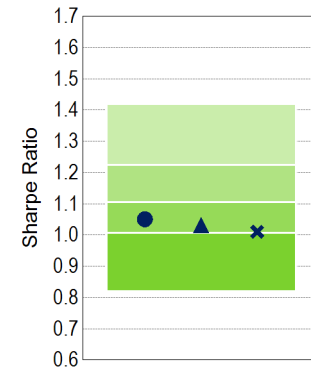
● Total Teachers Composite	
Value	6.10
Rank	29
▲ Policy Index	
Value	5.88
Rank	21
✖ Allocation Index	
Value	6.00
Rank	26
Universe	
5th %tile	4.87
25th %tile	6.00
Median	6.76
75th %tile	7.43
95th %tile	8.32

**Anlzd Alpha**



● Total Teachers Composite	
Value	0.15
Rank	32
▲ Policy Index	
Value	0.00
Rank	40
✖ Allocation Index	
Value	-0.12
Rank	45
Universe	
5th %tile	1.00
25th %tile	0.32
Median	-0.23
75th %tile	-0.80
95th %tile	-1.79

**Sharpe Ratio**



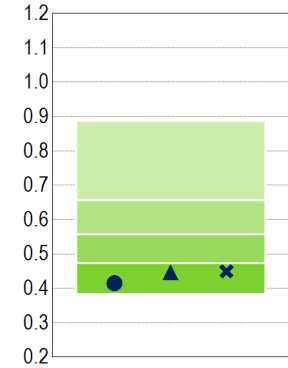
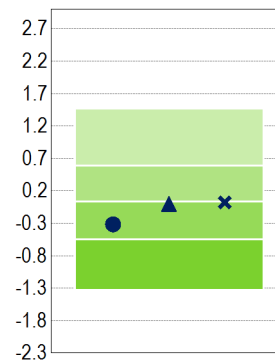
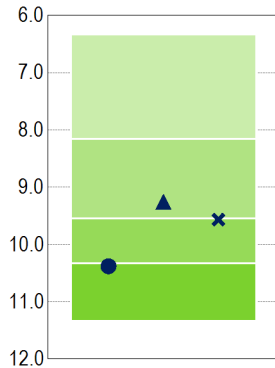
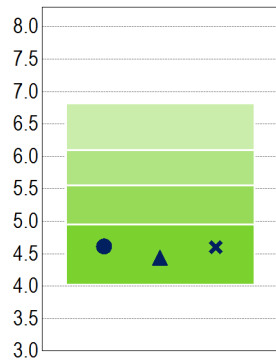
● Total Teachers Composite	
Value	1.05
Rank	65
▲ Policy Index	
Value	1.03
Rank	71
✖ Allocation Index	
Value	1.01
Rank	75
Universe	
5th %tile	1.42
25th %tile	1.23
Median	1.11
75th %tile	1.01
95th %tile	0.82



# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE - NET

## Teachers Composite vs. IFx Public DB Net 10 Years

**Anlzd Return**      **Anlzd Standard Deviation**      **Anlzd Alpha**      **Sharpe Ratio**



● Total Teachers Composite

Value	4.61
Rank	88
▲ Policy Index	
Value	4.44
Rank	91
✕ Allocation Index	
Value	4.60
Rank	88

Universe	
5th %tile	6.82
25th %tile	6.10
Median	5.56
75th %tile	4.97
95th %tile	4.03

● Total Teachers Composite

Value	10.38
Rank	79
▲ Policy Index	
Value	9.26
Rank	44
✕ Allocation Index	
Value	9.57
Rank	51

Universe	
5th %tile	6.34
25th %tile	8.14
Median	9.53
75th %tile	10.31
95th %tile	11.33

● Total Teachers Composite

Value	-0.32
Rank	64
▲ Policy Index	
Value	0.00
Rank	54
✕ Allocation Index	
Value	0.02
Rank	52

Universe	
5th %tile	1.47
25th %tile	0.60
Median	0.05
75th %tile	-0.54
95th %tile	-1.32

● Total Teachers Composite

Value	0.41
Rank	90
▲ Policy Index	
Value	0.45
Rank	82
✕ Allocation Index	
Value	0.45
Rank	82

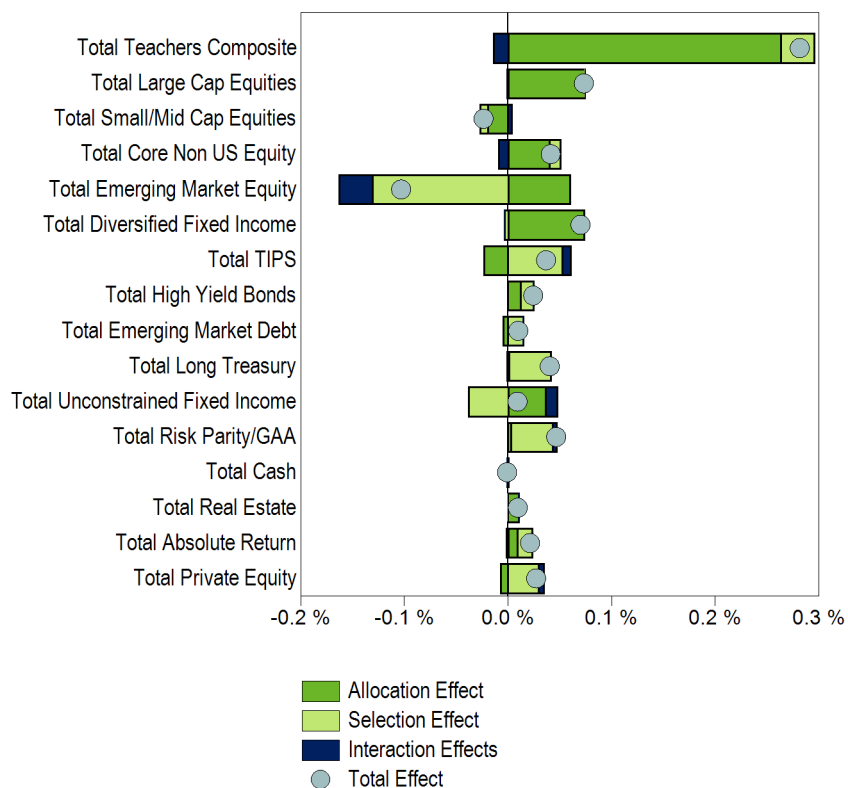
Universe	
5th %tile	0.89
25th %tile	0.66
Median	0.56
75th %tile	0.47
95th %tile	0.38





