

# FUND EVALUATION REPORT

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## San Francisco Retiree Health Care Trust Fund

May 8, 2017



**Confidentiality:** This evaluation is prepared by Meketa Investment Group, Inc. for the exclusive use of the San Francisco Retiree Health Care Trust Fund. This evaluation is not to be used for any other purpose or by any parties other than its Board Members, their employees, agents, attorneys, and/or consultants. No other parties are authorized to review or utilize the information contained herein without expressed written consent.

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M E K E T A     I N V E S T M E N T     G R O U P

BOSTON  
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FLORIDA

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OREGON

SAN DIEGO  
CALIFORNIA

LONDON  
UNITED KINGDOM

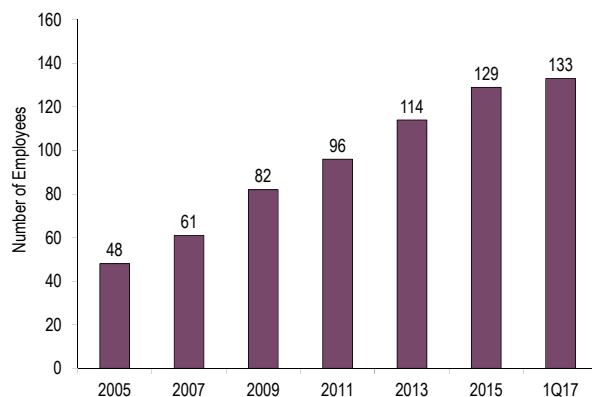
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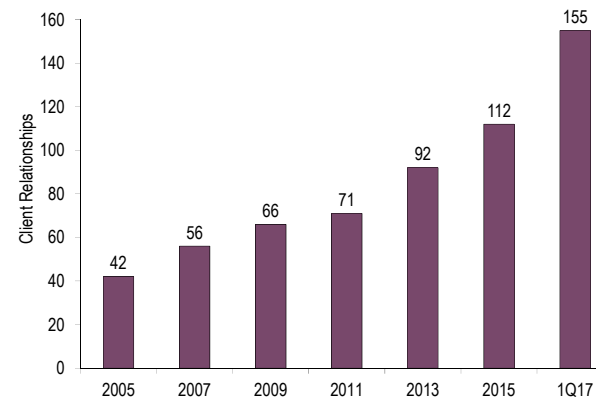
# **Meketa Investment Group Corporate Update**

- Staff of 133, including 85 investment professionals and 26 CFA Charterholders
- 155 clients, with over 250 funds throughout the United States
- Significant investment in staff and resources
- Offices in Boston, Chicago, Miami, Portland (OR), San Diego, and London
- Clients have aggregate assets of over \$890 billion
  - Over \$60 billion in assets committed to alternative investments
    - Private Equity
    - Infrastructure
    - Natural Resources
    - Real Estate
    - Hedge Funds
    - Commodities

**Employee Growth**



**Client Growth**



**Meketa Investment Group is proud to work for over 5 million American families everyday.**



## Asset Classes Followed Intensively by Meketa Investment Group

Domestic Equities	International Equities	Private Equity	Real Assets	Fixed Income	Hedge Funds
<ul style="list-style-type: none"> <li>- Passive</li> <li>- Enhanced Index</li> <li>- Large Cap</li> <li>- Midcap</li> <li>- Small Cap</li> <li>- Microcap</li> <li>- 130/30</li> </ul>	<ul style="list-style-type: none"> <li>- Large Cap Developed</li> <li>- Small Cap Developed</li> <li>- Emerging Markets</li> <li>- Frontier Markets</li> </ul>	<ul style="list-style-type: none"> <li>- Buyouts</li> <li>- Venture Capital</li> <li>- Private Debt</li> <li>- Special Situations</li> <li>- Secondaries</li> <li>- Fund of Funds</li> </ul>	<ul style="list-style-type: none"> <li>- Public REITs</li> <li>- Core Real Estate</li> <li>- Value Added Real Estate</li> <li>- Opportunistic Real Estate</li> <li>- Infrastructure</li> <li>- Timber</li> <li>- Natural Resources</li> <li>- Commodities</li> </ul>	<ul style="list-style-type: none"> <li>- Short-Term</li> <li>- Core</li> <li>- Core Plus</li> <li>- TIPS</li> <li>- High Yield</li> <li>- Bank Loans</li> <li>- Distressed</li> <li>- Global</li> <li>- Emerging Markets</li> </ul>	<ul style="list-style-type: none"> <li>- Long/Short Equity</li> <li>- Event Driven</li> <li>- Relative Value</li> <li>- Fixed Income Arbitrage</li> <li>- Multi Strategy</li> <li>- Market Neutral</li> <li>- Global Macro</li> <li>- Fund of Funds</li> <li>- Portable Alpha</li> </ul>

**Executive Summary  
As of March 31, 2017**

**San Francisco Retiree Health Care Trust Fund**

- The market value of the San Francisco Retiree Health Care Trust Fund increased from \$134.3 million to \$153.1 million during the quarter due to net cash inflows of \$11.6 million and positive performance. The Fund returned 5.1% during the quarter.
- The quarter-to-date performance was driven by domestic and international equity, which returned 6.1% and 7.3%, respectively. Fixed income returned 0.9%.
- As of quarter end, the San Francisco Retiree Health Care Trust Fund's cash position was 3%. We anticipate there were always be a nominal cash position due to contributions.

**San Francisco Community College District Retiree Health Care Trust Fund**

- The market value of the San Francisco Community College District Retiree Health Care Trust Fund increased from \$11.9 million to \$12.5 million during the quarter due to positive performance. The Fund returned 5.1% during the quarter.
- The quarter-to-date performance was driven by domestic and international equity, which returned 6.1% and 7.3%, respectively. Fixed income returned 0.9%.

# First Quarter Performance Report

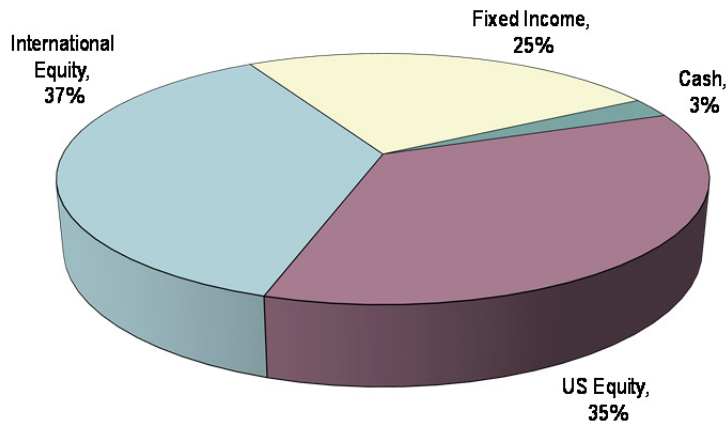


Total Fund Market Value

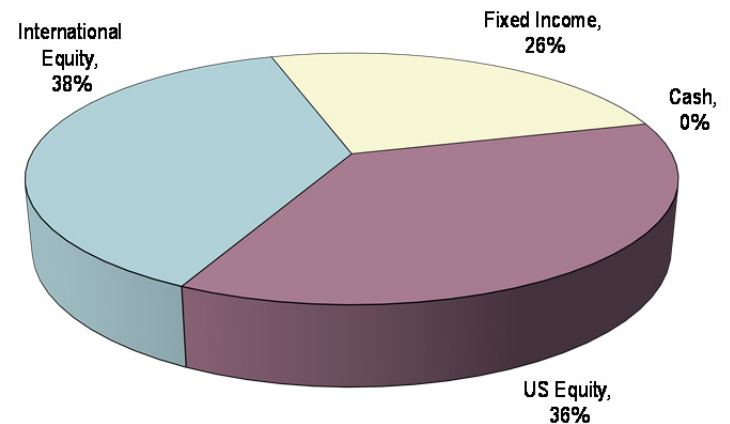
Market Value	US Equity (\$)	International Equity (\$)	Fixed Income (\$)	Cash (\$)	Total (\$)
San Francisco Retiree Health Care Trust Fund	54,231,583	56,711,862	38,266,913	3,905,138	153,115,496
San Francisco Community College District Retiree Health Care Trust Fund	4,541,251	4,748,945	3,204,400	1,513	12,496,109
<b>Total</b>	<b>58,772,834</b>	<b>61,460,807</b>	<b>41,471,313</b>	<b>3,906,651</b>	<b>165,611,605</b>

% Allocation by Asset Class	US Equity (%)	International Equity (%)	Fixed Income (%)	Cash (%)	Total (%)
San Francisco Retiree Health Care Trust Fund	35%	37%	25%	3%	100%
San Francisco Community College District Retiree Health Care Trust Fund	36%	38%	26%	0%	100%
<b>Total</b>	<b>35%</b>	<b>37%</b>	<b>25%</b>	<b>3%</b>	<b>100%</b>

San Francisco Retiree Health Care Trust Fund

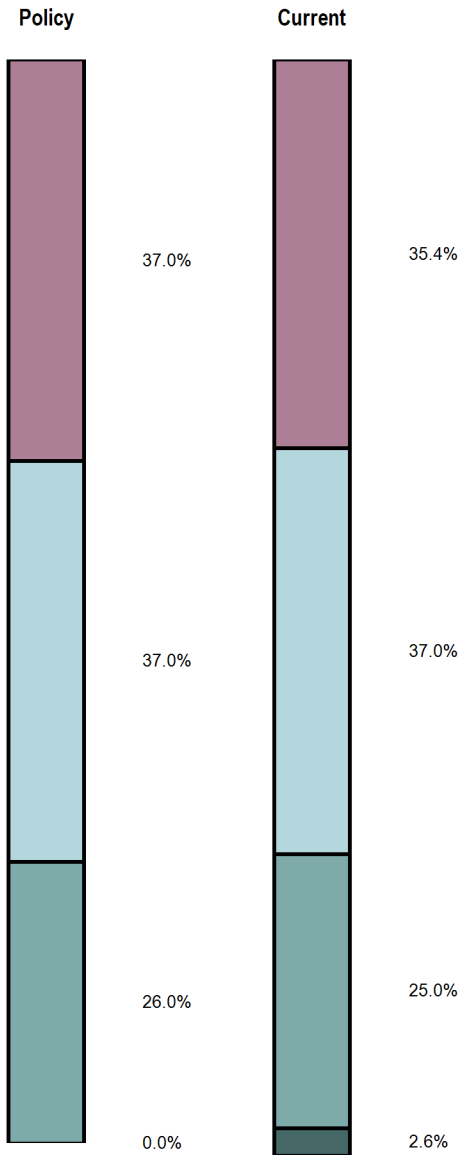


San Francisco Community College District Retiree Health Care Trust Fund



**San Francisco Retiree Health Care Trust Fund  
As of March 31, 2017**

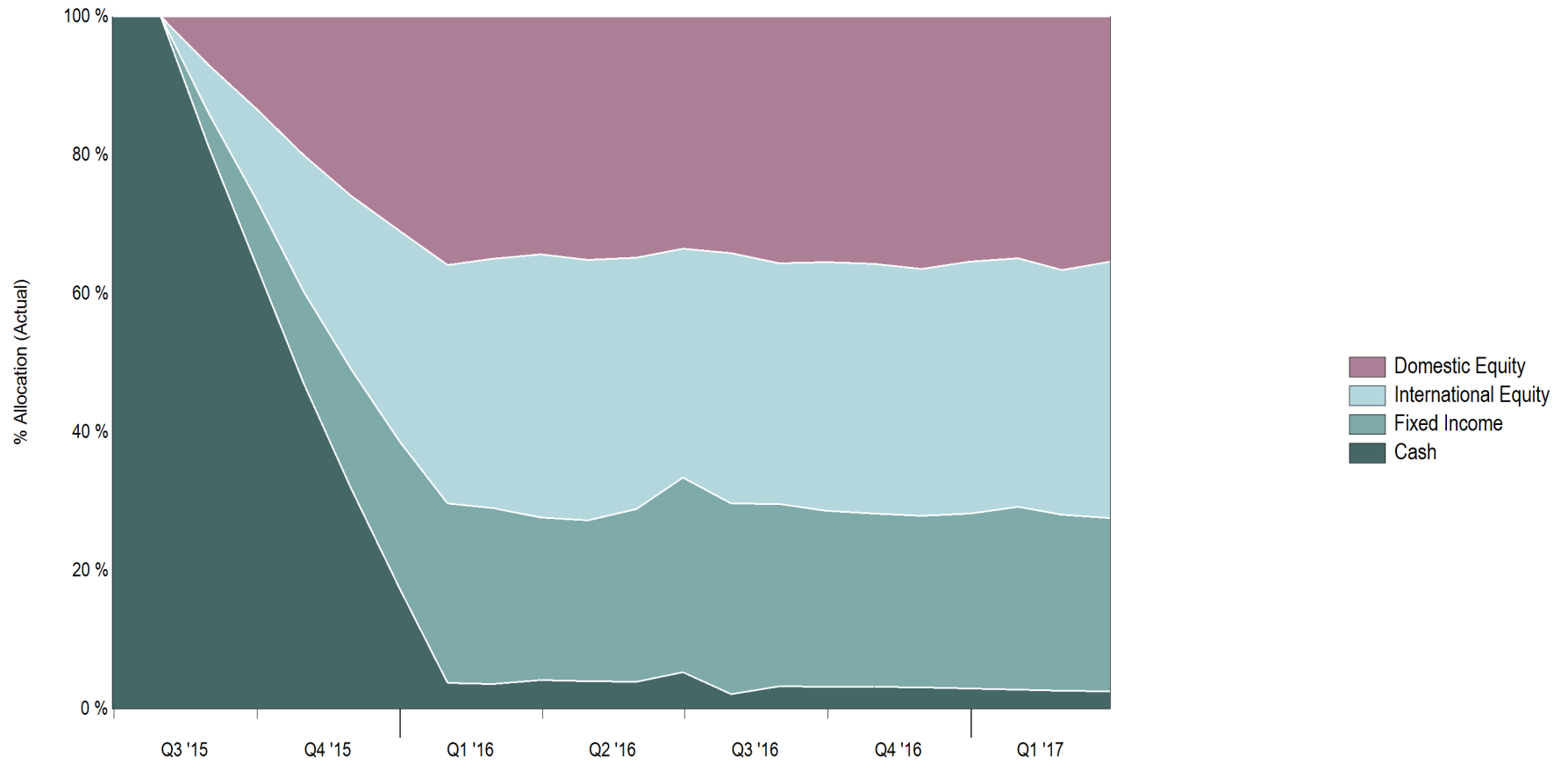
As of March 31, 2017



Allocation vs. Targets and Policy

	Current Balance	Current Allocation	Policy	Difference	Policy Range	Within IPS Range?
US Equity	\$54,231,583	35%	37%	-2%	32% - 42%	Yes
International Equity	\$56,711,862	37%	37%	0%	32% - 42%	Yes
Fixed Income	\$38,266,913	25%	26%	-1%	21% - 31%	Yes
Cash	\$3,905,138	3%	0%	3%	0% - 0%	No
<b>Total</b>	<b>\$153,115,496</b>	<b>100%</b>	<b>100%</b>			

Asset Allocation History  
1 Year 9 Months Ending March 31, 2017



As of March 31, 2017

## Asset Class Performance Summary

	Market Value (\$)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
<b>Total Fund</b>	<b>153,115,496</b>	<b>100.0</b>	<b>5.1</b>	<b>5.1</b>	<b>10.4</b>	<b>--</b>	<b>--</b>	<b>7.2</b>	<b>Sep-15</b>
<i>CPI - Medical Care</i>			1.1	1.1	3.5	3.1	2.9	3.9	Sep-15
<b>Domestic Equity</b>	<b>54,231,583</b>	<b>35.4</b>	<b>6.1</b>	<b>6.1</b>	<b>17.2</b>	<b>--</b>	<b>--</b>	<b>14.5</b>	<b>Sep-15</b>
<i>S&amp;P 500</i>			6.1	6.1	17.2	10.4	13.3	14.5	Sep-15
<b>International Equity</b>	<b>56,711,862</b>	<b>37.0</b>	<b>7.3</b>	<b>7.3</b>	<b>12.0</b>	<b>--</b>	<b>--</b>	<b>4.9</b>	<b>Sep-15</b>
<i>MSCI EAFE</i>			7.2	7.2	11.7	0.5	5.8	4.8	Sep-15
<b>Fixed Income</b>	<b>38,266,913</b>	<b>25.0</b>	<b>0.9</b>	<b>0.9</b>	<b>0.5</b>	<b>--</b>	<b>--</b>	<b>2.3</b>	<b>Sep-15</b>
<i>BBgBarc US Aggregate TR</i>			0.8	0.8	0.4	2.7	2.3	2.3	Sep-15
<b>Cash</b>	<b>3,905,138</b>	<b>2.6</b>	<b>0.2</b>	<b>0.2</b>	<b>0.7</b>	<b>--</b>	<b>--</b>	<b>0.7</b>	<b>Sep-15</b>
<i>91 Day T-Bills</i>			0.1	0.1	0.4	0.2	0.1	0.3	Sep-15

As of March 31, 2017

## Trailing Performance

	Market Value (\$)	% of Portfolio	3 Mo Net Cash Flows (\$)	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
<b>Total Fund</b>	<b>153,115,496</b>	<b>100.0</b>	<b>11,584,360</b>	<b>5.1</b>	<b>5.1</b>	<b>10.4</b>	<b>--</b>	<b>--</b>	<b>7.2</b>	<b>Sep-15</b>
<i>CPI - Medical Care</i>				1.1	1.1	3.5	3.1	2.9	3.9	Sep-15
<b>Domestic Equity</b>	<b>54,231,583</b>	<b>35.4</b>	<b>3,645,593</b>	<b>6.1</b>	<b>6.1</b>	<b>17.2</b>	<b>--</b>	<b>--</b>	<b>14.5</b>	<b>Sep-15</b>
<i>S&amp;P 500</i>				6.1	6.1	17.2	10.4	13.3	14.5	Sep-15
Northern Trust S&P 500 Index	54,231,583	35.4	3,645,593	6.1	6.1	17.2	--	--	14.5	Sep-15
<i>S&amp;P 500</i>				6.1	6.1	17.2	10.4	13.3	14.5	Sep-15
<b>International Equity</b>	<b>56,711,862</b>	<b>37.0</b>	<b>3,857,058</b>	<b>7.3</b>	<b>7.3</b>	<b>12.0</b>	<b>--</b>	<b>--</b>	<b>4.9</b>	<b>Sep-15</b>
<i>MSCI EAFE</i>				7.2	7.2	11.7	0.5	5.8	4.8	Sep-15
Northern Trust EAFE Index	56,711,862	37.0	3,857,058	7.3	7.3	12.0	--	--	4.9	Sep-15
<i>MSCI EAFE</i>				7.2	7.2	11.7	0.5	5.8	4.8	Sep-15
<b>Fixed Income</b>	<b>38,266,913</b>	<b>25.0</b>	<b>4,087,951</b>	<b>0.9</b>	<b>0.9</b>	<b>0.5</b>	<b>--</b>	<b>--</b>	<b>2.3</b>	<b>Sep-15</b>
<i>BBgBarc US Aggregate TR</i>				0.8	0.8	0.4	2.7	2.3	2.3	Sep-15
BlackRock U.S. Debt Index	38,266,913	25.0	4,087,951	0.9	0.9	0.5	--	--	2.3	Sep-15
<i>BBgBarc US Aggregate TR</i>				0.8	0.8	0.4	2.7	2.3	2.3	Sep-15
<b>Cash</b>	<b>3,905,138</b>	<b>2.6</b>	<b>-6,242</b>	<b>0.2</b>	<b>0.2</b>	<b>0.7</b>	<b>--</b>	<b>--</b>	<b>0.7</b>	<b>Sep-15</b>
<i>91 Day T-Bills</i>				0.1	0.1	0.4	0.2	0.1	0.3	Sep-15

As of March 31, 2017

## Account Information

Account Name	Northern Trust S&P 500 Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	9/01/15
Account Type	US Equity
Benchmark	S&P 500
Universe	

## Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Northern Trust S&P 500 Index	6.1	6.1	17.2	--	--	--	14.5	Sep-15
S&P 500	6.1	6.1	17.2	10.4	13.3	7.5	14.5	Sep-15

## Top 10 Holdings

APPLE	3.7%
MICROSOFT	2.5%
AMAZON.COM	1.7%
EXXON MOBIL	1.7%
JOHNSON & JOHNSON	1.7%
FACEBOOK CLASS A	1.6%
BERKSHIRE HATHAWAY 'B'	1.6%
JP MORGAN CHASE & CO.	1.5%
GENERAL ELECTRIC	1.3%
AT&T	1.3%
<b>Total</b>	<b>18.6%</b>

## Northern Trust S&amp;P 500 Index-NL Characteristics

	Portfolio Q1-17	Index Q1-17	Portfolio Q4-16
<b>Market Value</b>			
Market Value (\$M)	54.2	--	47.5
Number Of Holdings	506	505	506
<b>Characteristics</b>			
Weighted Avg. Market Cap. (\$B)	151.4	151.4	138.5
Median Market Cap (\$B)	19.9	19.9	18.7
P/E Ratio	24.6	23.7	23.1
Yield	2.0	2.0	2.1
EPS Growth - 5 Yrs.	9.5	9.0	8.0
Price to Book	4.9	4.4	4.7
Beta (holdings; domestic)	1.0	1.0	1.0
<b>Sector Distribution</b>			
Energy	6.6	6.6	7.5
Materials	2.8	2.9	2.8
Industrials	10.1	10.0	10.3
Consumer Discretionary	12.3	12.3	12.0
Consumer Staples	9.3	9.3	9.4
Health Care	13.9	13.9	13.6
Financials	14.3	14.4	14.8
Information Technology	22.0	22.1	20.7
Telecommunication Services	2.4	2.4	2.7
Utilities	3.2	3.2	3.2
Real Estate	2.9	2.9	2.9

As of March 31, 2017

## Account Information

Account Name	Northern Trust EAFE Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	9/01/15
Account Type	Non-US Stock All
Benchmark	MSCI EAFE
Universe	

## Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Northern Trust EAFE Index	7.3	7.3	12.0	--	--	--	4.9	Sep-15
MSCI EAFE	7.2	7.2	11.7	0.5	5.8	1.1	4.8	Sep-15

## Performance Summary Report

As of 3/31/2017

Region	Number Of Assets	% of Total	% of Bench	% Diff
North America ex U.S.	0	0%	0%	0%
United States	8	1%	0%	1%
Europe Ex U.K.	362	46%	45%	1%
United Kingdom	102	18%	18%	0%
Pacific Basin Ex Japan	153	14%	13%	1%
Japan	333	24%	23%	0%
Emerging Markets	1	0%	0%	0%
Other	12	1%	1%	0%
<b>Total</b>	<b>971</b>	<b>100%</b>	<b>100%</b>	<b>0%</b>

## Northern Trust EAFE Index Characteristics

	Portfolio Q1-17	Index Q1-17	Portfolio Q4-16
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## Market Value

Market Value (\$M)	56.7	--	48.9
Number Of Holdings	971	929	955

## Characteristics

Weighted Avg. Market Cap. (\$B)	53.3	53.0	51.0
Median Market Cap (\$B)	9.1	9.4	8.6
P/E Ratio	22.6	21.2	21.8
Yield	3.0	3.0	3.1
EPS Growth - 5 Yrs.	4.0	3.5	5.5
Price to Book	3.0	2.4	3.0
Beta (holdings; domestic)	1.0	1.0	1.0

## Sector Distribution

Energy	5.0	5.0	5.4
Materials	7.6	8.0	7.6
Industrials	14.4	14.3	14.0
Consumer Discretionary	12.3	12.2	12.5
Consumer Staples	11.4	11.4	11.1
Health Care	10.8	10.7	10.7
Financials	21.3	21.3	21.2
Information Technology	5.7	5.7	5.4
Telecommunication Services	4.4	4.4	4.5
Utilities	3.4	3.4	3.4
Real Estate	3.6	3.7	3.7



**Account Information**

Account Name	<b>BlackRock U.S. Debt Index</b>
Account Structure	<b>Commingled Fund</b>
Investment Style	<b>Passive</b>
Inception Date	<b>9/01/15</b>
Account Type	<b>US Fixed Income</b>
Benchmark	<b>BBgBarc US Aggregate TR</b>
Universe	

