

FUND EVALUATION REPORT

Massachusetts Housing Finance Agency Retirement System

Quarterly Review
December 31, 2017



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Executive Summary

As of December 31, 2017

As of December 31, 2017, the System was valued at \$149.1 million, an increase of \$3.3 million from the previous quarter.

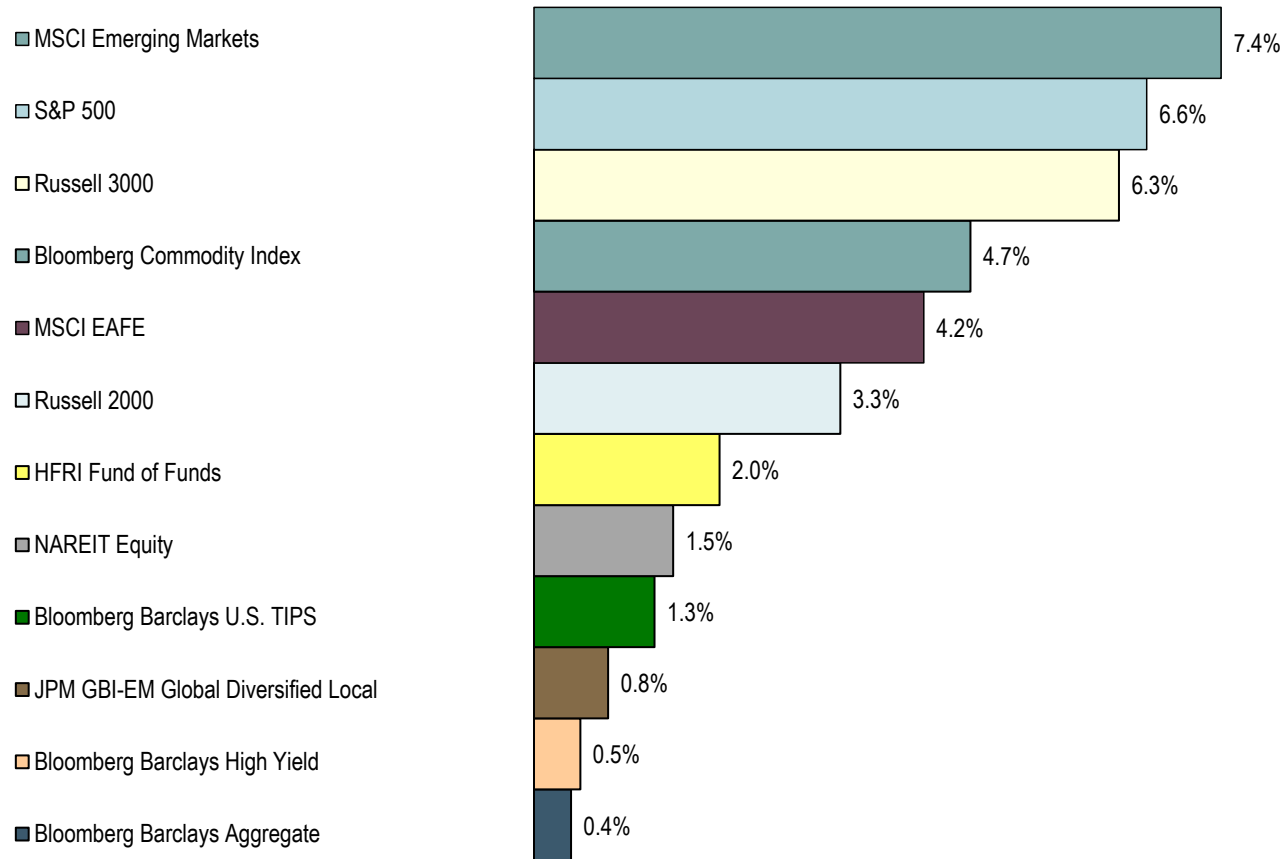
- The increase was primarily due to positive investment performance.
- The System returned 3.1% during the quarter and 14.2% for the calendar year.

Performance for all asset classes was positive during the quarter.

- U.S. and emerging market equities were the strongest performers, up 6.3% and 7.4% respectively. International developed equities were also up strongly, rising 4.7%. Public equities were also the strongest performers during the calendar year, with returns ranging from gains of 21.0% to 32.2%.
- Fixed income returns were more muted during the quarter. Emerging market debt and TIPS had moderate gains of 1.0% and 1.3%, respectively while returns for investment grade bonds (+0.5%) and high yield bonds (+0.1%) were weaker.
- The Victory Natural Resources portfolio was liquidated at the end of November and reinvested in early January, so its performance is not displayed. However, over the course of 2018 until liquidation, performance was approximately flat.
- Real estate performance was positive, up 7.6% during the calendar year.
- As December 31, 2017, all asset classes were within their respective target asset allocation ranges aside from natural resources, which was in transition.

The World Markets Fourth Quarter of 2017

The World Markets¹ Fourth Quarter of 2017



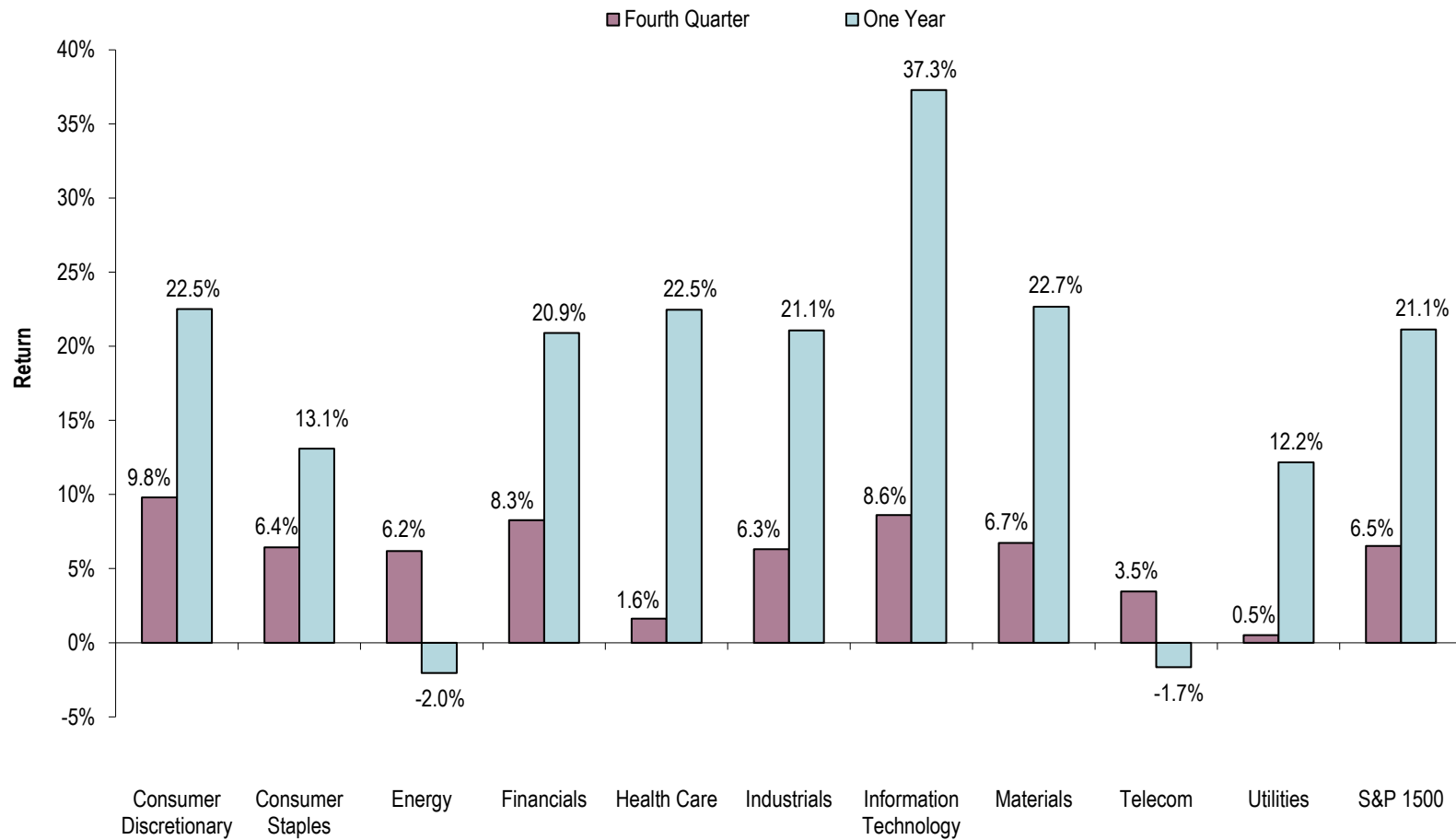
¹ Source: InvestorForce.

Index Returns¹

	4Q17 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
Domestic Equity					
Russell 3000	6.3	21.1	11.1	15.6	8.6
Russell 1000	6.6	21.7	11.2	15.7	8.6
Russell 1000 Growth	7.9	30.2	13.8	17.3	10.0
Russell 1000 Value	5.3	13.7	8.7	14.0	7.1
Russell MidCap	6.1	18.5	9.6	15.0	9.1
Russell MidCap Growth	6.8	25.3	10.3	15.3	9.1
Russell MidCap Value	5.5	13.3	9.0	14.7	9.1
Russell 2000	3.3	14.6	10.0	14.1	8.7
Russell 2000 Growth	4.6	22.2	10.3	15.2	9.2
Russell 2000 Value	2.0	7.8	9.5	13.0	8.2
Foreign Equity					
MSCI ACWI (ex. U.S.)	5.0	27.2	7.8	6.8	1.8
MSCI EAFE	4.2	25.0	7.8	7.9	1.9
MSCI EAFE (Local Currency)	3.7	15.2	8.5	11.4	3.3
MSCI EAFE Small Cap	6.1	33.0	14.2	12.9	5.8
MSCI Emerging Markets	7.4	37.3	9.1	4.3	1.7
MSCI Emerging Markets (Local Currency)	5.7	30.6	10.5	8.0	4.1
Fixed Income					
Bloomberg Barclays Universal	0.4	4.1	2.8	2.5	4.3
Bloomberg Barclays Aggregate	0.4	3.5	2.2	2.1	4.0
Bloomberg Barclays U.S. TIPS	1.3	3.0	2.0	0.1	3.5
Bloomberg Barclays High Yield	0.5	7.5	6.4	5.8	8.0
JPM GBI-EM Global Diversified (Local Currency)	0.8	8.9	7.1	5.8	8.3
Other					
NAREIT Equity	1.5	5.2	5.6	9.5	7.4
Bloomberg Commodity Index	4.7	1.7	-5.0	-8.5	-6.8
HFRI Fund of Funds	2.0	7.7	2.6	4.0	1.1

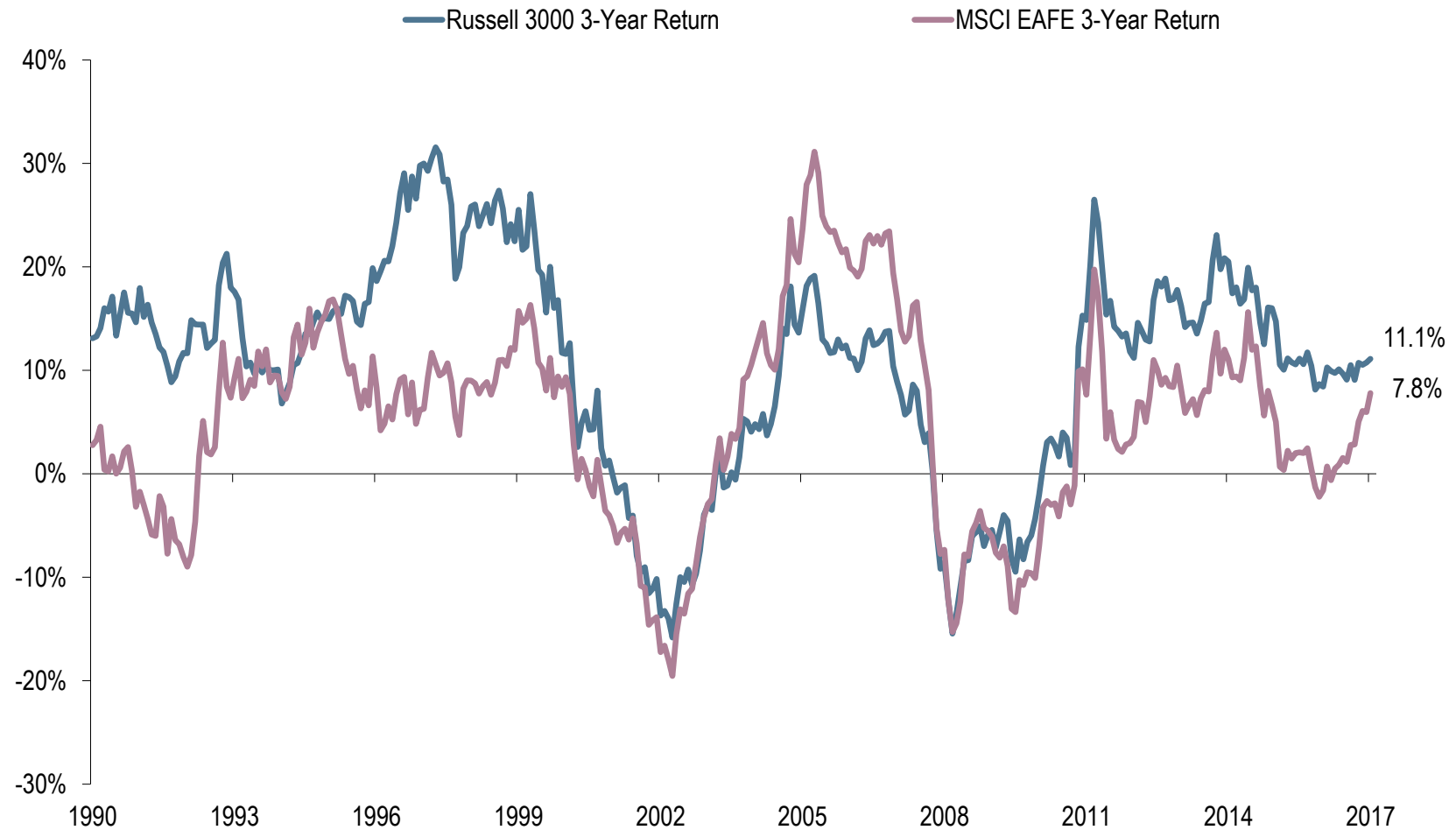
¹ Source: InvestorForce.

S&P Sector Returns¹



¹ Source: InvestorForce. Represents S&P 1500 (All Cap) data.

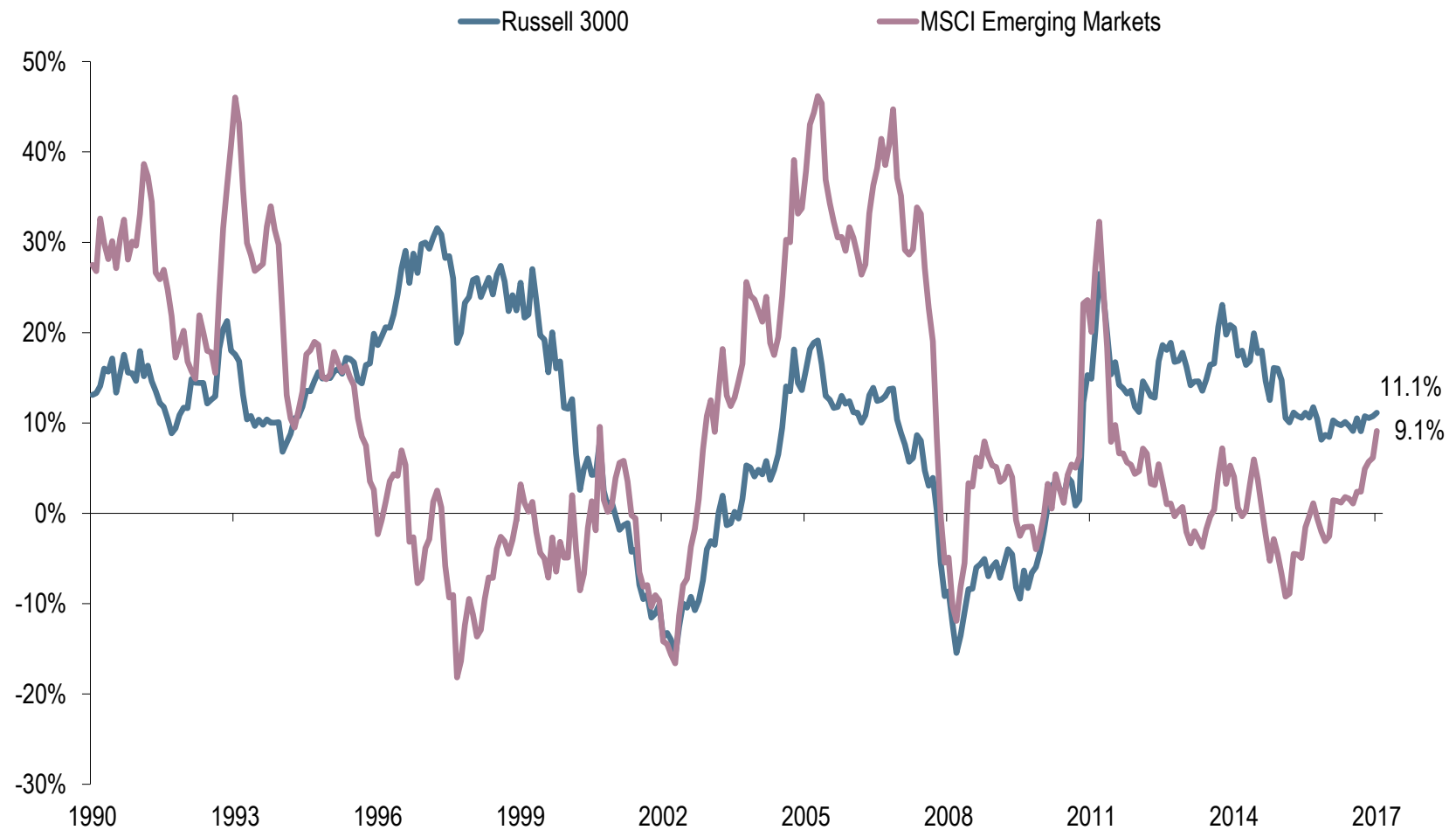
U.S. and Developed Market Foreign Equity Rolling Three-Year Returns¹



¹ Source: InvestorForce.



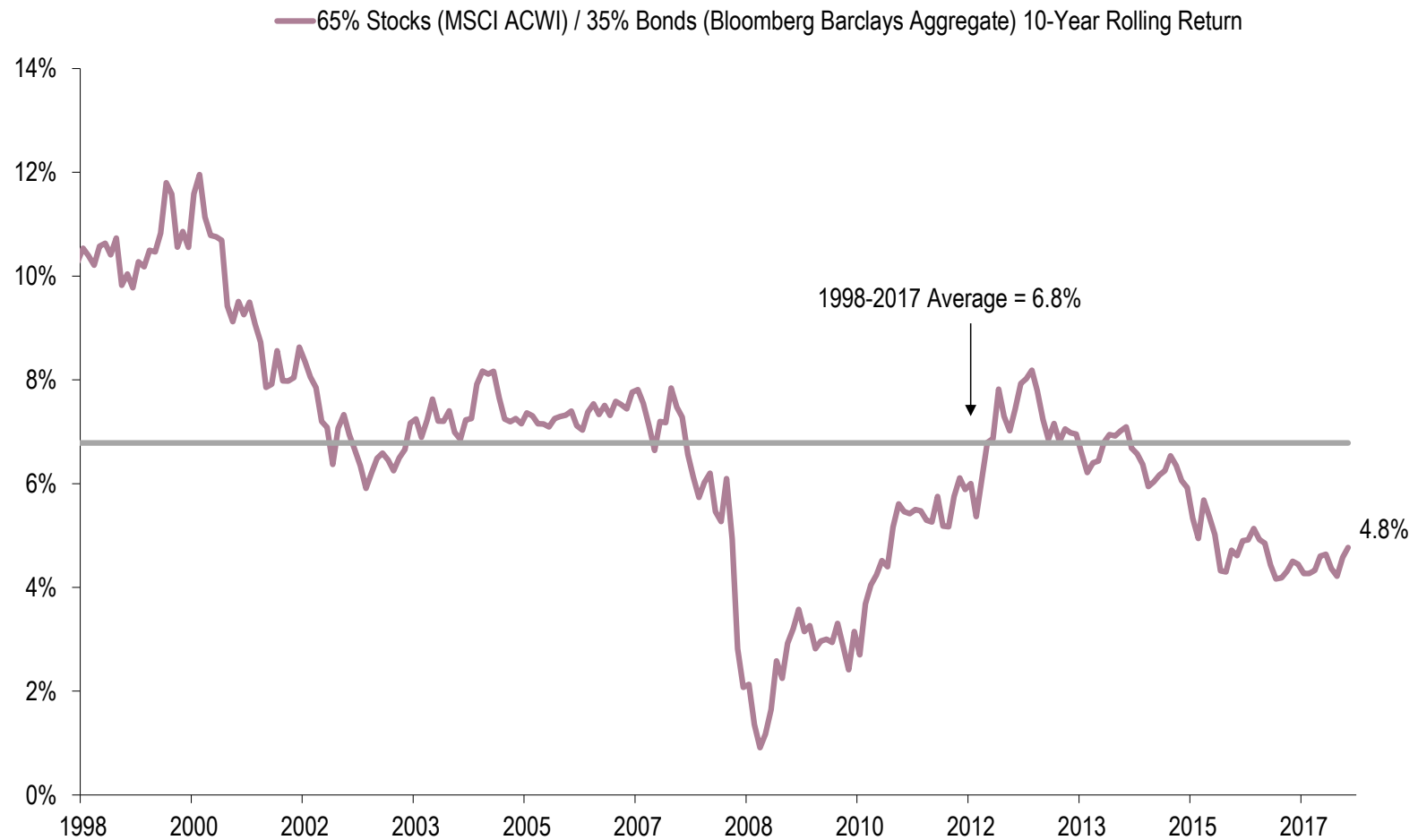
U.S. and Emerging Market Equity Rolling Three-Year Returns¹



¹ Source: InvestorForce.



