

Worcester Retirement System

Meeting Materials
February 13, 2020

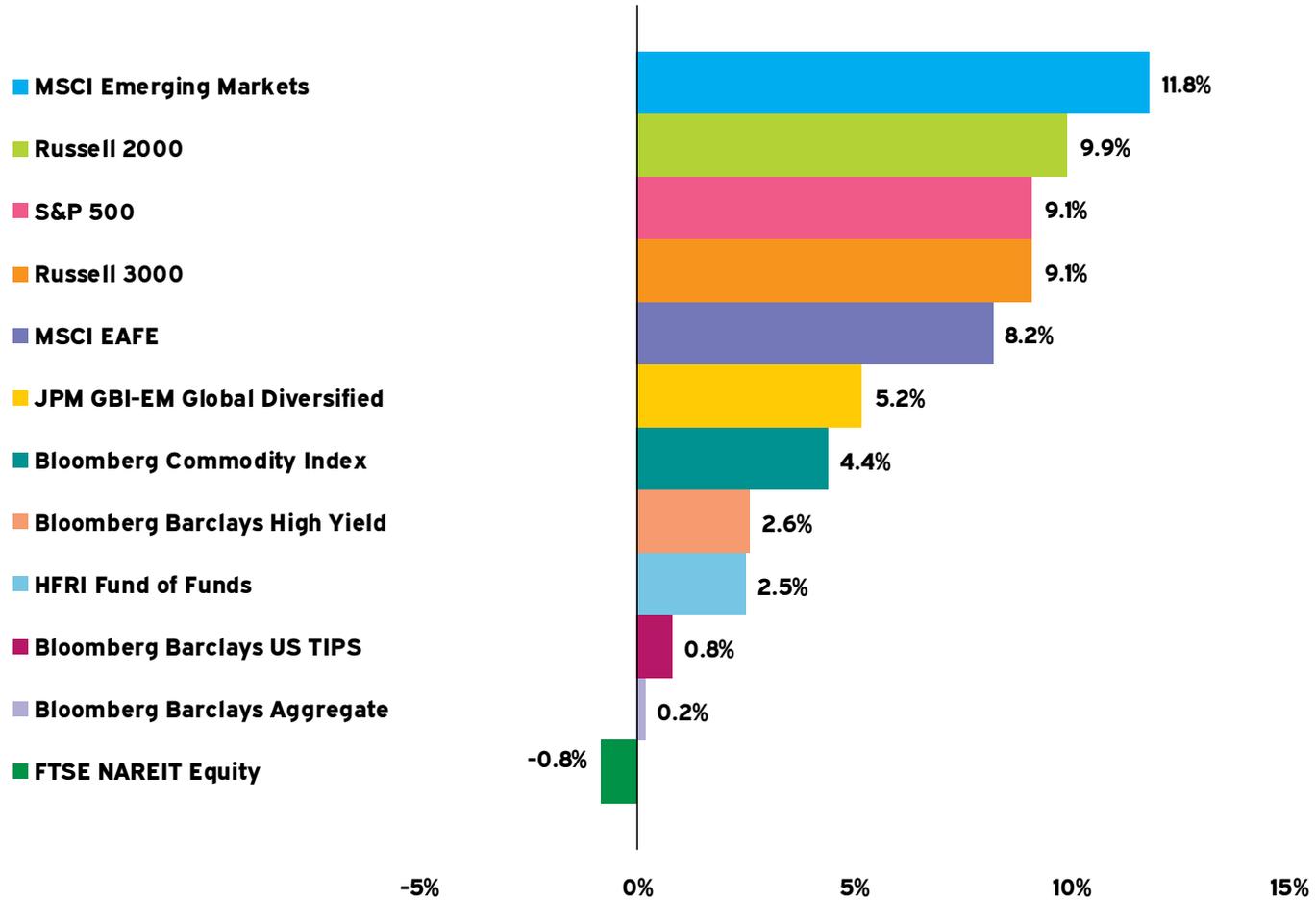
Fund Evaluation Report

Agenda

1. The Worlds Market Fourth Quarter of 2019
2. Estimated Retirement System Performance as of January 31, 2020
3. Fourth Quarter 2019 Performance Review
4. 2019 Year in Review
5. IR&M Succession Planning Update
6. Disclaimer, Glossary, and Notes

The World Markets Fourth Quarter of 2019

The World Markets¹ Fourth Quarter of 2019



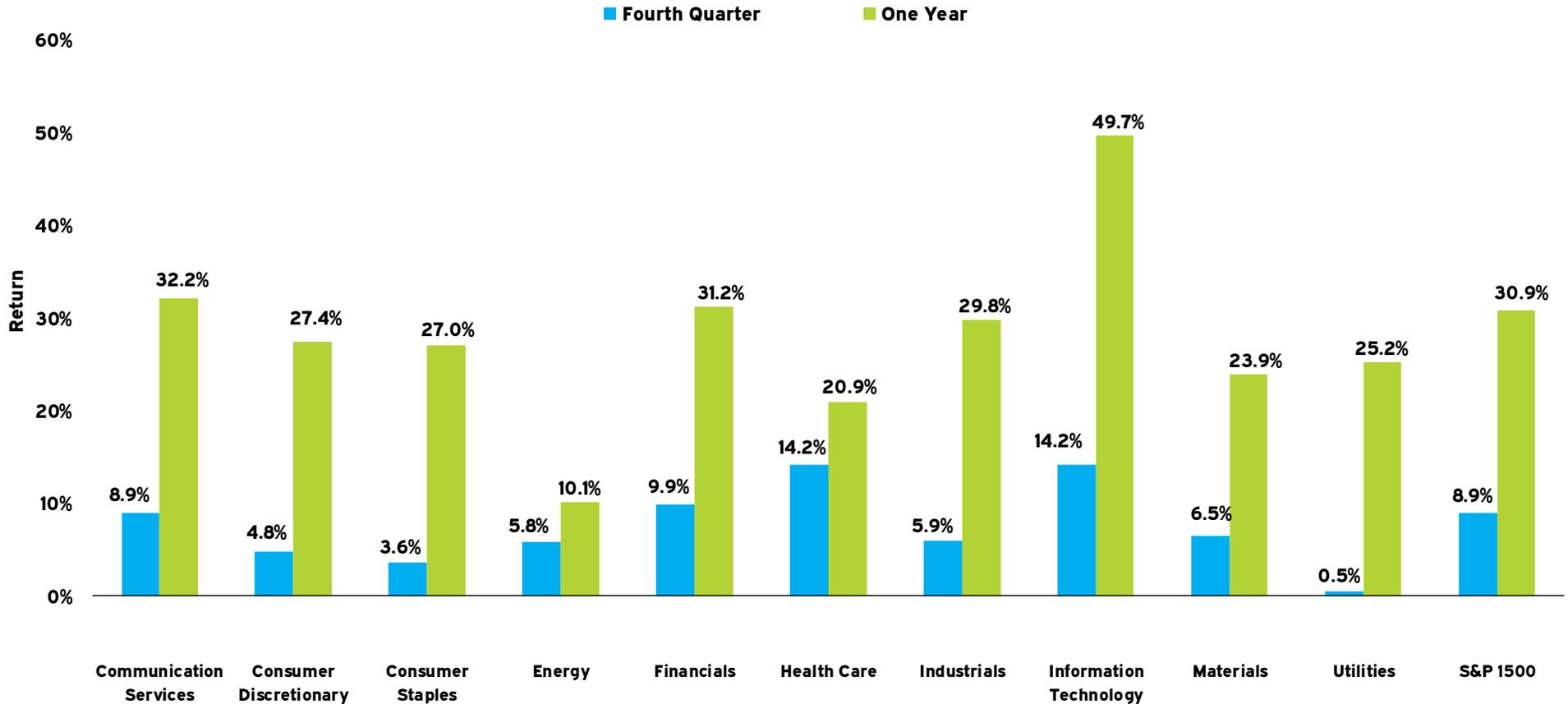
¹ Source: InvestorForce.

Index Returns¹

	4Q19 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
Domestic Equity					
S&P 500	9.1	31.5	15.3	11.7	13.6
Russell 3000	9.1	31.0	14.6	11.2	13.4
Russell 1000	9.0	31.4	15.0	11.5	13.5
Russell 1000 Growth	10.6	36.4	20.5	14.6	15.2
Russell 1000 Value	7.4	26.5	9.7	8.3	11.8
Russell MidCap	7.1	30.5	12.1	9.3	13.2
Russell MidCap Growth	8.2	35.5	17.4	11.6	14.2
Russell MidCap Value	6.4	27.1	8.1	7.6	12.4
Russell 2000	9.9	25.5	8.6	8.2	11.8
Russell 2000 Growth	11.4	28.5	12.5	9.3	13.0
Russell 2000 Value	8.5	22.4	4.8	7.0	10.6
Foreign Equity					
MSCI ACWI (ex. US)	8.9	21.5	9.9	5.5	5.0
MSCI EAFE	8.2	22.0	9.6	5.7	5.5
MSCI EAFE (Local Currency)	5.2	21.7	7.7	6.7	7.2
MSCI EAFE Small Cap	11.5	25.0	10.9	8.9	8.7
MSCI Emerging Markets	11.8	18.4	11.6	5.6	3.7
MSCI Emerging Markets (Local Currency)	9.5	18.1	11.5	7.5	6.1
Fixed Income					
Bloomberg Barclays Universal	0.5	9.3	4.3	3.4	4.1
Bloomberg Barclays Aggregate	0.2	8.7	4.0	3.0	3.7
Bloomberg Barclays US TIPS	0.8	8.4	3.3	2.6	3.4
Bloomberg Barclays High Yield	2.6	14.3	6.4	6.1	7.6
JPM GBI-EM Global Diversified	5.2	13.5	7.0	2.8	2.7
Other					
FTSE NAREIT Equity	-0.8	26.0	8.1	7.2	11.9
Bloomberg Commodity Index	4.4	7.7	-0.9	-3.9	-4.7
HFRI Fund of Funds	2.5	7.8	3.7	2.2	2.8

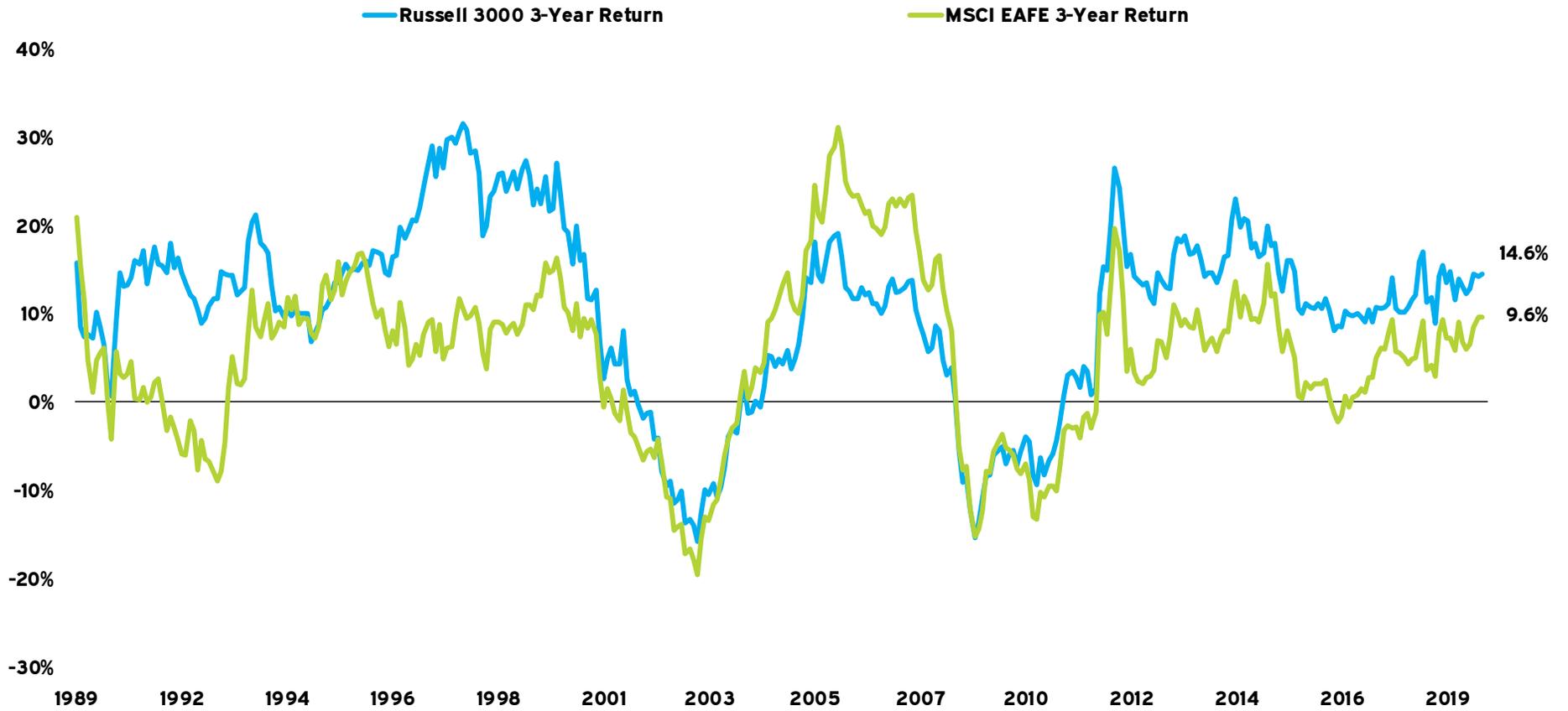
¹ Source: InvestorForce.

S&P Sector Returns¹



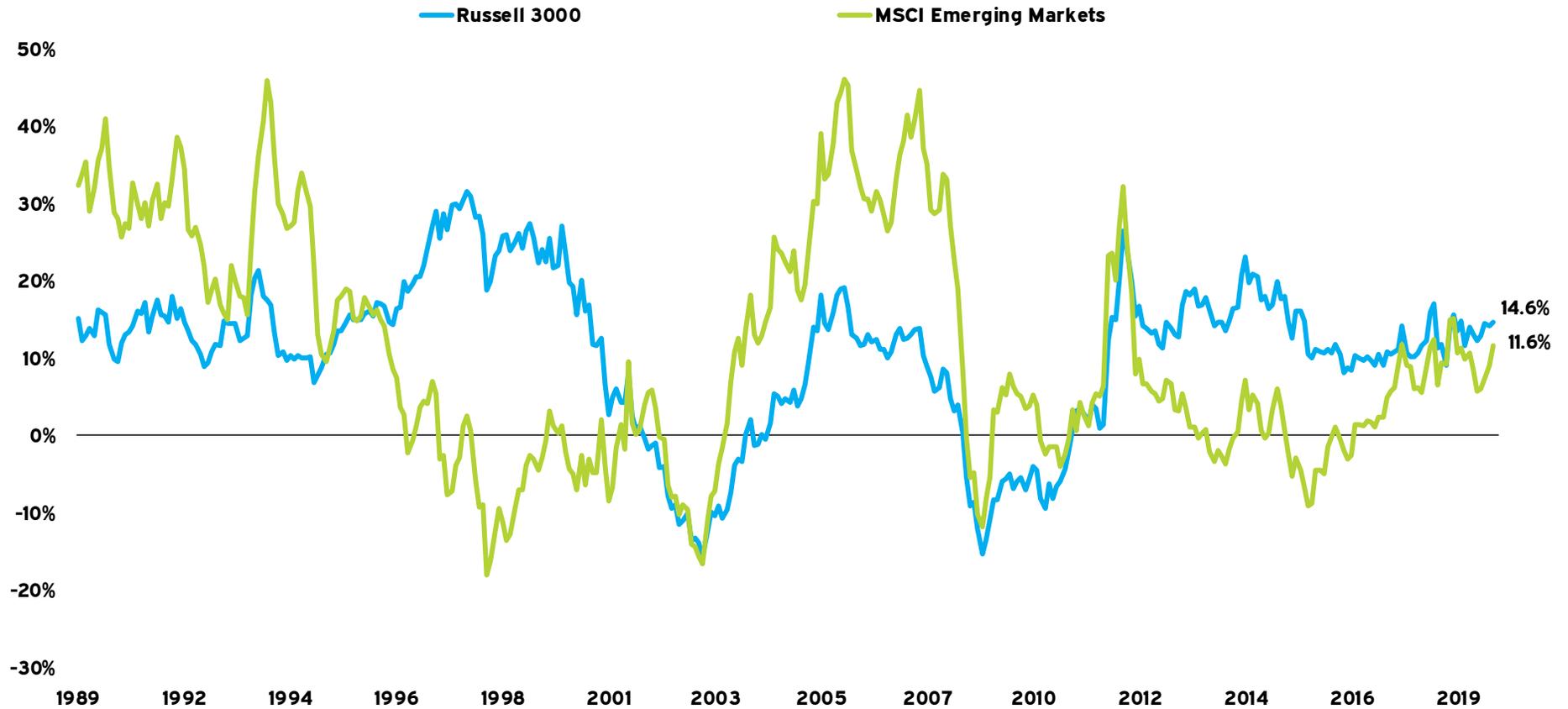
¹ Source: InvestorForce. Represents S&P 1500 (All Cap) data.

US and Developed Market Foreign Equity Rolling Three-Year Returns¹



¹ Source: InvestorForce.