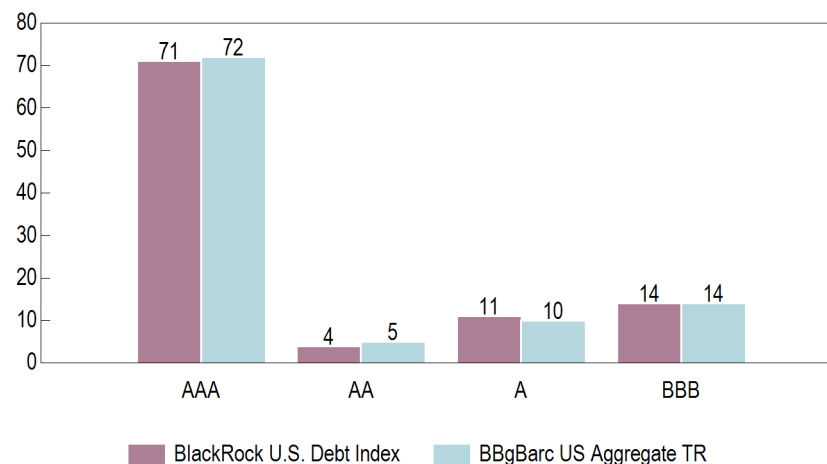
**Portfolio Performance Summary**

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
BlackRock U.S. Debt Index	0.9	0.9	0.5	--	--	--	2.3	Sep-15
BBgBarc US Aggregate TR	0.8	0.8	0.4	2.7	2.3	4.3	2.3	Sep-15

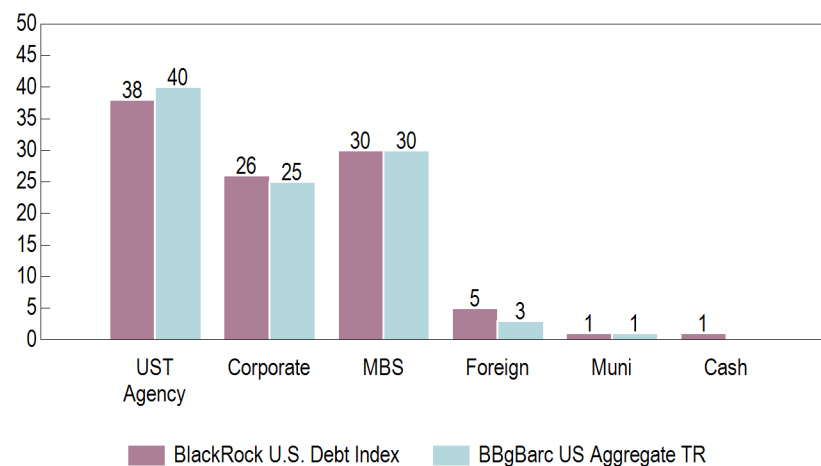
**BlackRock U.S. Debt Index-Non Lending Characteristics vs. BBgBarc US Aggregate TR**

	Portfolio Q1-17	Index Q1-17	Portfolio Q4-16
<b>Fixed Income Characteristics</b>			
Yield to Maturity	2.6	2.5	2.6
Average Duration	5.7	6.0	5.7
Average Quality	AA	AA	AA

**Credit Quality Allocation**



**Sector Allocation**



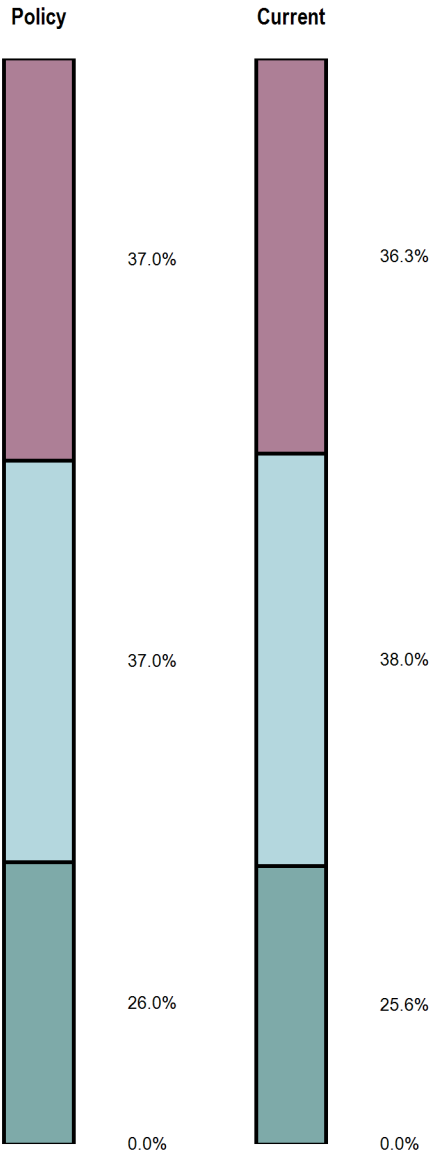
As of March 31, 2017

**Investment Expense Analysis**  
As Of March 31, 2017

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
<b>Domestic Equity</b>		<b>\$54,231,583</b>		
Northern Trust S&P 500 Index	0.035% of First \$50.0 Mil, 0.030% of Next \$50.0 Mil, 0.025% Thereafter	\$54,231,583	\$18,769	0.035%
<b>International Equity</b>		<b>\$56,711,862</b>		
Northern Trust EAFE Index	0.050% of Assets	\$56,711,862	\$28,356	0.050%
<b>Fixed Income</b>		<b>\$38,266,913</b>		
BlackRock U.S. Debt Index	0.050% of Assets	\$38,266,913	\$19,133	0.050%

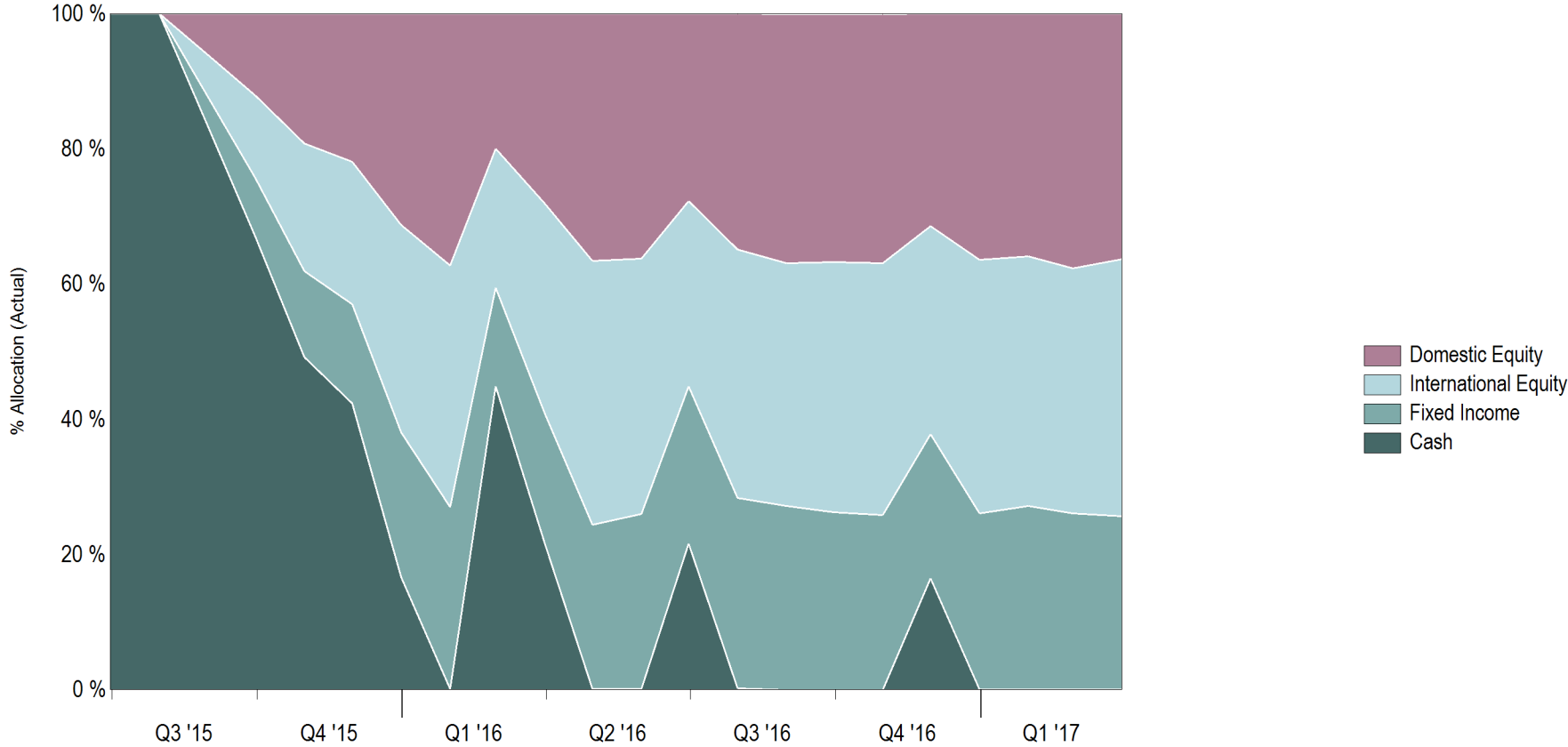
**San Francisco Community College District  
Health Care Trust Fund  
As of March 31, 2017**

As of March 31, 2017



Allocation vs. Targets and Policy							
	Current Balance	Current Allocation	Policy	Difference	Policy Range	Within IPS Range?	
US Equity	\$4,541,251	36%	37%	-1%	32% - 42%	Yes	
International Equity	\$4,748,945	38%	37%	1%	32% - 42%	Yes	
Fixed Income	\$3,204,400	26%	26%	0%	21% - 31%	Yes	
Cash	\$1,513	0%	0%	0%	0% - 0%	No	
<b>Total</b>	<b>\$12,496,109</b>	<b>100%</b>	<b>100%</b>				

Asset Allocation History  
1 Year 9 Months Ending March 31, 2017



As of March 31, 2017

## Asset Class Performance Summary

	Market Value (\$)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
<b>Total Fund</b>	<b>12,496,109</b>	<b>100.0</b>	<b>5.1</b>	<b>5.1</b>	<b>10.0</b>	<b>--</b>	<b>--</b>	<b>6.2</b>	<b>Sep-15</b>
<i>CPI - Medical Care</i>			<i>1.1</i>	<i>1.1</i>	<i>3.5</i>	<i>3.1</i>	<i>2.9</i>	<i>3.9</i>	<i>Sep-15</i>
<b>Domestic Equity</b>	<b>4,541,251</b>	<b>36.3</b>	<b>6.1</b>	<b>6.1</b>	<b>17.2</b>	<b>--</b>	<b>--</b>	<b>14.5</b>	<b>Sep-15</b>
<i>S&amp;P 500</i>			<i>6.1</i>	<i>6.1</i>	<i>17.2</i>	<i>10.4</i>	<i>13.3</i>	<i>14.5</i>	<i>Sep-15</i>
<b>International Equity</b>	<b>4,748,945</b>	<b>38.0</b>	<b>7.3</b>	<b>7.3</b>	<b>12.0</b>	<b>--</b>	<b>--</b>	<b>4.9</b>	<b>Sep-15</b>
<i>MSCI EAFE</i>			<i>7.2</i>	<i>7.2</i>	<i>11.7</i>	<i>0.5</i>	<i>5.8</i>	<i>4.8</i>	<i>Sep-15</i>
<b>Fixed Income</b>	<b>3,204,400</b>	<b>25.6</b>	<b>0.9</b>	<b>0.9</b>	<b>0.5</b>	<b>--</b>	<b>--</b>	<b>2.3</b>	<b>Sep-15</b>
<i>BBgBarc US Aggregate TR</i>			<i>0.8</i>	<i>0.8</i>	<i>0.4</i>	<i>2.7</i>	<i>2.3</i>	<i>2.3</i>	<i>Sep-15</i>
<b>Cash</b>	<b>1,513</b>	<b>0.0</b>	<b>0.2</b>	<b>0.2</b>	<b>0.7</b>	<b>--</b>	<b>--</b>	<b>0.7</b>	<b>Sep-15</b>
<i>91 Day T-Bills</i>			<i>0.1</i>	<i>0.1</i>	<i>0.4</i>	<i>0.2</i>	<i>0.1</i>	<i>0.3</i>	<i>Sep-15</i>

As of March 31, 2017

## Trailing Net Performance

	Market Value (\$)	% of Portfolio	3 Mo Net Cash Flows (\$)	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
<b>Total Fund</b>	<b>12,496,109</b>	<b>100.0</b>		<b>5.1</b>	<b>5.1</b>	<b>10.0</b>	<b>--</b>	<b>--</b>	<b>6.2</b>	<b>Sep-15</b>
<i>CPI - Medical Care</i>				1.1	1.1	3.5	3.1	2.9	3.9	Sep-15
<b>Domestic Equity</b>	<b>4,541,251</b>	<b>36.3</b>		<b>6.1</b>	<b>6.1</b>	<b>17.2</b>	<b>--</b>	<b>--</b>	<b>14.5</b>	<b>Sep-15</b>
<i>S&amp;P 500</i>				6.1	6.1	17.2	10.4	13.3	14.5	Sep-15
Northern Trust S&P 500 Index	4,541,251	36.3		6.1	6.1	17.2	--	--	14.5	Sep-15
<i>S&amp;P 500</i>				6.1	6.1	17.2	10.4	13.3	14.5	Sep-15
<b>International Equity</b>	<b>4,748,945</b>	<b>38.0</b>		<b>7.3</b>	<b>7.3</b>	<b>12.0</b>	<b>--</b>	<b>--</b>	<b>4.9</b>	<b>Sep-15</b>
<i>MSCI EAFE</i>				7.2	7.2	11.7	0.5	5.8	4.8	Sep-15
Northern Trust EAFE Index	4,748,945	38.0		7.3	7.3	12.0	--	--	4.9	Sep-15
<i>MSCI EAFE</i>				7.2	7.2	11.7	0.5	5.8	4.8	Sep-15
<b>Fixed Income</b>	<b>3,204,400</b>	<b>25.6</b>		<b>0.9</b>	<b>0.9</b>	<b>0.5</b>	<b>--</b>	<b>--</b>	<b>2.3</b>	<b>Sep-15</b>
<i>BBgBarc US Aggregate TR</i>				0.8	0.8	0.4	2.7	2.3	2.3	Sep-15
BlackRock U.S. Debt Index	3,204,400	25.6		0.9	0.9	0.5	--	--	2.3	Sep-15
<i>BBgBarc US Aggregate TR</i>				0.8	0.8	0.4	2.7	2.3	2.3	Sep-15
<b>Cash</b>	<b>1,513</b>	<b>0.0</b>		<b>0.2</b>	<b>0.2</b>	<b>0.7</b>	<b>--</b>	<b>--</b>	<b>0.7</b>	<b>Sep-15</b>
<i>91 Day T-Bills</i>				0.1	0.1	0.4	0.2	0.1	0.3	Sep-15

As of March 31, 2017

## Account Information

Account Name	Northern Trust S&P 500 Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	9/01/15
Account Type	US Equity
Benchmark	S&P 500
Universe	

## Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Northern Trust S&P 500 Index	6.1	6.1	17.2	--	--	--	14.5	Sep-15
S&P 500	6.1	6.1	17.2	10.4	13.3	7.5	14.5	Sep-15

## Top 10 Holdings

APPLE	3.7%
MICROSOFT	2.5%
AMAZON.COM	1.7%
EXXON MOBIL	1.7%
JOHNSON & JOHNSON	1.7%
FACEBOOK CLASS A	1.6%
BERKSHIRE HATHAWAY 'B'	1.6%
JP MORGAN CHASE & CO.	1.5%
GENERAL ELECTRIC	1.3%
AT&T	1.3%
<b>Total</b>	<b>18.6%</b>

## Northern Trust S&amp;P 500 Index-NL Characteristics

	Portfolio Q1-17	Index Q1-17	Portfolio Q4-16
<b>Market Value</b>			
Market Value (\$M)	4.5	--	4.3
Number Of Holdings	506	505	506
<b>Characteristics</b>			
Weighted Avg. Market Cap. (\$B)	151.4	151.4	138.5
Median Market Cap (\$B)	19.9	19.9	18.7
P/E Ratio	24.6	23.7	23.1
Yield	2.0	2.0	2.1
EPS Growth - 5 Yrs.	9.5	9.0	8.0
Price to Book	4.9	4.4	4.7
Beta (holdings; domestic)	1.0	1.0	1.0
<b>Sector Distribution</b>			
Energy	6.6	6.6	7.5
Materials	2.9	2.9	2.8
Industrials	10.0	10.0	10.3
Consumer Discretionary	12.3	12.3	12.0
Consumer Staples	9.3	9.3	9.4
Health Care	13.9	13.9	13.6
Financials	14.3	14.4	14.8
Information Technology	22.0	22.1	20.7
Telecommunication Services	2.4	2.4	2.7
Utilities	3.2	3.2	3.2
Real Estate	2.9	2.9	2.9



As of March 31, 2017

## Account Information

Account Name	Northern Trust EAFE Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	9/01/15
Account Type	Non-US Stock All
Benchmark	MSCI EAFE
Universe	

## Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Northern Trust EAFE Index	7.3	7.3	12.0	--	--	--	4.9	Sep-15
MSCI EAFE	7.2	7.2	11.7	0.5	5.8	1.1	4.8	Sep-15

## Performance Summary Report

As of 3/31/2017

Region	Number Of Assets	% of Total	% of Bench	% Diff
North America ex U.S.	0	0%	0%	0%
United States	8	1%	0%	1%
Europe Ex U.K.	362	46%	45%	1%
United Kingdom	102	18%	18%	0%
Pacific Basin Ex Japan	153	14%	13%	1%
Japan	333	24%	23%	0%
Emerging Markets	1	0%	0%	0%
Other	12	1%	1%	0%
<b>Total</b>	<b>971</b>	<b>100%</b>	<b>100%</b>	<b>0%</b>

## Northern Trust EAFE Index Characteristics

	Portfolio Q1-17	Index Q1-17	Portfolio Q4-16
--	-----------------	-------------	-----------------

## Market Value

Market Value (\$M)	4.7	--	4.4
Number Of Holdings	971	929	955

## Characteristics

Weighted Avg. Market Cap. (\$B)	53.3	53.0	51.0
Median Market Cap (\$B)	9.1	9.4	8.6
P/E Ratio	22.6	21.2	21.8
Yield	3.0	3.0	3.1
EPS Growth - 5 Yrs.	4.0	3.5	5.5
Price to Book	3.0	2.4	3.0
Beta (holdings; domestic)	1.0	1.0	1.0

## Sector Distribution

Energy	5.0	5.0	5.4
Materials	7.6	8.0	7.6
Industrials	14.4	14.3	14.0
Consumer Discretionary	12.3	12.2	12.5
Consumer Staples	11.4	11.4	11.1
Health Care	10.8	10.7	10.7
Financials	21.3	21.3	21.2
Information Technology	5.7	5.7	5.4
Telecommunication Services	4.4	4.4	4.5
Utilities	3.4	3.4	3.4
Real Estate	3.6	3.7	3.7

**Account Information**

Account Name	BlackRock U.S. Debt Index
Account Structure	Other
Investment Style	Active
Inception Date	9/01/15
Account Type	US Fixed Income
Benchmark	BBgBarc US Aggregate TR
Universe	

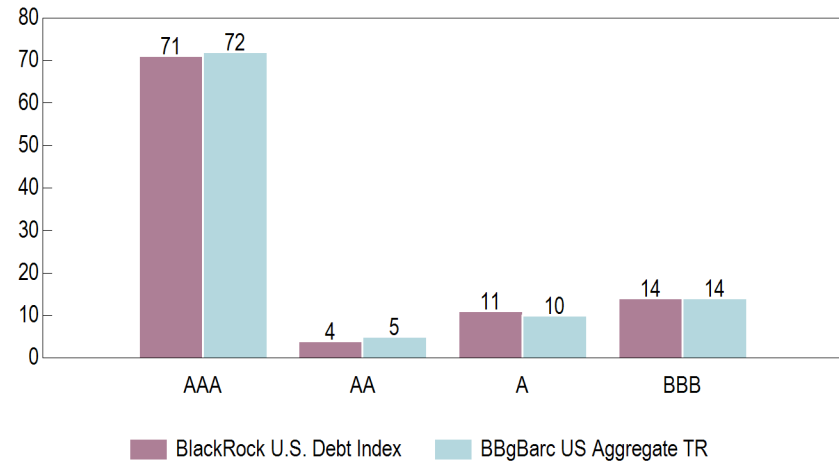
**Portfolio Performance Summary**

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
BlackRock U.S. Debt Index	0.9	0.9	0.5	--	--	--	2.3	Sep-15
BBgBarc US Aggregate TR	0.8	0.8	0.4	2.7	2.3	4.3	2.3	Sep-15

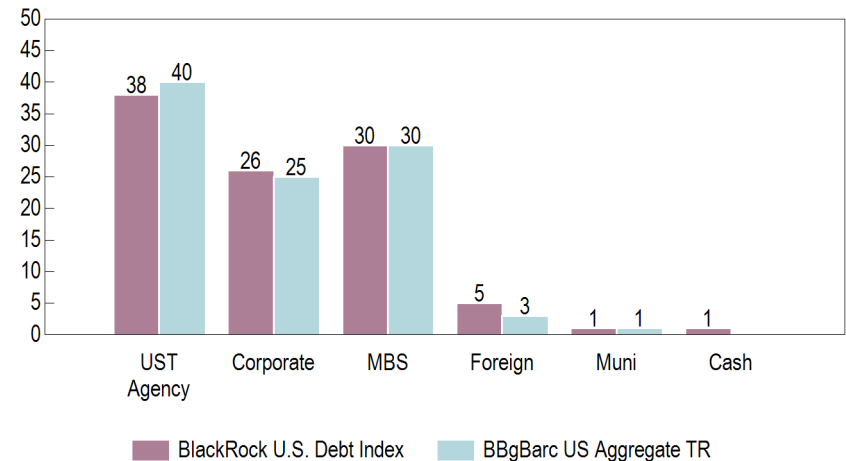
**BlackRock US Debt Index Fund "B" Characteristics vs. BBgBarc US Aggregate TR**

	Portfolio Q1-17	Index Q1-17	Portfolio Q4-16
<b>Fixed Income Characteristics</b>			
Yield to Maturity	2.6	2.5	2.6
Average Duration	5.7	6.0	5.7
Average Quality	AA	AA	AA

**Credit Quality Allocation**



**Sector Allocation**



As of March 31, 2017

## Investment Expense Analysis

As Of March 31, 2017

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
<b>Domestic Equity</b>		<b>\$4,541,251</b>		
Northern Trust S&P 500 Index	0.035% of First \$50.0 Mil, 0.030% of Next \$50.0 Mil, 0.025% Thereafter	\$4,541,251	\$1,589	0.035%
<b>International Equity</b>		<b>\$4,748,945</b>		
Northern Trust EAFE Index	0.050% of Assets	\$4,748,945	\$2,374	0.050%
<b>Fixed Income</b>		<b>\$3,204,400</b>		
BlackRock U.S. Debt Index	0.050% of Assets	\$3,204,400	\$1,602	0.050%

## **Education Session on High Yield Bonds**

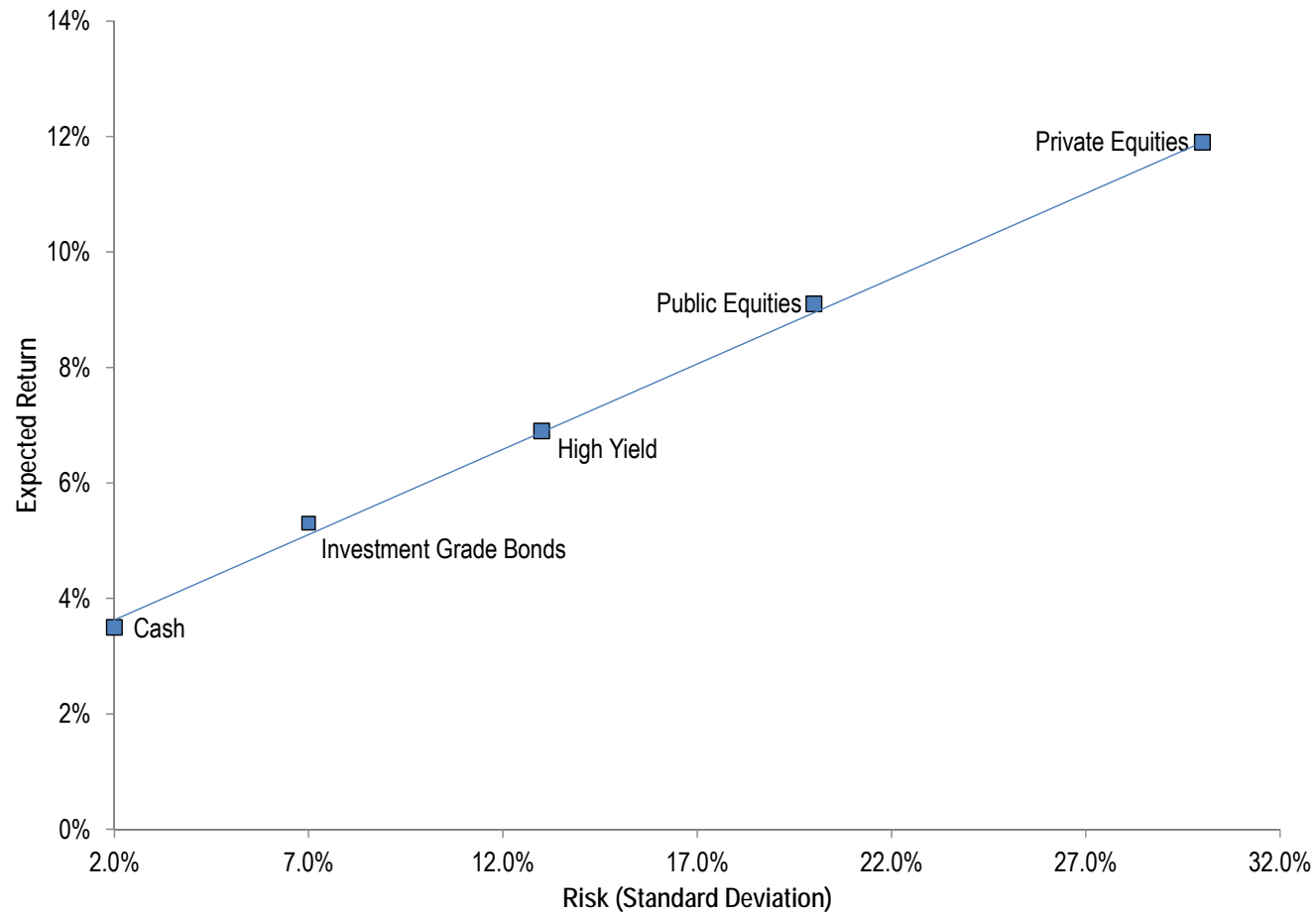
## What is a High Yield Bond?

