

# FUND EVALUATION REPORT

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## City of Marlborough Contributory Retirement System

Meeting Materials  
October 29, 2019



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

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FLORIDA

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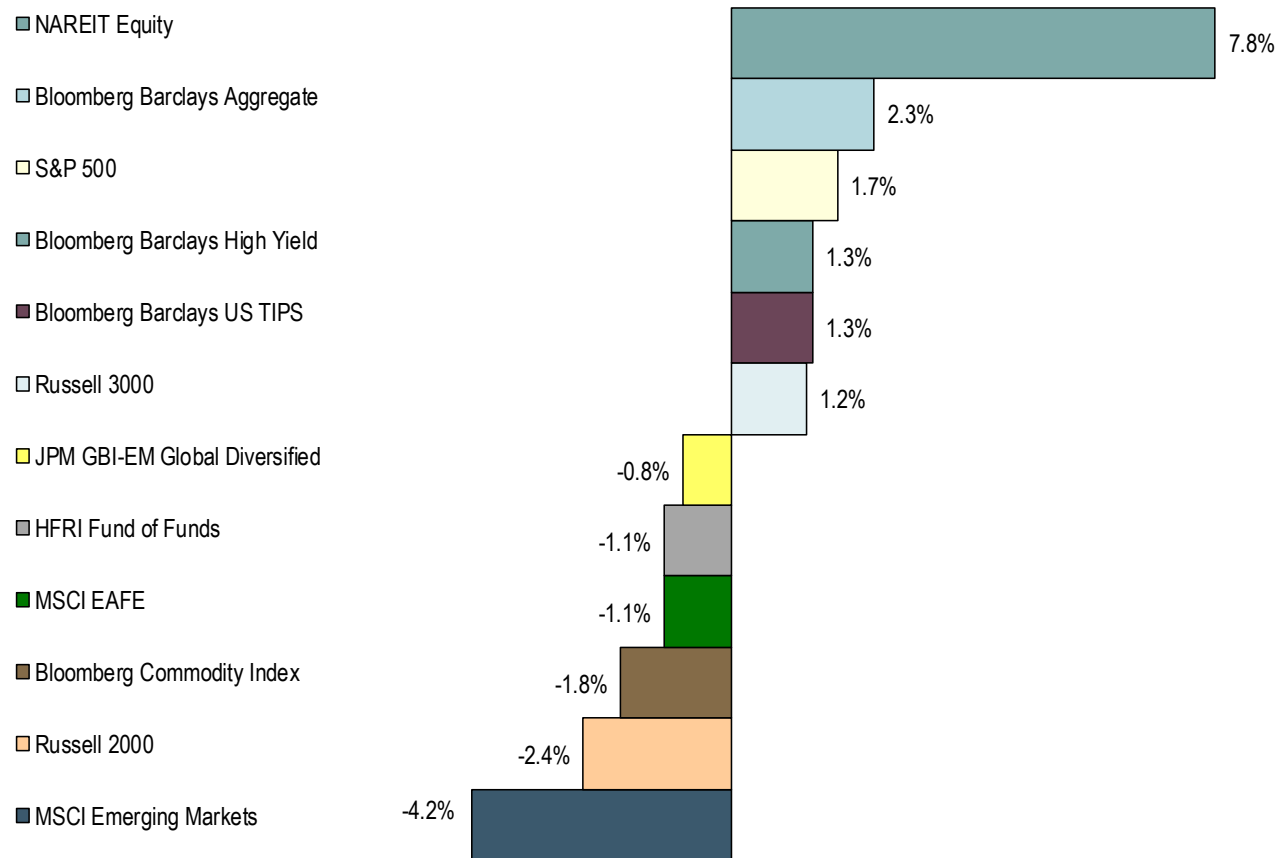
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- 1. The World Markets in the Third Quarter of 2019**
- 2. Retirement System Third Quarter Review**
- 3. Current Issues**
  - Custody RFP Respondent Review
- 4. Appendices**
  - Corporate Update
  - Disclaimer, Glossary, and Notes

## **The World Markets Third Quarter of 2019**

## The World Markets<sup>1</sup> Third Quarter of 2019



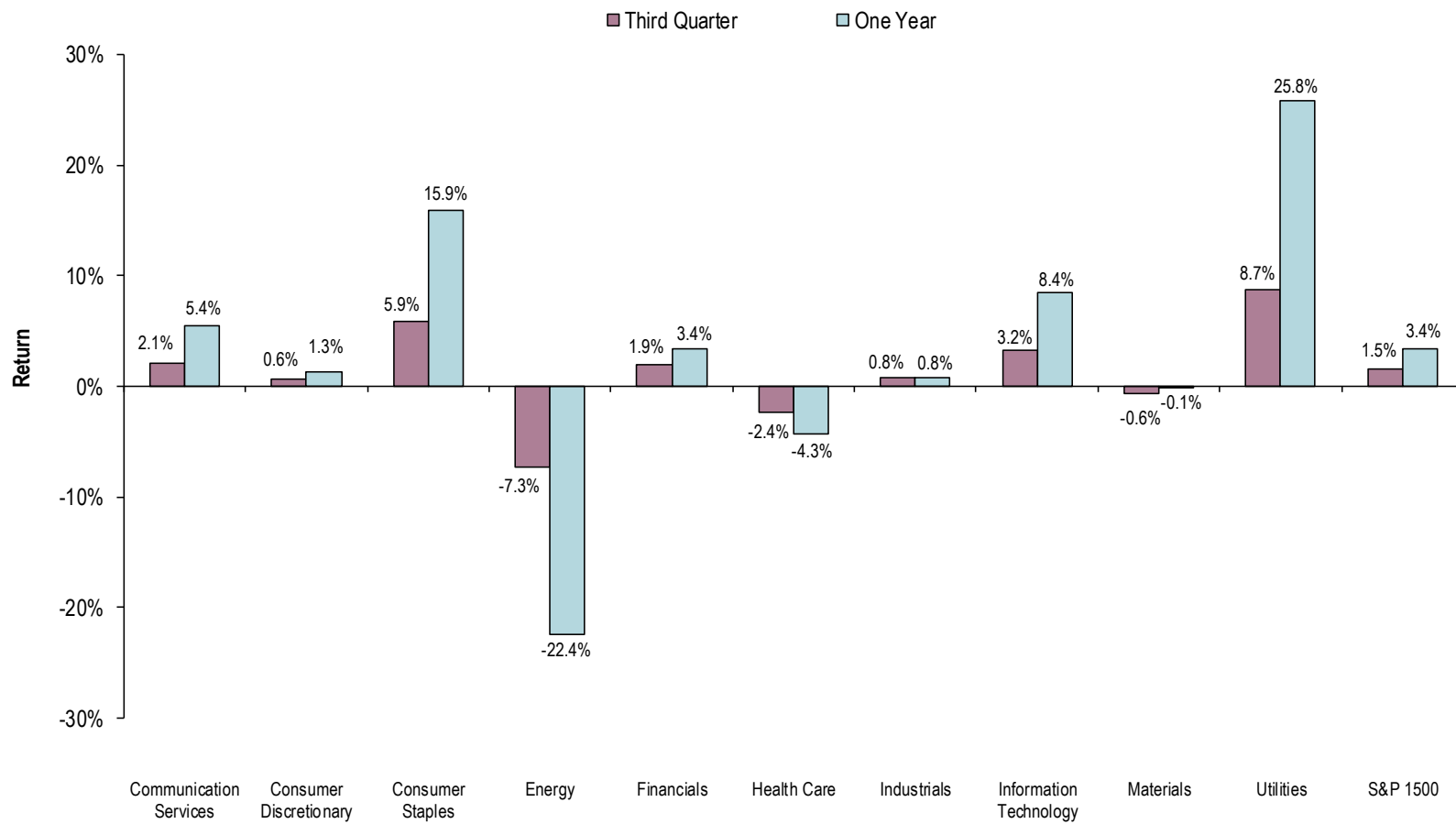
<sup>1</sup> Source: InvestorForce.

Index Returns<sup>1</sup>

	3Q19 (%)	YTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
<b>Domestic Equity</b>						
S&P 500	1.7	20.6	4.3	13.4	10.8	13.2
Russell 3000	1.2	20.1	2.9	12.8	10.4	13.1
Russell 1000	1.4	20.5	3.9	13.2	10.6	13.2
Russell 1000 Growth	1.5	23.3	3.7	16.9	13.4	14.9
Russell 1000 Value	1.4	17.8	4.0	9.4	7.8	11.5
Russell MidCap	0.5	21.9	3.2	10.7	9.1	13.1
Russell MidCap Growth	-0.7	25.2	5.2	14.5	11.1	14.1
Russell MidCap Value	1.2	19.5	1.6	7.8	7.6	12.3
Russell 2000	-2.4	14.2	-8.9	8.2	8.2	11.2
Russell 2000 Growth	-4.2	15.3	-9.6	9.8	9.1	12.2
Russell 2000 Value	-0.6	12.8	-8.2	6.5	7.2	10.1
<b>Foreign Equity</b>						
MSCI ACWI (ex. US)	-1.8	11.6	-1.2	6.3	2.9	4.5
MSCI EAFE	-1.1	12.8	-1.3	6.5	3.3	4.9
MSCI EAFE (Local Currency)	1.8	15.7	1.6	8.3	6.0	7.0
MSCI EAFE Small Cap	-0.4	12.1	-5.9	5.9	6.0	7.5
MSCI Emerging Markets	-4.2	5.9	-2.0	6.0	2.3	3.4
MSCI Emerging Markets (Local Currency)	-2.1	7.8	-0.2	7.6	5.5	5.9
<b>Fixed Income</b>						
Bloomberg Barclays Universal	2.1	8.8	10.1	3.2	3.6	4.1
Bloomberg Barclays Aggregate	2.3	8.5	10.3	2.9	3.4	3.7
Bloomberg Barclays US TIPS	1.3	7.6	7.1	2.2	2.4	3.5
Bloomberg Barclays High Yield	1.3	11.4	6.4	6.1	5.4	7.9
JPM GBI-EM Global Diversified	-0.8	7.9	10.1	3.1	0.6	2.4
<b>Other</b>						
NAREIT Equity	7.8	26.2	17.7	7.0	10.0	12.9
Bloomberg Commodity Index	-1.8	3.1	-6.6	-1.5	-7.2	-4.3
HFRI Fund of Funds	-1.1	5.0	-0.2	3.1	1.9	2.7

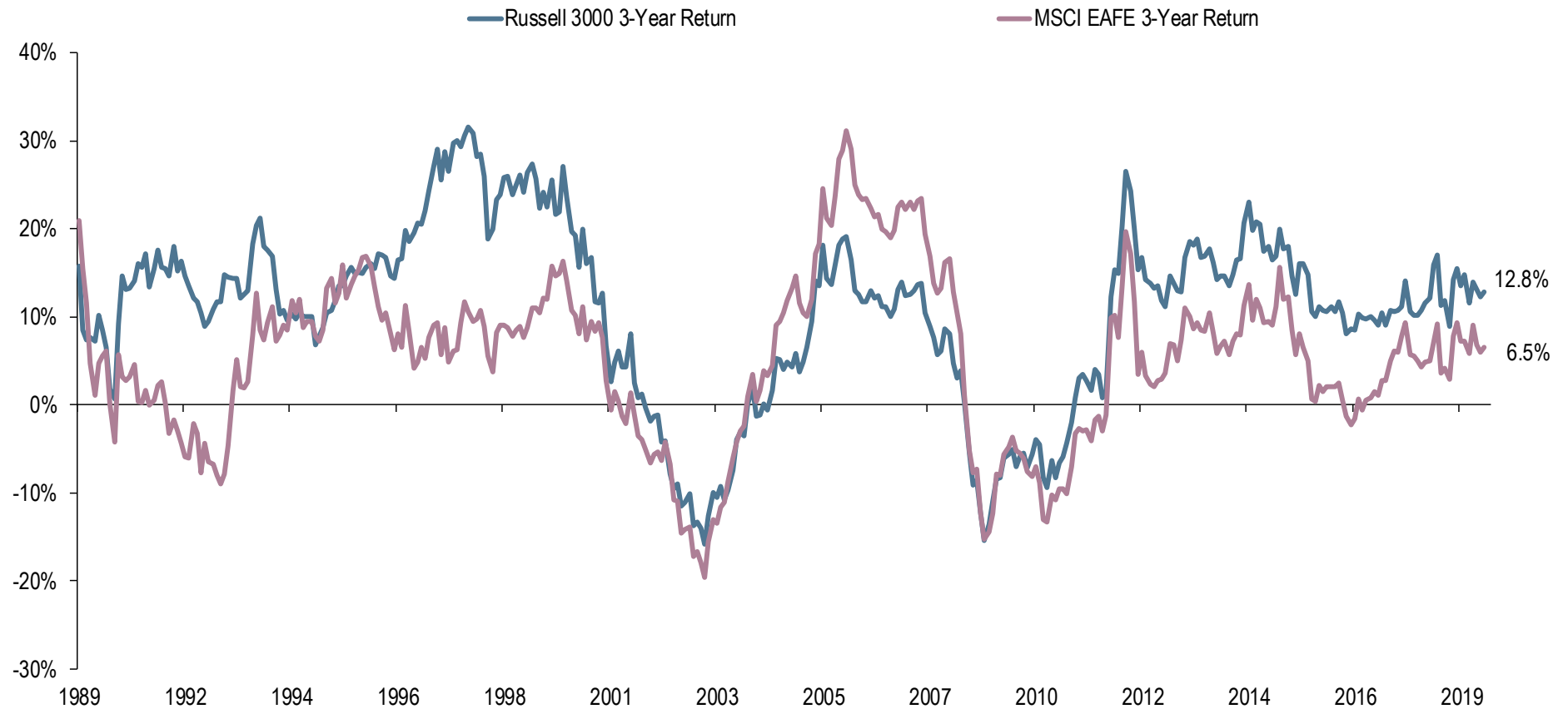
<sup>1</sup> Source: InvestorForce.

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



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

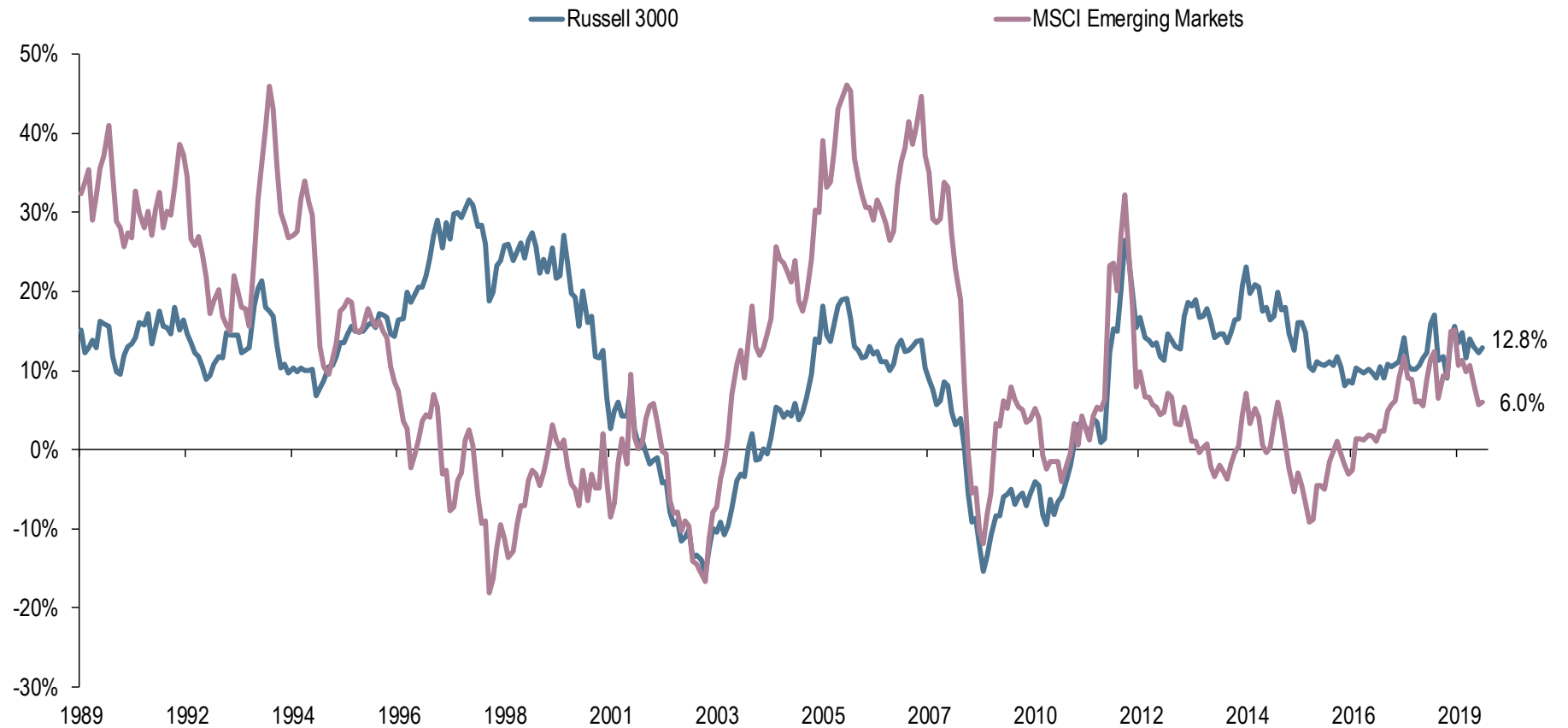
## US and Developed Market Foreign Equity Rolling Three-Year Returns<sup>1</sup>



<sup>1</sup> Source: InvestorForce.