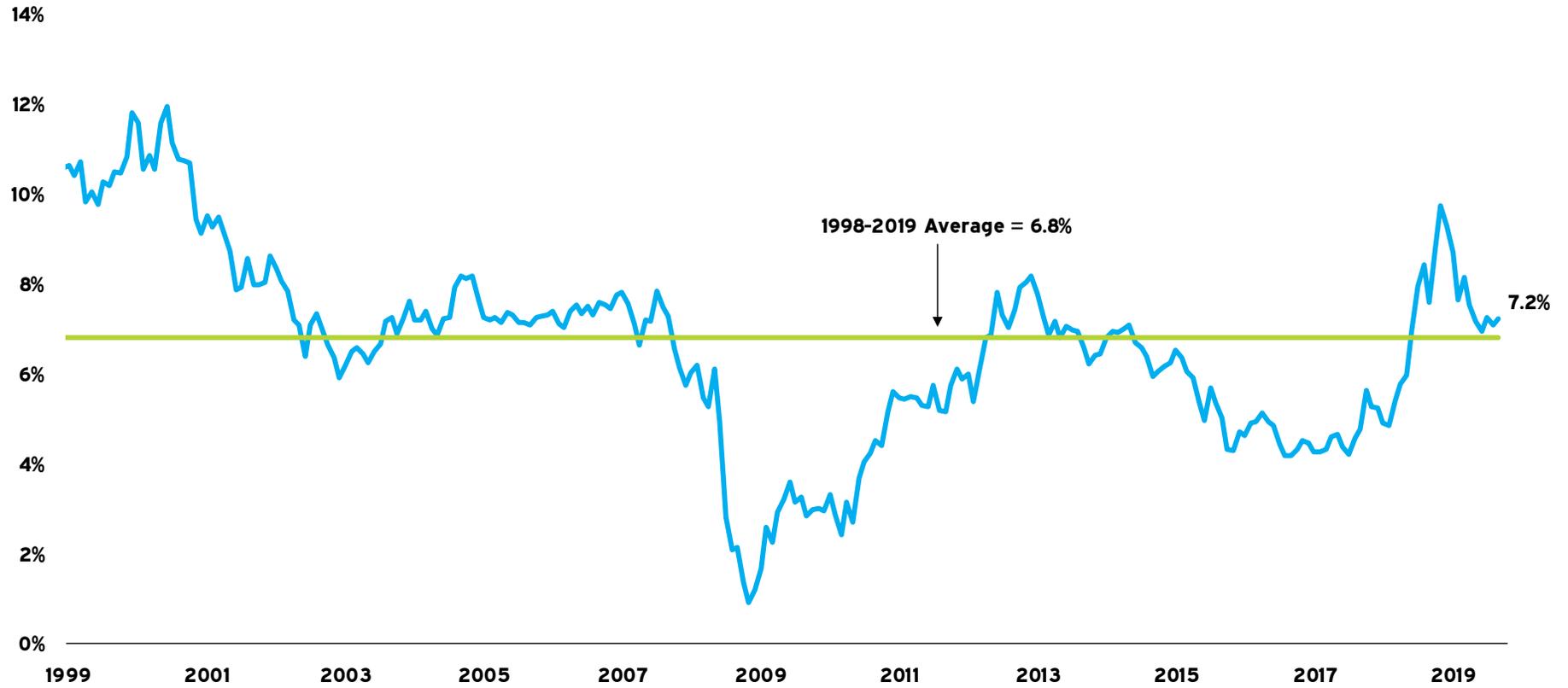
US and Emerging Market Equity Rolling Three-Year Returns¹



¹ Source: InvestorForce.

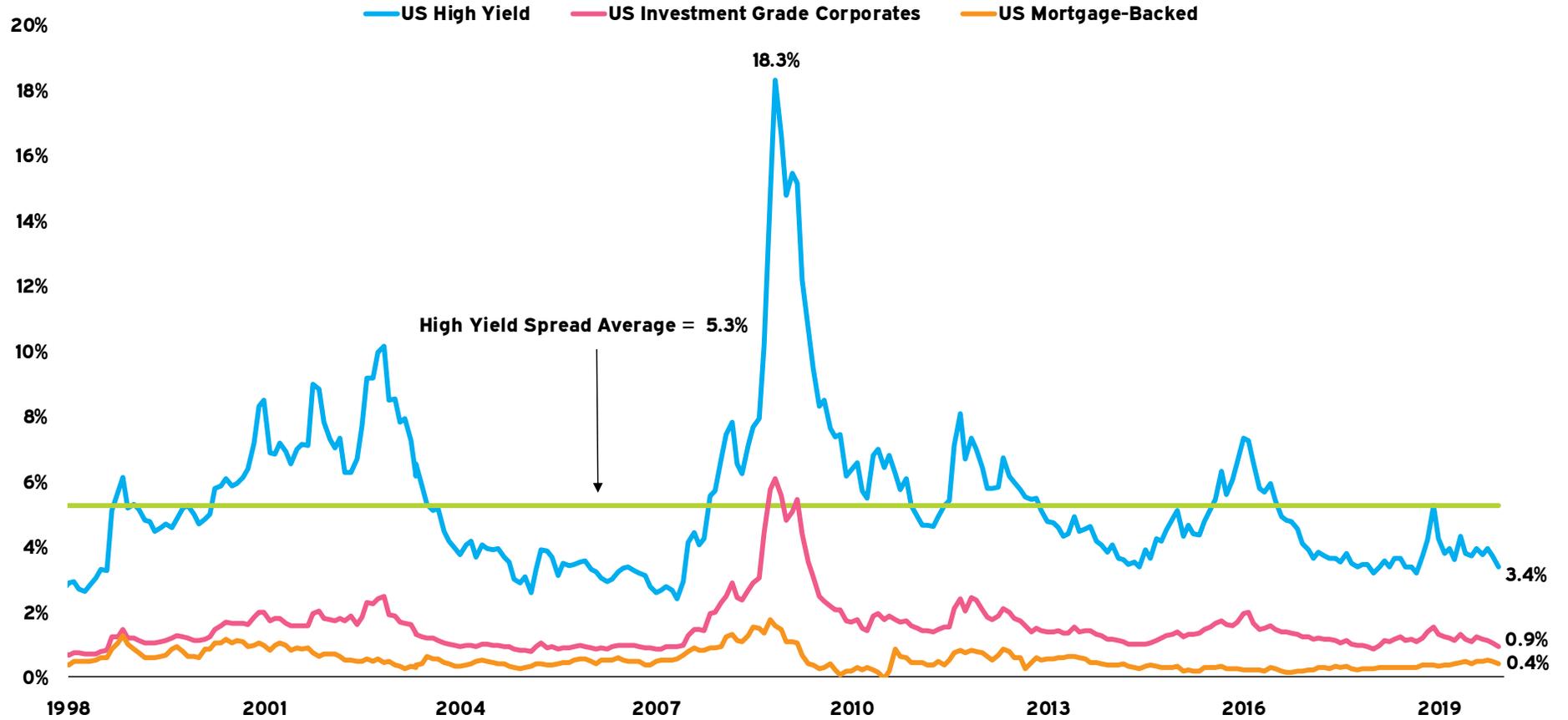
Rolling Ten-Year Returns: 65% Stocks and 35% Bonds¹

— 65% Stocks (MSCI ACWI) / 35% Bonds (Bloomberg Barclays Aggregate) 10-Year Rolling Return



¹ Source: InvestorForce.

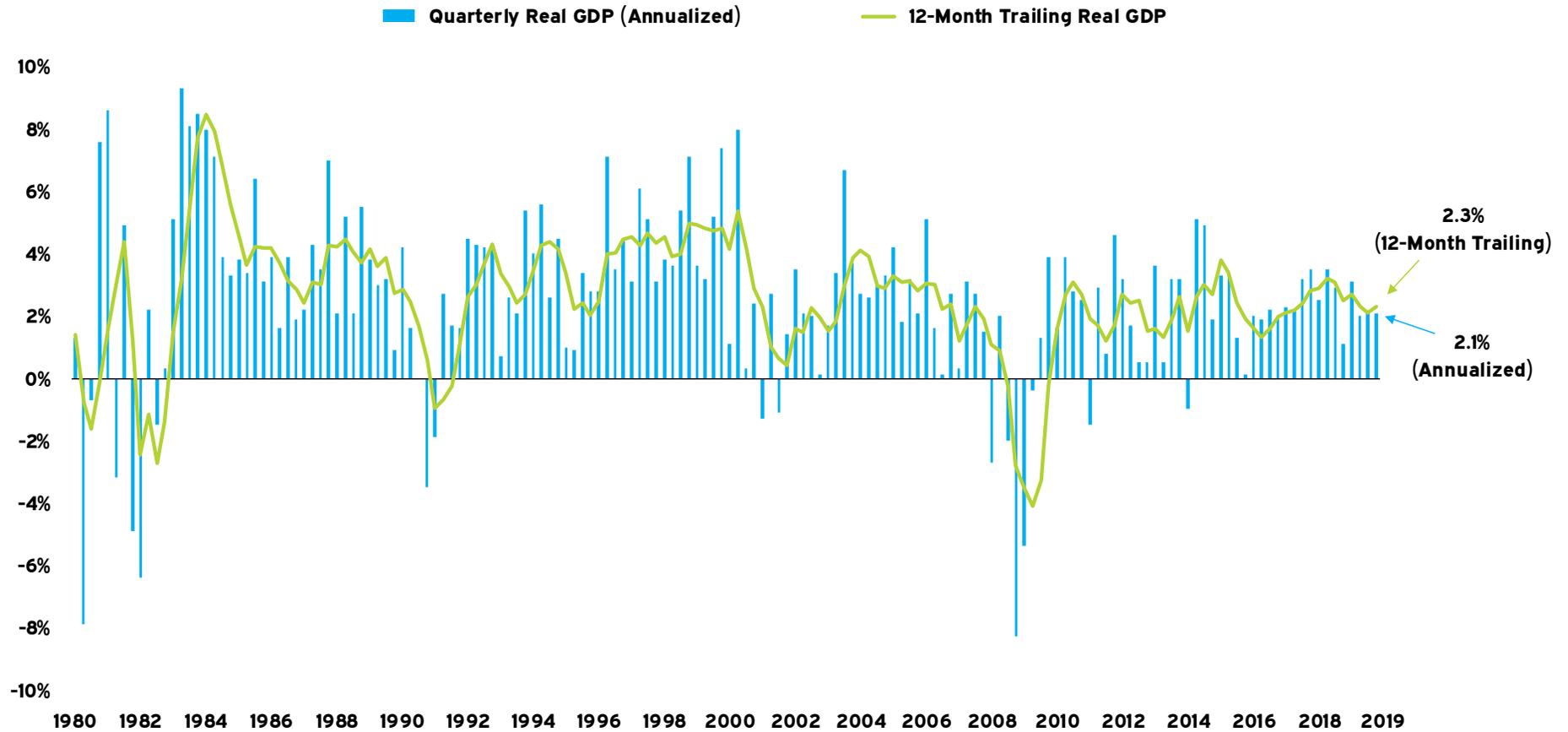
Credit Spreads vs. US Treasury Bonds^{1,2}



¹ Source: Barclays Live. Data represents the OAS.

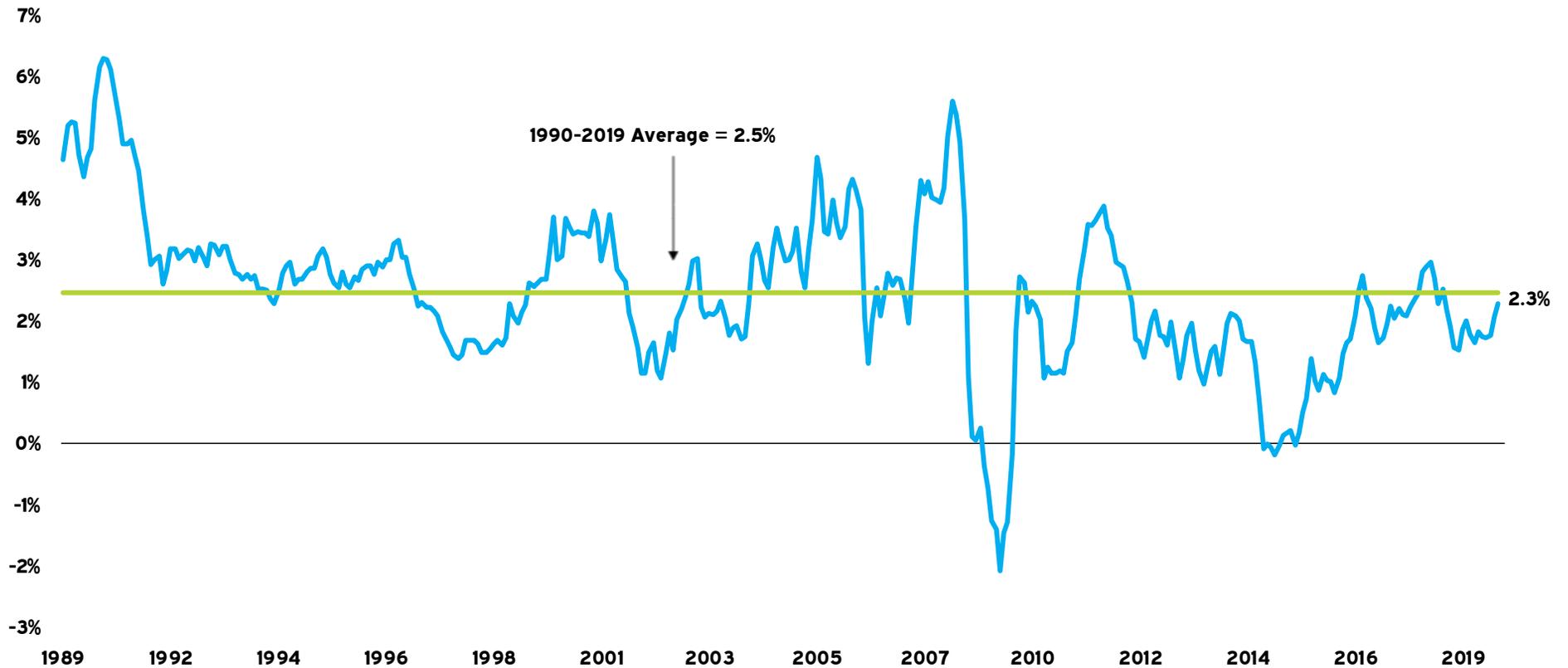
² The median high yield spread was 4.7% from 1997-2019.

US Real Gross Domestic Product (GDP) Growth¹



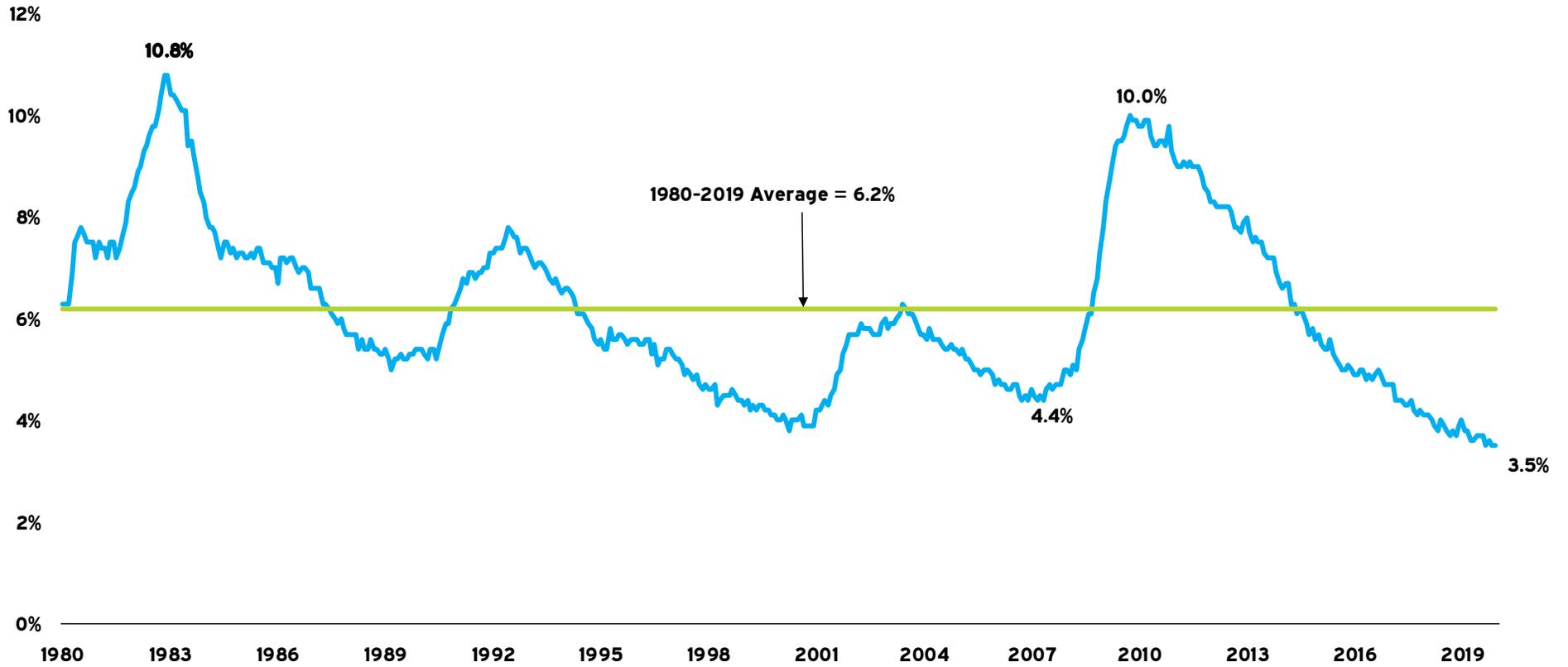
¹ Source: Bureau of Economic Analysis. Data is as of Q4 2019 and represents the first estimate.

US 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, 2019.

US Unemployment¹



¹ Source: Bureau of Labor Statistics. Data is as of December 31, 2019.

