

FUND EVALUATION REPORT

City of Marlborough Contributory Retirement System

Meeting Materials
July 30, 2019



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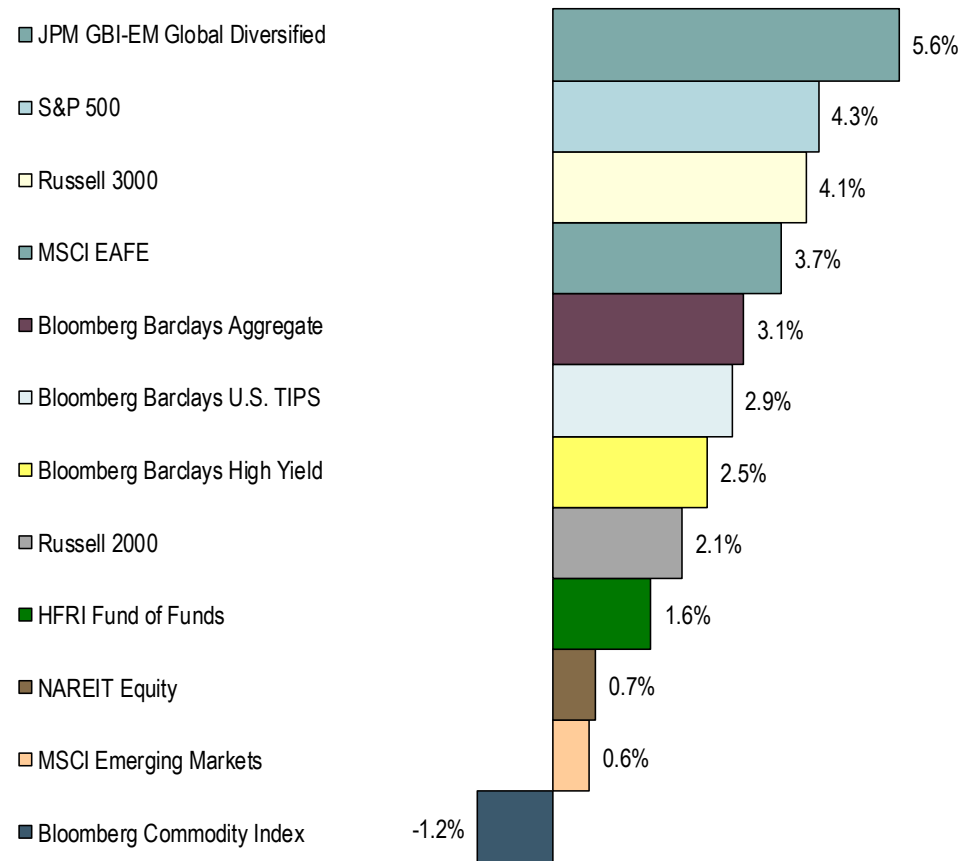
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The World Markets Second Quarter of 2019

The World Markets¹ Second Quarter of 2019



¹ Source: InvestorForce.

Index Returns¹

	2Q19 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
Domestic Equity					
S&P 500	4.3	10.4	14.2	10.7	14.7
Russell 3000	4.1	9.0	14.0	10.2	14.7
Russell 1000	4.2	10.0	14.1	10.5	14.8
Russell 1000 Growth	4.6	11.6	18.1	13.4	16.3
Russell 1000 Value	3.8	8.5	10.2	7.5	13.2
Russell MidCap	4.1	7.8	12.2	8.6	15.2
Russell MidCap Growth	5.4	13.9	16.5	11.1	16.0
Russell MidCap Value	3.2	3.7	8.9	6.7	14.6
Russell 2000	2.1	-3.3	12.3	7.1	13.4
Russell 2000 Growth	2.7	-0.5	14.7	8.6	14.4
Russell 2000 Value	1.4	-6.2	9.8	5.4	12.4
Foreign Equity					
MSCI ACWI (ex. U.S.)	3.0	1.3	9.4	2.2	6.5
MSCI EAFE	3.7	1.1	9.1	2.2	6.9
MSCI EAFE (Local Currency)	2.8	2.2	9.8	5.9	8.3
MSCI EAFE Small Cap	1.7	-6.3	9.1	4.4	9.7
MSCI Emerging Markets	0.6	1.2	10.7	2.5	5.8
MSCI Emerging Markets (Local Currency)	7.4	9.4	13.8	7.6	8.6
Fixed Income					
Bloomberg Barclays Universal	3.1	8.1	2.8	3.2	4.4
Bloomberg Barclays Aggregate	3.1	7.9	2.3	2.9	3.9
Bloomberg Barclays U.S. TIPS	2.9	4.8	2.1	1.8	3.6
Bloomberg Barclays High Yield	2.5	7.5	7.5	4.7	9.2
JPM GBI-EM Global Diversified	5.6	9.0	4.2	-0.5	3.4
Other					
NAREIT Equity	0.7	10.1	3.8	7.7	15.3
Bloomberg Commodity Index	-1.2	-6.8	-2.2	-9.1	-3.7
HFRI Fund of Funds	1.6	1.3	4.3	2.2	3.2

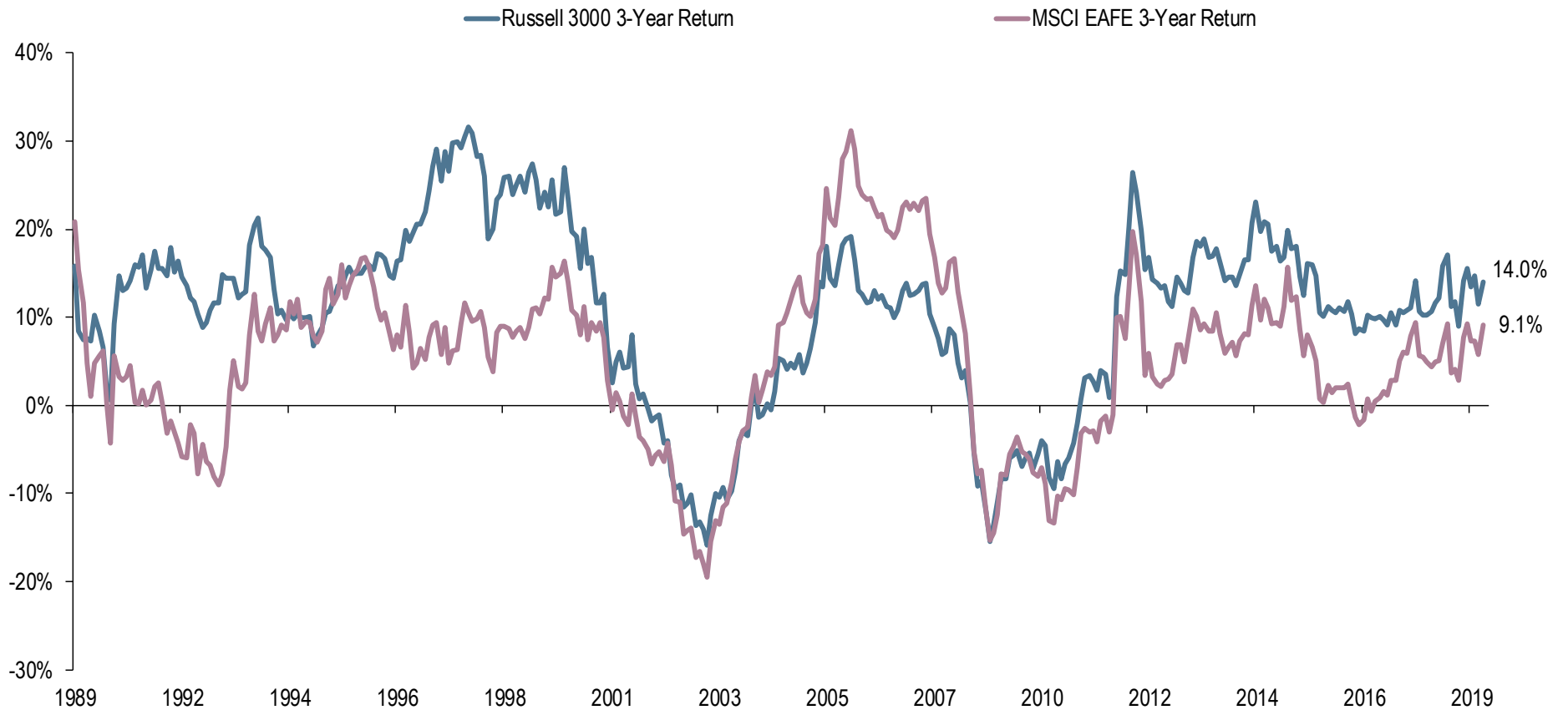
¹ Source: InvestorForce.

S&P Sector Returns¹



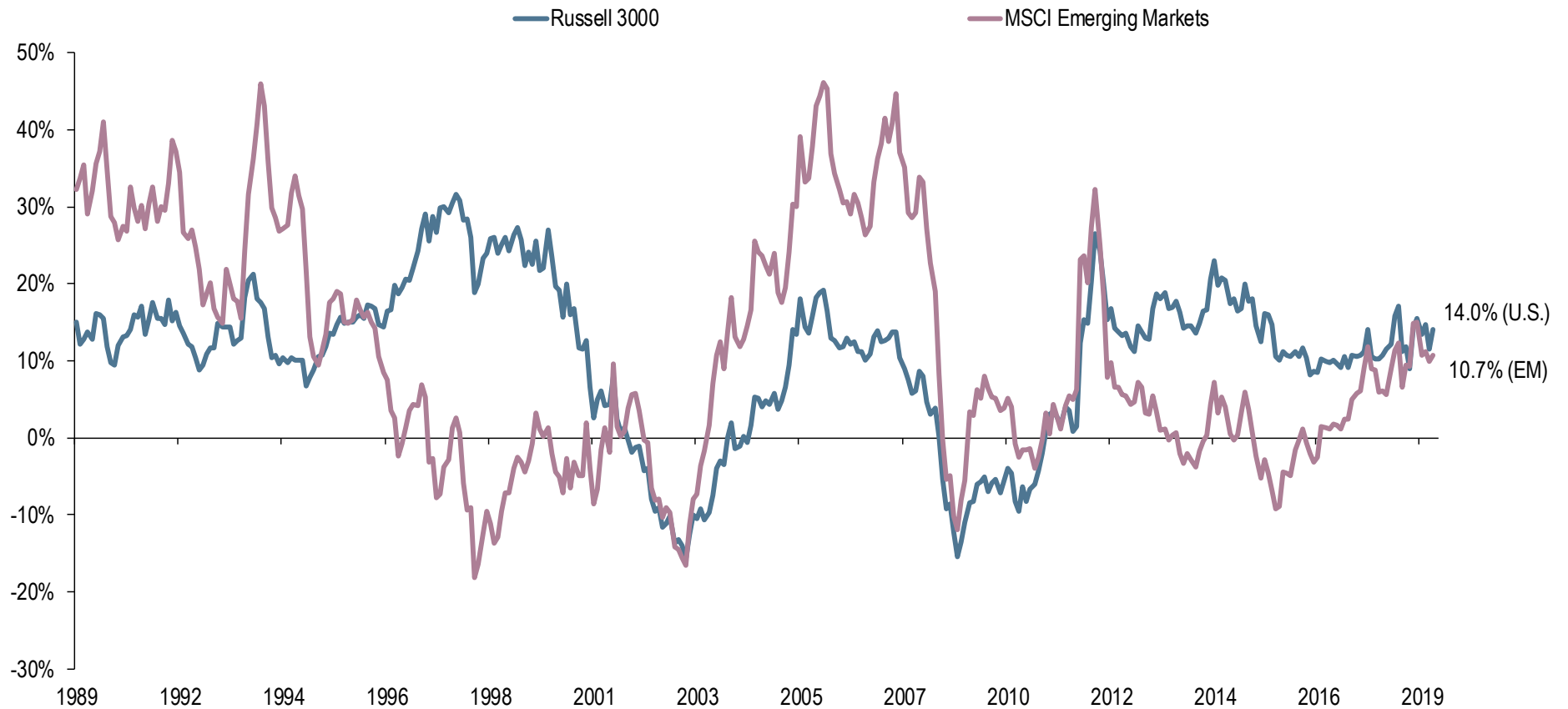
¹ Source: InvestorForce. Represents S&P 1500 (All Cap) data.

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



¹ Source: InvestorForce.

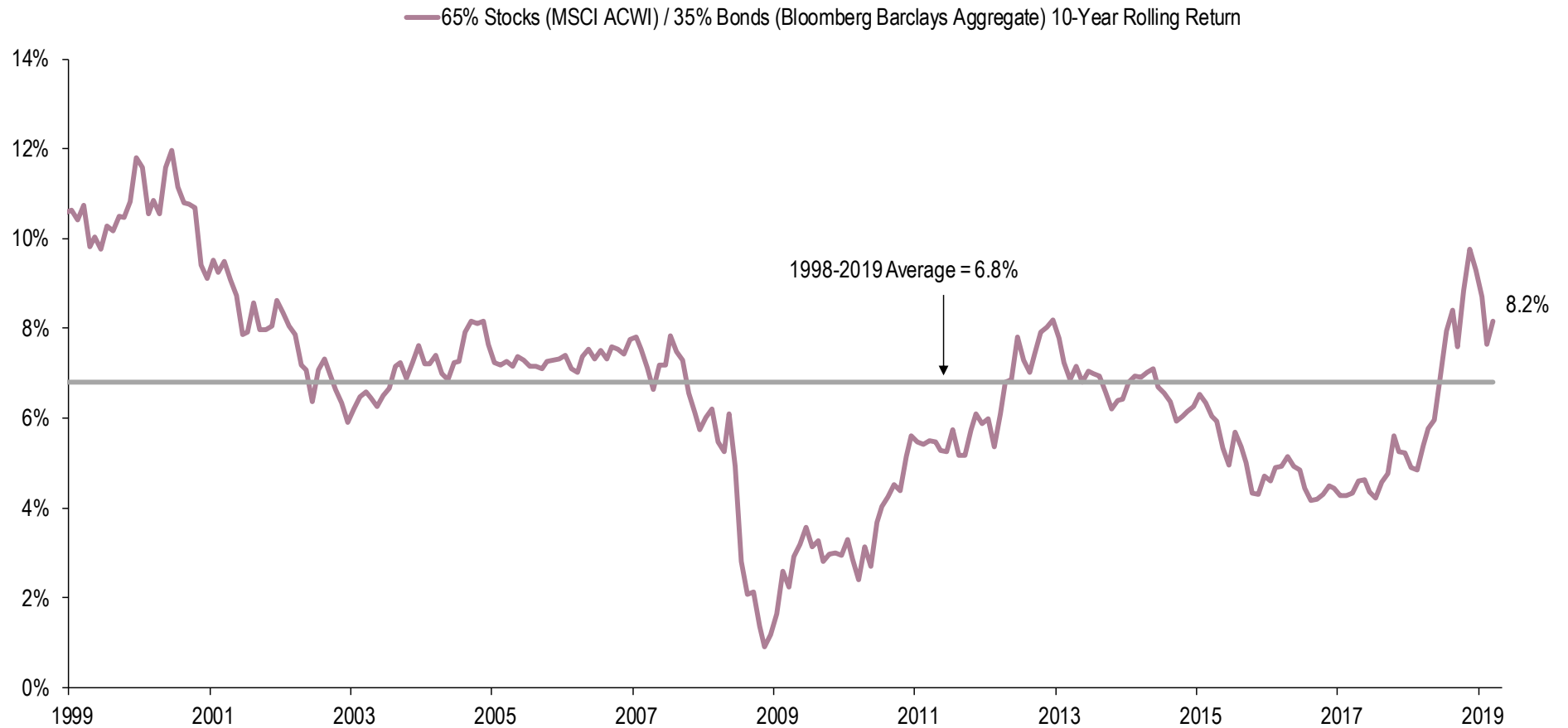
U.S. and Emerging Market Equity Rolling Three-Year Returns¹



¹ Source: InvestorForce.