# TOTAL FUND ATTRIBUTION ANALYSIS - NET

**Attribution Effects Relative to Policy Index  
3 Months Ending December 31, 2017**



Attribution Summary 3 Months Ending December 31, 2017							
	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Total Large Cap Equities	6.5%	6.5%	0.0%	0.0%	0.1%	0.0%	0.1%
Total Small/Mid Cap Equities	3.5%	3.6%	-0.1%	0.0%	0.0%	0.0%	0.0%
Total Core Non US Equity	4.6%	4.6%	0.1%	0.0%	0.0%	0.0%	0.0%
Total Emerging Market Equity	5.2%	7.4%	-2.3%	-0.1%	0.1%	0.0%	-0.1%
Total Diversified Fixed Income	0.4%	0.4%	0.0%	0.0%	0.1%	0.0%	0.1%
Total TIPS	1.2%	0.4%	0.9%	0.1%	0.0%	0.0%	0.0%
Total High Yield Bonds	0.7%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%
Total Emerging Market Debt	0.8%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%
Total Long Treasury	2.4%	0.4%	2.0%	0.0%	0.0%	0.0%	0.0%
Total Unconstrained Fixed Income	-0.2%	0.4%	-0.6%	0.0%	0.0%	0.0%	0.0%
Total Risk Parity/GAA	4.7%	3.7%	1.0%	0.0%	0.0%	0.0%	0.0%
Total Cash	0.0%	0.3%	-0.3%	0.0%	0.0%	0.0%	0.0%
Total Real Estate	1.8%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Absolute Return	2.2%	2.0%	0.2%	0.0%	0.0%	0.0%	0.0%
Total Private Equity	1.9%	0.0%	1.9%	0.0%	0.0%	0.0%	0.0%
<b>Total</b>	<b>3.3%</b>	<b>3.1%</b>	<b>0.3%</b>	<b>0.0%</b>	<b>0.3%</b>	<b>0.0%</b>	<b>0.3%</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 policyindex 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 alongwith the policy or target weight of each composite.

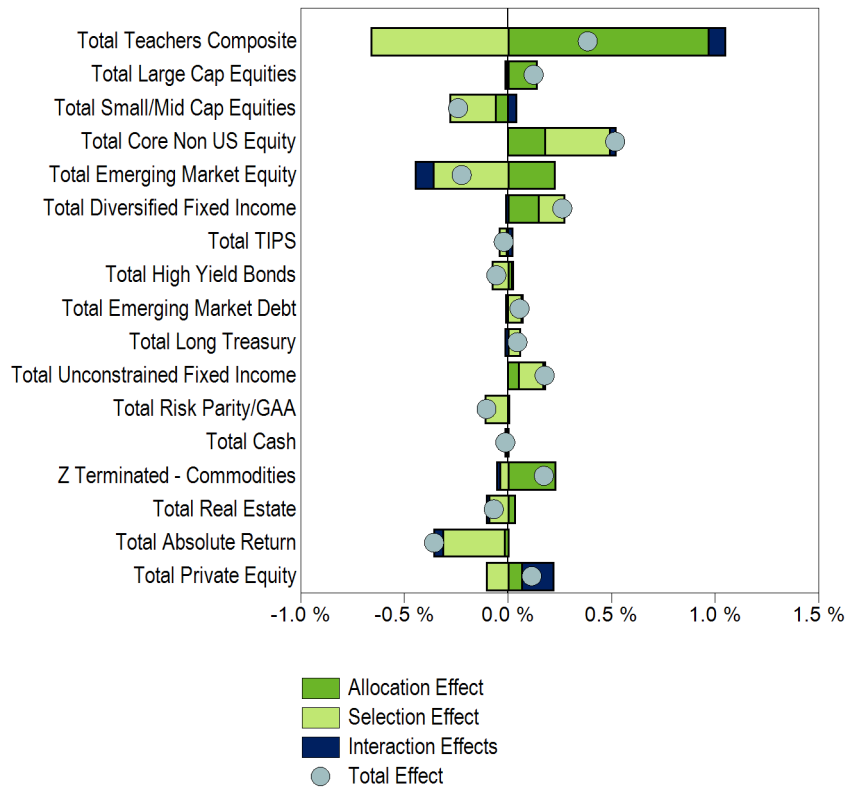
May not add up due to rounding.

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



# TOTAL FUND ATTRIBUTION ANALYSIS - NET

**Attribution Effects Relative to Policy Index  
1 Year Ending December 31, 2017**



Attribution Summary 1 Year Ending December 31, 2017							
	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Total Large Cap Equities	21.0%	21.1%	-0.1%	0.0%	0.1%	0.0%	0.1%
Total Small/Mid Cap Equities	9.6%	13.1%	-3.5%	-0.2%	-0.1%	0.0%	-0.2%
Total Core Non US Equity	28.9%	25.9%	3.0%	0.3%	0.2%	0.0%	0.5%
Total Emerging Market Equity	30.2%	37.3%	-7.1%	-0.4%	0.2%	-0.1%	-0.2%
Total Diversified Fixed Income	4.5%	3.5%	0.9%	0.1%	0.1%	0.0%	0.3%
Total TIPS	2.9%	3.5%	-0.6%	0.0%	0.0%	0.0%	0.0%
Total High Yield Bonds	6.1%	7.5%	-1.4%	-0.1%	0.0%	0.0%	-0.1%
Total Emerging Market Debt	10.6%	9.3%	1.2%	0.1%	0.0%	0.0%	0.1%
Total Long Treasury	--	--	--	0.1%	0.0%	0.0%	0.0%
Total Unconstrained Fixed Income	5.4%	3.5%	1.8%	0.1%	0.1%	0.0%	0.2%
Total Risk Parity/GAA	15.2%	16.3%	-1.1%	-0.1%	0.0%	0.0%	-0.1%
Total Cash	0.0%	0.9%	-0.9%	0.0%	0.0%	0.0%	0.0%
Z Terminated - Commodities	--	--	--	0.0%	0.2%	0.0%	0.2%
Total Real Estate	5.7%	7.0%	-1.3%	-0.1%	0.0%	0.0%	-0.1%
Total Absolute Return	4.0%	7.8%	-3.8%	-0.3%	0.0%	0.0%	-0.4%
Total Private Equity	14.2%	11.8%	2.5%	-0.1%	0.1%	0.1%	0.1%
<b>Total</b>	<b>13.6%</b>	<b>13.3%</b>	<b>0.3%</b>	<b>-0.7%</b>	<b>1.0%</b>	<b>0.1%</b>	<b>0.4%</b>

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

The target return shown for each composite is a custom index, based on aggregated policy indices. This policyindex 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 alongwith the policy or target weight of each composite.

May not add up due to rounding.