- Bonds that are rated as less than investment grade by the credit-rating agencies (e.g., Standard & Poor's, Moody's).
- High yield bonds are also known as “below investment grade bonds” or “junk bonds”.
- The asset class covers a wide range from just-below investment grade “BB”-rated issues to much riskier distressed securities.

## History of High Yield Bond Market

- High yield bonds have existed in one form or another since the inception of U.S. bond markets.
- First gained popularity in the late 1800s as a financing tool for extending the railroad system.
- Until the latter part of the twentieth century, the market consisted mostly of “fallen angels”.
- During the 1980s, original issue high yield debt started to gain respectability.
- Developed reputation as “junk bonds” due to negative press associated with LBOs in the late 1980s.

### Risk-Return Spectrum



- High yield bonds fit between investment grade bonds and common stocks on the risk-return spectrum.

### Historical Return and Volatility

January 1985 – December 2016	Average Annual Return (%)	Average Standard Deviation (%)	Sharpe Ratio
Cash Equivalents	3.6	0.8	0.00
Investment Grade Bonds	7.1	4.1	0.80
High Yield Bonds	9.1	8.5	0.59
Public Domestic Equity	11.0	15.2	0.44
January 2007 – December 2016			
Cash Equivalents	0.8	0.4	0.00
Investment Grade Bonds	4.3	3.4	1.04
High Yield Bonds	7.5	11.6	0.58
Public Domestic Equity	6.9	16.5	0.37

- High yield bonds offer a higher historical average return versus investment grade bonds; however, they do so with a higher level of volatility.
- High yield bonds have displayed volatility between investment grade bonds and equities.



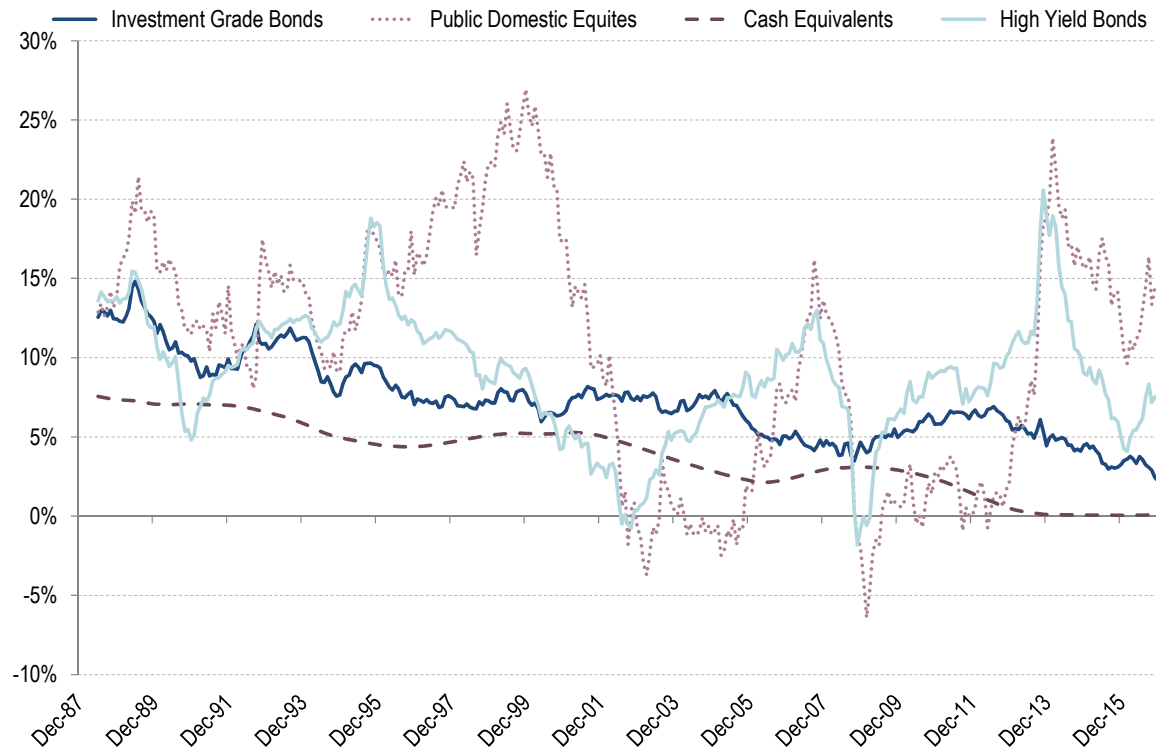
## Historical Correlations

January 1985 – December 2016	Cash Equivalents	Investment Grade Bonds	High Yield Bonds	Public Domestic Equities	Public Foreign Equities
Cash Equivalents	1.00	0.21	-0.01	0.04	0.05
Investment Grade Bonds		1.00	0.26	0.13	0.11
High Yield Bonds			1.00	0.61	0.52
Public Domestic Equities				1.00	0.69
Public Foreign Equities					1.00
<b>January 2007 – December 2016</b>					
Cash Equivalents	1.00	0.06	-0.15	-0.13	-0.06
Investment Grade Bonds		1.00	0.23	0.02	0.13
High Yield Bonds			1.00	0.73	0.77
Public Domestic Equities				1.00	0.89
Public Foreign Equities					1.00

- High yield bonds have moderate correlation with equities.

## Benefits of Investing in High Yield Bonds

### Rolling 5-Year Return Since 1985



- High yield bonds experienced different return patterns than other asset classes.

## Risks of Investing in High Yield Bonds

- Default risk
  - The risk of issuer failing to make timely payments of interest or principal
  - Default rates overstate the actual loss an investor experiences, as 40% of defaulted debt has been recovered historically
- Liquidity risk
  - The inability to trade at a price close to carrying value
  - Primarily a concern during a credit crunch
- Interest rate risk
  - The risk that interest rates will increase sharply and drive prices down
  - Default risk tends to overwhelm the effect of changing interest rates

## Risk/Return Analysis<sup>1</sup>

### Bond Portfolio Allocations

Aggregate Bond Portfolio	Expected Average Annual Return (%)	Expected Standard Deviation (%)	Sharpe Ratio
100% Investment Grade	3.5	6.1	0.18
100% High Yield	6.8	12.5	0.26
75% Investment Grade /25% High Yield	4.2	4.4	0.30

- High Yield allocation may improve the efficiency of a bond portfolio.

<sup>1</sup> Based on Meketa Investment Group's 2017 Annual Asset Study.



## Effect of Adding High Yield to Aggregate Bond Portfolio

- Duration
  - Slight decrease
- Quality
  - Modest decrease, usually from AA+ to A+ in an 75/25 portfolio
- Yield
  - Modest increase of 0.5% to 1.0% in an 75/25 portfolio

## Why Not Core Plus?

- Core plus managers often lack the expertise necessary to excel in the high yield bond market.
- Core plus managers often invest in only the largest issues in the high yield market.
- Tactical shifts by the manager prevent the fund from maintaining control of its exposure to the high yield market.
- Core plus managers often manage portfolios with more risk than the benchmarks they are being measured against.

## Summary

- High yield bonds are less risky than public equities.
- High yield bonds theoretically offer higher returns than investment grade bonds with higher volatility.
- A modest allocation to high yield bonds will likely maintain or increase the fund's investment return, without appreciably increasing total fund volatility.
- Adding an investment in high yield bonds can improve the fund's long-term risk-reward relationship.

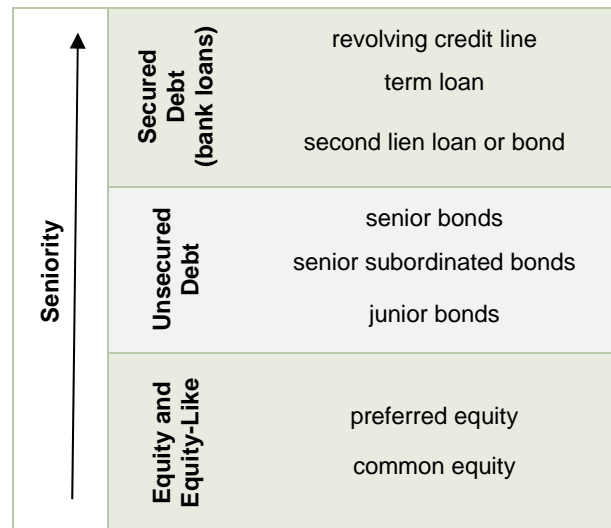
## **Education Session on Bank Loans**



### What are Bank Loans?

- Bank loans are senior secured, floating-rate loans made to corporations with below investment grade ratings.
- The most common reason a company issues loans are to finance an acquisition, corporate project, or leveraged buyout, or to refinance existing bank loans.
- Similar to high yield bonds, banks underwrite and syndicate bank loans, working with investment managers on pricing, structure, and covenants. Bank loans typically have three tranches: (1) the revolving credit line, (2) term loans, and (3) second lien loans or bonds. The revolving credit line is typically retained by banks.
- Bank loan managers invest primarily in institutional bank loan tranches.

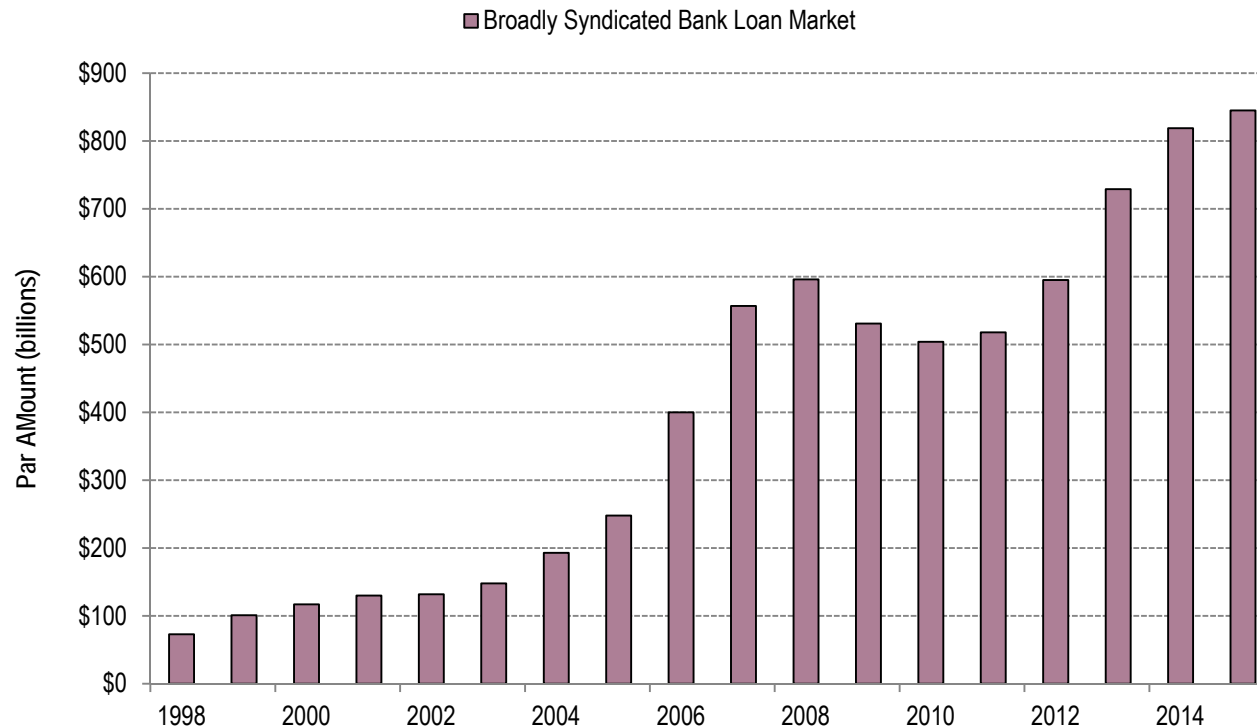
### Typical Capital Structure of a Below Investment Grade Company



## History of Bank Loans

- Bank loans emerged in the 1980s. They were typically held by banks on their balance sheets and not traded.
- In 1995, the industry established the Loan Syndications and Trading Association (LSTA), to develop and to govern market standards.
- The LSTA helped create stability in the asset class, causing the secondary market to flourish.
- The par amount of issuance of total bank loan (including revolvers and non-institutional tranches) rose from approximately \$100 billion in 1990 to approximately \$1 trillion in the mid-2000s.
- The bank loan buyer profile also changed dramatically. Originally, only banks purchased and held loans. Today, bank loan buyers include high yield managers, mutual funds, hedge funds, leveraged closed-end funds (Collateralized Loan Obligations or CLOs), and other institutional investors.

## Growth of the Bank Loan Market



- As investors became more comfortable with bank loans, the secondary market for broadly syndicated loans grew significantly. The par amount outstanding rose from less than \$200 billion in the early 1990s to over \$800 billion today.

## Bank Loans vs. High Yield Bonds

	Bank Loans	High Yield Bonds
Coupon Structure	Floating Rate	Fixed Rate
Example Coupon	LIBOR+ 4.0%	7.5%
Ranking	Senior	Senior Subordinated
Security <sup>1</sup>	Secured	Unsecured
Callability <sup>2</sup>	Callable	Not Callable

- Compared to high yield bonds, bank loans have a more senior position in the capital structure and are secured by company assets and cash flows. As a result, bank loans are considered less risky than high yield bonds.
- Historically, the recovery rate for defaulted bank loans has averaged 69%, while the recovery rate for high yield bonds has averaged 43%.
- Most bank loans carry a floating interest rate based on LIBOR plus a spread. The spread is based on the riskiness of the loan. Spreads typically range from 3.0% to 6.0% over LIBOR.
- During low interest rate periods, many bank loans are often issued with “LIBOR floors.” These features provide additional contractual cash returns to investors.

<sup>1</sup> Occasionally companies will issue unsecured bank loans or secured high yield bonds.

<sup>2</sup> Typically, bank loans are callable for the life of the loan. High yield bonds generally have a maturity of 8 to 10 years and are non-callable for the first 3 to 5 years.

## Historical Bank Loan Returns

As of December 31, 2016

### Trailing Period Returns

### Common Period<sup>1</sup> Statistics (Annualized)

Annualized Returns:	3 YR Return (%)	5 YR Return (%)	10 YR Return (%)	Common Period Return (%)	Standard Deviation (%)	Sharpe Ratio	Correlation to Bank Loans
CS Leveraged Loan	3.8	5.3	4.3	5.7	5.4	0.58	–
<i>Barclays High Yield</i>	4.7	7.4	7.5	8.0	9.1	0.60	0.74
<i>Barclays Aggregate</i>	3.0	2.2	4.3	5.6	3.8	0.79	-0.02

Calendar Year Returns:	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)	2011 (%)	2010 (%)	2009 (%)	2008 (%)	2007 (%)	2006 (%)	2005 (%)
CS Leveraged Loan	9.9	-0.4	2.0	6.2	9.4	1.8	10.0	44.9	-28.8	1.9	7.2	5.7
<i>Barclays High Yield</i>	17.1	-4.5	2.5	7.4	15.8	5.0	15.1	58.2	-26.2	1.9	11.8	2.7
<i>Barclays Aggregate</i>	2.6	0.5	6.0	-2.0	4.2	7.8	6.5	5.9	5.2	7.0	4.3	2.4

<sup>1</sup> Common period is from January 1992 to December 2016.



## Historical Correlations

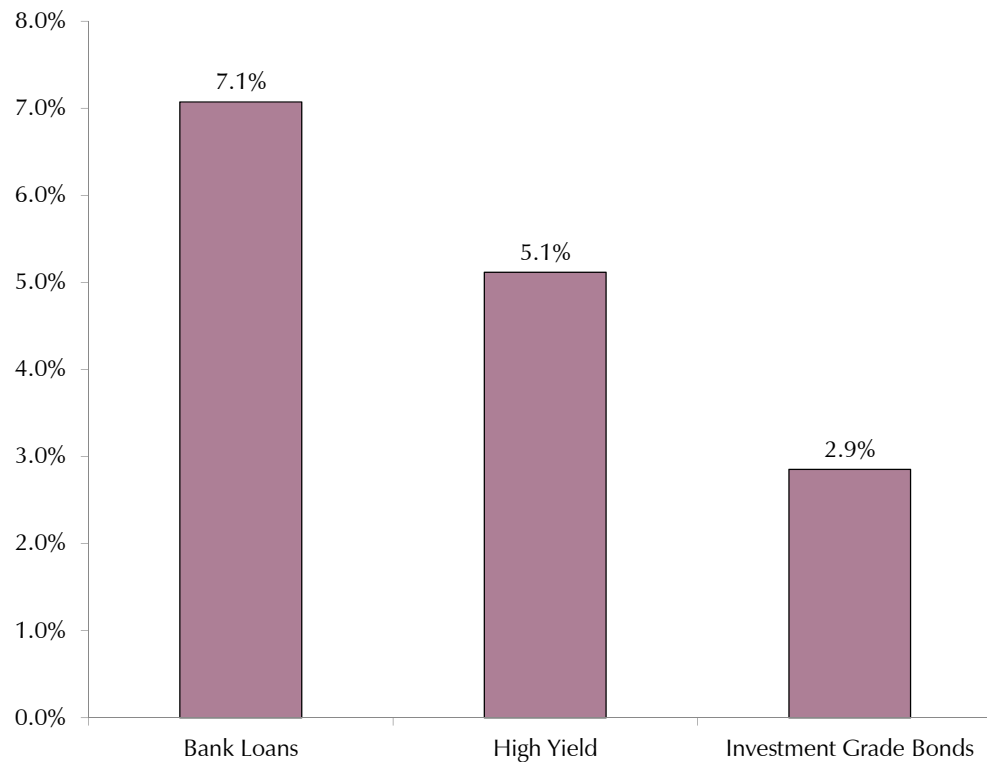
### January 1992 – December 2016

	Bank Loans	High Yield	Investment Grade Bonds	Intermediate Treasuries	Stocks
Bank Loans	1.00				
High Yield	0.74	1.00			
Investment Grade Bonds	-0.02	0.22	1.00		
Intermediate Treasuries	-0.32	-0.12	0.90	1.00	
Stocks	0.42	0.61	0.04	-0.18	1.00

\* Proxies used for Bank Loans, Investment Grade Bonds, Intermediate Treasuries, High Yield, and Stocks are the CSFB Leveraged Loan index, Barclays Aggregate index, Barclays Intermediate Treasury index, Barclays High Yield index, and the S&P 500 index, respectively.

- Bank loans have historically offered a diversification benefit compared to other traditional asset classes.

## Average One-Year Performance in Rising Rate Environments<sup>1</sup>



*\* Proxies for Bank Loans, High Yield, and Investment Grade Bonds are the CSFB Leveraged Loan index, Barclays High Yield index, and Barclays Aggregate index, respectively.*

- Bank Loans have outperformed high yield and investment grade bonds during periods of rising short-term interest rates.

<sup>1</sup> January 1992 through December 2016. A rising rate environment was defined as a 12-month period in which the 3-month Treasury yield increased by one standard deviation more than average.

## Advantages of Investing in Bank Loans

### Structure

- Unlike bonds that typically have fixed coupons, bank loan coupons are tied to short-term interest rates, which are variable.
- In the corporate capital structure, bank loans are senior and secured. Relative to fixed-rate bonds and equity, they have more protective covenants and a higher claim on company assets and cash flows in the event of default.

### Diversified source of return

- Bank loans represent an alternative, or complement, to high yield bonds, both from an investor's and an issuer's standpoint.
- Bank loans have exhibited lower correlations to other asset classes and can lower total Fund standard deviation, thus increasing risk-adjusted returns.
- Bank loans have historically experienced less volatility than high yield bonds.



## Potential Risks

- Company specific credit risk
  - Risk that the borrower will not meet the terms of the loan due to insufficient cash flow or covenant violations.
- Industry risk
  - A company's financial health is tied to the industry in which it operates. Highly leveraged companies are more vulnerable to negative industry trends.
- Capital market risk
  - Broadly syndicated bank loans typically do not amortize so issuing companies must repay the principal of maturing loans by issuing new loans. If the availability of credit in the markets is scarce, companies may find it difficult to refinance their debt.
- Liquidity risk
  - Bank loans do not trade on an exchange. They are less liquid than other forms of debt.

**There is no investable bank loan broad market index. An institutional investor must hire an active manager in order to gain exposure to the asset class.**

## Summary

- Bank loans represent an alternative to high yield bonds.
  - The key difference between the two are that bank loans pay a floating interest rate and occupy a more senior position in the capital structure.
- The bank loan market has grown rapidly in the last decade.
  - The establishment of governance standards and their popularity as a source for financing mergers and acquisitions have fueled this growth.
- Bank loans are likely to outperform high yield and investment grade bonds during periods of rising short-term interest rates.
- Bank loans represent an attractive area for diversification and to attain a reasonable risk-adjusted return.
  - As there is no investable bank loan index, investors would be required to hire an active manager.

# Asset Allocation Review

- 1. Background**
- 2. Asset Allocation Policy Options**
- 3. Mean Variance Optimization**
- 4. Risk Analysis**
- 5. Summary**
- 6. Appendices**

# Background

## Background

- Over the course of several quarters in late 2013 and throughout 2014, the Board reviewed several ways to invest the San Francisco Retiree Health Care Trust Fund (RHCTF) assets. These options included investing alongside SFERS, investing with one of the CalPERS CERBT portfolios, or devising a standalone asset allocation.
- Ultimately, the Board chose to leverage the SFERS custody and investment relationships as much as possible, but implement its own asset allocation. The decision was to utilize the passive strategies that SFERS was invested in, but not to invest alongside their active strategies. This limited RHCTF to the three passive asset classes in which the funds could be invested alongside SFERS: domestic equity (37% target allocation), international developed equity (37%), and investment grade bonds (26%).
- While federal tax code prevented RHCTF from utilizing the exact same investment pools as SFERS, the investment manager and custody relationships were still leveraged to gain access to strategies and companies that had been diligenced by SFERS. The Board decided that continuing with the aforementioned asset allocation policy was most appropriate, and after contracts were completed, the RHCTF began investing its assets in August 2015. As of March 31, 2016, the RHCTF had \$97 million, invested fairly close to the asset allocation targets. The Community College's RHCTF had an additional \$5 million.
- Meketa Investment Group, in our 2014 asset allocation reviews, recommended that the RHCTF consider investing in additional asset classes, outside the SFERS portfolio, once assets reached a "critical mass". Now that assets have grown to approximately \$165 million and are expected to grow meaningfully over the next several years due to contributions, we recommend the Board consider additional asset classes to further diversify the RHCTF.
- This document presents three options, with the intention of gathering feedback from the Board regarding their preferences for diversification, liquidity, return goals, and risk tolerance. Based on this feedback, further options can be presented at the next Board Meeting.

## **Asset Allocation Policy Options**

## Introduction to Asset Allocation Policy Review

- The goal of this review is not to declare one portfolio the “right” choice or the only prudent choice, but to highlight the risk and return tradeoffs of different policy portfolios.
- Over long periods of time, riskier assets, such as equities, are likely to produce relatively high rates of return. Consequently, higher allocations to risky assets increase the likelihood of the RHCTF achieving its long-term return expectations. However, riskier assets increase volatility in the short term.
- The asset allocation review process highlights the natural tension between long-term goals and short term risks, and should allow the Board to make more informed decisions regarding portfolio positioning.
- This document presents three asset allocation options for the RHCTF. Each of these options has a different expected return (7.0%, 7.5%, and 8.0%), highlighting the risk and return tradeoffs of portfolios with different exposures to risk assets.