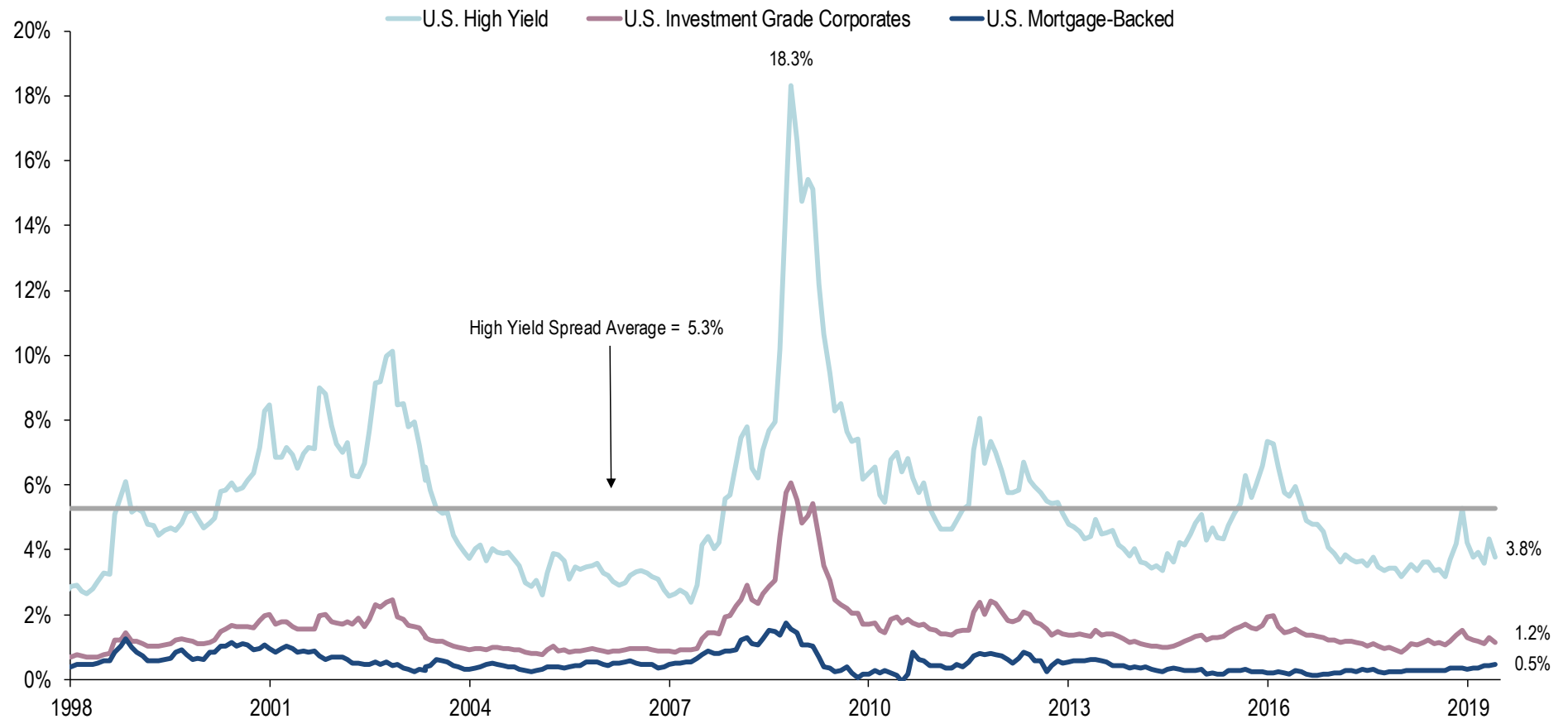


Rolling Ten-Year Returns: 65% Stocks and 35% Bonds¹



¹ Source: InvestorForce.

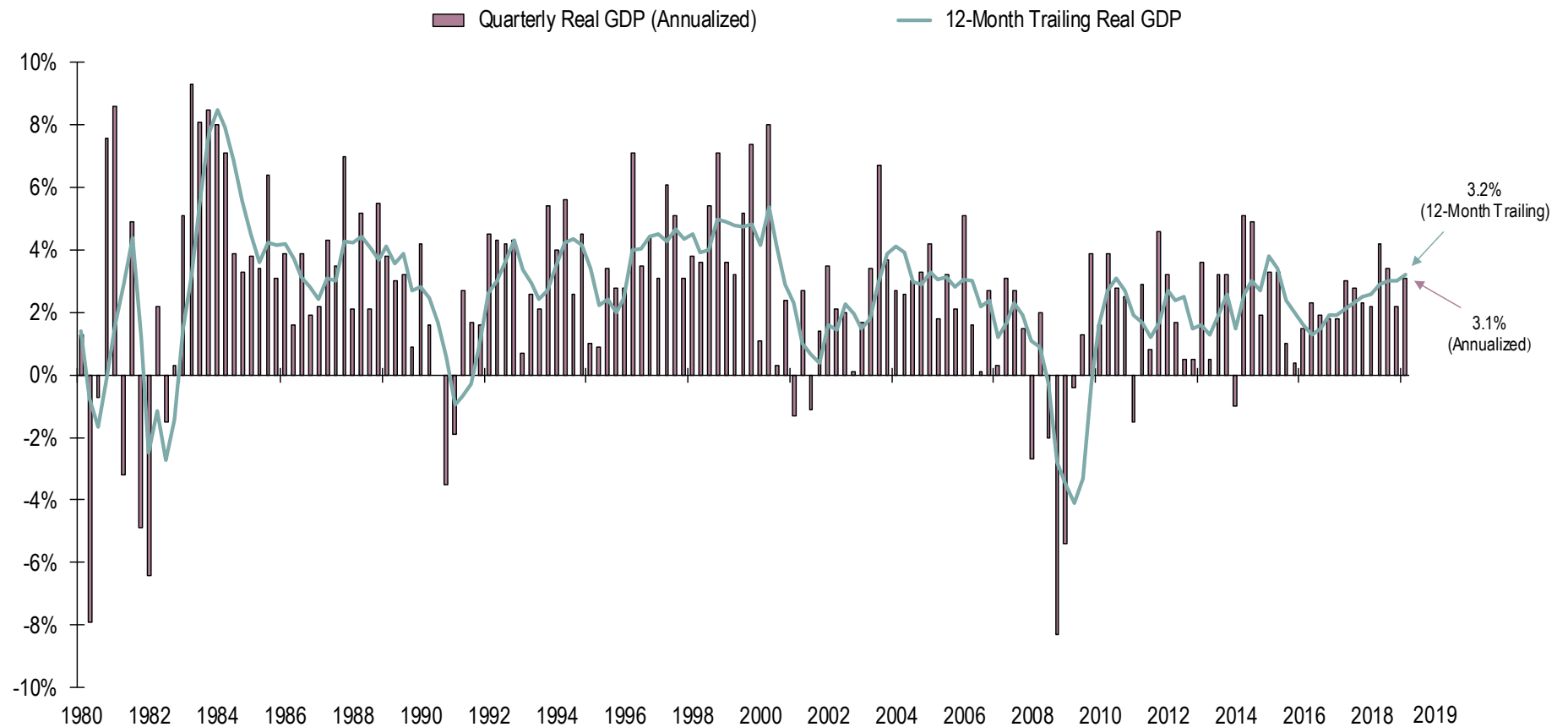
Credit Spreads vs. U.S. Treasury Bonds^{1,2}



¹ Source: Barclays Live.

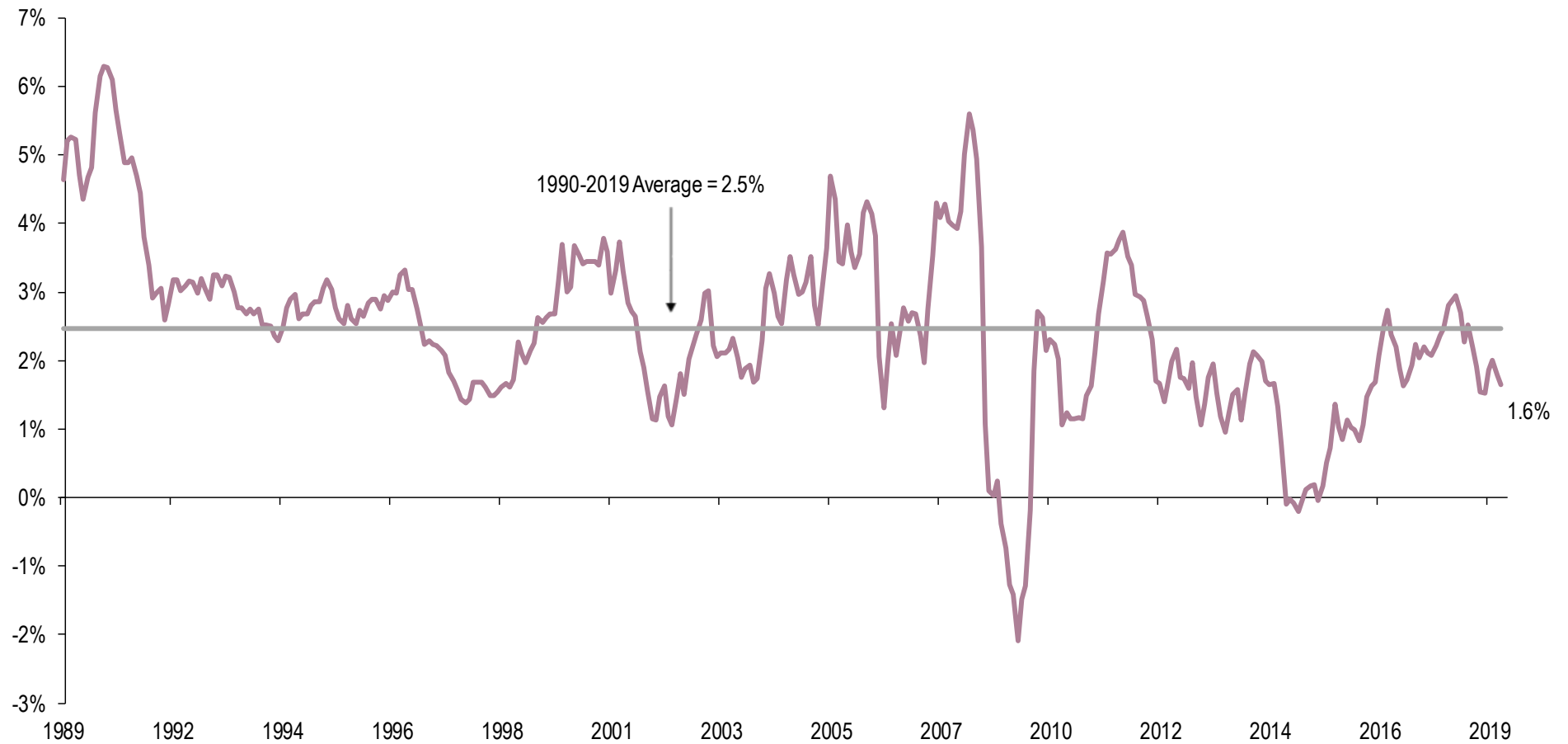
² The median high yield spread was 4.8% from 1997-2019.

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



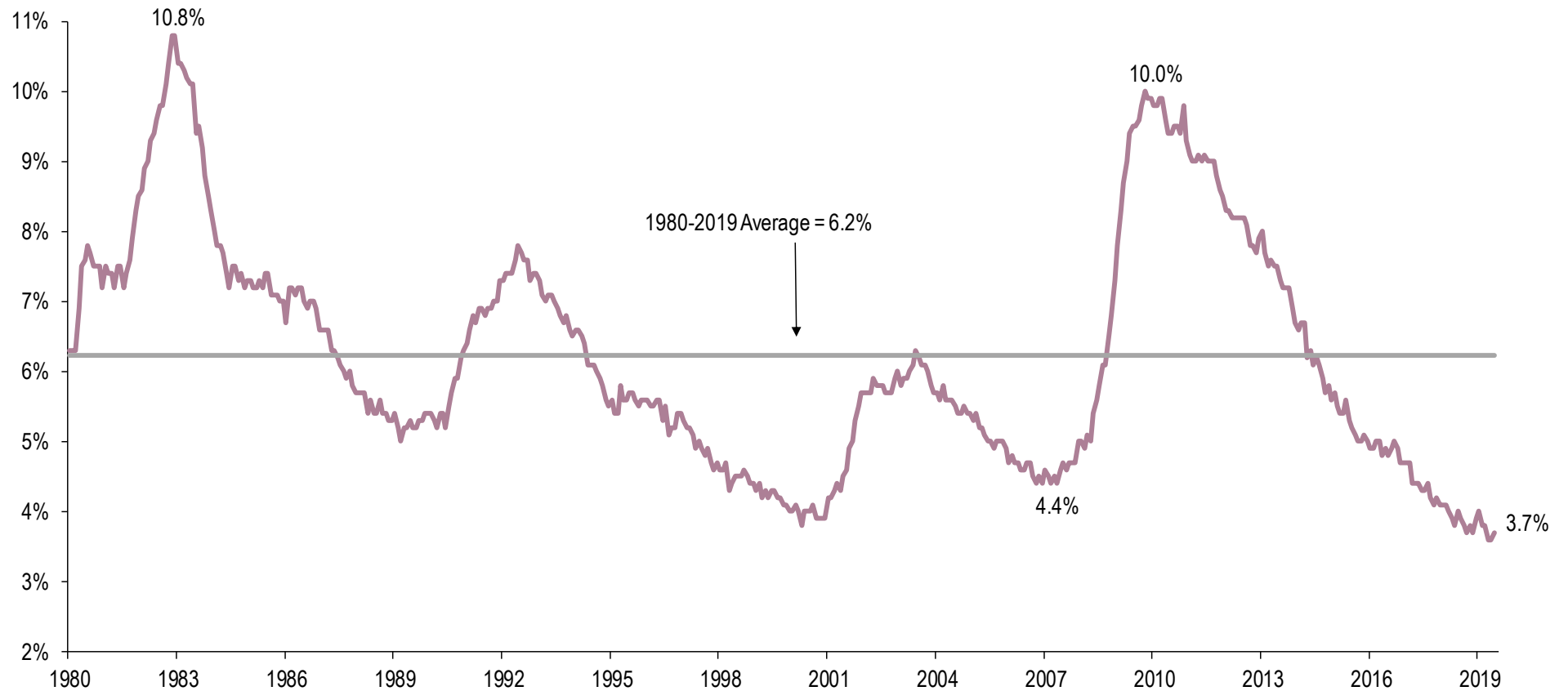
¹ Source: Bureau of Economic Analysis. Data is as of Q1 2019 and represents the third estimate.

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 June 30, 2019.

U.S. Unemployment¹



¹ Source: Bureau of Labor Statistics. Data is as of June 30, 2019.








