

**City of Marlborough
Contributory Retirement System**

**Meeting Materials
February 25, 2020**

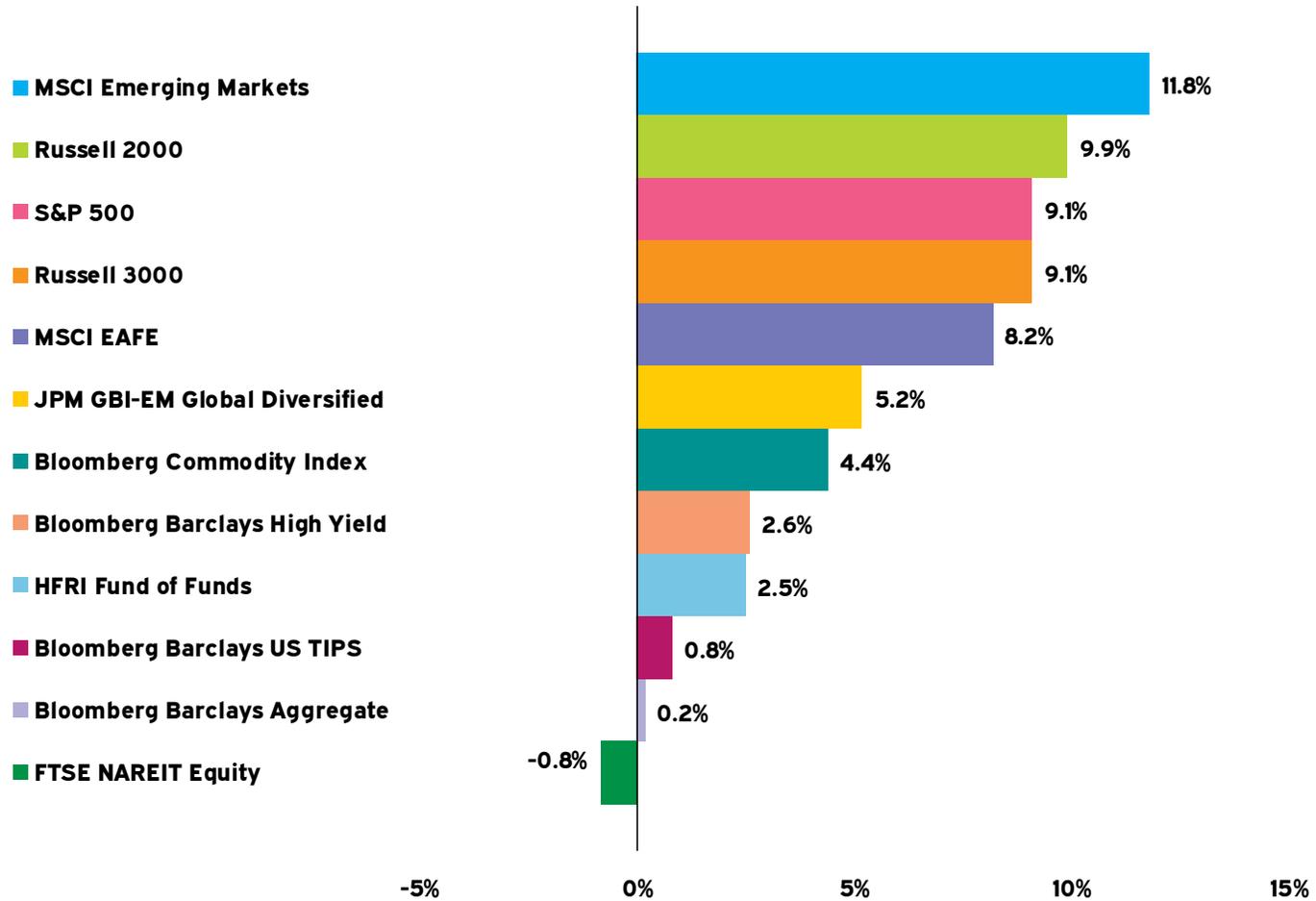
Fund Evaluation Report

Agenda

1. World Markets Fourth Quarter of 2019
2. Retirement System Interim Update
3. Retirement System Summary
 - Retirement System Detail
 - Portfolio Reviews
4. Current Issues
 - Asset Allocation Review
 - Peer Fee Review
5. Appendices
 - Corporate Update
 - Disclaimer, Glossary, and Notes

The World Markets Fourth Quarter of 2019

The World Markets¹ Fourth Quarter of 2019



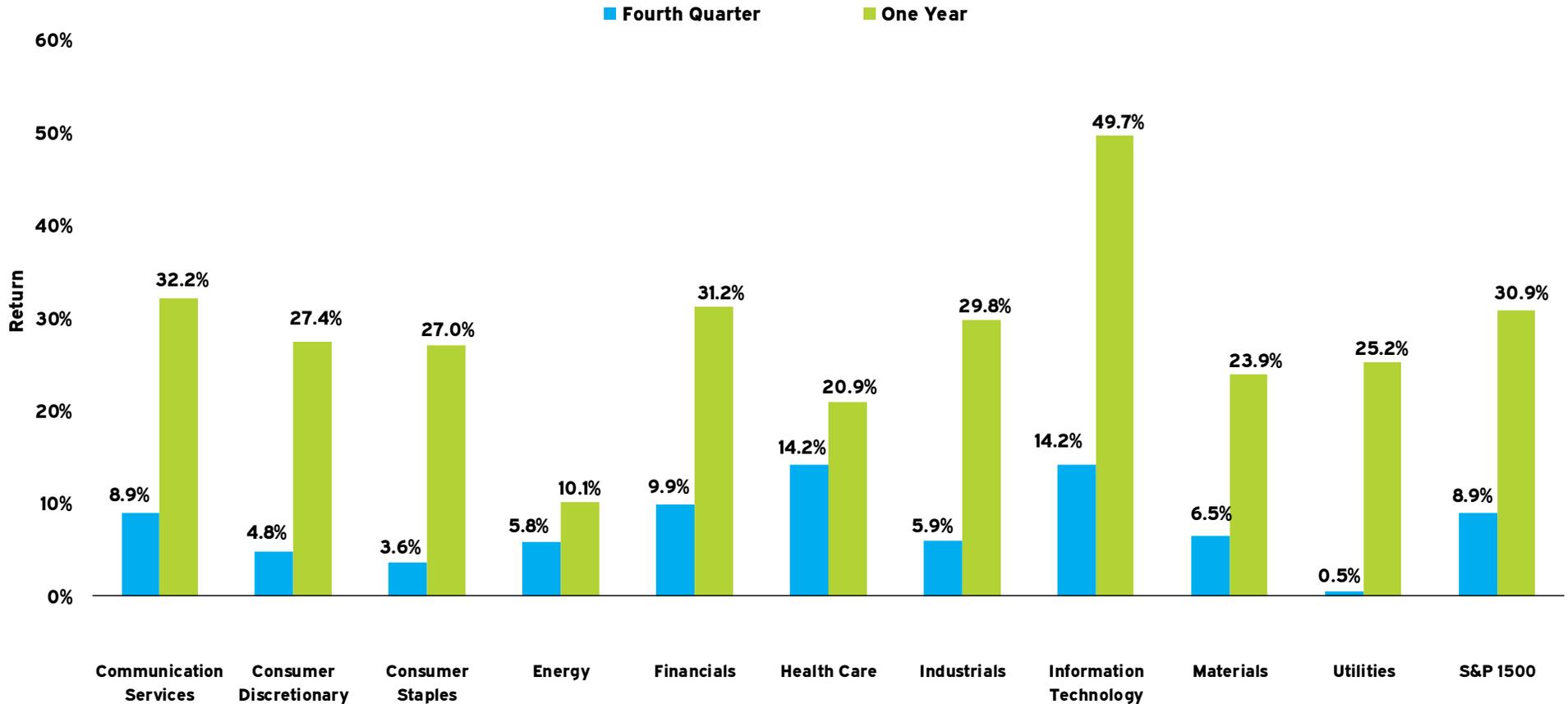
¹ Source: InvestorForce.