Estimated Retirement System Performance

Estimated Aggregate Performance

	January Estimate (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
Total Retirement System	-0.5	11.1	8.7	6.7	7.8
<i>60% MSCI ACWI/40% Barclays Global Aggregate</i>	-0.2	12.3	8.3	6.1	6.5

Benchmark Returns

	January Estimate (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
<i>Russell 3000</i>	-0.1	20.5	13.8	11.8	13.8
<i>MSCI EAFE</i>	-2.1	12.1	7.7	5.1	5.8
<i>MSCI Emerging Markets</i>	-4.7	3.8	7.9	4.5	3.8
<i>Barclays Aggregate</i>	1.9	9.6	4.6	3.0	3.8
<i>Barclays TIPS</i>	2.1	9.2	3.7	2.4	3.4
<i>Barclays High Yield</i>	0.0	9.4	5.9	6.0	7.4
<i>JPM GBI-EM Global Diversified</i>	-1.3	6.2	5.8	2.41	2.6
<i>S&P Global Natural Resources</i>	-7.6	-1.2	3.6	3.7	1.6

Fourth Quarter 2019 Performance Review

PRIT Look Through Analysis – Aggregate Assets | As of December 31, 2019

	Actual Asset ^{1,2} Allocation	PRIT Actual Asset Allocation ¹
Total Retirement System		
Global Equity Assets	45	44
<i>Domestic Equity Assets</i>	<i>21</i>	<i>23</i>
<i>International Developed Market Equity Assets</i>	<i>13</i>	<i>15</i>
<i>International Emerging Market Equity Assets</i>	<i>11</i>	<i>6</i>
Fixed Income Assets	23	23
<i>Core Fixed Income Assets³</i>	<i>14</i>	<i>15</i>
<i>Value-Added Fixed Income Assets⁴</i>	<i>9</i>	<i>8</i>
Real Estate Assets	10	10
Private Equity Assets	11	11
Portfolio Completion Strategies / Hedge Funds / GTAA	3	9
Real Assets (Natural Resources, Timber, Infrastructure)	7	4
Cash	1	<1

¹ Numbers may not sum to 100% due to rounding.

² Asset classes include a pro-rata allocation of the System's 31% holding of the PRIT Core Fund.

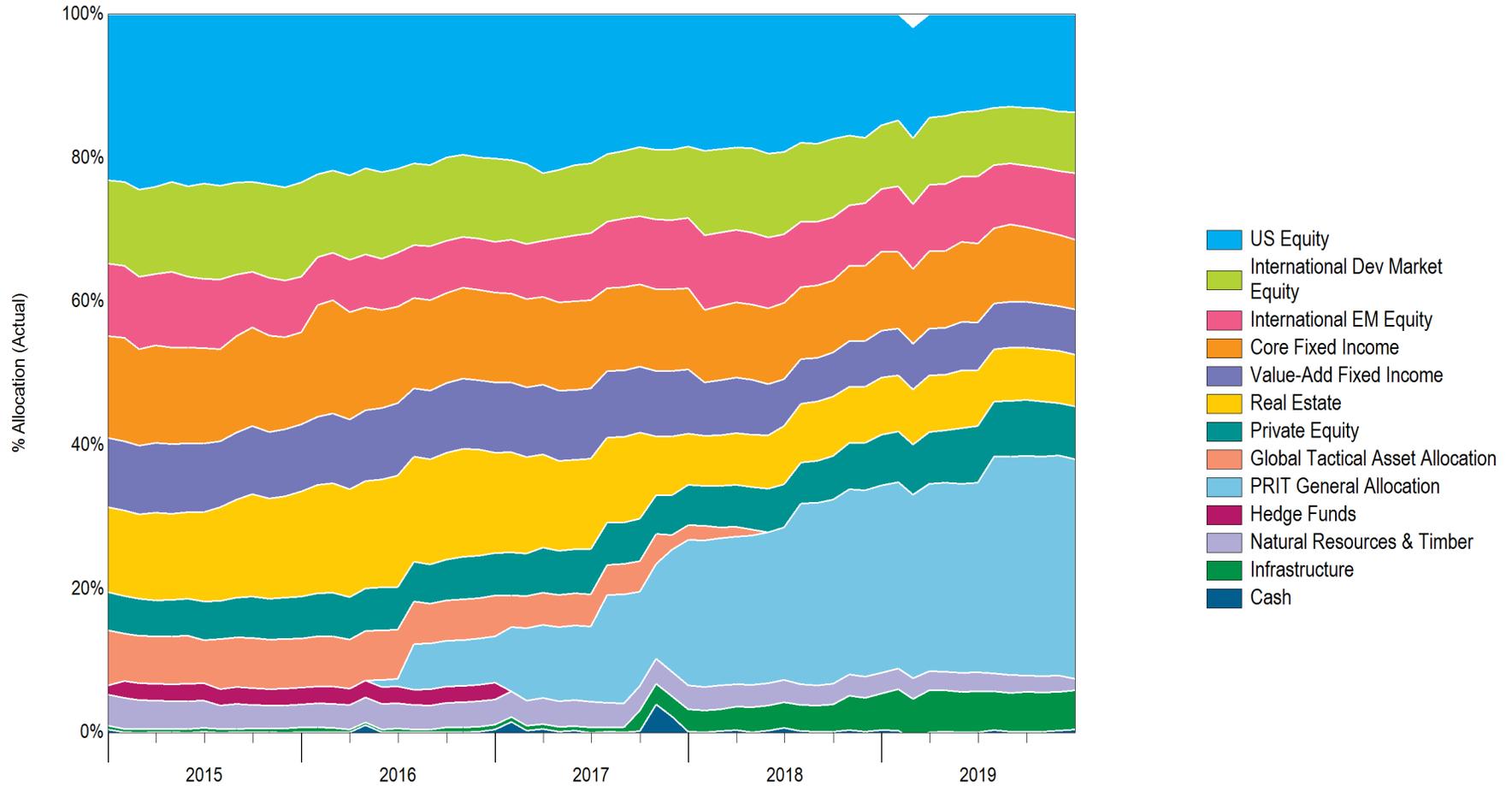
³ Retirement System figures include investment grade bonds and TIPS.

⁴ Retirement System figures include high yield fixed income and emerging market debt.

Retirement System Summary | As of December 31, 2019

Allocation vs. Policy Targets						
	Current Balance	Current Allocation	Policy	Policy Range	Within IPS Range?	
US Equity	\$142,399,445	14%	14%	9% - 19%	Yes	
International Dev Market Equity	\$87,704,406	8%	8%	4% - 12%	Yes	
International EM Equity	\$96,546,495	9%	8%	4% - 12%	Yes	
Core Fixed Income	\$101,588,128	10%	10%	5% - 15%	Yes	
Value-Add Fixed Income	\$64,827,922	6%	4%	2% - 6%	No	
Real Estate	\$75,199,045	7%	6%	4% - 8%	Yes	
Private Equity	\$76,903,093	7%	7%	4% - 10%	Yes	
PRIT General Allocation	\$317,693,109	31%	35%	0% - 50%	Yes	
Natural Resources & Timber	\$17,089,584	2%	3%	1% - 5%	Yes	
Infrastructure	\$56,805,696	5%	5%	2% - 8%	Yes	
Cash	\$4,356,263	0%	0%	0% - 5%	Yes	
Total	\$1,041,113,186	100%	100%			

Asset Allocation History
5 Years Ending December 31, 2019



Retirement System Summary | As of December 31, 2019

Asset Class Performance Summary									
	Market Value (\$)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total Retirement System	1,041,113,186	100.0	5.2	16.7	9.6	7.0	7.8	7.6	Oct-95
Total Retirement System (Net of Fees)			5.1	16.6	9.4	6.8	7.7	7.4	
<i>Custom Benchmark - Target Allocation</i>			5.3	16.9	9.1	7.1	8.1	--	Oct-95
<i>60% MSCI ACWI / 40% Barclays Global Aggregate</i>			5.5	18.6	9.3	6.1	6.4	6.3	Oct-95
Domestic Equity Assets	142,399,445	13.7	8.9	30.5	14.1	11.1	13.5	6.8	Aug-00
<i>Russell 3000</i>			9.1	31.0	14.6	11.2	13.4	6.6	Aug-00
International Developed Market Equity	87,704,406	8.4	9.1	23.0	10.4	6.8	6.7	5.4	Aug-00
<i>MSCI EAFE</i>			8.2	22.0	9.6	5.7	5.5	3.9	Aug-00
International Emerging Market Equity	96,546,495	9.3	12.2	21.9	12.9	6.6	5.4	7.2	Aug-06
<i>MSCI Emerging Markets</i>			11.8	18.4	11.6	5.6	3.7	5.4	Aug-06
Core Fixed Income	101,588,128	9.8	0.4	8.3	3.7	2.9	3.7	4.4	May-05
<i>Custom Benchmark - Fixed Income</i>			0.4	8.2	3.7	2.8	3.4	3.9	May-05
Value Added Fixed Income	64,827,922	6.2	3.2	13.0	6.4	5.5	6.0	7.2	May-05
<i>Custom High Yield Benchmark</i>			2.6	12.3	6.0	5.1	--	--	May-05
Real Estate	75,199,045	7.2	2.5	11.0	8.6	9.5	10.6	7.8	Oct-00
<i>NCREIF ODCE</i>			1.5	5.3	7.1	9.0	11.4	7.9	Oct-00
Private Equity	76,903,093	7.4	2.2	13.0	14.7	8.9	9.6	9.6	Oct-00
<i>Cambridge Associates FoF Composite 1Q Lag</i>			0.6	7.8	12.9	11.0	12.2	6.6	Oct-00
PRIT General Allocation	317,693,109	30.5	4.5	16.2	10.0	--	--	9.7	Jun-16
<i>60% MSCI ACWI / 40% Barclays Global Aggregate</i>			5.5	18.6	9.3	6.1	6.4	8.3	Jun-16
Real Assets	73,895,279	7.1	3.2	6.6	9.2	5.2	4.8	4.1	Oct-06
<i>CPI + 3%</i>			1.6	5.3	5.1	4.8	4.8	4.9	Oct-06
Cash	4,356,263	0.4							

Custom Benchmark - Fixed Income is comprised of 70% Barclays US Aggregate Index and 30% Barclays 1-10 Year TIPS Index.

Custom High Yield Benchmark is comprised of one third Barclays High Yield Index, one third Credit Suisse Leveraged Loans Index, and the final third being split evenly between JPMorgan's Emerging Market Bond Index and Emerging Markets Government Bond Index.

Retirement System Summary | As of December 31, 2019

	Trailing Performance									
	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total Retirement System	1,041,113,186	100.0	--	5.2	16.7	9.6	7.0	7.8	7.6	Oct-95
Total Retirement System (Net of Fees)				5.1	16.6	9.4	6.8	7.7	7.4	
<i>Custom Benchmark - Target Allocation</i>				5.3	16.9	9.1	7.1	8.1	--	Oct-95
<i>60% MSCI ACWI / 40% Barclays Global Aggregate</i>				5.5	18.6	9.3	6.1	6.4	6.3	Oct-95
Domestic Equity Assets	142,399,445	13.7	13.7	8.9	30.5	14.1	11.1	13.5	6.8	Aug-00
<i>Russell 3000</i>				9.1	31.0	14.6	11.2	13.4	6.6	Aug-00
SSgA S&P 500 Index (Net of Fees)	42,887,001	4.1	30.1	9.1	31.4	15.3	11.7	13.6	7.1	Aug-98
<i>S&P 500</i>				9.1	31.5	15.3	11.7	13.6	7.1	Aug-98
<i>Large Cap MStar MF Median</i>				8.6	29.7	14.1	10.3	12.7	7.2	Aug-98
<i>Large Cap MStar MF Rank</i>				37	33	35	28	26	51	Aug-98
SSgA Russell 1000 Growth Index (Net of Fees)	39,049,198	3.8	27.4	10.6	36.3	20.4	14.6	15.2	16.0	Nov-09
<i>Russell 1000 Growth</i>				10.6	36.4	20.5	14.6	15.2	16.0	Nov-09
<i>Large Growth MStar MF Median</i>				9.5	33.1	18.9	12.8	14.0	14.7	Nov-09
<i>Large Growth MStar MF Rank</i>				25	21	32	17	13	13	Nov-09
SSgA Russell 1000 Value Index (Net of Fees)	37,224,130	3.6	26.1	7.4	26.5	9.7	8.3	11.8	7.8	Jul-05
<i>Russell 1000 Value</i>				7.4	26.5	9.7	8.3	11.8	7.8	Jul-05
<i>Large Value MStar MF Median</i>				7.4	25.7	10.1	8.3	11.2	7.8	Jul-05
<i>Large Value MStar MF Rank</i>				52	43	58	47	30	50	Jul-05
SSgA S&P Midcap 400 Index (Net of Fees)	10,196,272	1.0	7.2	7.1	26.3	9.3	9.0	12.7	9.6	Sep-06
<i>S&P 400 MidCap</i>				7.1	26.2	9.3	9.0	12.7	9.5	Sep-06
<i>Mid Cap MStar MF Median</i>				7.2	30.1	11.1	8.9	12.2	8.9	Sep-06
<i>Mid Cap MStar MF Rank</i>				53	75	63	47	37	36	Sep-06

Retirement System Summary | As of December 31, 2019

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Lee Munder Small Cap Value (Net of Fees)	13,042,843	1.3	9.2	8.7	27.0	5.2	8.3	10.9	11.8	Nov-09
<i>Russell 2000 Value</i>				8.5	22.4	4.8	7.0	10.6	11.5	Nov-09
<i>Small Value MStar MF Median</i>				8.0	22.2	4.2	5.9	10.2	10.9	Nov-09
<i>Small Value MStar MF Rank</i>				28	13	37	9	32	34	Nov-09
International Developed Market Equity	87,704,406	8.4	8.4	9.1	23.0	10.4	6.8	6.7	5.4	Aug-00
<i>MSCI EAFE</i>				8.2	22.0	9.6	5.7	5.5	3.9	Aug-00
SSgA MSCI EAFE Index	61,933,066	5.9	70.6	8.2	22.5	9.9	6.0	5.8	6.2	Sep-04
<i>MSCI EAFE</i>				8.2	22.0	9.6	5.7	5.5	5.9	Sep-04
<i>Foreign MStar MF Median</i>				9.2	22.6	9.7	5.9	6.0	6.4	Sep-04
<i>Foreign MStar MF Rank</i>				74	52	47	48	57	56	Sep-04
Acadian Non-U.S. Small Cap Equity (Net of Fees)	25,771,340	2.5	29.4	11.1	22.9	11.0	9.7	9.8	8.1	Feb-05
<i>MSCI EAFE Small Cap</i>				11.5	25.0	10.9	8.9	8.7	6.9	Feb-05
<i>eV EAFE Small Cap Core Net Median</i>				12.0	23.4	10.5	8.1	9.3	8.3	Feb-05
<i>eV EAFE Small Cap Core Net Rank</i>				70	58	42	18	47	57	Feb-05
International Emerging Market Equity	96,546,495	9.3	9.3	12.2	21.9	12.9	6.6	5.4	7.2	Aug-06
<i>MSCI Emerging Markets</i>				11.8	18.4	11.6	5.6	3.7	5.4	Aug-06
PRIT Emerging Markets (Net of Fees)	96,546,495	9.3	100.0	12.2	21.9	12.8	--	--	10.8	Sep-16
<i>MSCI Emerging Markets</i>				11.8	18.4	11.6	5.6	3.7	9.4	Sep-16
<i>eV Emg Mkts Equity Net Median</i>				11.4	19.3	10.7	5.5	4.4	8.5	Sep-16
<i>eV Emg Mkts Equity Net Rank</i>				27	36	30	--	--	22	Sep-16

Retirement System Summary | As of December 31, 2019

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Core Fixed Income	101,588,128	9.8	9.8	0.4	8.3	3.7	2.9	3.7	4.4	May-05
<i>Custom Benchmark - Fixed Income</i>				0.4	8.2	3.7	2.8	3.4	3.9	May-05
IR&M Aggregate Bond	63,921,507	6.1	62.9	0.1	9.1	4.2	3.3	--	3.7	Feb-14
<i>BBgBarc US Aggregate TR</i>				0.2	8.7	4.0	3.0	3.7	3.3	Feb-14
<i>Intermediate Core Bond MStar MF Median</i>				0.1	8.5	3.9	3.0	3.8	3.2	Feb-14
<i>Intermediate Core Bond MStar MF Rank</i>				51	29	26	20	--	13	Feb-14
IR&M Intermediate TIPS	37,666,621	3.6	37.1	1.0	6.9	2.8	2.4	--	1.9	Feb-14
<i>BBgBarc US TIPS 1-10 Yr TR</i>				1.0	6.9	2.8	2.4	2.6	1.9	Feb-14
<i>Inflation-Protected Bond MStar MF Median</i>				0.9	8.1	3.1	2.3	3.0	2.0	Feb-14
<i>Inflation-Protected Bond MStar MF Rank</i>				48	63	63	46	--	60	Feb-14
Value Added Fixed Income	64,827,922	6.2	6.2	3.2	13.0	6.4	5.5	6.0	7.2	May-05
<i>Custom High Yield Benchmark</i>				2.6	12.3	6.0	5.1	--	--	May-05
High Yield Bonds	25,282,226	2.4	39.0	2.2	10.7	5.1	4.8	5.9	6.0	Jun-08
<i>50% BBgBarc US High Yield/ 50% Credit Suisse Leveraged Loans</i>				2.1	11.2	5.4	5.3	6.4	6.6	Jun-08
Loomis Sayles High Yield (Net of Fees)	13,632,566	1.3	53.9	2.8	12.1	5.6	--	--	--	Jan-96
<i>BBgBarc US High Yield TR</i>				2.6	14.3	6.4	6.1	7.6	7.1	Jan-96
<i>eV US High Yield Fixed Inc Net Median</i>				2.4	13.5	5.9	5.6	7.1	6.9	Jan-96
<i>eV US High Yield Fixed Inc Net Rank</i>				22	68	64	--	--	--	Jan-96
Loomis Sayles Bank Loans (Net of Fees)	11,649,660	1.1	46.1	1.2	8.0	3.6	--	--	--	Oct-05
<i>Credit Suisse Leveraged Loans</i>				1.7	8.2	4.5	4.5	5.2	4.6	Oct-05
<i>eV US Float-Rate Bank Loan Fixed Inc Net Median</i>				1.6	8.0	4.0	4.2	4.9	4.3	Oct-05
<i>eV US Float-Rate Bank Loan Fixed Inc Net Rank</i>				84	54	85	--	--	--	Oct-05