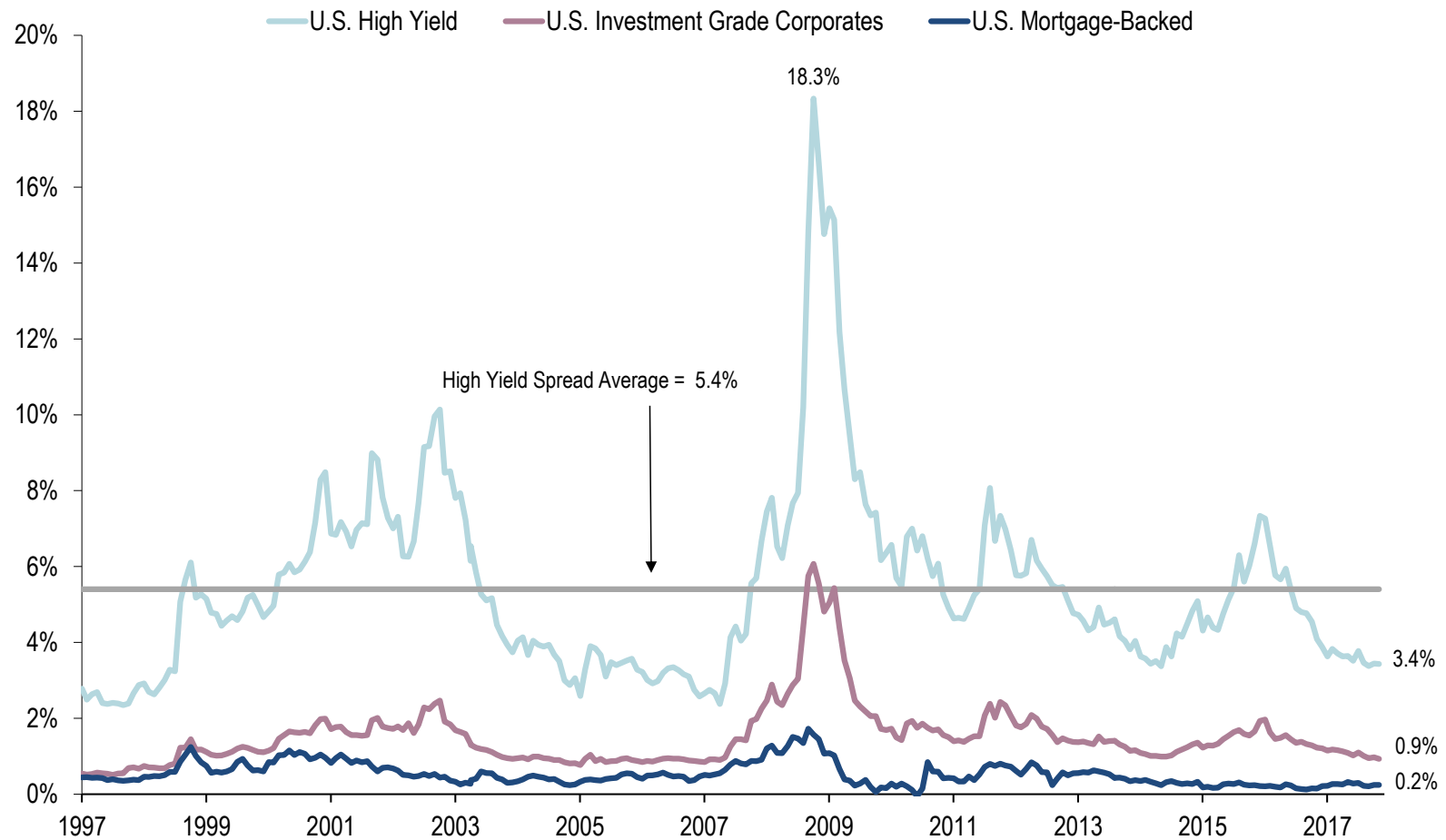
Rolling Ten-Year Returns: 65% Stocks and 35% Bonds¹



¹ Source: InvestorForce.



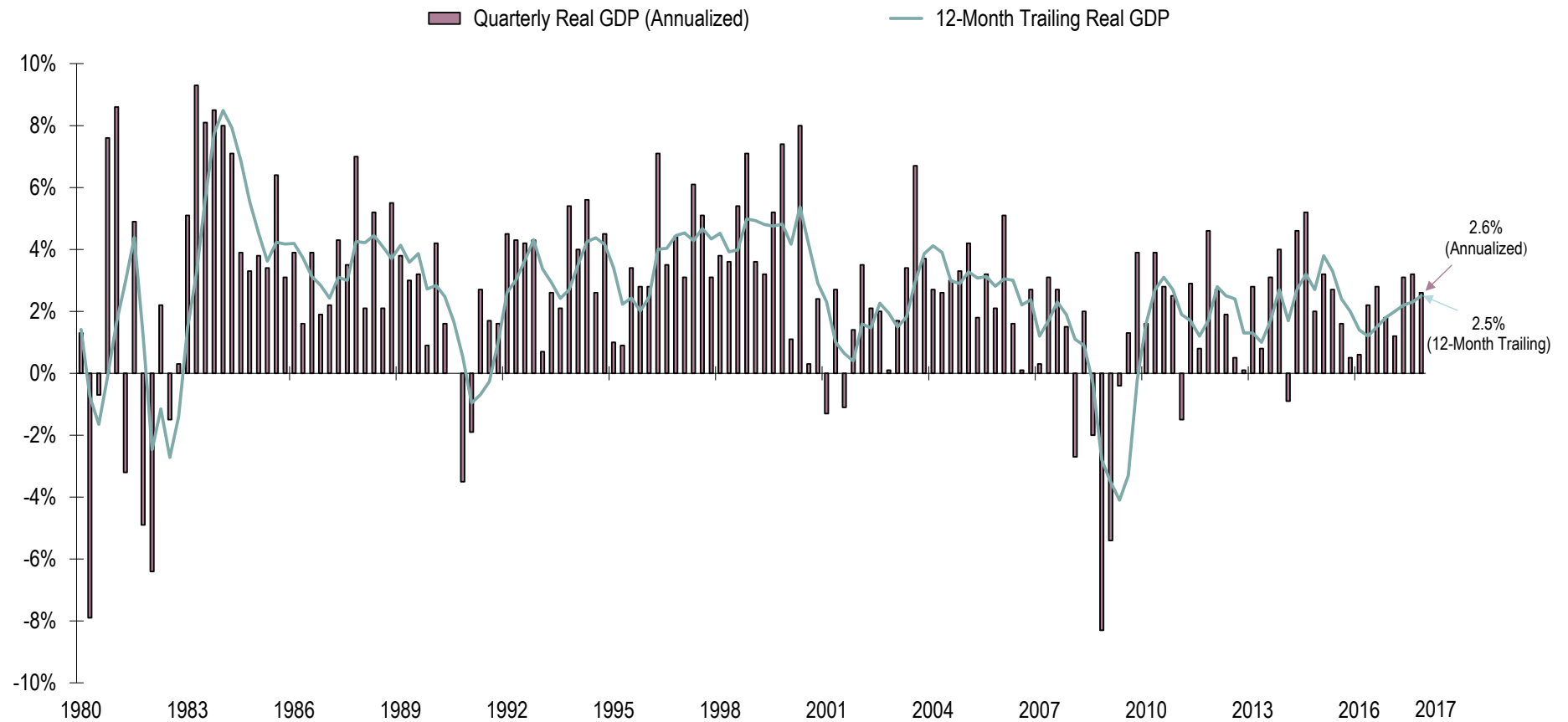
Credit Spreads vs. U.S. Treasury Bonds^{1,2}



¹ Source: Barclays Live.

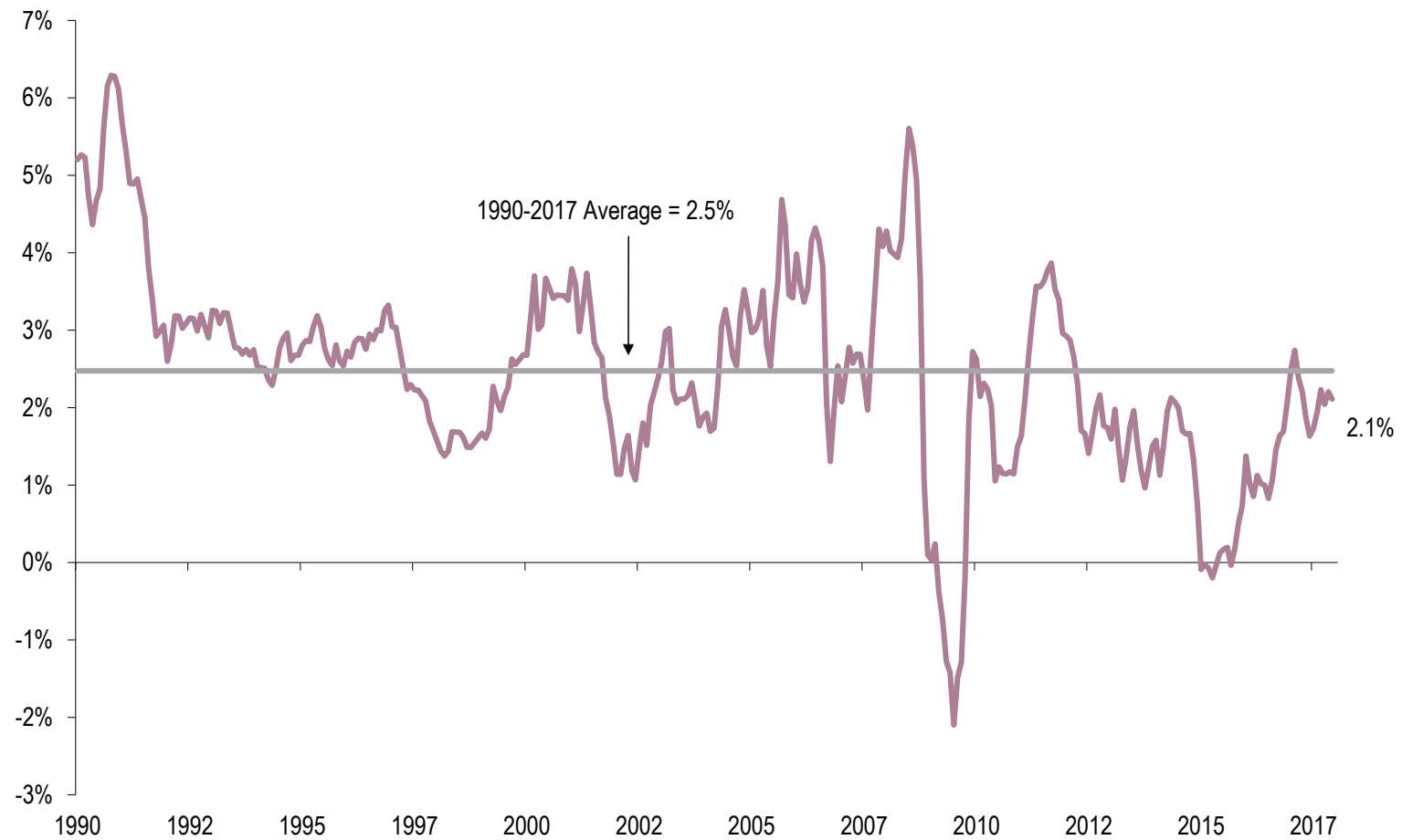
² The median high yield spread was 5.0% from 1997-2017.

U.S. Real Gross Domestic Product (GDP) Growth¹



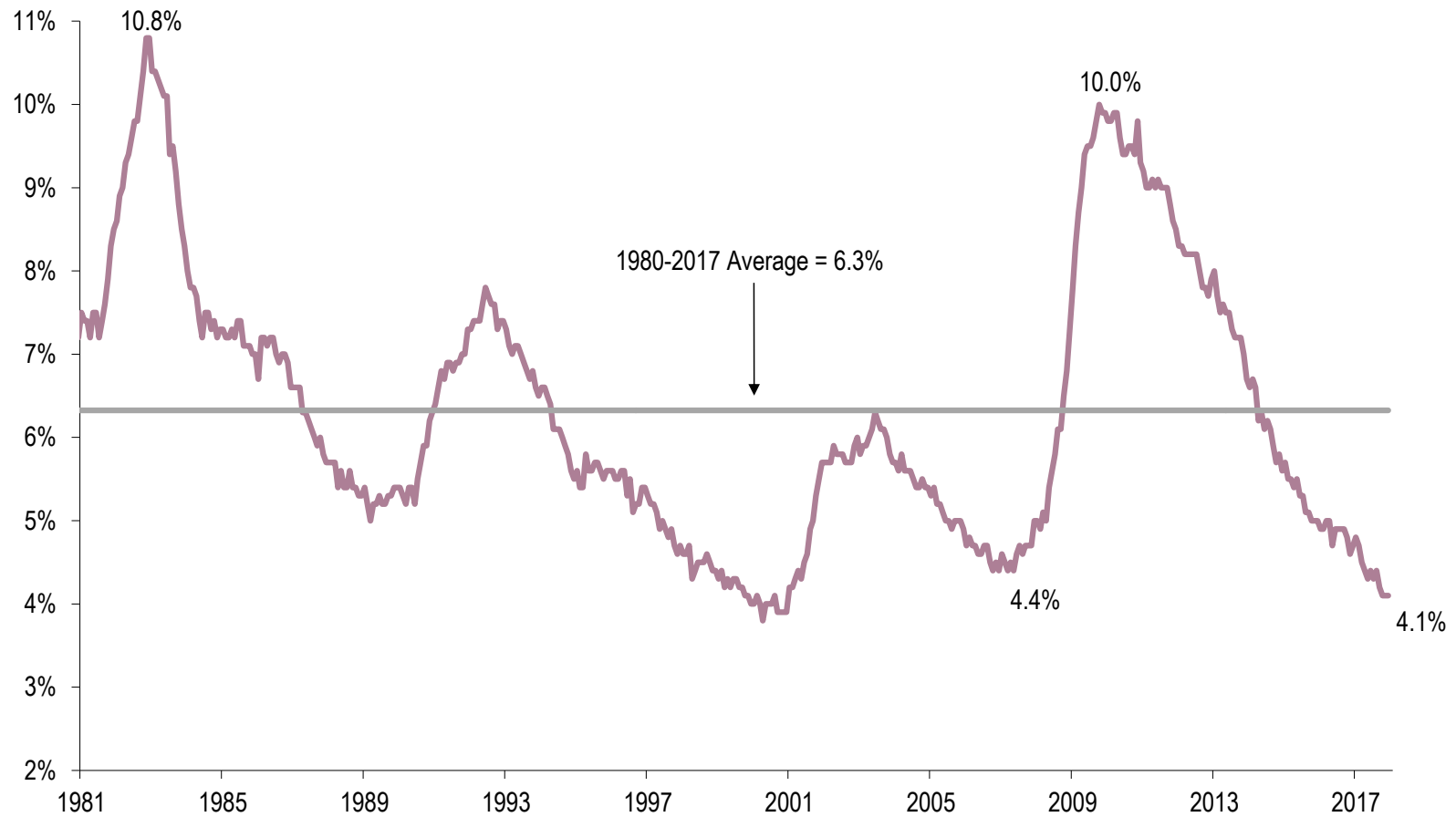
¹ Source: Bureau of Economic Analysis. Fourth quarter GDP data represents the first estimate.

U.S. Inflation (CPI) Trailing Twelve Months¹



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

U.S. Unemployment¹



¹ Source: Bureau of Labor Statistics. Data is as of December 31, 2017.

System Summary
As of December 31, 2017

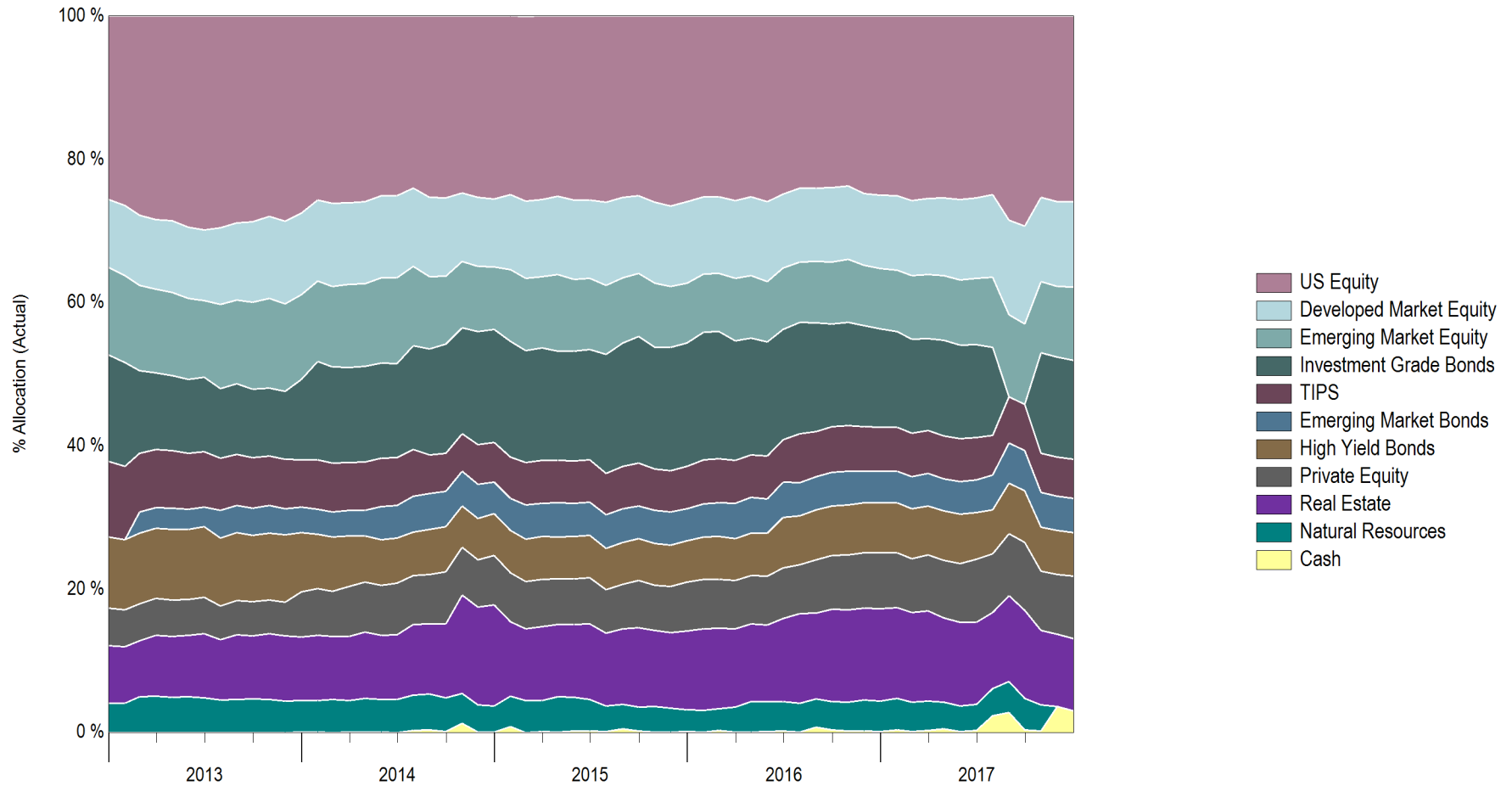
Total Retirement System

As of December 31, 2017

Allocation vs. Targets and Policy

	Current Balance	Current Allocation	Policy	Policy Range	Within IPS Range?
US Equity	\$38,628,838	26%	25%	20% - 30%	Yes
Developed Market Equity	\$17,819,146	12%	10%	6% - 14%	Yes
Emerging Market Equity	\$15,196,500	10%	10%	6% - 14%	Yes
Investment Grade Bonds	\$20,615,797	14%	10%	6% - 14%	Yes
TIPS	\$8,114,775	5%	6%	4% - 8%	Yes
Emerging Market Bonds	\$7,167,386	5%	5%	3% - 7%	Yes
High Yield Bonds	\$8,996,498	6%	6%	3% - 9%	Yes
Private Equity	\$13,008,124	9%	10%	6% - 14%	Yes
Real Estate	\$15,026,307	10%	10%	7% - 13%	Yes
Natural Resources	--	--	3%	1% - 5%	No
Infrastructure	--	--	5%	0% - 8%	Yes
Cash	\$4,543,960	3%	0%	0% - 5%	Yes
Total	\$149,117,331	100%	100%		