Index Returns¹

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

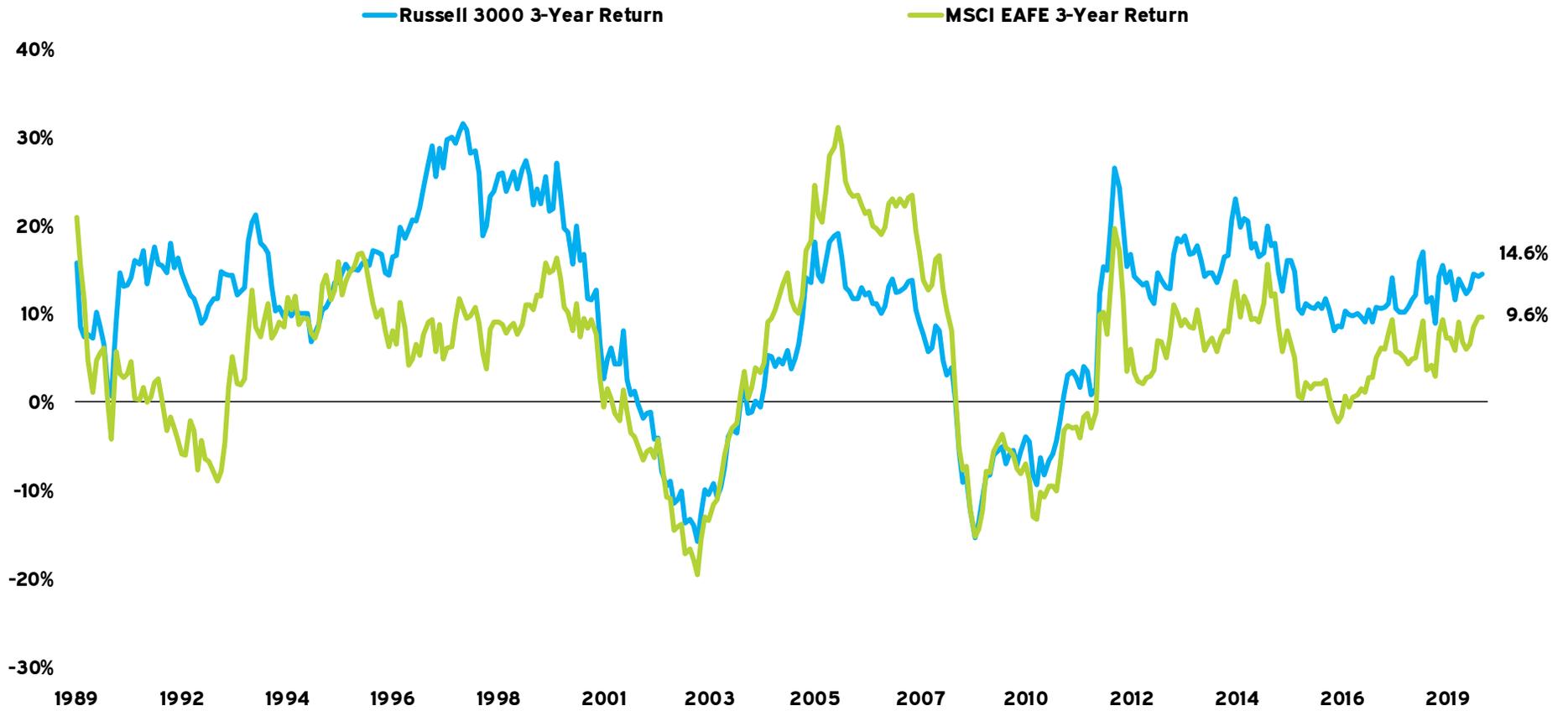
¹ Source: InvestorForce.

S&P Sector Returns¹



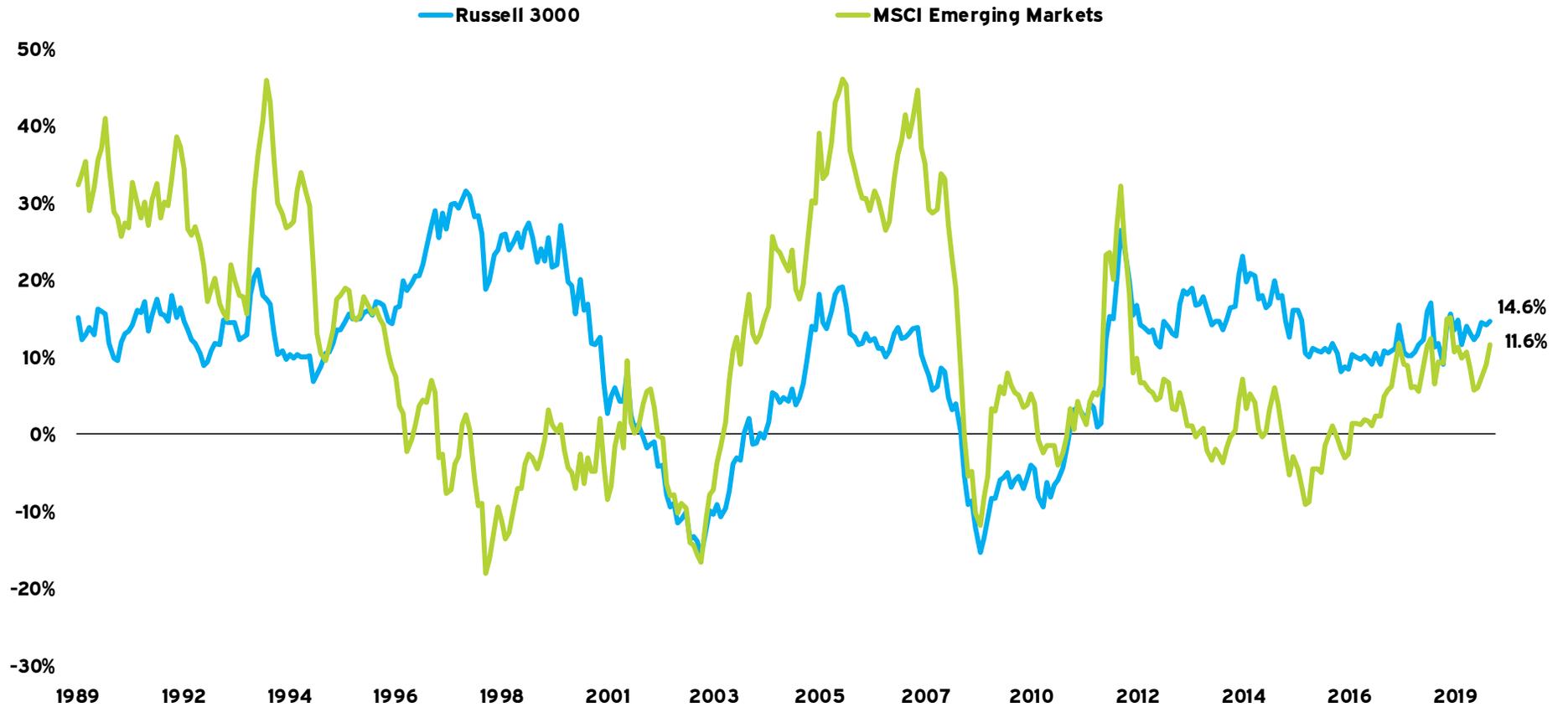
¹ Source: InvestorForce. Represents S&P 1500 (All Cap) data.

US and Developed Market Foreign Equity Rolling Three-Year Returns¹



¹ Source: InvestorForce.

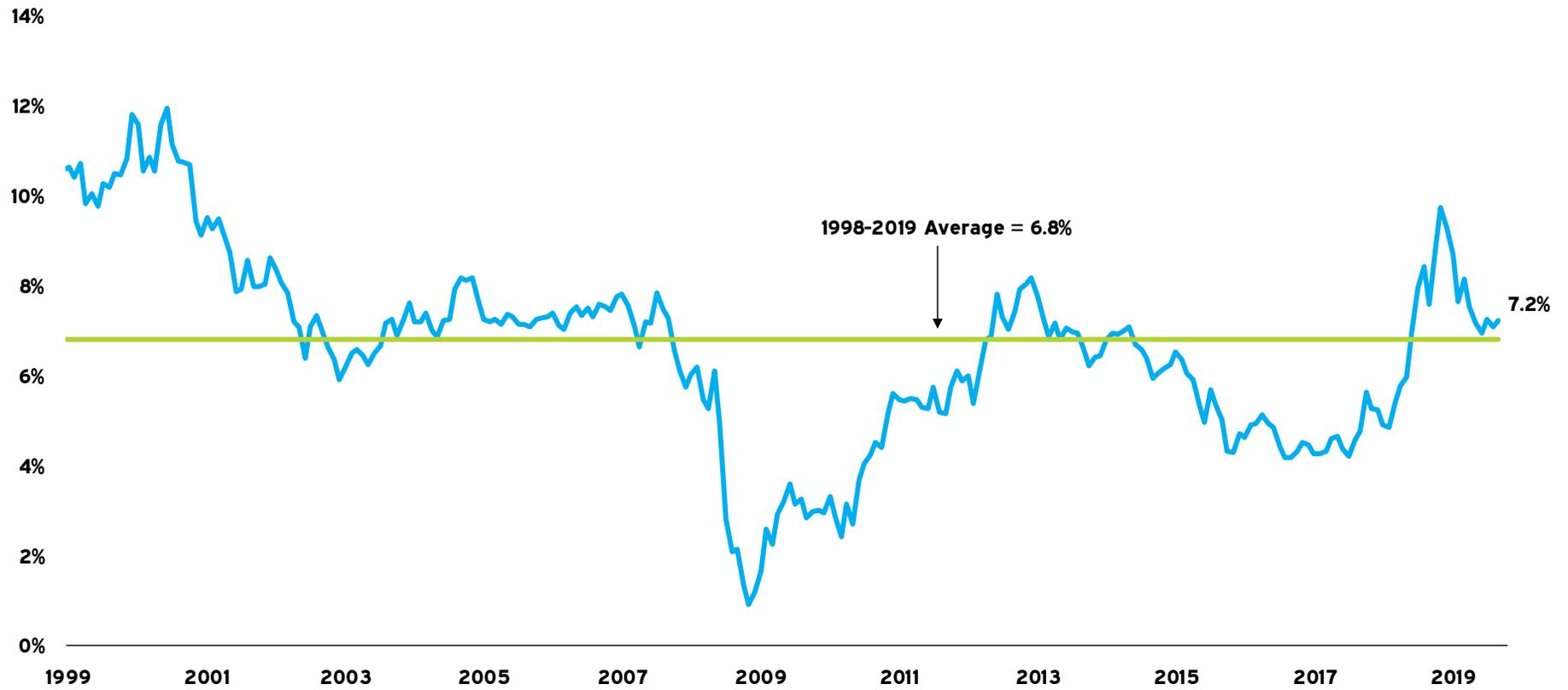
US and Emerging Market Equity Rolling Three-Year Returns¹



¹ Source: InvestorForce.