Retirement System Summary | As of December 31, 2019

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total Emerging Markets Debt	32,043,367	3.1	49.4	4.4	15.9	6.7	3.9	--	2.1	Aug-13
<i>50% JPM EMBI GD / 50% JPM GBI-EM</i>				3.5	14.3	6.9	4.6	4.8	3.7	Aug-13
Lazard Emerging Market Debt Blend	32,043,367	3.1	100.0	4.4	15.9	6.7	3.9	--	2.6	Aug-13
<i>50% JPM EMBI GD / 50% JPM GBI-EM</i>				3.5	14.3	6.9	4.6	4.8	3.7	Aug-13
<i>Emerging Markets Bond MStar MF Median</i>				2.8	13.9	6.0	5.5	6.0	4.8	Aug-13
<i>Emerging Markets Bond MStar MF Rank</i>				11	8	23	84	--	84	Aug-13
Mezzanine Debt	7,502,329	0.7	11.6	1.9	9.8	10.9	12.9	10.5	--	Oct-02
Northstar Mezzanine Partners VI	5,286,855	0.5	70.5							
Newstone Capital Partners II	656,634	0.1	8.8							
Northstar Mezzanine Partners V	1,503,657	0.1	20.0							
Northstar Mezzanine Partners IV	40,086	0.0	0.5							
Newstone Capital Partners	0	0.0	0.0							
Northstar Mezzanine Partners III	15,097	0.0	0.2							
Real Estate	75,199,045	7.2	7.2	2.5	11.0	8.6	9.5	10.6	7.8	Oct-00
<i>NCREIF ODCE</i>				1.5	5.3	7.1	9.0	11.4	7.9	Oct-00
Open-End Real Estate	71,213,275	6.8	94.7	2.5	10.6	8.0	8.9	10.4	7.4	Jan-99
PRIT Real Estate	71,213,275	6.8	100.0	2.5	10.6	8.0	8.7	--	11.0	Apr-10
<i>NCREIF ODCE</i>				1.5	5.3	7.1	9.0	11.4	11.6	Apr-10
<i>NCREIF ODCE Equal Weighted</i>				1.5	6.1	7.4	9.3	11.5	11.7	Apr-10
<i>Custom Benchmark</i>				1.7	8.9	7.7	8.7	11.3	11.4	Apr-10
Non-Core Real Estate	3,985,770	0.4	5.3	2.2	16.7	13.5	15.8	15.2	12.9	Oct-05
AEW Partners VII	3,985,770	0.4	100.0							

Retirement System Summary | As of December 31, 2019

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Private Equity	76,903,093	7.4	7.4	2.2	13.0	14.7	8.9	9.6	9.6	Oct-00
<i>Cambridge Associates FoF Composite 1Q Lag</i>				<i>0.6</i>	<i>7.8</i>	<i>12.9</i>	<i>11.0</i>	<i>12.2</i>	<i>6.6</i>	<i>Oct-00</i>
Buyouts	43,039,954	4.1	56.0	2.9	17.1	19.3	12.3	10.9	12.7	Oct-05
American Securities Partners VI	3,728,561	0.4	8.7							
Riverside Capital Appreciation Fund VI	4,656,622	0.4	10.8							
Vitruvian Investment Partnership I	314,503	0.0	0.7							
Riverside Micro Cap Fund III	7,050,913	0.7	16.4							
Ridgemont II	11,451,291	1.1	26.6							
Capital International Private Equity Fund VI	6,246,160	0.6	14.5							
Harvest Partners V	9,337	0.0	0.0							
TA XII	8,571,449	0.8	19.9							
Riverside Capital Fund V	604,066	0.1	1.4							
Riverside Europe III	183,893	0.0	0.4							
Charlesbank Equity Fund VI	223,160	0.0	0.5							
Fund of Funds	24,105,791	2.3	31.3	1.5	13.9	5.8	-3.4	2.2	7.1	Oct-05
PRIT Vintage Year 2016	5,257,065	0.5	21.8							
PRIT Vintage Year 2017	11,080,306	1.1	46.0							
European Strategic Partners	73,604	0.0	0.3							
INVESCO Private Capital II	40,740	0.0	0.2							
PRIT Vintage Year 2018	5,405,413	0.5	22.4							
PRIT Vintage Year 2019	2,248,664	0.2	9.3							

Retirement System Summary | As of December 31, 2019

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Venture Capital Funds	9,757,348	0.9	12.7	0.6	-5.1	-0.1	-1.2	5.0	5.6	Oct-05
Ascent Venture Partners V	4,447,304	0.4	45.6							
Asecent Venture Partners VI	4,157,657	0.4	42.6							
Boston Millennia Partners III	458,444	0.0	4.7							
Boston Millennia Partners II	427,535	0.0	4.4							
Ascent Venture Partners II	27,419	0.0	0.3							
Ascent Venture Partners IV	47,605	0.0	0.5							
Ascent Venture Partners III	191,384	0.0	2.0							
PRIT General Allocation	317,693,109	30.5	30.5	4.5	16.2	10.0	--	--	9.7	Jun-16
<i>60% MSCI ACWI / 40% Barclays Global Aggregate</i>				5.5	18.6	9.3	6.1	6.4	8.3	Jun-16
PRIT General Allocation Fund (Net of Fees)	317,693,109	30.5	100.0	4.5	16.2	10.0	--	--	9.7	Jun-16
<i>60% MSCI ACWI / 40% Barclays Global Aggregate</i>				5.5	18.6	9.3	6.1	6.4	8.3	Jun-16
Real Assets	73,895,279	7.1	7.1	3.2	6.6	9.2	5.2	4.8	4.1	Oct-06
<i>CPI + 3%</i>				1.6	5.3	5.1	4.8	4.8	4.9	Oct-06
Natural Resources Assets	14,161,901	1.4	19.2	-1.7	-6.9	3.1	-3.7	--	--	--
<i>S&P Global Natural Resources Index TR USD</i>				9.5	17.2	7.9	4.8	1.6	--	--

Retirement System Summary | As of December 31, 2019

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Natural Resources (Public)	8,896,842	0.9	62.8	8.2	16.3	8.0	3.8	--	-1.4	May-11
SSgA Global Natural Resources Stock Index (Net of Fees)	8,896,842	0.9	100.0	8.2	16.2	7.9	--	--	--	May-11
S&P Global LargeMidCap Commodity and Resources NR USD				8.0	15.9	7.5	3.3	1.2	-1.6	May-11
Natural Resources MStar MF Median				7.9	14.9	1.5	0.8	0.9	-2.2	May-11
Natural Resources MStar MF Rank				48	42	10	--	--	--	May-11
Natural Resources (Private)	5,265,059	0.5	37.2	-14.6	-29.9	-3.0	-13.1	--	3.0	Jul-10
White Deer Energy II	4,929,712	0.5	93.6							
White Deer Energy	335,347	0.0	6.4							
Timber	2,927,683	0.3	4.0	4.6	-7.3	-3.9	-2.5	-0.8	0.8	Oct-05
NCREIF Timberland (1-Quarter Lag)				0.2	2.1	3.1	4.4	4.0	6.5	Oct-05
RMK Select Timberland Investment Fund I	665,295	0.1	22.7							
Hancock Timberland VII	1,522,388	0.1	52.0							
RMK Select Timberland Investment Fund II	740,000	0.1	25.3							
RMK Balanced Timberland B	0	0.0	0.0							
Infrastructure	56,805,696	5.5	76.9	4.3	13.5	17.5	24.8	21.2	16.0	Jun-08
CPI+5%				2.0	7.3	7.1	6.8	6.8	6.6	Jun-08
IFM Global Infrastructure (Net of Fees)	43,537,038	4.2	76.6	5.2	14.6	--	--	--	16.4	Sep-17
Global Infrastructure Partners	978,411	0.1	1.7							
Global Infrastructure Partners III	12,151,150	1.2	21.4							
Global Infrastructure Partners IV, L.P.	139,096	0.0	0.2							

Retirement System Summary | As of December 31, 2019

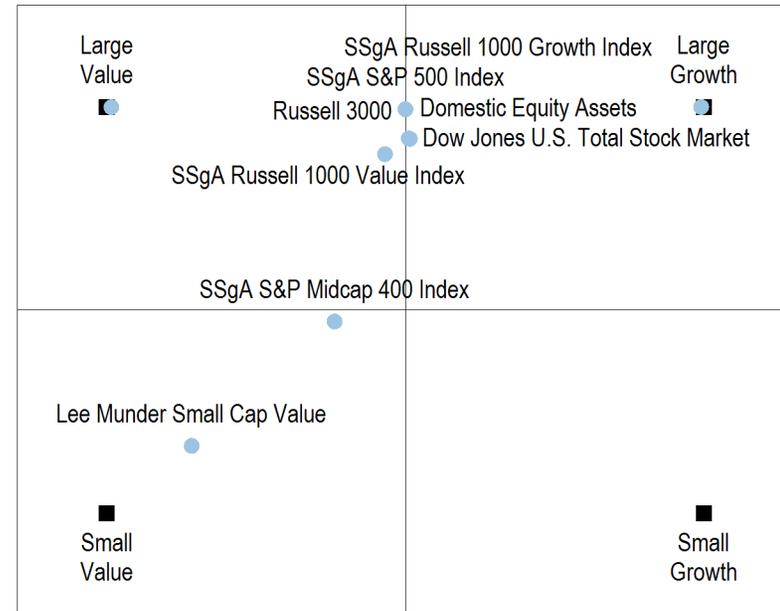
	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Cash	4,356,263	0.4	0.4							
Cash	4,356,263	0.4	100.0							

Domestic Equity Assets | As of December 31, 2019

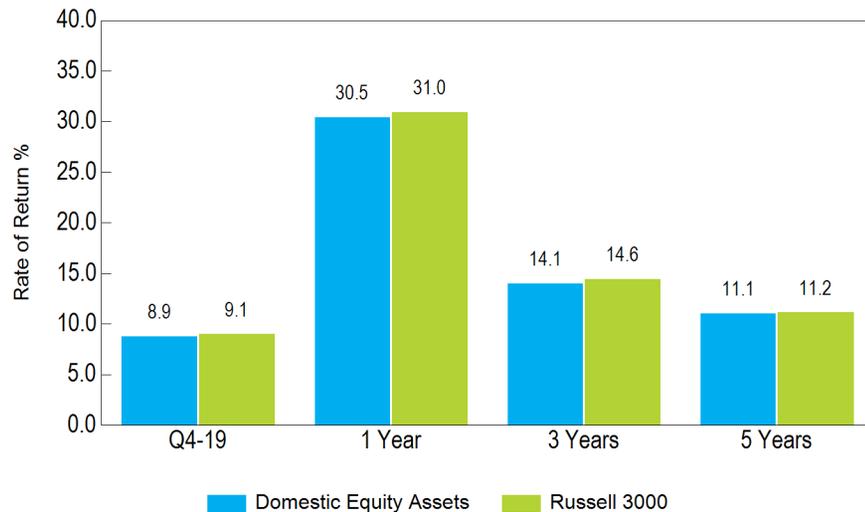
Asset Allocation on December 31, 2019

	Actual	Actual
SSgA S&P 500 Index	\$42,887,001	30.1%
SSgA Russell 1000 Growth Index	\$39,049,198	27.4%
SSgA Russell 1000 Value Index	\$37,224,130	26.1%
SSgA S&P Midcap 400 Index	\$10,196,272	7.2%
Lee Munder Small Cap Value	\$13,042,843	9.2%
Total	\$142,399,445	100.0%

Domestic Equity Assets Style Map 3 Years Ending December 31, 2019



Return Summary Ending December 31, 2019

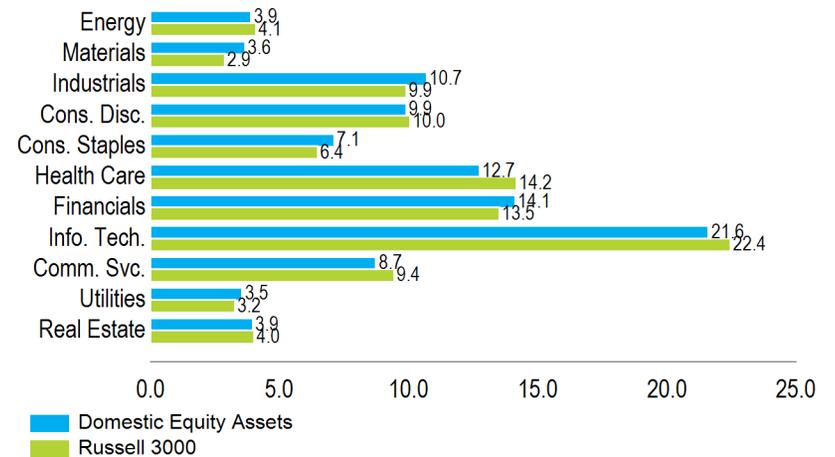


Domestic Equity Assets | As of December 31, 2019

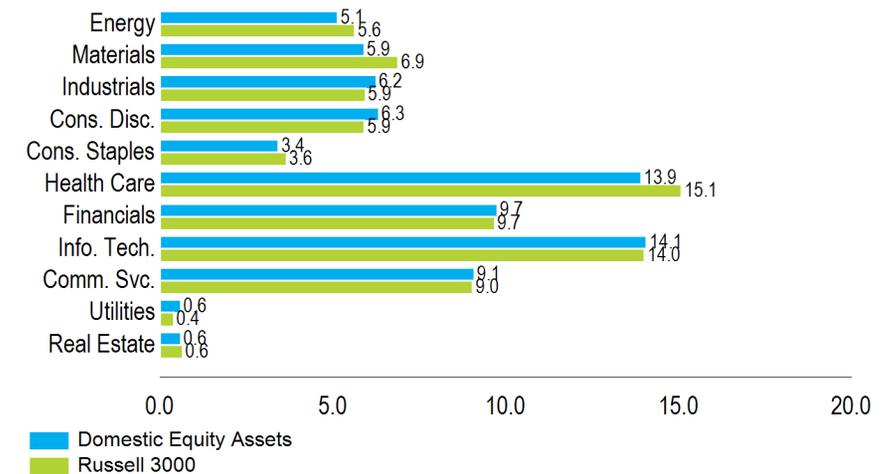
Domestic Equity Characteristics			
	Portfolio	Index	Portfolio
	Q4-19	Q4-19	Q3-19
Market Value			
Market Value (\$M)	142.40	--	130.81
Number Of Holdings	1211	2992	1215
Characteristics			
Weighted Avg. Market Cap. (\$B)	215.94	230.54	183.74
Median Market Cap (\$B)	9.84	1.76	9.23
P/E Ratio	22.63	22.77	20.37
Yield	1.80	1.79	1.90
EPS Growth - 5 Yrs.	12.21	13.06	12.41
Price to Book	3.48	3.65	3.30
Beta (holdings; domestic)	1.02	1.03	1.02

Top Holdings	
APPLE	3.7%
MICROSOFT	3.5%
AMAZON.COM	2.2%
FACEBOOK CLASS A	1.4%
BERKSHIRE HATHAWAY 'B'	1.3%
JP MORGAN CHASE & CO.	1.3%
ALPHABET A	1.2%
ALPHABET 'C'	1.2%
JOHNSON & JOHNSON	1.1%
VISA 'A'	0.9%
Total	17.9%

Sector Allocation (%) vs Russell 3000



Sector Returns (%) vs Russell 3000

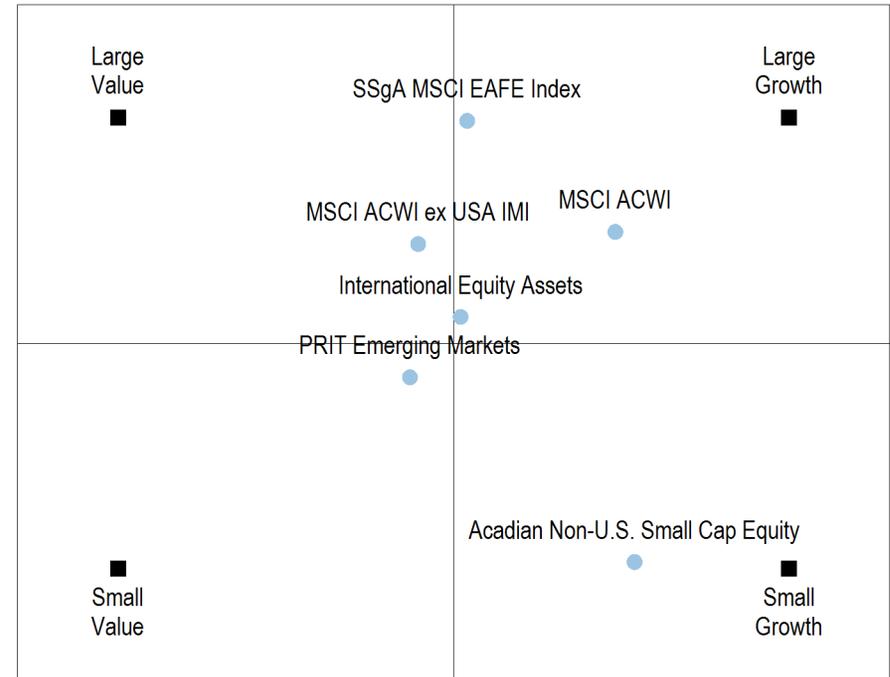


International Equity Assets | As of December 31, 2019

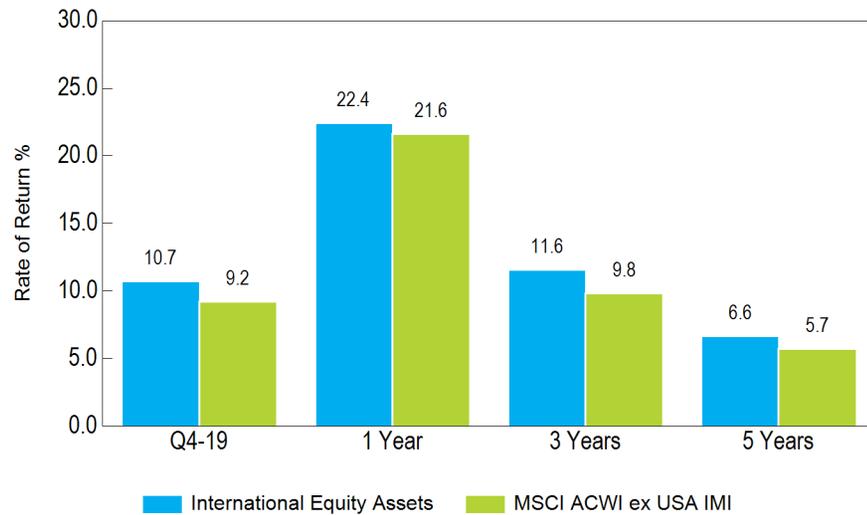
Asset Allocation on December 31, 2019

	Actual	Actual
SSgA MSCI EAFE Index	\$61,933,066	33.6%
Acadian Non-U.S. Small Cap Equity	\$25,771,340	14.0%
PRIT Emerging Markets	\$96,546,495	52.4%
Total	\$184,250,901	100.0%