Asset Allocation History
5 Years Ending December 31, 2017



Total Retirement System

As of December 31, 2017

Asset Class Performance Summary

	Market Value (\$)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total Retirement System	149,117,331	100.0	3.1	14.2	6.8	7.1	4.9	5.7	Jul-01
60% MSCI ACWI / 40% Barclays Global Aggregate			3.9	17.1	6.5	6.8	4.3	6.1	Jul-01
Domestic Equity Assets	38,628,838	25.9	6.3	21.0	11.2	15.6	8.7	7.1	Jul-01
Russell 3000			6.3	21.1	11.1	15.6	8.6	7.3	Jul-01
Total International Developed Market Equity	17,819,146	11.9	4.7	27.5	9.7	9.4	3.7	6.8	Jul-01
MSCI EAFE			4.2	25.0	7.8	7.9	1.9	5.7	Jul-01
International Emerging Market Equity Assets	15,196,500	10.2	7.4	32.2	6.6	2.2	0.6	1.8	Jul-07
MSCI Emerging Markets			7.4	37.3	9.1	4.3	1.7	3.3	Jul-07
Investment Grade Bond Assets	20,615,797	13.8	0.5	3.5	2.3	2.0	4.3	4.7	Jul-01
BBgBarc US Aggregate TR			0.4	3.5	2.2	2.1	4.0	4.7	Jul-01
High Yield Bond Assets	8,996,498	6.0	0.1	6.8	5.9	5.5	7.0	6.6	Feb-05
CSFB High Yield Index			0.5	7.0	6.4	5.7	7.6	7.2	Feb-05
TIPS Assets	8,114,775	5.4	1.3	3.0	2.0	0.1	3.5	4.2	Jul-07
BBgBarc US TIPS TR			1.3	3.0	2.0	0.1	3.5	4.3	Jul-07
Emerging Market Debt Assets	7,167,386	4.8	1.0	13.3	1.9	--	--	-3.5	Mar-13
JP Morgan GBI EM Global Diversified TR USD			0.8	15.2	2.5	-1.5	3.5	-1.7	Mar-13
Real Estate Assets	15,026,307	10.1	0.7	7.6	10.1	10.6	2.6	5.8	Apr-05
NCREIF ODCE (net)			1.9	6.7	9.4	10.5	4.1	6.7	Apr-05
Private Equity Assets	13,008,124	8.7	1.5	10.3	5.7	8.0	5.6	5.1	Oct-03
Cash	4,543,960	3.0							

Total Retirement System

As of December 31, 2017

Trailing Gross Performance

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total Retirement System	149,117,331	100.0	--	3.1	14.2	6.8	7.1	4.9	5.7	Jul-01
60% MSCI ACWI / 40% Barclays Global Aggregate				3.9	17.1	6.5	6.8	4.3	6.1	Jul-01
InvestorForce All DB \$50mm-\$250mm Gross Median				3.6	14.9	7.3	8.8	5.9	6.4	Jul-01
Domestic Equity Assets	38,628,838	25.9	25.9	6.3	21.0	11.2	15.6	8.7	7.1	Jul-01
Russell 3000				6.3	21.1	11.1	15.6	8.6	7.3	Jul-01
eV US Large Cap Equity Net Median				6.5	21.1	10.0	14.8	8.3	7.5	Jul-01
SSgA Russell 1000 Value Index-NL	17,352,505	11.6	44.9	5.4	13.8	8.7	14.1	7.2	7.7	Jan-05
Russell 1000 Value				5.3	13.7	8.7	14.0	7.1	7.6	Jan-05
eV US Large Cap Value Equity Gross Median				6.2	17.2	9.7	14.6	8.2	8.7	Jan-05
SSgA Russell 1000 Growth-NL	17,835,639	12.0	46.2	7.9	30.2	13.8	17.3	10.0	9.9	Jul-07
Russell 1000 Growth				7.9	30.2	13.8	17.3	10.0	9.8	Jul-07
eV US Large Cap Growth Equity Gross Median				7.0	28.8	12.3	16.7	9.6	9.7	Jul-07
SSgA Russell 2000 Index-NL	3,440,694	2.3	8.9	3.3	14.7	10.0	14.2	--	13.9	Aug-10
Russell 2000				3.3	14.6	10.0	14.1	8.7	13.8	Aug-10
eV US Small Cap Core Equity Gross Median				3.8	14.9	11.1	15.5	10.0	15.2	Aug-10
Total International Developed Market Equity	17,819,146	11.9	11.9	4.7	27.5	9.7	9.4	3.7	6.8	Jul-01
MSCI EAFE				4.2	25.0	7.8	7.9	1.9	5.7	Jul-01
eV EAFE Core Equity Net Median				4.2	27.1	8.7	9.1	3.1	6.8	Jul-01
SSgA MSCI EAFE Index-NL	13,254,321	8.9	74.4	4.2	25.5	8.2	8.3	--	7.8	Aug-10
MSCI EAFE				4.2	25.0	7.8	7.9	1.9	7.5	Aug-10
eV EAFE Core Equity Gross Median				4.3	27.8	9.5	9.6	3.7	9.4	Aug-10
SSgA MSCI EAFE Small Cap Index-NL	4,564,825	3.1	25.6	6.1	33.3	14.4	13.1	--	11.8	Aug-10
MSCI EAFE Small Cap				6.1	33.0	14.2	12.9	5.8	11.4	Aug-10
eV EAFE Small Cap Core Gross Median				6.1	34.1	15.1	14.5	6.5	13.5	Aug-10

Total Retirement System

As of December 31, 2017

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
International Emerging Market Equity Assets	15,196,500	10.2	10.2	7.4	32.2	6.6	2.2	0.6	1.8	Jul-07
MSCI Emerging Markets				7.4	37.3	9.1	4.3	1.7	3.3	Jul-07
eV Emg Mkts Equity Net Median				6.7	37.1	9.1	5.4	2.7	3.8	Jul-07
DFA Emerging Markets Value (Net)	2,796,331	1.9	18.4	7.9	33.8	9.2	3.7	1.4	2.5	Jul-07
MSCI Emerging Markets Value NR USD				6.8	28.1	6.2	1.7	1.0	2.7	Jul-07
eV Emg Mkts Equity Net Median				6.7	37.1	9.1	5.4	2.7	3.8	Jul-07
LMCG Emerging Markets (Net)	6,284,221	4.2	41.4	6.8	35.1	--	--	--	11.5	Aug-15
MSCI Emerging Markets				7.4	37.3	9.1	4.3	1.7	13.4	Aug-15
eV Emg Mkts Equity Net Median				6.7	37.1	9.1	5.4	2.7	13.1	Aug-15
KB Investors Emerging Markets Equity (Net)	6,115,948	4.1	40.2	7.3	27.2	--	--	--	16.0	Oct-15
MSCI Emerging Markets				7.4	37.3	9.1	4.3	1.7	21.0	Oct-15
eV Emg Mkts Equity Net Median				6.7	37.1	9.1	5.4	2.7	20.3	Oct-15
Investment Grade Bond Assets	20,615,797	13.8	13.8	0.5	3.5	2.3	2.0	4.3	4.7	Jul-01
BBgBarc US Aggregate TR				0.4	3.5	2.2	2.1	4.0	4.7	Jul-01
eV US Core Fixed Inc Gross Median				0.5	4.0	2.7	2.5	4.6	5.1	Jul-01
Longfellow Investment Grade Bond	20,615,797	13.8	100.0	0.5	--	--	--	--	0.5	Oct-17
BBgBarc US Aggregate TR				0.4	3.5	2.2	2.1	4.0	0.4	Oct-17
eV US Core Fixed Inc Gross Median				0.5	4.0	2.7	2.5	4.6	0.5	Oct-17
High Yield Bond Assets	8,996,498	6.0	6.0	0.1	6.8	5.9	5.5	7.0	6.6	Feb-05
CSFB High Yield Index				0.5	7.0	6.4	5.7	7.6	7.2	Feb-05
eV US High Yield Fixed Inc Gross Median				0.6	7.5	6.1	5.7	7.7	7.4	Feb-05
Columbia Institutional High Yield	8,996,498	6.0	100.0	0.1	6.8	5.9	5.5	--	6.4	Mar-12
BBgBarc US High Yield TR				0.5	7.5	6.4	5.8	8.0	6.6	Mar-12
eV US High Yield Fixed Inc Gross Median				0.6	7.5	6.1	5.7	7.7	6.6	Mar-12

Total Retirement System

As of December 31, 2017										
	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
TIPS Assets	8,114,775	5.4	5.4	1.3	3.0	2.0	0.1	3.5	4.2	Jul-07
BBgBarc US TIPS TR				1.3	3.0	2.0	0.1	3.5	4.3	Jul-07
eV US TIPS / Inflation Fixed Inc Net Median				1.3	3.1	1.9	0.1	3.6	4.3	Jul-07
SSgA TIPS-NL	8,114,775	5.4	100.0	1.3	3.0	2.0	0.1	3.5	4.2	Jul-07
BBgBarc US TIPS TR				1.3	3.0	2.0	0.1	3.5	4.3	Jul-07
eV US TIPS / Inflation Fixed Inc Gross Median				1.3	3.2	2.2	0.3	3.7	4.4	Jul-07
Emerging Market Debt Assets	7,167,386	4.8	4.8	1.0	13.3	1.9	--	--	-3.5	Mar-13
JP Morgan GBI EM Global Diversified TR USD				0.8	15.2	2.5	-1.5	3.5	-1.7	Mar-13
eV Emg Mkt Fixed Inc Unhedged Gross Median				1.0	12.4	6.4	3.6	7.1	3.8	Mar-13
Logan Circle Emerging Markets Debt (Net)	3,461,048	2.3	48.3	0.9	13.4	--	--	--	10.1	Nov-16
Logan Circle Custom Benchmark				0.7	10.6	5.5	2.6	5.7	6.3	Nov-16
eV Emg Mkt Fixed Inc Unhedged Gross Median				1.0	12.4	6.4	3.6	7.1	8.0	Nov-16
Aberdeen Emerging Markets Bond Fund	3,706,338	2.5	51.7	1.1	13.3	--	--	--	12.2	Dec-16
50% JPM EMBI GD / 50% JPM GBI-EM				1.0	12.7	4.9	1.5	5.5	13.4	Dec-16
eV Emg Mkt Fixed Inc Unhedged Gross Median				1.0	12.4	6.4	3.6	7.1	13.3	Dec-16
Real Estate Assets	15,026,307	10.1	10.1	0.7	7.6	10.1	10.6	2.6	5.8	Apr-05
NCREIF ODCE (net)				1.9	6.7	9.4	10.5	4.1	6.7	Apr-05
AG Realty Fund IV	4,157	0.0	0.0							
TA Associates Realty Fund IX	121,544	0.1	0.8							
TA Associates Realty Fund X	2,034,832	1.4	13.5							
Intercontinental U.S. REIF (Net)	5,520,397	3.7	36.7	1.0	4.8	9.3	--	--	9.6	Oct-14
NCREIF ODCE (net)				1.9	6.7	9.4	10.5	4.1	9.7	Oct-14

AG Realty Fund IV, TA Associates Realty Fund IX, and TA Associates Realty Fund X are based on September 30, 2017 fair market value, adjusted for subsequent cash flows.

Private Equity Assets: Based on September 30, 2017 fair market value, adjusted for subsequent cash flows.

Total Retirement System

As of December 31, 2017

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
AEW Core Property Trust (Net)	7,345,377	4.9	48.9	1.7	6.5	8.9	--	--	9.2	Oct-14
NCREIF ODCE (net)				1.9	6.7	9.4	10.5	4.1	9.7	Oct-14
Private Equity Assets	13,008,124	8.7	8.7	1.5	10.3	5.7	8.0	5.6	5.1	Oct-03
Ascent Venture Partners - Fund II	6,090	0.0	0.0							
Ascent Venture Partners - Fund III	84,308	0.1	0.6							
Ascent Venture Partners - Fund IV	161,046	0.1	1.2							
Ascent Venture Partners - Fund V	944,848	0.6	7.3							
Ascent Venture Partners - Fund VI	759,433	0.5	5.8							
Constitution Capital Partners Ironsides III	1,835,539	1.2	14.1							
Constitution Capital Partners Ironsides IV	513,112	0.3	3.9							
Constitution Capital Direct IV	2,214,660	1.5	17.0							
Goldman Sachs PEP 2005	871,998	0.6	6.7							
HarbourVest Partners VIII	1,206,159	0.8	9.3							
HarbourVest Partners IX	3,205,281	2.1	24.6							
HarbourVest X Buyout Fund	1,205,650	0.8	9.3							
Cash	4,543,960	3.0	3.0							
Cash STIF	4,543,960	3.0	100.0							

Total Retirement System

As of December 31, 2017

Calendar Year Performance

	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)	2011 (%)	2010 (%)	2009 (%)	2008 (%)
Total Retirement System	14.2	9.6	-2.7	4.3	10.9	12.2	2.2	12.5	17.7	-24.7
Domestic Equity Assets	21.0	13.1	0.4	12.4	33.5	16.3	1.0	17.5	30.8	-38.3
<i>Russell 3000</i>	21.1	12.7	0.5	12.6	33.6	16.4	1.0	16.9	28.3	-37.3
SSgA Russell 1000 Value Index-NL	13.8	17.3	-3.7	13.4	32.5	17.4	0.4	15.6	20.0	-36.8
<i>Russell 1000 Value</i>	13.7	17.3	-3.8	13.5	32.5	17.5	0.4	15.5	19.7	-36.8
SSgA Russell 1000 Growth-NL	30.2	7.2	5.6	13.1	33.5	15.4	2.6	16.7	37.2	-38.4
<i>Russell 1000 Growth</i>	30.2	7.1	5.7	13.0	33.5	15.3	2.6	16.7	37.2	-38.4
SSgA Russell 2000 Index-NL	14.7	21.5	-4.4	5.0	38.9	16.4	-4.1	--	--	--
<i>Russell 2000</i>	14.6	21.3	-4.4	4.9	38.8	16.3	-4.2	26.9	27.2	-33.8
Total International Developed Market Equity	27.5	1.6	2.0	-4.7	24.4	18.1	-12.6	11.4	36.3	-41.5
<i>MSCI EAFE</i>	25.0	1.0	-0.8	-4.9	22.8	17.3	-12.1	7.8	31.8	-43.4
SSgA MSCI EAFE Index-NL	25.5	1.4	-0.5	-4.6	23.1	17.7	-11.9	--	--	--
<i>MSCI EAFE</i>	25.0	1.0	-0.8	-4.9	22.8	17.3	-12.1	7.8	31.8	-43.4
SSgA MSCI EAFE Small Cap Index-NL	33.3	2.4	9.7	-4.7	29.5	20.1	-15.0	--	--	--
<i>MSCI EAFE Small Cap</i>	33.0	2.2	9.6	-4.9	29.3	20.0	-15.9	22.0	46.8	-47.0
International Emerging Market Equity Assets	32.2	11.7	-18.1	-4.4	-3.8	18.8	-25.6	22.1	92.3	-53.9
<i>MSCI Emerging Markets</i>	37.3	11.2	-14.9	-2.2	-2.6	18.2	-18.4	18.9	78.5	-53.3
DFA Emerging Markets Value (Net)	33.8	19.8	-18.8	-4.4	-3.8	18.8	-25.6	22.1	92.3	-53.9
<i>MSCI Emerging Markets Value NR USD</i>	28.1	14.9	-18.6	-4.1	-5.1	15.9	-17.9	19.8	79.1	-50.3
LMCG Emerging Markets (Net)	35.1	7.0	--	--	--	--	--	--	--	--
<i>MSCI Emerging Markets</i>	37.3	11.2	-14.9	-2.2	-2.6	18.2	-18.4	18.9	78.5	-53.3

Total Retirement System

As of December 31, 2017

	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)	2011 (%)	2010 (%)	2009 (%)	2008 (%)
KB Investors Emerging Markets Equity (Net)	27.2	12.0	--	--	--	--	--	--	--	--
<i>MSCI Emerging Markets</i>	37.3	11.2	-14.9	-2.2	-2.6	18.2	-18.4	18.9	78.5	-53.3
Investment Grade Bond Assets	3.5	2.7	0.8	6.1	-3.1	4.6	8.5	6.7	9.7	3.8
<i>BBgBarc US Aggregate TR</i>	3.5	2.6	0.5	6.0	-2.0	4.2	7.8	6.5	5.9	5.2
Longfellow Investment Grade Bond	--	--	--	--	--	--	--	--	--	--
<i>BBgBarc US Aggregate TR</i>	3.5	2.6	0.5	6.0	-2.0	4.2	7.8	6.5	5.9	5.2
High Yield Bond Assets	6.8	11.5	-0.2	4.1	6.0	13.6	6.2	12.9	43.2	-23.3
<i>CSFB High Yield Index</i>	7.0	18.3	-4.9	1.9	7.5	14.7	5.5	14.4	54.2	-26.2
Columbia Institutional High Yield	6.8	11.5	-0.2	4.1	6.0	--	--	--	--	--
<i>BBgBarc US High Yield TR</i>	7.5	17.1	-4.5	2.5	7.4	15.8	5.0	15.1	58.2	-26.2
TIPS Assets	3.0	4.5	-1.4	3.6	-8.6	6.9	13.5	6.3	11.3	-2.4
<i>BBgBarc US TIPS TR</i>	3.0	4.7	-1.4	3.6	-8.6	7.0	13.6	6.3	11.4	-2.4
SSgA TIPS-NL	3.0	4.5	-1.4	3.6	-8.6	6.9	13.5	6.3	11.3	-2.4
<i>BBgBarc US TIPS TR</i>	3.0	4.7	-1.4	3.6	-8.6	7.0	13.6	6.3	11.4	-2.4
Emerging Market Debt Assets	13.3	10.0	-15.2	-8.5	--	--	--	--	--	--
<i>JP Morgan GBI EM Global Diversified TR USD</i>	15.2	9.9	-14.9	-5.7	-9.0	16.8	-1.8	15.1	22.0	-5.2
Logan Circle Emerging Markets Debt (Net)	13.4	--	--	--	--	--	--	--	--	--
<i>Logan Circle Custom Benchmark</i>	10.6	10.4	-3.9	1.4	-4.4	17.9	2.0	12.6	27.9	-11.7
Aberdeen Emerging Markets Bond Fund	13.3	--	--	--	--	--	--	--	--	--
<i>50% JPM EMBI GD / 50% JPM GBI-EM</i>	12.7	10.2	-7.1	0.7	-7.1	17.2	2.8	13.8	26.0	-8.6

Total Retirement System

As of December 31, 2017

	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)	2011 (%)	2010 (%)	2009 (%)	2008 (%)
Real Estate Assets	7.6	9.0	13.8	12.8	10.1	12.5	16.7	12.7	-38.9	-14.2
<i>NCREIF ODCE (net)</i>	6.7	7.8	14.0	11.5	12.9	9.8	15.0	15.3	-30.4	-10.7
AG Realty Fund IV										
TA Associates Realty Fund IX										
TA Associates Realty Fund X										
Intercontinental U.S. REIF (Net)	4.8	10.9	12.5	--	--	--	--	--	--	--
<i>NCREIF ODCE (net)</i>	6.7	7.8	14.0	11.5	12.9	9.8	15.0	15.3	-30.4	-10.7
AEW Core Property Trust (Net)	6.5	7.6	12.8	--	--	--	--	--	--	--
<i>NCREIF ODCE (net)</i>	6.7	7.8	14.0	11.5	12.9	9.8	15.0	15.3	-30.4	-10.7
Private Equity Assets	10.3	6.3	0.8	13.5	9.5	9.2	7.9	19.9	-14.2	-2.8
Ascent Venture Partners - Fund II										
Ascent Venture Partners - Fund III										
Ascent Venture Partners - Fund IV										
Ascent Venture Partners - Fund V										
Ascent Venture Partners - Fund VI										
Constitution Capital Partners Ironsides III										
Constitution Capital Partners Ironsides IV										
Constitution Capital Direct IV										
Goldman Sachs PEP 2005										