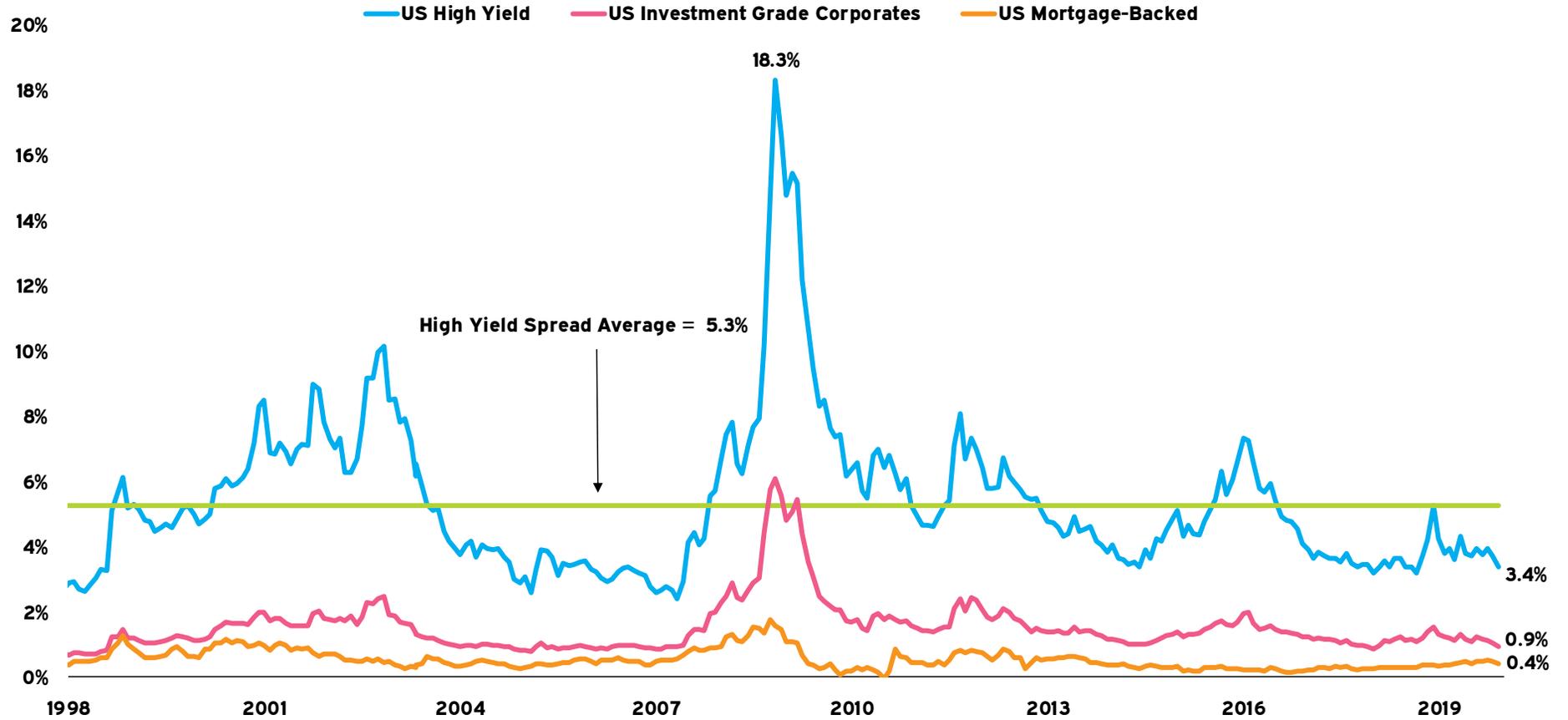
Rolling Ten-Year Returns: 65% Stocks and 35% Bonds¹

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



¹ Source: InvestorForce.

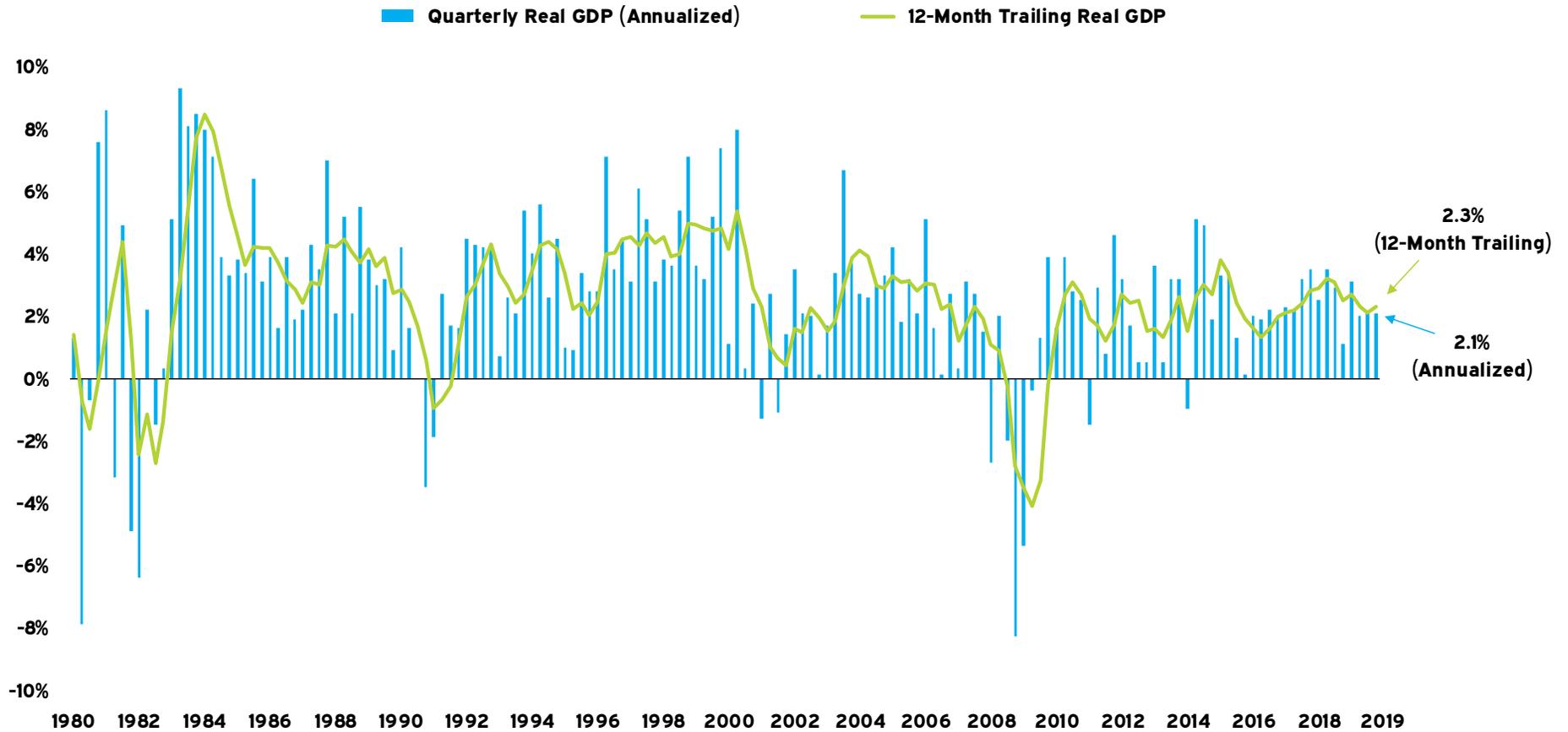
Credit Spreads vs. US Treasury Bonds^{1,2}



¹ Source: Barclays Live. Data represents the OAS.