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



# ANALYTICS DEFINITIONS

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

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

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

Vermont State Teachers

# RISK STATISTICS - 3 YEARS

	% of Tot	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Anlzd AJ	Rank	Sharpe Ratio	Rank	Sortino Ratio RF	Rank	Tracking Error	Rank
Total Teachers Composite	100.00%	6.80%	63	5.01%	15	0.17%	37	1.27	20	2.04	5	0.79%	29
Policy Index	--	6.58%	72	4.91%	10	0.00%	52	1.26	23	2.00	6	0.00%	1
Total Domestic Equity	24.12%	10.97%	32	10.22%	23	-0.05%	33	1.03	22	1.52	32	1.30%	2
Russell 3000	--	11.12%	30	10.23%	23	0.00%	32	1.05	20	1.56	28	0.00%	1
Total Large Cap Equities	21.08%	11.09%	29	10.11%	34	-0.34%	37	1.06	28	1.71	23	0.73%	1
S&P 500	--	11.41%	25	10.07%	33	0.00%	32	1.09	22	1.66	26	0.00%	1
Total Small/Mid Cap Equities	3.03%	9.93%	40	11.62%	36	1.96%	42	0.82	39	1.47	21	4.34%	12
Russell 2000	--	9.96%	40	14.11%	85	0.00%	70	0.68	66	1.03	64	0.00%	1
Total Core Non US Equity	18.55%	10.25%	35	11.15%	36	3.06%	33	0.88	31	1.37	30	1.97%	8
MSCI EAFE	--	7.80%	70	12.00%	75	0.00%	80	0.61	77	0.92	77	0.00%	1
Total Emerging Market Equity	7.60%	8.09%	69	14.43%	49	0.14%	63	0.53	67	0.98	48	5.48%	66
MSCI Emerging Markets	--	9.10%	52	15.57%	80	0.00%	65	0.56	59	0.97	50	0.00%	1
Total Fixed Income	29.09%	4.23%	29	3.00%	63	2.25%	24	1.27	20	1.77	25	1.82%	42
BBgBarc US Aggregate TR	--	2.24%	59	2.81%	58	0.00%	77	0.65	72	0.88	72	0.00%	1
Total Diversified Fixed Income	7.75%	3.33%	39	3.88%	76	0.48%	54	0.75	60	0.98	64	1.37%	29
BBgBarc US Aggregate TR	--	2.24%	59	2.81%	58	0.00%	77	0.65	72	0.88	72	0.00%	1
Total Unconstrained Fixed Income	3.90%	--	--	--	--	--	--	--	--	--	--	--	--
25% HY, 25% EMD, 50% BC Agg	--	4.44%	24	3.38%	48	0.00%	62	1.19	22	1.72	36	0.00%	1
Total High Yield Bonds	3.99%	5.83%	43	4.68%	49	0.60%	49	1.16	50	1.83	53	1.43%	27
BBgBarc US High Yield TR	--	6.35%	25	5.65%	87	0.00%	68	1.05	63	1.86	50	0.00%	1
Total TIPS	6.38%	2.03%	39	3.55%	65	-0.04%	46	0.45	33	0.97	29	0.17%	8
BBgBarc US TIPS TR	--	2.05%	36	3.51%	60	0.00%	40	0.46	30	0.99	27	0.00%	1
Total Emerging Market Debt	5.11%	7.31%	20	5.64%	30	0.43%	27	1.22	24	1.79	25	1.28%	7
JP Morgan EMBI Global Index	--	6.84%	32	5.46%	26	0.00%	35	1.17	28	1.65	33	0.00%	1
Total Real Estate	6.58%	9.07%	--	4.02%	--	-0.08%	--	2.15	--	76.44	--	1.01%	--
NCREIF Property Index	--	9.39%	--	4.00%	--	0.00%	--	2.24	--	79.26	--	0.00%	--
Total Absolute Return	7.08%	1.69%	75	3.08%	25	-0.46%	70	0.41	68	0.44	73	1.72%	9
HFRI Fund of Funds Composite Index	--	2.58%	59	3.30%	28	0.00%	63	0.65	48	0.70	59	0.00%	1
Total Risk Parity/GAA	4.44%	4.88%	50	6.98%	60	-0.30%	46	0.64	51	1.02	42	4.63%	50
60% MSCI World (Net) / 40% CITI WGBI	--	6.36%	19	6.73%	58	0.00%	44	0.88	19	1.62	6	0.00%	1



Vermont State Teachers

# RISK STATISTICS - 5 YEARS

	% of Tot	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Anlzd AJ	Rank	Sharpe Ratio	Rank	Sortino Ratio RF	Rank	Tracking Error	Rank
Total Teachers Composite	100.00%	6.42%	95	5.31%	27	-0.42%	66	1.16	85	2.06	70	0.83%	27
Policy Index	--	6.53%	94	5.01%	13	0.00%	44	1.25	76	2.21	54	0.00%	1
Total Domestic Equity	24.12%	--	--	--	--	--	--	--	--	--	--	--	--
Russell 3000	--	15.58%	30	9.75%	17	0.00%	28	1.57	13	2.60	19	0.00%	1
Total Large Cap Equities	21.08%	15.79%	31	9.62%	27	-0.15%	31	1.61	14	2.84	15	0.71%	1
S&P 500	--	15.79%	31	9.49%	23	0.00%	28	1.64	11	2.71	23	0.00%	1
Total Small/Mid Cap Equities	3.03%	14.43%	37	11.76%	41	2.82%	41	1.20	33	2.37	15	3.88%	3
Russell 2000	--	14.12%	43	13.91%	90	0.00%	84	1.00	75	1.61	72	0.00%	1
Total Core Non US Equity	18.55%	9.93%	36	11.20%	41	2.44%	37	0.86	33	1.59	24	1.99%	8
MSCI EAFE	--	7.90%	71	11.67%	70	0.00%	81	0.65	76	1.13	74	0.00%	1
Total Emerging Market Equity	7.60%	3.01%	89	14.27%	65	-1.06%	88	0.19	87	0.32	87	5.00%	59
MSCI Emerging Markets	--	4.35%	74	14.39%	69	0.00%	74	0.28	73	0.48	66	0.00%	1
Total Fixed Income	29.09%	--	--	--	--	--	--	--	--	--	--	--	--
BBgBarc US Aggregate TR	--	2.10%	57	2.85%	55	0.00%	76	0.64	71	0.90	66	0.00%	1
Total Diversified Fixed Income	7.75%	3.20%	38	4.23%	78	0.28%	60	0.69	65	0.96	62	1.61%	38
BBgBarc US Aggregate TR	--	2.10%	57	2.85%	55	0.00%	76	0.64	71	0.90	66	0.00%	1
Total Unconstrained Fixed Income	3.90%	--	--	--	--	--	--	--	--	--	--	--	--
25% HY, 25% EMD, 50% BC Agg	--	3.46%	33	3.69%	60	0.00%	72	0.87	48	1.22	46	0.00%	1
Total High Yield Bonds	3.99%	5.45%	41	4.32%	30	0.73%	37	1.20	35	1.84	51	1.37%	38
BBgBarc US High Yield TR	--	5.78%	26	5.22%	79	0.00%	66	1.06	62	1.86	48	0.00%	1
Total TIPS	6.38%	0.05%	52	4.50%	69	-0.08%	48	-0.05	46	-0.06	46	0.16%	1
BBgBarc US TIPS TR	--	0.13%	38	4.46%	59	0.00%	34	-0.03	35	-0.04	35	0.00%	1
Total Emerging Market Debt	5.11%	4.45%	16	6.46%	32	0.83%	21	0.65	20	0.88	19	1.24%	8
JP Morgan EMBI Global Index	--	3.75%	32	6.60%	33	0.00%	32	0.53	31	0.72	33	0.00%	1
Total Real Estate	6.58%	10.89%	--	4.72%	--	-0.10%	--	2.25	--	104.88	--	1.28%	--
NCREIF Property Index	--	10.19%	--	4.21%	--	0.00%	--	2.36	--	97.96	--	0.00%	--
Total Absolute Return	7.08%	4.19%	68	3.47%	32	0.42%	60	1.13	49	1.69	46	1.63%	6
HFRI Fund of Funds Composite Index	--	3.98%	69	3.25%	28	0.00%	66	1.14	48	1.50	54	0.00%	1
Total Risk Parity/GAA	4.44%	4.34%	61	7.22%	62	-1.99%	82	0.56	78	0.84	77	4.17%	44
60% MSCI World (Net) / 40% CITI WGBI	--	7.03%	30	6.61%	53	0.00%	44	1.02	26	2.12	4	0.00%	1