Total Retirement System

As of December 31, 2017

	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)	2011 (%)	2010 (%)	2009 (%)	2008 (%)
HarbourVest Partners VIII										
HarbourVest Partners IX										
HarbourVest X Buyout Fund										
Cash										
Cash STIF										

Statistics Summary
5 Years Ending December 31, 2017

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Total Retirement System	7.1%	6.0%	0.1	0.9	1.1	1.9%
60% MSCI ACWI / 40% Barclays Global Aggregate	6.8%	6.8%	--	1.0	1.0	0.0%
Total Equity	11.1%	10.0%	-1.2	0.9	1.1	3.9%
Russell 3000	15.6%	9.7%	--	1.0	1.6	0.0%
Domestic Equity Assets	15.5%	9.8%	-0.4	1.0	1.6	0.1%
Russell 3000	15.6%	9.7%	--	1.0	1.6	0.0%
SSgA Russell 1000 Value Index-NL	14.0%	9.9%	-0.9	1.0	1.4	0.1%
Russell 1000 Value	14.0%	9.9%	--	1.0	1.4	0.0%
SSgA Russell 1000 Growth-NL	17.2%	10.0%	-2.7	1.0	1.7	0.0%
Russell 1000 Growth	17.3%	10.0%	--	1.0	1.7	0.0%
SSgA Russell 2000 Index-NL	14.1%	13.9%	-0.4	1.0	1.0	0.1%
Russell 2000	14.1%	13.9%	--	1.0	1.0	0.0%
Total International Equity	5.5%	12.2%	-0.8	1.0	0.4	2.7%
MSCI ACWI ex USA IMI Gross	7.7%	11.4%	--	1.0	0.6	0.0%
Total International Developed Market Equity	9.3%	11.5%	1.3	1.0	0.8	1.1%
MSCI EAFE	7.9%	11.7%	--	1.0	0.7	0.0%
SSgA MSCI EAFE Index-NL	8.1%	11.7%	1.9	1.0	0.7	0.1%
MSCI EAFE	7.9%	11.7%	--	1.0	0.7	0.0%
SSgA MSCI EAFE Small Cap Index-NL	12.8%	11.5%	-0.2	1.0	1.1	0.2%
MSCI EAFE Small Cap	12.9%	11.6%	--	1.0	1.1	0.0%

Total Retirement System

As of December 31, 2017

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
International Emerging Market Equity Assets	2.1%	15.1%	-0.8	1.0	0.1	2.7%
MSCI Emerging Markets	4.3%	14.4%	--	1.0	0.3	0.0%
DFA Emerging Markets Value	3.7%	16.0%	0.8	1.0	0.2	2.3%
MSCI Emerging Markets Value NR USD	1.7%	15.4%	--	1.0	0.1	0.0%
LMCG Emerging Markets	--	--	--	--	--	--
MSCI Emerging Markets	4.3%	14.4%	--	1.0	0.3	0.0%
KB Investors Emerging Markets Equity	--	--	--	--	--	--
MSCI Emerging Markets	4.3%	14.4%	--	1.0	0.3	0.0%
Total Fixed Income	1.7%	4.0%	-0.4	1.3	0.4	1.9%
BBgBarc US Universal TR	2.5%	2.8%	--	1.0	0.8	0.0%
Investment Grade Bond Assets	1.9%	3.0%	-0.5	1.0	0.6	0.3%
BBgBarc US Aggregate TR	2.1%	2.8%	--	1.0	0.6	0.0%
Longfellow Investment Grade Bond	--	--	--	--	--	--
BBgBarc US Aggregate TR	2.1%	2.8%	--	1.0	0.6	0.0%
High Yield Bond Assets	5.5%	4.6%	-0.1	0.8	1.1	2.1%
CSFB High Yield Index	5.7%	5.3%	--	1.0	1.0	0.0%
Columbia Institutional High Yield	5.5%	4.6%	-0.2	0.8	1.1	1.9%
BBgBarc US High Yield TR	5.8%	5.2%	--	1.0	1.1	0.0%
TIPS Assets	0.1%	4.4%	-0.6	1.0	0.0	0.0%
BBgBarc US TIPS TR	0.1%	4.5%	--	1.0	0.0	0.0%
SSgA TIPS-NL	0.1%	4.4%	-0.9	1.0	0.0	0.1%
BBgBarc US TIPS TR	0.1%	4.5%	--	1.0	0.0	0.0%
Emerging Market Debt Assets	--	--	--	--	--	--
JP Morgan GBI EM Global Diversified TR USD	-1.5%	11.0%	--	1.0	-0.2	0.0%

Total Retirement System

As of December 31, 2017

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Logan Circle Emerging Markets Debt	--	--	--	--	--	--
Logan Circle Custom Benchmark	2.6%	6.9%	--	1.0	0.3	0.0%
Aberdeen Emerging Markets Bond Fund	--	--	--	--	--	--
50% JPM EMBI GD / 50% JPM GBI-EM	1.5%	8.3%	--	1.0	0.2	0.0%
Real Estate Assets	10.6%	4.5%	0.1	1.0	2.3	1.3%
NCREIF ODCE (net)	10.5%	4.4%	--	1.0	2.3	0.0%
AG Realty Fund IV	0.0%	0.0%	-2.4	0.0	--	4.4%
NCREIF ODCE (net)	10.5%	4.4%	--	1.0	2.3	0.0%
TA Associates Realty Fund IX	9.3%	5.5%	-0.3	1.0	1.6	3.5%
NCREIF ODCE (net)	10.5%	4.4%	--	1.0	2.3	0.0%
TA Associates Realty Fund X	--	--	--	--	--	--
NCREIF ODCE (net)	10.5%	4.4%	--	1.0	2.3	0.0%
Intercontinental U.S. REIF	--	--	--	--	--	--
NCREIF ODCE (net)	10.5%	4.4%	--	1.0	2.3	0.0%
AEW Core Property Trust	--	--	--	--	--	--
NCREIF ODCE (net)	10.5%	4.4%	--	1.0	2.3	0.0%
Private Equity Assets	8.0%	5.2%	--	--	1.5	--
Cambridge Associates US All PE (1 Qtr Lag)	--	--	--	--	--	--
Ascent Venture Partners - Fund II	39.1%	37.6%	--	--	1.0	--
Cambridge Associates US All PE (1 Qtr Lag)	--	--	--	--	--	--
Ascent Venture Partners - Fund III	-4.5%	18.5%	--	--	-0.3	--
Cambridge Associates US All PE (1 Qtr Lag)	--	--	--	--	--	--
Ascent Venture Partners - Fund IV	-25.8%	37.5%	--	--	-0.7	--

Massachusetts Housing Finance Agency Retirement System

As of December 31, 2017

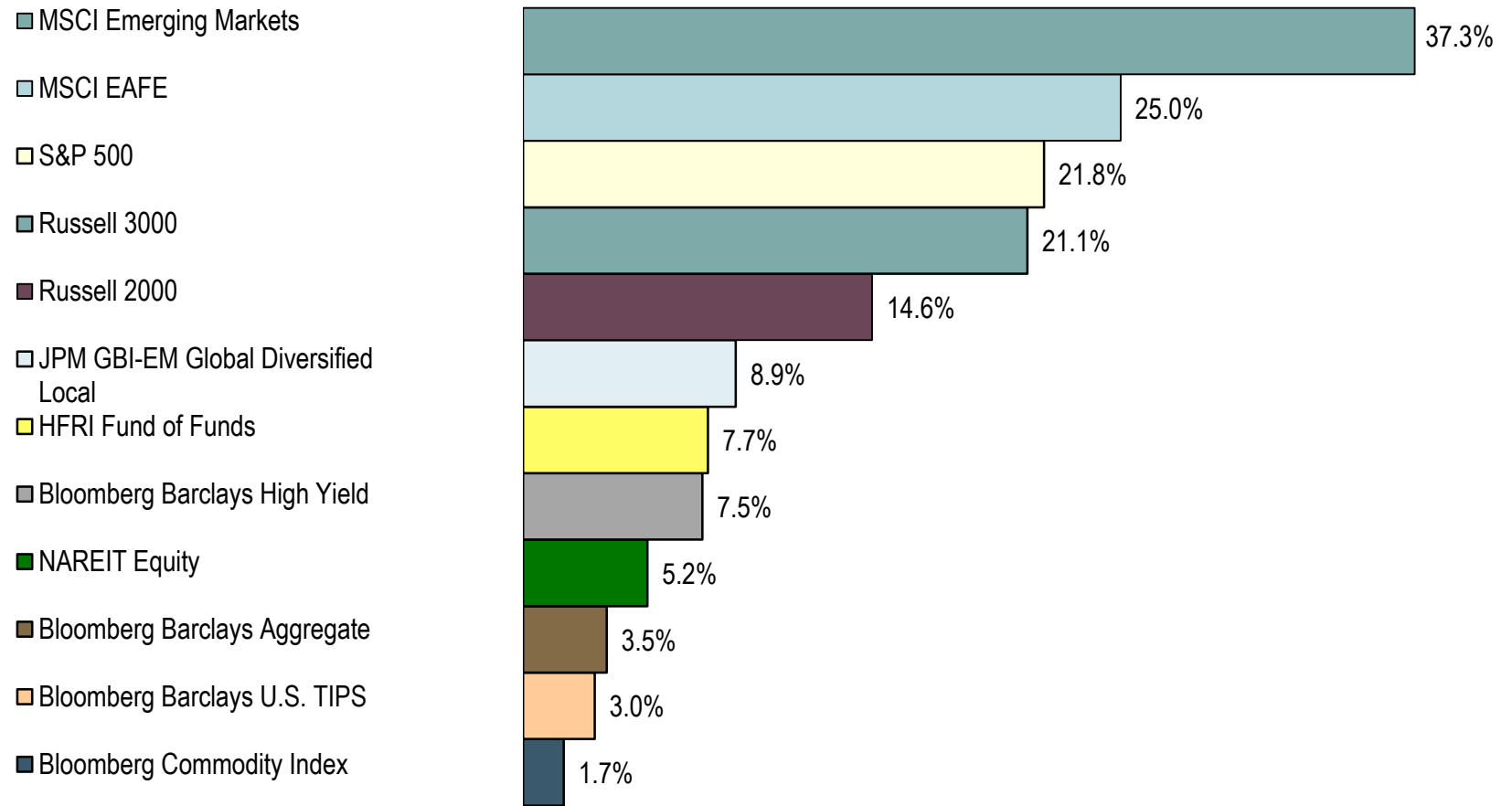
	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Cambridge Associates US All PE (1 Qtr Lag)	--	--	--	--	--	--
Ascent Venture Partners - Fund V	9.1%	7.5%	--	--	1.2	--
Cambridge Associates US All PE (1 Qtr Lag)	--	--	--	--	--	--
Ascent Venture Partners - Fund VI	--	--	--	--	--	--
Cambridge Associates US All PE (1 Qtr Lag)	--	--	--	--	--	--
Constitution Capital Partners Ironsides III	--	--	--	--	--	--
Cambridge Associates US All PE (1 Qtr Lag)	--	--	--	--	--	--
Constitution Capital Partners Ironsides IV	--	--	--	--	--	--
Cambridge Associates US All PE (1 Qtr Lag)	--	--	--	--	--	--
Constitution Capital Direct IV	--	--	--	--	--	--
Cambridge Associates US All PE (1 Qtr Lag)	--	--	--	--	--	--
Goldman Sachs PEP 2005	3.0%	8.5%	--	--	0.3	--
Cambridge Associates US All PE (1 Qtr Lag)	--	--	--	--	--	--
HarbourVest Partners VIII	16.0%	7.2%	--	--	2.2	--
Cambridge Associates US All PE (1 Qtr Lag)	--	--	--	--	--	--
HarbourVest Partners IX	--	--	--	--	--	--
Cambridge Associates US All PE (1 Qtr Lag)	--	--	--	--	--	--
HarbourVest X Buyout Fund	--	--	--	--	--	--
Cambridge Associates US All PE (1 Qtr Lag)	--	--	--	--	--	--

Current Issues

2017 Year in Review

Summary

- Overall, markets were positive for 2017 and ended on a highly positive note, particularly within U.S. and international equities. The U.S. has experienced largely stable growth and recent tax legislation could lead to more growth, but also higher inflation and tightening from the Fed.
- In the U.S., growth stocks significantly outperformed value stocks in 2017, a reversal from 2016, where value outperformed growth. Growth stocks outperformed value across all market caps, but most significantly within large cap.
- As expected, the Federal Reserve increased interest rates a fifth time in December by 0.25% to 1.50%. Additionally, the Fed recently began the process of reducing their \$4.0 trillion balance sheet.
- At their December meeting the Bank of Japan (BOJ) made no changes to their stimulative efforts, keeping bank deposit rates negative (-0.1%), and continuing to target a 0% yield on the 10-year government bond. They remain sanguine about the economic recovery and inflation rising.
- The European Central Bank held rates steady at their December meeting and reaffirmed a commitment to low rates and support. Signs of economic strength have many speculating that the ECB could announce that they will gradually reduce the level of asset purchases while keeping interest rates low. The strengthening euro is also a key consideration that could create a headwind to the bank's inflation target of close to 2%.
- The weakening dollar has lessened the burden for countries with dollar denominated debt and boosted returns in international equities for U.S. investors.
- In Europe, employment growth remains strong and inflation picked up, as lending and investment have both increased.
- China's economy is forecasted to slow as they reposition the economy and deal with lingering debt issues. India remains a bright spot, with higher growth forecasted. The IMF projects continued growth from Russia and Brazil.

World Markets in 2017¹¹ Cambridge Associates PE Composite performance shown through September 30, 2017.

2017 Retirement System Performance Review

	Average Allocation	Aggregate Performance	Est. Contribution to Return
Equity			
Domestic Equity	25%	20.9%	5.3%
Intl Developed Equity	11%	27.3%	3.0%
Emerging Markets	9%	31.5%	2.8%
Fixed Income			
Core Fixed Income	19%	3.3%	0.6%
Value-Added Fixed Income	11%	9.2%	1.0%
Real Estate	11%	7.4%	0.8%
Private Equity	8%	10.3%	0.8%
Natural Resources	4%	0.0%	0.0%
Cash	1%	0.0%	0.0%
Total Return			14.2¹%

- All asset classes produced positive returns in 2017, with domestic equities as the highest contributor to overall performance.

¹ Performance may not sum due to rounding and allocation averaging.

PRIT vs. MHFA Retirement System Performance

- The System underperformed PRIT in 2017, returning 14.0% net of fees vs. 17.2% net of fees for PRIT.
- The System's overweights to fixed income (30% total for the System vs. 20% for PRIT) significantly detracted from relative performance, as equity performance was stronger during the year.
- Overall, the System benefited from high relative exposure to U.S. and emerging market equities as well as low relative exposure to hedge funds.
 - By contrast, PRIT's overweight and performance within private equity bolstered PRIT's returns.
- The System's fixed income and private equity managers lagged in 2017.
 - Core fixed income relative performance was impacted by PRIT's position in U.S. Treasury STRIPS, up 13.8% during the year.
- Value-added fixed income relative performance was comparable to PRIT's Public Value-Added portfolio (up 8.9%, gross of fees during the year) but lagged the overall asset class due to strong performance in distressed debt investments.

System Detail
As of December 31, 2017

Domestic Equity Assets

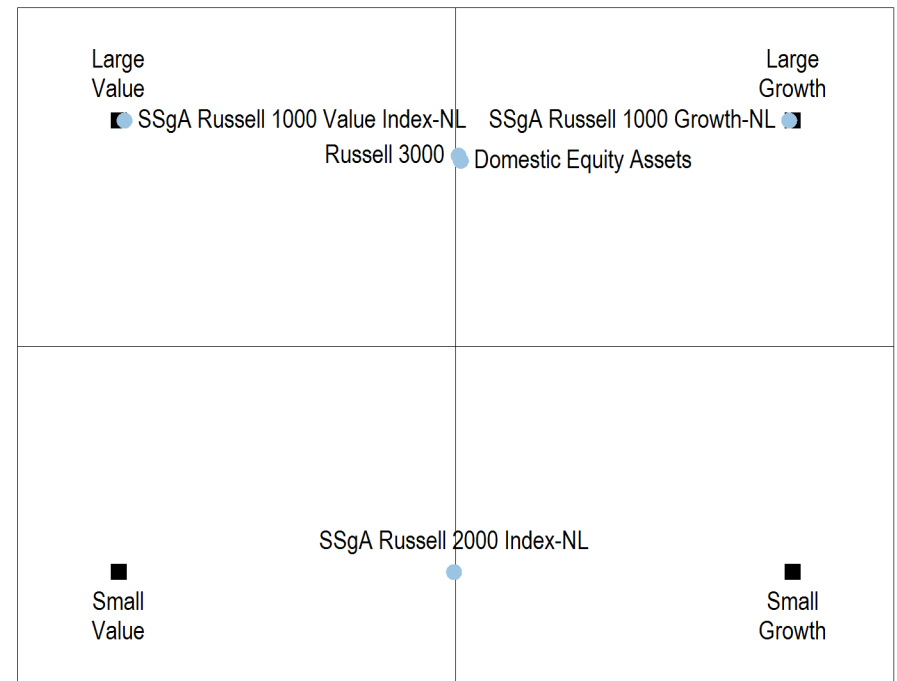
Domestic Equity Assets

As of December 31, 2017

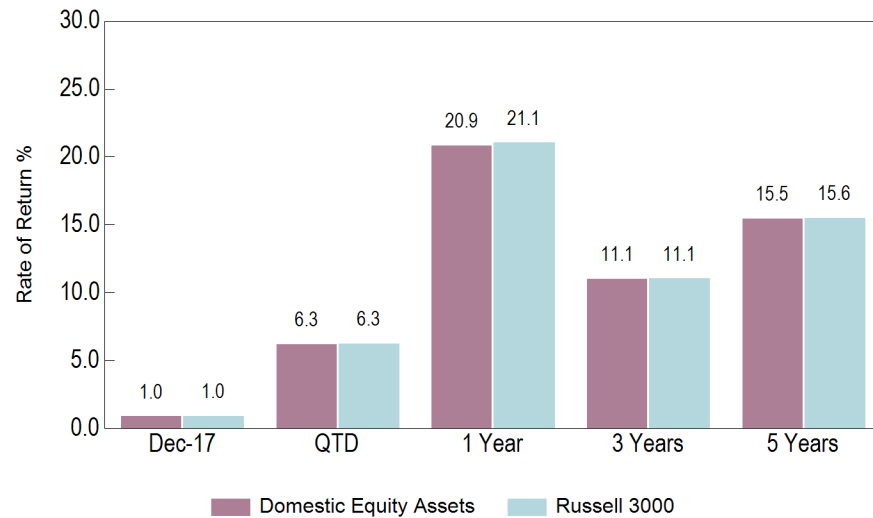
Asset Allocation on December 31, 2017

	Actual	Actual
SSgA Russell 1000 Growth-NL	\$17,835,639	46.2%
SSgA Russell 1000 Value Index-NL	\$17,352,505	44.9%
SSgA Russell 2000 Index-NL	\$3,440,694	8.9%
Total	\$38,628,838	100.0%

Domestic Equity Assets Style Map
3 Years Ending December 31, 2017



Return Summary
Ending December 31, 2017



Domestic Equity Assets

As of December 31, 2017

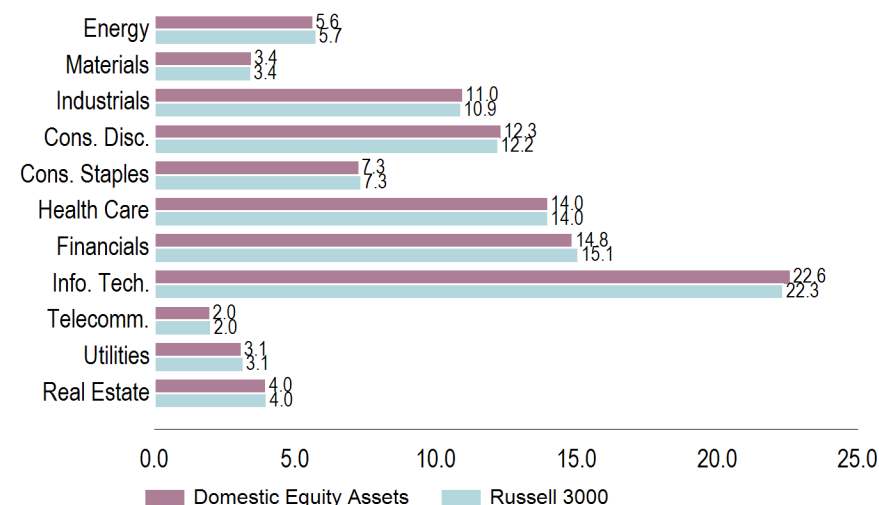
Domestic Equity Assets Characteristics

	Portfolio Q4-17	Index Q4-17	Portfolio Q3-17
Market Value			
Market Value (\$M)	38.6	--	36.8
Number Of Holdings	2945	2961	2980
Characteristics			
Weighted Avg. Market Cap. (\$B)	149.5	150.1	135.3
Median Market Cap (\$B)	2.1	1.7	2.0
P/E Ratio	26.7	25.0	25.6
Yield	1.8	1.7	1.8
EPS Growth - 5 Yrs.	13.5	10.3	12.7
Price to Book	5.8	4.6	5.2
Beta (holdings; domestic)	1.1	1.1	1.0