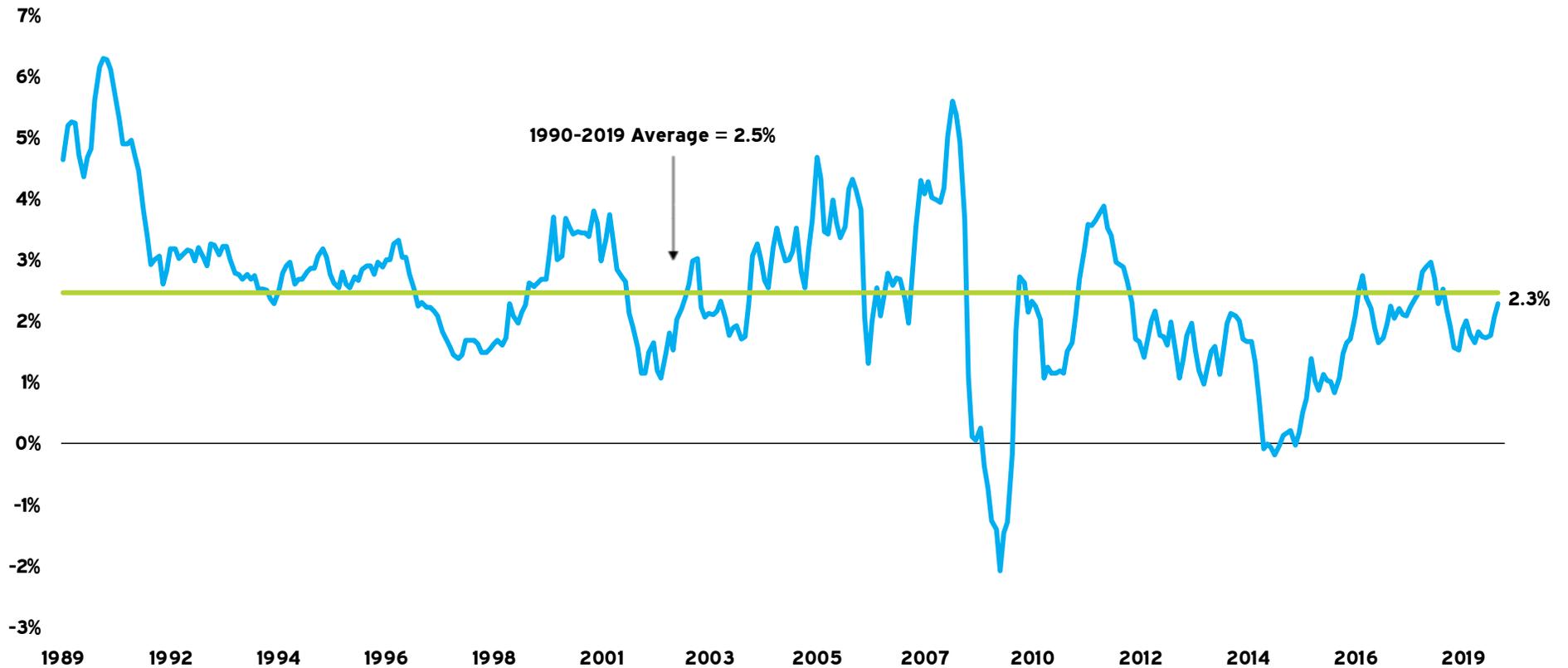
² The median high yield spread was 4.7% from 1997-2019.

US Real Gross Domestic Product (GDP) Growth¹



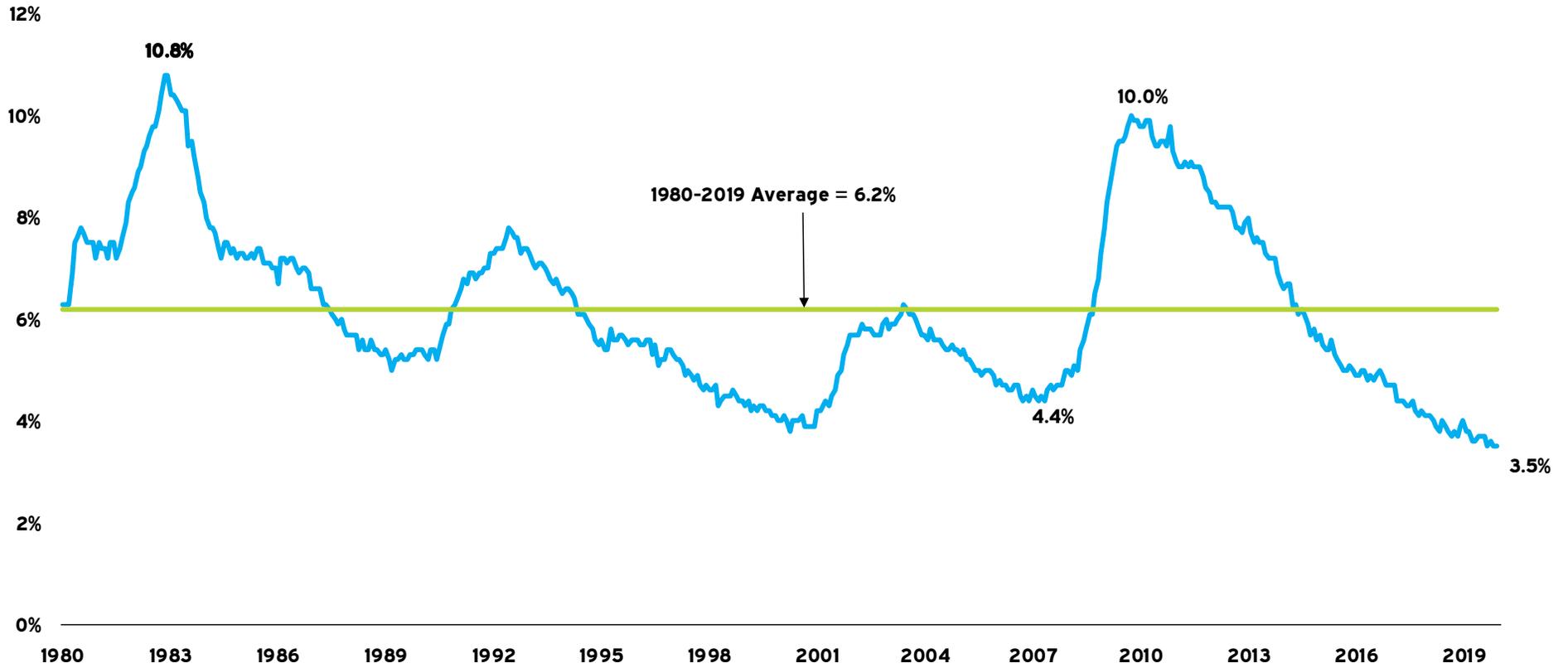
¹ Source: Bureau of Economic Analysis. Data is as of Q4 2019 and represents the first estimate.

US Inflation (CPI) Trailing Twelve Months¹



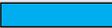
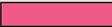
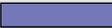
¹ Source: Bureau of Labor Statistics. Data is non-seasonally adjusted CPI, which may be volatile in the short-term. Data is as of December 31, 2019.

US Unemployment¹



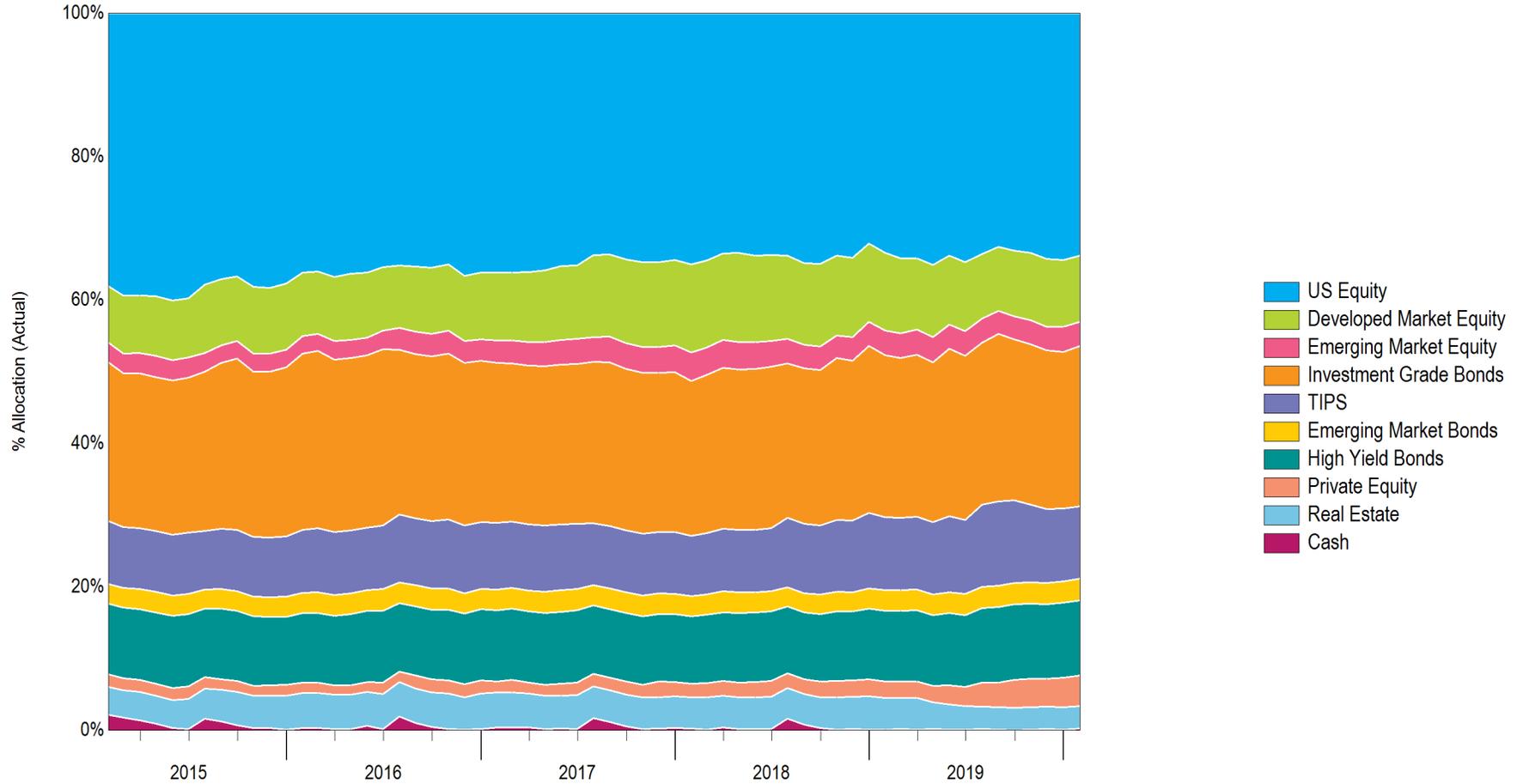
¹ Source: Bureau of Labor Statistics. Data is as of December 31, 2019.