## US and Emerging Market Equity Rolling Three-Year Returns<sup>1</sup>

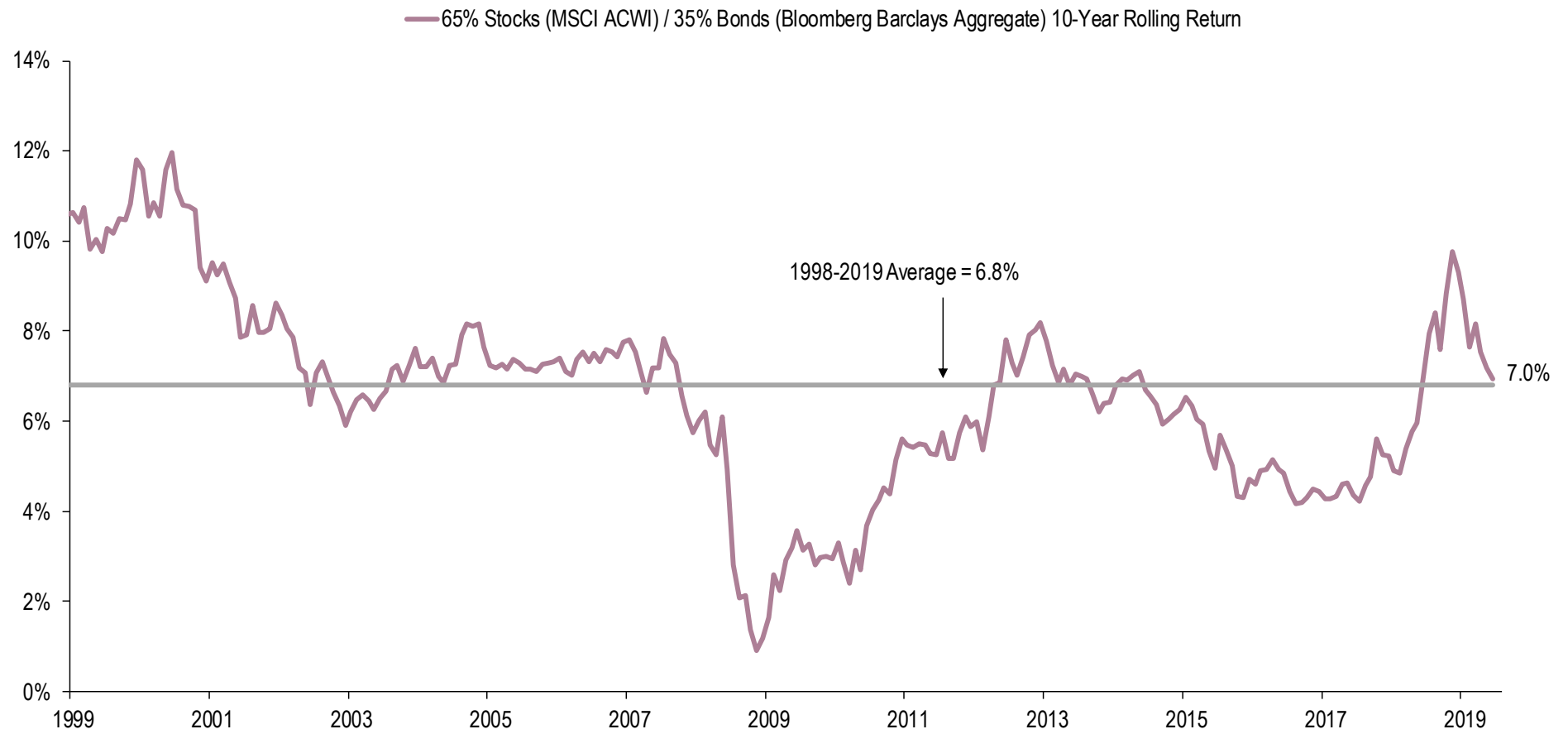


<sup>1</sup> Source: InvestorForce.





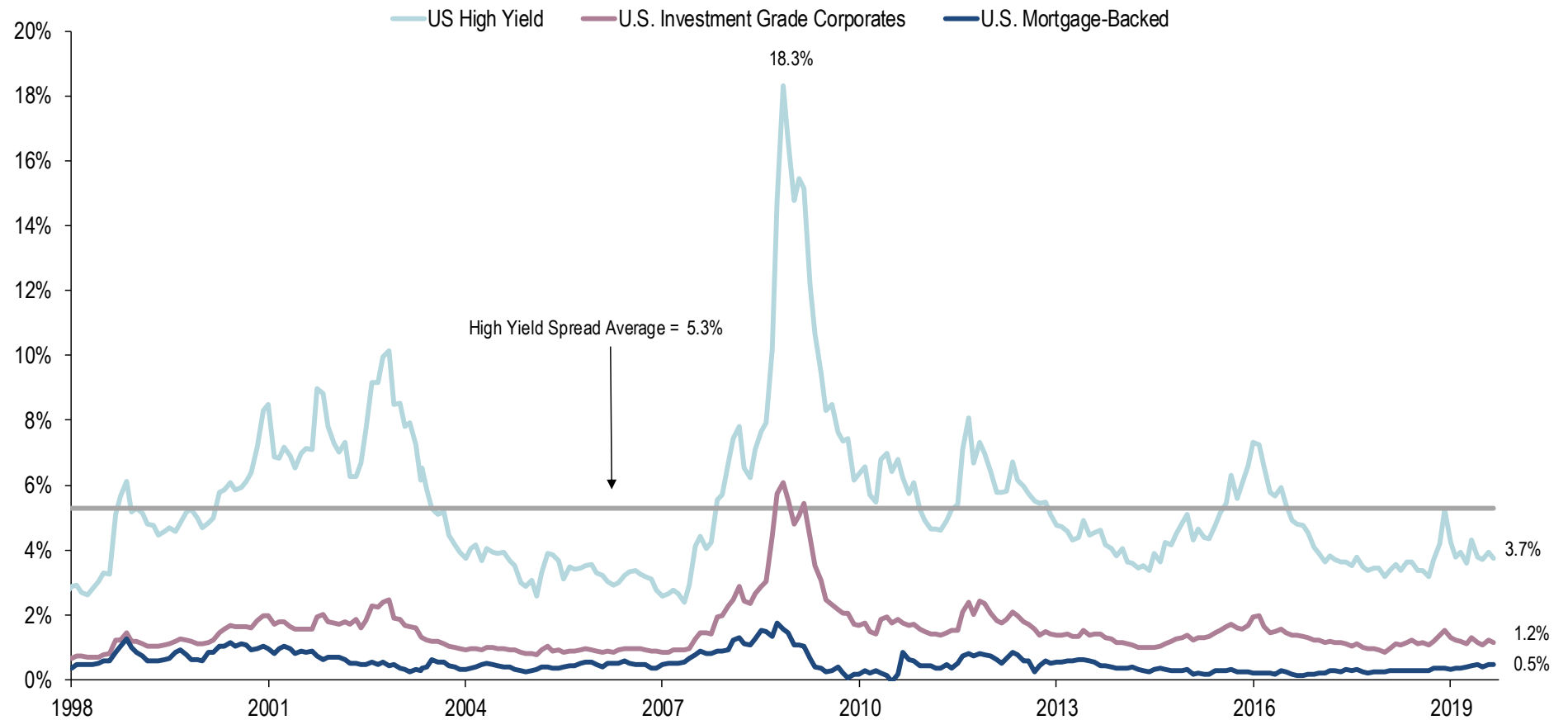
## Rolling Ten-Year Returns: 65% Stocks and 35% Bonds<sup>1</sup>



<sup>1</sup> Source: InvestorForce.



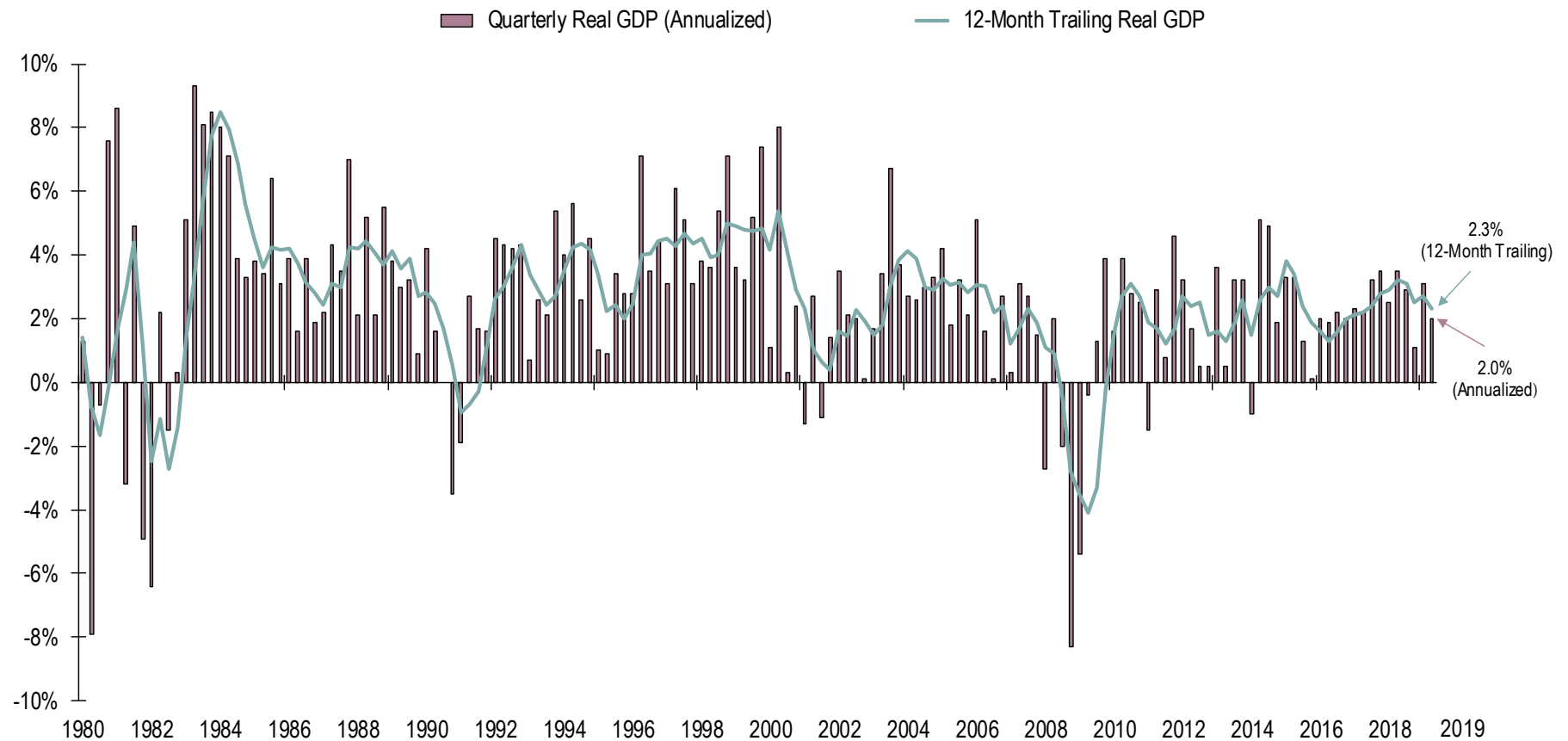
## Credit Spreads vs. US Treasury Bonds<sup>1,2</sup>



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

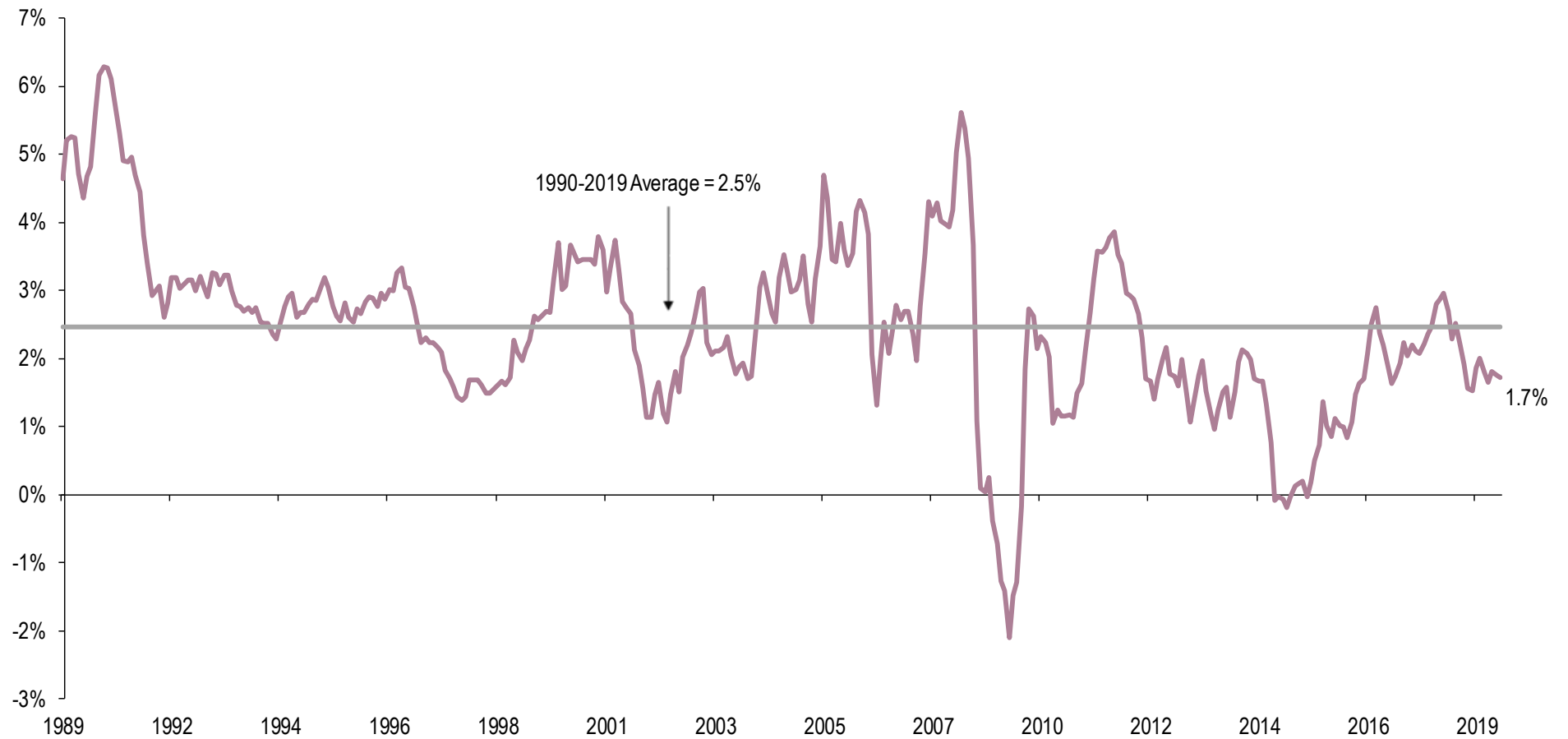
<sup>2</sup> The median high yield spread was 4.8% from 1997-2019.