### Asset Allocation Policy Options<sup>1</sup>

	Current	A	B	C
<b>Rate Sensitive</b>	<b>26</b>	<b>26</b>	<b>16</b>	<b>11</b>
Investment Grade Bonds	26	18	10	8
TIPS	--	8	6	3
<b>Credit</b>	<b>0</b>	<b>18</b>	<b>15</b>	<b>9</b>
High Yield Bonds	--	6	5	3
Bank Loans	--	6	5	3
Emerging Market Debt	--	6	5	3
<b>Equities</b>	<b>74</b>	<b>56</b>	<b>69</b>	<b>80</b>
U.S.	37	32	37	40
Int'l Developed Markets	37	14	17	20
Emerging Markets	--	10	15	20
<i>Expected Return</i>	<i>6.9</i>	<i>7.0</i>	<i>7.5</i>	<i>8.0</i>
<i>Standard Deviation</i>	<i>13.8</i>	<i>12.3</i>	<i>14.6</i>	<i>16.4</i>
<i>Sharpe Ratio</i>	<i>0.30</i>	<i>0.34</i>	<i>0.32</i>	<i>0.32</i>
<i>% Emerging Markets</i>	<i>0</i>	<i>16</i>	<i>20</i>	<i>23</i>
<i>% Non USD</i>	<i>38</i>	<i>26</i>	<i>34</i>	<i>41</i>

<sup>1</sup> Expected return and standard deviation are based upon Meketa Investment Group's 2017 Annual Asset Study. Meketa's expected return calculation is a 20-year geometric calculation. Throughout this document, returns for periods longer than one year are annualized.

### Review of Proposed Asset Allocation Policies

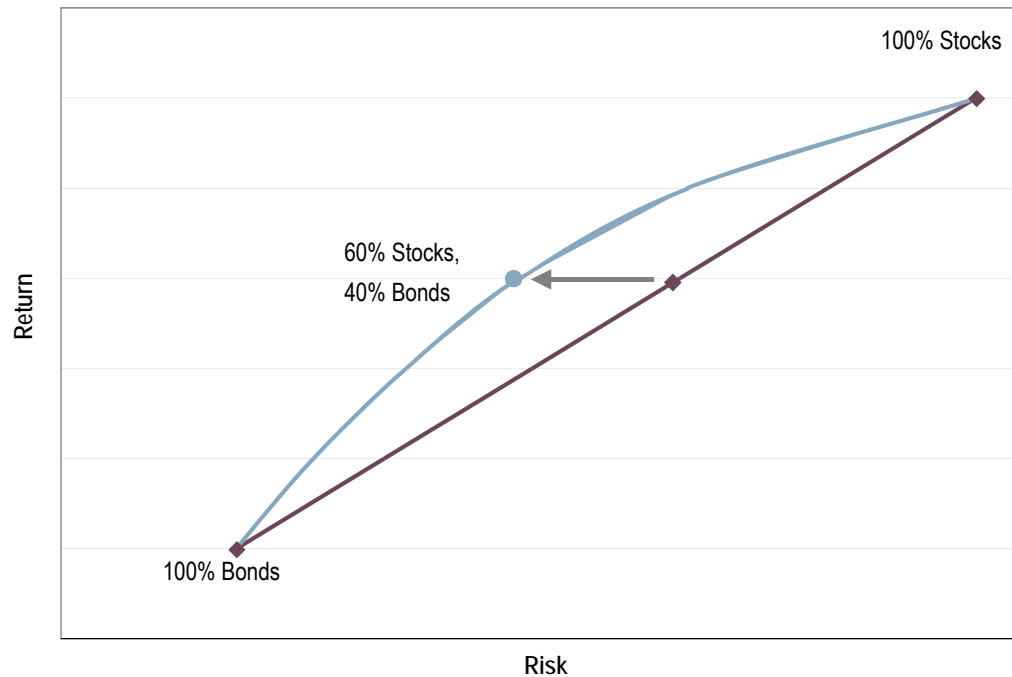
- Each policy assumes that 100% of the Trust's assets remain in liquid investments. Each of these policies has a different expected return – 7.0%, 7.5%, and 8.0%, respectively.
- As expected, the risk level (as defined by standard deviation) increases as the expected return increases. However, Policy A has a lower expected standard deviation than the Current Policy (despite a higher expected return) due to the diversification benefits of additional asset classes.
- Each of the policies includes new allocations to TIPS, high yield bonds, bank loans, emerging market debt, and emerging market equity.

# Mean Variance Optimization

## Mean Variance Optimization

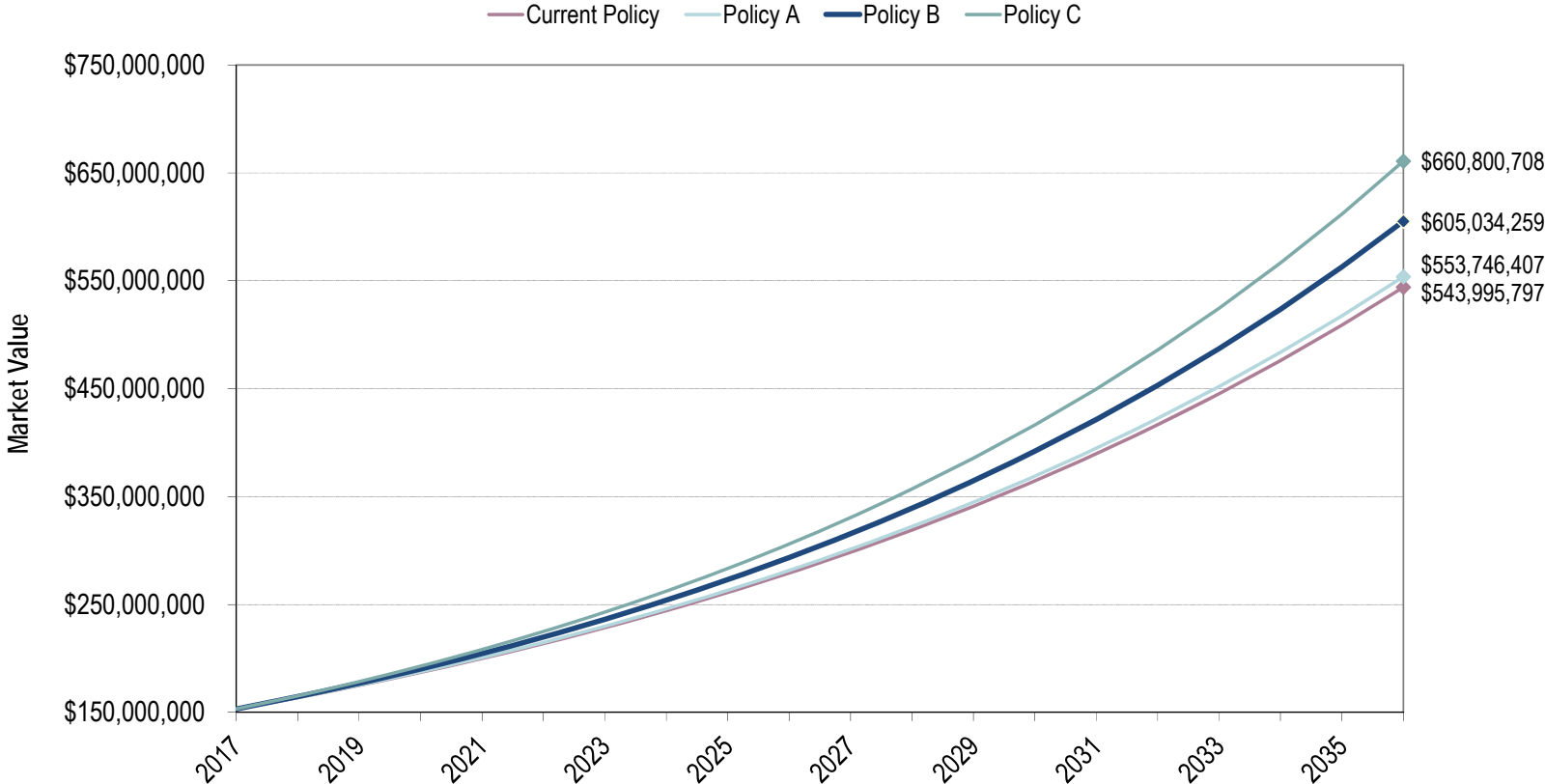
- Mathematically determines an “efficient frontier” of policy portfolios with the highest risk-adjusted returns.
- All asset classes exhibit only three characteristics, which serve as inputs to the model:
  - Expected return
  - Expected volatility
  - Expected covariance with all other assets
- The model assumes:
  - Normal return distribution
  - Stable volatility and covariances over time
  - Returns are not serially correlated
- The MVO Model tends to underestimate the risks of large negative events.

## The Efficient Frontier



- Combining uncorrelated assets produces an “efficient frontier.” Different combinations of assets (e.g., 60% stocks & 40% bonds) will lie along this efficient frontier.
- By combining assets that are not highly correlated with each other, the Funds can produce a higher return for a given level of risk than it could by investing in perfectly correlated assets. Alternatively, it can experience lower risk for a given level of return.

### Growth of Assets<sup>1</sup>



- Even apparently small differences in expected returns can result in meaningful differences over long time periods.

<sup>1</sup> Assumes each policy option produces its expected return in each calendar year and zero cash flows.



# Risk Analysis

## Types of Risk Analysis Addressed

- MVO-based risk analytics
  - Includes worst-case return expectations and Value at Risk (VAR)<sup>1</sup>
  - Relies on assumptions underlying MVO
- Scenario analysis
  - Stress tests policy portfolios using actual historical examples
  - Stress tests policy portfolios under specific hypothetical scenarios

---

<sup>1</sup> VaR is a risk measure that estimates the maximum loss on a portfolio over a given time horizon and a given confidence level (usually 95% or 99%).



### MVO-Based Risk Analysis

Scenario:	Current Policy (%)	Policy A (%)	Policy B (%)	Policy C (%)
<b>"Worst Case" Returns<sup>1</sup>:</b>				
One Year	-23.1	-20.3	-23.9	-26.5
Three Years ( <i>annualized</i> )	-11.6	-9.7	-11.9	-13.6
Five Years ( <i>annualized</i> )	-7.7	-6.2	-7.9	-9.1
Ten Years ( <i>annualized</i> )	-3.7	-2.6	-3.6	-4.5
Twenty Years	-0.7	0.1	-0.5	-1.0
<b>Probability of Experiencing Negative Returns</b>				
One Year	30.1	27.8	29.5	30.5
Three Years	18.3	15.4	17.5	18.9
Five Years	12.2	9.4	11.4	12.7
Ten Years	5.0	3.2	4.4	5.4
Twenty Years	1.0	0.4	0.8	1.1
<b>Probability of Achieving at least a 7.5% Return</b>				
One Year	48.2	48.1	50.0	51.0
Three Years	46.8	46.8	50.0	51.7
Five Years	45.9	45.8	50.0	52.2
Ten Years	44.2	44.1	50.0	53.2
Twenty Years	41.9	41.7	50.0	54.5

- Policy A appears to be the most defensive portfolio. However, it is the least likely to reach the target return over the long term.

<sup>1</sup> "Worst Case" Return Projections encompass 99.5% of possible outcomes.

### Historical Scenario Analysis<sup>1</sup> (Cumulative Return)

Scenario:	Current Policy (%)	Policy A (%)	Policy B (%)	Policy C (%)
<b>Market Crash</b>				
Stagflation (Jan '73 – Sep '74)	-31	-26	-30	-34
Crash of 1987 (Sep '87 – Nov '87)	-14	-13	-16	-18
Tech Bubble Bursts (Sep '00 – Sept '02)	-30	-21	-28	-33
Global Financial Crisis (Nov '07 – Feb '09)	-42	-30	-33	-37
Calendar Year 2008	-30	-28	-33	-37
<b>Strong Market</b>				
Bretton Woods Recovery (Oct '74 – Jun '75)	36	33	38	42
Volcker Recovery (Aug '82 – Apr '83)	39	40	44	46
Strong Tech (Sep '96 – Jan '99)	53	36	35	34
Best of Great Moderation (Apr '03 – Feb '04)	35	31	37	43
GFC Recovery (Mar '09 – Nov '09)	43	42	49	55

- During historical “down” markets, Policies A and B would have outperformed the Current Policy. Policy C would have outperformed the Current Policy as well during the Global Financial Crisis and Calendar Year 2008.

<sup>1</sup> See the Appendix for our scenario inputs. In periods where the ideal benchmark was not yet available we used the next closest benchmark(s) as a proxy.

### Stress Testing: Impact of Market Movements (Expected Return under Stressed Conditions)<sup>1</sup>

What happens if (over a 12-month period):	Current Policy (%)	Policy A (%)	Policy B (%)	Policy C (%)
10-Year T-Bond rates rise 100 bp	6.8	5.1	6.7	8.0
10-Year T-Bond rates rise 200 bp	4.4	2.2	4.4	6.0
10-Year T-Bond rates rise 300 bp	1.3	-1.2	1.4	3.4
BBB Spreads widen by 50 bp, HY by 200 bp	4.2	3.7	4.3	4.7
BBB Spreads widen by 300 bp, HY by 1000 bp	-28.9	-27.0	-31.0	-33.8
Trade-weighted US\$ gains 10%	0.8	2.4	1.0	-0.1
Trade-weighted US\$ gains 20%	1.6	4.7	2.1	-0.2
Equities decline 10%	-7.1	-6.2	-7.6	-8.5
Equities decline 25%	-17.7	-15.4	-18.9	-21.3
Equities decline 40%	-28.3	-24.7	-30.3	-34.1

- Each policy portfolio has a different sensitivity to four major risk factors: interest rates, credit spreads, currency values, and equity values.
- The Fund's primary risk factor would continue to be an equity market decline or significant spread in high yield bonds, no matter the policy.

<sup>1</sup> Assumes that assets not directly exposed to the factor are affected nonetheless. See the Appendix for further details.

# Summary

## Summary

- With assets surpassing \$165 million and expected to grow materially over the next few years, we recommend adding additional asset classes to further diversify the RHCTF.
- We believe the first step in the process should be a discussion amongst the Board regarding risk tolerance, return goals, liquidity preference, and which asset classes the Board is comfortable with.
- Using this feedback, Meketa would create asset allocation options that reflect the preferences of the Board and present them at a future Board Meeting.
- Once a long-term asset allocation is approved, we would recommend adding new asset classes and managers at a measured pace.

# Appendices

## Notes and Disclaimers

1. The returns shown in the Policy Options and Risk Analysis sections rely on estimates of expected return, standard deviation, and correlation developed by Meketa Investment Group. To the extent that actual return patterns to the asset classes differ from our expectations, the results in the table will be incorrect. However, our inputs represent our best unbiased estimates of these simple parameters.
2. The returns shown in the Policy Options and Risk Analysis sections use a lognormal distribution, which may or may not be an accurate representation of each asset classes' future return distribution. To the extent that it is not accurate in whole or in part, the probabilities listed in the table will be incorrect. As an example, if some asset classes' actual distributions are even more right-skewed than the lognormal distribution (i.e., more frequent low returns and less frequent high returns), then the probability of the portfolio hitting a given annual return will be lower than that stated in the table.
3. The standard deviation bars in the chart in the Risk Analysis section do not indicate the likelihood of a 1, 2, or 3 standard deviation event—they simply indicate the return we expect if such an event occurs. Since the likelihood of such an event is the same across allocations regardless of the underlying distribution, a relative comparison across policy choices remains valid.

## Scenario Return Inputs

Asset Class	Benchmark Used
Investment Grade Bonds	Barclays Aggregate
TIPS	Barclays U.S. TIPS
Intermediate-term Government Bonds	Ibbotson U.S. Intermediate Government
Long-term Government Bonds	Barclays Long Term Treasury
EM Bonds	JPM GBI-EM Global Diversified
Bank Loans	CSFB Leveraged Loan
High Yield Bonds	Barclays High Yield
Core Real Estate	NCREIF Property
Value-Added RE	NCREIF Townsend Value Added
Opportunistic RE	NCREIF Townsend Opportunistic
REITs	NAREIT Equity
Infrastructure (private)	S&P Global Infrastructure
Natural Resources (private)	S&P Global Natural Resources
Timber	NCREIF Timberland
Commodities	Summer Haven Commodity
U.S. Equity	Russell 3000
Public Foreign Equity (Developed)	MSCI EAFE
Public Foreign Equity (Emerging)	MSCI Emerging Markets
Private Equity	Venture Economics Private Equity Composite
Long-short Equity	HFRI Equity Hedge
Global Macro	HFRI Macro
Hedge Funds	HFRI Fund of Funds Composite



Stress Test Return Assumptions<sup>1</sup>

	Rates Rise 100 bp (%)	Rates Rise 200 bp (%)	Rates Rise 300 bp (%)	BBB Spreads widen by 50 bp (%)	BBB Spreads widen by 300 bp (%)	USD Gains 10% (%)	USD Gains 20% (%)	Equities Decline 10% (%)	Equities Decline 25% (%)	Equities Decline 40% (%)
Public Domestic Equity	10.3	9.0	6.9	6.0	-42.0	3.5	7.0	-10.0	-25.0	-40.0
Public Foreign Equity (Developed)	10.3	9.0	6.9	5.5	-33.0	-7.0	-14.0	-10.5	-26.3	-42.0
Public Foreign Equity (Emerging)	10.3	9.0	6.9	5.0	-39.0	-7.0	-14.0	-11.0	-27.5	-44.0
Long-Short Hedge Funds	6.4	7.0	6.0	6.5	-21.0	2.1	4.2	-6.0	-15.0	-24.0
Private Equity	5.2	4.5	3.5	6.0	-42.0	3.5	7.0	-8.0	-20.0	-32.0
Core Real Estate	8.7	9.6	8.7	9.5	-12.0	4.0	8.0	-5.0	-12.5	-20.0
REITs	7.9	8.0	6.0	0.5	-36.0	1.0	2.0	-9.5	-23.8	-38.0
Non-Core Real Estate	7.1	10.4	9.3	11.5	-24.0	4.0	8.0	-7.0	-17.5	-28.0
Infrastructure (private)	4.3	2.6	2.9	3.5	-24.0	3.0	6.0	-5.0	-12.5	-20.0
Natural Resources (private)	8.6	12.2	13.5	2.0	-16.5	-3.1	-6.2	-5.0	-12.5	-20.0
Natural Resources (public)	11.4	16.2	18.0	4.0	-33.0	-6.2	-12.3	-9.5	-23.8	-38.0
Commodities	8.7	4.6	-0.6	-0.5	-21.0	-15.0	-30.0	-7.0	-17.5	-28.0
Short-Term Bonds	-6.4	-12.2	-17.9	8.0	6.0	7.0	14.0	1.0	2.5	4.0
Long-Term Government Bonds	-15.3	-33.6	-52.0	12.0	15.0	10.0	20.0	5.0	12.5	20.0
TIPS	-7.0	-15.8	-24.6	8.5	12.0	8.0	16.0	1.0	2.5	4.0
Investment Grade Bonds	-3.4	-8.6	-13.9	-0.4	-4.6	8.0	16.0	2.0	5.0	8.0
Investment Grade Corporate Bonds	-4.3	-11.4	-18.5	-1.4	-18.5	8.0	16.0	-1.5	-3.8	-6.0
Foreign Developed Bonds	-5.1	-11.8	-18.5	0.0	-3.5	-6.3	-12.6	-2.0	-5.0	-8.0
Emerging Market Bonds (external)	-2.0	-7.9	-13.9	-2.7	-25.9	5.0	10.0	-2.0	-5.0	-8.0
Emerging Market Bonds (local)	-0.8	-6.6	-12.3	1.4	-8.0	-6.3	-12.6	-3.0	-7.5	-12.0
High Yield Bonds	1.5	-2.6	-6.7	-4.9	-35.9	4.5	9.0	-6.0	-15.0	-24.0
Bank Loans	5.0	6.0	7.5	2.5	-30.0	4.5	9.0	-6.0	-15.0	-24.0
Hedge Funds	5.8	6.2	3.6	3.5	-18.0	5.0	10.0	-5.0	-12.5	-20.0
TAA	7.8	5.7	3.1	6.5	-22.2	3.2	6.4	-7.0	-17.5	-28.0
Risk Parity	6.1	2.1	-2.5	5.6	-12.0	1.6	3.3	-2.0	-5.0	-8.0

<sup>1</sup> Assumptions are based on performance for each asset class during historical periods that resembled these situations.

## Overview of Annual Asset Study Methodology

- In order to construct an optimal portfolio from a risk-return standpoint, conventional financial wisdom dictates that one develop return, volatility, and correlation expectations over the relevant investing horizon.
- Given the uncertainty surrounding financial and economic forecasts, expectations development is challenging, and any of several methodological approaches may meaningfully contribute to this complex task.
- Meketa Investment Group's process relies on both quantitative and qualitative methodologies.
- First, we employ a large set of quantitative models to arrive at a set of baseline expected ten-year annualized returns for major asset classes.
- These models attempt to forecast a gross "beta" return for each public market asset class; that is, we specifically do not model "alpha," nor do we apply an estimate for management fees or other operational expenses<sup>1</sup>.
- Our models are fundamentally based (based on some theoretically defined return relationship with current observable factors).
- Some of these models are more predictive than others. For this reason, we next overlay a qualitative analysis, which takes the form of a data-driven deliberation among the research team and our Investment Policy Committee.
- Return assumptions for hard-to-predict asset classes as well as those with limited data will be influenced more heavily by our qualitative analysis.
- As a result of this process, we form our ten-year annualized return expectations, which serve as the primary foundation of our longer-term, twenty-year expectations.

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<sup>1</sup> Our expectations are net of fees where passive management is not available (e.g., private markets and hedge funds).

### Overview of Annual Asset Study Methodology (continued)

- We form our twenty-year annualized return expectations by systematically considering historical returns on an asset class by asset class level. Specifically, we construct a weighted average of our ten-year expectations and average historical returns in each asset class.
- The weights are determined by a qualitative assessment of the value of the historical data. Generally, if we have little confidence that the historical average return is representative of what an investor can expect<sup>1</sup>, we will weight our ten-year forecast more heavily. Therefore, the weight on our ten-year forecasts ranges from 0.5 to 0.9.
- We develop our twenty-year volatility and correlation expectations differently. We rely primarily on historical averages, with an emphasis given to the experience of the trailing ten years.
- Qualitative adjustments, when applied, usually serve to increase the correlations and volatility over and above the historical estimates (e.g., using the higher correlations usually observed during a volatile market).
- We also make adjustments to the volatility based on the historical skewness of each asset class (e.g., increasing the volatility for an asset class that has been negatively skewed).
- In the case of private markets and other illiquid asset classes where historical volatility and correlations have been artificially dampened, we seek public market equivalents on which to base our estimates before applying any qualitative adjustments.
- These volatility and correlation expectations are then combined with our twenty-year return expectations to assist us in subsequent asset allocation work, including mean-variance optimization and scenario analyses.

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<sup>1</sup> For example, we have less confidence in historical data that do not capture many possible market scenarios or that are overly polluted by survivorship bias.