Retirement System Interim Update

| Allocation vs. Targets and Policy | | | | | |
|---|----------------------|--------------------|-------------|--------------|--|
| | Current Balance | Current Allocation | Policy | Policy Range | |
|  US Equity | \$63,041,824 | 34% | 33% | 28% - 38% | |
|  Developed Market Equity | \$17,113,339 | 9% | 9% | 5% - 13% | |
|  Emerging Market Equity | \$6,246,554 | 3% | 3% | 1% - 5% | |
|  Investment Grade Bonds | \$41,689,330 | 22% | 22% | 17% - 27% | |
|  TIPS | \$18,754,431 | 10% | 10% | 7% - 13% | |
|  Emerging Market Bonds | \$5,655,490 | 3% | 3% | 1% - 5% | |
|  High Yield Bonds | \$19,594,862 | 11% | 10% | 7% - 13% | |
|  Private Equity | \$7,902,911 | 4% | 5% | 3% - 7% | |
|  Real Estate | \$5,851,132 | 3% | 5% | 2% - 8% | |
|  Cash | \$471,237 | 0% | 0% | 0% - 5% | |
| Total | \$186,321,111 | 100% | 100% | | |

January Market Values and Returns represent preliminary data from managers.
Cash balance is preliminary.

Asset Allocation History
5 Years Ending January 31, 2020



| Asset Class Performance Summary | | | | | | | | | | |
|--|----------------------|-------------------|-------------|-------------|--------------|--------------|---------------|---------------|------------------|-------------------|
| | Market Value (\$) | % of Portfolio | 1 Mo (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | 20 Yrs (%) | Inception (%) | Inception Date |
| Total Retirement System | 186,321,111 | 100.0 | -0.5 | 11.7 | 7.6 | 6.6 | 7.9 | 6.3 | 7.7 | Jul-88 |
| <i>55% MSCI World & 45% Barclays Aggregate</i> | | | <i>0.5</i> | <i>14.3</i> | <i>8.5</i> | <i>6.5</i> | <i>7.3</i> | <i>5.3</i> | <i>7.1</i> | <i>Jul-88</i> |
| <i>Consumer Price Index</i> | | | <i>0.4</i> | <i>2.5</i> | <i>2.0</i> | <i>2.0</i> | <i>1.8</i> | <i>2.1</i> | <i>2.5</i> | <i>Jul-88</i> |
| Domestic Equity Assets | 63,041,824 | 33.8 | -2.4 | 14.9 | 10.9 | 10.2 | 12.9 | 5.9 | 8.3 | Oct-06 |
| <i>Russell 3000</i> | | | <i>-0.1</i> | <i>20.5</i> | <i>13.8</i> | <i>11.8</i> | <i>13.8</i> | <i>6.6</i> | <i>9.1</i> | <i>Oct-06</i> |
| International Developed Markets Equity Assets | 17,113,339 | 9.2 | -2.1 | 12.4 | 7.9 | 5.3 | 5.0 | -- | 2.9 | Oct-06 |
| <i>MSCI EAFE</i> | | | <i>-2.1</i> | <i>12.1</i> | <i>7.8</i> | <i>5.1</i> | <i>5.8</i> | <i>3.5</i> | <i>3.2</i> | <i>Oct-06</i> |
| International Emerging Markets Equity Assets | 6,246,554 | 3.4 | -4.9 | 6.2 | 8.6 | 5.1 | -- | -- | 5.2 | Jan-15 |
| <i>MSCI Emerging Markets</i> | | | <i>-4.7</i> | <i>3.8</i> | <i>7.9</i> | <i>4.5</i> | <i>3.8</i> | <i>6.4</i> | <i>4.5</i> | <i>Jan-15</i> |
| Investment Grade Bonds Assets | 41,689,330 | 22.4 | 1.9 | 9.7 | 4.7 | 3.0 | 3.8 | 5.1 | 6.2 | Jul-88 |
| <i>BBgBarc US Aggregate TR</i> | | | <i>1.9</i> | <i>9.6</i> | <i>4.6</i> | <i>3.0</i> | <i>3.8</i> | <i>5.1</i> | <i>6.2</i> | <i>Jul-88</i> |
| High Yield Bond Assets | 19,594,862 | 10.5 | -0.1 | 9.7 | 6.1 | 5.7 | 6.9 | -- | 6.9 | Sep-03 |
| <i>BBgBarc US High Yield TR</i> | | | <i>0.0</i> | <i>9.4</i> | <i>5.9</i> | <i>6.0</i> | <i>7.4</i> | <i>7.2</i> | <i>7.8</i> | <i>Sep-03</i> |
| TIPS Assets | 18,754,431 | 10.1 | 2.1 | 9.2 | 3.7 | 2.4 | 3.4 | -- | 3.9 | Oct-05 |
| <i>BBgBarc US TIPS TR</i> | | | <i>2.1</i> | <i>9.2</i> | <i>3.7</i> | <i>2.4</i> | <i>3.4</i> | <i>5.6</i> | <i>3.9</i> | <i>Oct-05</i> |
| Emerging Market Debt Assets | 5,655,490 | 3.0 | 1.4 | 11.8 | 6.6 | 6.3 | -- | -- | 6.2 | Jan-15 |
| <i>JP Morgan EMBI Global Diversified</i> | | | <i>1.5</i> | <i>11.9</i> | <i>6.7</i> | <i>6.4</i> | <i>7.0</i> | <i>9.0</i> | <i>6.4</i> | <i>Jan-15</i> |
| Open-Ended Real Estate | 5,796,523 | 3.1 | 0.0 | 7.3 | 7.9 | 9.7 | 12.3 | 7.2 | 8.1 | Oct-95 |
| <i>NCREIF ODCE</i> | | | <i>0.0</i> | <i>5.3</i> | <i>7.1</i> | <i>9.0</i> | <i>11.4</i> | <i>8.2</i> | <i>9.0</i> | <i>Oct-95</i> |
| Total Closed End Real Estate | 54,609 | 0.0 | | | | | | | | |
| Private Equity Assets | 7,902,911 | 4.2 | | | | | | | | |
| Cash | 471,237 | 0.3 | | | | | | | | |

January Market Values and Returns reflect preliminary data from the managers.