## US Real Gross Domestic Product (GDP) Growth<sup>1</sup>



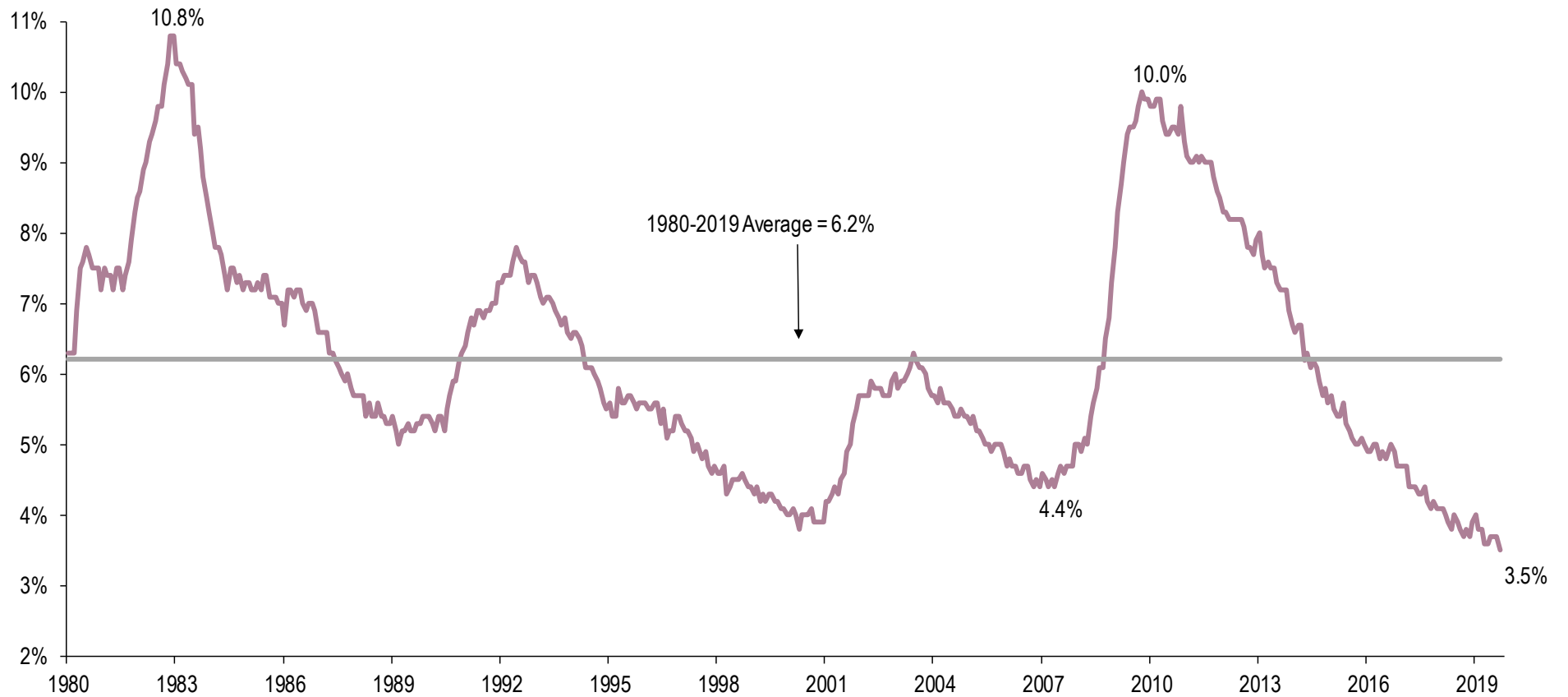
<sup>1</sup> Source: Bureau of Economic Analysis. Data is as of Q2 2019 and represents the third estimate.

## US Inflation (CPI) Trailing Twelve Months<sup>1</sup>



<sup>1</sup> Source: Bureau of Labor Statistics. Data is non-seasonally adjusted CPI, which may be volatile in the short-term. Data is as of September 30, 2019.

## US Unemployment<sup>1</sup>










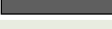


<sup>1</sup> Source: Bureau of Labor Statistics. Data is as of September 30, 2019.

## **Retirement System Third Quarter Review**

## Total Retirement System

As of September 30, 2019

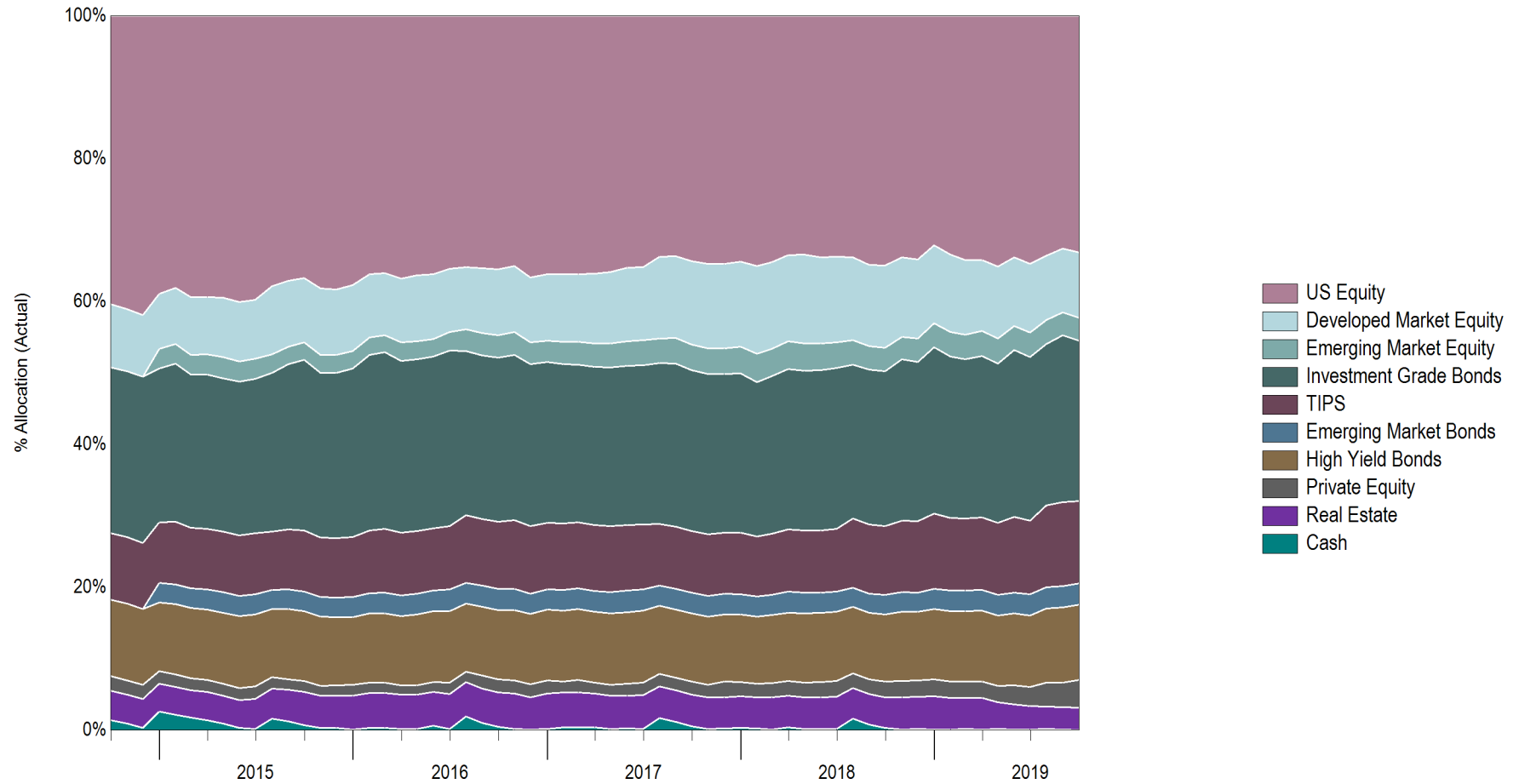
## Allocation vs. Targets and Policy

	Current Balance	Current Allocation	Policy	Policy Range
 US Equity	\$60,381,031	33%	33%	28% - 38%
 Developed Market Equity	\$16,631,075	9%	9%	5% - 13%
 Emerging Market Equity	\$5,923,332	3%	3%	1% - 5%
 Investment Grade Bonds	\$40,823,039	22%	22%	17% - 27%
 TIPS	\$21,114,492	12%	10%	7% - 13%
 Emerging Market Bonds	\$5,416,938	3%	3%	1% - 5%
 High Yield Bonds	\$19,196,662	11%	10%	7% - 13%
 Private Equity	\$7,037,082	4%	5%	3% - 7%
 Real Estate	\$5,761,323	3%	5%	2% - 8%
 Cash	\$5,466	0%	0%	0% - 5%
<b>Total</b>	<b>\$182,290,440</b>	<b>100%</b>	<b>100%</b>	

Market Values are preliminary.



Asset Allocation History  
5 Years Ending September 30, 2019





## Total Retirement System

As of September 30, 2019

	Actual Asset Allocation (%)	Target Allocation (%)	Target Range (%)	PRIT Asset Allocation <sup>1</sup> (%)
<b>Total Retirement System</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>
<i>Equity Assets</i>	45	45	37-53	37
Domestic Equity Assets	33	33	28-38	16
International Equity Assets	12	12	9-15	21
<i>Fixed Income Assets</i>	48	45	32-58	21
Domestic Investment Grade Assets	22	22	17-27	15
High Yield Bond Assets	11	10	7-13	6
TIPS	12	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	8
<i>Private Equity</i>	4	5	3-7	13
<i>Timber/Natural Resources</i>	NA	NA	NA	4
<i>Cash</i>	< 1	<1	0-5	1

<sup>1</sup> PRIT asset allocation as of September 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 September 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
<b>Total Retirement System (net)</b>	<b>182,290,440</b>	<b>100.0</b>	<b>1.1</b>	<b>12.5</b>	<b>5.0</b>	<b>6.8</b>	<b>6.1</b>	<b>7.7</b>	<b>6.4</b>	<b>7.6</b>	<b>Jul-88</b>
55% MSCI World & 45% Barclays Aggregate			1.3	13.7	6.0	7.1	5.7	6.9	5.3	7.0	Jul-88
Consumer Price Index			0.2	2.2	1.7	2.1	1.5	1.7	2.1	2.5	Jul-88
PRIT Core Fund (net)			1.4	11.4	4.5	8.4	7.1	8.4	6.6	8.5	Jul-88
InvMetrics Public DB \$50mm-\$250mm Net Median			0.7	12.8	3.9	7.8	6.2	7.8	5.9	8.1	Jul-88
InvMetrics Public DB \$50mm-\$250mm Net Rank			10	57	10	81	57	53	20	60	Jul-88
<b>Domestic Equity Assets (net)</b>	<b>60,381,031</b>	<b>33.1</b>	<b>0.5</b>	<b>18.2</b>	<b>1.9</b>	<b>11.3</b>	<b>9.5</b>	<b>12.5</b>	<b>6.0</b>	<b>8.0</b>	<b>Oct-06</b>
Russell 3000			1.2	20.1	2.9	12.8	10.4	13.1	6.7	8.6	Oct-06
PRIT Domestic Equity			1.4	20.2	2.5	12.8	10.3	12.9	6.5	7.5	Oct-06
<b>International Developed Markets Equity Assets (net)</b>	<b>16,631,075</b>	<b>9.1</b>	<b>-1.1</b>	<b>13.1</b>	<b>-1.0</b>	<b>6.6</b>	<b>3.0</b>	<b>4.3</b>	<b>--</b>	<b>2.5</b>	<b>Oct-06</b>
MSCI EAFE			-1.1	12.8	-1.3	6.5	3.3	4.9	3.7	2.9	Oct-06
<b>International Emerging Markets Equity Assets (net)</b>	<b>5,923,332</b>	<b>3.2</b>	<b>-3.2</b>	<b>8.8</b>	<b>1.4</b>	<b>6.5</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>4.4</b>	<b>Jan-15</b>
MSCI Emerging Markets			-4.2	5.9	-2.0	6.0	2.3	3.4	7.3	3.5	Jan-15
<b>Investment Grade Bonds Assets (net)</b>	<b>40,823,039</b>	<b>22.4</b>	<b>2.2</b>	<b>8.5</b>	<b>10.3</b>	<b>2.9</b>	<b>3.4</b>	<b>3.8</b>	<b>5.0</b>	<b>6.2</b>	<b>Jul-88</b>
BBgBarc US Aggregate TR			2.3	8.5	10.3	2.9	3.4	3.7	5.0	6.2	Jul-88
PRIT Core Fixed Income			4.3	12.6	14.0	2.7	5.2	5.2	5.7	7.0	Jul-88
<b>High Yield Bond Assets (net)</b>	<b>19,196,662</b>	<b>10.5</b>	<b>1.8</b>	<b>11.5</b>	<b>7.1</b>	<b>6.8</b>	<b>5.7</b>	<b>7.4</b>	<b>--</b>	<b>7.0</b>	<b>Sep-03</b>
BBgBarc US High Yield TR			1.3	11.4	6.4	6.1	5.4	7.9	7.1	7.8	Sep-03
PRIT Public Value-Added Fixed Income			0.6	8.4	5.6	4.2	3.3	5.3	--	6.3	Sep-03
<b>TIPS Assets (net)</b>	<b>21,114,492</b>	<b>11.6</b>	<b>1.3</b>	<b>7.5</b>	<b>7.1</b>	<b>2.2</b>	<b>2.4</b>	<b>3.4</b>	<b>--</b>	<b>3.8</b>	<b>Oct-05</b>
BBgBarc US TIPS TR			1.3	7.6	7.1	2.2	2.4	3.5	5.5	3.8	Oct-05
<b>Emerging Market Debt Assets (net)</b>	<b>5,416,938</b>	<b>3.0</b>	<b>0.3</b>	<b>13.1</b>	<b>9.5</b>	<b>4.3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>5.7</b>	<b>Jan-15</b>
JP Morgan EMBI Global Diversified			1.5	13.0	11.6	4.6	5.7	6.9	9.3	6.2	Jan-15

## Total Retirement System

As of September 30, 2019

	Market Value (\$)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
<b>Open-Ended Real Estate (net)</b>	<b>5,739,294</b>	<b>3.1</b>	<b>1.7</b>	<b>5.2</b>	<b>6.3</b>	<b>7.8</b>	<b>10.2</b>	<b>11.5</b>	<b>7.4</b>	<b>8.2</b>	<b>Oct-95</b>
<i>NCREIF ODCE</i>			1.3	3.8	5.6	7.3	9.3	10.9	8.3	9.1	Oct-95
<b>Total Closed End Real Estate (net)</b>	<b>22,029</b>	<b>0.0</b>									
<b>Private Equity Assets (net)</b>	<b>7,037,082</b>	<b>3.9</b>									
<b>Cash (net)</b>	<b>5,466</b>	<b>0.0</b>									

Cash Balance is preliminary.