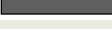


Retirement System Second Quarter Review

Retirement System Summary

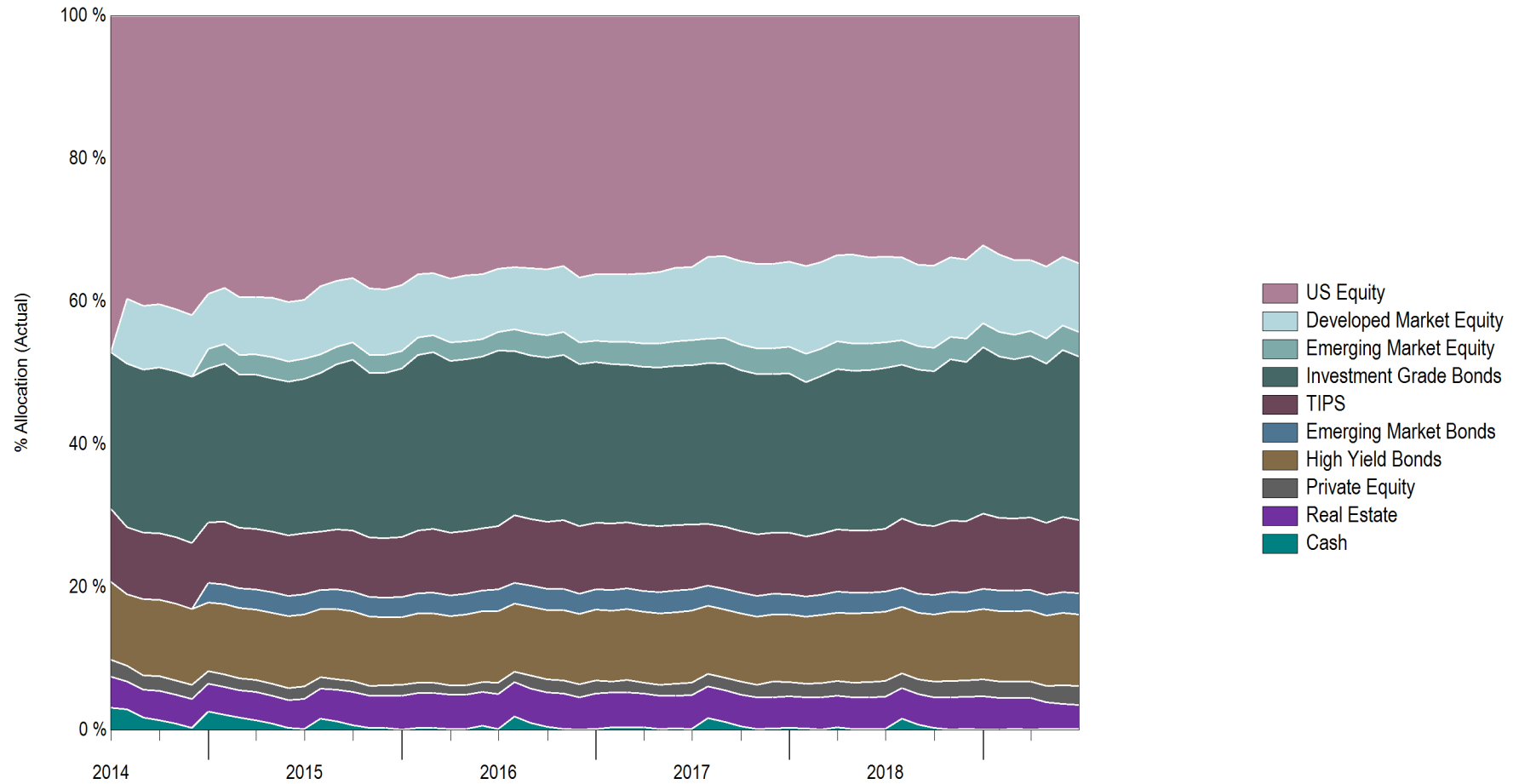
Total Retirement System

As of June 30, 2019

Allocation vs. Targets and Policy

	Current Balance	Current Allocation	Policy	Policy Range
 US Equity	\$60,744,410	35%	33%	28% - 38%
 Developed Market Equity	\$16,809,171	10%	9%	5% - 13%
 Emerging Market Equity	\$6,119,291	3%	3%	1% - 5%
 Investment Grade Bonds	\$40,071,297	23%	22%	17% - 27%
 TIPS	\$18,035,534	10%	10%	7% - 13%
 Emerging Market Bonds	\$5,203,863	3%	3%	1% - 5%
 High Yield Bonds	\$17,465,063	10%	10%	7% - 13%
 Private Equity	\$4,684,273	3%	5%	3% - 7%
 Real Estate	\$5,904,428	3%	5%	2% - 8%
 Cash	\$323,493	0%	0%	0% - 5%
Total	\$175,360,823	100%	100%	

Asset Allocation History
5 Years Ending June 30, 2019



Total Retirement System

As of June 30, 2019

	Actual Asset Allocation (%)	Target Allocation (%)	Target Range (%)	PRIT Asset Allocation ¹ (%)
Total Retirement System	NA	NA	NA	NA
<i>Equity Assets</i>	48	45	37-53	31
Domestic Equity Assets	35	33	28-38	16
International Equity Assets	13	12	9-15	21
<i>Fixed Income Assets</i>	46	45	32-53	20
Domestic Investment Grade Assets	23	22	17-27	14
High Yield Bond Assets	10	10	7-13	8
TIPS	10	10	7-13	-
Emerging Market Debt	3	3	1-5	-
<i>Portfolio Completion Strategies</i>	NA	NA	NA	16
<i>Real Estate Assets</i>	3	5	2-8	9
<i>Private Equity</i>	2	5	3-7	11
<i>Timber/Natural Resources</i>	NA	NA	NA	4
<i>Cash</i>	< 1	<1	0-5	< 1

¹ PRIT asset allocation as of June 30, 2019. TIPS and Emerging Market Debt are reflected in PRIT's Core and Value-Added Fixed Income Sleeves, respectively.

Total Retirement System

As of June 30, 2019

Asset Class Performance Summary

	Market Value (\$)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Total Retirement System (net)	175,360,823	100.0	3.4	11.4	6.4	7.8	5.6	8.6	6.2	7.7	Jul-88
55% MSCI World & 45% Barclays Aggregate			3.7	12.2	7.4	7.6	5.1	7.9	5.2	7.0	Jul-88
Consumer Price Index			0.8	2.0	1.6	2.0	1.5	1.7	2.2	2.5	Jul-88
PRIT Core Fund (net)			3.3	9.8	5.8	9.4	6.6	9.5	6.5	8.5	Jul-88
InvMetrics Public DB \$50mm-\$250mm Net Median			3.2	11.8	6.3	8.3	5.7	8.3	5.6	7.3	Jul-88
InvMetrics Public DB \$50mm-\$250mm Net Rank			18	59	44	74	56	43	13	37	Jul-88
Domestic Equity Assets (net)	60,744,410	34.6	4.2	17.6	7.1	13.2	9.2	14.2	5.6	8.2	Oct-06
Russell 3000			4.1	18.7	9.0	14.0	10.2	14.7	6.3	8.7	Oct-06
PRIT Domestic Equity			4.1	18.6	8.3	14.0	9.9	14.4	6.1	7.6	Oct-06
International Developed Markets Equity Assets (net)	16,809,171	9.6	3.8	14.3	1.4	9.3	1.8	6.3	--	2.6	Oct-06
MSCI EAFE			3.7	14.0	1.1	9.1	2.2	6.9	4.0	3.0	Oct-06
International Emerging Markets Equity Assets (net)	6,119,291	3.5	2.5	12.4	2.1	10.4	--	--	--	5.4	Jan-15
MSCI Emerging Markets			0.6	10.6	1.2	10.7	2.5	5.8	7.3	4.6	Jan-15
Investment Grade Bonds Assets (net)	40,071,297	22.9	3.1	6.1	7.9	2.3	3.0	3.9	4.9	6.1	Jul-88
BBgBarc US Aggregate TR			3.1	6.1	7.9	2.3	2.9	3.9	4.9	6.2	Jul-88
PRIT Core Fixed Income			4.0	8.0	8.2	1.6	4.6	5.3	5.5	6.9	Jul-88
High Yield Bond Assets (net)	17,465,063	10.0	2.6	9.5	7.6	6.7	4.2	7.8	--	6.8	Sep-03
BBgBarc US High Yield TR			2.5	9.9	7.5	7.5	4.7	9.2	6.9	7.8	Sep-03
PRIT Public Value-Added Fixed Income			2.6	7.9	6.5	5.2	2.6	6.3	--	6.4	Sep-03
TIPS Assets (net)	18,035,534	10.3	2.8	6.1	4.7	2.0	1.7	3.6	--	3.7	Oct-05
BBgBarc US TIPS TR			2.9	6.2	4.8	2.1	1.8	3.6	5.4	3.8	Oct-05
Emerging Market Debt Assets (net)	5,203,863	3.0	4.2	12.8	11.8	5.9	--	--	--	6.0	Jan-15
JP Morgan EMBI Global Diversified			4.1	11.3	12.4	5.5	5.3	7.8	9.2	6.2	Jan-15
Open-Ended Real Estate (net)	5,701,596	3.3	1.4	3.5	6.7	7.9	10.6	10.0	7.5	8.2	Oct-95
NCREIF ODCE			1.0	2.4	6.4	7.6	9.8	9.9	8.4	9.1	Oct-95

Cash Balance is as of April 30.



Total Retirement System

As of June 30, 2019

Trailing Performance

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Total Retirement System	175,360,823	100.0	--	3.5	11.4	6.5	7.9	5.6	8.6	6.2	7.7	Jul-88
55% MSCI World & 45% Barclays Aggregate				3.7	12.2	7.4	7.6	5.1	7.9	5.2	7.0	Jul-88
Consumer Price Index				0.8	2.0	1.6	2.0	1.5	1.7	2.2	2.5	Jul-88
PRIT Core Fund (net)				3.4	10.0	6.1	9.8	7.0	9.9	6.9	8.8	Jul-88
Domestic Equity Assets	60,744,410	34.6	34.6	4.3	17.7	7.3	13.3	9.3	14.3	5.7	8.2	Oct-06
Russell 3000				4.1	18.7	9.0	14.0	10.2	14.7	6.3	8.7	Oct-06
PRIT Domestic Equity				4.1	18.6	8.4	14.1	10.0	14.5	6.2	7.7	Oct-06
RhumbLine S&P 500 Index	18,883,023	10.8	31.1	4.3	18.5	10.4	14.2	10.7	14.7	6.0	6.4	Mar-99
S&P 500				4.3	18.5	10.4	14.2	10.7	14.7	5.9	6.4	Mar-99
Fiduciary Large Cap Equity	24,512,583	14.0	40.4	5.4	16.7	9.9	13.1	9.0	--	--	12.5	Sep-12
Russell 3000				4.1	18.7	9.0	14.0	10.2	14.7	6.3	13.6	Sep-12
Frontier Capital Appreciation	17,348,804	9.9	28.6	2.7	18.4	0.8	13.1	7.3	--	--	11.8	Feb-13
Russell 2500 Growth				4.1	23.9	6.1	16.1	10.0	15.7	7.9	13.1	Feb-13
International Developed Markets Equity Assets	16,809,171	9.6	9.6	3.8	14.3	1.4	9.3	1.8	6.3	--	2.6	Oct-06
MSCI EAFE				3.7	14.0	1.1	9.1	2.2	6.9	4.0	3.0	Oct-06
Rhumblin MSCI EAFE Index	16,809,171	9.6	100.0	3.8	14.3	1.4	9.3	--	--	--	2.9	Aug-14
MSCI EAFE				3.7	14.0	1.1	9.1	2.2	6.9	4.0	2.7	Aug-14
International Emerging Markets Equity Assets	6,119,291	3.5	3.5	2.5	12.4	2.1	10.4	--	--	--	5.4	Jan-15
MSCI Emerging Markets				0.6	10.6	1.2	10.7	2.5	5.8	7.3	4.6	Jan-15
DFA Emerging Markets	2,934,462	1.7	48.0	0.9	9.5	1.3	9.1	--	--	--	4.4	Jan-15
MSCI Emerging Markets				0.6	10.6	1.2	10.7	2.5	5.8	7.3	4.6	Jan-15

Total Retirement System

As of June 30, 2019

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Driehaus Emerging Market Equity	3,184,829	1.8	52.0	4.0	15.2	2.8	11.7	--	--	--	6.4	Jan-15
MSCI Emerging Markets				0.6	10.6	1.2	10.7	2.5	5.8	7.3	4.6	Jan-15
Investment Grade Bonds Assets	40,071,297	22.9	22.9	3.1	6.1	7.9	2.3	3.0	3.9	4.9	6.1	Jul-88
BBgBarc US Aggregate TR				3.1	6.1	7.9	2.3	2.9	3.9	4.9	6.2	Jul-88
PRIT Core Fixed Income				4.1	8.0	8.3	1.7	4.8	5.4	5.6	7.0	Jul-88
SSgA U.S. Aggregate Bond Index	40,071,297	22.9	100.0	3.1	6.1	7.9	2.3	3.0	3.9	--	4.6	May-01
BBgBarc US Aggregate TR				3.1	6.1	7.9	2.3	2.9	3.9	4.9	4.6	May-01
High Yield Bond Assets	17,465,063	10.0	10.0	2.7	9.8	8.1	7.1	4.5	7.9	--	6.8	Sep-03
BBgBarc US High Yield TR				2.5	9.9	7.5	7.5	4.7	9.2	6.9	7.8	Sep-03
PRIT Public Value-Added Fixed Income				2.7	8.1	6.9	5.6	3.0	6.7	--	6.8	Sep-03
Shenkman Capital	17,465,063	10.0	100.0	2.7	9.8	8.1	7.2	4.5	8.0	--	6.9	Apr-06
BBgBarc US High Yield TR				2.5	9.9	7.5	7.5	4.7	9.2	6.9	7.4	Apr-06
TIPS Assets	18,035,534	10.3	10.3	2.9	6.1	4.7	2.1	1.7	3.6	--	3.7	Oct-05
BBgBarc US TIPS TR				2.9	6.2	4.8	2.1	1.8	3.6	5.4	3.8	Oct-05
SSgA TIPS Index-NL	18,035,534	10.3	100.0	2.9	6.1	4.7	2.1	1.7	3.6	--	3.7	Oct-05
BBgBarc US TIPS TR				2.9	6.2	4.8	2.1	1.8	3.6	5.4	3.8	Oct-05
Emerging Market Debt Assets	5,203,863	3.0	3.0	4.2	12.8	11.8	5.9	--	--	--	6.0	Jan-15
JP Morgan EMBI Global Diversified				4.1	11.3	12.4	5.5	5.3	7.8	9.2	6.2	Jan-15
Payden Emerging Market Bond	5,203,863	3.0	100.0	4.2	12.8	11.8	5.9	--	--	--	6.0	Jan-15
JP Morgan EMBI Global Diversified				4.1	11.3	12.4	5.5	5.3	7.8	9.2	6.2	Jan-15

City of Marlborough Contributory Retirement System

As of June 30, 2019

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Open-Ended Real Estate	5,701,596	3.3	3.3	1.4	3.5	6.7	7.9	10.6	10.0	7.5	8.2	Oct-95
NCREIF ODCE				1.0	2.4	6.4	7.6	9.8	9.9	8.4	9.1	Oct-95
Clarion Partners	5,701,596	3.3	100.0	1.4	3.5	6.7	7.9	10.6	10.0	--	7.4	Oct-02
NCREIF ODCE				1.0	2.4	6.4	7.6	9.8	9.9	8.4	8.2	Oct-02
Total Closed End Real Estate (1)	202,832	0.1	0.1	0.0	4.2	-0.5	7.3	11.9	--	--	12.5	Jan-13
NCREIF ODCE				1.0	2.4	6.4	7.6	9.8	9.9	8.4	10.5	Jan-13
Colony Realty Partners IV	202,832	0.1	100.0	0.0	4.2	-0.5	7.3	11.9	--	--	--	Jan-13
NCREIF ODCE				1.0	2.4	6.4	7.6	9.8	9.9	8.4	10.5	Jan-13
Private Equity Assets (2)	4,684,273	2.7	2.7									
North American Strategic Partners 2006	695,536	0.4	14.8									
Ironsides Partnership Fund IV (3)	1,171,845	0.7	25.0									
Ironsides Direct Investment Fund IV (4)	2,816,893	1.6	60.1									
Cash (5)	323,493	0.2	0.2									

(1) System committed \$5 mil. to Rockwood XI Real Estate Fund during Q2 2019.