Top 10 Holdings

APPLE	3.1%
MICROSOFT	2.2%
FACEBOOK CLASS A	1.5%
AMAZON.COM	1.5%
JOHNSON & JOHNSON	1.3%
BERKSHIRE HATHAWAY 'B'	1.3%
EXXON MOBIL	1.3%
JP MORGAN CHASE & CO.	1.3%
ALPHABET 'C'	1.1%
ALPHABET A	1.1%
Total	15.7%

Sector Allocation (%) vs Russell 3000



	Portfolio Q3-17	Index Q3-17
Sector Performance		
Energy	6.72	6.82
Materials	5.15	5.42
Industrials	4.73	4.98
Consumer Discretionary	0.86	1.33
Consumer Staples	-1.37	-1.26
Health Care	3.23	3.71
Financials	5.02	5.20
Information Technology	8.48	8.37
Telecommunication Services	6.16	6.29
Utilities	3.03	3.09
Real Estate	1.22	1.18

Total International Equity

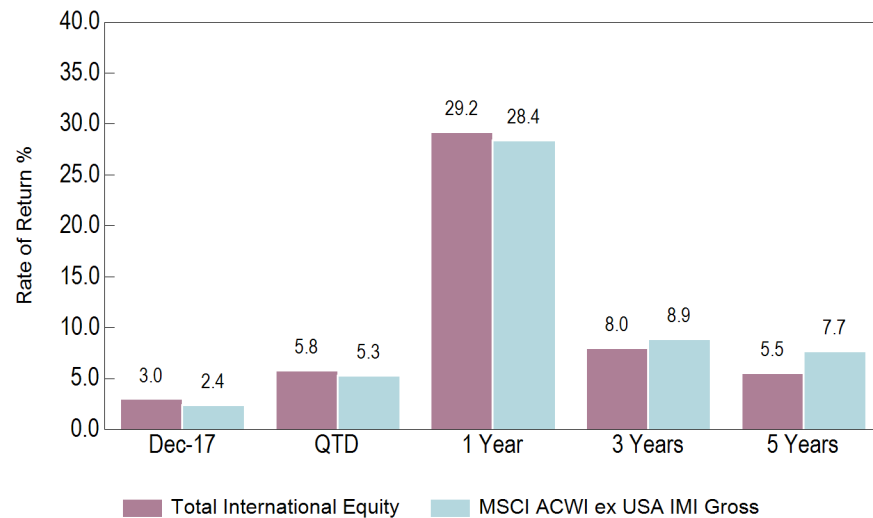
Total International Equity

As of December 31, 2017

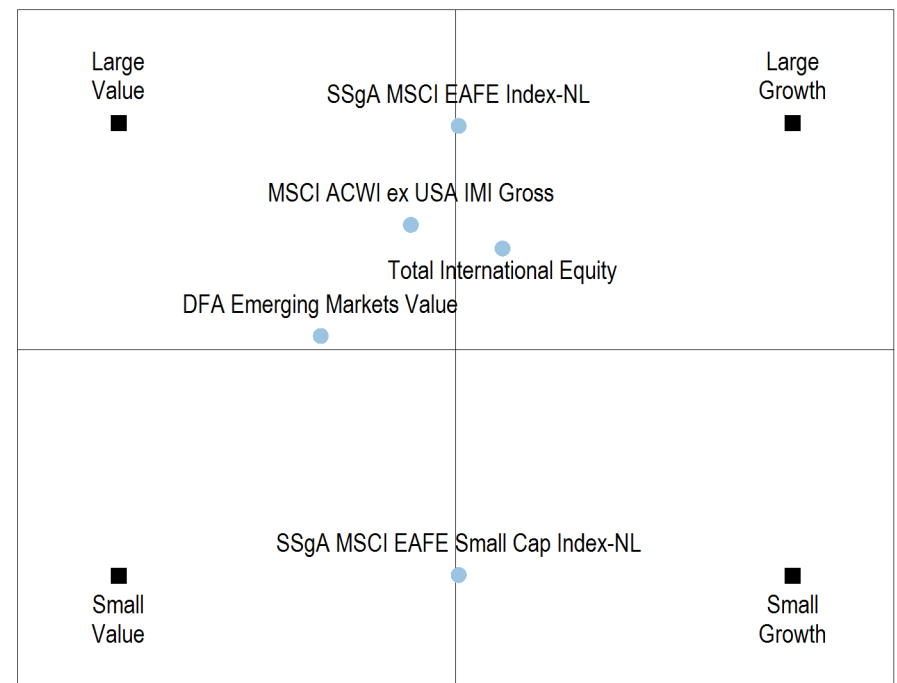
Asset Allocation on December 31, 2017

	Actual	Actual
DFA Emerging Markets Value	\$2,796,331	8.5%
KB Investors Emerging Markets Equity	\$6,115,948	18.5%
LMCG Emerging Markets	\$6,284,221	19.0%
SSgA MSCI EAFE Index-NL	\$13,254,321	40.1%
SSgA MSCI EAFE Small Cap Index-NL	\$4,564,825	13.8%
Total	\$33,015,646	100.0%

Return Summary
Ending December 31, 2017



Total International Equity Style Map
3 Years Ending December 31, 2017



Total International Equity

As of December 31, 2017

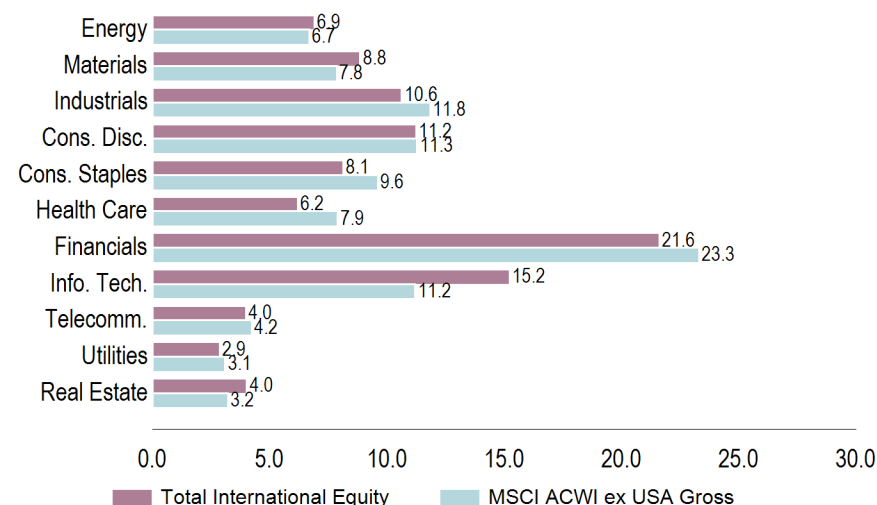
Total International Equity Characteristics

	Portfolio Q4-17	Index Q4-17	Portfolio Q3-17
Market Value			
Market Value (\$M)	33.0	--	31.2
Number Of Holdings	5690	1866	4422
Characteristics			
Weighted Avg. Market Cap. (\$B)	50.3	66.3	50.9
Median Market Cap (\$B)	1.3	8.6	1.2
P/E Ratio	19.3	20.8	19.5
Yield	2.8	2.7	3.0
EPS Growth - 5 Yrs.	8.0	6.7	7.7
Price to Book	3.2	2.8	3.0
Beta (holdings; domestic)	1.0	1.1	1.1

Top 10 Holdings

TAIWAN SEMICON.MNFG.	1.6%
CHINA CON.BANK 'H'	1.4%
SAMSUNG ELECTRONICS	1.1%
TENCENT HOLDINGS	1.0%
INDL&COML.BOC.'H'	0.9%
NESTLE 'R'	0.8%
HON HAI PRECN.IND.	0.8%
ALIBABA GROUP HLDG.SPN. ADR 1:1	0.8%
BANK OF CHINA 'H'	0.7%
HSBC HDG. (ORD \$0.50)	0.6%
Total	9.6%

Sector Allocation (%) vs MSCI ACWI ex USA Gross



	Portfolio Q3-17	Index Q3-17
Sector Performance		
Energy	14.42	12.90
Materials	12.16	10.72
Industrials	5.57	5.63
Consumer Discretionary	6.48	6.90
Consumer Staples	1.93	1.37
Health Care	0.72	0.81
Financials	6.39	6.15
Information Technology	6.89	9.99
Telecommunication Services	0.25	2.55
Utilities	5.07	4.62
Real Estate	10.24	6.11

Total International Equity

As of December 31, 2017

Total International Equity Region Allocation

vs MSCI ACWI ex USA Gross

Region	% of Total	% of Bench	% Diff
North America ex U.S.	0.0%	6.6%	-6.6%
United States	0.3%	0.0%	0.3%
Europe Ex U.K.	23.9%	31.6%	-7.7%
United Kingdom	9.3%	12.1%	-2.8%
Pacific Basin Ex Japan	10.8%	8.3%	2.5%
Japan	13.8%	16.6%	-2.7%
Emerging Markets	41.6%	24.5%	17.1%
Other	0.4%	0.5%	-0.1%
Total	100.0%	100.0%	0.0%

Total International Equity

As of December 31, 2017

Total International Equity Country Allocation

vs MSCI ACWI ex USA Gross

Country	% of Total	% of Bench	% Diff
ARGENTINA	0.0%	0.0%	0.0%
AUSTRALIA	3.7%	4.8%	-1.1%
AUSTRIA	0.2%	0.2%	0.1%
BAHRAIN	0.0%	0.0%	0.0%
BANGLADESH	0.0%	0.0%	0.0%
BELGIUM	0.7%	0.8%	0.0%
BRAZIL	3.6%	1.7%	1.9%
BULGARIA	0.0%	0.0%	0.0%
CANADA	0.0%	6.6%	-6.6%
CHILE	0.3%	0.3%	-0.1%
CHINA	7.4%	7.4%	0.0%
COLOMBIA	0.1%	0.1%	0.0%
CROATIA	0.0%	0.0%	0.0%
CZECH REPUBLIC	0.0%	0.0%	0.0%
DENMARK	1.0%	1.3%	-0.3%
EGYPT	0.0%	0.0%	0.0%
ESTONIA	0.0%	0.0%	0.0%
FINLAND	0.6%	0.6%	0.0%
FRANCE	4.7%	7.3%	-2.7%
GERMANY	4.7%	6.7%	-2.0%
GREECE	0.1%	0.1%	0.0%
HONG KONG	6.0%	2.5%	3.6%
HUNGARY	0.5%	0.1%	0.4%
INDIA	5.1%	2.2%	3.0%

Total International Equity

As of December 31, 2017

Country	% of Total	% of Bench	% Diff
INDONESIA	0.9%	0.6%	0.4%
IRELAND	0.3%	0.3%	-0.1%
ISRAEL	0.3%	0.3%	0.0%
ITALY	1.4%	1.6%	-0.2%
JAPAN	13.8%	16.6%	-2.7%
JORDAN	0.0%	0.0%	0.0%
KAZAKHSTAN	0.0%	0.0%	0.0%
KENYA	0.0%	0.0%	0.0%
KOREA	6.9%	3.8%	3.1%
KUWAIT	0.0%	0.0%	0.0%
LEBANON	0.0%	0.0%	0.0%
LITHUANIA	0.0%	0.0%	0.0%
LUXEMBOURG	0.1%	0.0%	0.1%
MALAYSIA	0.8%	0.6%	0.3%
MAURITIUS	0.0%	0.0%	0.0%
MEXICO	1.1%	0.7%	0.4%
MOROCCO	0.0%	0.0%	0.0%
NETHERLANDS	2.1%	2.5%	-0.3%
NEW ZEALAND	0.2%	0.1%	0.1%
NIGERIA	0.0%	0.0%	0.0%
NORWAY	0.5%	0.5%	0.0%
OMAN	0.0%	0.0%	0.0%
OTHER	0.1%	0.0%	0.1%
PAKISTAN	0.0%	0.0%	0.0%
PERU	0.0%	0.1%	-0.1%
PHILIPPINES	0.1%	0.3%	-0.2%
POLAND	0.3%	0.3%	0.0%

Total International Equity

As of December 31, 2017

Country	% of Total	% of Bench	% Diff
PORTUGAL	0.1%	0.1%	0.0%
QATAR	0.0%	0.1%	-0.1%
ROMANIA	0.0%	0.0%	0.0%
RUSSIA	1.1%	0.8%	0.3%
SERBIA	0.0%	0.0%	0.0%
SINGAPORE	0.8%	0.9%	-0.1%
SLOVENIA	0.0%	0.0%	0.0%
SOUTH AFRICA	3.2%	1.8%	1.4%
SPAIN	1.6%	2.2%	-0.6%
SRI LANKA	0.0%	0.0%	0.0%
SWEDEN	1.8%	1.8%	-0.1%
SWITZERLAND	3.9%	5.5%	-1.7%
TAIWAN	6.8%	2.8%	4.0%
THAILAND	1.8%	0.6%	1.2%
TUNISIA	0.0%	0.0%	0.0%
TURKEY	1.2%	0.3%	0.9%
UKRAINE	0.0%	0.0%	0.0%
UNITED ARAB EMIRATES	0.5%	0.2%	0.3%
UNITED KINGDOM	9.3%	12.1%	-2.8%
UNITED STATES	0.3%	0.0%	0.3%
VIETNAM	0.0%	0.0%	0.0%
Total	100.0%	100.0%	0.0%

Total Fixed Income

Total Fixed Income

As of December 31, 2017

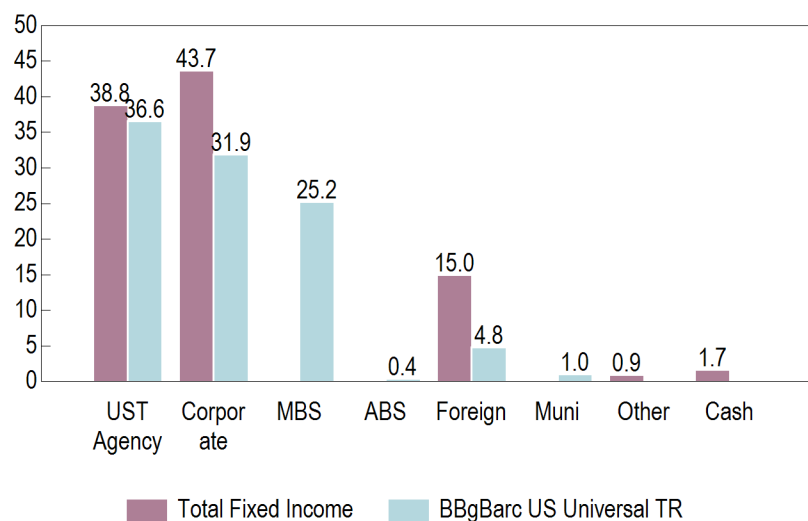
Asset Allocation on December 31, 2017

	Actual	Actual
Aberdeen Emerging Markets Bond Fund	\$3,706,338	8.3%
Columbia Institutional High Yield	\$8,996,498	20.0%
Logan Circle Emerging Markets Debt	\$3,461,048	7.7%
Longfellow Investment Grade Bond	\$20,615,797	45.9%
SSgA TIPS-NL	\$8,114,775	18.1%
Total	\$44,894,456	100.0%

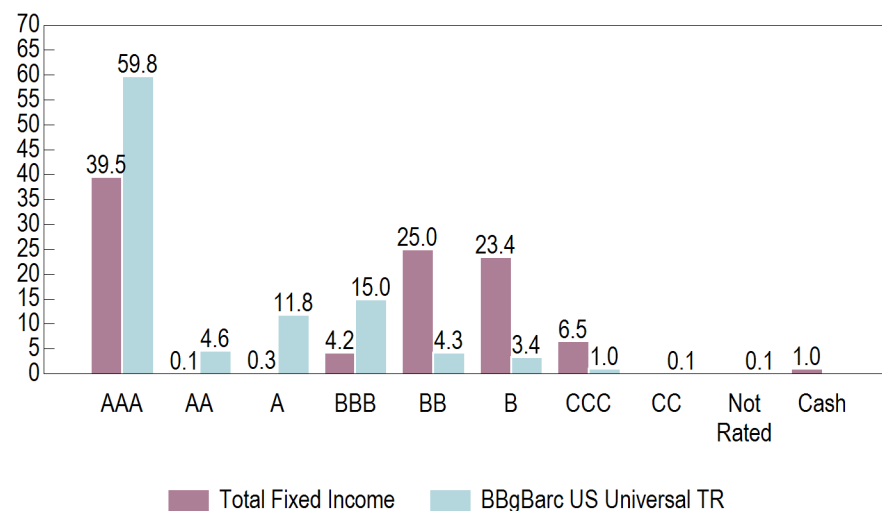
Total Fixed Income Fixed Income Characteristics
vs. BBgBarc US Universal TR

	Portfolio Q3-17	Index Q3-17	Portfolio Q2-17
Fixed Income Characteristics			
Yield to Maturity	3.99	2.87	3.32
Average Duration	5.06	5.75	5.36
Average Quality	A	AA	A
Weighted Average Maturity	7.94	11.99	7.95

Sector Allocation



Credit Quality Allocation



Portfolio Reviews
As of December 31, 2017

SSgA Russell 1000 Value Index-NL

As of December 31, 2017

Account Information

Account Name	SSgA Russell 1000 Value Index-NL
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	1/01/05
Account Type	Equity
Benchmark	Russell 1000 Value
Universe	eV US Large Cap Value Equity Gross

Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
SSgA Russell 1000 Value Index-NL	5.4	13.8	8.7	14.1	7.7	Jan-05
Russell 1000 Value	5.3	13.7	8.7	14.0	7.6	Jan-05
eV US Large Cap Value Equity Gross Median	6.2	17.2	9.7	14.6	8.7	Jan-05
eV US Large Cap Value Equity Gross Rank	75	87	72	64	82	Jan-05

Top 10 Holdings

BERKSHIRE HATHAWAY 'B'	3.0%
JP MORGAN CHASE & CO.	2.9%
EXXON MOBIL	2.8%
JOHNSON & JOHNSON	2.5%
BANK OF AMERICA	2.3%
WELLS FARGO & CO	2.1%
AT&T	1.9%
CHEVRON	1.9%
PROCTER & GAMBLE	1.8%
INTEL	1.7%
Total	23.1%

SSgA Russell 1000 Value Index-NL Characteristics

	Portfolio Q4-17	Index Q4-17	Portfolio Q3-17
Market Value			
Market Value (\$M)	17.4	--	16.5
Number Of Holdings	706	713	716
Characteristics			
Weighted Avg. Market Cap. (\$B)	120.5	119.4	113.0
Median Market Cap (\$B)	9.6	9.4	8.5
P/E Ratio	24.5	21.0	22.4
Yield	2.3	2.3	2.4
EPS Growth - 5 Yrs.	12.3	5.9	11.6
Price to Book	2.5	2.7	2.4
Beta (holdings; domestic)	1.1	1.1	1.0
Sector Distribution			
Energy	11.0	11.0	10.9
Materials	2.9	2.9	2.8
Industrials	8.4	8.4	8.6
Consumer Discretionary	6.8	6.8	6.8
Consumer Staples	8.6	8.6	8.7
Health Care	13.5	13.5	13.9
Financials	26.7	26.6	26.0
Information Technology	8.5	8.5	8.2
Telecommunication Services	3.0	3.0	3.2
Utilities	5.9	5.9	6.1
Real Estate	4.5	4.7	4.8

SSgA Russell 1000 Growth-NL

As of December 31, 2017

Account Information

Account Name	SSgA Russell 1000 Growth-NL
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	7/01/07
Account Type	Equity
Benchmark	Russell 1000 Growth
Universe	eV US Large Cap Growth Equity Gross

Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
SSgA Russell 1000 Growth-NL	7.9	30.2	13.8	17.3	9.9	Jul-07
Russell 1000 Growth	7.9	30.2	13.8	17.3	9.8	Jul-07
eV US Large Cap Growth Equity Gross Median	7.0	28.8	12.3	16.7	9.7	Jul-07
eV US Large Cap Growth Equity Gross Rank	24	42	26	34	40	Jul-07

Top 10 Holdings

APPLE	6.8%
MICROSOFT	5.0%
AMAZON.COM	3.6%
FACEBOOK CLASS A	3.2%
ALPHABET 'C'	2.5%
ALPHABET A	2.5%
HOME DEPOT	1.7%
UNITEDHEALTH GROUP	1.7%
VISA 'A'	1.6%
COMCAST 'A'	1.3%
Total	30.0%