## Total Retirement System

As of September 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
<b>Total Retirement System</b>	<b>182,290,440</b>	<b>100.0</b>	<b>--</b>	<b>1.1</b>	<b>12.6</b>	<b>5.2</b>	<b>6.9</b>	<b>6.2</b>	<b>7.7</b>	<b>6.4</b>	<b>7.7</b>	<b>Jul-88</b>
55% MSCI World & 45% Barclays Aggregate				1.3	13.7	6.0	7.1	5.7	6.9	5.3	7.0	Jul-88
Consumer Price Index				0.2	2.2	1.7	2.1	1.5	1.7	2.1	2.5	Jul-88
PRIT Core Fund (net)				1.4	11.5	4.8	8.8	7.5	8.9	7.1	8.8	Jul-88
<b>Domestic Equity Assets</b>	<b>60,381,031</b>	<b>33.1</b>	<b>33.1</b>	<b>0.5</b>	<b>18.4</b>	<b>2.1</b>	<b>11.4</b>	<b>9.7</b>	<b>12.5</b>	<b>6.0</b>	<b>8.1</b>	<b>Oct-06</b>
Russell 3000				1.2	20.1	2.9	12.8	10.4	13.1	6.7	8.6	Oct-06
PRIT Domestic Equity				1.4	20.2	2.6	12.9	10.4	13.0	6.6	7.7	Oct-06
RhumbLine S&P 500 Index	18,540,644	10.2	30.7	1.7	20.5	4.2	13.4	10.8	13.2	6.4	6.4	Mar-99
S&P 500				1.7	20.6	4.3	13.4	10.8	13.2	6.3	6.4	Mar-99
Fiduciary Large Cap Equity	24,585,860	13.5	40.7	0.3	17.0	5.9	12.1	9.5	--	--	12.1	Sep-12
Russell 3000				1.2	20.1	2.9	12.8	10.4	13.1	6.7	13.3	Sep-12
Frontier Capital Appreciation	17,254,527	9.5	28.6	-0.3	18.0	-4.9	8.4	8.3	--	--	11.3	Feb-13
Russell 2500 Growth				-3.2	20.0	-4.1	12.3	10.2	13.5	7.9	12.0	Feb-13
<b>International Developed Markets Equity Assets</b>	<b>16,631,075</b>	<b>9.1</b>	<b>9.1</b>	<b>-1.1</b>	<b>13.1</b>	<b>-1.0</b>	<b>6.6</b>	<b>3.0</b>	<b>4.3</b>	<b>--</b>	<b>2.5</b>	<b>Oct-06</b>
MSCI EAFE				-1.1	12.8	-1.3	6.5	3.3	4.9	3.7	2.9	Oct-06
Rhumblin MSCI EAFE Index	16,631,075	9.1	100.0	-1.1	13.1	-1.0	6.6	3.4	--	--	2.5	Aug-14
MSCI EAFE				-1.1	12.8	-1.3	6.5	3.3	4.9	3.7	2.4	Aug-14

## Total Retirement System

As of September 30, 2019

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
<b>International Emerging Markets Equity Assets</b>	<b>5,923,332</b>	<b>3.2</b>	<b>3.2</b>	<b>-3.2</b>	<b>8.8</b>	<b>1.4</b>	<b>6.5</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>4.4</b>	<b>Jan-15</b>
<i>MSCI Emerging Markets</i>				-4.2	5.9	-2.0	6.0	2.3	3.4	7.3	3.5	Jan-15
DFA Emerging Markets	2,811,774	1.5	47.5	-4.2	5.0	-1.7	4.9	--	--	--	3.2	Jan-15
<i>MSCI Emerging Markets</i>				-4.2	5.9	-2.0	6.0	2.3	3.4	7.3	3.5	Jan-15
Driehaus Emerging Market Equity	3,111,558	1.7	52.5	-2.3	12.5	4.3	8.0	--	--	--	5.6	Jan-15
<i>MSCI Emerging Markets</i>				-4.2	5.9	-2.0	6.0	2.3	3.4	7.3	3.5	Jan-15
<b>Investment Grade Bonds Assets</b>	<b>40,823,039</b>	<b>22.4</b>	<b>22.4</b>	<b>2.3</b>	<b>8.5</b>	<b>10.3</b>	<b>3.0</b>	<b>3.4</b>	<b>3.8</b>	<b>5.0</b>	<b>6.2</b>	<b>Jul-88</b>
<i>BBgBarc US Aggregate TR</i>				2.3	8.5	10.3	2.9	3.4	3.7	5.0	6.2	Jul-88
<i>PRIT Core Fixed Income</i>				4.3	12.7	14.1	2.8	5.3	5.3	5.8	7.1	Jul-88
SSgA U.S. Aggregate Bond Index	40,823,039	22.4	100.0	2.3	8.5	10.3	3.0	3.4	3.8	--	4.7	May-01
<i>BBgBarc US Aggregate TR</i>				2.3	8.5	10.3	2.9	3.4	3.7	5.0	4.7	May-01
<b>High Yield Bond Assets</b>	<b>19,196,662</b>	<b>10.5</b>	<b>10.5</b>	<b>1.9</b>	<b>11.8</b>	<b>7.6</b>	<b>6.2</b>	<b>5.3</b>	<b>7.2</b>	<b>--</b>	<b>6.9</b>	<b>Sep-03</b>
<i>BBgBarc US High Yield TR</i>				1.3	11.4	6.4	6.1	5.4	7.9	7.1	7.8	Sep-03
<i>PRIT Public Value-Added Fixed Income</i>				0.6	8.7	5.9	4.6	3.7	5.7	--	6.7	Sep-03
Shenkman Capital	19,196,662	10.5	100.0	1.9	11.8	7.6	6.2	5.3	7.2	--	6.9	Apr-06
<i>BBgBarc US High Yield TR</i>				1.3	11.4	6.4	6.1	5.4	7.9	7.1	7.4	Apr-06
<b>TIPS Assets</b>	<b>21,114,492</b>	<b>11.6</b>	<b>11.6</b>	<b>1.4</b>	<b>7.6</b>	<b>7.1</b>	<b>2.2</b>	<b>2.4</b>	<b>3.4</b>	<b>--</b>	<b>3.8</b>	<b>Oct-05</b>
<i>BBgBarc US TIPS TR</i>				1.3	7.6	7.1	2.2	2.4	3.5	5.5	3.8	Oct-05
SSgA TIPS Index-NL	21,114,492	11.6	100.0	1.4	7.6	7.1	2.2	2.4	3.4	--	3.8	Oct-05
<i>BBgBarc US TIPS TR</i>				1.3	7.6	7.1	2.2	2.4	3.5	5.5	3.8	Oct-05

## City of Marlborough Contributory Retirement System

As of September 30, 2019

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
<b>Emerging Market Debt Assets</b>	<b>5,416,938</b>	<b>3.0</b>	<b>3.0</b>	<b>0.3</b>	<b>13.1</b>	<b>9.5</b>	<b>4.3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>5.7</b>	<b>Jan-15</b>
<i>JP Morgan EMBI Global Diversified</i>				1.5	13.0	11.6	4.6	5.7	6.9	9.3	6.2	Jan-15
Payden Emerging Market Bond	5,416,938	3.0	100.0	0.3	13.1	9.5	4.3	--	--	--	5.7	Jan-15
<i>JP Morgan EMBI Global Diversified</i>				1.5	13.0	11.6	4.6	5.7	6.9	9.3	6.2	Jan-15
<b>Open-Ended Real Estate</b>	<b>5,739,294</b>	<b>3.1</b>	<b>3.1</b>	<b>1.7</b>	<b>5.2</b>	<b>6.3</b>	<b>7.8</b>	<b>10.2</b>	<b>11.5</b>	<b>7.4</b>	<b>8.2</b>	<b>Oct-95</b>
<i>NCREIF ODCE</i>				1.3	3.8	5.6	7.3	9.3	10.9	8.3	9.1	Oct-95
Clarion Partners	5,739,294	3.1	100.0	1.7	5.2	6.3	7.8	10.2	11.5	--	7.4	Oct-02
<i>NCREIF ODCE</i>				1.3	3.8	5.6	7.3	9.3	10.9	8.3	8.2	Oct-02
<b>Total Closed End Real Estate</b>	<b>22,029</b>	<b>0.0</b>	<b>0.0</b>									
Colony Realty Partners IV	22,029	0.0	100.0									
<b>Private Equity Assets</b>	<b>7,037,082</b>	<b>3.9</b>	<b>3.9</b>									
North American Strategic Partners 2006	721,818	0.4	10.3									
Ironsides Partnership Fund IV	1,360,570	0.7	19.3									
Ironsides Direct Investment Fund IV	2,931,842	1.6	41.7									
Ironsides Direct Investment Fund V, L.P.	2,022,853	1.1	28.7									
<b>Cash</b>	<b>5,466</b>	<b>0.0</b>	<b>0.0</b>									

Colony market values are as of June 30, 2019 and adjusted for subsequent flows  
Private Equity market values are as of June 30, 2019 and adjusted for subsequent flows  
Cash balance is preliminary.

## Total Retirement System

As of September 30, 2019

## Calendar Year Performance

	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)	2011 (%)	2010 (%)	2009 (%)
<b>Total Retirement System</b>	<b>-4.4</b>	<b>13.1</b>	<b>8.7</b>	<b>-0.2</b>	<b>6.3</b>	<b>14.0</b>	<b>10.9</b>	<b>2.4</b>	<b>12.3</b>	<b>16.8</b>
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
<b>Domestic Equity Assets</b>	<b>-6.7</b>	<b>20.3</b>	<b>14.6</b>	<b>-1.6</b>	<b>13.1</b>	<b>33.1</b>	<b>15.3</b>	<b>0.0</b>	<b>18.8</b>	<b>29.8</b>
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
<b>International Developed Markets Equity Assets</b>	<b>-13.5</b>	<b>24.9</b>	<b>1.4</b>	<b>-0.8</b>	<b>-8.7</b>	<b>21.2</b>	<b>15.0</b>	<b>-14.1</b>	<b>10.6</b>	<b>34.1</b>
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
<b>International Emerging Markets Equity Assets</b>	<b>-15.4</b>	<b>39.7</b>	<b>9.4</b>	<b>-12.7</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
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 September 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
<b>Investment Grade Bonds Assets</b>	<b>0.0</b>	<b>3.6</b>	<b>2.6</b>	<b>0.6</b>	<b>6.0</b>	<b>-2.0</b>	<b>4.3</b>	<b>7.8</b>	<b>6.6</b>	<b>6.0</b>
<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
<b>High Yield Bond Assets</b>	<b>-1.3</b>	<b>7.0</b>	<b>12.7</b>	<b>-2.3</b>	<b>2.9</b>	<b>6.4</b>	<b>12.4</b>	<b>6.0</b>	<b>12.8</b>	<b>34.3</b>
<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
<b>TIPS Assets</b>	<b>-1.3</b>	<b>3.0</b>	<b>4.7</b>	<b>-1.4</b>	<b>3.6</b>	<b>-8.6</b>	<b>6.9</b>	<b>13.5</b>	<b>6.3</b>	<b>11.3</b>
<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
<b>Emerging Market Debt Assets</b>	<b>-7.0</b>	<b>12.0</b>	<b>11.5</b>	<b>-0.8</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
<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

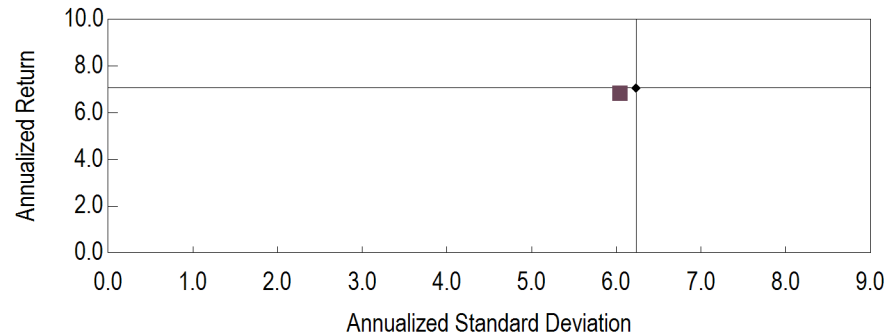


## Total Retirement System

As of September 30, 2019

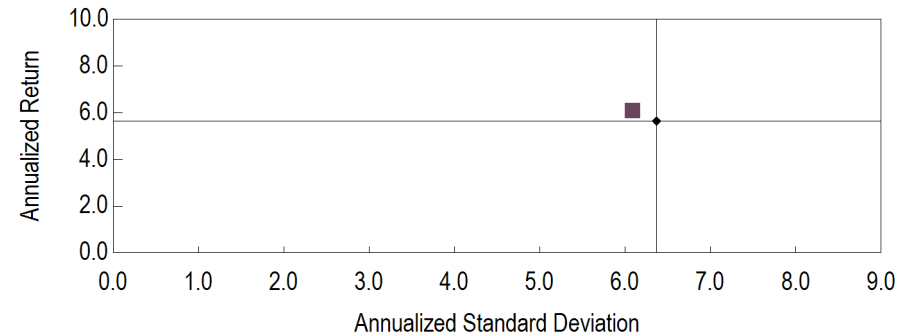
	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)	2011 (%)	2010 (%)	2009 (%)
<b>Open-Ended Real Estate</b>	<b>8.6</b>	<b>7.9</b>	<b>9.1</b>	<b>15.7</b>	<b>13.2</b>	<b>12.8</b>	<b>10.9</b>	<b>18.7</b>	<b>19.2</b>	<b>-38.6</b>
<i>NCREIF ODCE</i>	8.3	7.6	8.8	15.0	12.5	13.9	10.9	16.0	16.4	-29.8
Clarion Partners	8.6	7.9	9.1	15.7	13.2	12.8	10.9	18.7	19.2	-38.6
<i>NCREIF ODCE</i>	8.3	7.6	8.8	15.0	12.5	13.9	10.9	16.0	16.4	-29.8
<b>Total Closed End Real Estate</b>										
Colony Realty Partners IV										
<b>Private Equity Assets</b>										
North American Strategic Partners 2006 (net)										
Ironsides Partnership Fund IV (net)										
Ironsides Direct Investment Fund IV (net)										
Ironsides Direct Investment Fund V, L.P. (net)										
<b>Cash</b>										

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



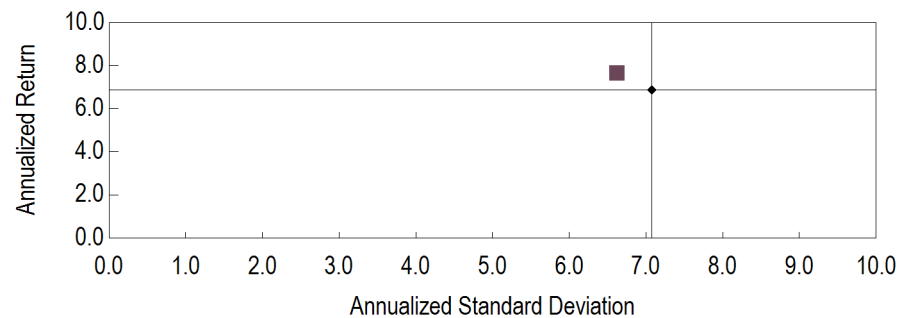
- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate

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



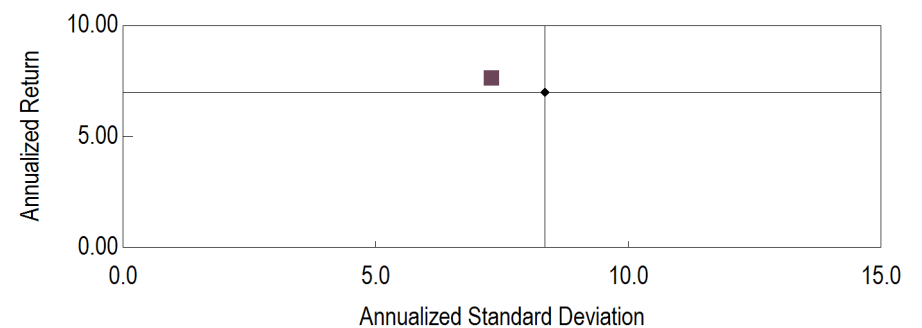
- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate

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



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

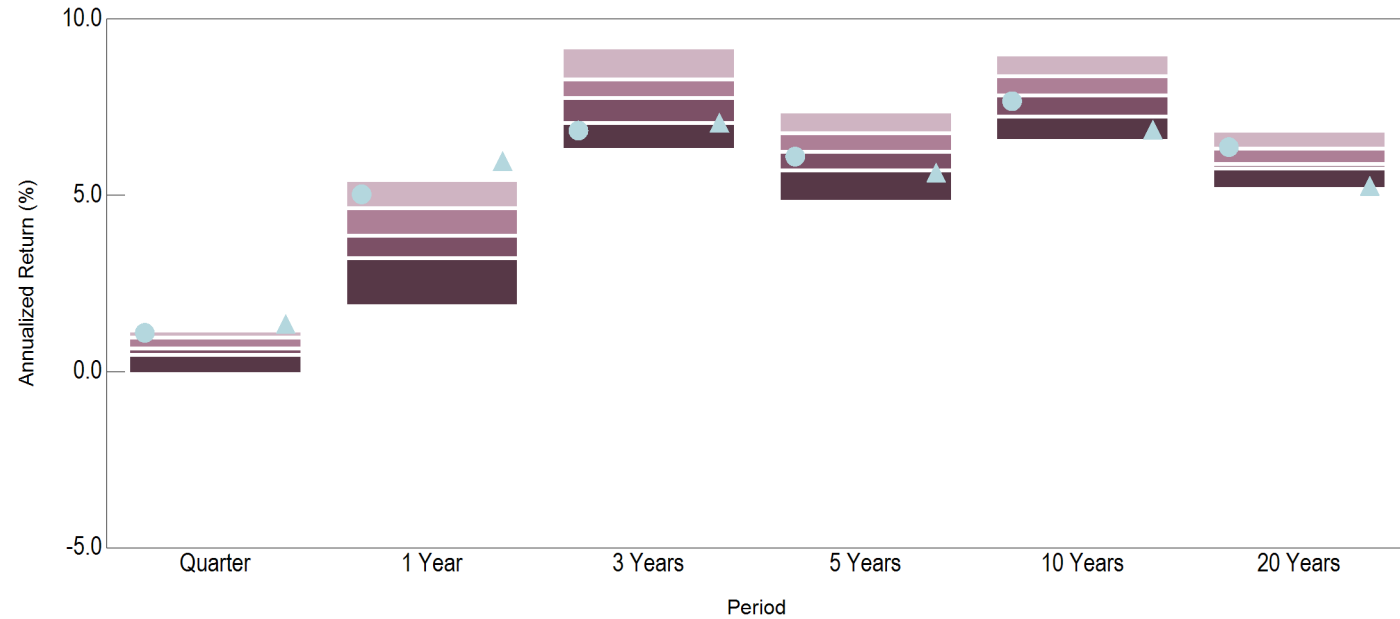
Annualized Return vs. Annualized Standard Deviation  
Since Inception