International Equity Assets Style Map 3 Years Ending December 31, 2019



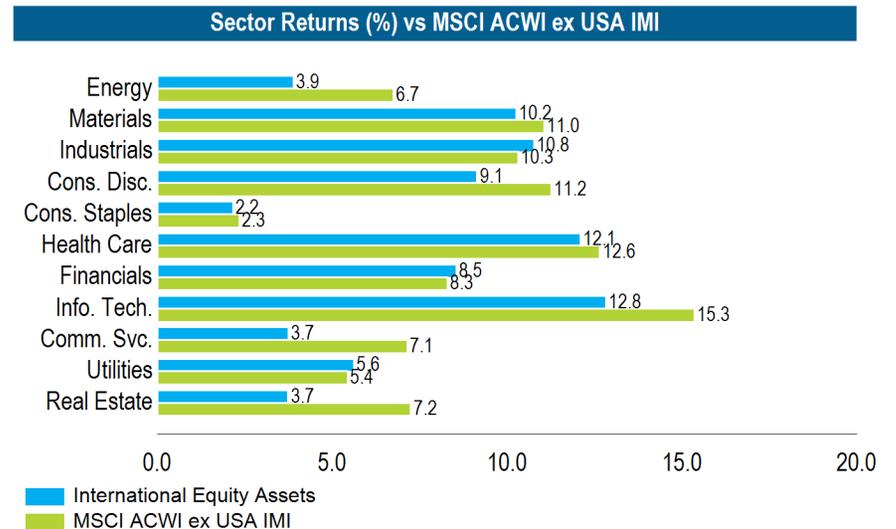
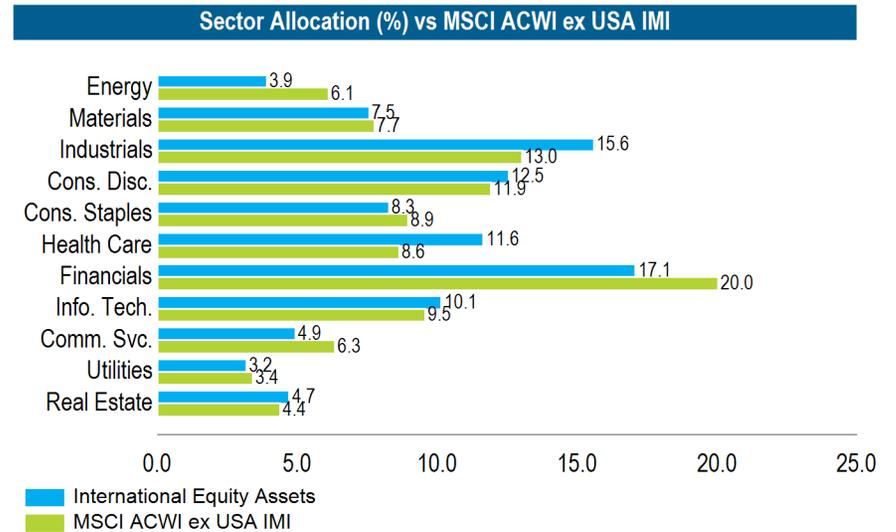
Return Summary Ending December 31, 2019



International Equity Assets | As of December 31, 2019

International Equity Characteristics			
	Portfolio	Index	Portfolio
	Q4-19	Q4-19	Q3-19
Market Value			
Market Value (\$M)	184.25	--	166.47
Number Of Holdings	2550	6587	2353
Characteristics			
Weighted Avg. Market Cap. (\$B)	45.29	64.46	43.05
Median Market Cap (\$B)	1.39	1.69	1.69
P/E Ratio	16.00	16.21	14.82
Yield	3.01	2.98	3.17
EPS Growth - 5 Yrs.	9.09	9.27	9.11
Price to Book	2.29	2.38	2.23
Beta (holdings; domestic)	0.99	1.03	0.98

Top Holdings	
NESTLE 'R'	1.5%
ROCHE HOLDING	1.1%
NOVARTIS 'R'	0.9%
TOYOTA MOTOR	0.8%
HSBC HOLDINGS	0.7%
TOTAL	0.6%
SAP	0.6%
ASTRAZENECA	0.6%
DISCOUNT	0.6%
LVMH	0.6%
Total	8.1%

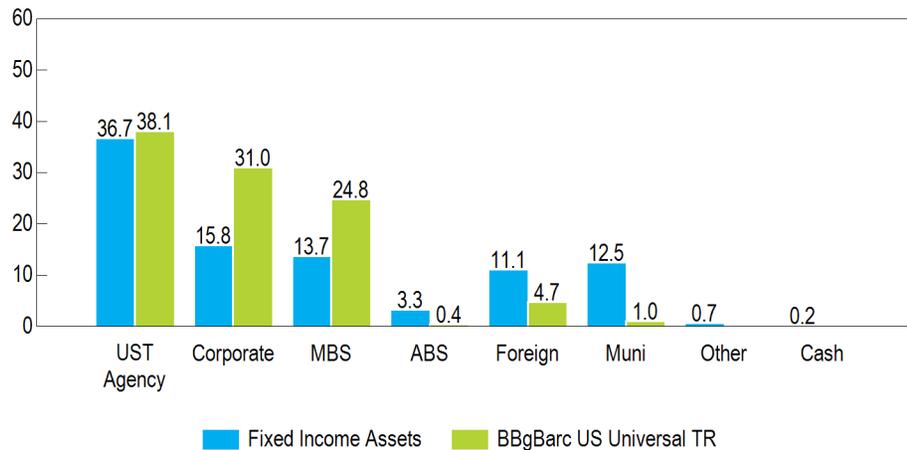


Fixed Income Assets | As of December 31, 2019

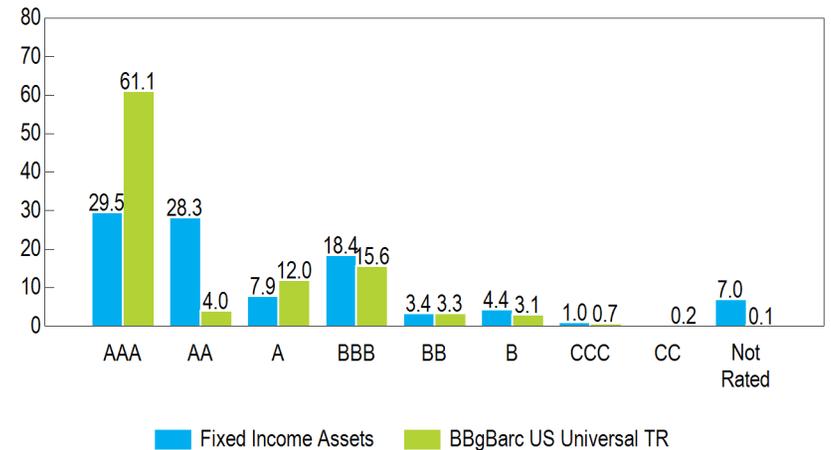
Asset Allocation on December 31, 2019		
	Actual	Actual
IR&M Aggregate Bond	\$63,921,507	38.4%
IR&M Intermediate TIPS	\$37,666,621	22.6%
Lazard Emerging Market Debt Blend	\$32,043,367	19.3%
Loomis Sayles Bank Loans	\$11,649,660	7.0%
Loomis Sayles High Yield	\$13,632,566	8.2%
Newstone Capital Partners II	\$656,634	0.4%
Northstar Mezzanine Partners III	\$15,097	0.0%
Northstar Mezzanine Partners IV	\$40,086	0.0%
Northstar Mezzanine Partners V	\$1,503,657	0.9%
Northstar Mezzanine Partners VI	\$5,286,855	3.2%
Total	\$166,416,050	100.0%

Fixed Income Characteristics vs. BBgBarc US Universal TR			
	Portfolio Q4-19	Index Q4-19	Portfolio Q3-19
Fixed Income Characteristics			
Yield to Maturity	2.79	2.75	2.66
Average Duration	5.72	6.13	5.78
Average Quality	AA	AA	AA
Weighted Average Maturity	7.84	12.18	7.89

Sector Allocation



Credit Quality Allocation



Private Equity Assets | As of December 31, 2019

Partnership	Vintage Year	Committed (\$)	Called	Distributed	Fair Value	Net IRR	Net Multiple
Ascent Venture Partners II	1995	\$2.0	\$1.9	\$6.4	<\$0.1	27.3%	3.3x
INVESCO Private Capital Fund of Funds	1998	\$5.0	\$4.6	\$6.6	\$0.1	BUY: 9.7%, VC:-2.2%, Non-US 10.0%	1.4x
Ascent Venture Partners III	1999	\$5.0	\$4.7	\$5.7	\$0.2	3.8%	1.3x
European Strategic Partners	2000	€ 6.0	\$6.9	\$10.9	<\$0.1	11.4%	1.6x
Boston Millennia Partners II	2000	\$4.0	\$4.0	\$3.0	\$0.5	-1.5%	0.9x
Ascent Venture Partners IV	2003	\$3.0	\$3.0	\$0.5	<\$0.1	-31.4%	0.2x
Charlesbank Equity Fund VI	2005	\$3.0	\$2.9	\$3.8	\$0.3	9.9%	1.4x
Riverside Europe III	2006	€ 5.0	\$6.3	\$5.1	\$0.2	-1.1%	0.8x
Harvest Partners V	2007	\$6.0	\$5.5	\$9.3	\$1.0	18.6%	1.9x
Riverside Capital Fund V	2007	\$4.0	\$3.8	\$4.4	\$0.7	8.7%	1.3x
Vitruvian Investment Partnership I	2007	€ 4.0	\$4.4	\$6.4	\$4.3	11.2%	2.4x
Boston Millennia Partners III	2010	\$3.0	\$2.0	\$2.8	\$0.5	16.6%	1.7x
Capital International Private Equity Fund VI	2010	\$7.5	\$6.3	\$2.0	\$6.6	-4.6%	1.4x
Ascent Venture Partners V	2010	\$5.0	\$4.7	\$3.3	\$4.3	8.4%	1.6x
American Securities Partners VI	2011	\$7.5	\$6.3	\$9.7	\$3.3	21.8%	2.1x
Riverside Capital Appreciation Fund VI	2013	\$7.5	\$7.0	\$3.7	\$6.5	13.9%	1.5x
Riverside Micro Cap Fund III	2014	\$7.5	\$4.5	\$2.9	\$7.4	25.8%	2.3x
Ridgmont II	2015	\$10.0	\$6.7	\$1.2	\$9.1	21.9%	1.4x
Ascent Venture Partners VI	2015	\$5.0	\$3.7	\$0.0	\$4.4	8.7%	1.2x
TA XII	2015	\$6.7	\$4.2	\$0.7	\$6.7	27.9%	1.8x
PRIT VY 2016	2016	\$8.3	\$5.3	\$0.0	\$5.4	NM	1.0x
PRIT VY 2017	2017	\$31.2	\$8.2	\$0.1	\$8.3	NM	1.0x
PRIT VY 2018	2018	\$14.1	\$4.6	\$0.0	\$4.1	NM	0.9x
Total Program (USD \$)		\$145.3	\$111.6	\$88.5	\$73.9		1.5x
Total Program (EUR €)		€ 15.0					

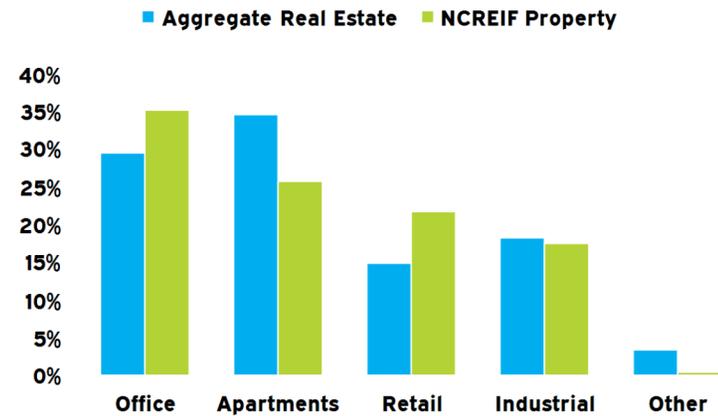
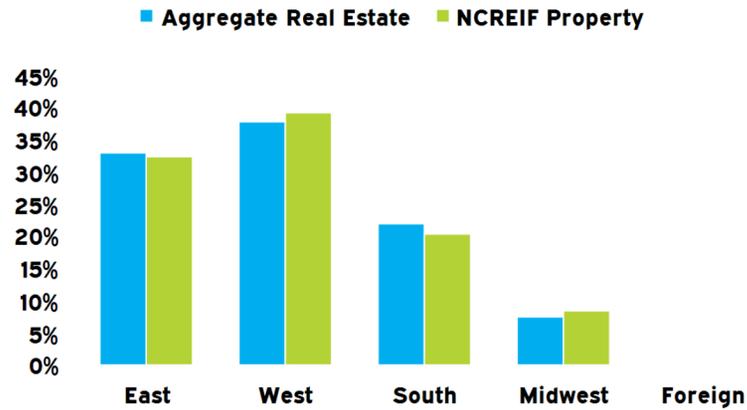
*Fair values for private markets assets are based on reported values of 3/31/19, adjusted for cash flows through 6/30/19.
Unless otherwise denoted, all values have been converted into US dollars using 3/31/2019 exchange rates.*

*Ascent Venture Partners II is winding down as of 8/31/2017, left over value is tax held back.
European Strategic Partners is winding down as of 3/31/2018 and only provides data annually.*

Mezzanine Debt Assets | As of December 31, 2019

Partnership	Vintage Year	Committed(\$)	Called	Distributed	Fair Value	Net IRR	Net Multiple
Newstone Capital	2006	\$5.0	\$5.9	\$7.9	\$<0.1	7.9%	1.3x
Newstone II	2010	\$5.0	\$6.6	\$7.4	\$0.7	8.5%	1.2x
Northstar Mezzanine Partners III	2002	\$5.0	\$5.0	\$7.8	\$0.7	10.7%	1.7x
Northstar Mezzanine Partners IV	2005	\$5.0	\$5.3	\$7.9	\$0.2	9.9%	1.5x
Northstar Mezzanine Partners V	2007	\$5.0	\$5.8	\$5.9	\$1.7	7.2%	1.3x
Northstar Mezzanine Partners VI	2014	\$7.5	\$7.2	\$3.7	\$5.5	9.1%	1.3x
Total Program		\$32.5	\$35.8	\$40.5	\$8.9		1.4x

Partnership	Market	Strategy	Vehicle	Fair Value	Net IRR
PRIT Real Estate	Private/Public	Diversified Core	Open-end	\$67.7	NA
AEW VII	Private	Opportunistic	Close-End	\$4.8	13.2%
AEW VI	Private	Opportunistic	Close-End	\$2.2	15.7%
Total Program				\$74.7	



Regional and property type allocation as of 9/30/2019.