## Meketa Investment Group 2017 Annual Asset Study

### Twenty-Year Annualized Return and Volatility Expectations for Major Asset Classes

Asset Class	Annualized Average Return (%)	Annualized Compounded Return (%)	Annualized Standard Deviation (%)
<b>Fixed Income</b>			
Cash Equivalents	2.8	2.8	1.0
Investment Grade Bonds	3.6	3.5	4.0
Long-term Government Bonds	4.6	3.8	12.5
TIPS	3.8	3.5	7.5
High Yield Bonds	6.8	6.0	12.5
Bank Loans	6.0	5.5	10.0
Foreign Bonds (unhedged)	2.8	2.4	9.0
Emerging Market Bonds (major; unhedged)	6.2	5.5	12.0
Emerging Market Bonds (local; unhedged)	7.0	5.9	14.5
<b>Equities</b>			
Public U.S. Equity	9.1	7.5	18.0
Public Developed Market Equity	9.3	7.3	20.0
Public Emerging Market Equity	13.2	9.8	26.0
Private Equity	12.1	9.2	24.0
Long-Short Hedge Funds	5.2	4.6	11.0
<b>Real Assets</b>			
REITs	10.7	6.5	29.0
Core Private Real Estate	6.5	5.7	12.5
Value Added Real Estate	9.0	7.2	19.0
Opportunistic Real Estate	12.0	8.9	25.0
Natural Resources (Private)	11.1	8.4	23.0
Commodities	6.4	4.5	19.5
Infrastructure (Core)	8.1	6.8	16.0
Infrastructure (Non-Core)	11.4	8.8	23.0
<b>Other</b>			
Hedge Funds	5.8	5.3	9.5

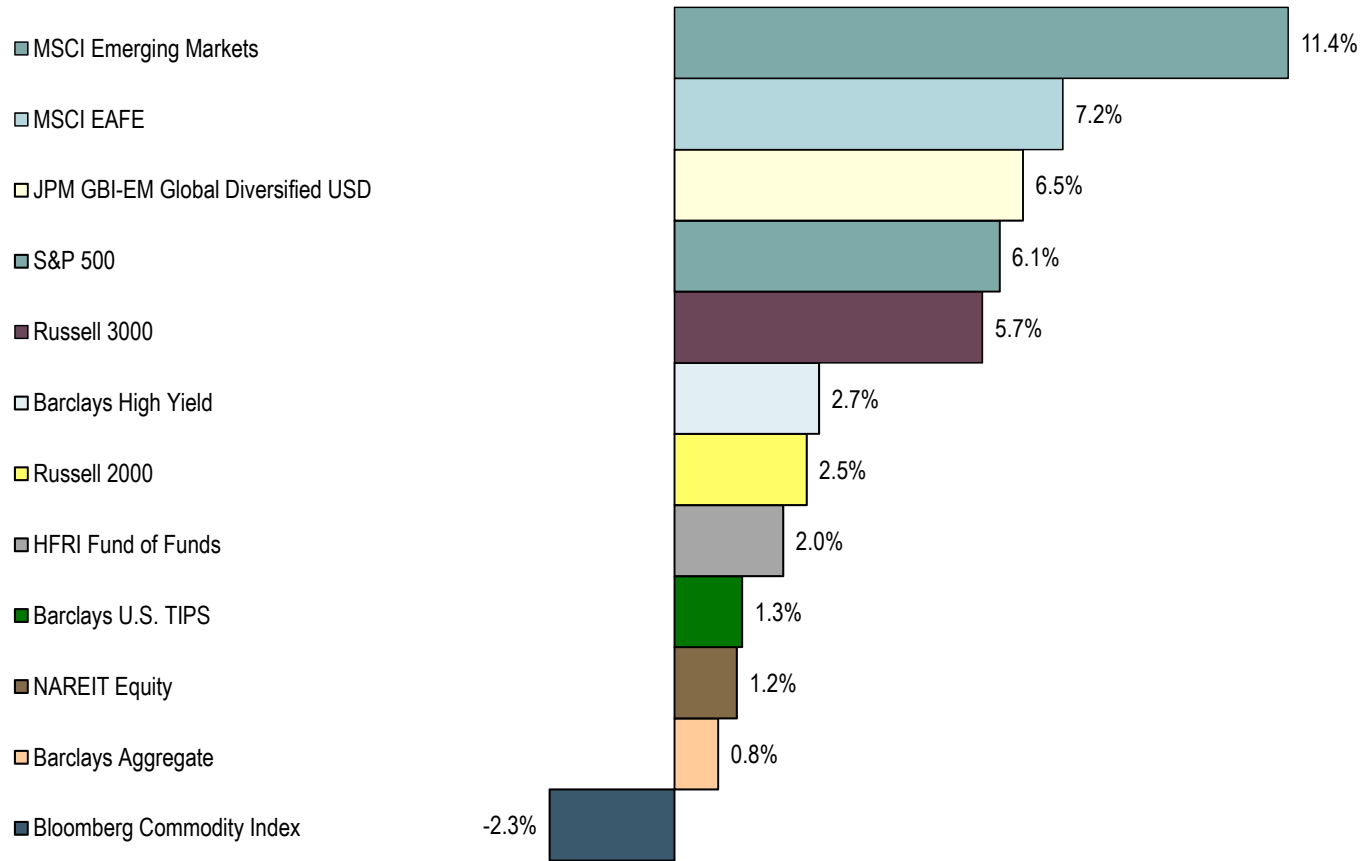
## Meketa Investment Group 2017 Annual Asset Study: Correlation Expectations

	Investment Grade Bonds	TIPS	High Yield Bonds	Bank Loans	Emerging Market Bonds (major)	US Equity	Developed Market Equity (non-US)	Emerging Market (Equity)
Investment Grade Bonds	1.00							
TIPS	0.80	1.00						
High Yield Bonds	0.20	0.30	1.00					
Bank Loans	0.00	0.20	0.80	1.00				
Emerging Market Bonds (major)	0.50	0.50	0.70	0.40	1.00			
US Equity	0.05	0.00	0.70	0.60	0.60	1.00		
Developed Market Equity (non-US)	0.05	0.15	0.70	0.60	0.60	0.90	1.00	
Emerging Market (Equity)	0.05	0.15	0.70	0.55	0.65	0.80	0.90	1.00

# Appendices

**The World Markets  
First Quarter of 2017**

### The World Markets<sup>1</sup> First Quarter of 2017



<sup>1</sup> Source: Thomson Reuters.



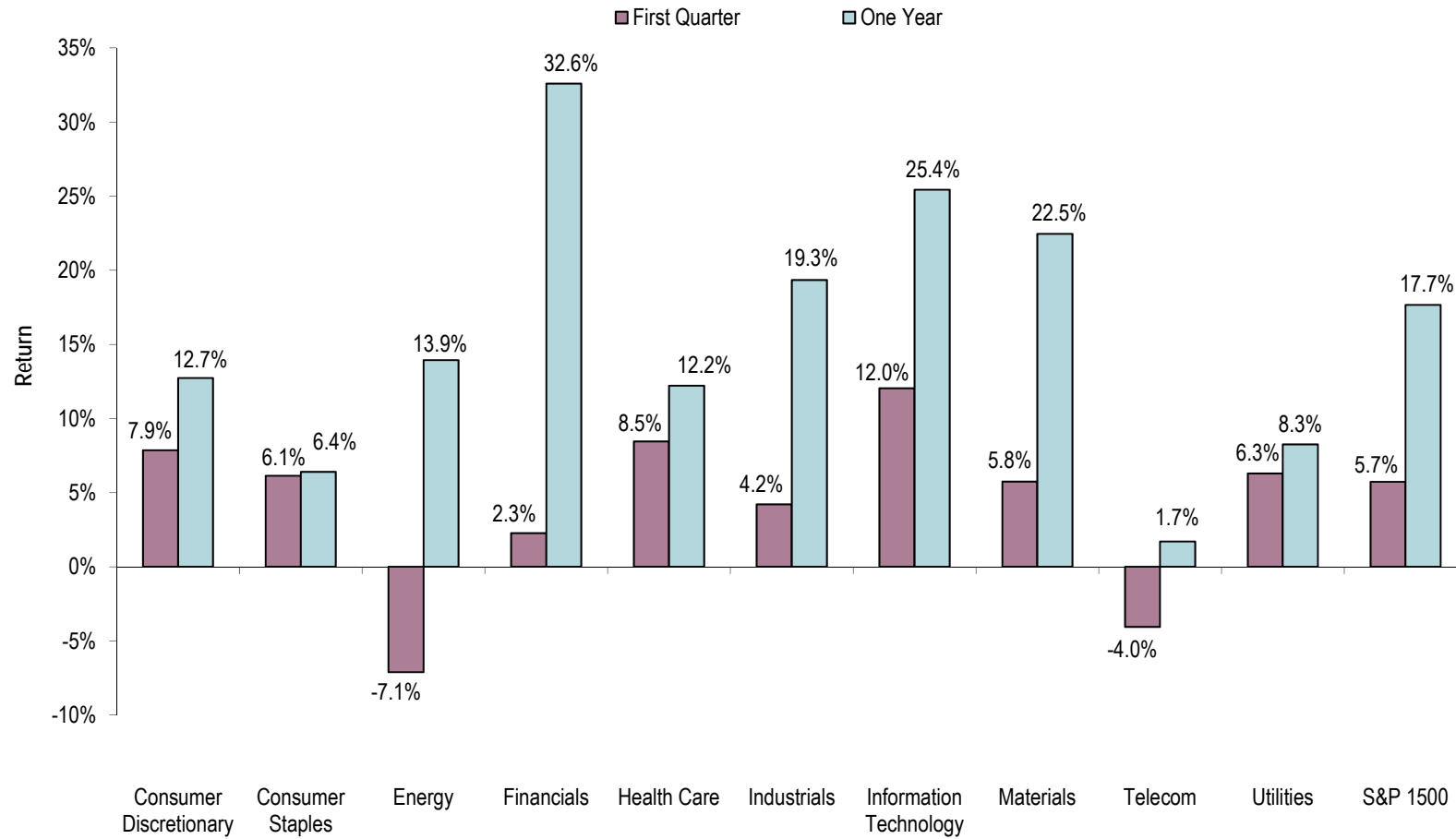


Index Returns<sup>1</sup>

	1Q17 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
<b>Domestic Equity</b>					
Russell 3000	5.7	18.1	9.8	13.2	7.5
Russell 1000	6.0	17.4	10.0	13.3	7.6
Russell 1000 Growth	8.9	15.8	11.3	13.3	9.1
Russell 1000 Value	3.3	19.2	8.7	13.1	5.9
Russell MidCap	5.1	17.0	8.5	13.1	7.9
Russell MidCap Growth	6.9	14.1	7.9	12.0	8.1
Russell MidCap Value	3.8	19.8	8.9	14.1	7.5
Russell 2000	2.5	26.2	7.2	12.4	7.1
Russell 2000 Growth	5.3	23.0	6.7	12.1	8.1
Russell 2000 Value	-0.1	29.4	7.6	12.5	6.1
<b>Foreign Equity</b>					
MSCI ACWI (ex. U.S.)	7.9	13.1	0.6	4.4	1.4
MSCI EAFE	7.2	11.7	0.5	5.8	1.1
MSCI EAFE (local currency)	4.7	18.0	7.3	10.7	2.3
MSCI EAFE Small Cap	8.0	11.0	3.6	9.2	3.0
MSCI Emerging Markets	11.4	17.2	1.2	0.8	2.7
MSCI Emerging Markets (local currency)	7.8	15.1	5.6	5.1	4.9
<b>Fixed Income</b>					
Bloomberg Barclays Universal	1.1	1.9	3.0	2.8	4.5
Bloomberg Barclays Aggregate	0.8	0.4	2.7	2.3	4.3
Bloomberg Barclays U.S. TIPS	1.3	1.5	2.0	1.0	4.2
Bloomberg Barclays High Yield	2.7	16.4	4.6	6.8	7.5
JPMorgan GBI-EM Global Diversified USD	6.5	5.5	-2.7	-1.6	4.1
<b>Other</b>					
NAREIT Equity	1.2	3.6	10.3	10.0	4.8
Bloomberg Commodity Index	-2.3	8.7	-13.9	-9.5	-6.2
HFRI Fund of Funds	2.0	5.9	1.7	3.1	1.2

<sup>1</sup> Source: Thomson Reuters.

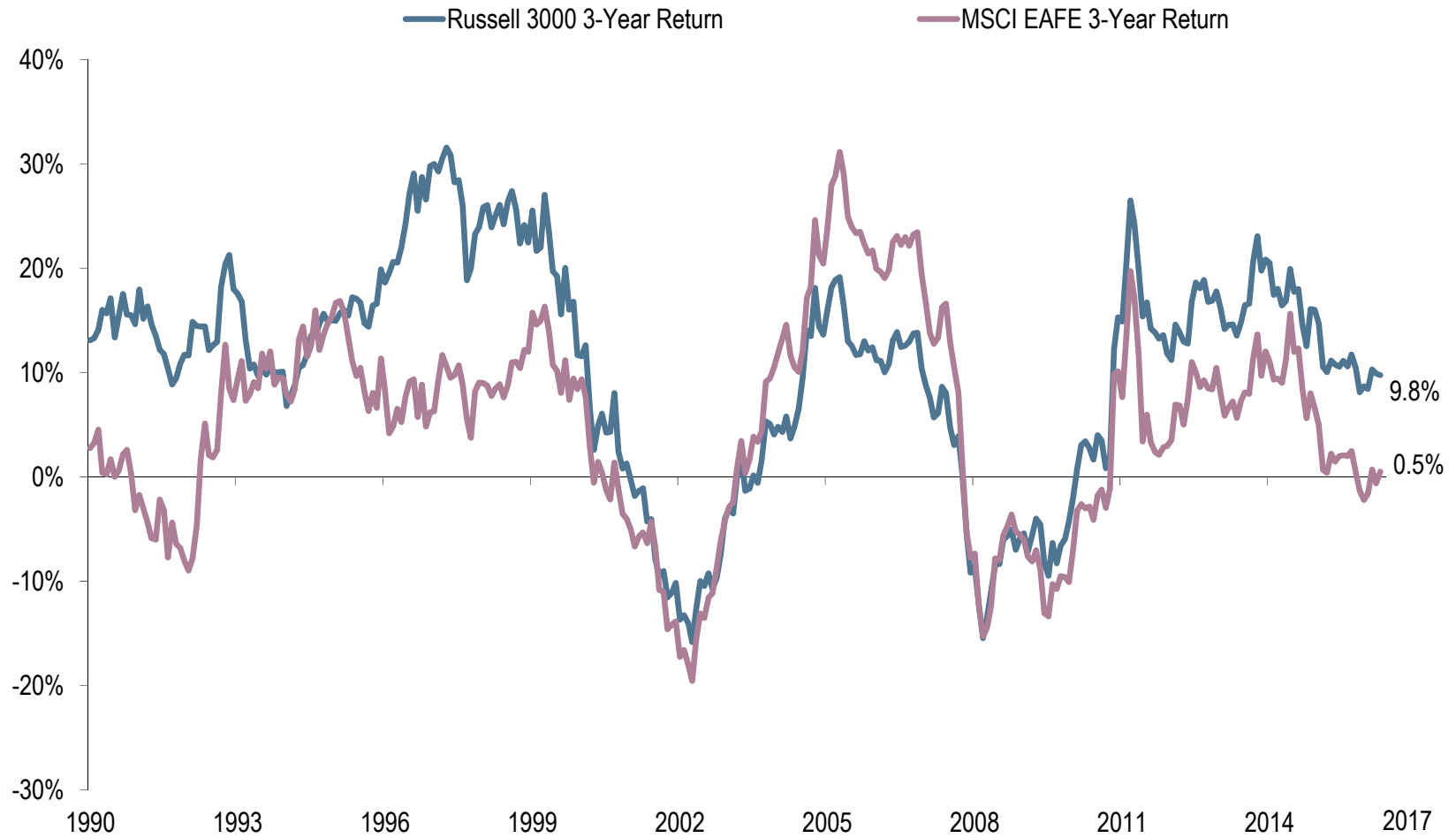
### S&P Sector Returns<sup>1</sup>



<sup>1</sup> Source: Thomson Reuters. Represents S&P 1500 (All Cap) data.



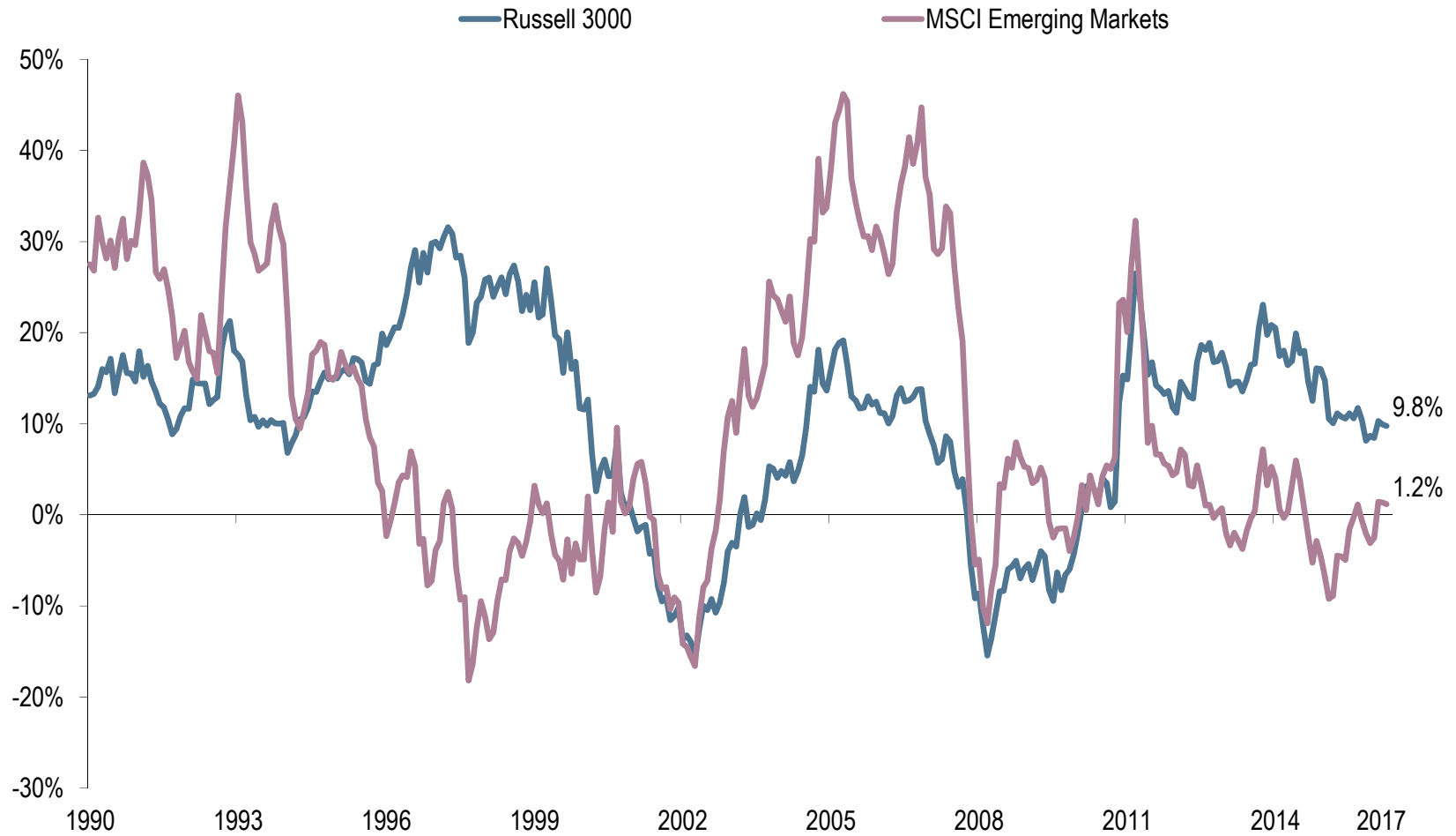
### U.S. and Developed Market Foreign Equity Rolling Three-Year Returns<sup>1</sup>



<sup>1</sup> Source: Thomson Reuters.



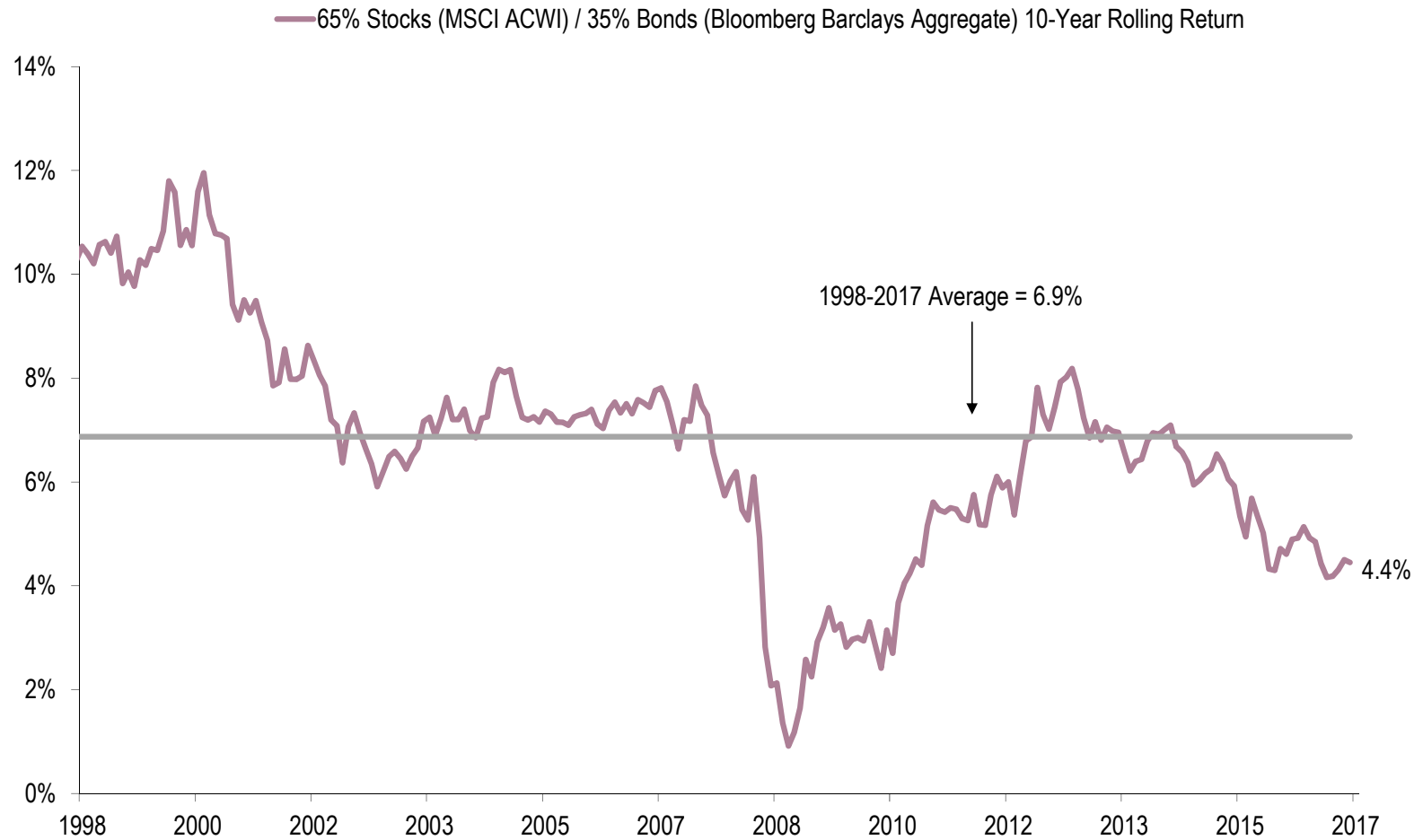
### U.S. and Emerging Market Equity Rolling Three-Year Returns<sup>1</sup>



<sup>1</sup> Source: Thomson Reuters.



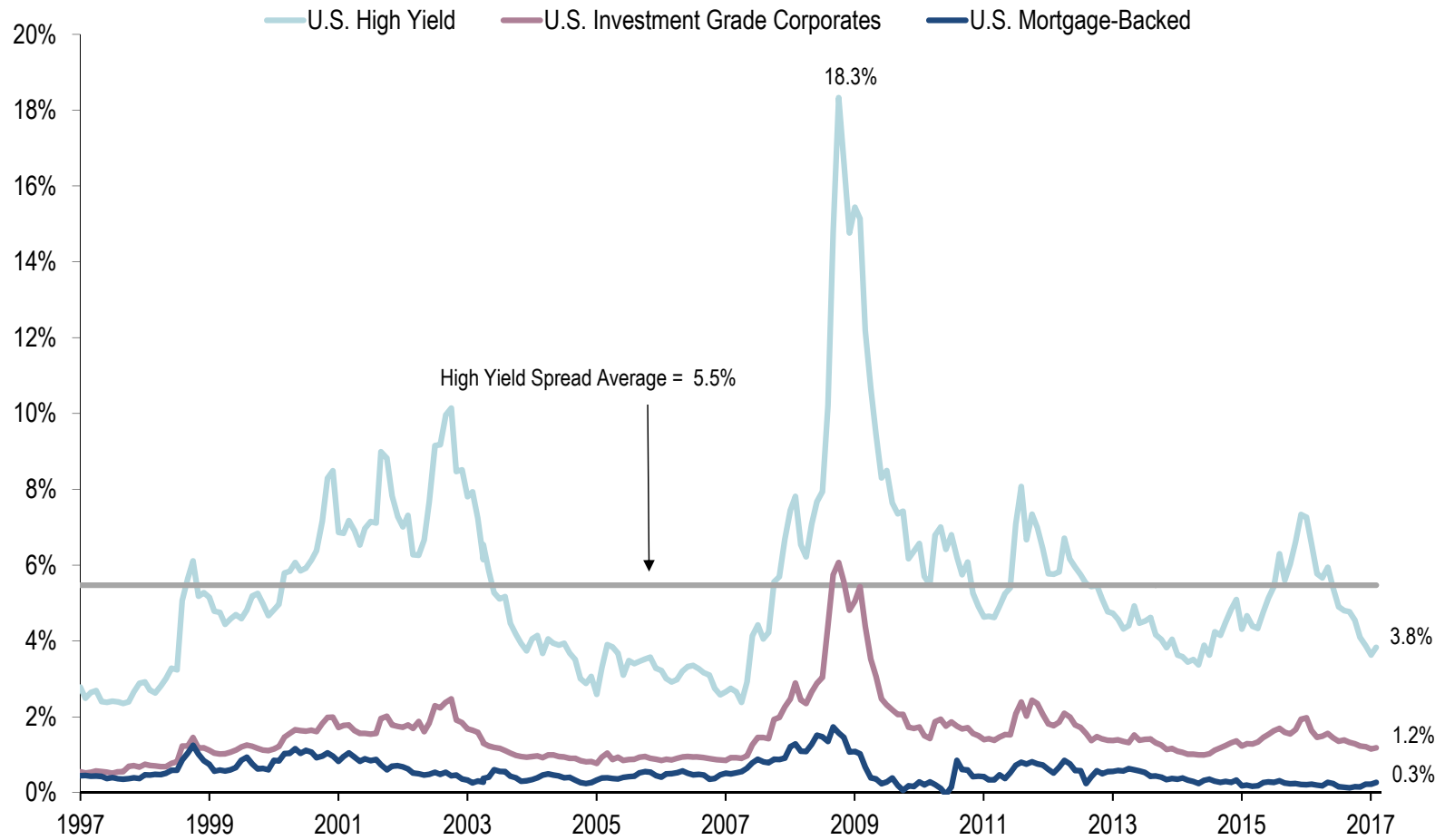
## Rolling Ten-Year Returns: 65% Stocks and 35% Bonds<sup>1</sup>



<sup>1</sup> Source: Thomson Reuters.