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

As of September 30, 2019

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



	Return (Rank)					
5th Percentile	1.2	5.4	9.2	7.4	9.0	6.8
25th Percentile	1.0	4.6	8.3	6.8	8.4	6.3
Median	0.7	3.9	7.8	6.2	7.8	5.9
75th Percentile	0.5	3.2	7.1	5.7	7.2	5.8
95th Percentile	-0.1	1.9	6.3	4.8	6.6	5.2
# of Portfolios	83	82	81	79	58	25
● Total Retirement System	1.1 (10)	5.0 (10)	6.8 (81)	6.1 (57)	7.7 (53)	6.4 (20)
▲ 55% MSCI World & 45% Barclays Aggregate	1.3 (4)	6.0 (2)	7.1 (75)	5.7 (79)	6.9 (87)	5.3 (94)

As of September 30, 2019

**Statistics Summary**  
**5 Years Ending September 30, 2019**

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Total Retirement System	6.1%	6.1%	0.4	0.9	0.8	1.1%
55% MSCI World & 45% Barclays Aggregate	5.7%	6.4%	--	1.0	0.7	0.0%
Equity Assets	7.7%	11.6%	-1.1	0.9	0.6	2.4%
Russell 3000	10.4%	12.2%	--	1.0	0.8	0.0%
Domestic Equity Assets	9.5%	12.2%	-0.5	1.0	0.7	1.7%
Russell 3000	10.4%	12.2%	--	1.0	0.8	0.0%
RhumbLine S&P 500 Index	10.8%	11.9%	-0.7	1.0	0.8	0.0%
S&P 500	10.8%	11.9%	--	1.0	0.8	0.0%
Fiduciary Large Cap Equity	9.5%	10.7%	-0.3	0.8	0.8	3.7%
Russell 3000	10.4%	12.2%	--	1.0	0.8	0.0%
Frontier Capital Appreciation	8.0%	16.4%	-0.4	1.0	0.4	5.4%
Russell 2500 Growth	10.2%	15.7%	--	1.0	0.6	0.0%
International Developed Markets Equity Assets	3.0%	12.3%	-0.4	1.0	0.2	0.8%
MSCI EAFE	3.3%	12.2%	--	1.0	0.2	0.0%
Rhumblin MSCI EAFE Index	3.4%	12.2%	0.6	1.0	0.2	0.3%
MSCI EAFE	3.3%	12.2%	--	1.0	0.2	0.0%
International Emerging Markets Equity Assets	--	--	--	--	--	--
MSCI Emerging Markets	2.3%	15.6%	--	1.0	0.1	0.0%
DFA Emerging Markets	--	--	--	--	--	--
MSCI Emerging Markets	2.3%	15.6%	--	1.0	0.1	0.0%

## Total Retirement System

As of September 30, 2019

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Driehaus Emerging Market Equity	--	--	--	--	--	--
MSCI Emerging Markets	2.3%	15.6%	--	1.0	0.1	0.0%
Investment Grade Bonds Assets	3.4%	3.1%	0.7	1.0	0.8	0.0%
BBgBarc US Aggregate TR	3.4%	3.1%	--	1.0	0.8	0.0%
SSgA U.S. Aggregate Bond Index	3.4%	3.1%	0.7	1.0	0.8	0.0%
BBgBarc US Aggregate TR	3.4%	3.1%	--	1.0	0.8	0.0%
High Yield Bond Assets	5.7%	5.0%	0.2	0.9	0.9	1.8%
BBgBarc US High Yield TR	5.4%	5.3%	--	1.0	0.8	0.0%
Shenkman Capital	5.0%	4.8%	-0.4	0.9	0.8	1.1%
BBgBarc US High Yield TR	5.4%	5.3%	--	1.0	0.8	0.0%
TIPS Assets	2.4%	3.5%	-0.6	1.0	0.4	0.0%
BBgBarc US TIPS TR	2.4%	3.5%	--	1.0	0.4	0.0%
SSgA TIPS Index-NL	2.4%	3.5%	-0.7	1.0	0.4	0.0%
BBgBarc US TIPS TR	2.4%	3.5%	--	1.0	0.4	0.0%
Emerging Market Debt Assets	--	--	--	--	--	--
JP Morgan EMBI Global Diversified	5.7%	5.5%	--	1.0	0.9	0.0%
Payden Emerging Market Bond	--	--	--	--	--	--
JP Morgan EMBI Global Diversified	5.7%	5.5%	--	1.0	0.9	0.0%
Open-Ended Real Estate	10.2%	4.5%	0.8	1.1	2.1	1.0%
NCREIF ODCE	9.3%	4.0%	--	1.0	2.1	0.0%
Clarion Partners	10.2%	4.5%	0.8	1.1	2.1	1.0%
NCREIF ODCE	9.3%	4.0%	--	1.0	2.1	0.0%

## Total Retirement System

As of September 30, 2019

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Total Closed End Real Estate	-1.7%	21.7%	-0.5	1.2	-0.1	21.2%
NCREIF ODCE	9.3%	4.0%	--	1.0	2.1	0.0%
Colony Realty Partners IV	-1.7%	21.7%	-0.5	1.2	-0.1	21.2%
NCREIF ODCE	9.3%	4.0%	--	1.0	2.1	0.0%
Comerica Short Term Fund	0.2%	0.2%	-2.4	0.0	-4.3	0.3%
91 Day T-Bills	1.0%	0.3%	--	1.0	0.0	0.0%

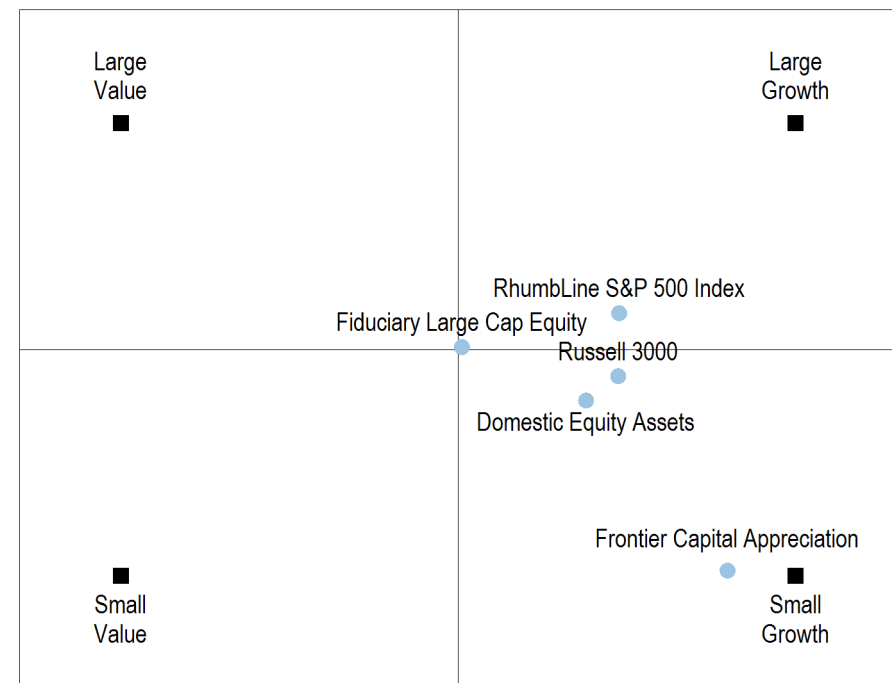
## Retirement System Detail

## Domestic Equity Assets

As of September 30, 2019

## Asset Allocation on September 30, 2019

	Actual	Actual
Fiduciary Large Cap Equity	\$24,585,860	40.7%
Frontier Capital Appreciation	\$17,254,527	28.6%
RhumbLine S&P 500 Index	\$18,540,644	30.7%
<b>Total</b>	<b>\$60,381,031</b>	<b>100.0%</b>

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



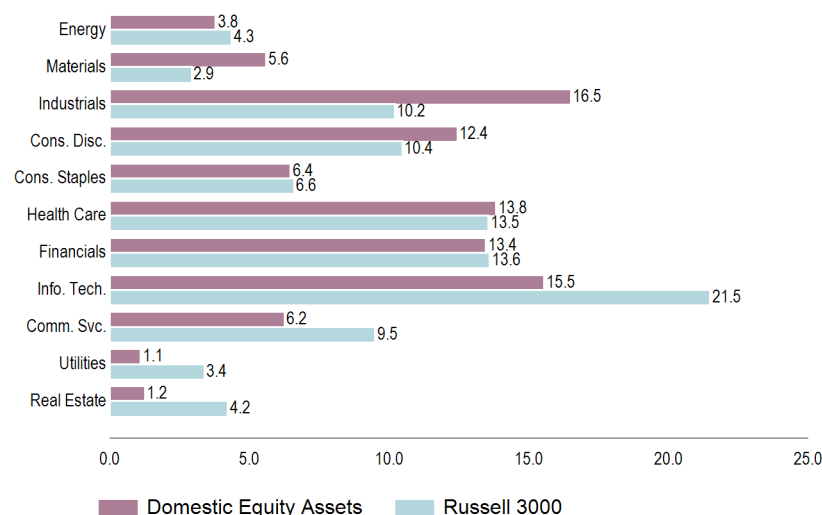
## Domestic Equity Assets

As of September 30, 2019

## Domestic Equity Assets Characteristics

	Portfolio Q3-19	Index Q3-19	Portfolio Q2-19
<b>Market Value</b>			
Market Value (\$M)	60.4	--	60.7
Number Of Holdings	631	2988	626
<b>Characteristics</b>			
Weighted Avg. Market Cap. (\$B)	112.6	195.3	120.8
Median Market Cap (\$B)	17.0	1.6	16.7
P/E Ratio	18.9	20.5	20.8
Yield	1.6	1.9	1.4
EPS Growth - 5 Yrs.	9.7	13.5	11.0
Price to Book	3.2	3.5	3.1
Beta (holdings; domestic)	1.1	1.0	1.2

## Sector Allocation (%) vs Russell 3000



## Top 10 Holdings

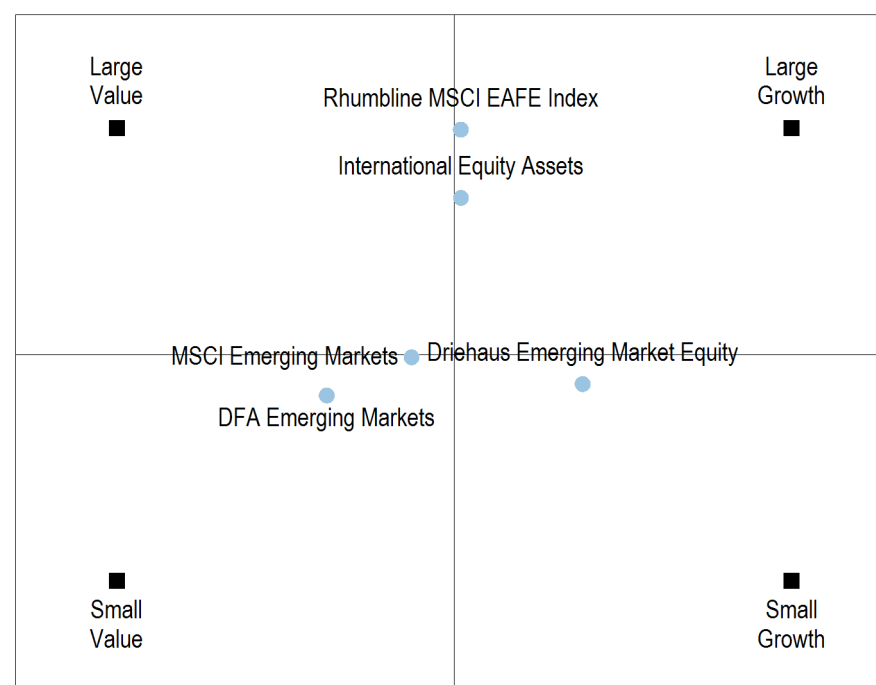
CASH - USD	4.0%
BERKSHIRE HATHAWAY 'B'	2.5%
DOLLAR GENERAL	2.2%
JP MORGAN CHASE & CO.	2.2%
HONEYWELL INTL.	2.0%
UNITEDHEALTH GROUP	2.0%
MASCO	1.8%
DOLLAR TREE	1.7%
EBAY	1.6%
TJX	1.5%
<b>Total</b>	<b>21.7%</b>

## International Equity Assets

As of September 30, 2019

## Asset Allocation on September 30, 2019

	Actual	Actual
DFA Emerging Markets	\$2,811,774	12.5%
Driehaus Emerging Market Equity	\$3,111,558	13.8%
Rhumblin MSCI EAFE Index	\$16,631,075	73.7%
<b>Total</b>	<b>\$22,554,407</b>	<b>100.0%</b>

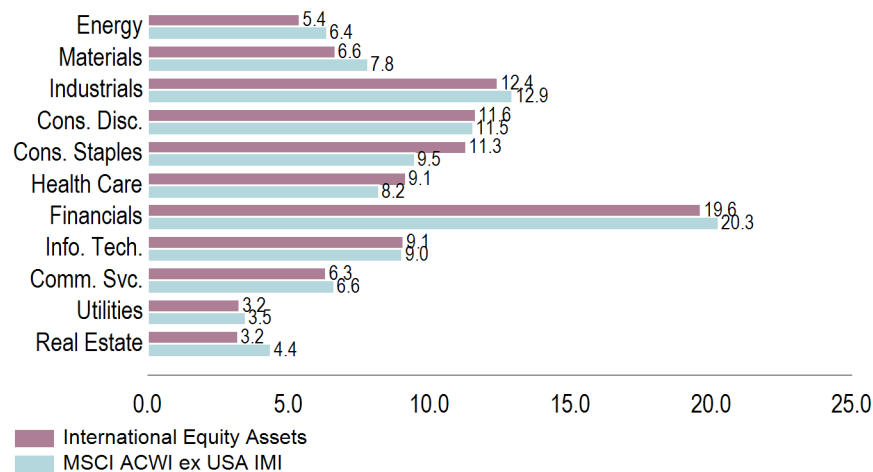
International Equity Assets Style Map  
3 Years Ending September 30, 2019

## International Equity Assets

As of September 30, 2019

International Equity Characteristics			
	Portfolio Q3-19	Index Q3-19	Portfolio Q2-19
<b>Market Value</b>			
Market Value (\$M)	22.6	--	22.9
Number Of Holdings	5831	6374	5888
<b>Characteristics</b>			
Weighted Avg. Market Cap. (\$B)	62.1	55.9	62.7
Median Market Cap (\$B)	0.6	1.5	0.6
P/E Ratio	15.7	15.0	15.5
Yield	3.1	3.2	3.1
EPS Growth - 5 Yrs.	8.3	9.2	9.1
Price to Book	2.4	2.3	2.4
Beta (holdings; domestic)	1.0	1.0	1.0

## Sector Allocation (%) vs MSCI ACWI ex USA IMI



## Top 10 Holdings

NESTLE 'R'	1.8%
ROCHE HOLDING	1.1%
NOVARTIS 'R'	1.0%
SAMSUNG ELECTRONICS	1.0%
NORTHERN INSTITUTIONAL U.S. GOVERNMENT SELECT PORTFOLIO	0.9%
TAIWAN SEMICON.SPN.ADR 1:5	0.8%
TOYOTA MOTOR	0.8%
HSBC HOLDINGS	0.8%
AIA GROUP	0.8%
TENCENT HOLDINGS	0.8%
<b>Total</b>	<b>9.8%</b>