Partnership	Vintage Year	Committed(\$)	Called	Distributed	Fair Value	Net IRR
RMK Fund B	1999	\$5.0	\$5.0	\$8.3	\$12	6.7%
RMK Fund 1	2001	\$5.0	\$5.0	\$1.4	\$4.4	2.4%
White Deer	2010	\$5.0	\$5.4	\$7.0	\$0.4	22.5%
Hancock VII	2005	\$5.0	\$5.0	\$3.6	\$1.5	1.2%
RMK Fund II	2007	\$5.0	\$5.0	\$1.8	\$2.8	0.1%
Global Infrastructure Partners B	2008	\$8.0	\$7.1	\$17.8	\$1.8	13.8%
White Deer II	2013	\$10.0	\$7.9	\$0.8	\$6.7	0.8%
Global Infrastructure Partners III	2016	\$15.0	\$11.0	\$0.7	\$12.2	7.8%
IFM	2017	\$20.0	\$35.0	\$2.0	\$40.5	12%
Total Program		\$78.0	\$86.4	\$43.5	\$71.5	

SSgA S&P 500 Index | As of December 31, 2019

Account Information

Account Name	SSgA S&P 500 Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	8/01/98
Account Type	US Equity
Benchmark	S&P 500
Universe	Large Cap MStar MF

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA S&P 500 Index	9.1	31.4	31.4	15.3	11.7	13.6	7.1	Aug-98
S&P 500	9.1	31.5	31.5	15.3	11.7	13.6	7.1	Aug-98
Large Cap MStar MF Median	8.6	29.7	29.7	14.1	10.3	12.7	7.2	Aug-98
Large Cap MStar MF Rank	37	33	33	35	28	26	51	Aug-98

U.S. Effective Style Map 3 Years Ending December 31, 2019

Large Value ■	SSgA S&P 500 Index ●	Large Growth ■
Small Value ■		Small Growth ■

SSgA S&P 500 Index Characteristics

	Portfolio Q4-19	Index Q4-19	Portfolio Q3-19
Market Value			
Market Value (\$M)	42.9	--	39.3
Number Of Holdings	505	505	505
Sector Distribution			
Energy	4.3	4.2	4.5
Materials	2.6	2.6	2.7
Industrials	9.1	9.0	9.3
Consumer Discretionary	9.8	10.1	10.1
Consumer Staples	7.2	7.8	7.6
Health Care	14.2	13.8	13.7
Financials	13.0	13.3	13.0
Information Technology	23.2	22.8	22.0
Communication Services	10.3	10.4	10.3
Utilities	3.3	3.2	3.6
Real Estate	2.9	2.8	3.2
Company Size Distribution			
Weighted Avg. Market Cap. (\$B)	271.0	272.0	231.6
Median Market Cap. (\$B)	23.6	23.6	22.5
Large Cap. (%)	54.0	54.2	51.7
Medium/Large Cap. (%)	29.3	29.4	31.5
Medium Cap. (%)	14.2	13.9	15.1
Medium/Small Cap. (%)	2.5	2.4	1.6
Small Cap. (%)	0.0	0.1	0.0

SSgA Russell 1000 Growth Index | As of December 31, 2019

Account Information

Account Name	SSgA Russell 1000 Growth Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	11/01/09
Account Type	US Equity
Benchmark	Russell 1000 Growth
Universe	Large Growth MStar MF

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA Russell 1000 Growth Index	10.6	36.3	36.3	20.4	14.6	15.2	16.0	Nov-09
Russell 1000 Growth	10.6	36.4	36.4	20.5	14.6	15.2	16.0	Nov-09
Large Growth MStar MF Median	9.5	33.1	33.1	18.9	12.8	14.0	14.7	Nov-09
Large Growth MStar MF Rank	25	21	21	32	17	13	13	Nov-09

U.S. Effective Style Map

3 Years Ending December 31, 2019

Large Value	SSgA Russell 1000 Growth Index	Large Growth
■	Russell 1000 Growth	■
Small Value		Small Growth
■		■

SSgA Russell 1000 Growth Index Characteristics

	Portfolio Q4-19	Index Q4-19	Portfolio Q3-19
Market Value			
Market Value (\$M)	39.0	--	35.3
Number Of Holdings	530	530	529
Sector Distribution			
Energy	0.3	0.3	0.3
Materials	1.3	1.3	1.4
Industrials	9.3	9.3	10.0
Consumer Discretionary	13.8	13.8	14.4
Consumer Staples	4.6	4.6	4.9
Health Care	14.7	14.7	14.2
Financials	3.1	3.1	3.2
Information Technology	39.1	38.9	37.8
Communication Services	11.4	11.6	11.2
Utilities	0.0	0.0	0.0
Real Estate	2.4	2.4	2.6
Company Size Distribution			
Weighted Avg. Market Cap. (\$B)	365.7	362.9	303.8
Median Market Cap. (\$B)	13.1	13.0	12.2
Large Cap. (%)	59.1	57.8	55.4
Medium/Large Cap. (%)	22.9	23.9	26.2
Medium Cap. (%)	12.3	12.7	12.9
Medium/Small Cap. (%)	5.3	5.2	5.4
Small Cap. (%)	0.4	0.4	0.1

SSgA Russell 1000 Value Index | As of December 31, 2019

Account Information

Account Name	SSgA Russell 1000 Value Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	7/01/05
Account Type	US Equity
Benchmark	Russell 1000 Value
Universe	Large Value MStar MF

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA Russell 1000 Value Index	7.4	26.5	26.5	9.7	8.3	11.8	7.8	Jul-05
Russell 1000 Value	7.4	26.5	26.5	9.7	8.3	11.8	7.8	Jul-05
Large Value MStar MF Median	7.4	25.7	25.7	10.1	8.3	11.2	7.8	Jul-05
Large Value MStar MF Rank	52	43	43	58	47	30	50	Jul-05

SSgA Russell 1000 Value Index Characteristics

	Portfolio Q4-19	Index Q4-19	Portfolio Q3-19
Market Value			
Market Value (\$M)	37.2	--	34.7
Number Of Holdings	762	764	758
Sector Distribution			
Energy	8.2	8.2	8.4
Materials	4.3	4.3	4.3
Industrials	9.7	9.7	9.5
Consumer Discretionary	5.9	5.9	6.1
Consumer Staples	8.9	8.9	9.2
Health Care	12.9	13.0	12.4
Financials	23.9	23.9	23.6
Information Technology	6.3	6.3	6.1
Communication Services	8.0	8.2	8.1
Utilities	6.6	6.6	7.0
Real Estate	5.0	5.2	5.3
Company Size Distribution			
Weighted Avg. Market Cap. (\$B)	124.7	123.3	115.8
Median Market Cap. (\$B)	9.6	9.6	9.0
Large Cap. (%)	38.3	38.5	37.9
Medium/Large Cap. (%)	30.5	30.4	30.9
Medium Cap. (%)	17.9	17.9	20.0
Medium/Small Cap. (%)	10.8	10.5	10.2
Small Cap. (%)	2.4	2.7	0.9

U.S. Effective Style Map 3 Years Ending December 31, 2019

Large Value SSgA Russell 1000 Value Index	Large Growth
Russell 1000 Value	■
Small Value	Small Growth
■	■

SSgA S&P Midcap 400 Index | As of December 31, 2019

Account Information

Account Name	SSgA S&P Midcap 400 Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	9/01/06
Account Type	US Equity
Benchmark	S&P 400 MidCap
Universe	Mid Cap MStar MF

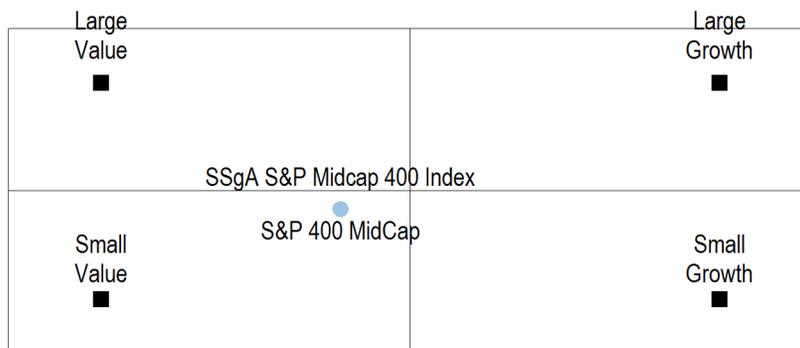
Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA S&P Midcap 400 Index	7.1	26.3	26.3	9.3	9.0	12.7	9.6	Sep-06
S&P 400 MidCap	7.1	26.2	26.2	9.3	9.0	12.7	9.5	Sep-06
Mid Cap MStar MF Median	7.2	30.1	30.1	11.1	8.9	12.2	8.9	Sep-06
Mid Cap MStar MF Rank	53	75	75	63	47	37	36	Sep-06

SSgA S&P Midcap 400 Index Characteristics

	Portfolio Q4-19	Index Q4-19	Portfolio Q3-19
Market Value			
Market Value (\$M)	10.2	--	9.5
Number Of Holdings	400	400	401
Characteristics			
Weighted Avg. Market Cap. (\$B)	6.0	6.0	5.8
Median Market Cap (\$B)	4.3	4.3	4.1
P/E Ratio	21.7	21.7	20.0
Yield	1.7	1.7	1.7
EPS Growth - 5 Yrs.	11.6	11.5	11.0
Price to Book	2.7	2.8	2.7
Beta (holdings; domestic)	1.1	1.1	1.1
Sector Distribution			
Energy	2.1	2.2	2.2
Materials	6.1	6.1	6.1
Industrials	15.6	15.5	15.9
Consumer Discretionary	13.6	14.1	12.5
Consumer Staples	2.9	3.3	2.8
Health Care	9.7	9.6	9.8
Financials	16.6	16.5	16.8
Information Technology	15.6	15.4	15.2
Communication Services	1.9	2.0	2.4
Utilities	4.6	4.3	4.9
Real Estate	11.2	10.9	11.4

U.S. Effective Style Map 3 Years Ending December 31, 2019



Lee Munder Small Cap Value | As of December 31, 2019

Account Information

Account Name	Lee Munder Small Cap Value
Account Structure	Separate Account
Investment Style	Active
Inception Date	11/01/09
Account Type	US Equity
Benchmark	Russell 2000 Value
Universe	Small Value MStar MF

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Lee Munder Small Cap Value	8.9	28.1	28.1	6.1	9.0	11.3	12.1	Nov-09
Russell 2000 Value	8.5	22.4	22.4	4.8	7.0	10.6	11.5	Nov-09
Small Value MStar MF Median	8.0	22.2	22.2	4.2	5.9	10.2	10.9	Nov-09
Small Value MStar MF Rank	26	12	12	18	3	19	25	Nov-09

U.S. Effective Style Map

3 Years Ending December 31, 2019

Large Value	Large Growth
Small Value	Small Growth
 Lee Munder Small Cap Value  Russell 2000 Value	

Lee Munder Small Cap Value Characteristics

	Portfolio Q4-19	Index Q4-19	Portfolio Q3-19
Market Value			
Market Value (\$M)	13.0	--	12.0
Number Of Holdings	91	1402	92
Sector Distribution			
Energy	2.2	5.8	2.2
Materials	9.9	4.7	10.6
Industrials	19.1	12.6	21.3
Consumer Discretionary	7.0	9.7	6.5
Consumer Staples	12.3	2.7	11.2
Health Care	3.6	5.4	2.6
Financials	20.8	30.2	20.4
Information Technology	12.2	9.7	11.8
Communication Services	2.4	2.2	2.2
Utilities	5.2	5.9	5.2
Real Estate	3.3	11.1	4.2
Company Size Distribution			
Weighted Avg. Market Cap. (\$B)	3.3	2.2	3.1
Median Market Cap. (\$B)	2.7	0.7	2.5
Large Cap. (%)	0.0	0.0	0.0
Medium/Large Cap. (%)	0.0	0.0	0.0
Medium Cap. (%)	0.0	0.0	0.7
Medium/Small Cap. (%)	30.0	8.6	47.4
Small Cap. (%)	70.0	91.3	51.9

SSgA MSCI EAFE Index | As of December 31, 2019

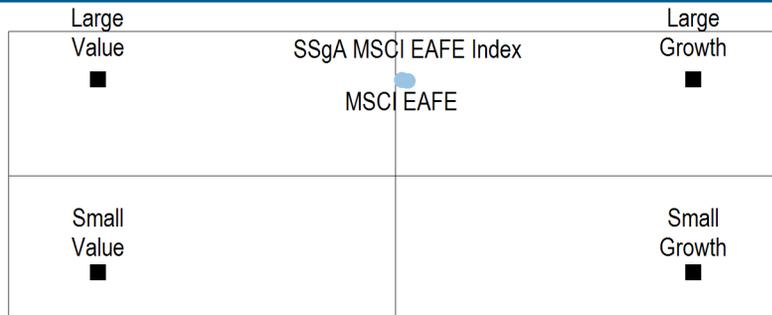
Account Information

Account Name	SSgA MSCI EAFE Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	9/01/04
Account Type	Non-US Stock Developed
Benchmark	MSCI EAFE
Universe	Foreign MStar MF

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA MSCI EAFE Index	8.2	22.5	22.5	9.9	6.0	5.8	6.2	Sep-04
MSCI EAFE	8.2	22.0	22.0	9.6	5.7	5.5	5.9	Sep-04
Foreign MStar MF Median	9.2	22.6	22.6	9.7	5.9	6.0	6.4	Sep-04
Foreign MStar MF Rank	74	52	52	47	48	57	56	Sep-04

Non U.S. Effective Style Map vs. EAFE 3 Years Ending December 31, 2019



SSgA MSCI EAFE Index Characteristics

	Portfolio Q4-19	Index Q4-19	Portfolio Q3-19
Market Value			
Market Value (\$M)	61.9	--	57.3
Number Of Holdings	930	918	939
Sector Distribution			
Energy	4.8	4.9	5.1
Materials	7.1	7.1	7.0
Industrials	15.1	15.1	14.7
Consumer Discretionary	11.6	11.6	11.5
Consumer Staples	11.2	11.3	12.0
Health Care	12.1	12.2	11.5
Financials	18.6	18.6	18.6
Information Technology	7.0	7.0	6.8
Communication Services	5.2	5.2	5.4
Utilities	3.7	3.7	3.8
Real Estate	3.2	3.4	3.3
Company Size Distribution			
Weighted Avg. Market Cap. (\$B)	63.6	63.7	60.3
Median Market Cap. (\$B)	10.8	10.8	9.8
Large Cap. (%)	73.8	74.4	73.2
Medium Cap. (%)	21.6	21.1	21.2
Small Cap. (%)	4.6	4.5	5.6

Acadian Non-U.S. Small Cap Equity | As of December 31, 2019

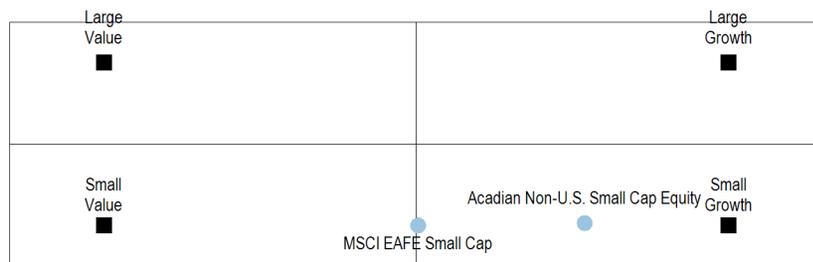
Account Information

Account Name	Acadian Non-U.S. Small Cap Equity
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	2/01/05
Account Type	Non-US Stock Developed
Benchmark	MSCI EAFE Small Cap
Universe	eV EAFE Small Cap Core Net

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Acadian Non-U.S. Small Cap Equity	11.1	22.9	22.9	11.0	9.7	9.8	8.1	Feb-05
MSCI EAFE Small Cap	11.5	25.0	25.0	10.9	8.9	8.7	6.9	Feb-05
eV EAFE Small Cap Core Net Median	12.0	23.4	23.4	10.5	8.1	9.3	8.3	Feb-05
eV EAFE Small Cap Core Net Rank	70	58	58	42	18	47	57	Feb-05

Non U.S. Effective Style Map vs. EAFE 3 Years Ending December 31, 2019



Acadian Non-U.S. Small Cap Equity Characteristics

	Portfolio Q4-19	Index Q4-19	Portfolio Q3-19
Market Value			
Market Value (\$M)	25.8	--	23.2
Number Of Holdings	1652	2345	1443
Characteristics			
Weighted Avg. Market Cap. (\$B)	2.3	2.8	2.3
Median Market Cap (\$B)	0.5	1.1	0.5
P/E Ratio	14.0	17.0	12.9
Yield	2.6	2.5	2.8
EPS Growth - 5 Yrs.	14.0	11.0	14.3
Price to Book	2.1	2.2	2.0
Beta (holdings; domestic)	0.9	0.9	0.9
Sector Distribution			
Energy	1.7	2.5	2.2
Materials	8.6	8.0	9.2
Industrials	16.8	21.6	14.3
Consumer Discretionary	14.7	12.6	14.9
Consumer Staples	1.3	6.1	2.4
Health Care	10.6	7.3	11.0
Financials	13.5	10.8	12.6
Information Technology	17.4	10.2	16.8
Communication Services	4.3	4.6	4.8
Utilities	1.9	2.4	2.4
Real Estate	8.2	13.6	8.4

PRIT Emerging Markets | As of December 31, 2019

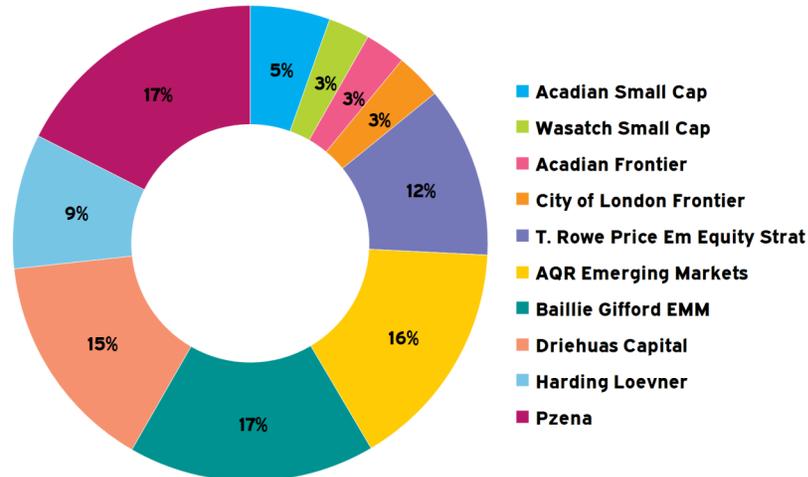
Account Information

Account Name	PRIT Emerging Markets
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	9/01/16
Account Type	Non-US Stock Emerging
Benchmark	MSCI Emerging Markets
Universe	eV Emg Mkts Equity Net

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
PRIT Emerging Markets	12.2	21.9	21.9	12.8	--	--	10.8	Sep-16
<i>MSCI Emerging Markets</i>	<i>11.8</i>	<i>18.4</i>	<i>18.4</i>	<i>11.6</i>	<i>5.6</i>	<i>3.7</i>	<i>9.4</i>	<i>Sep-16</i>
<i>eV Emg Mkts Equity Net Median</i>	<i>11.4</i>	<i>19.3</i>	<i>19.3</i>	<i>10.7</i>	<i>5.5</i>	<i>4.4</i>	<i>8.5</i>	<i>Sep-16</i>
<i>eV Emg Mkts Equity Net Rank</i>	<i>27</i>	<i>36</i>	<i>36</i>	<i>30</i>	<i>--</i>	<i>--</i>	<i>22</i>	<i>Sep-16</i>

Manager Allocation



IR&M Aggregate Bond | As of December 31, 2019

Account Information

Account Name	IR&M Aggregate Bond
Account Structure	Separate Account
Investment Style	Active
Inception Date	2/01/14
Account Type	US Fixed Income Investment Grade
Benchmark	BBgBarc US Aggregate TR
Universe	Intermediate Core Bond MStar MF

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
IR&M Aggregate Bond	0.1	9.1	9.1	4.2	3.3	--	3.7	Feb-14
BBgBarc US Aggregate TR	0.2	8.7	8.7	4.0	3.0	3.7	3.3	Feb-14
Intermediate Core Bond MStar MF Median	0.1	8.5	8.5	3.9	3.0	3.8	3.2	Feb-14
Intermediate Core Bond MStar MF Rank	51	29	29	26	20	--	13	Feb-14