(2) System committed \$4 mil. each to Harborvest 2019 Global Fund and Ironside V during Q2 2019.

(3) Ironsides Partnership Fund IV NAV is as of 3/31/2019 adjusted for cash flows through 6/30/2019.

(4) Direct Investment Fund IV NAV is as of 3/31/2019 adjusted for cash flows through 6/30/2019.

(5) Cash balance is as of April 30, 2019.

Total Retirement System

As of June 30, 2019

Calendar Year Performance

	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)	2011 (%)	2010 (%)	2009 (%)
Total Retirement System	-4.4	13.1	8.7	-0.2	6.3	14.0	10.9	2.4	12.3	16.8
55% MSCI World & 45% Barclays Aggregate	-4.6	13.6	5.5	0.0	5.5	13.0	10.7	0.7	10.0	19.2
Consumer Price Index	1.9	2.1	2.1	0.7	0.8	1.5	1.7	3.0	1.5	2.7
PRIT Core Fund (net)	-1.8	17.7	8.0	1.1	8.1	15.2	13.9	0.1	13.6	17.7
Domestic Equity Assets	-6.7	20.3	14.6	-1.6	13.1	33.1	15.3	0.0	18.8	29.8
Russell 3000	-5.2	21.1	12.7	0.5	12.6	33.6	16.4	1.0	16.9	28.3
PRIT Domestic Equity	-5.1	20.8	12.9	0.3	11.7	33.7	16.9	1.1	16.8	25.4
RhumbLine S&P 500 Index	-4.4	21.8	11.9	1.4	13.6	32.2	16.0	2.1	15.0	26.6
S&P 500	-4.4	21.8	12.0	1.4	13.7	32.4	16.0	2.1	15.1	26.5
Fiduciary Large Cap Equity (net)	-3.7	19.2	13.8	-2.4	12.4	30.5	--	--	--	--
Russell 3000	-5.2	21.1	12.7	0.5	12.6	33.6	16.4	1.0	16.9	28.3
Frontier Capital Appreciation (net)	-13.9	19.1	20.5	-6.5	12.4	--	--	--	--	--
Russell 2500 Growth	-7.5	24.5	9.7	-0.2	7.1	40.6	16.1	-1.6	28.9	41.7
International Developed Markets Equity Assets	-13.5	24.9	1.4	-0.8	-8.7	21.2	15.0	-14.1	10.6	34.1
MSCI EAFE	-13.8	25.0	1.0	-0.8	-4.9	22.8	17.3	-12.1	7.8	31.8
Rhumblin MSCI EAFE Index (net)	-13.5	24.9	1.4	-0.8	--	--	--	--	--	--
MSCI EAFE	-13.8	25.0	1.0	-0.8	-4.9	22.8	17.3	-12.1	7.8	31.8
International Emerging Markets Equity Assets	-15.4	39.7	9.4	-12.7	--	--	--	--	--	--
MSCI Emerging Markets	-14.6	37.3	11.2	-14.9	-2.2	-2.6	18.2	-18.4	18.9	78.5
DFA Emerging Markets (net)	-15.2	36.6	12.4	-14.9	--	--	--	--	--	--
MSCI Emerging Markets	-14.6	37.3	11.2	-14.9	-2.2	-2.6	18.2	-18.4	18.9	78.5

Total Retirement System

As of June 30, 2019

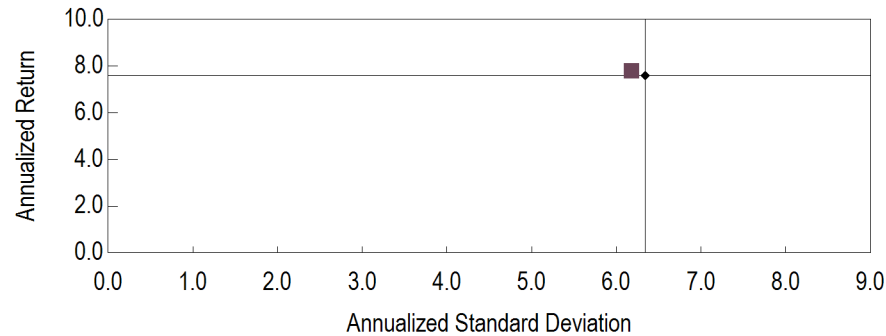
	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)	2011 (%)	2010 (%)	2009 (%)
Driehaus Emerging Market Equity (net)	-15.6	43.0	6.5	-10.6	--	--	--	--	--	--
<i>MSCI Emerging Markets</i>	-14.6	37.3	11.2	-14.9	-2.2	-2.6	18.2	-18.4	18.9	78.5
Investment Grade Bonds Assets	0.0	3.6	2.6	0.6	6.0	-2.0	4.3	7.8	6.6	6.0
<i>BBgBarc US Aggregate TR</i>	0.0	3.5	2.6	0.5	6.0	-2.0	4.2	7.8	6.5	5.9
<i>PRIT Core Fixed Income</i>	-0.8	5.4	4.0	-2.0	15.2	-2.8	6.4	8.1	7.5	11.9
SSgA U.S. Aggregate Bond Index	0.0	3.6	2.6	0.6	6.0	-2.0	4.3	7.8	6.6	6.0
<i>BBgBarc US Aggregate TR</i>	0.0	3.5	2.6	0.5	6.0	-2.0	4.2	7.8	6.5	5.9
High Yield Bond Assets	-1.3	7.0	12.7	-2.3	2.9	6.4	12.4	6.0	12.8	34.3
<i>BBgBarc US High Yield TR</i>	-2.1	7.5	17.1	-4.5	2.5	7.4	15.8	5.0	15.1	58.2
<i>PRIT Public Value-Added Fixed Income</i>	-2.1	9.0	11.7	-4.7	-0.2	-1.5	14.7	5.3	13.6	39.7
Shenkman Capital	-1.3	7.2	12.7	-2.3	2.9	6.4	12.4	6.0	12.8	34.3
<i>BBgBarc US High Yield TR</i>	-2.1	7.5	17.1	-4.5	2.5	7.4	15.8	5.0	15.1	58.2
TIPS Assets	-1.3	3.0	4.7	-1.4	3.6	-8.6	6.9	13.5	6.3	11.3
<i>BBgBarc US TIPS TR</i>	-1.3	3.0	4.7	-1.4	3.6	-8.6	7.0	13.6	6.3	11.4
SSgA TIPS Index-NL	-1.3	3.0	4.7	-1.4	3.6	-8.6	6.9	13.5	6.3	11.3
<i>BBgBarc US TIPS TR</i>	-1.3	3.0	4.7	-1.4	3.6	-8.6	7.0	13.6	6.3	11.4
Emerging Market Debt Assets	-7.0	12.0	11.5	-0.8	--	--	--	--	--	--
<i>JP Morgan EMBI Global Diversified</i>	-4.3	10.3	10.2	1.2	7.4	-5.3	17.4	7.3	12.2	29.8
Payden Emerging Market Bond (net)	-7.0	12.0	11.5	-0.8	--	--	--	--	--	--
<i>JP Morgan EMBI Global Diversified</i>	-4.3	10.3	10.2	1.2	7.4	-5.3	17.4	7.3	12.2	29.8

Total Retirement System

As of June 30, 2019

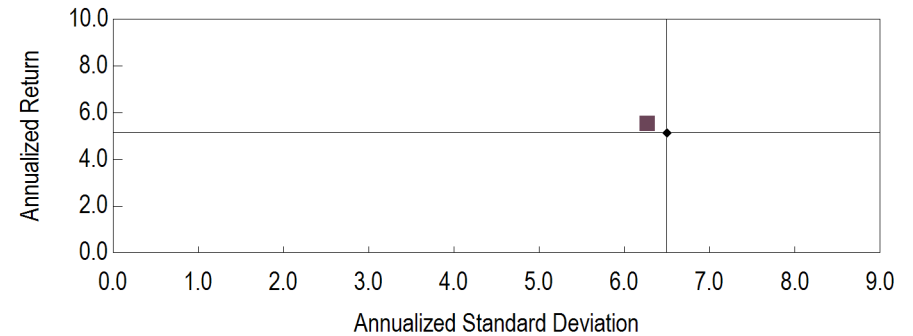
	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)	2011 (%)	2010 (%)	2009 (%)
Open-Ended Real Estate	8.6	7.9	9.1	15.7	13.2	12.8	10.9	18.7	19.2	-38.6
NCREIF ODCE	8.3	7.6	8.8	15.0	12.5	13.9	10.9	16.0	16.4	-29.8
Clarion Partners	8.6	7.9	9.1	15.7	13.2	12.8	10.9	18.7	19.2	-38.6
NCREIF ODCE	8.3	7.6	8.8	15.0	12.5	13.9	10.9	16.0	16.4	-29.8
Total Closed End Real Estate	-1.8	15.1	9.5	23.8	13.3	18.8	--	--	--	--
NCREIF ODCE	8.3	7.6	8.8	15.0	12.5	13.9	10.9	16.0	16.4	-29.8
Colony Realty Partners IV	-1.8	15.1	9.5	23.8	13.3	--	--	--	--	--
NCREIF ODCE	8.3	7.6	8.8	15.0	12.5	13.9	10.9	16.0	16.4	-29.8
Private Equity Assets										
North American Strategic Partners 2006 (net)										
Ironsides Partnership Fund IV (net)										
Ironsides Direct Investment Fund IV (net)										
Cash										

Annualized Return vs. Annualized Standard Deviation
3 Years Ending June 30, 2019



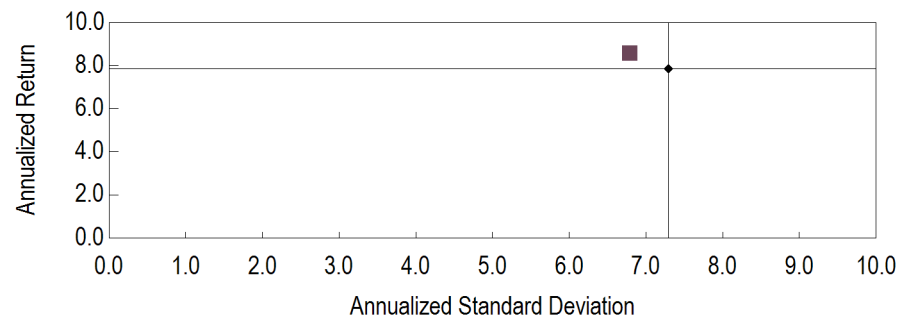
- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate

Annualized Return vs. Annualized Standard Deviation
5 Years Ending June 30, 2019



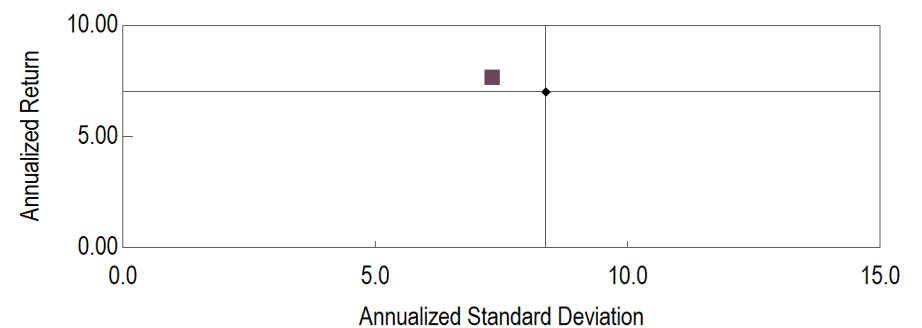
- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate

Annualized Return vs. Annualized Standard Deviation
10 Years Ending June 30, 2019



- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate

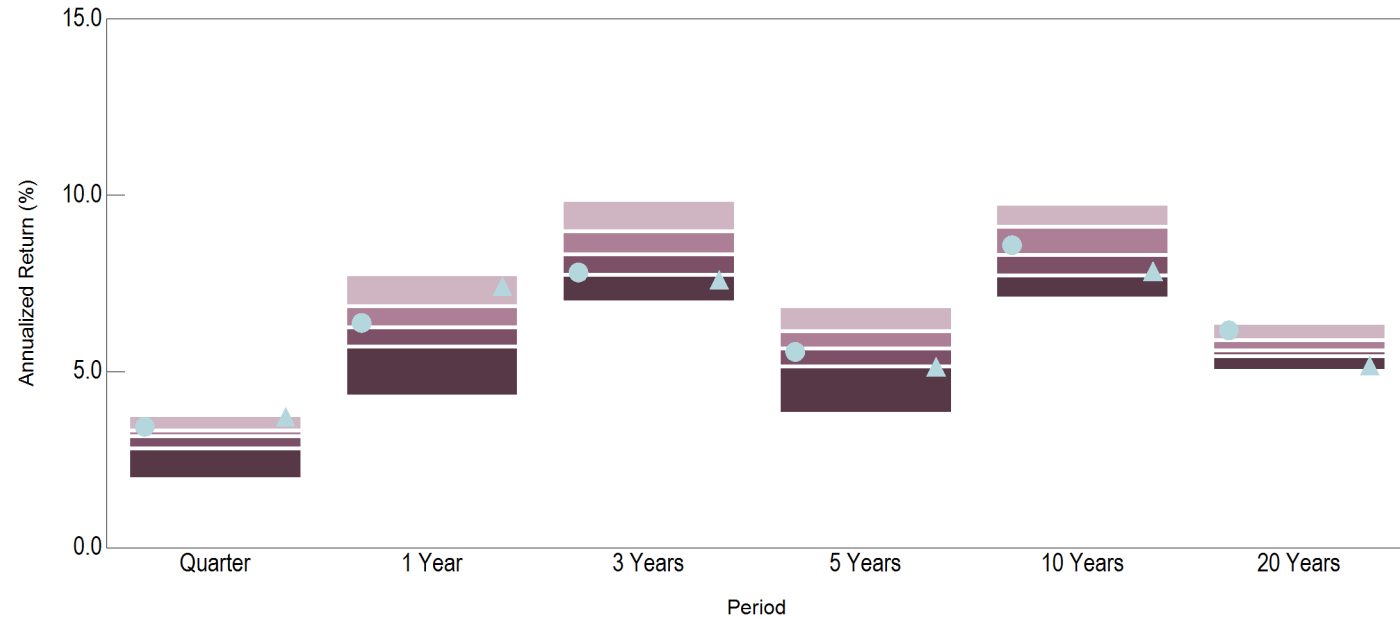
Annualized Return vs. Annualized Standard Deviation
Since Inception



- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate

As of June 30, 2019

InvMetrics Public DB \$50mm-\$250mm Net Return Comparison
Ending June 30, 2019



	Return (Rank)					
5th Percentile	3.8	7.7	9.9	6.8	9.8	6.4
25th Percentile	3.3	6.9	9.0	6.2	9.1	5.9
Median	3.2	6.3	8.3	5.7	8.3	5.6
75th Percentile	2.8	5.7	7.8	5.2	7.7	5.4
95th Percentile	2.0	4.3	7.0	3.8	7.1	5.0
# of Portfolios	75	74	69	68	49	16
● Total Retirement System	3.4 (18)	6.4 (44)	7.8 (74)	5.6 (56)	8.6 (43)	6.2 (13)
▲ 55% MSCI World & 45% Barclays Aggregate	3.7 (7)	7.4 (10)	7.6 (81)	5.1 (77)	7.9 (69)	5.2 (91)

As of June 30, 2019

Statistics Summary
5 Years Ending June 30, 2019

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Total Retirement System	5.6%	6.3%	0.4	1.0	0.7	1.1%
55% MSCI World & 45% Barclays Aggregate	5.1%	6.5%	--	1.0	0.7	0.0%
Equity Assets	7.2%	11.7%	-1.2	0.9	0.5	2.4%
Russell 3000	10.2%	12.3%	--	1.0	0.8	0.0%
Domestic Equity Assets	9.2%	12.4%	-0.6	1.0	0.7	1.7%
Russell 3000	10.2%	12.3%	--	1.0	0.8	0.0%
RhumbLine S&P 500 Index	10.7%	12.0%	-0.5	1.0	0.8	0.0%
S&P 500	10.7%	12.0%	--	1.0	0.8	0.0%
Fiduciary Large Cap Equity	9.0%	10.8%	-0.3	0.8	0.8	3.7%
Russell 3000	10.2%	12.3%	--	1.0	0.8	0.0%
Frontier Capital Appreciation	7.0%	16.9%	-0.6	1.0	0.4	4.9%
Russell 2500 Growth	10.0%	16.1%	--	1.0	0.6	0.0%
International Developed Markets Equity Assets	1.8%	12.3%	-0.5	1.0	0.1	0.8%
MSCI EAFE	2.2%	12.3%	--	1.0	0.1	0.0%
Rhumblin MSCI EAFE Index	--	--	--	--	--	--
MSCI EAFE	2.2%	12.3%	--	1.0	0.1	0.0%
International Emerging Markets Equity Assets	--	--	--	--	--	--
MSCI Emerging Markets	2.5%	15.8%	--	1.0	0.1	0.0%
DFA Emerging Markets	--	--	--	--	--	--
MSCI Emerging Markets	2.5%	15.8%	--	1.0	0.1	0.0%

As of June 30, 2019

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Driehaus Emerging Market Equity	--	--	--	--	--	--
MSCI Emerging Markets	2.5%	15.8%	--	1.0	0.1	0.0%
Investment Grade Bonds Assets	3.0%	2.9%	1.0	1.0	0.7	0.0%
BBgBarc US Aggregate TR	2.9%	2.9%	--	1.0	0.7	0.0%
SSgA U.S. Aggregate Bond Index	3.0%	2.9%	1.0	1.0	0.7	0.0%
BBgBarc US Aggregate TR	2.9%	2.9%	--	1.0	0.7	0.0%
High Yield Bond Assets	4.2%	5.0%	-0.4	0.9	0.7	1.1%
BBgBarc US High Yield TR	4.7%	5.5%	--	1.0	0.7	0.0%
Shenkman Capital	4.2%	5.0%	-0.5	0.9	0.7	1.1%
BBgBarc US High Yield TR	4.7%	5.5%	--	1.0	0.7	0.0%
TIPS Assets	1.7%	3.5%	-0.6	1.0	0.2	0.0%
BBgBarc US TIPS TR	1.8%	3.5%	--	1.0	0.3	0.0%
SSgA TIPS Index-NL	1.7%	3.5%	-0.6	1.0	0.2	0.0%
BBgBarc US TIPS TR	1.8%	3.5%	--	1.0	0.3	0.0%
Emerging Market Debt Assets	--	--	--	--	--	--
JP Morgan EMBI Global Diversified	5.3%	5.5%	--	1.0	0.8	0.0%
Payden Emerging Market Bond	--	--	--	--	--	--
JP Morgan EMBI Global Diversified	5.3%	5.5%	--	1.0	0.8	0.0%
Open-Ended Real Estate	10.6%	4.7%	0.8	1.1	2.1	1.0%
NCREIF ODCE	9.8%	4.2%	--	1.0	2.1	0.0%
Clarion Partners	10.6%	4.7%	0.8	1.1	2.1	1.0%
NCREIF ODCE	9.8%	4.2%	--	1.0	2.1	0.0%

As of June 30, 2019

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Total Closed End Real Estate	11.9%	7.2%	0.4	1.3	1.5	4.8%
NCREIF ODCE	9.8%	4.2%	--	1.0	2.1	0.0%
Colony Realty Partners IV	11.9%	7.2%	0.4	1.3	1.5	4.8%
NCREIF ODCE	9.8%	4.2%	--	1.0	2.1	0.0%
Comerica Short Term Fund	0.2%	0.2%	-2.3	-0.1	-4.7	0.3%
91 Day T-Bills	0.9%	0.3%	--	1.0	0.0	0.0%

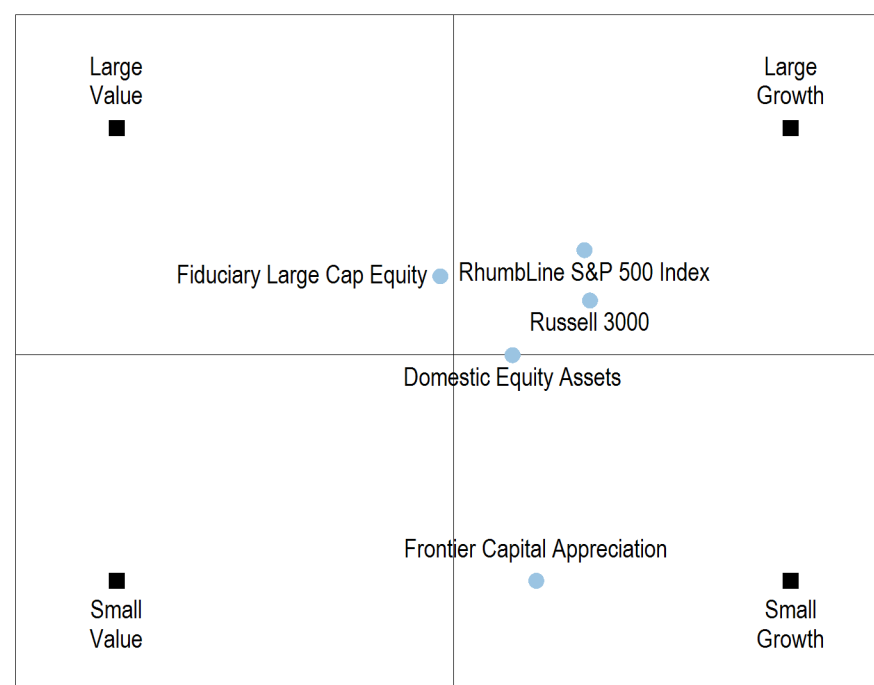
Retirement System Detail

Domestic Equity Assets

As of June 30, 2019

Asset Allocation on June 30, 2019

	Actual	Actual
Fiduciary Large Cap Equity	\$24,512,583	40.4%
Frontier Capital Appreciation	\$17,348,804	28.6%
RhumbLine S&P 500 Index	\$18,883,023	31.1%
Total	\$60,744,410	100.0%

Domestic Equity Assets Style Map
3 Years Ending June 30, 2019

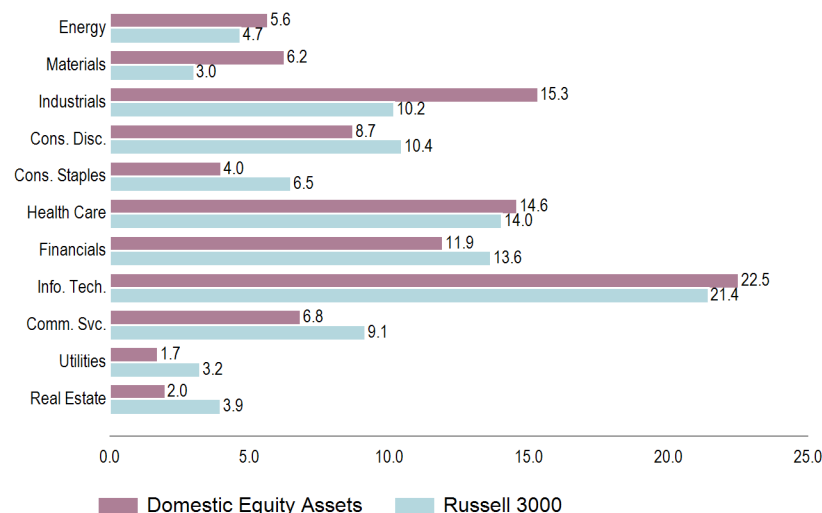
Domestic Equity Assets

As of June 30, 2019

Domestic Equity Assets Characteristics

	Portfolio Q2-19	Index Q2-19	Portfolio Q1-19
Market Value			
Market Value (\$M)	60.7	--	58.7
Number Of Holdings	626	2954	632
Characteristics			
Weighted Avg. Market Cap. (\$B)	120.8	190.7	116.1
Median Market Cap (\$B)	16.7	1.6	15.5
P/E Ratio	20.8	20.5	19.8
Yield	1.4	1.9	1.5
EPS Growth - 5 Yrs.	11.0	13.0	10.8
Price to Book	3.1	3.4	3.1
Beta (holdings; domestic)	1.2	1.0	1.1

Sector Allocation (%) vs Russell 3000



Top 10 Holdings

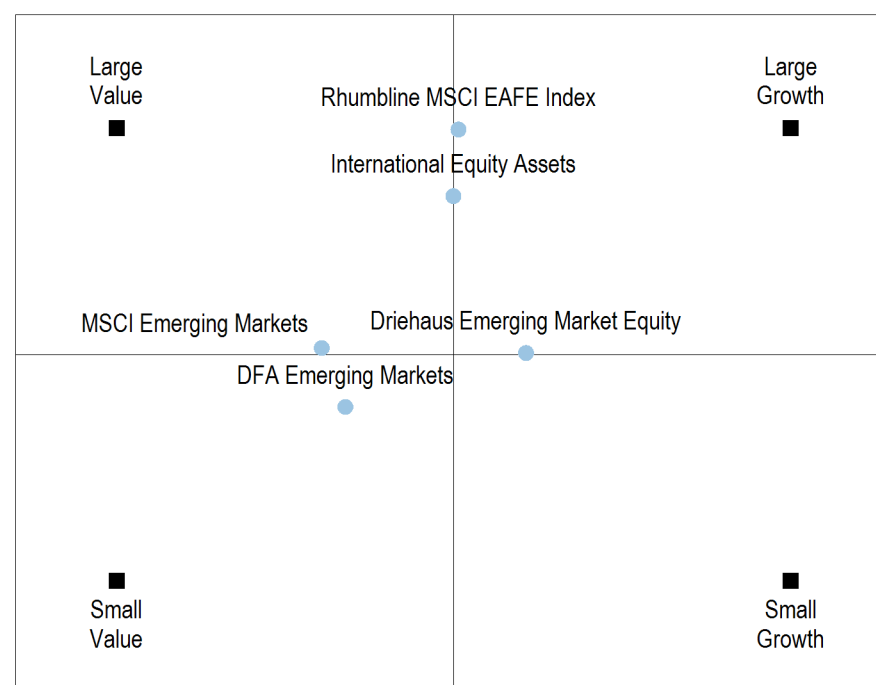
MICROSOFT	2.2%
APPLE	1.8%
AMAZON.COM	1.6%
UNITED AIRLINES HOLDINGS	1.6%
INSULET	1.3%
COOPER COS.	1.0%
ALLEGHENY TECHS.	1.0%
FACEBOOK CLASS A	1.0%
TUTOR PERINI	0.9%
BERKSHIRE HATHAWAY 'B'	0.9%
Total	13.3%

International Equity Assets

As of June 30, 2019

Asset Allocation on June 30, 2019

	Actual	Actual
DFA Emerging Markets	\$2,934,462	12.8%
Driehaus Emerging Market Equity	\$3,184,829	13.9%
Rhumblin MSCI EAFE Index	\$16,809,171	73.3%
Total	\$22,928,462	100.0%

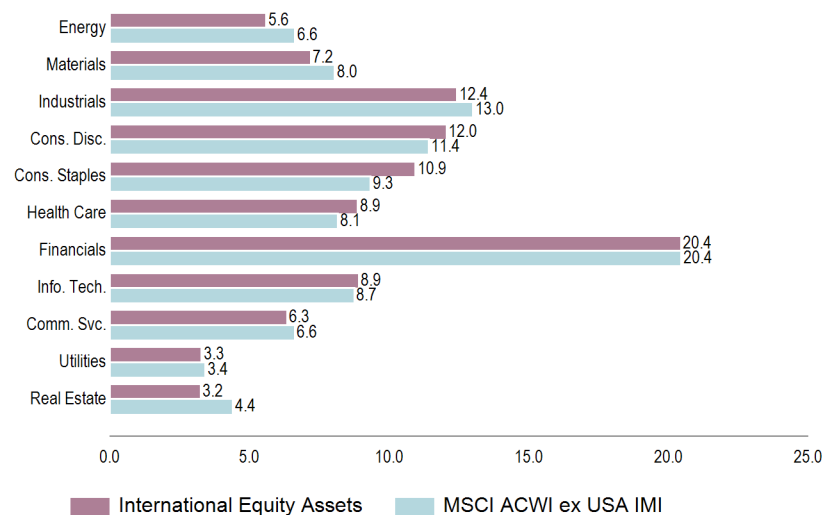
International Equity Assets Style Map
3 Years Ending June 30, 2019

International Equity Assets

As of June 30, 2019

International Equity Characteristics			
	Portfolio Q2-19	Index Q2-19	Portfolio Q1-19
Market Value			
Market Value (\$M)	22.9	--	23.1
Number Of Holdings	5887	6381	5906
Characteristics			
Weighted Avg. Market Cap. (\$B)	62.7	57.1	62.9
Median Market Cap (\$B)	0.6	1.6	0.6
P/E Ratio	15.5	14.9	14.7
Yield	3.1	3.1	3.2
EPS Growth - 5 Yrs.	9.1	9.9	10.4
Price to Book	2.4	2.3	2.3
Beta (holdings; domestic)	1.0	1.0	1.0

Sector Allocation (%) vs MSCI ACWI ex USA IMI



Top 10 Holdings

NESTLE 'R'	1.7%
ROCHE HOLDING	1.1%
NOVARTIS 'R'	1.0%
SAMSUNG ELECTRONICS	1.0%
AIA GROUP	0.9%
HSBC HOLDINGS	0.9%
TENCENT HOLDINGS	0.8%
TAIWAN SEMICON.SPN.ADR 1:5	0.8%
ROYAL DUTCH SHELL A(LON)	0.8%
TOYOTA MOTOR	0.7%
Total	9.7%