| Trailing Performance | | | | | | | | | | | |
|--|----------------------|-------------------|----------------|-------------|-------------|--------------|--------------|---------------|---------------|------------------|-------------------|
| | Market Value (\$) | % of Portfolio | % of Sector | 1 Mo (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | 20 Yrs (%) | Inception (%) | Inception Date |
| Total Retirement System | 186,321,111 | 100.0 | -- | -0.5 | 11.7 | 7.6 | 6.6 | 7.9 | 6.3 | 7.7 | Jul-88 |
| 55% MSCI World & 45% Barclays Aggregate | | | | 0.5 | 14.3 | 8.5 | 6.5 | 7.3 | 5.3 | 7.1 | Jul-88 |
| Consumer Price Index | | | | 0.4 | 2.5 | 2.0 | 2.0 | 1.8 | 2.1 | 2.5 | Jul-88 |
| Domestic Equity Assets | 63,041,824 | 33.8 | 33.8 | -2.4 | 14.9 | 10.9 | 10.2 | 12.9 | 5.9 | 8.3 | Oct-06 |
| Russell 3000 | | | | -0.1 | 20.5 | 13.8 | 11.8 | 13.8 | 6.6 | 9.1 | Oct-06 |
| RhumbLine S&P 500 Index | 19,607,628 | 10.5 | 31.1 | 0.0 | 21.6 | 14.5 | 12.3 | 13.9 | 6.4 | 6.8 | Mar-99 |
| S&P 500 | | | | 0.0 | 21.7 | 14.5 | 12.4 | 14.0 | 6.3 | 6.7 | Mar-99 |
| Fiduciary Large Cap Equity | 25,187,743 | 13.5 | 40.0 | -3.1 | 12.5 | 10.1 | 9.4 | -- | -- | 11.9 | Sep-12 |
| Russell 3000 | | | | -0.1 | 20.5 | 13.8 | 11.8 | 13.8 | 6.6 | 13.9 | Sep-12 |
| Frontier Capital Appreciation | 18,246,453 | 9.8 | 28.9 | -3.7 | 11.4 | 7.9 | 8.3 | -- | -- | 11.7 | Feb-13 |
| Russell 2500 Growth | | | | 0.1 | 18.7 | 14.3 | 11.2 | 14.5 | 6.7 | 13.1 | Feb-13 |
| International Developed Markets Equity Assets | 17,113,339 | 9.2 | 9.2 | -2.1 | 12.4 | 7.9 | 5.3 | 5.0 | -- | 2.9 | Oct-06 |
| MSCI EAFE | | | | -2.1 | 12.1 | 7.8 | 5.1 | 5.8 | 3.5 | 3.2 | Oct-06 |
| Rhumblin MSCI EAFE Index | 17,113,339 | 9.2 | 100.0 | -2.1 | 12.4 | 7.9 | 5.3 | -- | -- | 3.4 | Aug-14 |
| MSCI EAFE | | | | -2.1 | 12.1 | 7.8 | 5.1 | 5.8 | 3.5 | 3.3 | Aug-14 |
| International Emerging Markets Equity Assets | 6,246,554 | 3.4 | 3.4 | -4.9 | 6.2 | 8.6 | 5.1 | -- | -- | 5.2 | Jan-15 |
| MSCI Emerging Markets | | | | -4.7 | 3.8 | 7.9 | 4.5 | 3.8 | 6.4 | 4.5 | Jan-15 |
| DFA Emerging Markets | 2,920,068 | 1.6 | 46.7 | -6.1 | 0.8 | 5.9 | 3.7 | -- | -- | 3.8 | Jan-15 |
| MSCI Emerging Markets | | | | -4.7 | 3.8 | 7.9 | 4.5 | 3.8 | 6.4 | 4.5 | Jan-15 |
| Driehaus Emerging Market Equity | 3,326,486 | 1.8 | 53.3 | -3.9 | 11.6 | 11.3 | 6.5 | -- | -- | 6.6 | Jan-15 |
| MSCI Emerging Markets | | | | -4.7 | 3.8 | 7.9 | 4.5 | 3.8 | 6.4 | 4.5 | Jan-15 |

| | Market Value (\$) | % of Portfolio | % of Sector | 1 Mo (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | 20 Yrs (%) | Inception (%) | Inception Date |
|--|----------------------|-------------------|----------------|-------------|-------------|--------------|--------------|---------------|---------------|------------------|-------------------|
| Investment Grade Bonds Assets | 41,689,330 | 22.4 | 22.4 | 1.9 | 9.7 | 4.7 | 3.0 | 3.8 | 5.1 | 6.2 | Jul-88 |
| <i>BBgBarc US Aggregate TR</i> | | | | <i>1.9</i> | <i>9.6</i> | <i>4.6</i> | <i>3.0</i> | <i>3.8</i> | <i>5.1</i> | <i>6.2</i> | <i>Jul-88</i> |
| SSgA U.S. Aggregate Bond Index | 41,689,330 | 22.4 | 100.0 | 1.9 | 9.7 | 4.7 | 3.0 | 3.8 | -- | 4.7 | May-01 |
| <i>BBgBarc US Aggregate TR</i> | | | | <i>1.9</i> | <i>9.6</i> | <i>4.6</i> | <i>3.0</i> | <i>3.8</i> | <i>5.1</i> | <i>4.7</i> | <i>May-01</i> |
| High Yield Bond Assets | 19,594,862 | 10.5 | 10.5 | -0.1 | 9.7 | 6.1 | 5.7 | 6.9 | -- | 6.9 | Sep-03 |
| <i>BBgBarc US High Yield TR</i> | | | | <i>0.0</i> | <i>9.4</i> | <i>5.9</i> | <i>6.0</i> | <i>7.4</i> | <i>7.2</i> | <i>7.8</i> | <i>Sep-03</i> |
| Shenkman Capital | 19,594,862 | 10.5 | 100.0 | -0.1 | 9.7 | 6.1 | 5.7 | 6.9 | -- | 6.9 | Apr-06 |
| <i>BBgBarc US High Yield TR</i> | | | | <i>0.0</i> | <i>9.4</i> | <i>5.9</i> | <i>6.0</i> | <i>7.4</i> | <i>7.2</i> | <i>7.4</i> | <i>Apr-06</i> |
| TIPS Assets | 18,754,431 | 10.1 | 10.1 | 2.1 | 9.2 | 3.7 | 2.4 | 3.4 | -- | 3.9 | Oct-05 |
| <i>BBgBarc US TIPS TR</i> | | | | <i>2.1</i> | <i>9.2</i> | <i>3.7</i> | <i>2.4</i> | <i>3.4</i> | <i>5.6</i> | <i>3.9</i> | <i>Oct-05</i> |
| SSgA TIPS Index-NL | 18,754,431 | 10.1 | 100.0 | 2.1 | 9.2 | 3.7 | 2.4 | 3.4 | -- | 3.9 | Oct-05 |
| <i>BBgBarc US TIPS TR</i> | | | | <i>2.1</i> | <i>9.2</i> | <i>3.7</i> | <i>2.4</i> | <i>3.4</i> | <i>5.6</i> | <i>3.9</i> | <i>Oct-05</i> |
| Emerging Market Debt Assets | 5,655,490 | 3.0 | 3.0 | 1.4 | 11.8 | 6.6 | 6.3 | -- | -- | 6.2 | Jan-15 |
| <i>JP Morgan EMBI Global Diversified</i> | | | | <i>1.5</i> | <i>11.9</i> | <i>6.7</i> | <i>6.4</i> | <i>7.0</i> | <i>9.0</i> | <i>6.4</i> | <i>Jan-15</i> |
| Payden Emerging Market Bond | 5,655,490 | 3.0 | 100.0 | 1.4 | 11.8 | 6.6 | 6.3 | -- | -- | 6.2 | Jan-15 |
| <i>JP Morgan EMBI Global Diversified</i> | | | | <i>1.5</i> | <i>11.9</i> | <i>6.7</i> | <i>6.4</i> | <i>7.0</i> | <i>9.0</i> | <i>6.4</i> | <i>Jan-15</i> |
| Open-Ended Real Estate | 5,796,523 | 3.1 | 3.1 | 0.0 | 7.3 | 7.9 | 9.7 | 12.3 | 7.2 | 8.1 | Oct-95 |
| <i>NCREIF ODCE</i> | | | | <i>0.0</i> | <i>5.3</i> | <i>7.1</i> | <i>9.0</i> | <i>11.4</i> | <i>8.2</i> | <i>9.0</i> | <i>Oct-95</i> |
| Clarion Partners | 5,796,523 | 3.1 | 100.0 | 0.0 | 7.3 | 7.9 | 9.7 | 12.3 | -- | 7.3 | Oct-02 |
| <i>NCREIF ODCE</i> | | | | <i>0.0</i> | <i>5.3</i> | <i>7.1</i> | <i>9.0</i> | <i>11.4</i> | <i>8.2</i> | <i>8.1</i> | <i>Oct-02</i> |

| | Market Value (\$) | % of Portfolio | % of Sector | 1 Mo (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | 20 Yrs (%) | Inception (%) | Inception Date |
|--|----------------------|-------------------|----------------|-------------|-------------|--------------|--------------|---------------|---------------|------------------|-------------------|
| Total Closed End Real Estate | 54,609 | 0.0 | 0.0 | | | | | | | | |
| Colony Realty Partners IV | 21,529 | 0.0 | 39.4 | | | | | | | | |
| Rockwood Capital Real Estate Partners Fund XI, L.P. | 33,080 | 0.0 | 60.6 | | | | | | | | |
| Private Equity Assets | 7,902,911 | 4.2 | 4.2 | | | | | | | | |
| North American Strategic Partners 2006 | 623,610 | 0.3 | 7.9 | | | | | | | | |
| Ironsides Partnership Fund IV | 1,574,679 | 0.8 | 19.9 | | | | | | | | |
| Ironsides Direct Investment Fund IV | 3,098,461 | 1.7 | 39.2 | | | | | | | | |
| Ironsides Direct Investment Fund V, L.P. | 2,406,161 | 1.3 | 30.4 | | | | | | | | |
| HarbourVest 2019 Global Fund | 200,000 | 0.1 | 2.5 | | | | | | | | |
| Cash | 471,237 | 0.3 | 0.3 | | | | | | | | |

January Market Values and Returns represent preliminary data from managers.
Cash balance is preliminary.