### Credit Spreads vs. U.S. Treasury Bonds<sup>1,2</sup>

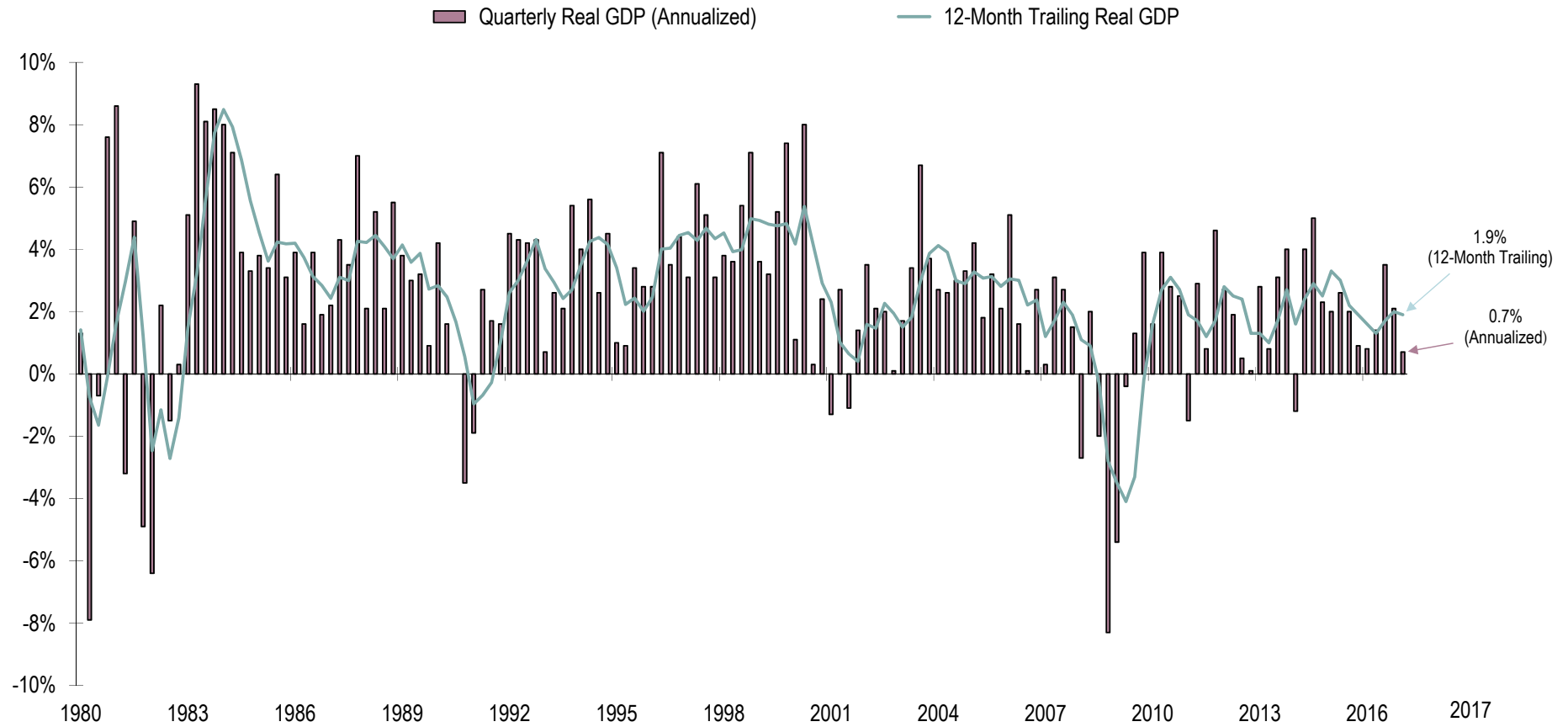


<sup>1</sup> Source: Barclays Live.

<sup>2</sup> The median high yield spread was 5.1% from 1997-2017.



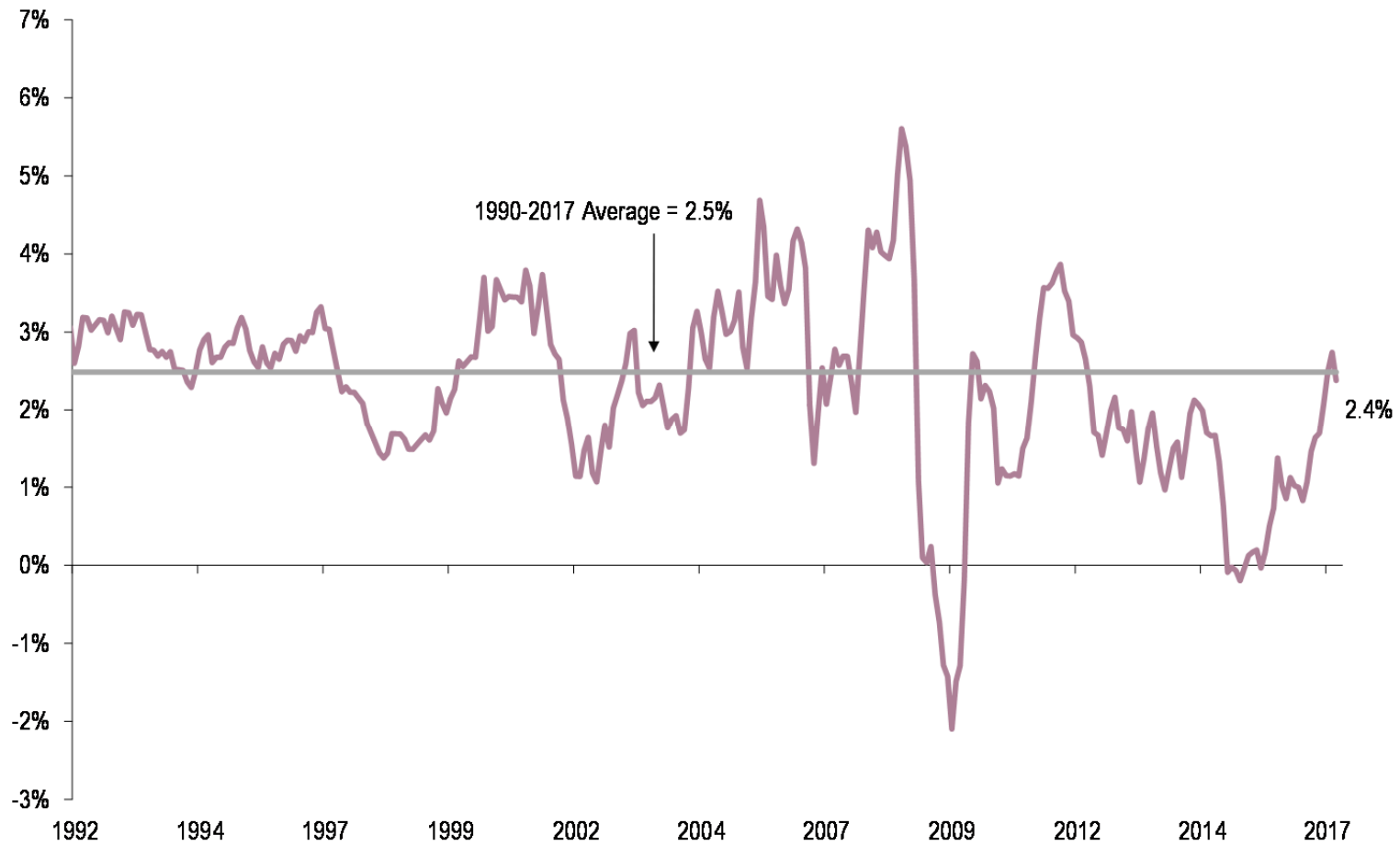
### U.S. Real Gross Domestic Product (GDP) Growth<sup>1</sup>



<sup>1</sup> Source: Bureau of Economic Analysis. Data is as of Q1 2017 and represents the first estimate.



### U.S. Inflation (CPI) Trailing Twelve Months<sup>1</sup>

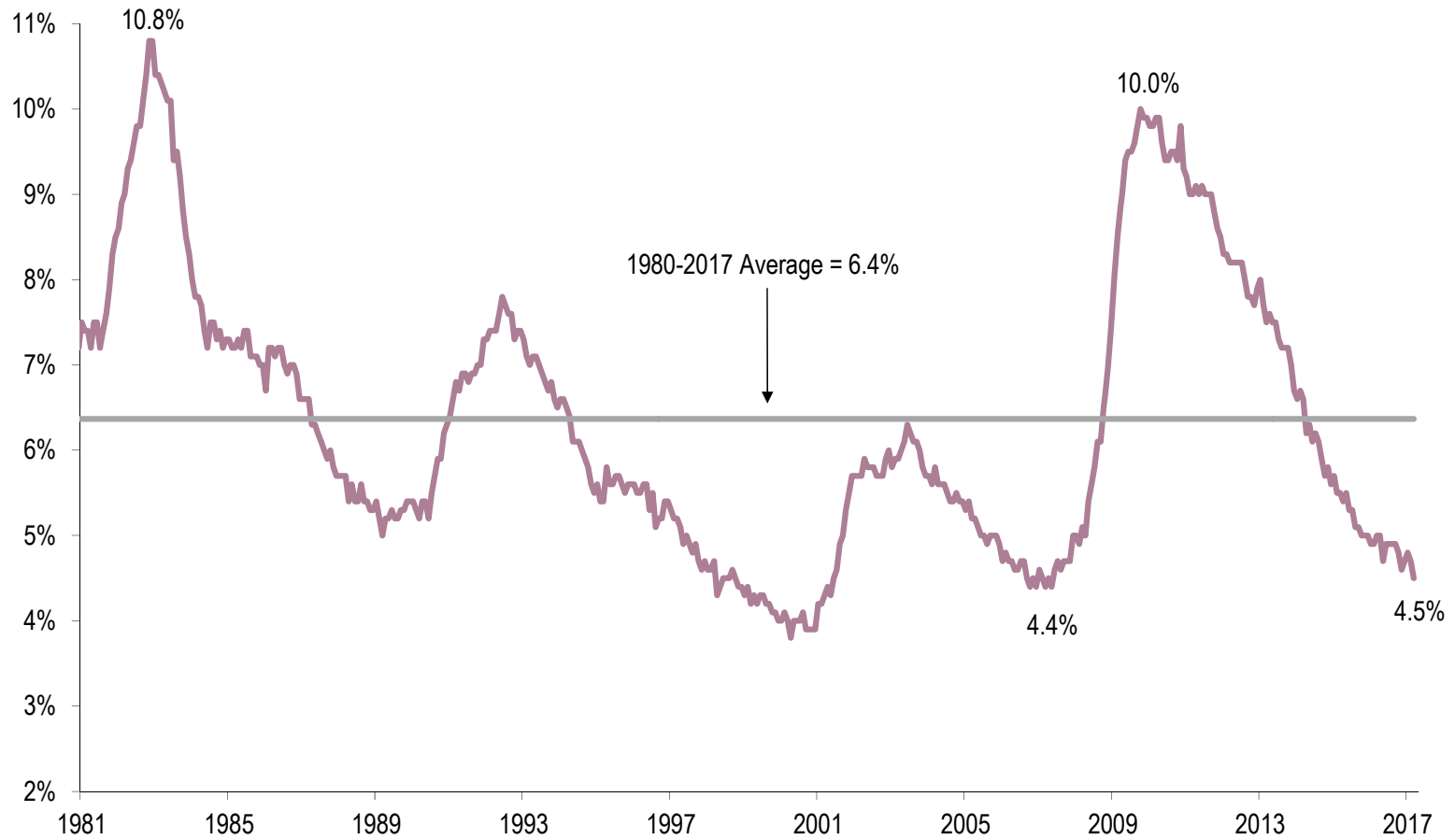


<sup>1</sup> Source: Bureau of Labor Statistics. Data is non-seasonally adjusted CPI, which may be volatile in the short-term. Data is as of March 31, 2017.





### U.S. Unemployment<sup>1</sup>



<sup>1</sup> Source: Bureau of Labor Statistics. Data is as of March 31, 2017.



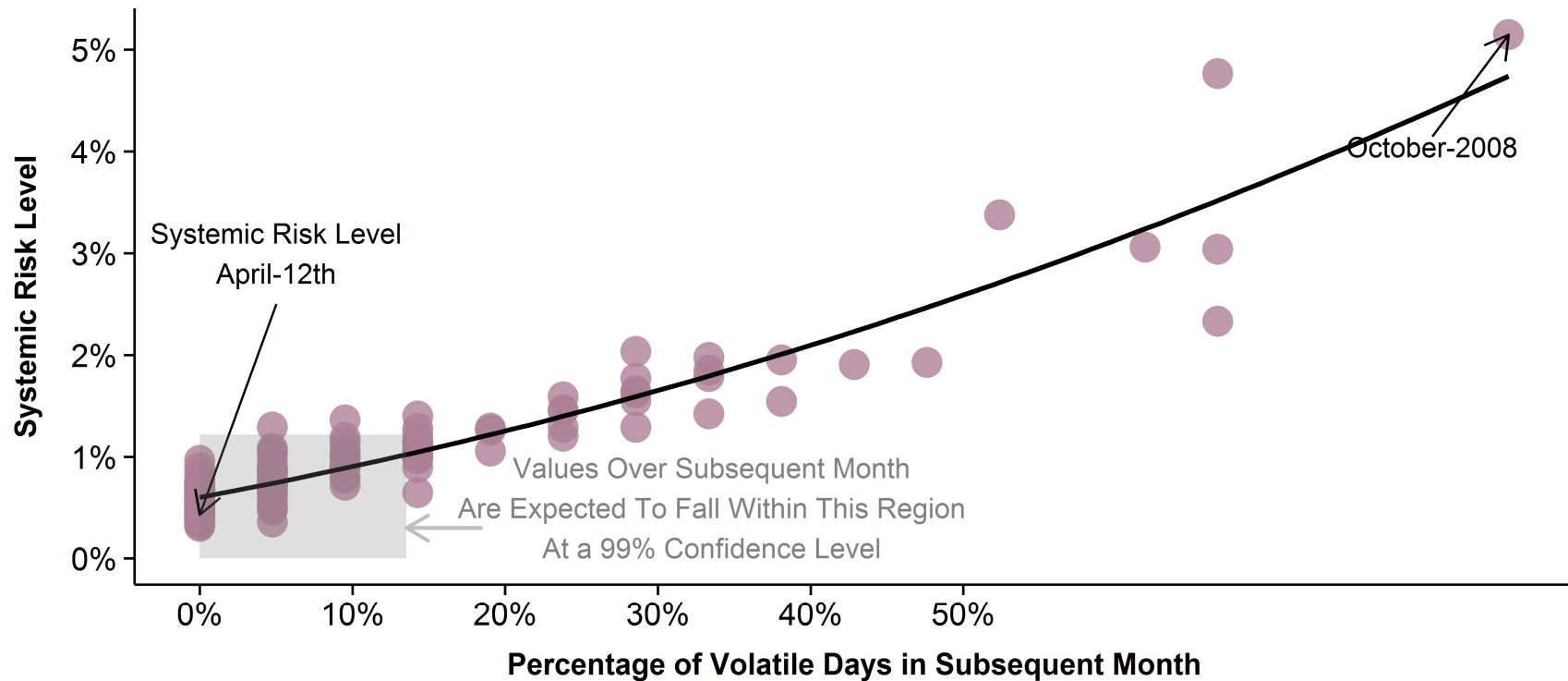
## Capital Markets Outlook

## Capital Markets Outlook<sup>1</sup>

- Investors are faced with three primary issues in the near-term: 1) historically low bond yields, 2) the potential for a transition into a rising rate environment, 3) higher volatility going forward as global political, fiscal, and monetary policy uncertainty remains high.
  - The price of the U.S. stock market relative to ten-year average earnings has trended up after the financial crisis, and remains above its historical average (26.2x versus 20.7x).
    - Within U.S. Equity markets, valuations for companies based on both size (small vs. large cap) and value (growth vs. value) remain within a reasonable range.
  - Developed international and emerging market stocks are trading at lower valuations than U.S. stocks.
    - These valuations have been kept lower because of sovereign debt issues, weak economic growth in Europe, and a cyclical slowdown in emerging economies.
    - Both of these measures have seen sustained positive trends as the issues and economic fundamentals mentioned above have improved in recent months.
  - Risk across markets measured by our Systemic Risk metric remains subdued and while this is positive in the short term many serious medium term risks loom large.
    - The recent 'Brexit' vote, along with other political upheaval and monetary policy changes by central banks, will continue to have a meaningful impact.
  - As of April 13th, spreads for both high yield and investment grade corporate bonds were below their respective historical averages (3.5% and 0.9%).
  - At 2.2%, the yield on the ten-year Treasury remained far below its post-WWII average of 5.9%.

<sup>1</sup> Sources: Bloomberg, U.S. Treasury, and Meketa Investment Group. Data is as of April 13, 2017.

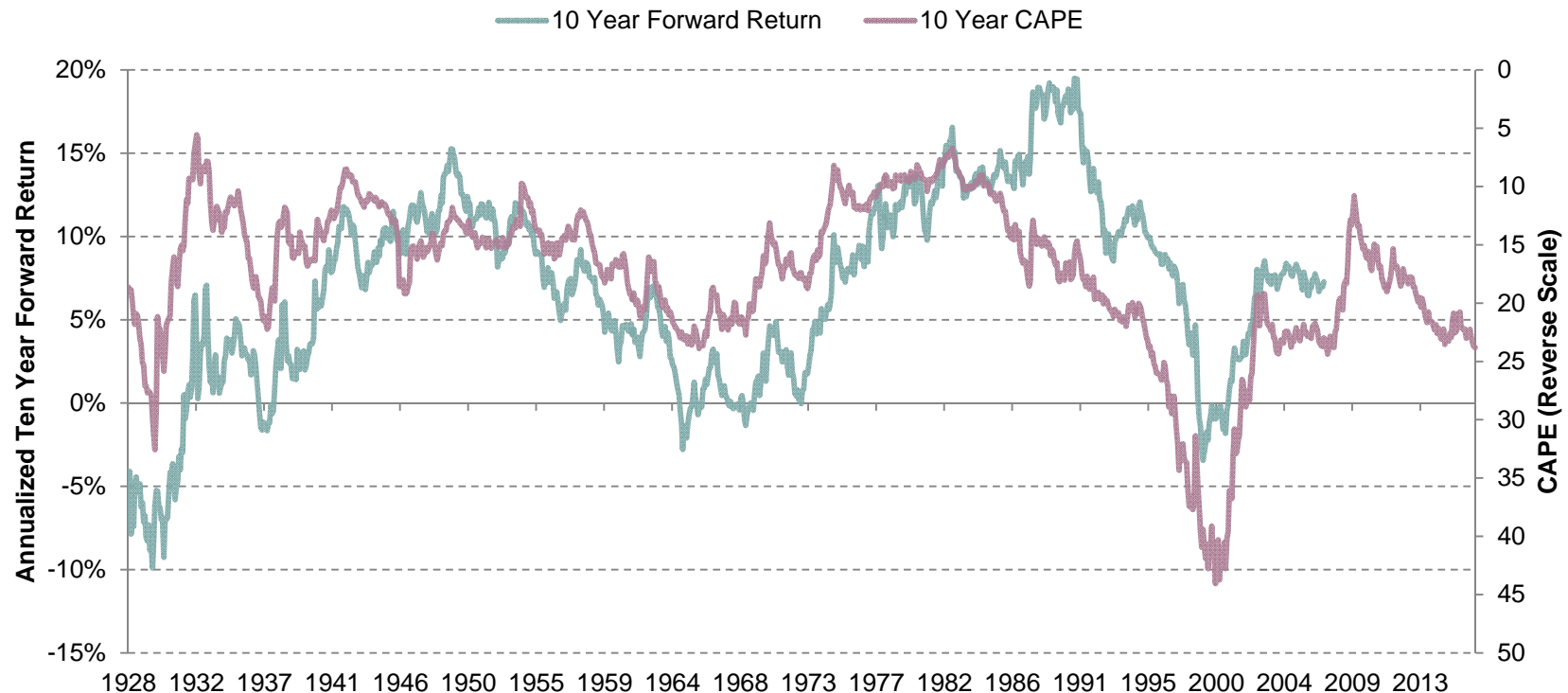
## Systemic Risk and Volatile Market Days<sup>1</sup>



- Systemic Risk, which measures risk across markets, is important because the more contagion of risk that exists between assets, the more likely it is that markets will experience volatile periods.
- After a volatile start to the year, our Systemic Risk measure has returned to reasonable levels. While the number of volatile days can differ, this indicates that the next month should be in the lowest 14%.

<sup>1</sup> Source: Meketa Investment Group, as of April 12, 2017. Volatile days are defined as the top 10 percent of realized turbulence which is a multivariate distance between asset returns.

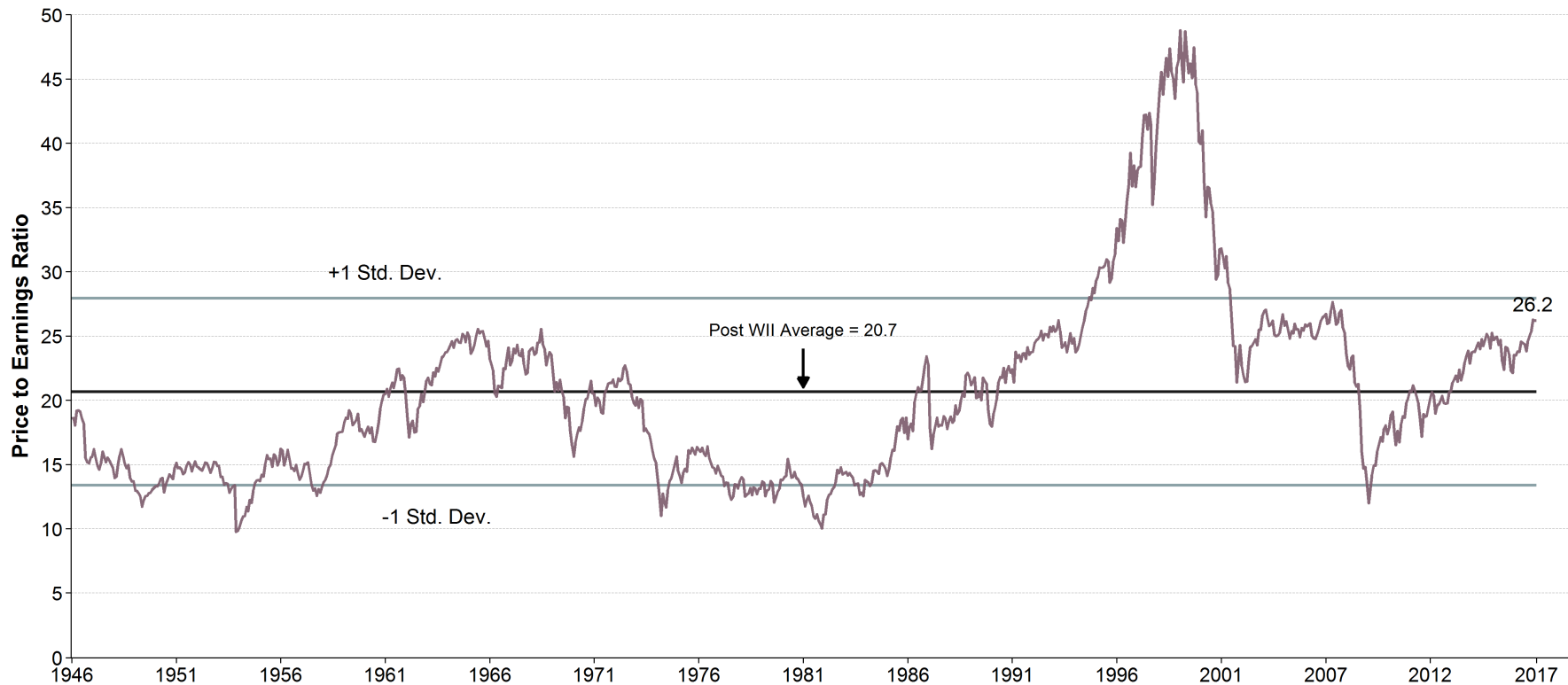
## The U.S. Cyclically Adjusted P/E<sup>1</sup> and Long-Term Equity Returns



- One of the most powerful predictors of long-term equity returns has been the Cyclically Adjusted Price to Earnings Ratio (CAPE).
- This fundamentally driven measure is highly correlated with future returns, which are shown in the chart above using the CAPE metric on a reverse scale.