# APPENDIX

NEPC, LLC

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# KEY MARKET THEMES

## Extended US Economic Cycle

### Economic cycles do not die of old age

The US economy is in an extended expansionary cycle despite being eight years removed from the last recession

Financial health of US consumers and ongoing recovery of the housing market continue to drive economic growth

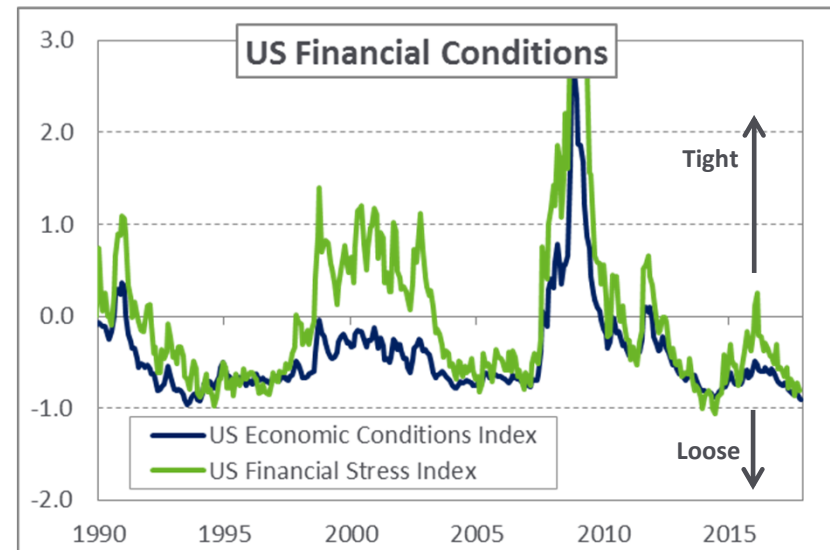
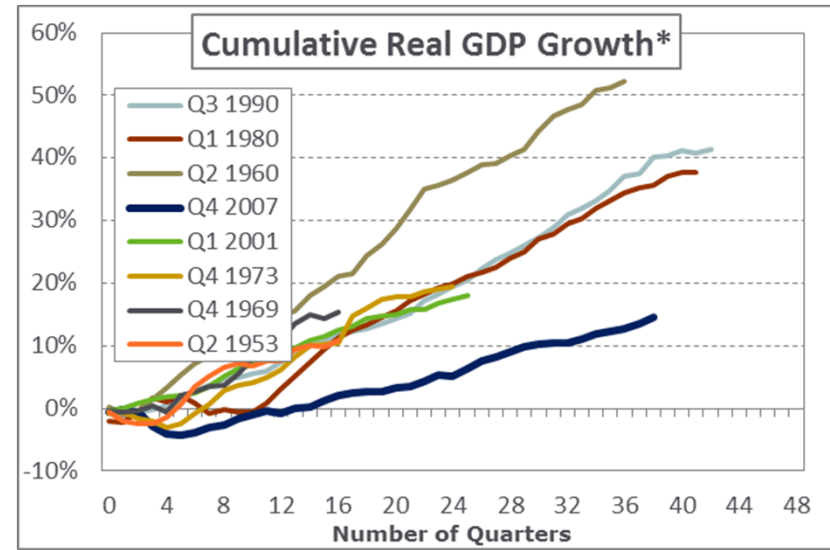
A prolonged US economic expansion can support a continued rally for US equities despite elevated valuation levels

### US financial conditions remain loose and support steady economic gains

Low inflation provides a foundation for positive economic conditions and reinforces the Fed's gradual monetary policy approach

Moderating US dollar strength is another form of easy financial conditions, benefiting global trade flows and credit creation

Reversal in these easy conditions may be fueled by actions outside the US, such as a misstep by global central banks and/or increased volatility in the Chinese yuan



Source: (Top) Bloomberg, \*Cumulative GDP growth from prior cycle peak  
Source: (Bottom) Federal Reserve Bank of Chicago and Kansas City



# KEY MARKET THEMES

## Extended US Economic Cycle

### Excess capacity remains in the system and provides fuel for the expansion

Labor market gains have been robust but slack remains as many have not returned to the workforce

Muted wage gains and low inflation metrics are reflective of the excess capacity remaining in the US economy

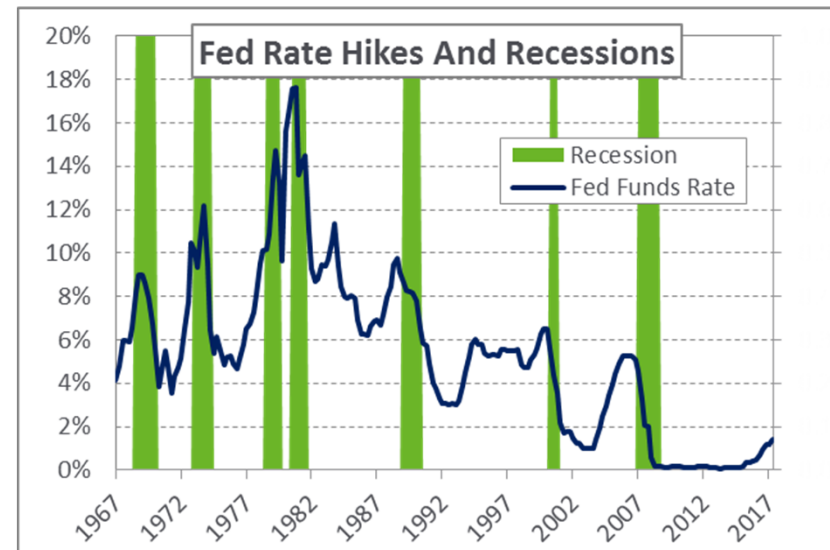
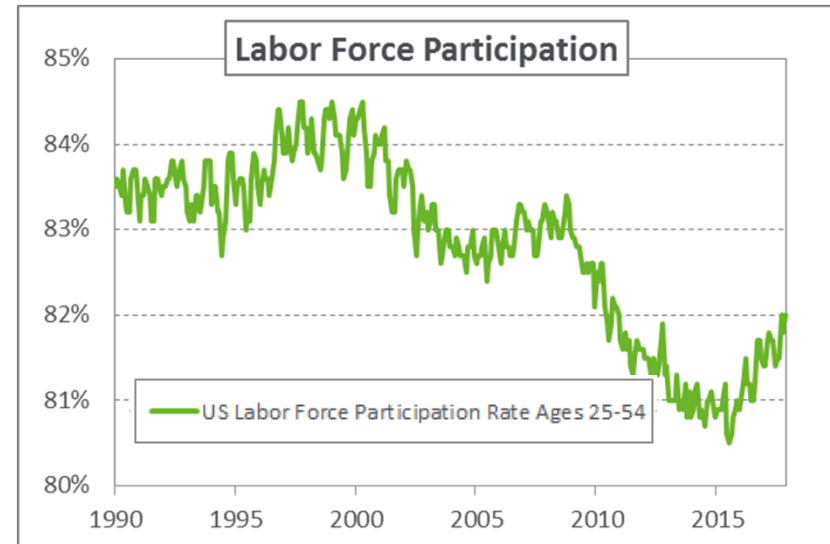
Tax cuts and fiscal stimulus can potentially remove spare economic capacity and be a catalyst for an uptick in inflation measures