As of June 30, 2019

Country Allocation Report

As of 6/30/2019

Region	% of Total	% of Bench	% Diff
North America ex U.S.	0.1%	6.8%	-6.7%
United States	1.5%	0.0%	1.5%
Europe Ex U.K.	34.9%	30.3%	4.6%
United Kingdom	11.7%	11.4%	0.3%
Pacific Basin Ex Japan	12.2%	8.6%	3.6%
Japan	17.4%	16.7%	0.7%
Emerging Markets	21.6%	24.9%	-3.3%
Other	0.7%	1.2%	-0.5%
Total	100.0%	100.0%	0.0%

International Equity Assets

As of June 30, 2019

International Equity Country Allocation

vs MSCI ACWI ex USA IMI

Country	% of Total	% of Bench	% Diff
	0.0%	0.4%	-0.4%
ARGENTINA	0.0%	0.1%	-0.1%
AUSTRALIA	5.2%	4.9%	0.3%
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	2.3%	2.0%	0.3%
BULGARIA	0.0%	0.0%	0.0%
CANADA	0.1%	6.8%	-6.7%
CHILE	0.2%	0.3%	-0.1%
CHINA	3.1%	7.6%	-4.5%
COLOMBIA	0.1%	0.1%	0.0%
CROATIA	0.0%	0.0%	0.0%
CZECH REPUBLIC	0.0%	0.0%	0.0%
DENMARK	1.2%	1.2%	0.1%
EGYPT	0.1%	0.0%	0.1%
ESTONIA	0.0%	0.0%	0.0%
FINLAND	0.7%	0.7%	0.0%
FRANCE	8.3%	6.9%	1.4%
GERMANY	6.4%	5.6%	0.8%
GREECE	0.1%	0.1%	0.0%
HONG KONG	5.7%	2.5%	3.1%
HUNGARY	0.2%	0.1%	0.1%

International Equity Assets

As of June 30, 2019

Country	% of Total	% of Bench	% Diff
INDIA	3.3%	2.5%	0.8%
INDONESIA	0.7%	0.6%	0.2%
IRELAND	0.4%	0.4%	0.0%
ISRAEL	0.4%	0.5%	-0.1%
ITALY	1.7%	1.7%	0.0%
JAPAN	17.4%	16.7%	0.7%
JORDAN	0.0%	0.0%	0.0%
KAZAKHSTAN	0.0%	0.0%	0.0%
KENYA	0.0%	0.0%	0.0%
KOREA	3.0%	3.3%	-0.2%
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	0.4%	0.6%	-0.2%
MAURITIUS	0.0%	0.0%	0.0%
MEXICO	0.8%	0.7%	0.2%
MOROCCO	0.0%	0.0%	0.0%
NETHERLANDS	3.4%	2.3%	1.1%
NEW ZEALAND	0.2%	0.2%	-0.1%
NIGERIA	0.0%	0.0%	0.0%
NORWAY	0.6%	0.6%	0.0%
OMAN	0.0%	0.0%	0.0%
OTHER	0.2%	0.0%	0.2%
PAKISTAN	0.0%	0.0%	0.0%
PERU	0.2%	0.1%	0.1%
PHILIPPINES	0.4%	0.3%	0.1%

International Equity Assets

As of June 30, 2019

Country	% of Total	% of Bench	% Diff
POLAND	0.4%	0.3%	0.1%
PORTUGAL	0.1%	0.1%	0.0%
QATAR	0.0%	0.3%	-0.3%
ROMANIA	0.0%	0.0%	0.0%
RUSSIA	0.9%	0.9%	-0.1%
SERBIA	0.0%	0.0%	0.0%
SINGAPORE	1.2%	1.0%	0.2%
SLOVENIA	0.0%	0.0%	0.0%
SOUTH AFRICA	1.5%	1.5%	0.0%
SPAIN	2.2%	1.9%	0.2%
SRI LANKA	0.0%	0.0%	0.0%
SWEDEN	1.9%	2.1%	-0.2%
SWITZERLAND	6.9%	5.8%	1.0%
TAIWAN	2.9%	3.0%	-0.1%
THAILAND	0.9%	0.8%	0.1%
TUNISIA	0.0%	0.0%	0.0%
TURKEY	0.1%	0.1%	0.0%
UKRAINE	0.0%	0.0%	0.0%
UNITED ARAB EMIRATES	0.0%	0.2%	-0.2%
UNITED KINGDOM	11.7%	11.4%	0.3%
UNITED STATES	1.5%	0.0%	1.5%
VIETNAM	0.0%	0.0%	0.0%
Total	100.0%	100.0%	0.0%

Fixed Income Assets

As of June 30, 2019

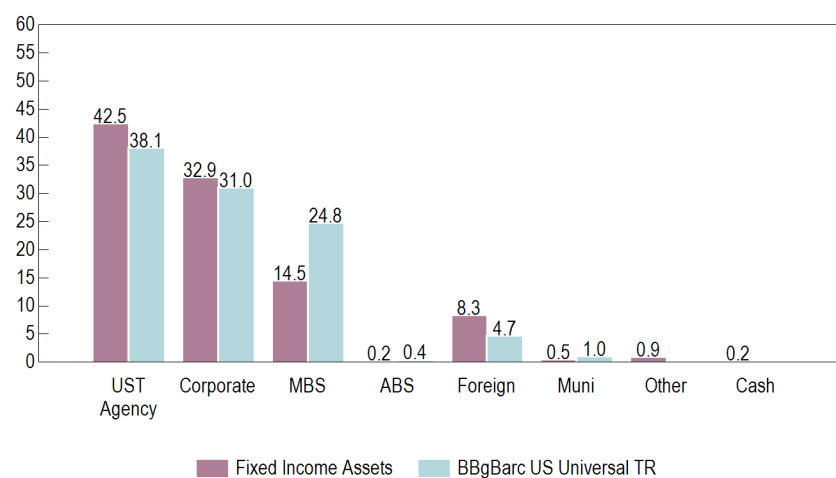
Asset Allocation on June 30, 2019

	Actual	Actual
Payden Emerging Market Bond	\$5,203,863	6.4%
Shenkman Capital	\$17,465,063	21.6%
SSgA TIPS Index-NL	\$18,035,534	22.3%
SSgA U.S. Aggregate Bond Index	\$40,071,297	49.6%
Total	\$80,775,757	100.0%

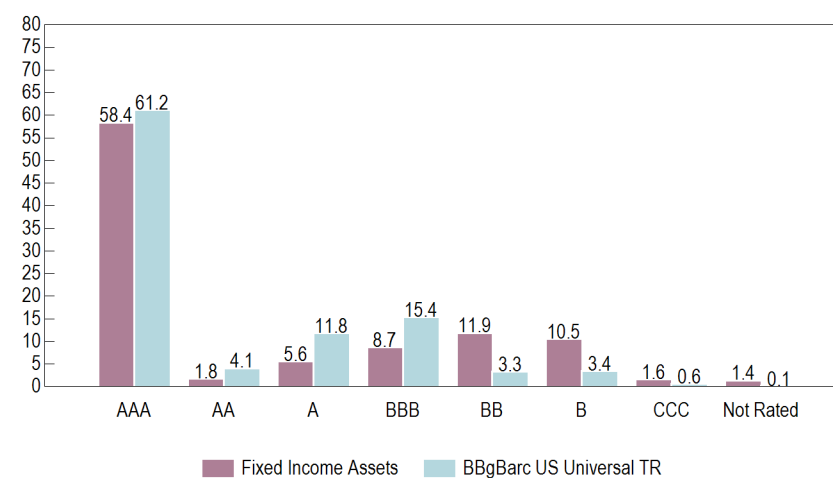
Fixed Income Characteristics
vs. BBgBarc US Universal TR

	Portfolio Q2-19	Index Q2-19	Portfolio Q1-19
Fixed Income Characteristics			
Yield to Maturity	3.1	2.9	3.8
Average Duration	4.0	--	5.1
Average Quality	AA	AA	A
Weighted Average Maturity	7.4	7.8	7.7

Sector Allocation



Credit Quality Allocation



Portfolio Reviews

RhumbLine S&P 500 Index

As of June 30, 2019

Account Information

Account Name	RhumbLine S&P 500 Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	3/01/99
Account Type	US Equity
Benchmark	S&P 500
Universe	eV US Passive S&P 500 Equity Net

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
RhumbLine S&P 500 Index	4.3	18.5	10.4	14.2	10.7	14.7	6.4	Mar-99
S&P 500	4.3	18.5	10.4	14.2	10.7	14.7	6.4	Mar-99

Top 10 Holdings

MICROSOFT	4.1%
APPLE	3.5%
AMAZON.COM	3.2%
FACEBOOK CLASS A	1.9%
BERKSHIRE HATHAWAY 'B'	1.7%
ISHARES CORE S&P 500 ETF	1.5%
JOHNSON & JOHNSON	1.5%
JP MORGAN CHASE & CO.	1.5%
ALPHABET 'C'	1.3%
EXXON MOBIL	1.3%
Total	21.5%

RhumbLine S&P 500 Index Characteristics

	Portfolio Q2-19	Index Q2-19	Portfolio Q1-19
Market Value			
Market Value (\$M)	18.9	--	18.5
Number Of Holdings	507	505	507
Characteristics			
Weighted Avg. Market Cap. (\$B)	224.8	225.0	211.8
Median Market Cap (\$B)	22.2	22.1	21.2
P/E Ratio	20.6	20.6	20.2
Yield	2.0	2.0	2.0
EPS Growth - 5 Yrs.	12.8	12.8	12.3
Price to Book	3.6	3.6	3.5
Beta (holdings; domestic)	1.0	1.0	1.0

Sector Distribution

Energy	5.0	5.1	5.4
Materials	2.7	2.7	2.6
Industrials	9.2	9.4	9.4
Consumer Discretionary	10.0	10.2	10.1
Consumer Staples	7.2	7.3	7.2
Health Care	14.0	14.2	14.5
Financials	14.4	13.1	13.2
Information Technology	21.2	21.5	21.1
Communication Services	10.0	10.2	10.0
Utilities	3.3	3.3	3.3
Real Estate	3.0	3.1	3.0

Fiduciary Large Cap Equity

As of June 30, 2019

Account Information

Account Name	Fiduciary Large Cap Equity
Account Structure	Mutual Fund
Investment Style	Active
Inception Date	9/01/12
Account Type	US Equity
Benchmark	Russell 3000
Universe	eV US Large Cap Equity Net

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Fiduciary Large Cap Equity	5.4	16.7	9.9	13.1	9.0	--	12.5	Sep-12
Russell 3000	4.1	18.7	9.0	14.0	10.2	14.7	13.6	Sep-12

Top Holdings as of March 31, 2019

BERKSHIRE HATHAWAY INC B	5.00%
HONEYWELL INTERNATIONAL INC	4.54%
UNITEDHEALTH GROUP INC	4.38%
DOLLAR GENERAL CORP	3.93%
MASCO CORP	3.93%
DOLLAR TREE INC	3.72%
EBAY INC	3.71%
ACCENTURE PLC CLASS A	3.70%
JPMORGAN CHASE & CO	3.67%
NESTLE SA ADR	3.49%

Fund Characteristics as of March 31, 2019

Versus Russell 3000

Sharpe Ratio (3 Year)	1.10
Average Market Cap (\$mm)	54,935.82
Price/Earnings	16.32
Price/Book	2.65
Price/Sales	1.67
Price/Cash Flow	12.03
Dividend Yield	2.06
Number of Equity Holdings	32
R-Squared (3 Year)	0.86
Alpha (3 Year)	0.07%

Sector Allocation as of March 31, 2019

BASIC MATERIALS	9.69%
COMMUNICATION SERVICES	1.69%
CONSUMER CYCLICAL	12.94%
CONSUMER DEFENSIVE	19.32%
ENERGY	2.79%
FINANCIAL SERVICES	16.83%
HEALTHCARE	11.02%
INDUSTRIALS	13.63%
REAL ESTATE	0.00%
TECHNOLOGY	12.08%
UTILITIES	0.00%

Frontier Capital Appreciation

As of June 30, 2019

Account Information

Account Name	Frontier Capital Appreciation
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	2/01/13
Account Type	US Equity
Benchmark	Russell 2500 Growth
Universe	eV US Small-Mid Cap Growth Equity Net

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Frontier Capital Appreciation	2.5	17.9	0.0	12.6	7.0	--	11.6	Feb-13
Russell 2500 Growth	4.1	23.9	6.1	16.1	10.0	15.7	13.1	Feb-13

Top 10 Holdings

UNITED AIRLINES HOLDINGS	3.2%
INSULET	2.7%
ALLEGHENY TECHS.	2.1%
COOPER COS.	2.1%
TUTOR PERINI	1.9%
COGENT COMMS.HOLDINGS	1.7%
KBR	1.7%
UNIVERSAL DISPLAY	1.6%
MONOLITHIC PWR.SYS.	1.6%
AMERICAN AIRLINES GROUP	1.5%
Total	20.0%

Frontier Capital Appreciation Characteristics

	Portfolio Q2-19	Index Q2-19	Portfolio Q1-19
Market Value			
Market Value (\$M)	17.3	--	16.9
Number Of Holdings	141	1477	144

Characteristics

Weighted Avg. Market Cap. (\$B)	6.1	6.3	5.6
Median Market Cap (\$B)	2.7	1.2	2.6
P/E Ratio	20.7	24.8	19.2
Yield	0.9	0.7	0.9
EPS Growth - 5 Yrs.	7.0	16.9	7.0
Price to Book	2.7	4.9	2.6
Beta (holdings; domestic)	1.4	1.3	1.3

Sector Distribution

Energy	6.4	1.0	5.6
Materials	10.1	4.3	11.0
Industrials	22.0	16.7	21.7
Consumer Discretionary	7.2	14.7	5.1
Consumer Staples	0.5	1.9	0.4
Health Care	15.2	22.1	14.3
Financials	9.2	7.1	8.6
Information Technology	23.9	25.9	25.1
Communication Services	3.3	3.3	2.9
Utilities	0.0	0.3	0.0
Real Estate	0.8	2.8	0.9

Rhumbline MSCI EAFE Index

As of June 30, 2019

Account Information

Account Name	Rhumbline MSCI EAFE Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	8/01/14
Account Type	Non-US Stock Developed
Benchmark	MSCI EAFE
Universe	eV EAFE All Cap Equity Net

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Rhumbline MSCI EAFE Index	3.8	14.3	1.4	9.3	--	--	2.9	Aug-14
MSCI EAFE	3.7	14.0	1.1	9.1	2.2	6.9	2.7	Aug-14

Top 10 Holdings

NESTLE 'R'	2.3%
NOVARTIS 'R'	1.4%
ROCHE HOLDING	1.4%
HSBC HOLDINGS	1.2%
ROYAL DUTCH SHELL A(LON)	1.0%
TOYOTA MOTOR	1.0%
BP	1.0%
SAP	1.0%
TOTAL	0.9%
AIA GROUP	0.9%
Total	12.1%

Rhumbline MSCI EAFE Index Characteristics

	Portfolio Q2-19	Index Q2-19	Portfolio Q1-19
Market Value			
Market Value (\$M)	16.8	--	17.1
Number Of Holdings	937	922	934
Characteristics			
Weighted Avg. Market Cap. (\$B)	61.2	61.2	59.0
Median Market Cap (\$B)	10.1	10.1	10.1
P/E Ratio	15.5	15.5	15.1
Yield	3.4	3.4	3.4
EPS Growth - 5 Yrs.	7.9	7.9	9.3
Price to Book	2.3	2.3	2.2
Beta (holdings; domestic)	1.0	1.0	1.0