SSgA Russell 1000 Growth-NL Characteristics

	Portfolio Q4-17	Index Q4-17	Portfolio Q3-17
Market Value			
Market Value (\$M)	17.8	--	17.0
Number Of Holdings	552	551	547
Characteristics			
Weighted Avg. Market Cap. (\$B)	205.3	204.5	181.8
Median Market Cap (\$B)	11.8	11.7	10.8
P/E Ratio	29.9	28.8	28.9
Yield	1.3	1.3	1.4
EPS Growth - 5 Yrs.	15.5	14.5	14.4
Price to Book	9.6	7.7	8.7
Beta (holdings; domestic)	1.1	1.1	1.0
Sector Distribution			
Energy	0.9	0.9	0.9
Materials	3.7	3.7	3.8
Industrials	12.8	12.8	12.5
Consumer Discretionary	18.1	18.1	17.8
Consumer Staples	6.8	6.8	6.7
Health Care	12.8	12.8	13.7
Financials	3.4	3.4	3.4
Information Technology	37.9	37.9	37.6
Telecommunication Services	1.0	1.0	1.0
Utilities	0.0	0.0	0.0
Real Estate	2.5	2.5	2.6

SSgA Russell 2000 Index-NL

As of December 31, 2017

Account Information

Account Name	SSgA Russell 2000 Index-NL
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	8/01/10
Account Type	Equity
Benchmark	Russell 2000
Universe	eV US Small Cap Core Equity Gross

Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
SSgA Russell 2000 Index-NL	3.3	14.7	10.0	14.2	13.9	Aug-10
Russell 2000	3.3	14.6	10.0	14.1	13.8	Aug-10
eV US Small Cap Core Equity Gross Median	3.8	14.9	11.1	15.5	15.2	Aug-10
eV US Small Cap Core Equity Gross Rank	60	53	70	74	82	Aug-10

Top 10 Holdings

NEKTAR THERAPEUTICS	0.4%
BLUEBIRD BIO	0.4%
SAGE THERAPEUTICS	0.3%
EXACT SCIS.	0.3%
GRUBHUB	0.3%
KNIGHT-SWIFT TRSP.HDG. 'A'	0.3%
CATALENT	0.3%
CURTISS WRIGHT	0.3%
EPAM SYSTEMS	0.3%
STERLING BANCORP	0.2%
Total	3.0%

SSgA Russell 2000 Index-NL Characteristics

	Portfolio Q4-17	Index Q4-17	Portfolio Q3-17
Market Value			
Market Value (\$M)	3.4	--	3.3
Number Of Holdings	1967	1983	1999
Characteristics			
Weighted Avg. Market Cap. (\$B)	2.3	2.4	2.2
Median Market Cap (\$B)	0.8	0.8	0.8
P/E Ratio	21.0	18.4	25.9
Yield	1.3	1.0	1.3
EPS Growth - 5 Yrs.	9.1	7.9	8.8
Price to Book	3.9	3.3	3.8
Beta (holdings; domestic)	1.3	1.3	1.3
Sector Distribution			
Energy	4.0	3.8	3.7
Materials	4.5	4.6	4.4
Industrials	15.4	15.4	15.0
Consumer Discretionary	12.5	12.6	11.9
Consumer Staples	2.8	2.8	2.7
Health Care	15.2	15.4	15.6
Financials	17.9	17.8	18.3
Information Technology	16.6	16.7	16.8
Telecommunication Services	0.8	0.8	0.8
Utilities	3.5	3.5	3.6
Real Estate	6.6	6.7	7.0

SSgA MSCI EAFE Index-NL

As of December 31, 2017

Account Information

Account Name	SSgA MSCI EAFE Index-NL
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	8/01/10
Account Type	Equity
Benchmark	MSCI EAFE
Universe	eV EAFE Core Equity Gross

Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
SSgA MSCI EAFE Index-NL	4.2	25.5	8.2	8.3	7.8	Aug-10
MSCI EAFE	4.2	25.0	7.8	7.9	7.5	Aug-10
eV EAFE Core Equity Gross Median	4.3	27.8	9.5	9.6	9.4	Aug-10
eV EAFE Core Equity Gross Rank	54	71	75	80	88	Aug-10

Top 10 Holdings

NESTLE 'R'	1.8%
HSBC HDG. (ORD \$0.50)	1.4%
NOVARTIS 'R'	1.2%
ROCHE HOLDING	1.2%
TOYOTA MOTOR	1.1%
ROYAL DUTCH SHELL A(LON)	1.0%
BP	0.9%
TOTAL	0.9%
BRITISH AMERICAN TOBACCO	0.9%
ROYAL DUTCH SHELL B	0.8%
Total	11.2%

SSgA MSCI EAFE Index-NL Characteristics

	Portfolio Q4-17	Index Q4-17	Portfolio Q3-17
Market Value			
Market Value (\$M)	13.3	--	12.7
Number Of Holdings	940	928	962
Characteristics			
Weighted Avg. Market Cap. (\$B)	60.0	59.8	58.9
Median Market Cap (\$B)	11.6	11.5	10.5
P/E Ratio	20.6	20.4	22.3
Yield	2.9	2.9	3.0
EPS Growth - 5 Yrs.	5.5	5.5	4.7
Price to Book	3.2	2.7	3.1
Beta (holdings; domestic)	1.1	1.0	1.1
Sector Distribution			
Energy	5.3	5.3	5.0
Materials	8.2	8.2	7.8
Industrials	14.6	14.7	14.4
Consumer Discretionary	12.2	12.3	12.2
Consumer Staples	11.2	11.1	11.3
Health Care	10.1	10.1	10.6
Financials	21.3	21.2	21.4
Information Technology	6.4	6.5	6.3
Telecommunication Services	3.9	3.9	4.1
Utilities	3.2	3.2	3.3
Real Estate	3.4	3.5	3.5

SSgA MSCI EAFE Small Cap Index-NL

As of December 31, 2017

Account Information

Account Name	SSgA MSCI EAFE Small Cap Index-NL
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	8/01/10
Account Type	Equity
Benchmark	MSCI EAFE Small Cap
Universe	eV EAFE Small Cap Core Gross

Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
SSgA MSCI EAFE Small Cap Index-NL	6.1	33.3	14.4	13.1	11.8	Aug-10
MSCI EAFE Small Cap	6.1	33.0	14.2	12.9	11.4	Aug-10
eV EAFE Small Cap Core Gross Median	6.1	34.1	15.1	14.5	13.5	Aug-10
eV EAFE Small Cap Core Gross Rank	48	64	63	67	88	Aug-10

Top 10 Holdings

INFORMA	0.3%
SMURFIT KAPPA GROUP	0.3%
RENTOKIL INITIAL	0.3%
TEMENOS GROUP	0.3%
SMITH (DS)	0.3%
LEG IMMOBILIEN	0.3%
KINGSPAN GROUP	0.3%
HALMA	0.2%
SCA 'B'	0.2%
ASR NEDERLAND	0.2%
Total	2.7%

SSgA MSCI EAFE Small Cap Index-NL Characteristics

	Portfolio Q4-17	Index Q4-17	Portfolio Q3-17
Market Value			
Market Value (\$M)	4.6	--	4.3
Number Of Holdings	2316	2307	1052
Characteristics			
Weighted Avg. Market Cap. (\$B)	2.8	2.8	2.8
Median Market Cap (\$B)	1.2	1.2	1.1
P/E Ratio	21.5	20.0	23.2
Yield	2.2	2.1	2.1
EPS Growth - 5 Yrs.	14.3	11.9	12.9
Price to Book	3.4	2.7	3.0
Beta (holdings; domestic)	0.9	0.9	0.9
Sector Distribution			
Energy	2.5	2.5	2.9
Materials	9.5	9.5	8.4
Industrials	21.3	21.4	23.4
Consumer Discretionary	15.9	16.0	15.4
Consumer Staples	6.9	7.0	7.2
Health Care	6.7	6.7	7.3
Financials	11.5	11.5	12.6
Information Technology	11.4	11.4	11.6
Telecommunication Services	1.4	1.4	1.0
Utilities	2.0	2.0	2.2
Real Estate	10.3	10.3	7.5

DFA Emerging Markets Value

As of December 31, 2017

Account Information

Account Name	DFA Emerging Markets Value
Account Structure	Mutual Fund
Investment Style	Active
Inception Date	7/01/07
Account Type	Equity
Benchmark	MSCI Emerging Markets Value NR USD
Universe	eV Emg Mkts Equity Net

Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
DFA Emerging Markets Value	7.9	33.8	9.2	3.7	2.5	Jul-07
MSCI Emerging Markets Value NR USD	6.8	28.1	6.2	1.7	2.7	Jul-07
eV Emg Mkts Equity Net Median	6.7	37.1	9.1	5.4	3.8	Jul-07
eV Emg Mkts Equity Net Rank	24	70	47	83	87	Jul-07

Top 10 Holdings

CHINA CON.BANK 'H'	2.5%
RELIANCE INDUSTRIES	2.5%
INDL&COML.BOC.'H'	2.0%
VALE ON	1.6%
VALE ON ADR 1:1	1.4%
STANDARD BK.GP.	1.3%
HYUNDAI MOTOR	1.2%
PTT FB	1.0%
BANK OF CHINA 'H'	1.0%
POSCO	1.0%
Total	15.5%

DFA Characteristics

	Portfolio Q4-17	Index Q4-17	Portfolio Q3-17
Market Value			
Market Value (\$M)	2.8	--	2.6
Number Of Holdings	2324	541	2294
Characteristics			
Weighted Avg. Market Cap. (\$B)	23.3	41.0	20.7
Median Market Cap (\$B)	0.4	5.7	0.4
P/E Ratio	16.4	14.1	15.3
Yield	2.7	3.1	2.9
EPS Growth - 5 Yrs.	-0.1	4.3	0.1
Price to Book	1.4	1.8	1.3
Beta (holdings; domestic)	1.1	1.1	1.2
Sector Distribution			
Energy	13.4	12.0	13.2
Materials	18.1	10.7	17.3
Industrials	9.0	5.7	9.0
Consumer Discretionary	9.0	6.7	9.4
Consumer Staples	3.2	3.5	3.4
Health Care	0.5	1.3	0.4
Financials	28.6	35.2	28.8
Information Technology	8.7	10.8	9.4
Telecommunication Services	2.9	6.8	2.3
Utilities	1.6	3.9	1.6
Real Estate	3.9	3.3	4.2

LMCG Emerging Markets

As of December 31, 2017

Account Information

Account Name	LMCG Emerging Markets
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	8/01/15
Account Type	Equity
Benchmark	MSCI Emerging Markets
Universe	eV Emg Mkts Equity Net

Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
LMCG Emerging Markets	7.0	36.0	--	--	11.8	Aug-15
MSCI Emerging Markets	7.4	37.3	9.1	4.3	13.4	Aug-15
eV Emg Mkts Equity Net Median	6.7	37.1	9.1	5.4	13.1	Aug-15
eV Emg Mkts Equity Net Rank	42	57	--	--	68	Aug-15

Top 10 Holdings

SAMSUNG ELECTRONICS	5.4%
TENCENT HOLDINGS	5.4%
TAIWAN SEMICON.MNFG.	3.5%
ALIBABA GROUP HLDG.SPN. ADR 1:1	3.5%
CHINA CON.BANK 'H'	2.1%
NASPERS	1.8%
ITAU UNIBANCO HOLDING PN	1.4%
MARUTI SUZUKI INDIA	1.4%
AMBEV ON	1.4%
SK HYNIX	1.3%
Total	27.1%

LMCG Emerging Markets Characteristics

	Portfolio Q4-17	Index Q4-17	Portfolio Q3-17
Market Value			
Market Value (\$M)	6.3	--	5.9
Number Of Holdings	113	846	117
Characteristics			
Weighted Avg. Market Cap. (\$B)	88.6	89.8	77.9
Median Market Cap (\$B)	10.0	6.0	9.8
P/E Ratio	20.1	22.1	19.3
Yield	2.4	2.1	2.6
EPS Growth - 5 Yrs.	9.8	11.7	13.3
Price to Book	4.2	3.3	4.0
Beta (holdings; domestic)	1.1	1.1	1.1
Sector Distribution			
Energy	7.8	6.8	8.6
Materials	9.9	7.3	8.3
Industrials	3.2	5.3	3.9
Consumer Discretionary	10.8	10.2	10.9
Consumer Staples	5.5	6.5	6.7
Health Care	3.0	2.7	3.7
Financials	21.1	23.5	17.2
Information Technology	28.2	27.7	27.4
Telecommunication Services	5.7	4.8	4.6
Utilities	2.2	2.4	2.3
Real Estate	2.6	2.8	4.4

KB Investors Emerging Markets Equity

As of December 31, 2017

Account Information

Account Name	KB Investors Emerging Markets Equity
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	10/01/15
Account Type	Equity
Benchmark	MSCI Emerging Markets
Universe	eV Emg Mkts Equity Net

Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
KB Investors Emerging Markets Equity	7.6	28.1	--	--	16.3	Oct-15
MSCI Emerging Markets	7.4	37.3	9.1	4.3	21.0	Oct-15
eV Emg Mkts Equity Net Median	6.7	37.1	9.1	5.4	20.3	Oct-15
eV Emg Mkts Equity Net Rank	28	90	--	--	85	Oct-15

Top 10 Holdings

TAIWAN SEMICON.MNFG.	4.6%
CHINA CON.BANK 'H'	3.7%
NETEASE ADR 1:25	3.3%
NCISOFT	2.9%
HON HAI PRECN.IND.	2.7%
INDL&COML.BOC.'H'	2.7%
TATA CONSULTANCY SVS.	2.7%
BAJAJ AUTO	2.5%
HCL TECHNOLOGIES	2.5%
THAI OIL FB	2.4%
Total	29.9%

KB Investors Emerging Markets Equity Characteristics

	Portfolio Q4-17	Index Q4-17	Portfolio Q3-17
Market Value			
Market Value (\$M)	6.1	--	5.7
Number Of Holdings	117	846	121
Characteristics			
Weighted Avg. Market Cap. (\$B)	38.7	89.8	36.2
Median Market Cap (\$B)	7.1	6.0	6.8
P/E Ratio	15.9	22.1	14.5
Yield	3.5	2.1	3.9
EPS Growth - 5 Yrs.	10.6	11.7	10.0
Price to Book	3.0	3.3	2.5
Beta (holdings; domestic)	0.9	1.1	1.0
Sector Distribution			
Energy	7.9	6.8	7.7
Materials	6.9	7.3	7.9
Industrials	6.7	5.3	5.4
Consumer Discretionary	8.2	10.2	8.8
Consumer Staples	6.1	6.5	5.0
Health Care	2.4	2.7	1.1
Financials	23.7	23.5	26.4
Information Technology	28.5	27.7	26.4
Telecommunication Services	4.6	4.8	4.9
Utilities	2.2	2.4	3.2
Real Estate	2.8	2.8	3.2

Longfellow Investment Grade Bond

As of December 31, 2017

Account Information

Account Name	Longfellow Investment Grade Bond
Account Structure	Separate Account
Investment Style	Active
Inception Date	10/01/17
Account Type	Fixed
Benchmark	BBgBarc US Aggregate TR
Universe	eV US Core Fixed Inc Gross

Portfolio Performance Summary

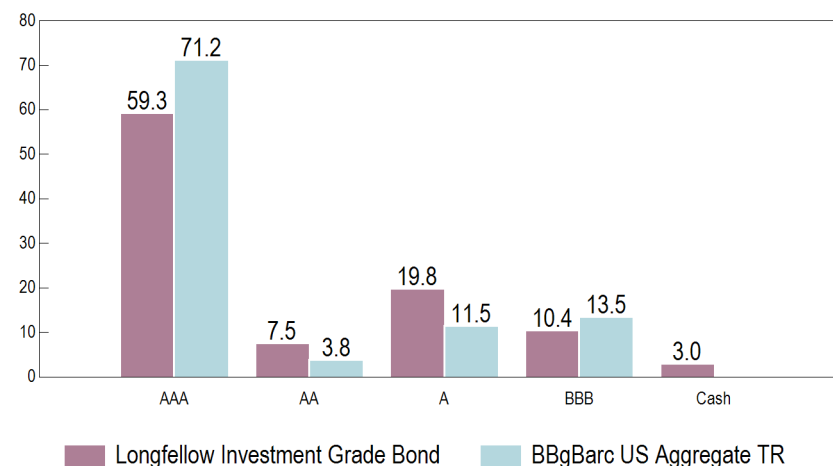
	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
Longfellow Investment Grade Bond	0.5	--	--	--	0.5	Oct-17
BBgBarc US Aggregate TR	0.4	3.5	2.2	2.1	0.4	Oct-17
eV US Core Fixed Inc Gross Median	0.5	4.0	2.7	2.5	0.5	Oct-17
eV US Core Fixed Inc Gross Rank	59	--	--	--	59	Oct-17

Longfellow Investment Grade Bond Characteristics

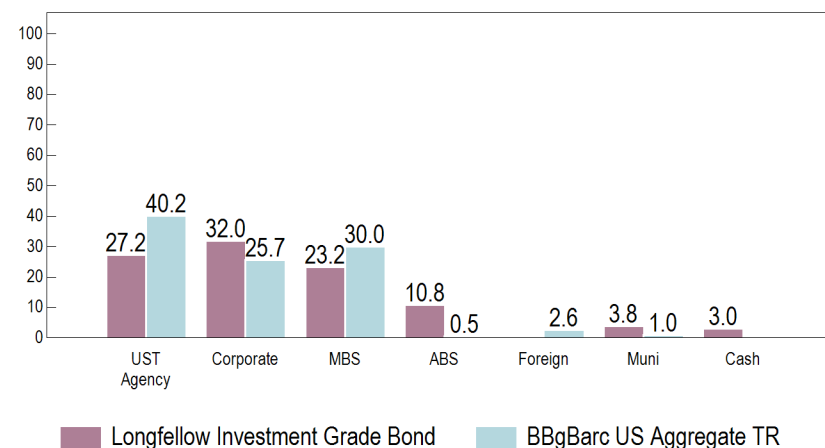
vs. BBgBarc US Aggregate TR

	Portfolio Q4-17	Index Q4-17
Fixed Income Characteristics		
Yield to Maturity	2.7	2.7
Average Duration	5.4	6.0
Average Quality	AA	AA
Weighted Average Maturity	7.1	13.1

Credit Quality Allocation



Sector Allocation



As of December 31, 2017

Account Information

Account Name	Columbia Insitutional High Yield
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	3/01/12
Account Type	Fixed
Benchmark	BBgBarc US High Yield TR
Universe	eV US High Yield Fixed Inc Gross

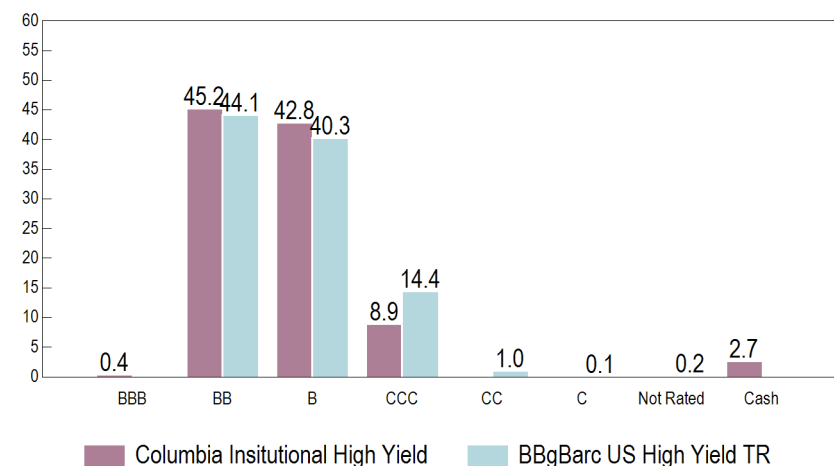
Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
Columbia Insitutional High Yield	0.1	6.8	5.9	5.5	6.4	Mar-12
BBgBarc US High Yield TR	0.5	7.5	6.4	5.8	6.6	Mar-12
eV US High Yield Fixed Inc Gross Median	0.6	7.5	6.1	5.7	6.6	Mar-12
eV US High Yield Fixed Inc Gross Rank	94	72	59	62	63	Mar-12

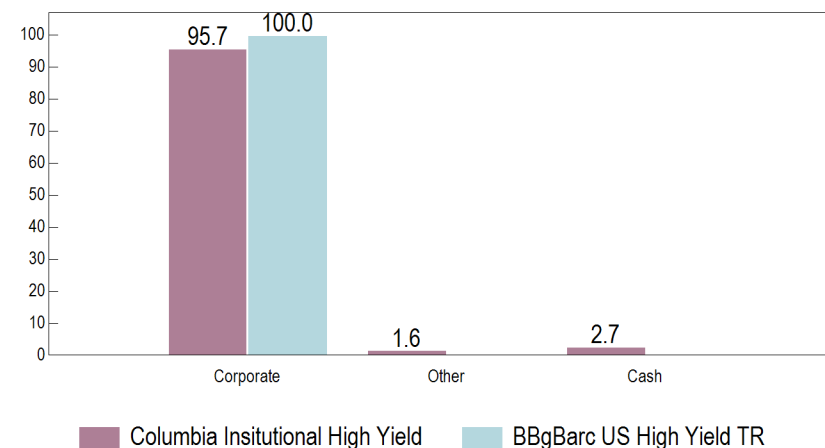
Columbia Insitutional High Yield Characteristics
vs. BBgBarc US High Yield TR