### US recession concerns are muted

An acceleration in inflation leading to a tightening of financial conditions has historically been a catalyst to end economic expansions

However, improved US household balance sheets have room to expand and support further consumer spending gains

Improving global economic conditions reinforce an expansion of the US economy as global growth factors synchronize



Source: (Top) Federal Reserve Bank of St. Louis

Source: (Bottom) Federal Reserve, NEPC





# KEY MARKET THEMES

## Synchronized Economic Resurgence

### Global economic conditions are improving in a synchronized fashion

Coordinated global growth factors reinforce economic gains across the globe and are distinct from the extension of the US economic cycle

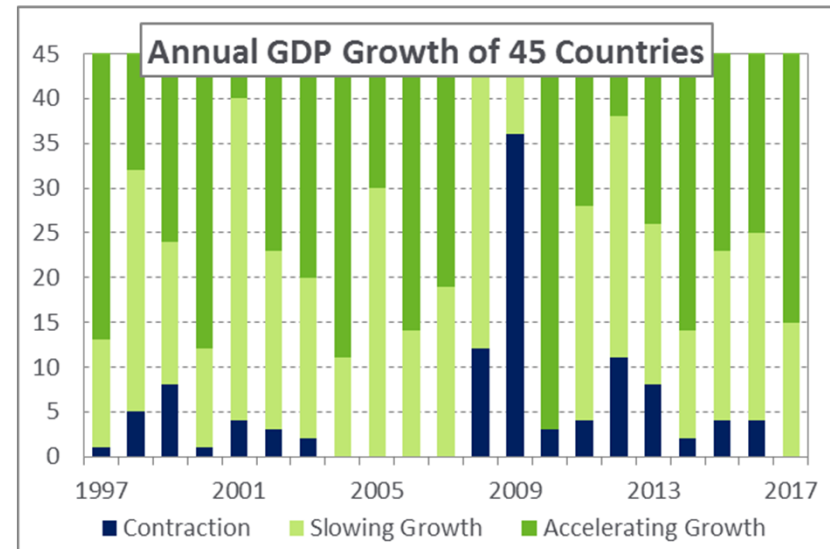
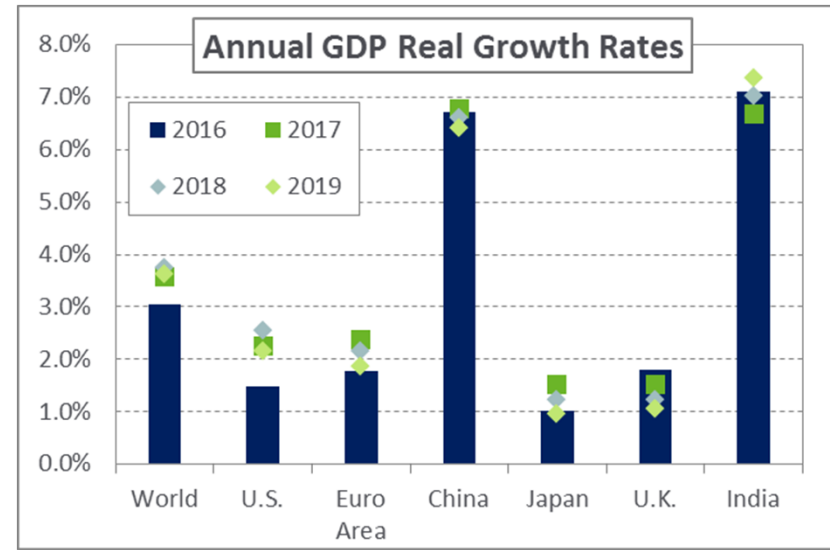
Non-US corporate revenues and equities are best positioned to benefit from a widespread boost in global economic conditions

### Positive growth rates harmonized across the globe are relatively rare

Conditions are the result of Europe, Japan, and large parts of the emerging world transitioning out of economic malaise

Persistence of the theme over several years would provide a substantial benefit to equity markets globally – specifically in Europe and Japan

Historically, periods of synchronized growth have been derailed by higher inflation levels and central banks tightening policy



Source: (Top) OECD  
Source: (Bottom) OECD



# KEY MARKET THEMES

## Synchronized Economic Resurgence

### Erosion of excess economic capacity is a catalyst to boost economic gains

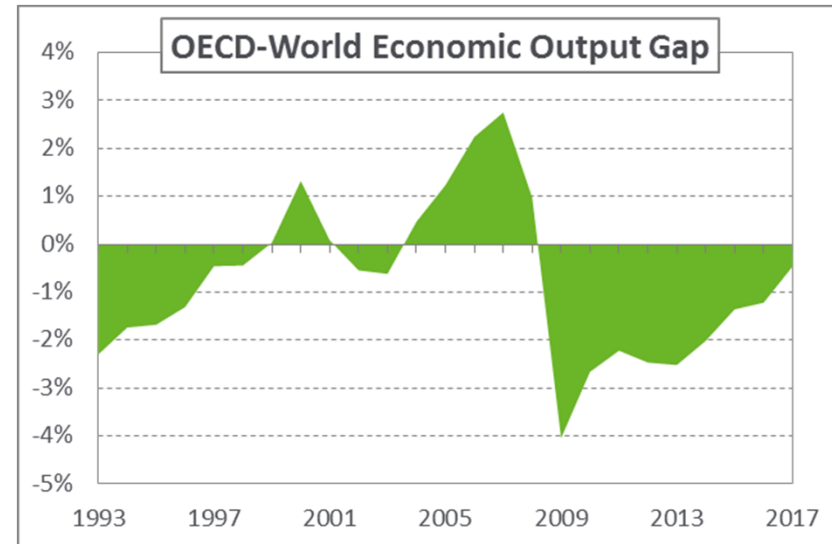
Despite recent labor market improvements, potential for labor reform in Europe and improved workforce participation in Japan offer multi-year benefits to economic growth

Material decline in emerging market inflation provides a cushion for real interest rates to fall and fuel an expansion of economic activity

### Economic resurgence is delicate and can be disrupted by lingering global risk factors

US dollar strength, dislocation in China's credit expansion, and restrictive US trade policy pose the greatest threats

The foundation of synchronized economic resurgence is the continuation of positive trends associated with the other key market themes



Source: (Top) OECD  
Source: (Bottom) IMF



# KEY MARKET THEMES

## Federal Reserve Gradualism

### The Federal Reserve is expected to slowly increase interest rates

Expected path of Fed policy through 2020 matters more than timing of the next hike as the disconnect between market expectations and Fed signaling has grown