Statistics Summary

3 Years Ending December 31, 2019

	Anlzd Return	Anlzd Standard Deviation	Beta	Information Ratio	R-Squared
IR&M Aggregate Bond	4.18%	2.81%	0.96	0.61	0.99
BBgBarc US Aggregate TR	4.03%	2.91%	1.00	--	1.00

IR&M Aggregate Bond Characteristics vs. BBgBarc US Aggregate TR

	Portfolio Q4-19	Index Q4-19	Portfolio Q3-19
Fixed Income Characteristics			
Yield to Maturity	2.5	2.3	2.4
Average Duration	5.8	6.3	5.7
Average Quality	AA	AA	AA
Weighted Average Maturity	8.1	13.1	8.1
US Sector Allocation			
UST/Agency	17.9	42.1	16.2
Corporate	32.1	25.1	32.8
MBS	28.6	29.1	29.5
ABS	6.8	0.5	7.6
Foreign	--	2.3	--
Muni	1.8	1.0	1.7
Cash	0.2	--	0.2
Credit Quality Allocation			
AAA	7.0	72.0	7.4
AA	55.7	3.4	55.0
A	9.7	10.8	9.2
BBB	18.7	13.8	19.2
Not Rated	8.8	--	9.1
Cash	--	--	0.1

IR&M Intermediate TIPS | As of December 31, 2019

Account Information

Account Name	IR&M Intermediate TIPS
Account Structure	Separate Account
Investment Style	Active
Inception Date	2/01/14
Account Type	US Inflation Protected Fixed
Benchmark	BBgBarc US TIPS 1-10 Yr TR
Universe	Inflation-Protected Bond MStar MF

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
IR&M Intermediate TIPS	1.0	6.9	6.9	2.8	2.4	--	1.9	Feb-14
BBgBarc US TIPS 1-10 Yr TR	1.0	6.9	6.9	2.8	2.4	2.6	1.9	Feb-14
<i>Inflation-Protected Bond MStar MF Median</i>	0.9	8.1	8.1	3.1	2.3	3.0	2.0	Feb-14
<i>Inflation-Protected Bond MStar MF Rank</i>	48	63	63	63	46	--	60	Feb-14

Statistics Summary

3 Years Ending December 31, 2019

	Anlzd Return	Anlzd Standard Deviation	Beta	Information Ratio	R-Squared
IR&M Intermediate TIPS	2.81%	2.12%	1.01	0.22	1.00
BBgBarc US TIPS 1-10 Yr TR	2.79%	2.09%	1.00	--	1.00

IR&M Intermediate TIPS Characteristics

vs. BBgBarc US TIPS TR

	Portfolio Q4-19	Index Q4-19	Portfolio Q3-19
Fixed Income Characteristics			
Yield to Maturity	0.1	0.2	0.3
Average Duration	4.9	7.4	5.1
Average Quality	AAA	AAA	AAA
Weighted Average Maturity	5.0	8.0	5.2
US Sector Allocation			
UST/Agency	99.9	100.0	99.8
Cash	0.1	--	0.2
Credit Quality Allocation			
AAA	99.9	100.0	99.8
Cash	0.1	--	0.2

Loomis Sayles - High Yield/Bank Loans | As of December 31, 2019

Account Information

Account Name	Loomis Sayles - High Yield/Bank Loans
Account Structure	Separate Account
Investment Style	Active
Inception Date	1/01/96
Account Type	US Fixed Income High Yield
Benchmark	Credit Suisse Leveraged Loans
Universe	eV US High Yield Fixed Inc Gross

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Loomis Sayles - High Yield/Bank Loans	0.0	7.8	7.8	4.2	4.2	5.6	6.7	Jan-96
Credit Suisse Leveraged Loans	1.7	8.2	8.2	4.5	4.5	5.2	5.0	Jan-96
BBgBarc US High Yield TR	2.6	14.3	14.3	6.4	6.1	7.6	7.1	Jan-96
eV US High Yield Fixed Inc Gross Median	2.6	14.3	14.3	6.5	6.1	7.7	7.5	Jan-96
eV US High Yield Fixed Inc Gross Rank	99	96	96	99	95	97	96	Jan-96

Statistics Summary

3 Years Ending December 31, 2019

	Anlzd Return	Anlzd Standard Deviation	Beta	Information Ratio	R-Squared
Loomis Sayles - High Yield/Bank Loans	4.17%	3.23%	0.97	-0.16	0.64
Credit Suisse Leveraged Loans	4.48%	2.66%	1.00	--	1.00

Loomis Sayles - High Yield/Bank Loans Characteristics vs. BBgBarc US High Yield TR

	Portfolio Q4-19	Index Q4-19	Portfolio Q3-19
Fixed Income Characteristics			
Yield to Maturity	5.3	7.1	5.9
Average Duration	2.0	4.6	2.1
Average Quality	BB	B	BB
Weighted Average Maturity	4.8	5.9	4.9
US Sector Allocation			
Corporate	44.6	100.0	42.9
MBS	0.0	--	0.1
ABS	0.2	--	0.2
Foreign	0.8	--	0.8
Yankee	--	--	0.6
Other	49.3	--	51.0
Cash	5.1	--	4.5
Credit Quality Allocation			
AAA	5.2	--	4.6
AA	0.2	--	0.2
A	0.1	--	0.1
BBB	3.0	--	3.0
BB	46.4	47.7	45.9
B	38.2	38.8	39.0
CCC	6.6	12.5	7.0
CC	--	0.6	--
C	--	0.1	--
Not Rated	0.4	0.3	0.3

Lazard Emerging Market Debt Blend | As of December 31, 2019

Account Information

Account Name	Lazard Emerging Market Debt Blend
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	8/01/13
Account Type	International Emerging Market Debt
Benchmark	50% JPM EMBI GD / 50% JPM GBI-EM
Universe	Emerging Markets Bond MStar MF

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Lazard Emerging Market Debt Blend	4.4	15.9	15.9	6.7	3.9	--	2.6	Aug-13
50% JPM EMBI GD / 50% JPM GBI-EM	3.5	14.3	14.3	6.9	4.6	4.8	3.7	Aug-13
Emerging Markets Bond MStar MF Median	2.8	13.9	13.9	6.0	5.5	6.0	4.8	Aug-13
Emerging Markets Bond MStar MF Rank	11	8	8	23	84	--	84	Aug-13

Statistics Summary

3 Years Ending December 31, 2019

	Anlzd Return	Anlzd Standard Deviation	Beta	Information Ratio	R-Squared
Lazard Emerging Market Debt Blend	6.66%	8.15%	1.22	-0.15	0.98
50% JPM EMBI GD / 50% JPM GBI-EM	6.92%	6.60%	1.00	--	1.00

Negative allocations indicate collateral posted for derivative

Lazard Emerging Market Debt Blend Characteristics vs. JP Morgan EMBI Global Diversified

	Portfolio Q4-19	Index Q4-19	Portfolio Q3-19
Fixed Income Characteristics			
Yield to Maturity	6.5	4.9	6.1
Average Duration	6.5	7.5	6.8
Average Quality	BB	BB	BB
Weighted Average Maturity	10.6	12.2	10.6
Credit Quality Allocation			
AAA	-8.2	--	-2.8
AA	7.0	5.9	4.3
A	13.6	11.7	16.9
BBB	39.3	31.9	37.9
BB	14.0	14.1	15.8
B	18.4	25.8	17.5
CCC	4.3	1.8	3.7
CC	--	1.5	--
Not Rated	11.6	7.2	6.5

Account Information

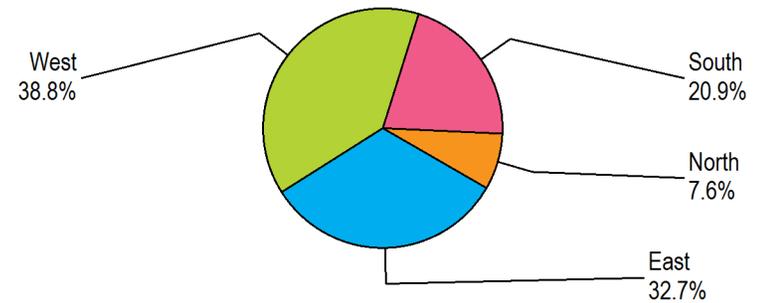
Account Name	PRIT Real Estate
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	4/01/10
Account Type	Real Estate
Benchmark	NCREIF ODCE
Universe	

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
PRIT Real Estate	2.5	10.6	10.6	8.0	8.7	--	11.0	Apr-10
NCREIF ODCE	1.5	5.3	5.3	7.1	9.0	11.4	11.6	Apr-10
NCREIF ODCE Equal Weighted	1.5	6.1	6.1	7.4	9.3	11.5	11.7	Apr-10
Custom Benchmark	1.7	8.9	8.9	7.7	8.7	11.3	11.4	Apr-10

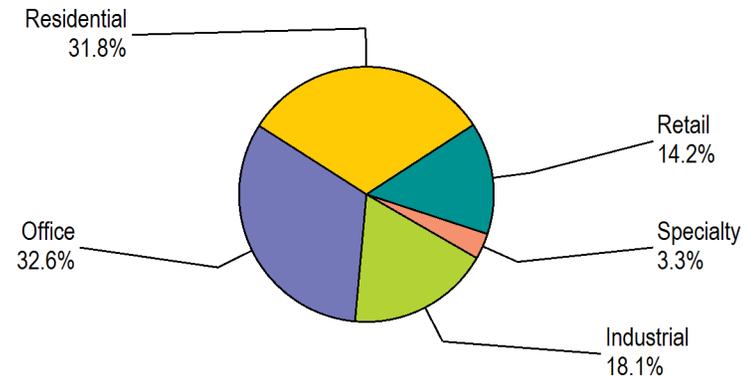
Geographic Diversification

Allocation as of December 31, 2019



Geographic Diversification: North refers to Midwest

Property Type Allocation



Geographic and property type allocation are as of 9/30/2019

PRIT General Allocation Fund | As of December 31, 2019

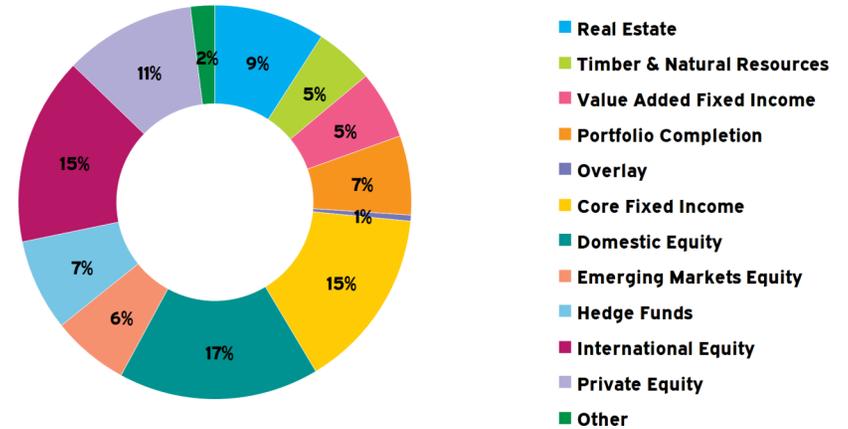
Account Information

Account Name	PRIT General Allocation Fund
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	6/01/16
Account Type	Global Macro
Benchmark	60% MSCI ACWI / 40% Barclays Global Aggregate
Universe	

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
PRIT General Allocation Fund	4.5	16.2	16.2	10.0	--	--	9.7	Jun-16
60% MSCI ACWI / 40% Barclays Global Aggregate	5.5	18.6	18.6	9.3	6.1	6.4	8.3	Jun-16

Manager Allocation



SSgA Global Natural Resources Stock Index | As of December 31, 2019

Account Information

Account Name	SSgA Global Natural Resources Stock Index		
Account Structure	Commingled Fund		
Investment Style	Passive		
Inception Date	5/01/11		
Account Type	Real Assets		
Benchmark	S&P Global LargeMidCap Commodity and Resources NR USD		
Universe	Natural Resources MStar MF		

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA Global Natural Resources Stock Index	8.2	16.2	16.2	7.9	--	--	--	May-11
S&P Global LargeMidCap Commodity and Resources NR USD	8.0	15.9	15.9	7.5	3.3	1.2	-1.6	May-11
Natural Resources MStar MF Median	7.9	14.9	14.9	1.5	0.8	0.9	-2.2	May-11
Natural Resources MStar MF Rank	48	42	42	10	--	--	--	May-11

Top 10 Holdings

NUTRIEN	5.2%
EXXON MOBIL	5.1%
ARCHER DANIELS MIDLAND	4.9%
CORTEVA	4.2%
BHP GROUP	4.2%
CHEVRON	3.9%
RIO TINTO	3.1%
BHP GROUP	2.6%
FMC	2.5%
TOTAL	2.4%
Total	38.0%

SSgA Global Natural Resources Stock Index Characteristics

	Portfolio Q4-19	Portfolio Q3-19
Market Value		
Market Value (\$M)	8.9	8.2
Number Of Holdings	203	178
Characteristics		
Weighted Avg. Market Cap. (\$B)	62.4	60.2
Median Market Cap (\$B)	8.2	8.9
P/E Ratio	15.1	14.2
Yield	3.6	3.7
EPS Growth - 5 Yrs.	2.8	1.4
Price to Book	1.8	1.7
Beta (holdings; domestic)	1.1	1.1
Sector Distribution		
Energy	32.7	34.0
Materials	54.6	53.6
Industrials	0.0	0.0
Consumer Discretionary	0.0	0.0
Consumer Staples	11.7	11.1
Health Care	0.0	0.0
Financials	0.0	0.0
Information Technology	0.0	0.0
Communication Services	0.0	0.0
Utilities	0.0	0.0
Real Estate	0.0	0.0

Investment Expense Analysis | As of December 31, 2019

Investment Expense Analysis				
As Of December 31, 2019				
Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Total Retirement System		\$1,041,113,186		
Domestic Equity Assets		\$142,399,445		
SSgA S&P 500 Index	0.0500% of First 50.0 Mil, 0.0400% of Next 50.0 Mil, 0.0200% Thereafter	\$42,887,001	\$21,444	0.05%
SSgA Russell 1000 Growth Index	0.0800% of First 50.0 Mil, 0.0600% of Next 50.0 Mil, 0.0400% Thereafter	\$39,049,198	\$31,239	0.08%
SSgA Russell 1000 Value Index	0.0800% of First 50.0 Mil, 0.0600% of Next 50.0 Mil, 0.0400% Thereafter	\$37,224,130	\$29,779	0.08%
SSgA S&P Midcap 400 Index	0.0800% of First 50.0 Mil, 0.0600% of Next 50.0 Mil, 0.0400% Thereafter	\$10,196,272	\$8,157	0.08%
Lee Munder Small Cap Value	0.9000% of Assets	\$13,042,843	\$117,386	0.90%
International Developed Market Equity		\$87,704,406		
SSgA MSCI EAFE Index	0.1000% of First 50.0 Mil, 0.0800% of Next 50.0 Mil, 0.0500% Thereafter	\$61,933,066	\$59,546	0.10%
Acadian Non-U.S. Small Cap Equity	0.7500% of Assets	\$25,771,340	\$193,285	0.75%
International Emerging Market Equity		\$96,546,495		
PRIT Emerging Markets	0.3100% of Assets	\$96,546,495	\$299,294	0.31%
Fixed Income Assets		\$166,416,050		
Core Fixed Income		\$101,588,128		
Total Investment Grade Bonds		\$63,921,507		
IR&M Aggregate Bond	0.2500% of First 75.0 Mil, 0.2000% Thereafter	\$63,921,507	\$159,804	0.25%
TIPS		\$37,666,621		
IR&M Intermediate TIPS	0.0500% of Assets	\$37,666,621	\$18,833	0.05%
Value Added Fixed Income		\$64,827,922		
Loomis Sayles High Yield	0.5000% of Assets	\$13,632,566	\$68,163	0.50%
Loomis Sayles Bank Loans	0.4700% of Assets	\$11,649,660	\$54,753	0.47%

Investment Expense Analysis | As of December 31, 2019

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Total Emerging Markets Debt		\$32,043,367		
Lazard Emerging Market Debt Blend	0.8500% of Assets	\$32,043,367	\$272,369	0.85%
Mezzanine Debt		\$7,502,329		
Northstar Mezzanine Partners VI	2.0% management fee; 20.0% carried interest; 8% preferred return	\$5,286,855		
Newstone Capital Partners II	Management Fee: 1.5% of commitments during the investment period; thereafter, 1% of invested capital, less permanent write-downs and principal repayments Preferred Return: 8% Carried Interest: 20%	\$656,634		
Northstar Mezzanine Partners V	2.0% management fee; 20.0% carried interest; 8% preferred return	\$1,503,657		
Northstar Mezzanine Partners IV	2.0% management fee; 20.0% carried interest; 8% preferred return	\$40,086		
Newstone Capital Partners	1.5% management fee; 8% preferred return; 20% carried interest	\$0		
Northstar Mezzanine Partners III	2.0% management fee; 20.0% carried interest; 8% preferred return	\$15,097		
Real Estate		\$75,199,045		
Open-End Real Estate		\$71,213,275		
PRIT Real Estate	0.6400% of Assets	\$71,213,275	\$455,765	0.64%
Non-Core Real Estate		\$3,985,770		
AEW Partners VII	1.25% management fee, 9% preferred return, 20% carried interest	\$3,985,770		
AEW Partners VI	1.0% on committed capital during the investment period; 1.0% on net invested equity capital thereafter; 20% carried interest; 9% preferred return	\$0		