## International Equity Assets

As of September 30, 2019

## Country Allocation Report

As of 9/30/2019

Region	% of Total	% of Bench	% Diff
North America ex U.S.	0.1%	7.0%	-6.9%
United States	1.6%	0.0%	1.6%
Europe Ex U.K.	35.5%	30.2%	5.3%
United Kingdom	11.7%	11.1%	0.6%
Pacific Basin Ex Japan	11.9%	8.3%	3.6%
Japan	18.3%	17.3%	1.0%
Emerging Markets	20.4%	24.6%	-4.2%
Other	0.6%	1.5%	-0.9%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

## International Equity Assets

As of September 30, 2019

## International Equity Country Allocation

vs MSCI ACWI ex USA IMI

Country	% of Total	% of Bench	% Diff
	0.0%	0.6%	-0.6%
ARGENTINA	0.0%	0.1%	0.0%
AUSTRALIA	5.2%	4.8%	0.4%
AUSTRIA	0.2%	0.2%	0.0%
BAHRAIN	0.0%	0.0%	0.0%
BANGLADESH	0.0%	0.0%	0.0%
BELGIUM	0.7%	0.8%	-0.1%
BRAZIL	2.3%	1.9%	0.3%
CANADA	0.1%	7.0%	-6.9%
CHILE	0.2%	0.3%	0.0%
CHINA	2.6%	7.8%	-5.2%
COLOMBIA	0.1%	0.1%	0.0%
CROATIA	0.0%	0.0%	0.0%
CZECH REPUBLIC	0.0%	0.0%	0.0%
DENMARK	1.3%	1.2%	0.1%
EGYPT	0.1%	0.1%	0.1%
ESTONIA	0.0%	0.0%	0.0%
FINLAND	0.7%	0.7%	0.0%
FRANCE	8.5%	6.8%	1.7%
GERMANY	6.3%	5.5%	0.8%
GREECE	0.1%	0.1%	0.0%
HONG KONG	5.4%	2.3%	3.1%
HUNGARY	0.2%	0.1%	0.1%
INDIA	2.9%	2.3%	0.6%

## International Equity Assets

As of September 30, 2019

Country	% of Total	% of Bench	% Diff
INDONESIA	0.7%	0.5%	0.2%
IRELAND	0.4%	0.4%	0.0%
ISRAEL	0.4%	0.5%	-0.1%
ITALY	1.7%	1.7%	0.0%
JAPAN	18.3%	17.3%	1.0%
JORDAN	0.0%	0.0%	0.0%
KAZAKHSTAN	0.0%	0.0%	0.0%
KENYA	0.0%	0.0%	0.0%
KOREA	2.9%	3.2%	-0.3%
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	0.5%	0.6%	-0.1%
MAURITIUS	0.0%	0.0%	0.0%
MEXICO	0.7%	0.6%	0.0%
MOROCCO	0.0%	0.0%	0.0%
NETHERLANDS	3.7%	2.4%	1.3%
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%
POLAND	0.4%	0.3%	0.1%

## International Equity Assets

As of September 30, 2019

Country	% of Total	% of Bench	% Diff
PORTUGAL	0.1%	0.1%	0.0%
QATAR	0.0%	0.3%	-0.3%
ROMANIA	0.0%	0.0%	0.0%
RUSSIA	0.8%	0.9%	-0.1%
SERBIA	0.0%	0.0%	0.0%
SINGAPORE	1.1%	0.9%	0.2%
SLOVENIA	0.0%	0.0%	0.0%
SOUTH AFRICA	1.4%	1.3%	0.0%
SPAIN	2.2%	1.9%	0.3%
SRI LANKA	0.0%	0.0%	0.0%
SWEDEN	1.9%	2.1%	-0.2%
SWITZERLAND	7.1%	5.8%	1.2%
TAIWAN	3.0%	3.1%	-0.1%
THAILAND	0.9%	0.8%	0.1%
TUNISIA	0.0%	0.0%	0.0%
TURKEY	0.1%	0.2%	0.0%
UNITED ARAB EMIRATES	0.1%	0.2%	-0.1%
UNITED KINGDOM	11.7%	11.1%	0.6%
UNITED STATES	1.6%	0.0%	1.6%
VIETNAM	0.0%	0.0%	0.0%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

## Fixed Income Assets

As of September 30, 2019

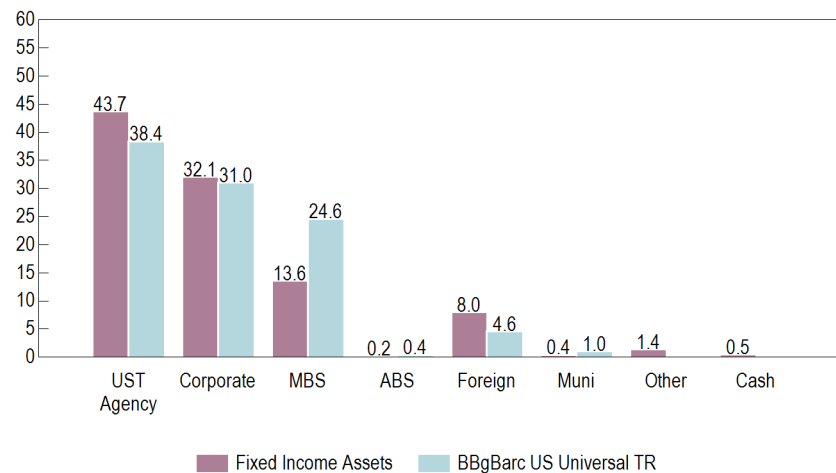
### Asset Allocation on September 30, 2019

	Actual	Actual
Payden Emerging Market Bond	\$5,416,938	6.3%
Shenkman Capital	\$19,196,662	22.2%
SSgA TIPS Index-NL	\$21,114,492	24.4%
SSgA U.S. Aggregate Bond Index	\$40,823,039	47.2%
<b>Total</b>	<b>\$86,551,131</b>	<b>100.0%</b>

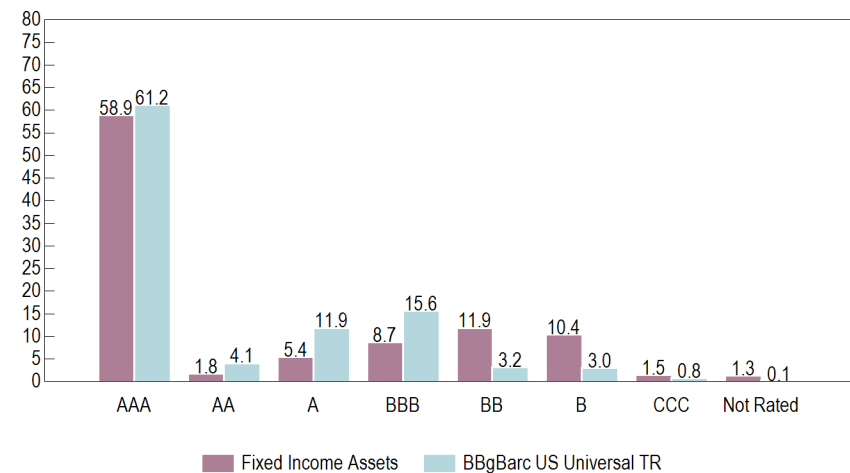
### Fixed Income Characteristics vs. BBgBarc US Universal TR

	Portfolio Q3-19	Index Q3-19	Portfolio Q2-19
<b>Fixed Income Characteristics</b>			
Yield to Maturity	3.2	3.1	3.4
Average Duration	4.1	6.1	4.2
Average Quality	A	AA	A
Weighted Average Maturity	7.8	7.8	7.6

### Sector Allocation



### Credit Quality Allocation





## Portfolio Reviews

## RhumbLine S&amp;P 500 Index

As of September 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	1.7	20.5	4.2	13.4	10.8	13.2	6.4	Mar-99
S&P 500	1.7	20.6	4.3	13.4	10.8	13.2	6.4	Mar-99

## Top 10 Holdings

MICROSOFT	4.2%
APPLE	3.8%
AMAZON.COM	2.9%
FACEBOOK CLASS A	1.7%
BERKSHIRE HATHAWAY 'B'	1.6%
JP MORGAN CHASE & CO.	1.5%
ISHARES CORE S&P 500 ETF	1.5%
ALPHABET 'C'	1.5%
ALPHABET A	1.5%
JOHNSON & JOHNSON	1.4%
<b>Total</b>	<b>21.6%</b>

RhumbLine S&P 500 Index Equity Characteristics  
vs S&P 500

	Portfolio Q3-19	Index Q3-19	Portfolio Q2-19
<b>Market Value</b>			
Market Value (\$M)	18.54	--	18.88
Number Of Holdings	507	505	507
<b>Characteristics</b>			
Weighted Avg. Market Cap. (\$B)	230.58	230.50	224.81
Median Market Cap (\$B)	22.53	22.53	22.24
P/E Ratio	20.57	20.51	20.58
Yield	1.97	1.96	1.95
EPS Growth - 5 Yrs.	13.39	13.51	12.81
Price to Book	3.67	3.65	3.60
Beta (holdings; domestic)	0.99	0.99	1.00
<b>Sector Distribution</b>			
Energy	4.45	4.64	4.96
Materials	2.64	2.71	2.74
Industrials	9.16	9.39	9.20
Consumer Discretionary	9.96	10.12	10.02
Consumer Staples	7.48	7.37	7.16
Health Care	13.41	13.63	13.99
Financials	14.25	13.11	14.38
Information Technology	21.61	21.92	21.15
Communication Services	10.24	10.49	10.04
Utilities	3.52	3.42	3.25
Real Estate	3.13	3.19	2.99

## Fiduciary Large Cap Equity

As of September 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	0.3	17.0	5.9	12.1	9.5	--	12.1	Sep-12
Russell 3000	1.2	20.1	2.9	12.8	10.4	13.1	13.3	Sep-12

## Top Holdings as of June 30, 2019

BERKSHIRE HATHAWAY INC B	5.17%
HONEYWELL INTERNATIONAL INC	4.92%
DOLLAR GENERAL CORP	4.39%
UNITEDHEALTH GROUP INC	4.37%
JPMORGAN CHASE & CO	3.98%
MASCO CORP	3.97%
EBAY INC	3.94%
DOLLAR TREE INC	3.85%
QUEST DIAGNOSTICS INC	3.59%
UNILEVER PLC ADR	3.55%

## Fund Characteristics as of June 30, 2019

Versus Russell 3000

Sharpe Ratio (3 Year)	1.08
Average Market Cap (\$mm)	54,548.03
Price/Earnings	17.33
Price/Book	2.98
Price/Sales	1.80
Price/Cash Flow	13.57
Dividend Yield	1.68
Number of Equity Holdings	31
R-Squared (3 Year)	0.89
Alpha (3 Year)	0.13%

## Sector Allocation as of June 30, 2019

BASIC MATERIALS	9.76%
COMMUNICATION SERVICES	0.00%
CONSUMER CYCLICAL	15.15%
CONSUMER DEFENSIVE	19.42%
ENERGY	2.55%
FINANCIAL SERVICES	17.27%
HEALTHCARE	11.71%
INDUSTRIALS	14.57%
REAL ESTATE	0.00%
TECHNOLOGY	9.57%
UTILITIES	0.00%

## Frontier Capital Appreciation

As of September 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	-0.5	17.3	-5.7	7.8	8.0	--	11.0	Feb-13
Russell 2500 Growth	-3.2	20.0	-4.1	12.3	10.2	13.5	12.0	Feb-13

## Top 10 Holdings

CASH - USD	4.6%
UNITED AIRLINES HOLDINGS	3.2%
INSULET	2.6%
TUTOR PERINI	2.4%
MASTEC	1.8%
MONOLITHIC PWR.SYS.	1.7%
COOPER COS.	1.7%
ALLEGHENY TECHS.	1.6%
KBR	1.6%
COGENT COMMS.HOLDINGS	1.5%
<b>Total</b>	<b>22.8%</b>

## Frontier Capital Appreciation Characteristics

	Portfolio Q3-19	Index Q3-19	Portfolio Q2-19
<b>Market Value</b>			
Market Value (\$M)	17.3	--	17.3
Number Of Holdings	140	1376	141

## Characteristics

Weighted Avg. Market Cap. (\$B)	6.3	5.2	6.1
Median Market Cap (\$B)	2.7	1.2	2.7
P/E Ratio	19.4	26.8	20.7
Yield	0.9	0.7	0.9
EPS Growth - 5 Yrs.	8.0	15.6	7.0
Price to Book	2.6	5.1	2.7
Beta (holdings; domestic)	1.3	1.2	1.4

## Sector Distribution

Energy	5.7	0.5	6.4
Materials	9.5	3.6	10.1
Industrials	22.8	17.9	22.0
Consumer Discretionary	6.9	13.9	7.2
Consumer Staples	0.5	2.2	0.5
Health Care	13.8	22.4	15.2
Financials	8.8	6.4	9.2
Information Technology	23.1	25.1	23.9
Communication Services	3.4	2.9	3.3
Utilities	0.0	0.9	0.0
Real Estate	0.9	4.3	0.8

## Rhumbline MSCI EAFE Index

As of September 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	-1.1	13.1	-1.0	6.6	3.4	--	2.5	Aug-14
MSCI EAFE	-1.1	12.8	-1.3	6.5	3.3	4.9	2.4	Aug-14

## Top 10 Holdings

NESTLE 'R'	2.4%
ROCHE HOLDING	1.5%
NOVARTIS 'R'	1.3%
TOYOTA MOTOR	1.1%
HSBC HOLDINGS	1.1%
ROYAL DUTCH SHELL A(LON)	0.9%
BP	0.9%
TOTAL	0.9%
ASTRAZENECA	0.9%
SAP	0.8%
<b>Total</b>	<b>11.8%</b>

## Rhumbline MSCI EAFE Index Characteristics

	Portfolio Q3-19	Index Q3-19	Portfolio Q2-19
<b>Market Value</b>			
Market Value (\$M)	16.6	--	16.8
Number Of Holdings	939	922	937
<b>Characteristics</b>			
Weighted Avg. Market Cap. (\$B)	60.4	59.7	61.2
Median Market Cap (\$B)	9.9	9.9	10.1
P/E Ratio	15.9	15.8	15.5
Yield	3.3	3.3	3.4
EPS Growth - 5 Yrs.	7.0	7.0	7.9
Price to Book	2.3	2.3	2.3
Beta (holdings; domestic)	1.0	1.0	1.0

## Sector Distribution

Energy	5.1	5.1	5.5
Materials	6.9	7.2	7.3
Industrials	14.7	14.8	14.7
Consumer Discretionary	11.2	11.4	11.1
Consumer Staples	11.9	11.8	11.6
Health Care	11.5	11.3	11.0
Financials	18.4	18.8	18.7
Information Technology	6.6	6.8	6.6
Communication Services	5.3	5.4	5.4
Utilities	3.7	3.7	3.7
Real Estate	3.5	3.5	3.5

## DFA Emerging Markets

As of September 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	-4.2	5.0	-1.7	4.9	--	--	3.2	Jan-15
MSCI Emerging Markets	-4.2	5.9	-2.0	6.0	2.3	3.4	3.5	Jan-15

## Top 10 Holdings

SAMSUNG ELECTRONICS	4.4%
TAIWAN SEMICON.SPN.ADR 1:5	1.8%
TENCENT HOLDINGS	1.8%
TAIWAN SEMICON.MNFG.	1.3%
SK HYNIX	0.9%
VALE ON	0.9%
ALIBABA GROUP HOLDING ADR 1:8	0.8%
RELIANCE INDUSTRIES	0.8%
PING AN INSURANCE (GROUP) OF CHINA 'H'	0.7%
PETROLEO BRASILEIRO PN	0.7%
<b>Total</b>	<b>14.1%</b>