	Portfolio Q4-17	Index Q4-17	Portfolio Q3-17
Fixed Income Characteristics			
Yield to Maturity	4.9	6.2	4.6
Average Duration	4.0	3.9	3.8
Average Quality	BB	B	BB
Weighted Average Maturity	7.1	6.3	6.9

Credit Quality Allocation



Sector Allocation



As of December 31, 2017

Account Information

Account Name	SSgA TIPS-NL
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	7/01/07
Account Type	Fixed
Benchmark	BBgBarc US TIPS TR
Universe	eV US TIPS / Inflation Fixed Inc Gross

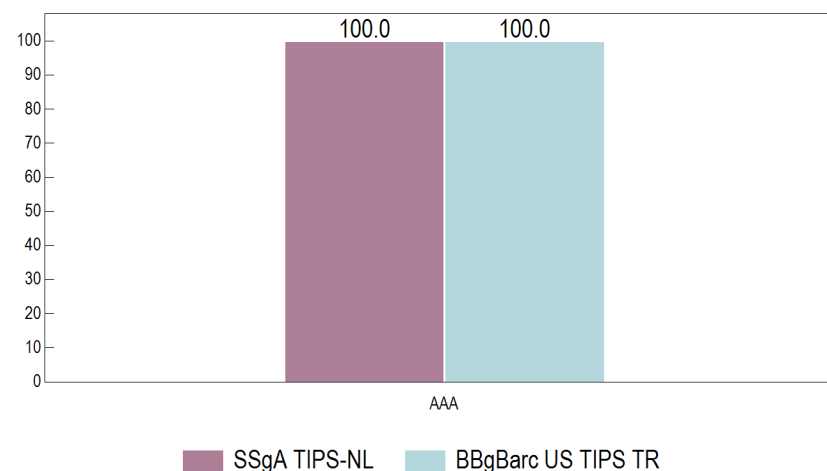
Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
SSgA TIPS-NL	1.3	3.0	2.0	0.1	4.2	Jul-07
BBgBarc US TIPS TR	1.3	3.0	2.0	0.1	4.3	Jul-07
eV US TIPS / Inflation Fixed Inc Gross Median	1.3	3.2	2.2	0.3	4.4	Jul-07
eV US TIPS / Inflation Fixed Inc Gross Rank	54	68	77	88	67	Jul-07

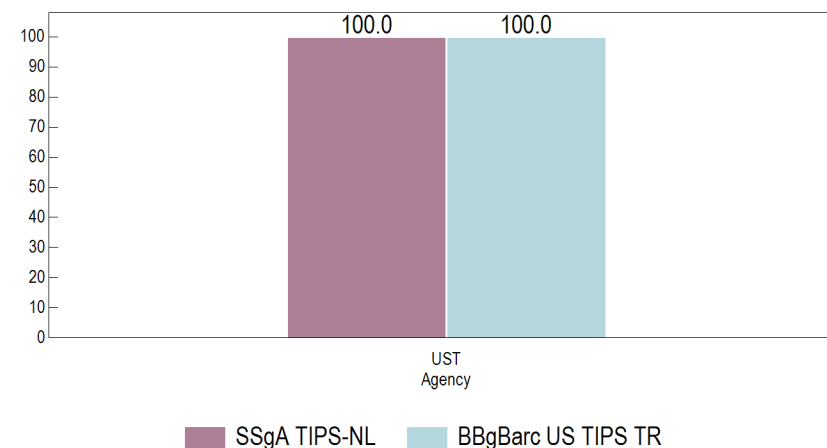
SSgA TIPS-NL Characteristics
vs. BBgBarc US TIPS TR

	Portfolio Q4-17	Index Q4-17	Portfolio Q3-17
Fixed Income Characteristics			
Yield to Maturity	2.3	0.4	2.4
Average Duration	5.8	5.8	6.0
Average Quality	AAA	AAA	AAA
Weighted Average Maturity	8.3	8.3	8.4

Credit Quality Allocation



Sector Allocation



Aberdeen Emerging Markets Bond Fund

As of September 30, 2017

Account Information

Account Name	Aberdeen Emerging Markets Bond Fund
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	12/01/16
Account Type	Fixed
Benchmark	50% JPM EMBI GD / 50% JPM GBI-EM
Universe	eV Emg Mkt Fixed Inc Unhedged Gross

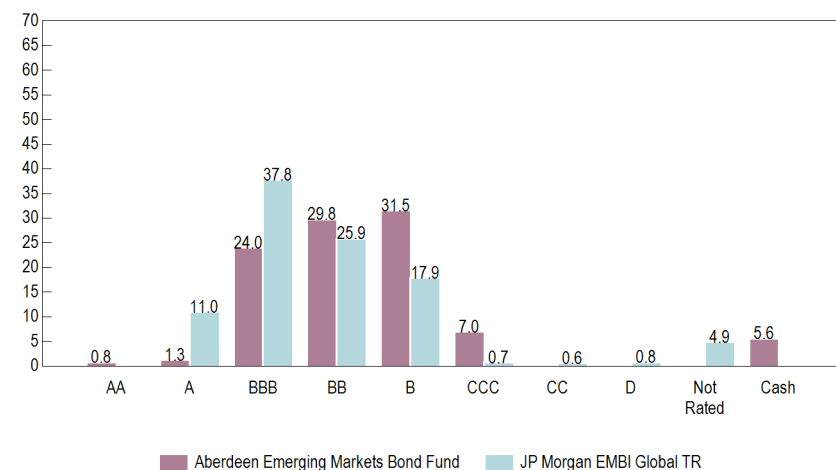
Portfolio Performance Summary

	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Aberdeen Emerging Markets Bond Fund	0.9	12.7	12.7	--	--	--	11.7	Dec-16
50% JPM EMBI GD / 50% JPM GBI-EM	1.0	12.7	12.7	4.9	1.5	5.5	13.4	Dec-16
eV Emg Mkt Fixed Inc Unhedged Gross Median	1.0	12.4	12.4	6.4	3.6	7.1	13.3	Dec-16
eV Emg Mkt Fixed Inc Unhedged Gross Rank	58	48	48	--	--	--	66	Dec-16

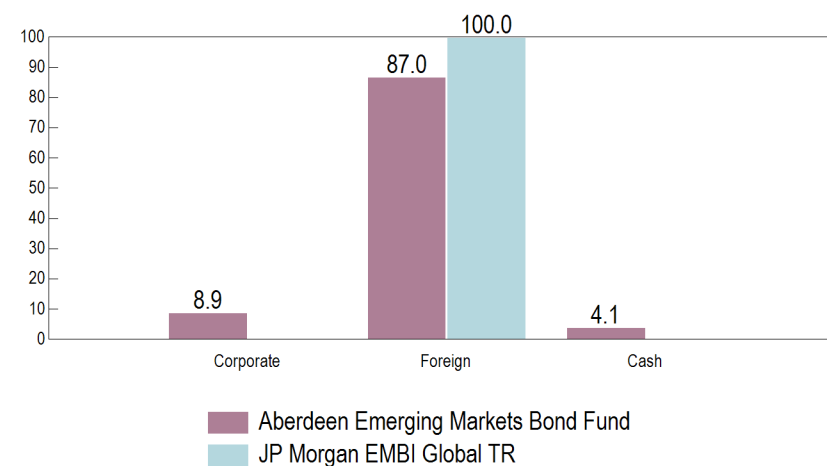
Aberdeen Emerging Markets Bond Fund Fixed Income Characteristics
vs. JP Morgan EMBI Global TR

	Portfolio Q4-17	Index Q4-17	Portfolio Q3-17
Fixed Income Characteristics			
Yield to Maturity	5.4	5.0	5.9
Average Duration	6.0	7.1	6.0
Average Quality	BB	BB	BB
Weighted Average Maturity	9.6	11.1	9.5

Credit Quality Allocation



US Sector Allocation



As of December 31, 2017

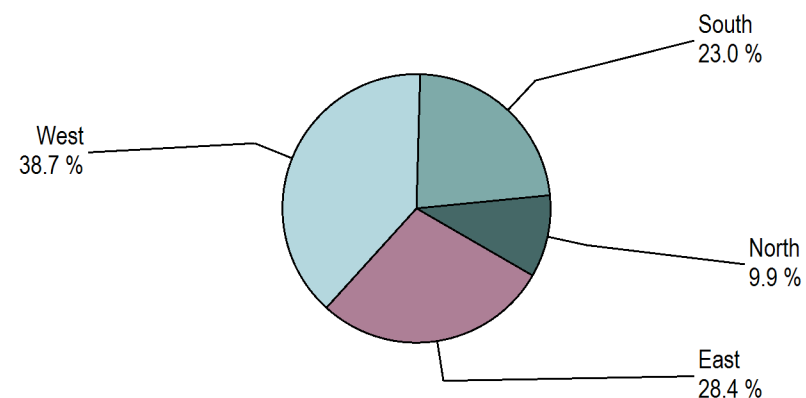
Account Information

Account Name	Intercontinental U.S. REIF
Account Structure	Other
Investment Style	Active
Inception Date	10/01/14
Account Type	Real Estate
Benchmark	NCREIF ODCE (net)
Universe	

Portfolio Performance Summary

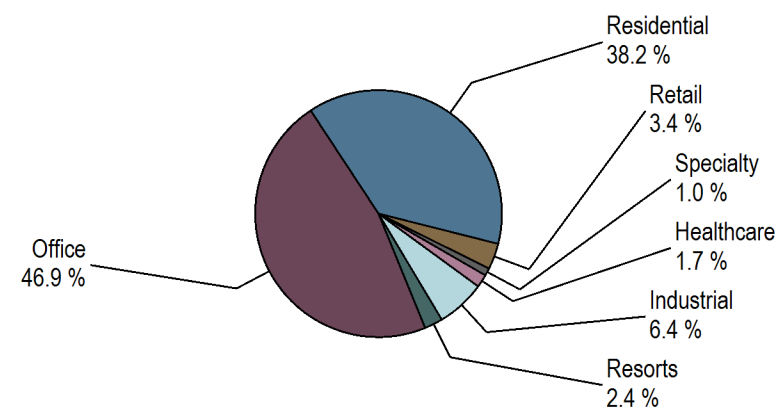
	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
Intercontinental U.S. REIF	1.0	5.5	11.0	--	11.6	Oct-14
NCREIF ODCE (net)	1.9	6.7	9.4	10.5	9.7	Oct-14

Geographic Diversification



North represents Midwest.

Property Type Allocation



Note: Number of investments is 114.



AEW Core Property Trust

As of December 31, 2017

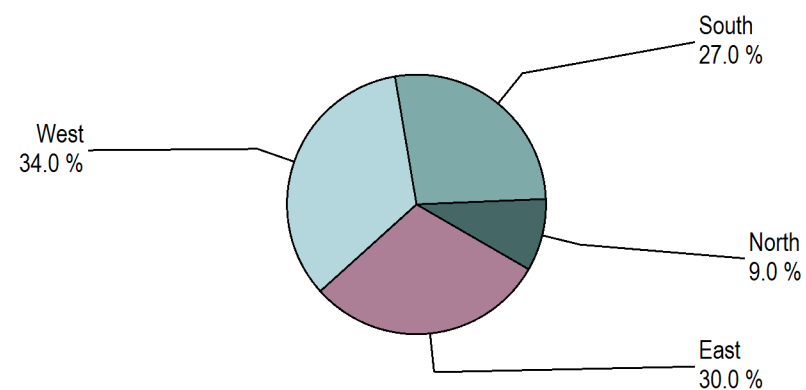
Account Information

Account Name	AEW Core Property Trust
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	10/01/14
Account Type	Real Estate
Benchmark	NCREIF ODCE (net)
Universe	

Portfolio Performance Summary

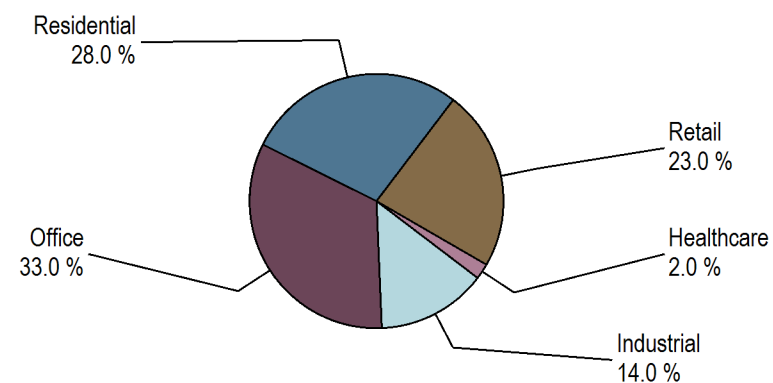
	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Return (%)	Since
AEW Core Property Trust	1.7	6.9	9.7	--	9.9	Oct-14
NCREIF ODCE (net)	1.9	6.7	9.4	10.5	9.7	Oct-14

Geographic Diversification



North represents Midwest.

Property Type Allocation



Note: Number of investments is 68 and Net IRR is 9.37%.



As of December 31, 2017

Account Information

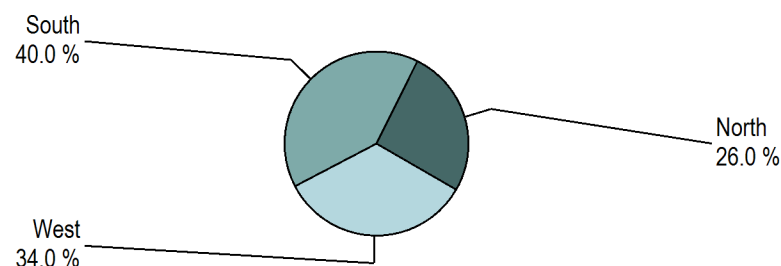
Account Name	TA Associates Realty Fund IX
Account Structure	Other
Investment Style	Active
Inception Date	5/01/10
Account Type	Real Estate
Benchmark	NCREIF ODCE (net)
Universe	

Non-Marketable Securities Overview

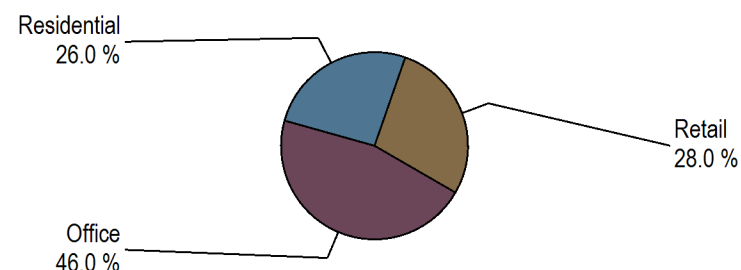
As of December 31, 2017

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Real Estate	TA Associates Realty Fund IX	2010	\$3,000,000	\$2,880,000	\$4,605,730	\$121,544	\$4,727,274	\$120,000
	Total Account		\$3,000,000	\$2,880,000	\$4,605,730	\$121,544	\$4,727,274	\$120,000

Geographic Diversification



Property Type Allocation



Investment Strategy: TA Associates Realty Fund IX uses a value-added strategy to create a diversified portfolio of direct real estate investments. Fund IX expects to invest in office, industrial, retail, and multifamily properties located primarily in major U.S. markets. Historically, TA Realty commingled funds have received about two-thirds of return from income and maintained moderate leverage of approximately 50% to 55% of the aggregate value of the Fund's real estate investments. Most value-added improvements include re-development, re-positioning, re-tenanting or recapitalization. TA Realty expects to proactively manage tenant and industry exposure with no significant concentration towards either.

Note: As of September 30 2017, the number of investments is 8 and Net IRR is 10.46%.



As of December 31, 2017

Account Information

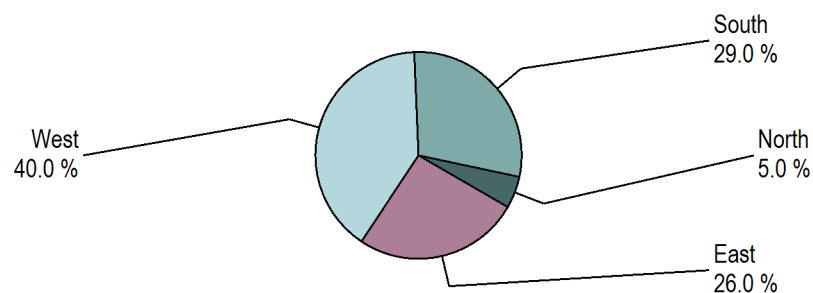
Account Name	TA Associates Realty Fund X
Account Structure	Other
Investment Style	Active
Inception Date	4/01/13
Account Type	Real Estate
Benchmark	NCREIF ODCE (net)
Universe	

Non-Marketable Securities Overview

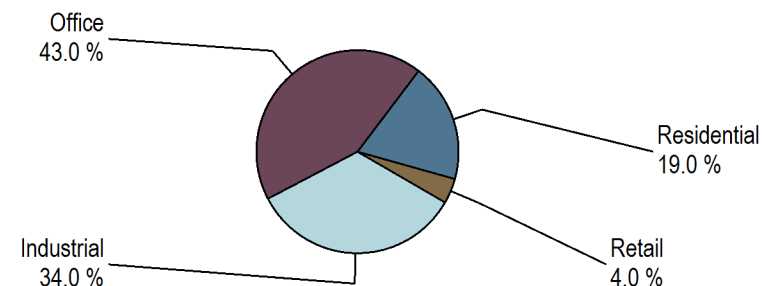
As of December 31, 2017

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Real Estate	TA Associates Realty Fund X	2013	\$3,000,000	\$3,005,227	\$2,284,168	\$2,034,832	\$4,319,000	-\$5,227
	Total Account		\$3,000,000	\$3,005,227	\$2,284,168	\$2,034,832	\$4,319,000	-\$5,227

Geographic Diversification



Property Type Allocation



Investment Strategy: TA Associates Realty Fund X uses a value-added strategy to create a diversified portfolio of direct real estate investments. The strategy is anticipated to target under-leased office, industrial, multifamily, and retail assets that are expected to be well-located, functional buildings with strong net operating income (NOI) growth potential. Geographically, the fund will target over 35 U.S. markets with broad regional diversification targets of 25% to 40% in the west, 20% to 35% in the east, 20% to 30% in the south, and 10% to 20% in the Midwest. The fund will target 35% leverage, with a maximum of 50%. Most value-added improvements include redevelopment, repositioning, retenanting, or recapitalization.

Note: As of September 30 2017, the number of investments is 76 and Net IRR is 12.62%.

AG Realty Fund IV

As of December 31, 2017

Account Information

Account Name	AG Realty Fund IV
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	
Account Type	Real Estate
Benchmark	NCREIF ODCE (net)
Universe	

Non-Marketable Securities Overview

As of December 31, 2017

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Real Estate	AG Realty Fund IV	2004	\$1,000,000	\$950,000	\$1,332,500	\$0	\$1,332,500	\$50,000
	Total Account		\$1,000,000	\$950,000	\$1,332,500	\$0	\$1,332,500	\$50,000

Investment Strategy: Funded in 1999, Angelo Gordon's Fund IV is an opportunistic real estate portfolio. Leverage on the portfolio is about 50%. About 75% of return is expected to result from capital appreciation, with the remaining 25% coming from income. The portfolio's emphasis is on purchasing sub-performing and non-performing commercial properties in the \$30 million range. The firm then enhances these properties through redevelopment or other measures. Angelo Gordon seeks to limit downside risk in the portfolio through diversification.

Note: Number of investments is 0.



Ascent Venture Partners - Fund II

As of December 31, 2017

Account Information

Account Name	Ascent Venture Partners - Fund II
Account Structure	Other
Investment Style	Active
Inception Date	9/01/01
Account Type	Private Equity
Benchmark	Cambridge Associates US All PE (1 Qtr Lag)
Universe	

Non-Marketable Securities Overview by Account Type

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Private Equity	Ascent Venture Partners - Fund II	1995	\$500,000	\$484,254	\$1,607,392	\$6,090	\$1,613,482	\$15,746
	Total Account		\$500,000	\$484,254	\$1,607,392	\$6,090	\$1,613,482	\$15,746

Investment Strategy:

Ascent Venture Partners seeks to build private equity portfolios that are balanced with respect to industry (high and low technology ventures), and diverse with respect to company growth stage (from seed through buyout and re capitalization). Ascent favors proven management teams and reasonable valuations. Ascent has shifted their focus to liquidating the remaining investments in the partnership.

Note: As of September 30, 2017, the Net IRR is 27.02%.