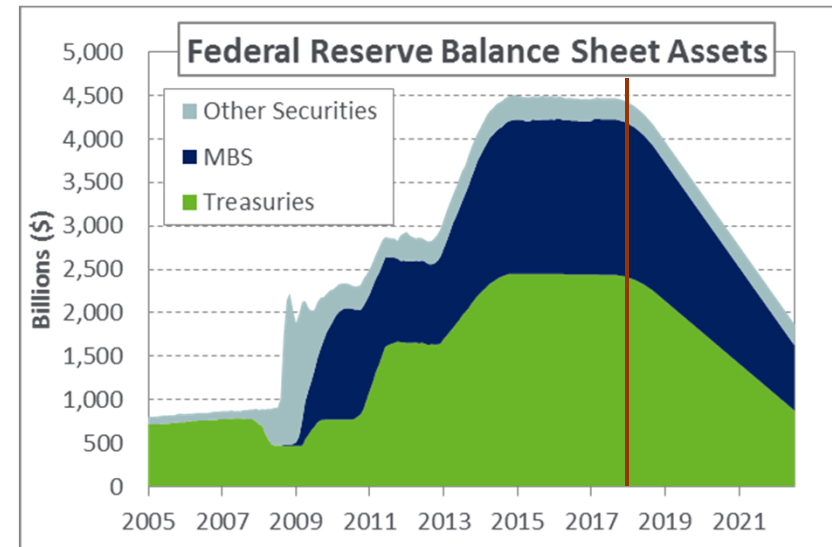
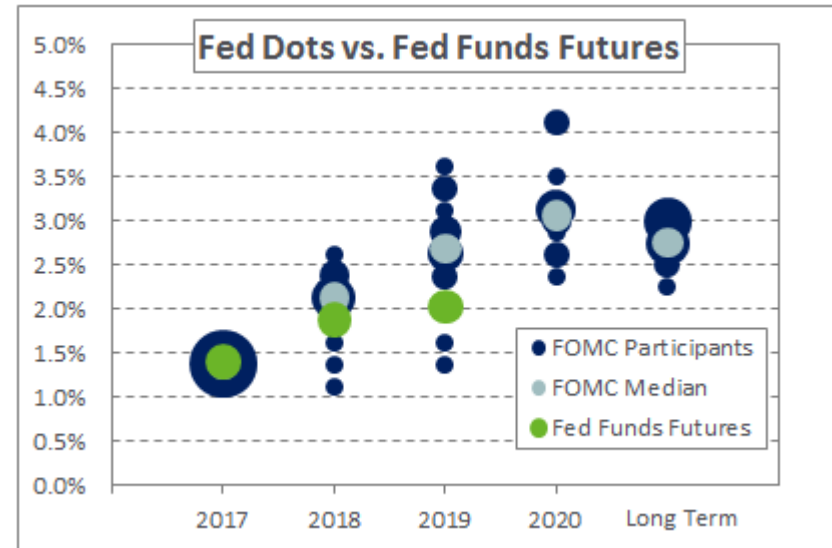
A relatively accommodative Fed is likely to continue, unless there is a dramatic acceleration in inflation

### The Fed's balance sheet normalization is a low grade tightening of monetary policy but its impact is untested

Fed is expected to be careful and data dependent yet balance sheet disbursement into a strong economy will likely have tightening effects – in the same way balance sheet expansion had easing effects

The balance sheet will gradually shrink over time assuming conditions remain supportive

The gradual progression of balance sheet reduction combined with the accommodative policies of global central banks supports easy global financial conditions



Source: (Top) Bloomberg, NEPC  
Source: (Bottom) Bloomberg, NEPC



# KEY MARKET THEMES

## Federal Reserve Gradualism

**Gradualism is the policy of choice globally as the major central banks manage unprecedented initiatives**

ECB's QE program is expanding but at a slower rate

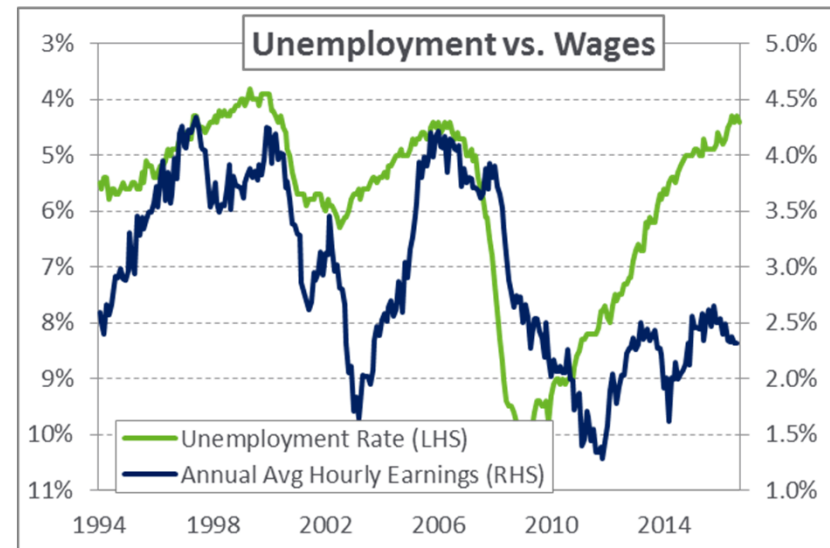
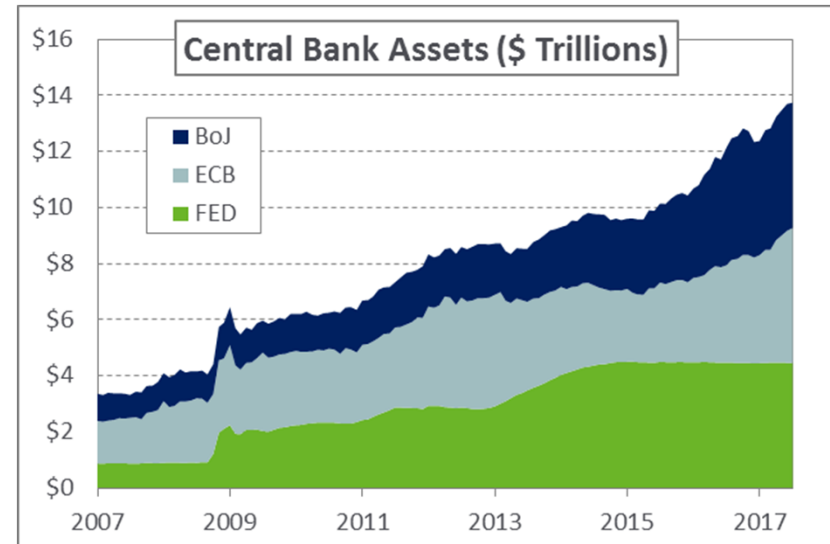
However, the reinvestment of balance sheet holdings is likely to continue for an extended period of time

Bank of Japan's QE yield-curve control program has rapidly slowed bond purchases but solidified steepness in the yield curve

**Inflation expected to shift marginally higher in the coming years**

Improvements in wage growth and aggregate economic activity support modest upticks in inflation but still within the Fed's tolerance bands to gradually raise rates

Fed has stated a willingness to let the economy "run hot" and accept some inflation to repair the deflationary effects of the past decade



Source: (Top) Bloomberg, NEPC  
Source: (Bottom): Bloomberg, FRED



# KEY MARKET THEMES

## China Transitions

### China is the global growth engine but faces fundamental transitions

China's economic transition is pivoting from production and investment focused to a service and consumption based economy