## DFA Emerging Markets Characteristics

	Portfolio Q3-19	Index Q3-19	Portfolio Q2-19
<b>Market Value</b>			
Market Value (\$M)	2.8	--	2.9
Number Of Holdings	4867	1194	4925
<b>Characteristics</b>			
Weighted Avg. Market Cap. (\$B)	45.3	80.2	44.3
Median Market Cap (\$B)	0.4	5.3	0.4
P/E Ratio	12.8	13.6	13.0
Yield	3.1	3.1	3.0
EPS Growth - 5 Yrs.	11.0	12.9	11.1
Price to Book	2.2	2.4	2.1
Beta (holdings; domestic)	1.1	1.1	1.1
<b>Sector Distribution</b>			
Energy	7.0	7.7	7.0
Materials	10.3	7.4	11.0
Industrials	8.8	5.4	9.0
Consumer Discretionary	10.4	13.3	10.6
Consumer Staples	7.4	6.6	7.2
Health Care	2.9	2.7	3.0
Financials	18.3	24.9	19.2
Information Technology	19.1	14.7	17.7
Communication Services	7.5	11.6	7.7
Utilities	3.5	2.8	3.5
Real Estate	3.8	2.9	4.0

## Driehaus Emerging Market Equity

As of September 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	-2.3	12.5	4.3	8.0	--	--	5.6	Jan-15
MSCI Emerging Markets	-4.2	5.9	-2.0	6.0	2.3	3.4	3.5	Jan-15

## Top 10 Holdings

NORTHERN INSTITUTIONAL U.S. GOVERNMENT SELECT PORTFOLIO	6.4%
TAIWAN SEMICON.SPN.ADR 1:5	4.5%
TENCENT HOLDINGS	4.3%
ALIBABA GROUP HOLDING ADR 1:8	3.7%
SAMSUNG ELECTRONICS	3.3%
PING AN INSURANCE (GROUP) OF CHINA 'H'	2.6%
ICICI BK.ADR 1:2	2.2%
HDFC BANK ADR 1:3	2.0%
CP ALL NVDR	1.8%
WALMART DE MEXICO 'V'	1.7%
<b>Total</b>	<b>32.4%</b>

## Driehaus Emerging Market Equity Characteristics

	Portfolio Q3-19	Index Q3-19	Portfolio Q2-19
<b>Market Value</b>			
Market Value (\$M)	3.1	--	3.2
Number Of Holdings	100	1194	97

## Characteristics

Weighted Avg. Market Cap. (\$B)	88.5	80.2	88.7
Median Market Cap (\$B)	14.9	5.3	15.3
P/E Ratio	21.0	13.6	21.2
Yield	1.9	3.1	2.0
EPS Growth - 5 Yrs.	13.1	12.9	14.6
Price to Book	3.6	2.4	3.8
Beta (holdings; domestic)	1.0	1.1	1.0

## Sector Distribution

Energy	5.6	7.7	4.9
Materials	1.9	7.4	2.8
Industrials	3.5	5.4	3.8
Consumer Discretionary	15.0	13.3	18.3
Consumer Staples	11.5	6.6	12.1
Health Care	2.3	2.7	2.7
Financials	27.5	24.9	30.6
Information Technology	13.2	14.7	13.0
Communication Services	10.7	11.6	10.2
Utilities	0.4	2.8	0.5
Real Estate	1.1	2.9	1.0

## SSgA U.S. Aggregate Bond Index

As of September 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

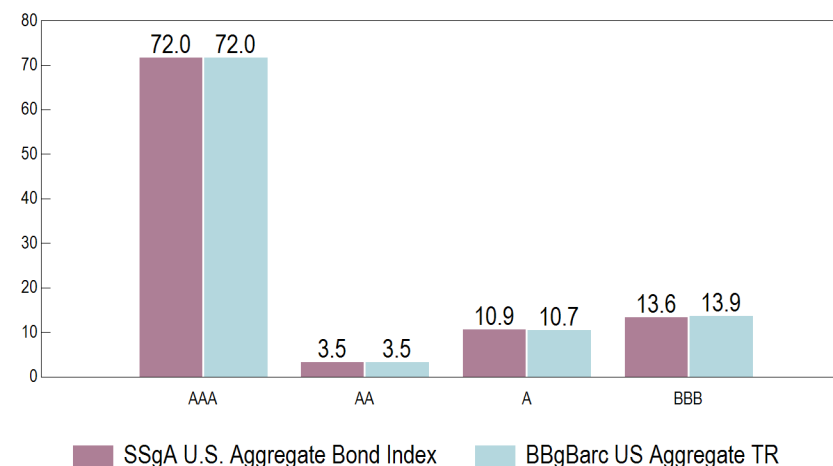
## Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA U.S. Aggregate Bond Index	2.2	8.5	10.3	2.9	3.4	3.8	4.7	May-01
BBgBarc US Aggregate TR	2.3	8.5	10.3	2.9	3.4	3.7	4.7	May-01

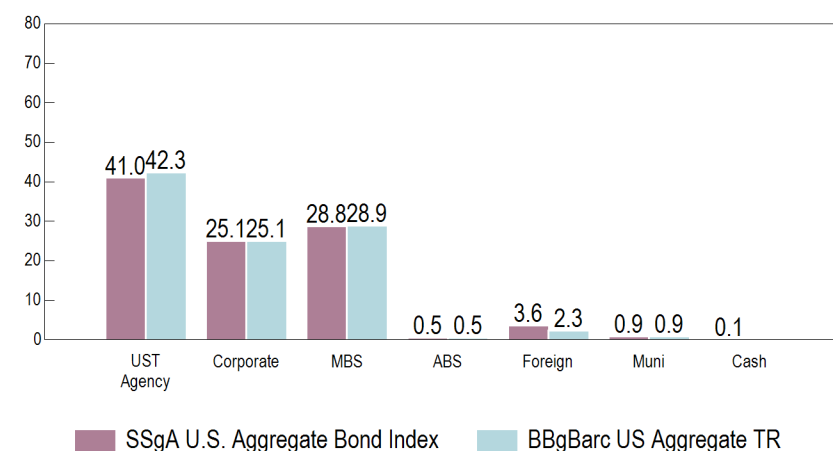
SSgA U.S. Aggregate Bond Index Characteristics  
vs. BBgBarc US Aggregate TR

	Portfolio Q3-19	Index Q3-19	Portfolio Q2-19
Fixed Income Characteristics			
Yield to Maturity	2.5	2.3	2.5
Average Duration	5.8	6.3	5.7
Average Quality	AA	AA	AA
Weighted Average Maturity	7.9	7.8	7.8

## Credit Quality Allocation



## Sector Allocation





## 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

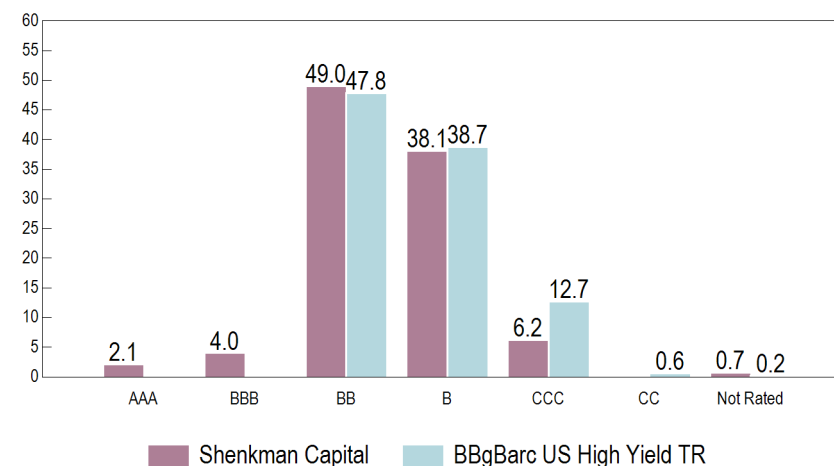
## Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Shenkman Capital	1.8	11.5	7.1	5.7	5.0	7.0	6.8	Apr-06
BBgBarc US High Yield TR	1.3	11.4	6.4	6.1	5.4	7.9	7.4	Apr-06

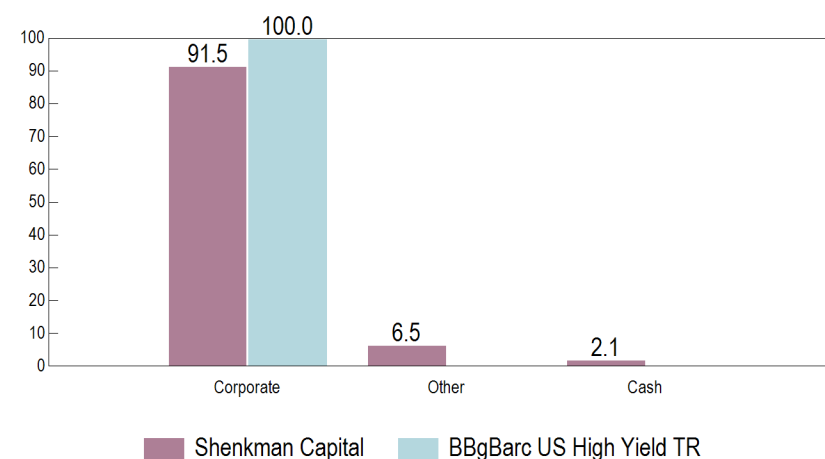
Shenkman Capital Characteristics  
vs. BBgBarc US High Yield TR

	Portfolio Q3-19	Index Q3-19	Portfolio Q2-19
Fixed Income Characteristics			
Yield to Maturity	5.5	5.8	5.7
Average Duration	2.9	4.5	3.0
Average Quality	BB	B	BB
Weighted Average Maturity	5.8	5.8	5.6

## Credit Quality Allocation



## Sector Allocation



As of September 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

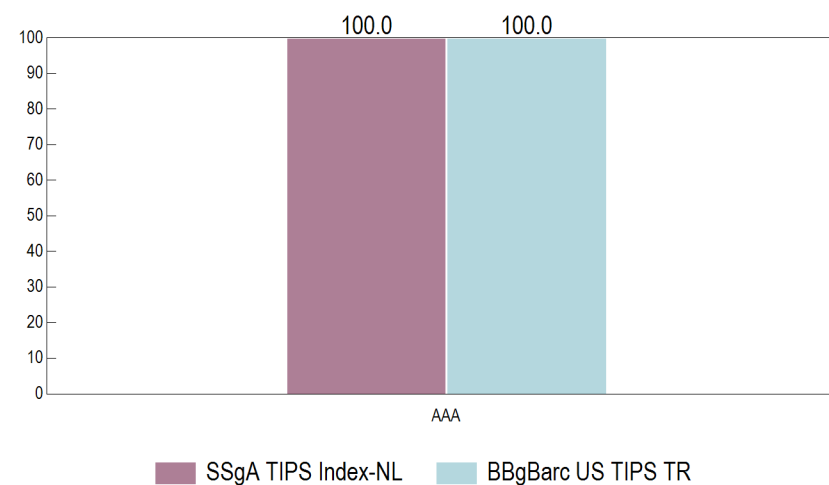
## Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA TIPS Index-NL	1.3	7.5	7.1	2.2	2.4	3.4	3.8	Oct-05
BBgBarc US TIPS TR	1.3	7.6	7.1	2.2	2.4	3.5	3.8	Oct-05

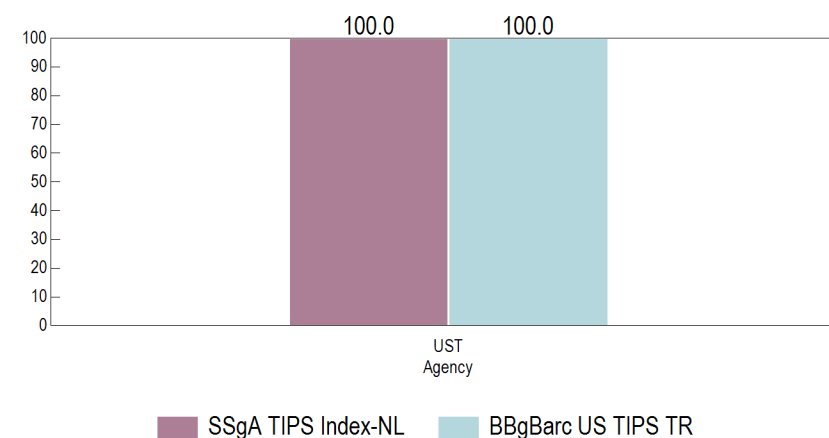
SSgA TIPS Index-NL Characteristics  
vs. BBgBarc US TIPS TR

	Portfolio Q3-19	Index Q3-19	Portfolio Q2-19
Fixed Income Characteristics			
Yield to Maturity	1.9	1.9	2.1
Average Duration	4.9	4.9	1.2
Average Quality	AAA	AAA	AAA
Weighted Average Maturity	8.4	8.4	8.1

## Credit Quality Allocation



## Sector Allocation



## Payden Emerging Market Bond

As of September 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	0.3	13.1	9.5	4.3	--	--	5.7	Jan-15
JP Morgan EMBI Global Diversified	1.5	13.0	11.6	4.6	5.7	6.9	6.2	Jan-15

## Fund Characteristics as of August 31, 2019

Versus JP Morgan EMBI Global Diversified

Sharpe Ratio (3 Year)	0.43
Average Duration	7.40
Average Coupon	6.58%
Average Effective Maturity	12.04
R-Squared (3 Year)	0.93
Alpha (3 Year)	-0.10%
Beta (3 Year)	1.17

## Payden Emerging Market Bond Characteristics

vs. JP Morgan EMBI Global TR

	Portfolio Q3-19	Portfolio Q2-19
Fixed Income Characteristics		
Yield to Maturity	6.3	6.7
Average Duration	7.4	6.8
Average Quality	BB	BB
Weighted Average Maturity	12.0	10.9

## Fixed Income Sectors as of August 31, 2019

GOVERNMENT	64.87%
MUNICIPAL	0.00%
CORPORATE	17.09%
SECURITIZED	0.00%
CASH & EQUIVALENTS	3.44%
DERIVATIVE	14.60%

## Credit Quality as of September 30, 2019

AAA	1.00%
AA	3.00%
A	6.00%
BBB	27.00%
BB	19.00%
B	35.00%
Below B	6.00%
Not Rated	3.00%

As of September 30, 2019

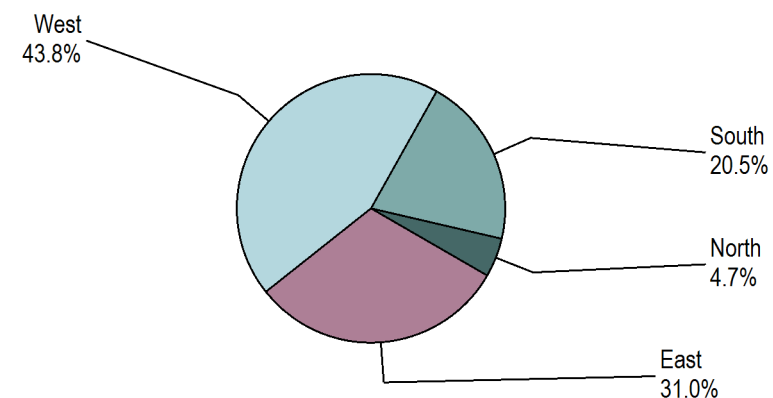
## Account Information

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

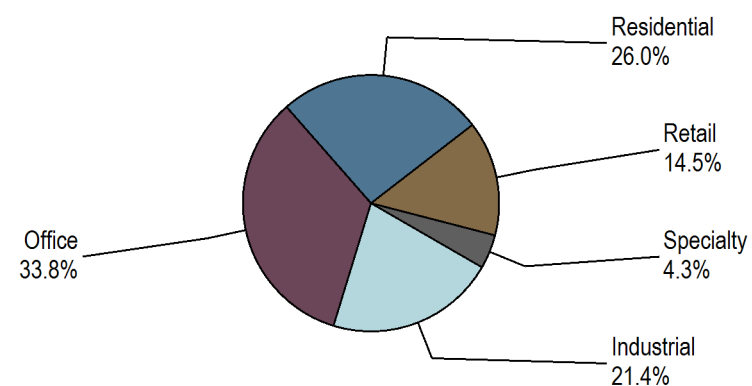
## Portfolio Performance Summary

	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Clarion Partners	1.7	5.2	6.3	7.8	10.2	11.5	7.4	Oct-02
NCREIF ODCE	1.3	3.8	5.6	7.3	9.3	10.9	8.2	Oct-02