| | Calendar Year Performance | | | | | | | | | |
|--|---------------------------|--------------|-------------|-------------|--------------|-------------|-------------|-------------|--------------|-------------|
| | 2019 (%) | 2018 (%) | 2017 (%) | 2016 (%) | 2015 (%) | 2014 (%) | 2013 (%) | 2012 (%) | 2011 (%) | 2010 (%) |
| Total Retirement System | 17.6 | -4.4 | 13.1 | 8.7 | -0.2 | 6.3 | 14.0 | 10.9 | 2.4 | 12.3 |
| 55% MSCI World & 45% Barclays Aggregate | 19.1 | -4.6 | 13.6 | 5.5 | 0.0 | 5.5 | 13.0 | 10.7 | 0.7 | 10.0 |
| Consumer Price Index | 2.3 | 1.9 | 2.1 | 2.1 | 0.7 | 0.8 | 1.5 | 1.7 | 3.0 | 1.5 |
| Domestic Equity Assets | 27.9 | -6.7 | 20.3 | 14.6 | -1.6 | 13.1 | 33.1 | 15.3 | 0.0 | 18.8 |
| Russell 3000 | 31.0 | -5.2 | 21.1 | 12.7 | 0.5 | 12.6 | 33.6 | 16.4 | 1.0 | 16.9 |
| RhumbLine S&P 500 Index | 31.4 | -4.4 | 21.8 | 11.9 | 1.4 | 13.6 | 32.2 | 16.0 | 2.1 | 15.0 |
| S&P 500 | 31.5 | -4.4 | 21.8 | 12.0 | 1.4 | 13.7 | 32.4 | 16.0 | 2.1 | 15.1 |
| Fiduciary Large Cap Equity (net) | 23.8 | -3.7 | 19.2 | 13.8 | -2.4 | 12.4 | 30.5 | -- | -- | -- |
| Russell 3000 | 31.0 | -5.2 | 21.1 | 12.7 | 0.5 | 12.6 | 33.6 | 16.4 | 1.0 | 16.9 |
| Frontier Capital Appreciation (net) | 28.9 | -13.9 | 19.1 | 20.5 | -6.5 | 12.4 | -- | -- | -- | -- |
| Russell 2500 Growth | 32.7 | -7.5 | 24.5 | 9.7 | -0.2 | 7.1 | 40.6 | 16.1 | -1.6 | 28.9 |
| International Developed Markets Equity Assets | 22.3 | -13.5 | 24.9 | 1.4 | -0.8 | -8.7 | 21.2 | 15.0 | -14.1 | 10.6 |
| MSCI EAFE | 22.0 | -13.8 | 25.0 | 1.0 | -0.8 | -4.9 | 22.8 | 17.3 | -12.1 | 7.8 |
| Rhumblin MSCI EAFE Index (net) | 22.3 | -13.5 | 24.9 | 1.4 | -0.8 | -- | -- | -- | -- | -- |
| MSCI EAFE | 22.0 | -13.8 | 25.0 | 1.0 | -0.8 | -4.9 | 22.8 | 17.3 | -12.1 | 7.8 |
| International Emerging Markets Equity Assets | 20.7 | -15.4 | 39.7 | 9.4 | -12.7 | -- | -- | -- | -- | -- |
| MSCI Emerging Markets | 18.4 | -14.6 | 37.3 | 11.2 | -14.9 | -2.2 | -2.6 | 18.2 | -18.4 | 18.9 |
| DFA Emerging Markets (net) | 16.0 | -15.2 | 36.6 | 12.4 | -14.9 | -- | -- | -- | -- | -- |
| MSCI Emerging Markets | 18.4 | -14.6 | 37.3 | 11.2 | -14.9 | -2.2 | -2.6 | 18.2 | -18.4 | 18.9 |
| Driehaus Emerging Market Equity (net) | 25.3 | -15.6 | 43.0 | 6.5 | -10.6 | -- | -- | -- | -- | -- |
| MSCI Emerging Markets | 18.4 | -14.6 | 37.3 | 11.2 | -14.9 | -2.2 | -2.6 | 18.2 | -18.4 | 18.9 |

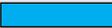
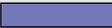
| | 2019 (%) | 2018 (%) | 2017 (%) | 2016 (%) | 2015 (%) | 2014 (%) | 2013 (%) | 2012 (%) | 2011 (%) | 2010 (%) |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Investment Grade Bonds Assets | 8.7 | 0.0 | 3.6 | 2.6 | 0.6 | 6.0 | -2.0 | 4.3 | 7.8 | 6.6 |
| <i>BBgBarc US Aggregate TR</i> | 8.7 | 0.0 | 3.5 | 2.6 | 0.5 | 6.0 | -2.0 | 4.2 | 7.8 | 6.5 |
| SSgA U.S. Aggregate Bond Index | 8.7 | 0.0 | 3.6 | 2.6 | 0.6 | 6.0 | -2.0 | 4.3 | 7.8 | 6.6 |
| <i>BBgBarc US Aggregate TR</i> | 8.7 | 0.0 | 3.5 | 2.6 | 0.5 | 6.0 | -2.0 | 4.2 | 7.8 | 6.5 |
| High Yield Bond Assets | 14.5 | -1.3 | 7.1 | 12.7 | -2.3 | 2.9 | 6.4 | 12.4 | 6.0 | 12.8 |
| <i>BBgBarc US High Yield TR</i> | 14.3 | -2.1 | 7.5 | 17.1 | -4.5 | 2.5 | 7.4 | 15.8 | 5.0 | 15.1 |
| Shenkman Capital | 14.5 | -1.3 | 7.2 | 12.7 | -2.3 | 2.9 | 6.4 | 12.4 | 6.0 | 12.8 |
| <i>BBgBarc US High Yield TR</i> | 14.3 | -2.1 | 7.5 | 17.1 | -4.5 | 2.5 | 7.4 | 15.8 | 5.0 | 15.1 |
| TIPS Assets | 8.4 | -1.3 | 3.0 | 4.7 | -1.4 | 3.6 | -8.6 | 6.9 | 13.5 | 6.3 |
| <i>BBgBarc US TIPS TR</i> | 8.4 | -1.3 | 3.0 | 4.7 | -1.4 | 3.6 | -8.6 | 7.0 | 13.6 | 6.3 |
| SSgA TIPS Index-NL | 8.4 | -1.3 | 3.0 | 4.7 | -1.4 | 3.6 | -8.6 | 6.9 | 13.5 | 6.3 |
| <i>BBgBarc US TIPS TR</i> | 8.4 | -1.3 | 3.0 | 4.7 | -1.4 | 3.6 | -8.6 | 7.0 | 13.6 | 6.3 |
| Emerging Market Debt Assets | 16.5 | -7.0 | 12.0 | 11.5 | -0.8 | -- | -- | -- | -- | -- |
| <i>JP Morgan EMBI Global Diversified</i> | 15.0 | -4.3 | 10.3 | 10.2 | 1.2 | 7.4 | -5.3 | 17.4 | 7.3 | 12.2 |
| Payden Emerging Market Bond (net) | 16.5 | -7.0 | 12.0 | 11.5 | -0.8 | -- | -- | -- | -- | -- |
| <i>JP Morgan EMBI Global Diversified</i> | 15.0 | -4.3 | 10.3 | 10.2 | 1.2 | 7.4 | -5.3 | 17.4 | 7.3 | 12.2 |
| Open-Ended Real Estate | 7.3 | 8.6 | 7.9 | 9.1 | 15.7 | 13.2 | 12.8 | 10.9 | 18.7 | 19.2 |
| <i>NCREIF ODCE</i> | 5.3 | 8.3 | 7.6 | 8.8 | 15.0 | 12.5 | 13.9 | 10.9 | 16.0 | 16.4 |
| Clarion Partners | 7.3 | 8.6 | 7.9 | 9.1 | 15.7 | 13.2 | 12.8 | 10.9 | 18.7 | 19.2 |
| <i>NCREIF ODCE</i> | 5.3 | 8.3 | 7.6 | 8.8 | 15.0 | 12.5 | 13.9 | 10.9 | 16.0 | 16.4 |

| | 2019 (%) | 2018 (%) | 2017 (%) | 2016 (%) | 2015 (%) | 2014 (%) | 2013 (%) | 2012 (%) | 2011 (%) | 2010 (%) |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Total Closed End Real Estate | | | | | | | | | | |
| Colony Realty Partners IV | | | | | | | | | | |
| Rockwood Capital Real Estate Partners Fund XI, L.P. (net) | | | | | | | | | | |
| Private Equity Assets | | | | | | | | | | |
| 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) | | | | | | | | | | |
| HarbourVest 2019 Global Fund (net) | | | | | | | | | | |
| Cash | | | | | | | | | | |