<sup>1</sup> Source: PE data are from Robert Shiller's website from 1927 - 1946; S&P and Bloomberg 1946 – present. S&P 500 equity returns are from Bloomberg for the entire period. Data is from December 31, 1927 to April 13, 2017.

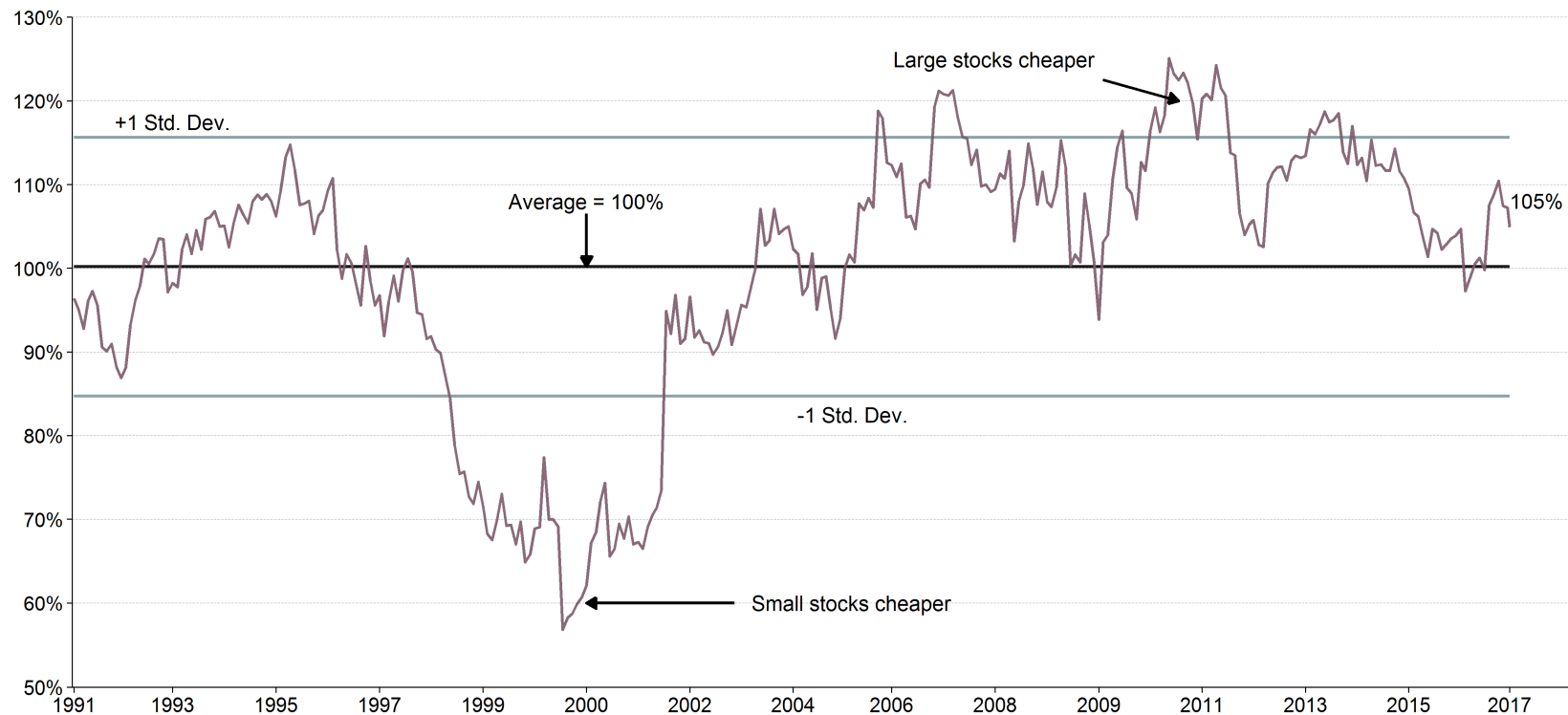
## U.S. Equity Cyclically Adjusted P/E<sup>1</sup>



- As of April 13th, the cyclically adjusted P/E ratio for the S&P 500 was 26.2x which is above its post-WWII average of 20.7x.
- Historically, a P/E ratio at this level has led to below average future returns over a 10 year horizon.

<sup>1</sup> Source: Standard & Poor's. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years. Data is from January 31, 1946 to April 13, 2017.

## Small Cap P/E vs. Large Cap P/E<sup>1</sup>



- The P/E ratio of small cap stocks (Russell 2000) relative to large cap stocks (Russell 1000) has been a consistent indicator of the relative valuation between companies based on their size.
- At 105%, this relative valuation metric currently indicates that large size companies are slightly cheaper than smaller size companies.

<sup>1</sup> Source: Russell Investments. Earnings figures represent 12-month "as reported" earnings. Data is as of April 13, 2017.

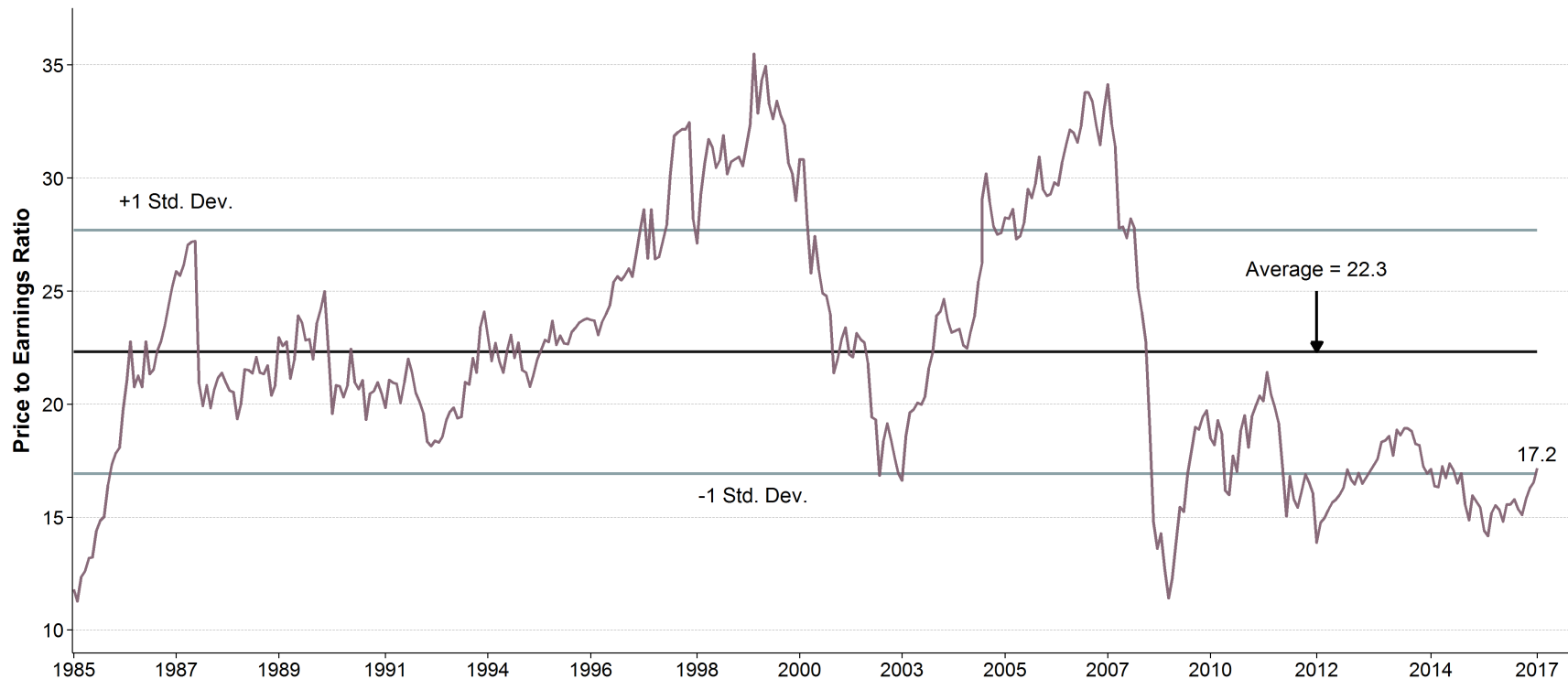
Growth P/E vs. Value P/E<sup>1</sup>

- The P/E ratio of growth stocks (Russell 3000 Growth) relative to value stocks (Russell 3000 Value) was at a level of 119% as of April 13th, which is slightly below its long-term average.
- Of note, the long-term average was sharply influenced by the technology bubble of the late 1990s.

<sup>1</sup> Source: Bloomberg, MSCI, and Meketa Investment Group. Earnings figures represent 12-month "as reported" earnings. Data is as of April 13, 2017.



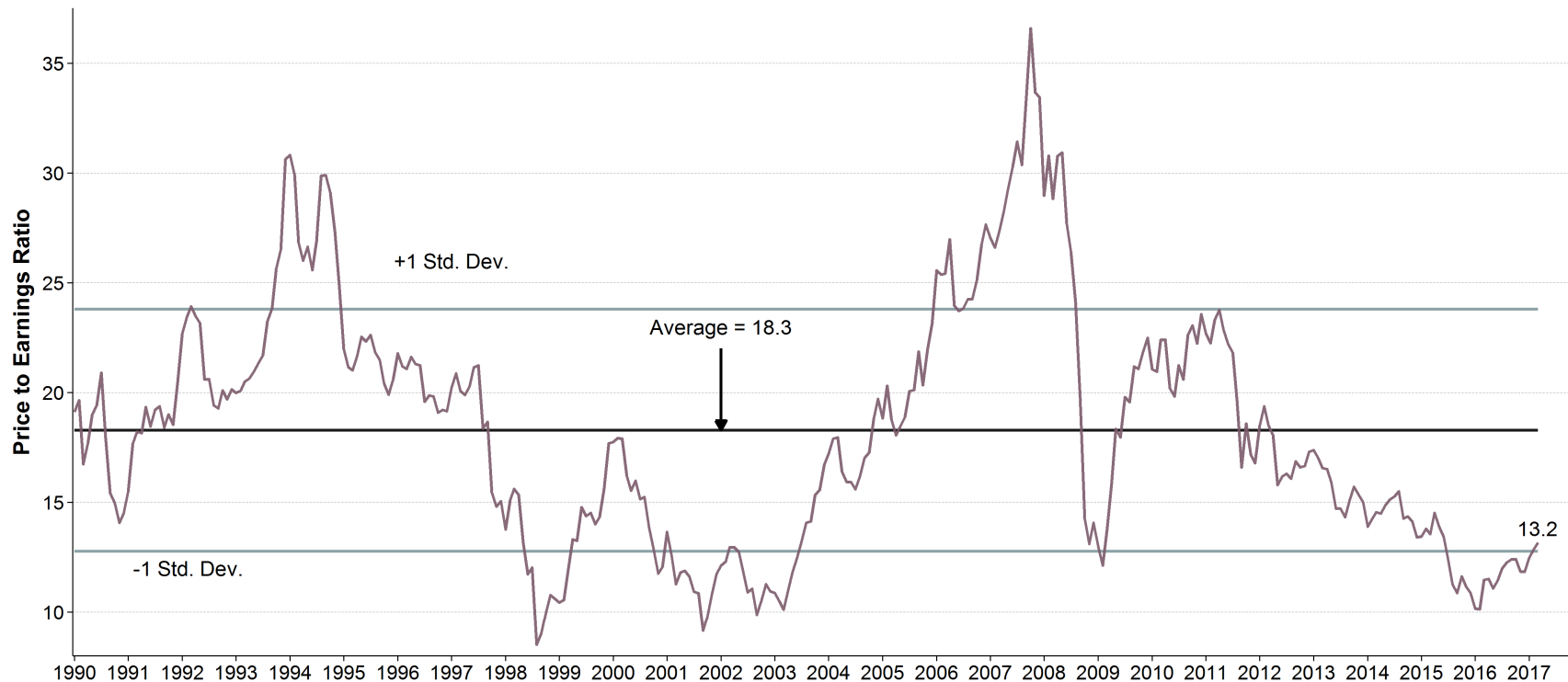
## Developed International Equity Cyclically Adjusted P/E<sup>1</sup>



- As of March 31st the price to earnings valuation for the MSCI EAFE (ex-Japan) is significantly below the historical average.
- Sovereign debt concerns and the slow pace of economic growth in Europe likely account for the low valuation levels.

<sup>1</sup> Source: MSCI and Bloomberg. Earnings figures represent the average of monthly “as reported” earnings over the previous ten years. Data is as of March 31, 2017.

## Emerging Market Equity Cyclically Adjusted P/E<sup>1</sup>



- Emerging market equities (MSCI Emerging Markets) are priced significantly below their (brief) historical average.
- By this metric, emerging market equities are trading at a much lower valuation than U.S. equities, and at a slightly lower valuation than non-U.S. developed market equities.

<sup>1</sup> Source: MSCI and Bloomberg. Earnings figures represent the average of monthly “as reported” earnings over the previous ten years. Data is as of March 31, 2017.

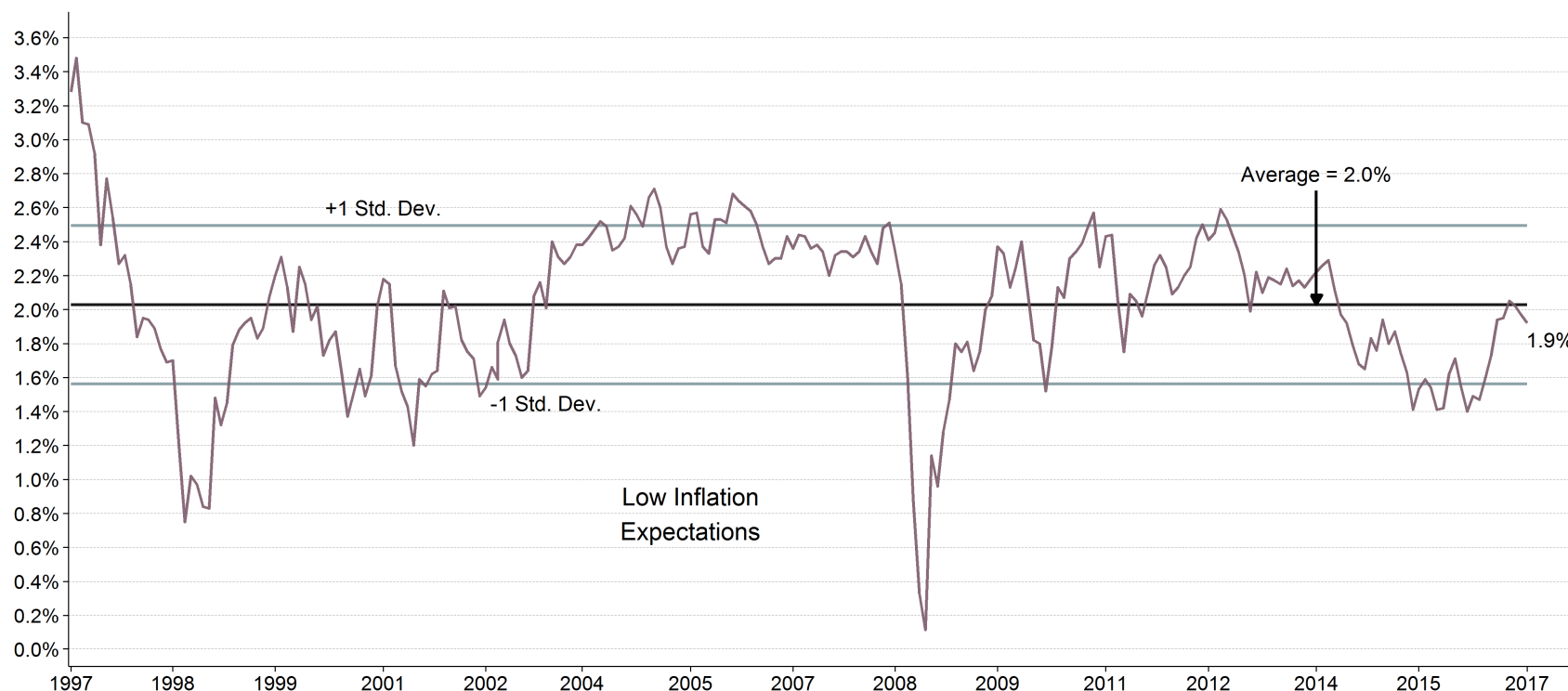
## Ten-Year Treasury Yields<sup>1</sup>



- As of April 13th the ten-year Treasury yield was 2.2%, well below the post-WWII average, but above the 1.8% level of one year ago.
- Markets have begun to focus on the path of central bank interest rates; at the beginning of last year, the FOMC began the first rising rate environment since 2006, and guidance is for multiple hikes to occur in 2017.

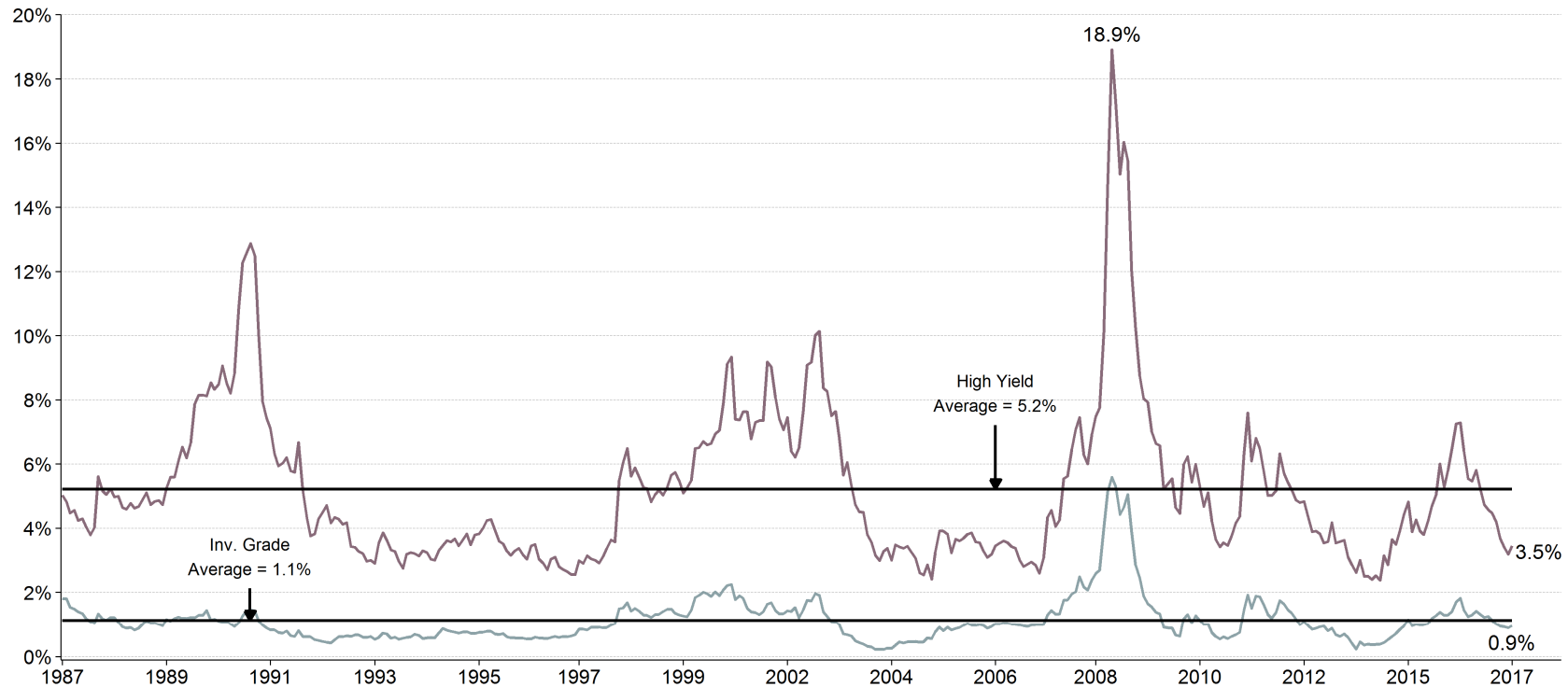
<sup>1</sup> Source: U.S. Treasury. Data is as of April 13, 2017.

## Ten-Year Breakeven Inflation<sup>1</sup>



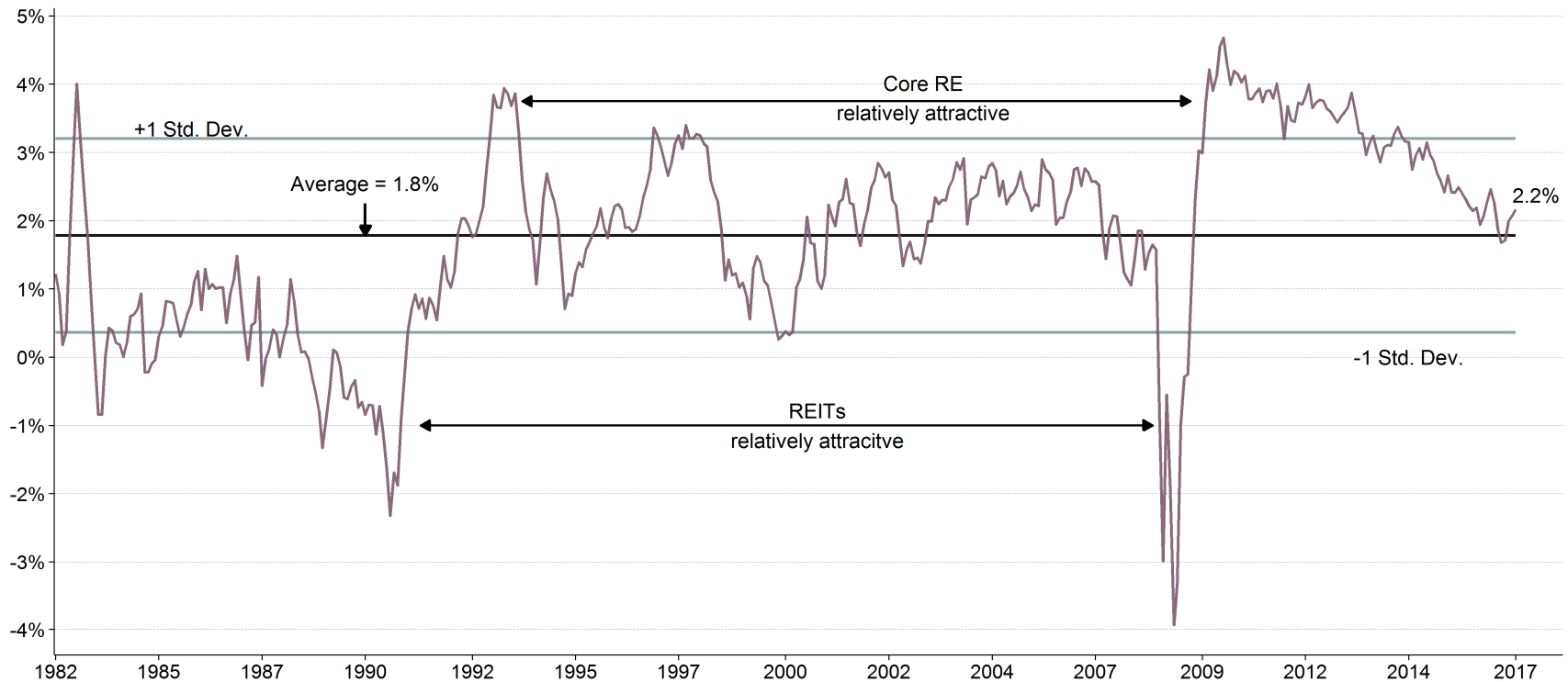
- Breakeven (or expected) inflation, the difference between the nominal yield on a ten-year Treasury and the real yield on a ten-year TIPS, is slightly below its twenty-year average.
- The most recent year-over-year inflation rate was 2.4%, indicating that the market future expectation is for inflation to be roughly in line relative to current inflation.

<sup>1</sup> Source: U.S. Treasury and Federal Reserve. Data is as of April 13, 2017 for TIPS and Treasuries. Inflation is measured by the Consumer Price Index (CPI-U NSA) for which the most recent data point is from March 31, 2017.

Credit Spreads<sup>1</sup>

- As of March 31st, credit spreads (versus U.S. Treasury bonds) for both high yield and investment grade corporate bonds were below their respective historical averages.