## Geographic Diversification



## Property Type Allocation



As of September 30, 2019

**Annual Investment Expense Analysis**  
**As Of September 30, 2019**

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
<b>Equity Assets</b>		<b>\$82,935,438</b>		
<b>Domestic Equity Assets</b>		<b>\$60,381,031</b>		
RhumbLine S&P 500 Index	0.07% of First 25.0 Mil, 0.05% of Next 25.0 Mil, 0.04% Thereafter	\$18,540,644	\$12,978	0.07%
Fiduciary Large Cap Equity	0.66% of Assets	\$24,585,860	\$162,267	0.66%
Frontier Capital Appreciation	0.79% of Assets	\$17,254,527	\$136,311	0.79%
<b>International Equity Assets</b>		<b>\$22,554,407</b>		
<b>International Developed Markets Equity Assets</b>		<b>\$16,631,075</b>		
Rhumblin MSCI EAFE Index	0.08% of First 25.0 Mil, 0.07% of Next 25.0 Mil, 0.05% Thereafter	\$16,631,075	\$13,305	0.08%
<b>International Emerging Markets Equity Assets</b>		<b>\$5,923,332</b>		
DFA Emerging Markets	0.52% of Assets	\$2,811,774	\$14,621	0.52%
Driehaus Emerging Market Equity	0.90% of Assets	\$3,111,558	\$28,004	0.90%
<b>Fixed Income Assets</b>		<b>\$86,551,131</b>		
<b>Investment Grade Bonds Assets</b>		<b>\$40,823,039</b>		
SSgA U.S. Aggregate Bond Index	0.04% of Assets	\$40,823,039	\$16,329	0.04%
<b>High Yield Bond Assets</b>		<b>\$19,196,662</b>		
Shenkman Capital	0.45% of Assets	\$19,196,662	\$86,385	0.45%
<b>TIPS Assets</b>		<b>\$21,114,492</b>		
SSgA TIPS Index-NL	0.04% of Assets	\$21,114,492	\$8,446	0.04%
<b>Emerging Market Debt Assets</b>		<b>\$5,416,938</b>		
Payden Emerging Market Bond	0.69% of Assets	\$5,416,938	\$37,377	0.69%

## Total Retirement System

As of September 30, 2019

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
<b>Real Estate Assets</b>		<b>\$5,761,323</b>		
<b>Open-Ended Real Estate</b>		<b>\$5,739,294</b>		
Clarion Partners	1.10% of Assets	\$5,739,294	\$63,132	1.10%
<b>Total Closed End Real Estate</b>		<b>\$22,029</b>		
Colony Realty Partners IV	1.5% management fee based on committed equity during the investment period and invested equity thereafter	\$22,029		
<b>Private Equity Assets</b>		<b>\$7,037,082</b>		
North American Strategic Partners 2006	0.8% on drawn and undrawn capital less investments sold or written off   5% carried interest, 8% preferred return	\$721,818		
Ironsides Partnership Fund IV	0% Management fee, 8% Preferred Return, 5% Carried Interest	\$1,360,570		
Ironsides Direct Investment Fund IV	0.5% Management fee, 8% Preferred Return, 15% Carried Interest	\$2,931,842		
Ironsides Direct Investment Fund V, L.P.	0.5% Management fee, 8% preferred return, 15% carried interest	\$2,022,853		
<b>Cash</b>		<b>\$5,466</b>		
Comerica Short Term Fund		\$5,466		
<b>Total</b>		<b>\$182,290,440</b>	<b>\$579,155</b>	<b>0.32%</b>

## Current Issues

## **Custody RFP Respondent Review**



## Background

- As required by PERAC, the City of Marlborough Contributory Retirement System must conduct a search for each service provider at least every seven years.
- In compliance with this mandate, Meketa Investment Group (MIG) issued a Request for Proposal (“RFP”) for Custody Services on September 17, 2019 with responses due by October 2, 2019.
- Four custodian banks responded to the RFP. These include Comerica, People’s United Bank, U.S. Bank, and UMB Bank.
  - The incumbent custodian is Comerica.
- Meketa reviewed the services offered, the custody platform, and the costs for each firm.
- A summary of the respondents can be found on the following pages.

**Custody Bank Respondents**

<b>Custodian</b>	<b>Headquarters</b>	<b>Client Service Location</b>	<b>Overall Rating</b>
Comerica Bank	Dallas, TX	Detroit, MI	Highly Advantageous
U.S. Bank	Minneapolis, MN	Minneapolis, MN	Highly Advantageous
People's United Bank	Bridgeport, CT	Beverly, MA	Advantageous
UMB Bank	Kansas City, MO	Kansas City, MO	Advantageous

## Selecting a Custodian

- The primary service provided by custodians is the safekeeping and recording of assets. In today's world, custody services are highly automated.
- A top-tier custodian will:
  - Maintain ongoing investment in state-of-the-art technology (including disaster recovery and cyber security systems).
  - Work on a direct automated basis with the Fund's money managers.
  - Provide accurate statements and accounting information in a timely manner every month.
  - Appoint a dedicated team that will respond to client requests in a quick and timely manner.
  - Offer additional services, such as performance measurement, benefit payments, and securities lending.

**Comerica Bank**

Rating Criteria	Rating	Rationale
Overall	Highly Advantageous	
Organization	Highly Advantageous	<ul style="list-style-type: none"> <li>Comerica Bank is the principal subsidiary of Comerica Incorporated, a full-service financial provider that was established in 1849 as the Detroit Savings Fund Institute. The corporation became known as Comerica in 1982. Today, Comerica Incorporated is a publicly held company listed on the New York Stock Exchange under the symbol CMA.</li> <li>The bank's long-term debt is rated BBB+/A3/A and stable by the three major rating agencies.</li> </ul>
Team	Advantageous	<ul style="list-style-type: none"> <li>The team currently manages seven Massachusetts public retirement systems clients with \$760m combined AUM.</li> <li>Dual support from two experienced relationship managers.</li> <li>Overall team has had more employees lost than gained from 2013-2017. No minimum for years of experience required.</li> </ul>
Systems	Highly Advantageous	<ul style="list-style-type: none"> <li>In house system trust accounting system developed by SunGard.</li> <li>System updated and upgraded twice annually. Dedicated technology team of 11 individuals. Back up support provided by SunGard.</li> <li>\$3 million dollars annually budgeted for system upgrades and enhancements.</li> </ul>
Cash Management	Highly Advantageous	<ul style="list-style-type: none"> <li>Provide availability of a range of STIF vehicles.</li> <li>No STIF issues within the past five years.</li> <li>Ability to forecast cash for three months.</li> </ul>
Fees	Highly Advantageous	<ul style="list-style-type: none"> <li>5 bps fee for actively-managed investment accounts under custody.</li> <li>Transaction and account level fees.</li> <li>Fees guaranteed for 3 years.</li> <li>Flat fee proposal of \$20,000</li> </ul>

**U.S. Bank**

Rating Criteria	Rating	Rationale
Overall	Highly Advantageous	
Organization	Highly Advantageous	<ul style="list-style-type: none"> <li>US Bancorp was founded in 1863, and is the second oldest continuously chartered bank. Currently US Bank is the sixth largest custodian in the nation. U.S. Bancorp, the parent company of U.S. Bank is publicly owned and traded on the NYSE under the ticker symbol USB.</li> <li>The bank's debt is rated A1/A+/AA- with an outlook of stable by the three major rating agencies.</li> </ul>
Team	Advantageous	<ul style="list-style-type: none"> <li>The team currently manages 479 clients and \$121B in public client assets.</li> <li>Dedicated relationship manager and account manager with deep client experience. Minimum 10 years' experience required to be an RM.</li> </ul>
Systems	Highly Advantageous	<ul style="list-style-type: none"> <li>SEI deploys both mainframe and server-based hardware and software to maintain US Bank's trust system. SEI has an open-ended architecture that provides virtually unlimited capacity for growth. The system provides computerized trust and portfolio accounting systems. There is a dedicated technology team for support. \$30 million dollars annually is spent on investment in new IT technology.</li> <li>The system is audited annually by internal and external auditors.</li> </ul>
Cash Management	Highly Advantageous	<ul style="list-style-type: none"> <li>Provide availability of a range of STIF vehicles.</li> <li>No STIF issues within the past five years.</li> <li>Ability to forecast cash up to three years.</li> </ul>
Fees	Highly Advantageous	<ul style="list-style-type: none"> <li>0.75 basis points on the first \$100 million, 0.65 basis points on the balance.</li> <li>No Account level fees.</li> <li>Fees guaranteed for three years.</li> </ul>

## People's United Bank

Rating Criteria	Rating	Rationale
Overall	Advantageous	
Organization	Advantageous	<ul style="list-style-type: none"> <li>• People's United Bank, N.A., was founded in 1842. Originally a state-chartered bank, in 2006, People's changed to a federally-chartered savings bank. In 2007, People's Bank completed the second-step conversion, raising \$3.44 billion in capital.</li> <li>• In February of 2015, the Office of the Comptroller of the Currency approved the conversion of People's United Bank from a federally-chartered savings bank to a national banking association.</li> <li>• The bank's long-term debt is rated BBB+/Baa2 by S&amp;P and Moody's.</li> <li>• Common equity tier 1 capital and total risk-based capital ratios were 10.3 percent and 12.8 percent, respectively.</li> </ul>
Team	Highly Advantageous	<ul style="list-style-type: none"> <li>• Team supports 18 municipal public pension fund clients with two Massachusetts Public Pension plans with \$5B AUM.</li> <li>• Lead relationship manager has over 30 years experience and is supported by two experienced client / relationship managers.</li> </ul>
Systems	Highly Advantageous	<ul style="list-style-type: none"> <li>• Internally developed system with dedicated internal support staff. Additional use of Workbench interface supported by BNY Mellon. Will continue to use BNY for the foreseeable future. BNY invests over \$600M per year in technology.</li> </ul>
Cash Management	Highly Advantageous	<ul style="list-style-type: none"> <li>• Provide availability of a range of STIF vehicles.</li> <li>• No STIF issues within the past five years.</li> <li>• Ability to forecast cash up to 60 days.</li> </ul>
Fees	Advantageous	<ul style="list-style-type: none"> <li>• 2 bps fee for assets under custody.</li> <li>• Additional account level and transaction fees.</li> <li>• Flat fee proposal of \$25,000 per year.</li> <li>• Fees guaranteed for five years.</li> </ul>

**UMB Bank**

Rating Criteria	Rating	Rationale
Overall	Advantageous	
Organization	Not Advantageous	<ul style="list-style-type: none"> <li>UMB first offered custody services to institutional investors in 1948. Founded in 1913, UMB Financial Corporation (NASDAQ: UMBF) is a financial services holding company that offers complete banking, asset management, health spending solutions, and related financial services to commercial, institutional and personal customers nationwide. UMB Financial Corporation is currently rated A.</li> <li>Subsidiaries of the holding company include mutual fund and alternative investment services groups.</li> <li>UMB Institutional Custody provides domestic and global custody, real-time operating system availability, industry and client-specific interfaces, automated cash management, and straight-through securities processing.</li> <li>Does not currently service a Massachusetts public plan. Client base and organization focused in southern US.</li> </ul>
Team	Advantageous	<ul style="list-style-type: none"> <li>UMB Institutional Custody currently has 145 clients, with assets under custody of \$152 billion. Institutional assets under custody are \$89.7B.</li> <li>The Institutional Custody segment employs 88 professionals, including 18 dedicated to client service. The custody administrator provides day-to-day operational support on the account, while the Relationship Manager works with the client to familiarize them with UMB's products, reports, systems and additional capabilities.</li> </ul>
Systems	Advantageous	<ul style="list-style-type: none"> <li>UMB uses FIS's Global Plus system for custody services. Global Plus is a multicurrency, trade date, accrual-based asset management and accounting platform. It supports the processing requirements of both domestic and international asset management and consolidates international and domestic investments for client reporting.</li> <li>Global Plus processes all phases of a security transaction, from order entry through settlement. All transactions and instructions are posted online.</li> </ul>
Cash Management	Advantageous	<ul style="list-style-type: none"> <li>Offers tax exempt money market mutual funds from both the Federated and Fidelity family of funds.</li> <li>Online portal provides a Daily Forecasts report for forecasting cash.</li> <li>No STIF issues within the past five years.</li> </ul>
Fees	Highly Advantageous	<ul style="list-style-type: none"> <li>1 basis point on the first \$250 million.</li> <li>Portfolio transaction fees.</li> <li>Fee estimates are preliminary and negotiated on a case-by-case basis.</li> </ul>

**Proposed Fees**

<b>Manager</b>	<b>Estimated Effective Fee<sup>1</sup> (%)</b>	<b>Estimated Annual Fee (\$)</b>
Comerica Bank	0.011	\$20.0k
U.S. Bank	0.007	\$12.7k
Peoples United Bank	0.014	\$25.0k
UMB Bank	0.010	\$18.0k

<sup>1</sup> Based on \$180M AUM, current account structure and current trade balances.





## Summary

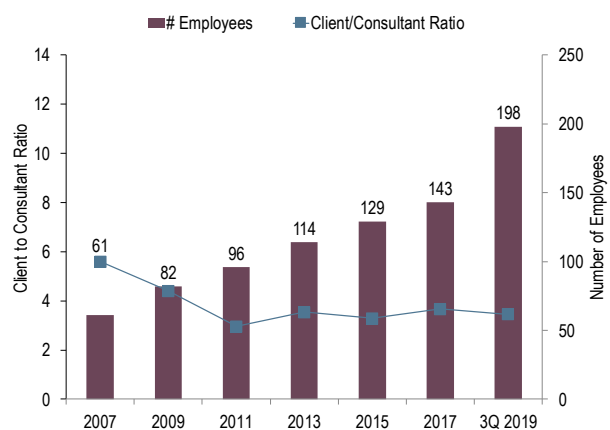
- A total of 4 custodian banks submitted responses to this search.
- Based on our review and evaluation of each respondent, Meketa Investment Group has ranked Comerica and US Bank as “Highly Advantageous”.

## Appendices

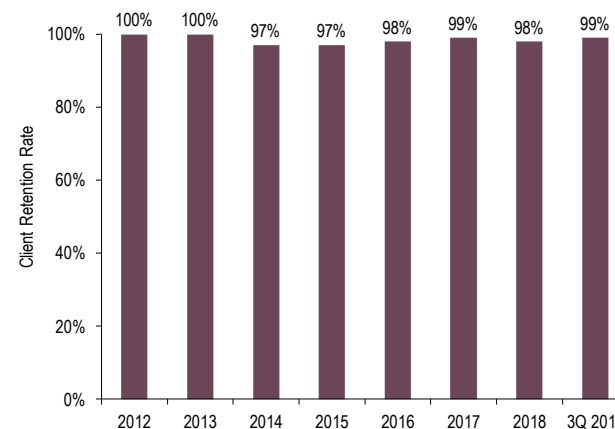
## **Meketa Investment Group Corporate Update**

- Staff of 198, including 133 investment professionals and 41 CFA Charterholders
- 214 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 Ratio<sup>1</sup>



### Client Retention Rate<sup>2</sup>



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

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

<sup>2</sup> 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"> <li>- Passive</li> <li>- Enhanced Index</li> <li>- Large Cap</li> <li>- Midcap</li> <li>- Small Cap</li> <li>- Microcap</li> <li>- 130/30</li> </ul>	<ul style="list-style-type: none"> <li>- Large Cap Developed</li> <li>- Small Cap Developed</li> <li>- Emerging Markets</li> <li>- Frontier Markets</li> </ul>	<ul style="list-style-type: none"> <li>- Buyouts</li> <li>- Venture Capital</li> <li>- Private Debt</li> <li>- Special Situations</li> <li>- Secondaries</li> <li>- Fund of Funds</li> </ul>	<ul style="list-style-type: none"> <li>- Public REITs</li> <li>- Core Real Estate</li> <li>- Value Added Real Estate</li> <li>- Opportunistic Real Estate</li> <li>- Infrastructure</li> <li>- Timber</li> <li>- Natural Resources</li> <li>- Commodities</li> </ul>	<ul style="list-style-type: none"> <li>- Short-Term</li> <li>- Core</li> <li>- Core Plus</li> <li>- TIPS</li> <li>- High Yield</li> <li>- Bank Loans</li> <li>- Distressed</li> <li>- Global</li> <li>- Emerging Markets</li> </ul>	<ul style="list-style-type: none"> <li>- Long/Short Equity</li> <li>- Event Driven</li> <li>- Relative Value</li> <li>- Fixed Income Arbitrage</li> <li>- Multi Strategy</li> <li>- Market Neutral</li> <li>- Global Macro</li> <li>- Fund of Funds</li> <li>- Portable Alpha</li> </ul>

## **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.