Ascent Venture Partners - Fund III

As of December 31, 2017

Account Information

Account Name	Ascent Venture Partners - Fund III
Account Structure	Other
Investment Style	Active
Inception Date	6/01/01
Account Type	Private Equity
Benchmark	Cambridge Associates US All PE (1 Qtr Lag)
Universe	

Non-Marketable Securities Overview by Account Type

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Private Equity	Ascent Venture Partners - Fund III	1999	\$1,500,000	\$1,395,000	\$1,697,063	\$84,308	\$1,781,371	\$105,000
	Total Account		\$1,500,000	\$1,395,000	\$1,697,063	\$84,308	\$1,781,371	\$105,000

Investment Strategy:

Ascent Venture Partners seeks to build private equity portfolios that are balanced with respect to industry (high and low technology ventures), and diverse with respects to company growth stage (from seed through buyout and re-capitalization). Ascent favors proven management teams and reasonable valuations. Ascent has shifted their focus to liquidating the remaining investments in the partnership.

Note: As of September 30, 2017 the Net IRR is 3.92%.



Ascent Venture Partners - Fund IV

As of December 31, 2017

Account Information

Account Name	Ascent Venture Partners - Fund IV
Account Structure	Other
Investment Style	Active
Inception Date	3/19/04
Account Type	Private Equity
Benchmark	Cambridge Associates US All PE (1 Qtr Lag)
Universe	

Non-Marketable Securities Overview by Account Type

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Private Equity	Ascent Venture Partners - Fund IV	2003	\$1,000,000	\$1,000,000	\$155,588	\$161,046	\$316,634	\$0
	Total Account		\$1,000,000	\$1,000,000	\$155,588	\$161,046	\$316,634	\$0

Investment Strategy:

Located in Boston, Ascent Venture Partners (formerly known as Pioneer Capital) was formed in 1999, after Landmark Partners purchased Pioneer's interest. Ascent focuses primarily on high growth companies in the information technology sector. Ascent is an active investor, typically taking a board seat in portfolio companies. As a result, Ascent has focused its investments in the Eastern United States.

Note: As of September 30, 2017 the Net IRR is -15.39%.



Ascent Venture Partners - Fund V

As of December 31, 2017

Account Information

Account Name	Ascent Venture Partners - Fund V
Account Structure	Other
Investment Style	Active
Inception Date	9/22/08
Account Type	Private Equity
Benchmark	Cambridge Associates US All PE (1 Qtr Lag)
Universe	

Non-Marketable Securities Overview by Account Type

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Private Equity	Ascent Venture Partners - Fund V	2010	\$1,000,000	\$880,000	\$569,783	\$944,848	\$1,514,631	\$120,000
	Total Account		\$1,000,000	\$880,000	\$569,783	\$944,848	\$1,514,631	\$120,000

Investment Strategy:

Ascent Venture Partners V is an early stage venture capital fund focused on making investments within the technology products and services industry. Specific areas of interest include next generation software (open source and Software-as-a-Service), data management and analysis, automated computing, security and compliance, financial services, and applications associated with the convergence of remote devices. The GP is located in Boston and will invest in the eastern United States and Canada. The Fund will target companies that have pre-money valuations of \$3 to \$15 million and have the potential for a \$100 million exit value.

Note: As of September 30, 2017 the Net IRR is 10.93%.



Ascent Venture Partners - Fund VI

As of December 31, 2017

Account Information

Account Name	Ascent Venture Partners - Fund VI
Account Structure	Other
Investment Style	Active
Inception Date	6/30/15
Account Type	Private Equity
Benchmark	Cambridge Associates US All PE (1 Qtr Lag)
Universe	

Non-Marketable Securities Overview by Account Type

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Private Equity	Ascent Venture Partners - Fund VI	2015	\$1,500,000	\$585,000	\$0	\$759,433	\$759,433	\$915,000
	Total Account		\$1,500,000	\$585,000	\$0	\$759,433	\$759,433	\$915,000

As of December 31, 2017

Account Information

Account Name	Goldman Sachs PEP 2005
Account Structure	Other
Investment Style	Active
Inception Date	8/01/06
Account Type	Private Equity
Benchmark	Cambridge Associates US All PE (1 Qtr Lag)
Universe	

Non-Marketable Securities Overview by Account Type

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Private Equity	Goldman Sachs PEP 2005	2006	\$3,000,000	\$2,926,669	\$2,830,658	\$871,998	\$3,702,656	\$73,331
	Total Account		\$3,000,000	\$2,926,669	\$2,830,658	\$871,998	\$3,702,656	\$73,331

Investment Strategy:

Goldman Sachs Private Equity Partners 2005 is a fund of funds formed to create a diversified portfolio of 18 to 25 partnerships. The Fund will invest opportunistically in order to commit to the "very best managers." The Fund expects to commit approximately \$40 million to each partnership. Previous funds have invested approximately 30% outside the U.S.

As of 9/30/2017 the IRR is 4.56%

As of December 31, 2017

Account Information

Account Name	HarbourVest Partners VIII
Account Structure	Other
Investment Style	Active
Inception Date	12/20/07
Account Type	Private Equity
Benchmark	Cambridge Associates US All PE (1 Qtr Lag)
Universe	

Non-Marketable Securities Overview by Account Type

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Private Equity	HarbourVest Partners VIII	2006	\$2,500,000	\$2,350,000	\$2,823,166	\$1,206,159	\$4,029,325	\$150,000
	Total Account		\$2,500,000	\$2,350,000	\$2,823,166	\$1,206,159	\$4,029,325	\$150,000

Investment Strategy:

HarbourVest Partners, known as Hancock Venture Partners until 1997, was founded in 1982 to invest in private equity partnerships. The HarbourVest Partners VIII Investment Program consists of three separate fund of funds, each dedicated to distinct private equity strategies: buyout, venture capital and mezzanine debt partnerships. Each vehicle will invest primarily in newly raised funds, but will also invest a portion of assets in secondary interest.

Note: As of September 30, 2017, the Net IRR is 10.5%.



As of December 31, 2017

Account Information

Account Name	HarbourVest Partners IX
Account Structure	Other
Investment Style	Active
Inception Date	10/22/13
Account Type	Private Equity
Benchmark	Cambridge Associates US All PE (1 Qtr Lag)
Universe	

Non-Marketable Securities Overview

As of December 31, 2017

As of December 31, 2017

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Private Equity	HarbourVest Partners IX	2010	\$5,000,000	\$3,212,500	\$1,563,232	\$3,205,281	\$4,768,513	\$1,787,500
	Total Account		\$5,000,000	\$3,212,500	\$1,563,232	\$3,205,281	\$4,768,513	\$1,787,500

Investment Strategy:

HarbourVest Partners, known as Hancock Venture Partners until 1997, was founded in 1982 to invest in private equity partnerships. The HarbourVest Partners IX Fund consists of three separate fund of funds, each dedicated to distinct private equity strategies: buyout, venture capital, and mezzanine debt partnerships. Each vehicle will invest primarily in newly-raised funds, but will also invest a portion of assets in secondary interests.

Note: As of September 30, 2017 the Net IRR is 16.8%.



HarbourVest X Buyout Fund

As of December 31, 2017

Account Information

Account Name	HarbourVest X Buyout Fund
Account Structure	Other
Investment Style	Active
Inception Date	4/06/16
Account Type	Private Equity
Benchmark	Cambridge Associates US All PE (1 Qtr Lag)
Universe	

As of December 31, 2017

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Private Equity	HarbourVest X Buyout Fund	2016	\$6,500,000	\$901,327	\$56,544	\$0	\$56,544	\$5,598,673
	Total Account		\$6,500,000	\$901,327	\$56,544	\$0	\$56,544	\$5,598,673

Investment Strategy:

HarbourVest Partners, known as Hancock Venture Partners until 1997, was founded in 1982 to invest in private equity partnerships. The HarbourVest Partners IX Fund consists of three separate fund of funds, each dedicated to distinct private equity strategies: buyout, venture capital, and mezzanine debt partnerships. Each vehicle will invest primarily in newly-raised funds, but will also invest a portion of assets in secondary interests.

Note: As of September 30, 2016, the Net IRR is 14.9%.



Constitution Capital Partners Ironsides III

As of December 31, 2017

Account Information

Account Name	Constitution Capital Partners Ironsides III
Account Structure	Other
Investment Style	Active
Inception Date	
Account Type	Private Equity
Benchmark	Cambridge Associates US All PE (1 Qtr Lag)
Universe	

Non-Marketable Securities Overview

As of December 31, 2017

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Private Equity	Constitution Capital Partners Ironsides III	2014	\$5,000,000	\$1,856,218	\$119,753	\$0	\$119,753	\$3,143,782
	Total Account		\$5,000,000	\$1,856,218	\$119,753	\$0	\$119,753	\$3,143,782

Investment Strategy:

Constitution Capital seeks investments in underlying private equity funds ranging in size from \$200 million to approximately \$1.0 billion, with a few larger potentially. Constitution has noted their preference to invest the majority of capital to funds of less than \$1 billion. Constitution has noted their preference to invest the majority of capital to funds of less than \$1 billion. Constitution targets a variety of fund types (domestic middle-market buyout, special situations, growth equity, distressed, and sector-specific) and will allocate amongst them opportunistically. The group will not invest in early-stage venture capital funds or mega buyout funds. The portfolio will have 12 to 15 underlying fund investments of approximately \$10 million to \$20 million each. For co-investments, it is anticipated that a total of 12-15 co-investments will each range from \$5 million to \$25 million. The enterprise values of the underlying companies are expected to range from \$100 million to \$1.5 billion.

Note: As of March 31, 2017, the Gross IRR is 14.1%.



Constitution Capital Partners Ironsides IV

As of September 30, 2017

Account Information

Account Name	Constitution Capital Partners Ironsides IV
Account Structure	Other
Investment Style	Active
Inception Date	
Account Type	Private Equity
Benchmark	Cambridge Associates US All PE (1 Qtr Lag)

Non-Marketable Securities Overview

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Private Equity	Constitution Capital Partners Ironsides IV	2016	\$3,250,000	\$488,311	\$0	\$0	\$0	\$2,761,689
	Total Account		\$3,250,000	\$488,311	\$0	\$0	\$0	\$2,761,689

Investment Strategy:

Constitution Capital seeks investments in underlying private equity funds ranging in size from \$200 million to approximately \$1.0 billion, with a few larger potentially. Constitution has noted their preference to invest the majority of capital to funds of less than \$1 billion. Constitution has noted their preference to invest the majority of capital to funds of less than \$1 billion. Constitution targets a variety of fund types (domestic middle-market buyout, special situations, growth equity, distressed, and sector-specific) and will allocate amongst them opportunistically. The group will not invest in early-stage venture capital funds or mega buyout funds. The portfolio will have 12 to 15 underlying fund investments of approximately \$10 million to \$20 million each. For co-investments, it is anticipated that a total of 12-15 co-investments will each range from \$5 million to \$25 million. The enterprise values of the underlying companies are expected to range from \$100 million to \$1.5 billion.

Note: As of March 31, 2017, the Gross IRR is 25.6%.



Constitution Capital Direct IV

As of September 30, 2017

Account Information

Account Name	Constitution Capital Direct IV
Account Structure	Other
Investment Style	Active
Inception Date	
Account Type	Private Equity
Benchmark	Cambridge Associates US All PE (1 Qtr Lag)
Universe	

Non-Marketable Securities Overview

Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	Total Value (RV + Dist)	Unfunded Commitment
Private Equity	Constitution Capital Direct IV	2016	\$3,250,000	\$2,798,202	\$472,771	\$2,214,660	\$2,687,431	\$451,798
	Total Account		\$3,250,000	\$2,798,202	\$472,771	\$2,214,660	\$2,687,431	\$451,798

Total Retirement System

As of September 30, 2017

Investment Expense Analysis

As Of December 31, 2017

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Total Equity		\$71,644,484		
Domestic Equity Assets		\$38,628,838		
SSgA Russell 1000 Value Index-NL	0.08% of First \$50.0 Mil, 0.06% of Next \$50.0 Mil, 0.04% Thereafter	\$17,352,505	\$13,882	0.08%
SSgA Russell 1000 Growth-NL	0.08% of First \$50.0 Mil, 0.06% of Next \$50.0 Mil, 0.04% Thereafter	\$17,835,639	\$14,269	0.08%
SSgA Russell 2000 Index-NL	0.08% of Assets	\$3,440,694	\$2,753	0.08%
Total International Equity		\$33,015,646		
Total International Developed Market Equity		\$17,819,146		
SSgA MSCI EAFE Index-NL	0.10% of First \$50.0 Mil, 0.08% of Next \$50.0 Mil, 0.05% Thereafter	\$13,254,321	\$13,254	0.10%
SSgA MSCI EAFE Small Cap Index-NL	0.23% of Assets	\$4,564,825	\$10,499	0.23%
International Emerging Market Equity Assets		\$15,196,500		
DFA Emerging Markets Value	0.61% of Assets	\$2,796,331	\$17,058	0.61%
LMCG Emerging Markets	0.85% of Assets	\$6,284,221	\$53,416	0.85%
KB Investors Emerging Markets Equity	0.89% of Assets	\$6,115,948	\$54,432	0.89%
Total Fixed Income		\$44,894,456		
Investment Grade Bond Assets		\$20,615,797		
Longfellow Investment Grade Bond		\$20,615,797		
High Yield Bond Assets		\$8,996,498		
Columbia Institutional High Yield	0.45% of Assets	\$8,996,498	\$40,484	0.45%
TIPS Assets		\$8,114,775		
SSgA TIPS-NL	0.06% of First \$50.0 Mil, 0.05% of Next \$50.0 Mil, 0.04% Thereafter	\$8,114,775	\$4,869	0.06%
Emerging Market Debt Assets		\$7,167,386		
Logan Circle Emerging Markets Debt	0.65% of Assets	\$3,461,048	\$22,497	0.65%

Total Retirement System

As of September 30, 2017

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Aberdeen Emerging Markets Bond Fund	0.45% of Assets	\$3,706,338	\$16,679	0.45%
Real Estate Assets		\$15,026,307		
Total Non-Core Real Estate		\$2,160,533		
AG Realty Fund IV	1.25% of Assets	\$4,157	\$52	1.25%
TA Associates Realty Fund IX	0.5% in year 1, 0.8% in year 2, 1.1% in year 3, all based upon total committed capital; then 1.2% in year 4, 1.2% in year 5, 1.125% in year 6, 1.0% in year 7 and 0.60%	\$121,544		
TA Associates Realty Fund X	0.5% in year 1, 0.8% in year 2, 1.1% in year 3, all based upon total committed capital; then 1.2% in year 4, 1.25% in year 5, 1.2% in year 6, 1.0% in year 7, and 0.60% thereafter, all based upon gross investment cost.	\$2,034,832		
Total Core Real Estate		\$12,865,774		
Intercontinental U.S. REIF	1.10% of First \$25.0 Mil, 1.00% of Next \$25.0 Mil, 20.00% performance fee after, 8.00% Preferred Return	\$5,520,397		
AEW Core Property Trust	1.10% of First \$10.0 Mil, 1.00% of Next \$15.0 Mil	\$7,345,377	\$80,799	1.10%
Private Equity Assets		\$13,008,124		
Ascent Venture Partners - Fund II	Management Fee: 2.50% of commitment; Carried Interest: 20%	\$6,090		
Ascent Venture Partners - Fund III	Management Fee: 2.25% of commitment; Carried Interest: 20%	\$84,308		
Ascent Venture Partners - Fund IV	Management Fee: 2.50% of Commitment; Carried Interest: 20%	\$161,046		
Ascent Venture Partners - Fund V	Management Fee: 2.50% of commitment; Carried Interest: 20%	\$944,848		
Ascent Venture Partners - Fund VI		\$759,433		

Massachusetts Housing Finance Agency Retirement System

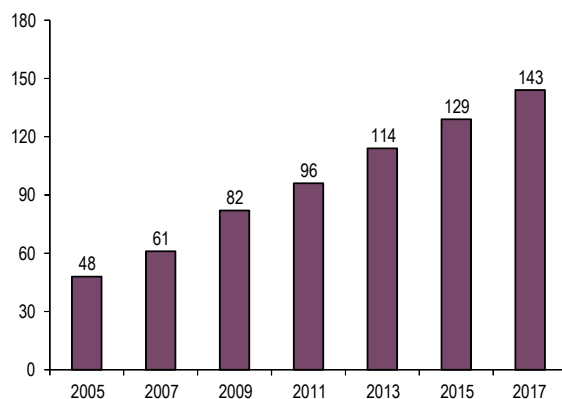
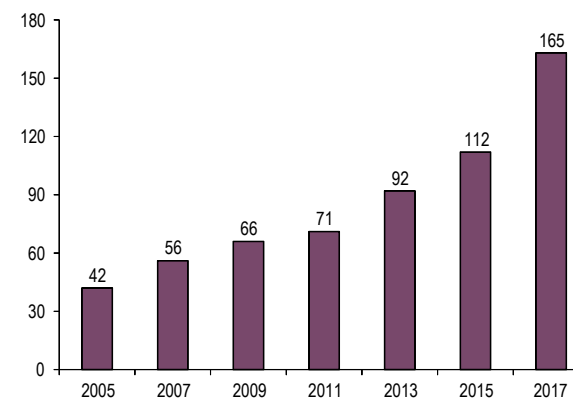
As of September 30, 2017

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Constitution Capital Partners Ironsides III	0.75% per annum management fee on commitments during the investment period and on outstanding commitments thereafter. 5.0% carried interest with an 8% preferred return. Organizational expenses are capped at \$1.0 million.	\$1,835,539		
Constitution Capital Partners Ironsides IV		\$513,112		
Constitution Capital Direct IV	0.50% per annum management fee on commitments during the investment period and on outstanding commitments (average across Direct and Partnership Funds) thereafter. 15.0% carried interest with an 8% preferred return.	\$2,214,660		
Goldman Sachs PEP 2005	Management Fee: 1.0% of commitment through the 5th anniversary, 75% of the fee charged in previous year thereafter. Carried Interest: 5%; Preferred Return: 8%	\$871,998		
HarbourVest Partners VIII	0.50% of committed capital in year one, 0.75% in year two, 1.00% in years three through nine, declining 10% each year thereafter. 10% carried interest on cumulative net secondary investment profits; 15% carried interest on net direct investment profits	\$1,206,159		
HarbourVest Partners IX	0.50% of committed capital in year one, 0.75% in year two, 1.00% in years three through nine, declining 10% each year thereafter.	\$3,205,281		
HarbourVest X Buyout Fund	0.75% of capital commitments average over life of fund.	\$1,205,650		
Cash		\$4,543,960		
Cash STIF		\$4,543,960		

Appendices

Meketa Investment Group Corporate Update

- Staff of 143, including 96 investment professionals and 32 CFA Charterholders
- 165 clients, with over 290 funds throughout the United States
- Significant investment in staff and resources
- Offices in Boston, Chicago, Miami, Portland (OR), San Diego, and London
- We advise on over \$600 billion in client assets
 - Over \$90 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"> - Passive - Enhanced Index - Large Cap - Midcap - Small Cap - Microcap - 130/30 	<ul style="list-style-type: none"> - Large Cap Developed - Small Cap Developed - Emerging Markets - Frontier Markets 	<ul style="list-style-type: none"> - Buyouts - Venture Capital - Private Debt - Special Situations - Secondaries - Fund of Funds 	<ul style="list-style-type: none"> - Public REITs - Core Real Estate - Value Added Real Estate - Opportunistic Real Estate - Infrastructure - Timber - Natural Resources - Commodities 	<ul style="list-style-type: none"> - Short-Term - Core - Core Plus - TIPS - High Yield - Bank Loans - Distressed - Global - Emerging Markets 	<ul style="list-style-type: none"> - Long/Short Equity - Event Driven - Relative Value - Fixed Income Arbitrage - Multi Strategy - Market Neutral - Global Macro - Fund of Funds - Portable Alpha

Disclaimer, Glossary, and Notes

The material contained in this report is confidential and may not be reproduced, disclosed, or distributed, in whole or in part, to any person or entity other than the intended recipient. The data are provided for informational purposes only, may not be complete, and cannot be relied upon for any purpose other than for discussion.

Meketa Investment Group has prepared this report on the basis of sources believed to be reliable. The data are based on matters as they are known as of the date of preparation of the report, and not as of any future date, and will not be updated or otherwise revised to reflect information that subsequently becomes available.

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.

This document may contain certain forward-looking statements, forecasts, estimates, projections, and opinions ("Forward Statements"). No representation is made or will be made that any Forward Statements will be achieved or will prove to be correct. A number of factors, in addition to any risk factors stated in this material, could cause actual future results to vary materially from the Forward Statements. No representation is given that the assumptions disclosed in this document upon which Forward Statements may be based are reasonable. There can be no assurance that the investment strategy or objective of any fund or investment will be achieved, or that the Retirement System will receive a return of the amount invested.

In some cases, Meketa Investment Group assists the Board Members 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 Retirement Board.

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.