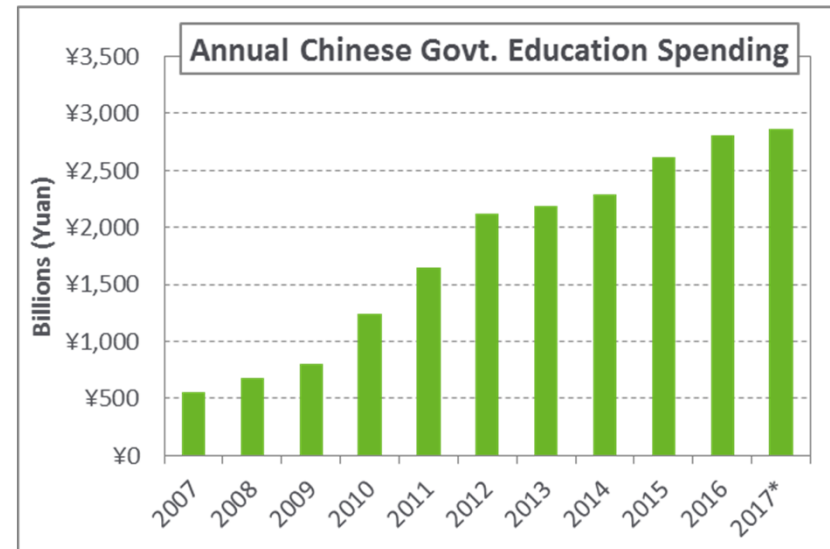
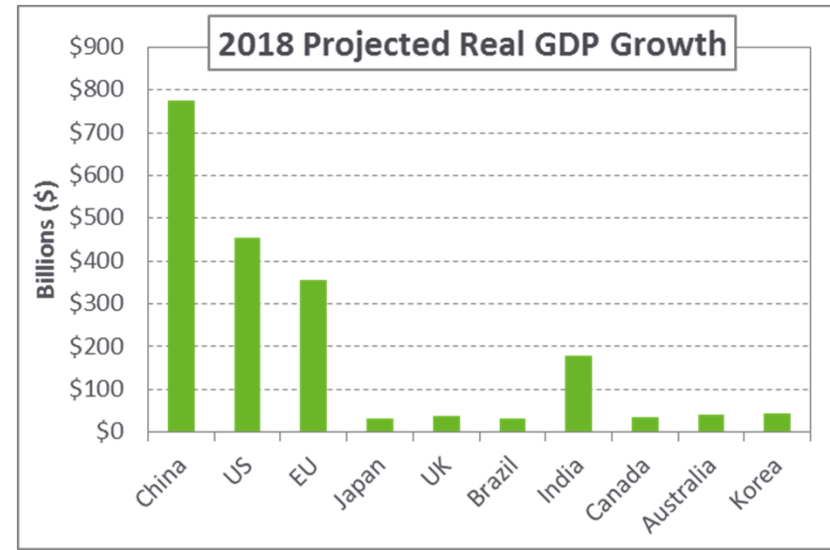
Fixed investment is required to sustain the production based economy and support employment as the rural population moves to urban centers

Any disruption to these transitions will have global repercussions due to China's role in the global economy

### China must manage competing social goals in attempting to sustain growth

Engineering an orderly transition to a consumer-led economy requires supporting employment outside the major cities and improving quality of life metrics such as air quality in the urban centers

Future growth in a services based economy requires advancement in productivity, technology, and a more skilled labor force



Source: (Top) Bloomberg

Source: (Bottom) Bloomberg, \*Includes estimate for Nov/Dec 2017



# KEY MARKET THEMES

## China Transitions

### The PBOC is tasked with straddling a delicate path as the economy evolves

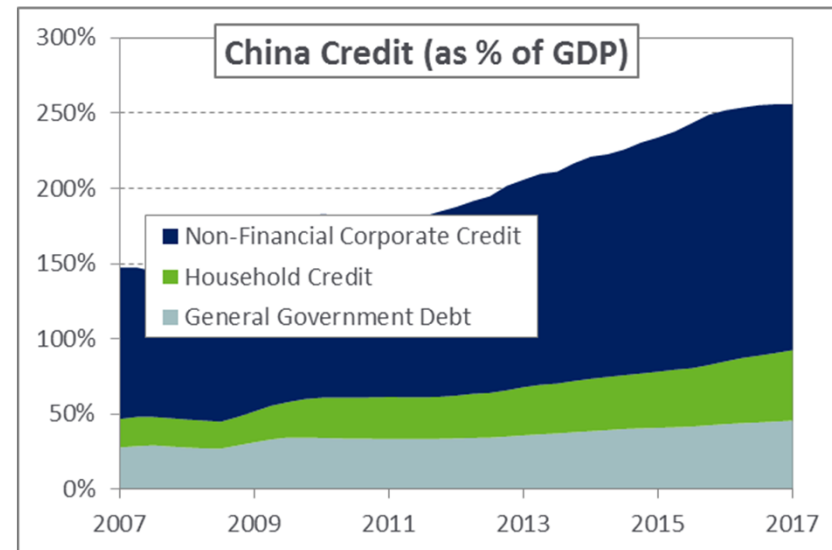
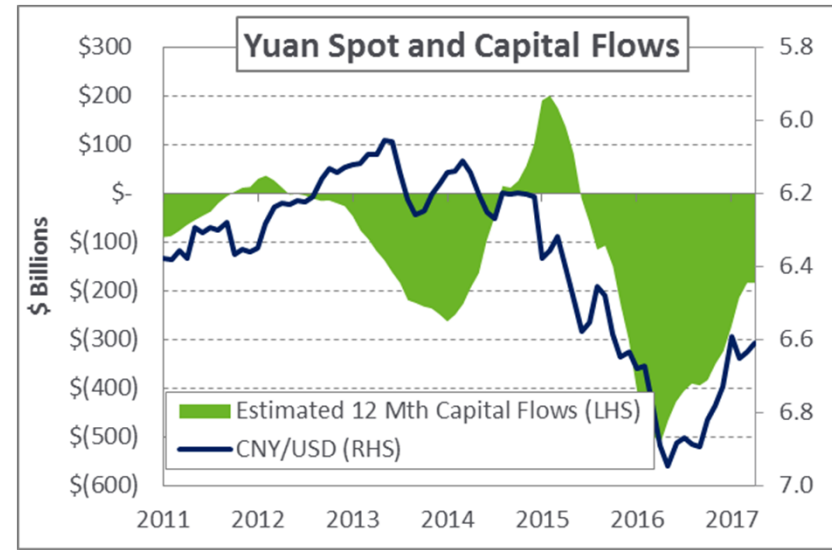
China maintains control of its currency and monetary policy but would have to make concessions to open its capital account and allow the free movement of capital in order to encourage investment

Restrictions on capital markets are slowly being eased, with an eye towards limiting social disruption

### China's government is negotiating a balance of tightening credit expansion and support for economic growth

Continued credit expansion and real estate development risk inflating asset price bubbles and pose a systemic risk

Markets have responded positively to the PBOC's management of a more stable yuan as capital outflow pressure has eased but currency devaluation remains a tail risk



Source: (Top) Bloomberg, NEPC  
Source: (Bottom) Bank of International Settlements



# KEY MARKET THEMES

## Globalization Backlash

### Uneven economic growth and wage gains have fueled political discontent in the developed world

Election results in France have assuaged fears of political gridlock in the EU

Italian election in first half of 2018 is another potential flashpoint on globalization