Investment Expense Analysis | As of December 31, 2019

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Private Equity		\$76,903,093		
Buyouts		\$43,039,954		
American Securities Partners VI	\$3 billion target; \$5 million minimum for individual investors and \$10 million minimum for institutional investors. 80/20 carry	\$3,728,561		
Riverside Capital Appreciation Fund VI	2 % management fee , 8% preferred return, 20% carried interest	\$4,656,622		
Vitruvian Investment Partnership I	2.0% management fee; 8% preferred return; 20% carried interest	\$314,503		
Riverside Micro Cap Fund III	2.0% management fee; 8% preferred; 20% carry	\$7,050,913		
Ridgemont II	Performance-based 2.0000 and 20.0000	\$11,451,291	\$495,241	4.32%
Capital International Private Equity Fund VI	80/20 carry 1.5% management fee \$2.5 billion target	\$6,246,160		
Harvest Partners V	2.0% management fee; 20% carried interest; 8% preferred return	\$9,337		
TA XII	Performance-based 1.6500 and 20.0000	\$8,571,449	\$217,166	2.53%
Riverside Capital Fund V	2.25% management fee; 8% preferred return; 20% carried interest	\$604,066		
Riverside Europe III	2.5% management fee; 8% preferred return; 20% carried interest	\$183,893		
Charlesbank Equity Fund VI	2.0% of commitments during commitment period; 2.0% of funded commitments afterwards; 20.0% carried interest; 8.0% preferred return	\$223,160		
Fund of Funds		\$24,105,791		
PRIT Vintage Year 2016	1.0000% of Assets	\$5,257,065	\$52,571	1.00%
PRIT Vintage Year 2017	1.0000% of Assets	\$11,080,306	\$110,803	1.00%
European Strategic Partners	Management fee: 0.75% of undrawn commitment, 1.0% of drawn commitment; Carried interest: 15.0% on direct investments and 5.0% on fund investments; 8.0% preferred return	\$73,604		

Investment Expense Analysis | As of December 31, 2019

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
INVESCO Private Capital II	Management Fee: 0.50% for Buyout Fund (40%); 1.0% for Venture Fund (30%); 1.0% for Non-U.S. Fund (30%); discounted to an aggregate 0.75% on Diversified Portfolio	\$40,740		
INVESCO US Buyout	0.5000% of Assets	\$35,504	\$178	0.50%
INVESCO Venture	1.0000% of Assets	\$5,236	\$52	1.00%
PRIT Vintage Year 2018	1.0000% of Assets	\$5,405,413	\$54,054	1.00%
PRIT Vintage Year 2019	1.0000% of Assets	\$2,248,664	\$22,487	1.00%
Venture Capital Funds		\$9,757,348		
Ascent Venture Partners V	2.50% of commitments; 20 % carried Interest	\$4,447,304		
Asecent Venture Partners VI	2.50% of commitments; 20% carried interest	\$4,157,657		
Boston Millennia Partners III	1.5% of reported value; 20% carried interest	\$458,444		
Boston Millennia Partners II	1.25% management fee	\$427,535		
Ascent Venture Partners IV	2.50% of commitments; 20% carried interest	\$47,605		
Ascent Venture Partners III	2.25% of commitments; 20% carried interest	\$191,384		
PRIT General Allocation		\$317,693,109		
PRIT General Allocation Fund	0.5300% of Assets	\$317,693,109	\$1,683,773	0.53%
Real Assets		\$73,895,279		
Natural Resources Assets		\$14,161,901		
Natural Resources (Public)		\$8,896,842		
SSgA Global Natural Resources Stock Index	0.1500% of Assets	\$8,896,842	\$13,345	0.15%
Natural Resources (Private)		\$5,265,059		
White Deer Energy II	2% Management Fee, 20% Carried Interest, 8% Preferred Return	\$4,929,712		

Investment Expense Analysis | As of December 31, 2019

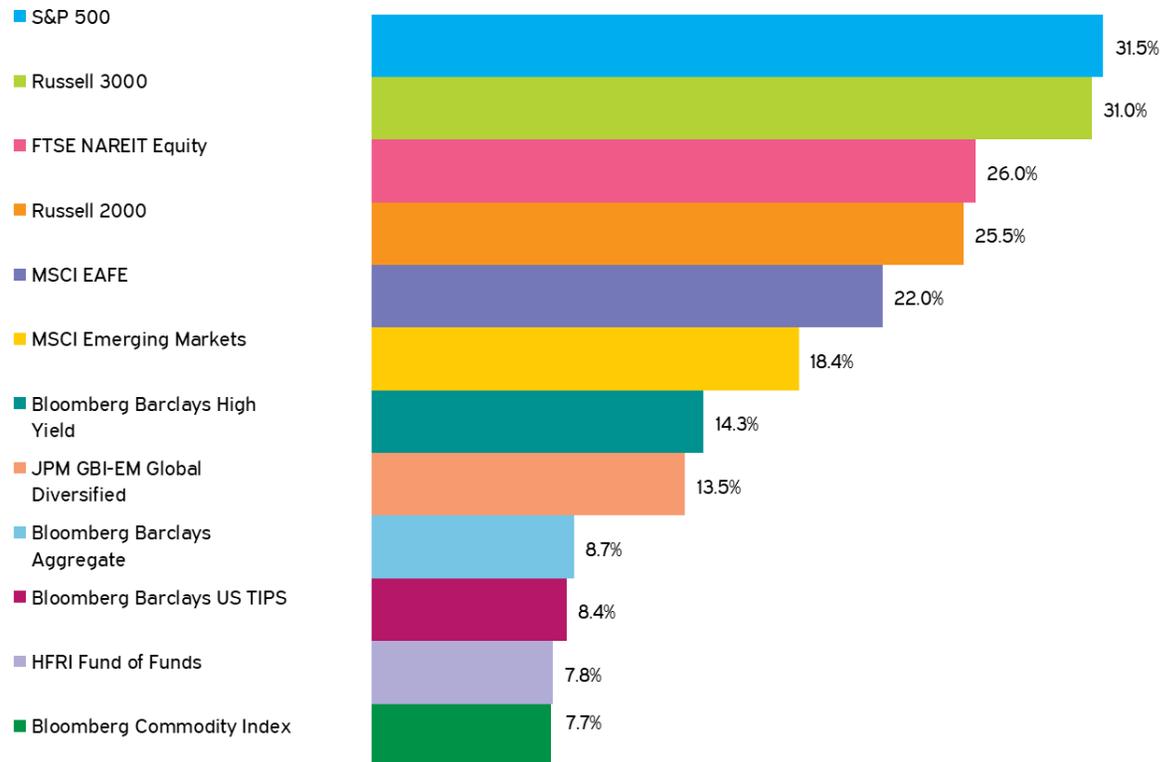
Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
White Deer Energy	2% of commitments during the investment period; thereafter, 2% of contributions net of realized investments and writedowns; 8% preferred return; 20% carried interest	\$335,347		
Timber		\$2,927,683		
RMK Select Timberland Investment Fund I	1.00% management fee; 15.0% incentive fee collected at end on returns in excess of a net real IRR of 8.0%.	\$665,295		
Hancock Timberland VII	Management fee: 0.95% on committed capital; 20% carried interest; 8% preferred return	\$1,522,388		
RMK Select Timberland Investment Fund II	100 bp management fee; 15.0% incentive fee collected at end on returns in excess of a net real IRR of 8.0%	\$740,000		
RMK Balanced Timberland B	1.00% management fee; 15.0% incentive fee collected at end on returns in excess of a net real IRR of 8.0%	\$0		
Infrastructure		\$56,805,696		
IFM Global Infrastructure	Performance-based 0.7700 and 8.0000	\$43,537,038	\$517,907	1.19%
Global Infrastructure Partners	2.0% management fee; 20% carried interest; 8% preferred return	\$978,411		
Global Infrastructure Partners III	1.75% of a capital commitment up to \$75 million during commitment period 1.75% of invested capital deemed outstanding after commitment period	\$12,151,150		
Global Infrastructure Partners IV, L.P.		\$139,096		
Cash		\$4,356,263		
Cash		\$4,356,263		

2019 Year in Review

Market Summary

- Year 2019 was a banner year for investors around the world. US stocks, as measured by the S&P 500, gained 31.5%, and MSCI EAFE gained 22.0% in 2019.
- US stocks rose to record highs in December due to the news of a finalized phase-one trade deal between US & China. In addition, British general election results came back with overwhelming support for Boris Johnson, offering new clarity around the future of Brexit.
- The US market marked a big milestone in 2019, becoming the longest running bull market ever. The primary drivers were accommodative Fed policy, better than expected corporate earnings, strong consumer confidence, and historically low unemployment rates.
- In October, the Federal Reserve cut interest rates for the third time in 2019. The Fed also expanded its balance sheet to record levels as a means of supporting the repo market, which experienced stress recently due to low liquidity. The rate cuts helped to eliminate recession fears brought by yield-curve inversion during the summer of 2019.
- Other central banks around the world implemented similar easing policy to support their economies on the back of slowing global growth.
- The unemployment rate finished the quarter at 3.5%, the same level as the prior quarter-end and close to 50-year lows.

World Markets in 2019¹



¹ Source: Investor Force

2019 Retirement System Performance Review

	Average Allocation ¹ (%)	Aggregate Performance (%)	Est. Contribution to Return ¹ (%)
Equity			
Domestic Equity	14	30.3	4.1
Intl Developed Equity	9	22.6	1.9
Emerging Markets	9	21.9	2.0
Fixed Income			
Core Fixed Income	11	8.1	0.9
Value-Add Fixed Income	7	12.3	0.8
Real Estate	8	11.0	0.8
Private Equity	8	13.0	1.0
Balanced ²	29	16.2	4.6
Real Assets	8	6.6	0.5
Total Return (net)			16.6

- Performance was strong in 2019, as most asset class experienced double-digit gains, with domestic and international developed market equity leading the way.

¹ Weighted average allocation. Numbers may not sum to 100% due to rounding.

² Represented by PRIT Core Fund.

2019 PRIT Attribution (net)

	System Allocation (%)	PRIT Allocation (%)	Index Performance ¹ (%)	WRS Allocation Effect	System Performance (%)	PRIT Performance ² (%)	WRS Manager Effect
Total Performance (net of fees)					16.6	16.1	
U.S. Equity	14	23	31.0	-	30.3	30.1	+
International Equity	9	15	22.0	-	22.6	24.7	-
Emerging Markets Equity	9	6	18.4	+	21.9	21.9	NM
Core Fixed Income	11	14	8.7	-	8.1	11.2	-
Value-Added Fixed Income	7	8	14.3	+	12.3	9.5	+
Real Estate	8	9	4.4	+	11.1	10.6	+
Private Equity	8	11	7.8	+	13.0	12.5	+
Portfolio Completion	0	9	7.8	+	NA	7.6	NM
Real Assets / Timber	8	4	5.3	-	6.6	0.8	+
PRIT Core	29	NA	16.1	-	16.2	NA	NM

- Allocation effect is substantially impacted by the System's holding of the PRIT Core Fund, which underperformed.
- Selection effect was strongly positive in real assets as well as value-added fixed income and moderately positive for private equity and US equity.

¹ Indexes used in descending order: Russell 3000, MSCI EAFE, MSCI EM, Bloomberg Barclays Aggregate, Bloomberg Barclays High Yield, NCREIF ODCE (net), Cambridge Associates PE Fund of Fund Index (lagged), HFRI HFOF Composite (lagged), CPI+3%, and PRIT Core Fund.

² Asset class returns are net of fees unless excluding Value-Added Fixed Income.

Worcester Retirement System

- The System experienced a gain of 16.6% for the calendar year 2019, underperforming the Target Allocation Benchmark by 30 basis points, net of fees.
- Every asset class had positive performance in 2019.
- The System's exposures to equities (public and private), high yield bonds, EM debt, real estate, natural resources, and infrastructure added double-digit gains.
- The System benefited from manager selection in the international developed equity, high yield bonds, emerging market debt, private equity, real estate, and infrastructure asset classes. Emerging market equity and natural resources managers underperformed their respective benchmarks during the year.
- The high exposure to the Core Fund makes it more difficult to allocate differently from PRIT and consequently difficult to generate excess return versus PRIT through asset allocation.
 - However, this high exposure to the Core Fund does reduce tracking error versus PRIT in years where the System would have underperformed.
 - Much of the System's outperformance is attributable to strong manager selection or allocations within broader asset classes that differ from PRIT (e.g., infrastructure within real assets).

IR&M Succession Planning Update

- In early January, IR&M notified us that effective January 1, 2020, Jack Sommers, one of the firm's co-founders and a managing principal, has officially assumed the role of Executive Chairperson.
- Further, Bill O'Malley, Director of IR&M's Investment Team, has become co-CIO and CEO of the firm. Mr. O'Malley has been with IR&M for 25 years, and is also one of its managing principals.
- In addition, Jim Gubitosi, Senior Portfolio Manager, was named co-CIO alongside Mr. O'Malley, while Sarah Kilpatrick, Senior Portfolio Manager, has taken on the role of COO, overseeing operations, technology, and investment and portfolio risk functions. Mr. Kilpatrick is also a tenured professional, having been with IR&M for 16 years.
- IR&M assured us that there were no changes to their ownership structure, and that the investment team remains stable, with no departures.
- We don't have any meaningful concerns with the above changes at IR&M, at this time; however, we will continue to monitor the IR&M portfolios and organization, and report to the Board, as needed.

Disclaimer, Glossary, and Notes

WE HAVE PREPARED THIS REPORT (THIS "REPORT") FOR THE SOLE BENEFIT OF THE INTENDED RECIPIENT (THE "RECIPIENT").

SIGNIFICANT EVENTS MAY OCCUR (OR HAVE OCCURRED) AFTER THE DATE OF THIS REPORT AND THAT IT IS NOT OUR FUNCTION OR RESPONSIBILITY TO UPDATE THIS REPORT. ANY OPINIONS OR RECOMMENDATIONS PRESENTED HEREIN REPRESENT OUR GOOD FAITH VIEWS AS OF THE DATE OF THIS REPORT AND ARE SUBJECT TO CHANGE AT ANY TIME. ALL INVESTMENTS INVOLVE RISK. THERE CAN BE NO GUARANTEE THAT THE STRATEGIES, TACTICS, AND METHODS DISCUSSED HERE WILL BE SUCCESSFUL.

INFORMATION USED TO PREPARE THIS REPORT WAS OBTAINED FROM INVESTMENT MANAGERS, CUSTODIANS, AND OTHER EXTERNAL SOURCES. WHILE WE HAVE EXERCISED REASONABLE CARE IN PREPARING THIS REPORT, WE CANNOT GUARANTEE THE ACCURACY OF ALL SOURCE INFORMATION CONTAINED HEREIN.

CERTAIN INFORMATION CONTAINED IN THIS REPORT MAY CONSTITUTE "FORWARD - LOOKING STATEMENTS," WHICH CAN BE IDENTIFIED BY THE USE OF TERMINOLOGY SUCH AS "MAY," "WILL," "SHOULD," "EXPECT," "AIM," "ANTICIPATE," "TARGET," "PROJECT," "ESTIMATE," "INTEND," "CONTINUE" OR "BELIEVE," OR THE NEGATIVES THEREOF OR OTHER VARIATIONS THEREON OR COMPARABLE TERMINOLOGY. ANY FORWARD-LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION ARE BASED UPON CURRENT ASSUMPTIONS. CHANGES TO ANY ASSUMPTIONS MAY HAVE A MATERIAL IMPACT ON FORWARD - LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS. ACTUAL RESULTS MAY THEREFORE BE MATERIALLY DIFFERENT FROM ANY FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION.

PERFORMANCE DATA CONTAINED HEREIN REPRESENT PAST PERFORMANCE. PAST PERFORMANCE IS NO GUARANTEE OF FUTURE RESULTS.

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.

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.

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.

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.

Tracking Error: A divergence between the price behavior of a position or a portfolio and the price behavior of a benchmark, as defined by the difference in standard deviation.

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%.

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

Yield to Worst: The lowest potential yield that can be received on a bond without the issuer actually defaulting. The yield to worst is calculated by making worst-case scenario assumptions on the issue by calculating the returns that would be received if provisions, including prepayment, call, or sinking fund, are used by the issuer.

NCREIF Property Index (NPI): Measures unleveraged investment performance of a very large pool of individual commercial real estate properties acquired in the private market by tax-exempt institutional investors for investment purposes only. The NPI index is capitalization-weighted for a quarterly time series composite total rate of return.

NCREIF Fund Index - Open End Diversified Core Equity (NFI-ODCE): Measures the investment performance of 28 open-end commingled funds pursuing a core investment strategy that reflects funds' leverage and cash positions. The NFI-ODCE index is equal-weighted and is reported gross and net of fees for a quarterly time series composite total rate of return.

Sources: *Investment Terminology*, International Foundation of Employee Benefit Plans, 1999.
The Handbook of Fixed Income Securities, Fabozzi, Frank J., 1991

The Russell Indices®, TM, SM are trademarks/service marks of the Frank Russell Company.

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.

Benchmark Notes**Custom Benchmark**

Custom Benchmark is composed of 23% Russell 3000, 22% MSCI ACWI ex US, 6% Cambridge Associates Fund of Funds Composites 1q lagged, 7% Barclays Aggregate, 6% Barclays High Yield, 3% blended benchmark comprised of 50% JPM EMBI GD 50% JPM GBI-EM, 6% Barclays US TIPS, 3% NCREIF Timberland, 10% NCREIF ODCE, 2% DJ Brookfield Global Infrastructure, 7% of a blended benchmark comprising 60% MSCI ACWI and 40% Barclays Global Aggregate Bond indices, 2% S&P North American Natural Resources Sector and 2% HFRI Fund of Funds Composite.

Spliced Benchmark

60% MSCI ACWI and 40% Barclays Global Aggregate Bond indexes since June 2015, Barclay's US Tips 1-10 Year prior.

SSgA MSCI EAFE

SSgA MSCI EAFE index fund performance is based on the aggregate of the daily liquidity fund and the semi-monthly liquidity fund.

PRIT Real Estate

PRIT Real Estate inception date shown is based on the first full quarter invested.

Custom Real Estate Benchmark

Custom Benchmark is composed of 80% NCREIF ODCE, 10% NAREIT Equity and 10% FTSE EPRA NAREIT Developed ex. U.S. REIT.