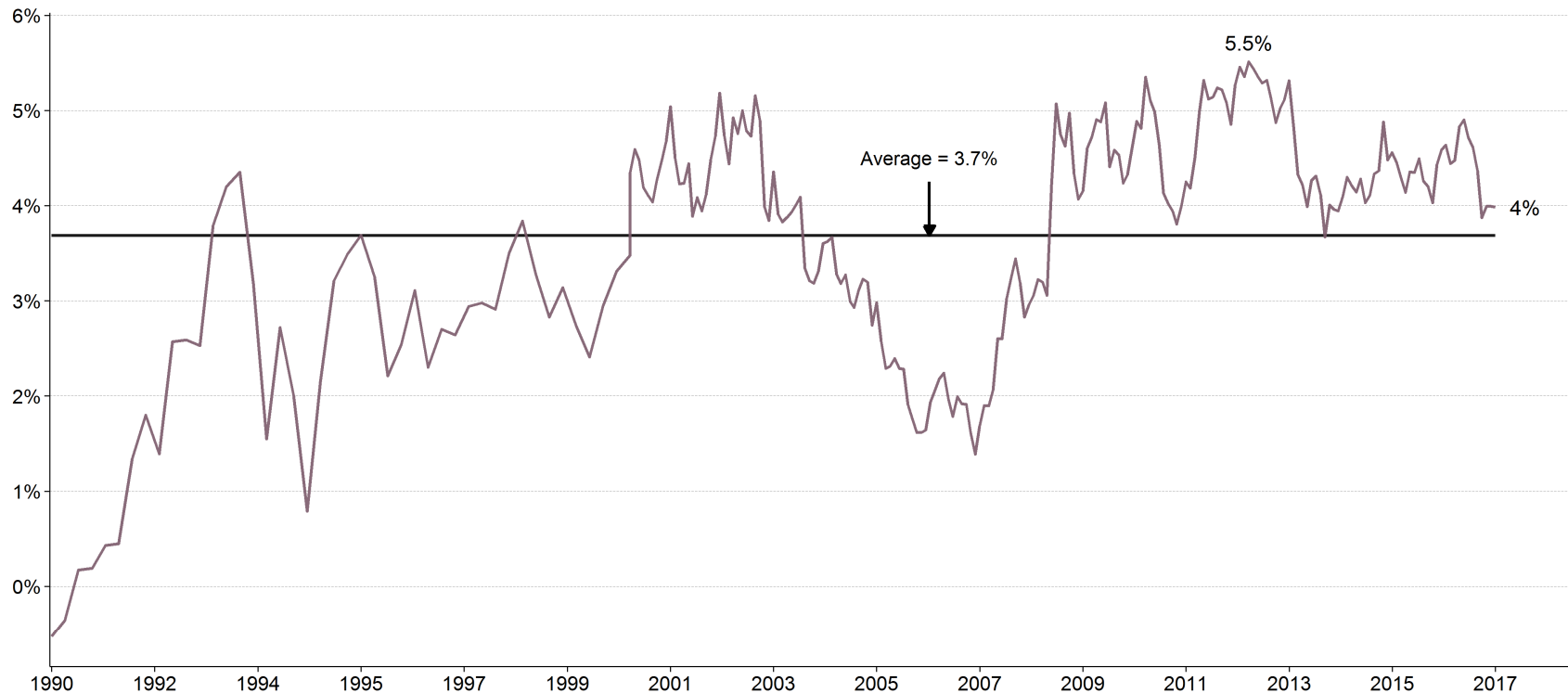
<sup>1</sup> Source: Barclays Capital. High Yield is proxied by the Barclays High Yield index and Investment Grade Corporates are proxied by the Barclays U.S. Corporate Investment Grade index. Data is as of March 31, 2017.

Core Real Estate vs. REITs<sup>1</sup>

- The spread between core real estate cap rates and REIT yields was 2.2%, reaching slightly above the long-term historical average level.
- REITs were yielding 3.9%, well below the 10.1% level of early 2009.

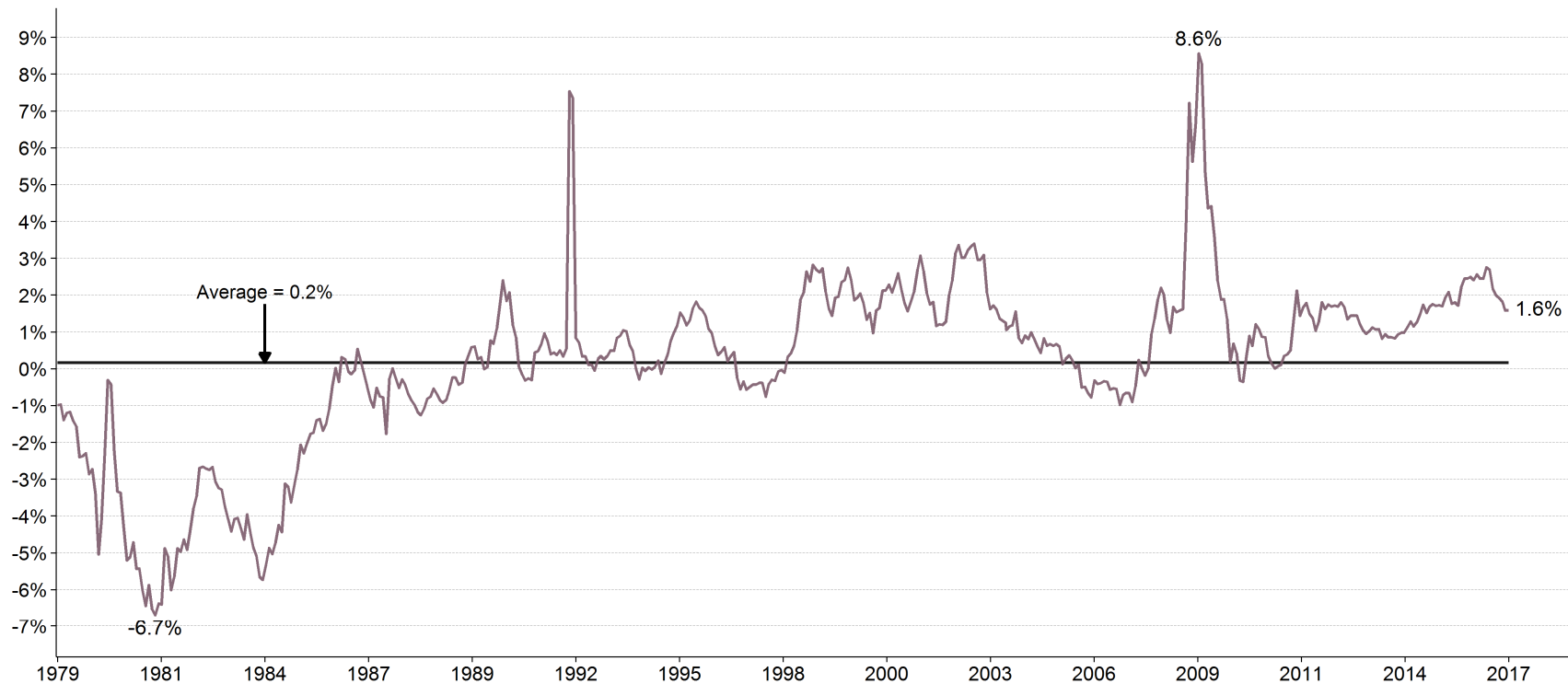
<sup>1</sup> Sources: Bloomberg, Real Capital Analytics, NCREIF, and Meketa Investment Group. Core Real Estate is proxied by weighted sector transaction based indices from Real Capital Analytics and Meketa Investment Group and data is as of February 28, 2017. REITs are proxied by the yield for the NAREIT Equity index and data is as of April 13, 2017.

## Core Real Estate Spread vs. Ten-Year Treasury<sup>1</sup>



- At 4%, the difference between the 6.4% cap rate for core real estate and the 2.2% yield for the ten-year Treasury is above its historical average.
- Still, the absolute level of core real estate cap rates is near a historical low.

<sup>1</sup> Source: Real Capital Analytics, U.S. Treasury, Bloomberg, and Meketa Investment Group. Core Real Estate is proxied by weighted sector transaction based indices from Real Capital Analytics and Meketa Investment Group and data is as of February 28, 2017. U.S. Treasury data uses the latest yield data which is as of April 13, 2017.

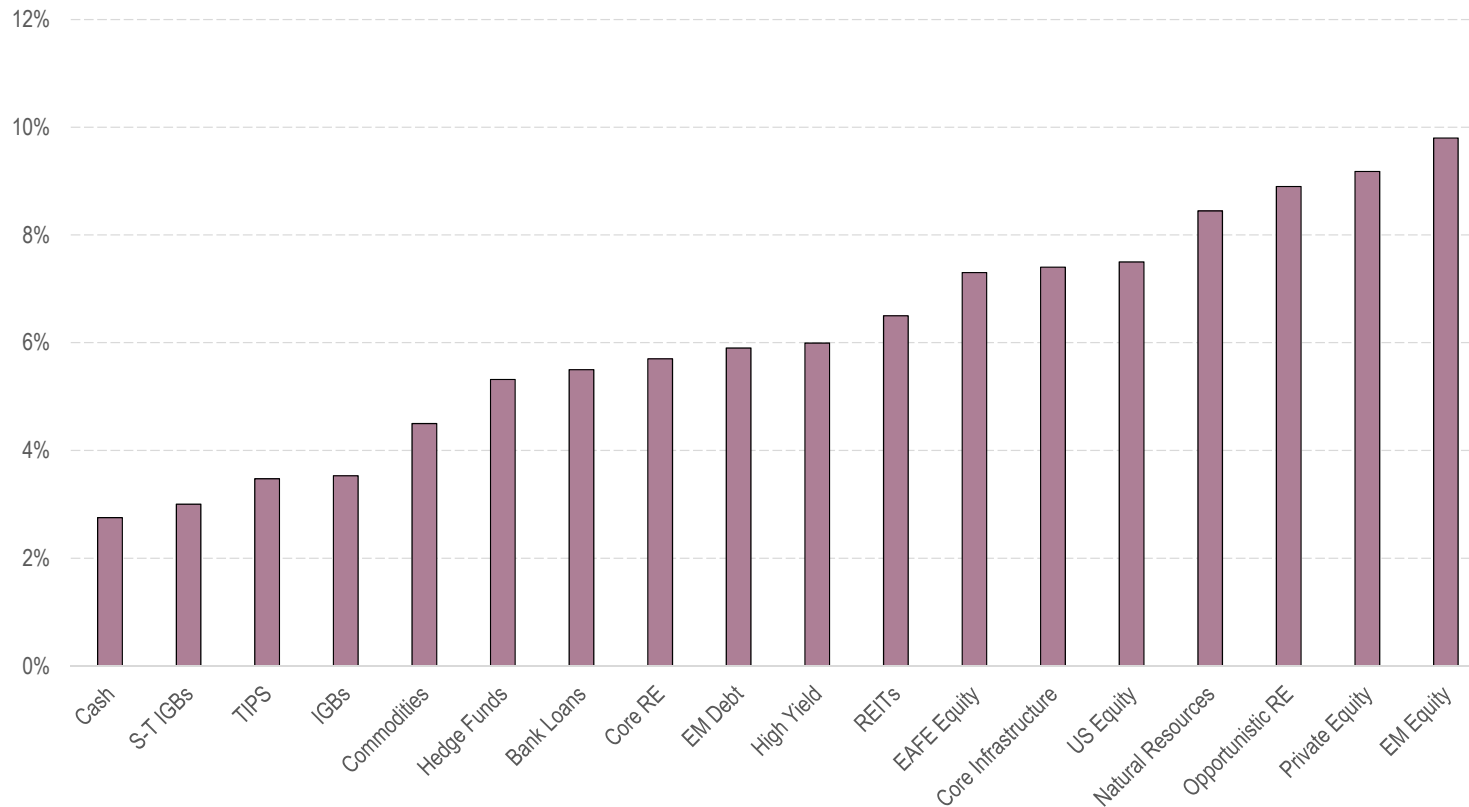
REITs Dividend Yield Spread vs. Ten-Year Treasury<sup>1</sup>

- As of April 13th, REIT yield spreads were 1.6%. This spread represents a change of -0.9% from the previous year.
- As with core real estate, the absolute level of REIT dividend yields is near a historical low.

<sup>1</sup> Source: NAREIT, U.S. Treasury. REITs are proxied by the yield for the NAREIT Equity index. Data is as of April 13, 2017.



## Long-Term Outlook<sup>1</sup>



- Based on Meketa Investment Group's long-term expectations, only a handful of asset classes are priced to produce returns above 8% per year. All of these asset classes incorporate a high degree of volatility.

<sup>1</sup> Twenty-year expected returns based upon Meketa Investment Group's 2017 Annual Asset Study.

### Total Return Comparison of Barclays U.S. Aggregate Minus Barclays U.S. TIPS<sup>1</sup>

		Changes In Rates (bps)				
		-100	-50	0	50	100
Inflation Rate Scenarios	4.0%	-3.67%	-3.59%	-3.67%	-3.92%	-4.33%
	3.0%	-2.67%	-2.59%	-2.67%	-2.92%	-3.33%
	2.0%	-1.67%	-1.59%	-1.67%	-1.92%	-2.33%
	1.0%	-0.67%	-0.59%	-0.67%	-0.92%	-1.33%
	0.0%	0.33%	0.41%	0.33%	0.08%	-0.33%

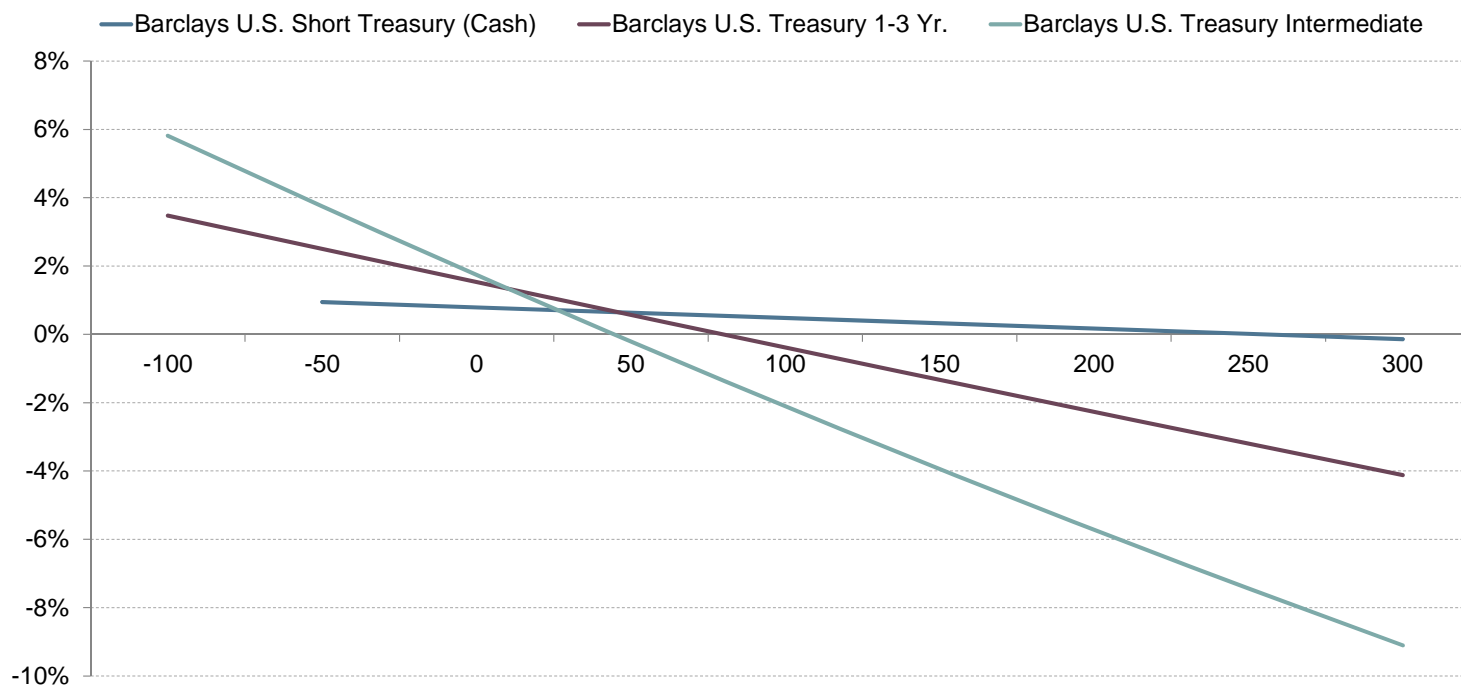
#### Total Return Scenario: 100 bps Rate Increase and 2% Inflation

Total Return Over Longer Holding Periods	1 Year	3 Year	5 Year	7 Year	10 Year
Barclays U.S. Aggregate	-3.30%	1.16%	2.08%	2.48%	2.78%
Barclays U.S. Treasury U.S. TIPS	-0.98%	2.96%	3.77%	4.11%	4.38%

<sup>1</sup> Data is as of March 31, 2017 via Barclays, Bloomberg, and Meketa Investment Group. Scenario assumes that the rate increase happens over one year.



### Total Return Given Changes in Interest Rates (bps)<sup>1</sup>



	Total Return for Given Changes in Interest Rates (bps)									Statistics	
	-100	-50	0	50	100	150	200	250	300	Duration	YTW
Barclays U.S. Short Treasury (Cash)		0.9%	0.8%	0.6%	0.5%	0.3%	0.2%	0.0%	-0.1%	0.31	0.79%
Barclays U.S. Treasury 1-3 Yr.	3.5%	2.5%	1.5%	0.6%	-0.4%	-1.3%	-2.3%	-3.2%	-4.1%	1.93	1.53%
Barclays U.S. Treasury Intermediate	5.8%	3.7%	1.7%	-0.2%	-2.1%	-3.9%	-5.7%	-7.4%	-9.1%	3.96	1.74%
Barclays U.S. Treasury Long	22.5%	12.2%	3.0%	-5.3%	-12.5%	-18.7%	-24.0%	-28.2%	-31.4%	17.5	2.96%

<sup>1</sup> Data represents the expected total return from a given change in interest rates (shown in basis points) over a 12-month period assuming a parallel shift in rates. Data is as of March 31, 2017 via Barclays, Bloomberg, and Meketa Investment Group.



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In general, the valuation numbers presented in this report are prepared by the custodian bank for listed securities, and by the fund manager or appropriate General Partner in the case of unlisted securities. The data used in the market comparison sections of this report are sourced from various databases. These data are continuously updated and are subject to change.

This report does not contain all the information necessary to fully evaluate the potential risks of any of the investments described herein. Because of inherent uncertainties involved in the valuations of investments that are not publicly traded, any estimated fair values shown in this report may differ significantly from the values that would have been used had a ready market for the underlying securities existed, and the differences could be material. Note that for unlisted securities the valuations may be lagged by one or more calendar quarters, or may reflect original cost.

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In some cases, Meketa Investment Group assists the Trustees in handling capital calls or asset transfers among investment managers. In these cases, we do not make any representations as to the managers’ use of the funds, but do confirm that the capital called or transferred is within the amounts authorized by the Trustees.

**Credit Risk:** Refers to the risk that the issuer of a fixed income security may default (i.e., the issuer will be unable to make timely principal and/or interest payments on the security.)

**Duration:** Measure of the sensitivity of the price of a bond to a change in its yield to maturity. Duration summarizes, in a single number, the characteristics that cause bond prices to change in response to a change in interest rates. For example, the price of a bond with a duration of three years will rise by approximately 3% for each 1% decrease in its yield to maturity. Conversely, the price will decrease 3% for each 1% increase in the bond's yield. Price changes for two different bonds can be compared using duration. A bond with a duration of six years will exhibit twice the percentage price change of a bond with a three-year duration. The actual calculation of a bond's duration is somewhat complicated, but the idea behind the calculation is straightforward. The first step is to measure the time interval until receipt for each cash flow (coupon and principal payments) from a bond. The second step is to compute a weighted average of these time intervals. Each time interval is measured by the present value of that cash flow. This weighted average is the duration of the bond measured in years.

**Information Ratio:** This statistic is a measure of the consistency of a portfolio's performance relative to a benchmark. It is calculated by subtracting the benchmark return from the portfolio return (excess return), and dividing the resulting excess return by the standard deviation (volatility) of this excess return. A positive information ratio indicates outperformance versus the benchmark, and the higher the information ratio, the more consistent the outperformance.

**Jensen's Alpha:** A measure of the average return of a portfolio or investment in excess of what is predicted by its beta or "market" risk.  $\text{Portfolio Return} - [\text{Risk Free Rate} + \text{Beta} * (\text{market return} - \text{Risk Free Rate})]$ .

**Market Capitalization:** For a firm, market capitalization is the total market value of outstanding common stock. For a portfolio, market capitalization is the sum of the capitalization of each company weighted by the ratio of holdings in that company to total portfolio holdings; thus it is a weighted-average capitalization. Meketa Investment Group considers the largest 65% of the broad domestic equity market as large capitalization, the next 25% of the market as medium capitalization, and the smallest 10% of stocks as small capitalization.

**Market Weighted:** Stocks in many indices are weighted based on the total market capitalization of the issue. Thus, the individual returns of higher market-capitalization issues will more heavily influence an index's return than the returns of the smaller market-capitalization issues in the index.

**Maturity:** The date on which a loan, bond, mortgage, or other debt/security becomes due and is to be paid off.

**Prepayment Risk:** The risk that prepayments will increase (homeowners will prepay all or part of their mortgage) when mortgage interest rates decline; hence, investors' monies will be returned to them in a lower interest rate environment. Also, the risk that prepayments will slow down when mortgage interest rates rise; hence, investors will not have as much money as previously anticipated in a higher interest rate environment. A prepayment is any payment in excess of the scheduled mortgage payment.

**Price-Book Value (P/B) Ratio:** The current market price of a stock divided by its book value per share. Meketa Investment Group calculates P/B as the current price divided by Compustat's quarterly common equity. Common equity includes common stock, capital surplus, retained earnings, and treasury stock adjusted for both common and nonredeemable preferred stock. Similar to high P/E stocks, stocks with high P/B's tend to be riskier investments.

**Price-Earnings (P/E) Ratio:** A stock's market price divided by its current or estimated future earnings. Lower P/E ratios often characterize stocks in low growth or mature industries, stocks in groups that have fallen out of favor, or stocks of established blue chip companies with long records of stable earnings and regular dividends. Sometimes a company that has good fundamentals may be viewed unfavorably by the market if it is an industry that is temporarily out of favor. Or a business may have experienced financial problems causing investors to be skeptical about its future. Either of these situations would result in lower relative P/E ratios. Some stocks exhibit above-average sales and earnings growth or expectations for above average growth. Consequently, investors are willing to pay more for these companies' earnings, which results in elevated P/E ratios. In other words, investors will pay more for shares of companies whose profits, in their opinion, are expected to increase faster than average. Because future events are in no way assured, high P/E stocks tend to be riskier and more volatile investments. Meketa Investment Group calculates P/E as the current price divided by the I/B/E/S consensus of twelve-month forecast earnings per share.

**Quality Rating:** The rank assigned a security by such rating services as Fitch, Moody's, and Standard & Poor's. The rating may be determined by such factors as (1) the likelihood of fulfillment of dividend, income, and principal payment of obligations; (2) the nature and provisions of the issue; and (3) the security's relative position in the event of liquidation of the company. Bonds assigned the top four grades (AAA, AA, A, BBB) are considered investment grade because they are eligible bank investments as determined by the controller of the currency.

**Sharpe Ratio:** A commonly used measure of risk-adjusted return. It is calculated by subtracting the risk free return (usually three-month Treasury bill) from the portfolio return and dividing the resulting excess return by the portfolio's total risk level (standard deviation). The result is a measure of return per unit of total risk taken. The higher the Sharpe ratio, the better the fund's historical risk adjusted performance.

**Standard Deviation:** A measure of the total risk of an asset or a portfolio. Standard deviation measures the dispersion of a set of numbers around a central point (e.g., the average return). If the standard deviation is small, the distribution is concentrated within a narrow range of values. For a normal distribution, about two thirds of the observations will fall within one standard deviation of the mean, and 95% of the observations will fall within two standard deviations of the mean.

**STIF Account:** Short-term investment fund at a custodian bank that invests in cash-equivalent instruments. It is generally used to safely invest the excess cash held by portfolio managers.

**Style:** The description of the type of approach and strategy utilized by an investment manager to manage funds. For example, the style for equities is determined by portfolio characteristics such as price-to-book value, price-to-earnings ratio, and dividend yield. Equity styles include growth, value, and core.

**Yield to Maturity:** The yield, or return, provided by a bond to its maturity date; determined by a mathematical process, usually requiring the use of a “basis book.” For example, a 5% bond pays \$5 a year interest on each \$100 par value. To figure its current yield, divide \$5 by \$95—the market price of the bond—and you get 5.26%. Assume that the same bond is due to mature in five years. On the maturity date, the issuer is pledged to pay \$100 for the bond that can be bought now for \$95. In other words, the bond is selling at a discount of 5% below par value. To figure yield to maturity, a simple and approximate method is to divide 5% by the five years to maturity, which equals 1% pro rata yearly. Add that 1% to the 5.26% current yield, and the yield to maturity is roughly 6.26%.

$$\frac{5\% \text{ (discount)}}{5 \text{ (yrs. to maturity)}} = 1\% \text{ pro rata, plus } 5.26\% \text{ (current yield)} = 6.26\% \text{ (yield to maturity)}$$

Sources: [Investment Terminology](#), International Foundation of Employee Benefit Plans, 1999.  
[The Handbook of Fixed Income Securities](#), Fabozzi, Frank J., 1991.



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Throughout this report, numbers may not sum due to rounding.

Returns for periods greater than one year are annualized throughout this report.

Values shown are in millions of dollars, unless noted otherwise.