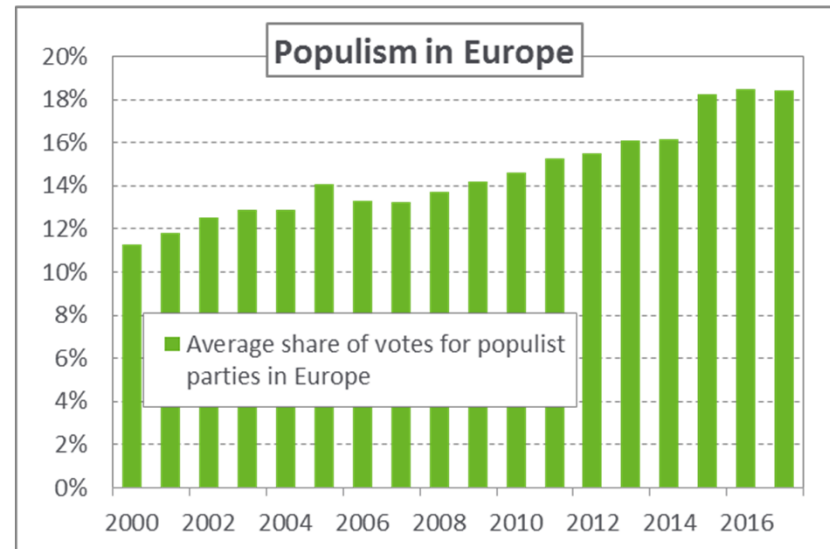
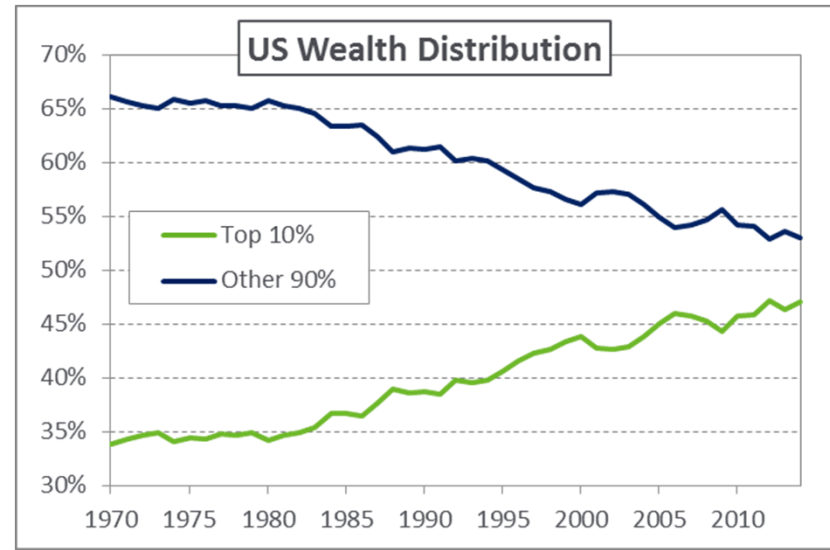
Anti-establishment political bias is likely a long term trend and potentially leads to higher levels of currency volatility over time

### For many nations, a turn inward is associated with globalization fatigue

Often fuels greater expression of nationalism and increased geopolitical risks as multilateral relationships are reassessed

Populist movements destabilize the political order and shifts away from political orthodoxy heighten tail risks

However, equity markets often overreact to geopolitical concerns and sell-offs can be a buying opportunity for investors



Source: (Top) World Wealth & Income Database

Source: (Bottom) World Bank



# KEY MARKET THEMES

## Globalization Backlash

### Major shifts in US trade policy did not materialize in 2017

However, a more aggressive protectionist policy would represent a material risk to global markets and the world economy

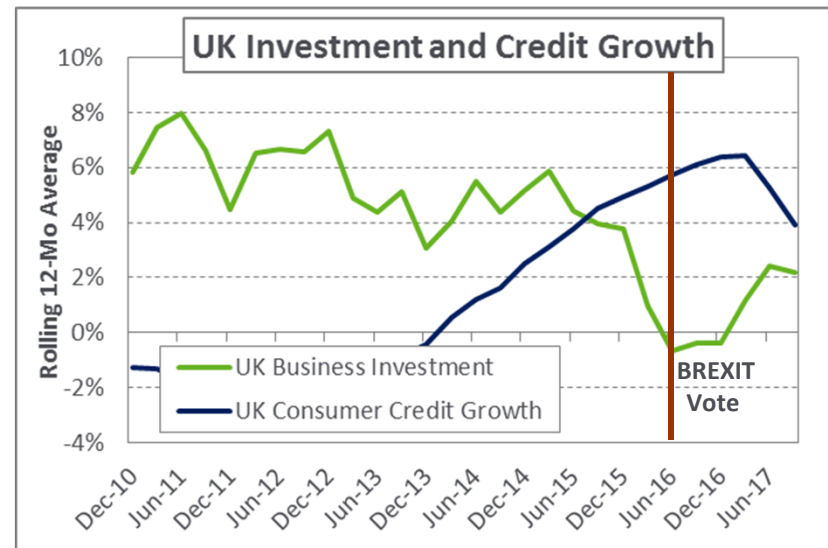
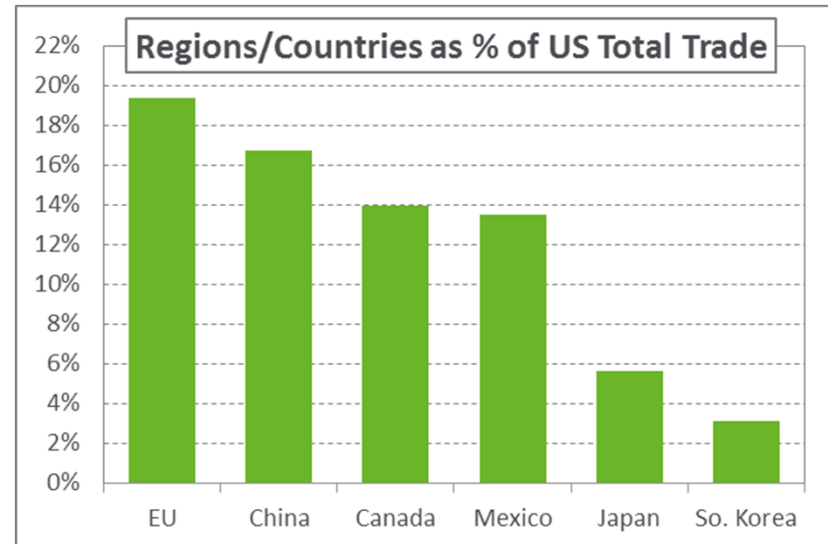
Markets have taken to interpreting the US administration's rhetoric with a grain of salt but ongoing NAFTA negotiations are a concern

### The UK serves as a live case study for the effects of globalization backlash

While it is early in the process, economic metrics across the country have turned lower in the 18 months since UK voted to leave the European Union

Expected disruption to financial regulations, customs controls, and business confidence in the UK are proving to be a cautionary tale for a turn away from globalization

However, the economic unease of voters remain and popularity of anti-establishment political parties poses a risk to the global economic order



Source: (Top) Federal Reserve Bank of St. Louis

Source: (Bottom) Bloomberg