Sector Distribution

Energy	5.5	5.5	5.7
Materials	7.3	7.4	7.4
Industrials	14.6	14.8	14.1
Consumer Discretionary	11.1	11.1	10.8
Consumer Staples	11.6	11.7	11.6
Health Care	11.0	11.2	11.1
Financials	18.7	18.9	18.6
Information Technology	6.6	6.7	6.2
Communication Services	5.4	5.4	5.3
Utilities	3.7	3.7	3.6
Real Estate	3.5	3.6	3.7

DFA Emerging Markets

As of June 30, 2019

Account Information

Account Name	DFA Emerging Markets
Account Structure	Mutual Fund
Investment Style	Active
Inception Date	1/01/15
Account Type	Non-US Stock Emerging
Benchmark	MSCI Emerging Markets
Universe	eV Emg Mkt Equity Hedged Net

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
DFA Emerging Markets	0.9	9.5	1.3	9.1	--	--	4.4	Jan-15
MSCI Emerging Markets	0.6	10.6	1.2	10.7	2.5	5.8	4.6	Jan-15

Top 10 Holdings

SAMSUNG ELECTRONICS	4.2%
TENCENT HOLDINGS	1.9%
TAIWAN SEMICON.SPN.ADR 1:5	1.5%
TAIWAN SEMICON.MNFG.	1.1%
VALE ON	0.9%
ALIBABA GROUP HLDG.SPN. ADR 1:1	0.8%
PING AN INSURANCE (GROUP) OF CHINA 'H'	0.7%
SK HYNIX	0.7%
RELIANCE INDUSTRIES	0.7%
PETROLEO BRASILEIRO PN	0.7%
Total	13.2%

DFA Emerging Markets Characteristics

	Portfolio Q2-19	Index Q2-19	Portfolio Q1-19
Market Value			
Market Value (\$M)	2.9	--	2.9
Number Of Holdings	4924	1193	4954
Characteristics			
Weighted Avg. Market Cap. (\$B)	44.3	81.7	44.2
Median Market Cap (\$B)	0.4	5.6	0.4
P/E Ratio	13.0	14.1	12.6
Yield	3.0	2.8	2.9
EPS Growth - 5 Yrs.	11.1	13.3	11.5
Price to Book	2.1	2.4	2.2
Beta (holdings; domestic)	1.1	1.1	1.1

Sector Distribution

Energy	7.0	7.9	6.8
Materials	11.0	7.7	11.2
Industrials	9.0	5.5	9.0
Consumer Discretionary	10.6	13.5	10.9
Consumer Staples	7.2	6.4	7.2
Health Care	3.0	2.6	3.2
Financials	19.2	25.2	18.5
Information Technology	17.7	13.8	18.0
Communication Services	7.7	11.5	7.6
Utilities	3.5	2.7	3.4
Real Estate	4.0	3.0	4.1

Driehaus Emerging Market Equity

As of June 30, 2019

Account Information

Account Name	Driehaus Emerging Market Equity
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	1/01/15
Account Type	Non-US Stock Emerging
Benchmark	MSCI Emerging Markets
Universe	eV Emg Mkt Equity Hedged Net

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Driehaus Emerging Market Equity	4.0	15.2	2.8	11.7	--	--	6.4	Jan-15
MSCI Emerging Markets	0.6	10.6	1.2	10.7	2.5	5.8	4.6	Jan-15

Top 10 Holdings

TAIWAN SEMICON.SPN.ADR 1:5	4.6%
TENCENT HOLDINGS	4.3%
ALIBABA GROUP HLDG.SPN. ADR 1:1	3.9%
SAMSUNG ELECTRONICS	3.3%
HDFC BANK ADR 1:3	2.9%
PING AN INSURANCE (GROUP) OF CHINA 'H'	2.6%
ICICI BK.ADR 1:2	2.4%
CP ALL NVDR	1.9%
INDL&COML.BOC.'H'	1.9%
LOJAS RENNER ON	1.8%
Total	29.7%

Driehaus Emerging Market Equity Characteristics

	Portfolio Q2-19	Index Q2-19	Portfolio Q1-19
Market Value			
Market Value (\$M)	3.2	--	3.1
Number Of Holdings	97	1193	98
Characteristics			
Weighted Avg. Market Cap. (\$B)	88.7	81.7	102.7
Median Market Cap (\$B)	15.3	5.6	18.3
P/E Ratio	21.2	14.1	16.1
Yield	2.0	2.8	2.0
EPS Growth - 5 Yrs.	14.6	13.3	15.3
Price to Book	3.8	2.4	3.4
Beta (holdings; domestic)	1.0	1.1	1.0

Sector Distribution

Energy	4.9	7.9	8.0
Materials	2.8	7.7	3.6
Industrials	3.8	5.5	2.8
Consumer Discretionary	18.3	13.5	14.9
Consumer Staples	10.9	6.4	10.8
Health Care	2.7	2.6	2.2
Financials	30.6	25.2	31.3
Information Technology	13.0	13.8	11.7
Communication Services	10.2	11.5	10.3
Utilities	0.5	2.7	0.9
Real Estate	1.0	3.0	1.5

SSgA U.S. Aggregate Bond Index

As of June 30, 2019

Account Information

Account Name	SSgA U.S. Aggregate Bond Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	5/01/01
Account Type	US Fixed Income Investment Grade
Benchmark	BBgBarc US Aggregate TR
Universe	eV US Core Fixed Inc Net

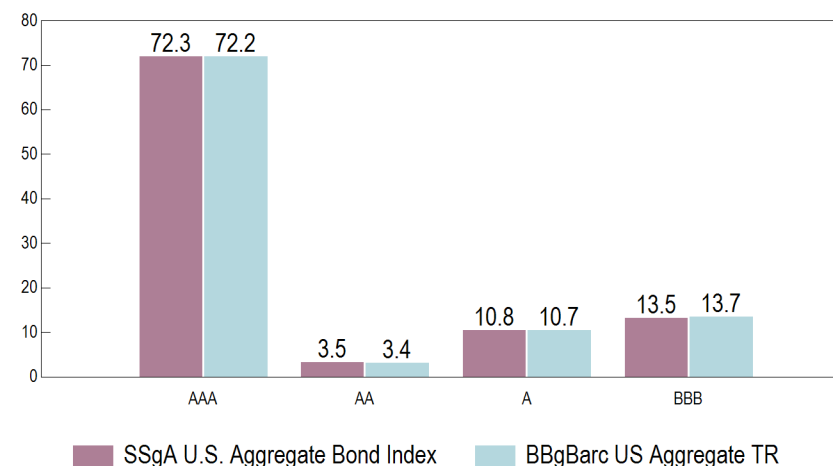
Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA U.S. Aggregate Bond Index	3.1	6.1	7.9	2.3	3.0	3.9	4.6	May-01
BBgBarc US Aggregate TR	3.1	6.1	7.9	2.3	2.9	3.9	4.6	May-01

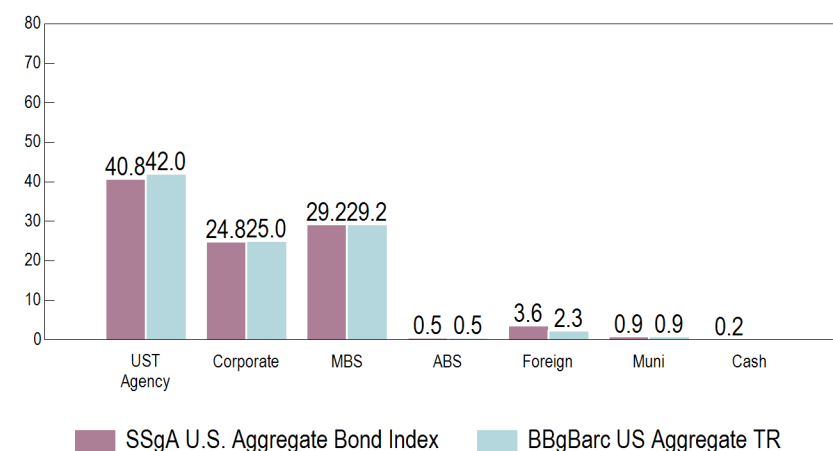
SSgA U.S. Aggregate Bond Index Characteristics
vs. BBgBarc US Aggregate TR

	Portfolio Q2-19	Index Q2-19	Portfolio Q1-19
Fixed Income Characteristics			
Yield to Maturity	2.5	2.5	2.9
Average Duration	5.7	6.1	5.8
Average Quality	AA	AA	AA
Weighted Average Maturity	7.8	7.8	8.1

Credit Quality Allocation



Sector Allocation



As of June 30, 2019

Account Information

Account Name	Shenkman Capital
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	4/01/06
Account Type	US Fixed Income High Yield
Benchmark	BBgBarc US High Yield TR
Universe	eV US High Yield Fixed Inc Net

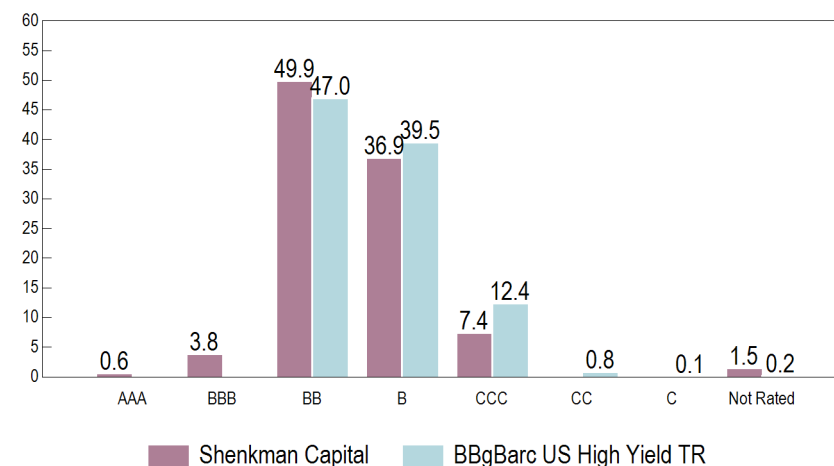
Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Shenkman Capital	2.6	9.5	7.6	6.7	4.2	7.8	6.7	Apr-06
BBgBarc US High Yield TR	2.5	9.9	7.5	7.5	4.7	9.2	7.4	Apr-06

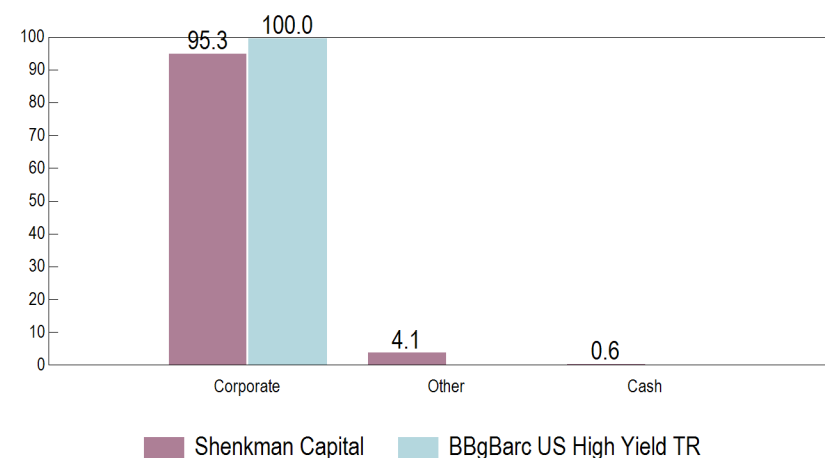
Shenkman Capital Characteristics
vs. BBgBarc US High Yield TR

	Portfolio Q2-19	Index Q2-19	Portfolio Q1-19
Fixed Income Characteristics			
Yield to Maturity	5.7	6.4	6.0
Average Duration	3.0	4.5	3.0
Average Quality	BB	B	BB
Weighted Average Maturity	5.6	5.8	5.5

Credit Quality Allocation



Sector Allocation



SSgA TIPS Index-NL

As of June 30, 2019

Account Information

Account Name	SSgA TIPS Index-NL
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	10/01/05
Account Type	US Inflation Protected Fixed
Benchmark	BBgBarc US TIPS TR
Universe	eV US TIPS / Inflation Fixed Inc Net

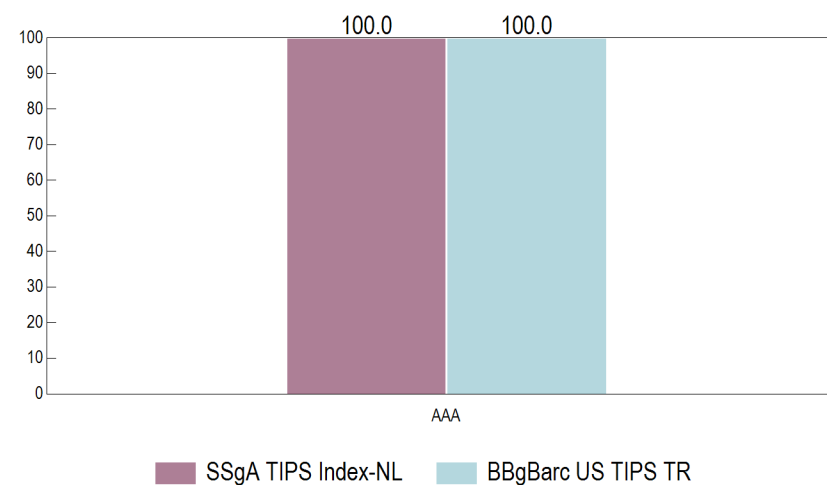
Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA TIPS Index-NL	2.8	6.1	4.7	2.0	1.7	3.6	3.7	Oct-05
BBgBarc US TIPS TR	2.9	6.2	4.8	2.1	1.8	3.6	3.8	Oct-05

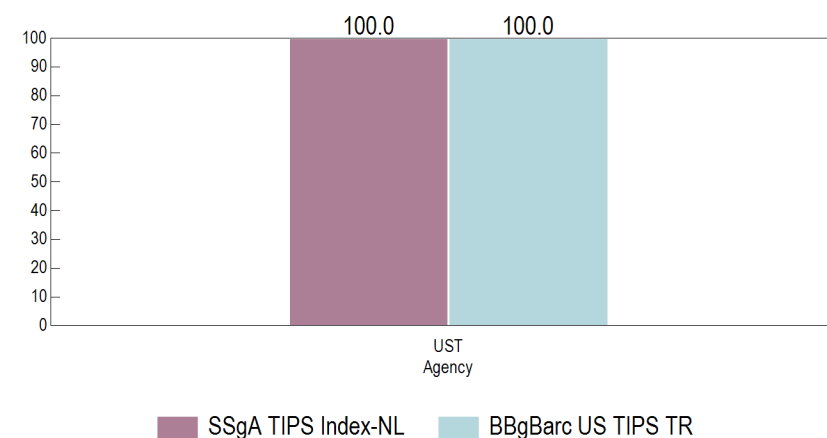
SSgA TIPS Index-NL Characteristics
vs. BBgBarc US TIPS TR

	Portfolio Q2-19	Index Q2-19	Portfolio Q1-19
Fixed Income Characteristics			
Yield to Maturity	2.1	0.4	2.6
Average Duration	1.2	7.5	5.2
Average Quality	AAA	AAA	AAA
Weighted Average Maturity	8.1	8.1	8.1

Credit Quality Allocation



Sector Allocation



Payden Emerging Market Bond

As of June 30, 2019

Account Information

Account Name	Payden Emerging Market Bond
Account Structure	Mutual Fund
Investment Style	Active
Inception Date	1/01/15
Account Type	International Emerging Market Debt
Benchmark	JP Morgan EMBI Global Diversified
Universe	eV Emg Mkt Fixed Inc Hedged Net

Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Payden Emerging Market Bond	4.2	12.8	11.8	5.9	--	--	6.0	Jan-15
JP Morgan EMBI Global Diversified	4.1	11.3	12.4	5.5	5.3	7.8	6.2	Jan-15

Fund Characteristics as of May 31, 2019

Versus JP Morgan EMBI Global Diversified

Sharpe Ratio (3 Year)	0.63
Average Duration	6.80
Average Coupon	6.77%
Average Effective Maturity	10.92
R-Squared (3 Year)	0.95
Alpha (3 Year)	-0.06%
Beta (3 Year)	1.15

Payden Emerging Market Bond Characteristics

vs. JP Morgan EMBI Global TR

	Portfolio Q2-19	Index Q2-19	Portfolio Q1-19
Fixed Income Characteristics			
Yield to Maturity	6.7	5.7	7.1
Average Duration	6.8	7.3	6.7
Average Quality	BB	BBB	B
Weighted Average Maturity	10.9	11.7	10.9

Fixed Income Sectors as of May 31, 2019

GOVERNMENT	68.89%
MUNICIPAL	0.00%
CORPORATE	19.90%
SECURITIZED	0.00%
CASH & EQUIVALENTS	2.30%
DERIVATIVE	8.92%

Credit Quality as of June 30, 2019

AAA	1.00%
AA	2.00%
A	4.00%
BBB	23.00%
BB	20.00%
B	37.00%
Below B	10.00%
Not Rated	3.00%

As of June 30, 2019

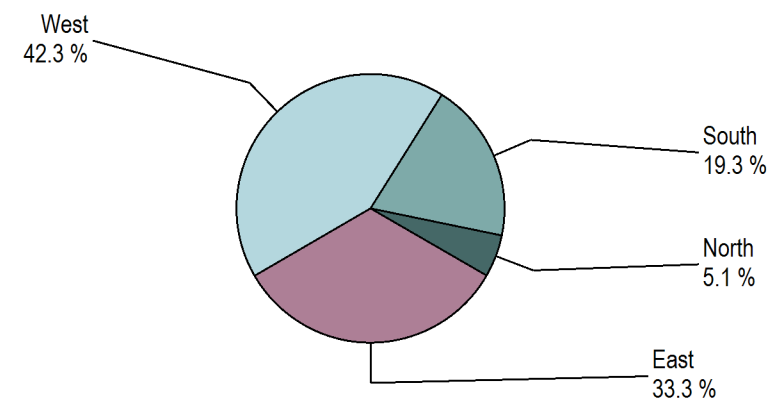
Account Information

Account Name	Clarion Partners
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	10/01/02
Account Type	Real Estate
Benchmark	NCREIF ODCE
Universe	US Real Estate Equity

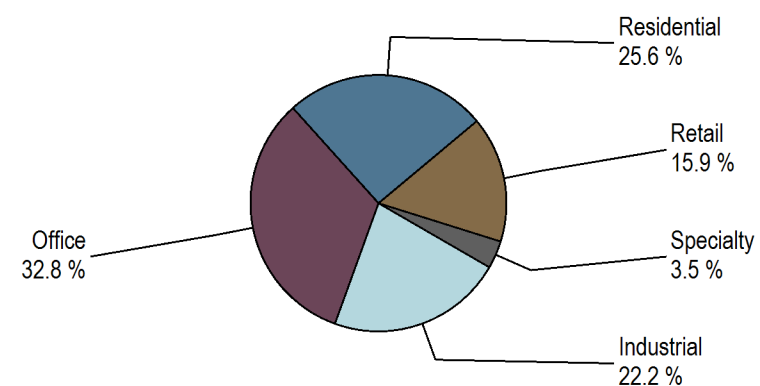
Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Clarion Partners	1.4	3.5	6.7	7.9	10.6	10.0	7.4	Oct-02
NCREIF ODCE	1.0	2.4	6.4	7.6	9.8	9.9	8.2	Oct-02

Geographic Diversification



Property Type Allocation



Colony Realty Partners IV

As of June 30, 2019

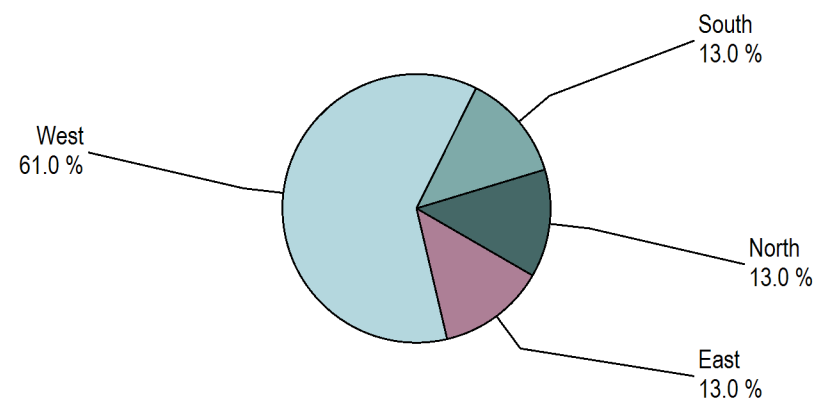
Account Information

Account Name	Colony Realty Partners IV
Account Structure	Other
Investment Style	Active
Inception Date	1/01/13
Account Type	Real Estate
Benchmark	NCREIF ODCE
Universe	US Real Estate Equity

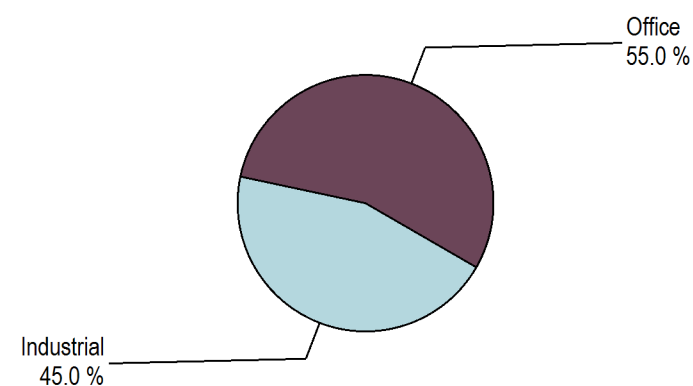
Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Colony Realty Partners IV	0.0	4.2	-0.5	7.3	11.9	--	--	Jan-13
NCREIF ODCE	1.0	2.4	6.4	7.6	9.8	9.9	10.5	Jan-13

Geographic Diversification



Property Type Allocation



As of June 30, 2019

Annual Investment Expense Analysis
As Of June 30, 2019

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Equity Assets		\$83,672,871		
Domestic Equity Assets		\$60,744,410		
RhumbLine S&P 500 Index	0.07% of First 25.0 Mil, 0.05% of Next 25.0 Mil, 0.04% Thereafter	\$18,883,023	\$13,218	0.07%
Fiduciary Large Cap Equity	0.66% of Assets	\$24,512,583	\$161,783	0.66%
Frontier Capital Appreciation	0.79% of Assets	\$17,348,804	\$137,056	0.79%
International Equity Assets		\$22,928,462		
International Developed Markets Equity Assets		\$16,809,171		
Rhumblin MSCI EAFE Index	0.08% of First 25.0 Mil, 0.07% of Next 25.0 Mil, 0.05% Thereafter	\$16,809,171	\$13,447	0.08%
International Emerging Markets Equity Assets		\$6,119,291		
DFA Emerging Markets	0.52% of Assets	\$2,934,462	\$15,259	0.52%
Driehaus Emerging Market Equity	0.90% of Assets	\$3,184,829	\$28,663	0.90%
Fixed Income Assets		\$80,775,757		
Investment Grade Bonds Assets		\$40,071,297		
SSgA U.S. Aggregate Bond Index	0.04% of Assets	\$40,071,297	\$16,029	0.04%
High Yield Bond Assets		\$17,465,063		
Shenkman Capital	0.45% of Assets	\$17,465,063	\$78,593	0.45%
TIPS Assets		\$18,035,534		
SSgA TIPS Index-NL	0.04% of Assets	\$18,035,534	\$7,214	0.04%
Emerging Market Debt Assets		\$5,203,863		
Payden Emerging Market Bond	0.69% of Assets	\$5,203,863	\$35,907	0.69%

Total Retirement System

As of June 30, 2019

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Real Estate Assets		\$5,904,428		
Open-Ended Real Estate		\$5,701,596		
Clarion Partners	1.10% of Assets	\$5,701,596	\$62,718	1.10%
Total Closed End Real Estate		\$202,832		
Colony Realty Partners IV	1.5% management fee based on committed equity during the investment period and invested equity thereafter	\$202,832		
Private Equity Assets		\$4,684,273		
North American Strategic Partners 2006	0.8% on drawn and undrawn capital less investments sold or written off 5% carried interest, 8% preferred return	\$695,536		
Ironsides Partnership Fund IV	0% Management fee, 8% Preferred Return, 5% Carried Interest	\$1,171,845		
Ironsides Direct Investment Fund IV	0.5% Management fee, 8% Preferred Return, 15% Carried Interest	\$2,816,893		
Cash		\$323,493		
Comerica Short Term Fund		\$323,493		
Total		\$175,360,823	\$569,886	0.32%

Private Market Funds Overview

Private Market Funds Overview As of June, 30 2019

Partnership	Vintage Year	Committed	Called	Distributed	Fair Value	Net IRR ¹
Colony Realty Partners IV	2012	\$2.0	\$2.2	\$3.1	\$0.2	13.0%
North American Strategic Partners 2006	2006	\$4.5	\$4.3	\$5.1	\$0.7	6.8%
Ironsides Partnership Fund IV	2015	\$2.5	\$0.8	\$0.1	\$0.9	13.2%
Ironsides Direct Investment Fund IV	2015	\$2.5	\$2.7	\$0.2	\$2.8	4.5%

¹ As of December 31, 2018.



Current Issues

Appropriation Memo



MEMORANDUM

To: Retirement Board, Marlborough Retirement System
From: Henry Jaung, Steve MacLellan,
Meketa Investment Group
Date: June 21, 2019
Re: Annual Appropriation Investment

Based on March ending market values, subsequent cash flows, and estimated performance thereafter, Meketa Investment Group recommends the System's annual appropriation be invested as shown in the table below:

Investment Portfolio	Proposed Cash Flow (\$mm)
Shenkman High Yield	+1.4
SSgA U.S. Aggregate Bond Index	+1.2
SSgA U.S. TIPS Index	+2.8
Payden EM Bond	+0.2
Cash (for Payroll & Capital Calls)	+3.0 ¹
TOTAL	+8.6

This recommendation is consistent with the System's current asset allocation and the allocation targets of the Investment Policy Statement.

Please do not hesitate to contact us if you have any questions.

SJM/HJ/bc

¹ Amount is approximate and represents remainder of appropriation after making other recommended investments.

Payden & Rygel

New Portfolio Structure Memo



MEMORANDUM

To: Retirement Board, Marlborough Retirement System
From: Henry Jaung, Steve MacLellan,
Meketa Investment Group
Date: July 30, 2019
Re: Payden EMD Vehicle Change

Background

Payden & Rygel manages the System's emerging market debt portfolio, totaling \$5.2 million as of June 30, 2019 and represents 3.0% of the overall System's assets. More specifically, the System is invested in Payden's Emerging Market Bond mutual fund, a portfolio focused predominantly on dollar-denominated debt of emerging market borrowers with opportunistic allocations to locally-denominated debt.

The portfolio has returned roughly in line with its benchmark, returning 6.0% versus 6.2%, net of fees, since inception in January 2015.

Discussion & Recommendation

Recently, Payden and Meketa negotiated a discounted fee for Meketa's clients invested in the emerging market bond strategy, accessed by investing in a special share class of Payden's collective investment trust ("CIT") vehicle. By transferring to the CIT, the System would reduce the fees charged to the portfolio from 0.69% to 0.53%, or approximately \$8,300 per year on \$5.2 million. Although the System currently accesses this strategy through a mutual fund, it does have other investments that use CITs or other private commingled funds that are substantially similar to CITs. Additionally, the strategy is the same as that followed by the mutual fund; the only substantial change would be operational.

We view the risks of switching vehicles as being minimal with the biggest potential obstacle being regulatory. After discussing a potential vehicle change with PERAC, they have agreed that such a switch would be acceptable without a new procurement provided they receive 1) a justification memorandum recommending the new vehicle and outlining the nature of the change, 2) trust documents for the new vehicle confirming terms (e.g., fees, etc.) and 3) a copy of Board minutes approving the vehicle transfer.

Memorandum
July 30, 2019
Page 2 of 2

We recommend the Board approve the vehicle change subject to approval by PERAC. The investment is essentially the same aside from the fees being lowered. We will work with PERAC and the System's staff to provide the requested documents.

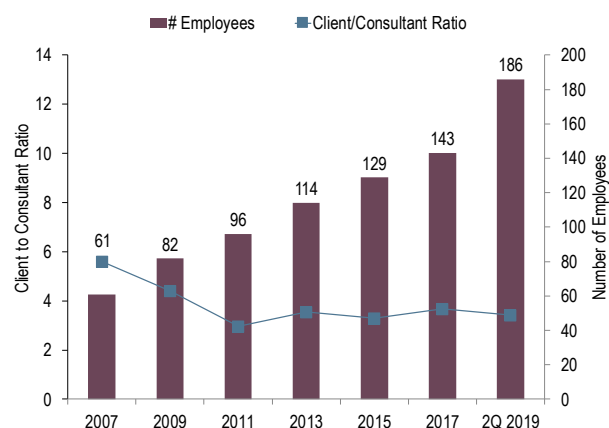
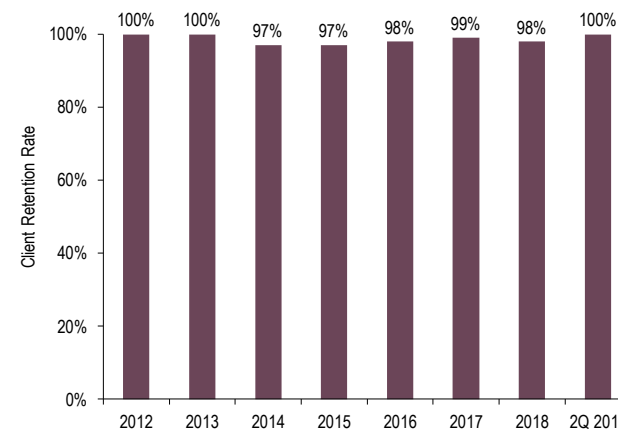
Please do not hesitate to contact us if you have any questions.

SJM/HJ/bc

Appendices

Meketa Investment Group Corporate Update

- Staff of 186, including 127 investment professionals and 40 CFA Charterholders
- 212 clients, with over 300 funds throughout the United States
- Significant investment in staff and resources
- Offices in Boston, Chicago, Miami, New York, Portland (OR), San Diego, and London
- We advise on \$1.4 trillion in client assets
 - Over \$100 billion in assets committed to alternative investments
 - Private Equity ▪ Infrastructure ▪ Natural Resources
 - Real Estate ▪ Hedge Funds ▪ Commodities

Client to Consultant Ratio¹**Client Retention Rate²**

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

¹ On March 15, 2019, 31 employees joined the firm as part of the merger of Meketa Investment Group and Pension Consulting Alliance.

² Client Retention Rate is one minus the number of clients lost divided by the number of clients at prior year-end.

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

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. 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.