| Annual Investment Expense Analysis | | | | |
|--|---|---------------------|---------------------|---------------|
| As Of January 31, 2020 | | | | |
| Name | Fee Schedule | Market Value | Estimated Fee Value | Estimated Fee |
| Equity Assets | | \$86,401,718 | | |
| Domestic Equity Assets | | \$63,041,824 | | |
| RhumbLine S&P 500 Index | 0.07% of First 25.0 Mil, 0.05% of Next 25.0 Mil, 0.04% Thereafter | \$19,607,628 | \$13,725 | 0.07% |
| Fiduciary Large Cap Equity | 0.66% of Assets | \$25,187,743 | \$166,239 | 0.66% |
| Frontier Capital Appreciation | 0.79% of Assets | \$18,246,453 | \$144,147 | 0.79% |
| International Equity Assets | | \$23,359,893 | | |
| International Developed Markets Equity Assets | | \$17,113,339 | | |
| Rhumblin MSCI EAFE Index | 0.08% of First 25.0 Mil, 0.07% of Next 25.0 Mil, 0.05% Thereafter | \$17,113,339 | \$13,691 | 0.08% |
| International Emerging Markets Equity Assets | | \$6,246,554 | | |
| DFA Emerging Markets | 0.52% of Assets | \$2,920,068 | \$15,184 | 0.52% |
| Driehaus Emerging Market Equity | 0.90% of Assets | \$3,326,486 | \$29,938 | 0.90% |
| Fixed Income Assets | | \$85,694,113 | | |
| Investment Grade Bonds Assets | | \$41,689,330 | | |
| SSgA U.S. Aggregate Bond Index | 0.04% of Assets | \$41,689,330 | \$16,676 | 0.04% |
| High Yield Bond Assets | | \$19,594,862 | | |
| Shenkman Capital | 0.45% of Assets | \$19,594,862 | \$88,177 | 0.45% |
| TIPS Assets | | \$18,754,431 | | |
| SSgA TIPS Index-NL | 0.04% of Assets | \$18,754,431 | \$7,502 | 0.04% |
| Emerging Market Debt Assets | | \$5,655,490 | | |
| Payden Emerging Market Bond | 0.69% of Assets | \$5,655,490 | \$39,023 | 0.69% |

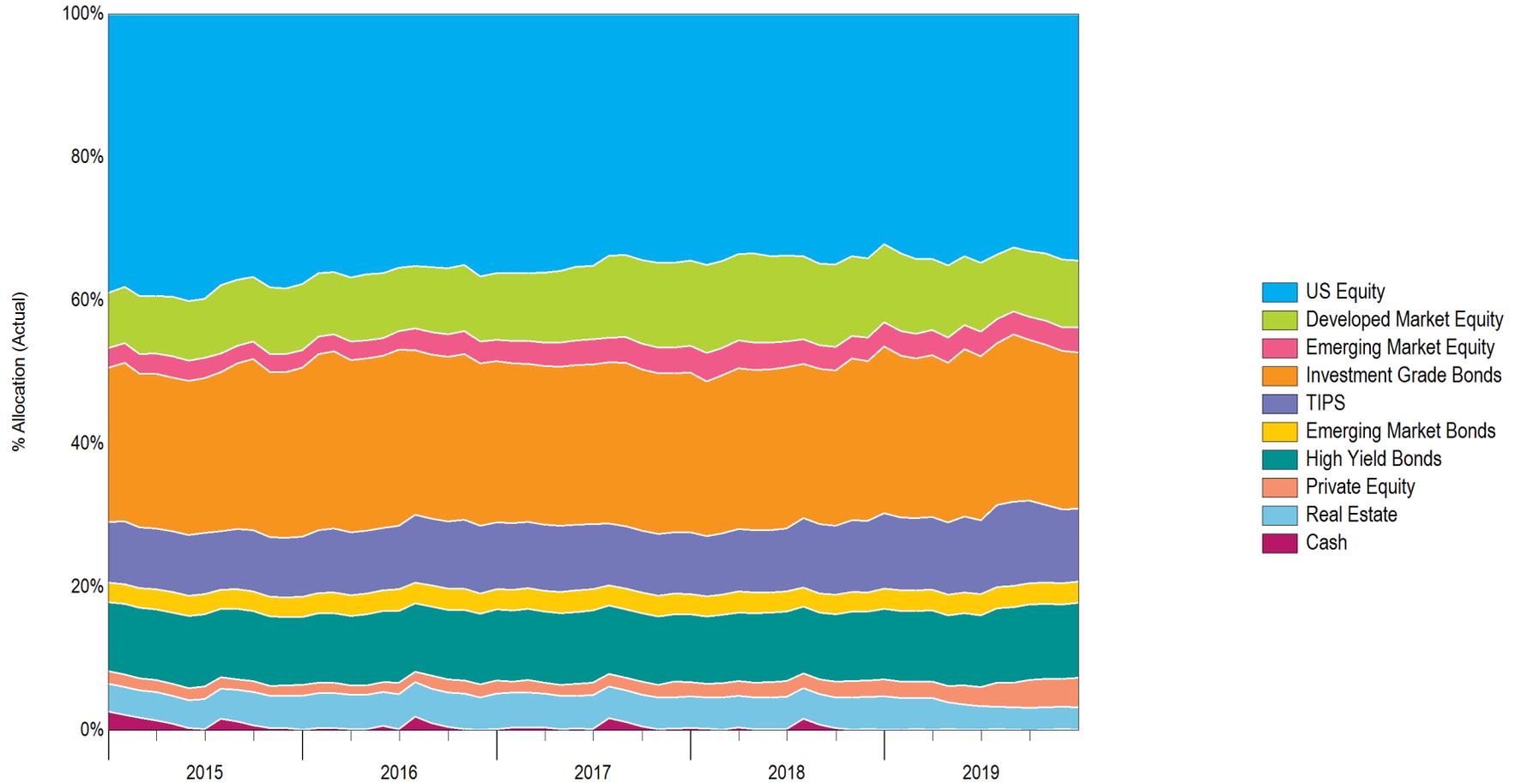
| Name | Fee Schedule | Market Value | Estimated Fee Value | Estimated Fee |
|---|---|----------------------|---------------------|---------------|
| Real Estate Assets | | \$5,851,132 | | |
| Open-Ended Real Estate | | \$5,796,523 | | |
| Clarion Partners | 1.10% of Assets | \$5,796,523 | \$63,762 | 1.10% |
| Total Closed End Real Estate | | \$54,609 | | |
| Colony Realty Partners IV | 1.5% management fee based on committed equity during the investment period and invested equity thereafter | \$21,529 | | |
| Rockwood Capital Real Estate Partners Fund XI, L.P. | 1.4% of committed capital during investment period; 1.4% on invested equity thereafter | \$33,080 | | |
| Private Equity Assets | | \$7,902,911 | | |
| North American Strategic Partners 2006 | 0.8% on drawn and undrawn capital less investments sold or written off 5% carried interest, 8% preferred return | \$623,610 | | |
| Ironsides Partnership Fund IV | 0% Management fee, 8% Preferred Return, 5% Carried Interest | \$1,574,679 | | |
| Ironsides Direct Investment Fund IV | 0.5% Management fee, 8% Preferred Return, 15% Carried Interest | \$3,098,461 | | |
| Ironsides Direct Investment Fund V, L.P. | 0.5% Management fee, 8% preferred return, 15% carried interest | \$2,406,161 | | |
| HarbourVest 2019 Global Fund | 0.69% average annual management fee; 8.0% preferred return on secondary and direct investments and with corresponding carried interest of 12.5% on secondary and direct investments | \$200,000 | | |
| Cash | | \$471,237 | | |
| Comerica Short Term Fund | | \$471,237 | | |
| Total | | \$186,321,111 | \$598,064 | 0.32% |

Retirement System Summary

| Allocation vs. Targets and Policy | | | | | |
|---|----------------------|--------------------|-------------|--------------|--|
| | Current Balance | Current Allocation | Policy | Policy Range | |
|  US Equity | \$64,573,826 | 34% | 33% | 28% - 38% | |
|  Developed Market Equity | \$17,481,489 | 9% | 9% | 5% - 13% | |
|  Emerging Market Equity | \$6,571,809 | 4% | 3% | 1% - 5% | |
|  Investment Grade Bonds | \$40,897,935 | 22% | 22% | 17% - 27% | |
|  TIPS | \$19,158,842 | 10% | 10% | 7% - 13% | |
|  Emerging Market Bonds | \$5,580,081 | 3% | 3% | 1% - 5% | |
|  High Yield Bonds | \$19,629,557 | 10% | 10% | 7% - 13% | |
|  Private Equity | \$7,631,210 | 4% | 5% | 3% - 7% | |
|  Real Estate | \$5,851,132 | 3% | 5% | 2% - 8% | |
|  Cash | \$249,681 | 0% | 0% | 0% - 5% | |
| Total | \$187,625,561 | 100% | 100% | | |

Market Values are preliminary.

Asset Allocation History
5 Years Ending December 31, 2019



| | Actual Asset Allocation (%) | Target Allocation (%) | Target Range (%) | PRIT Asset Allocation ¹ (%) |
|----------------------------------|-----------------------------|-----------------------|------------------|--|
| Total Retirement System | NA | NA | NA | NA |
| Equity Assets | 47 | 45 | 37-53 | 39 |
| Domestic Equity Assets | 34 | 33 | 28-38 | 17 |
| International Equity Assets | 13 | 12 | 9-15 | 22 |
| Fixed Income Assets | 45 | 45 | 32-58 | 21 |
| Domestic Investment Grade Assets | 22 | 22 | 17-27 | 15 |
| High Yield Bond Assets | 10 | 10 | 7-13 | 6 |
| TIPS | 10 | 10 | 7-13 | - |
| Emerging Market Debt | 3 | 3 | 1-5 | - |
| Portfolio Completion Strategies | NA | NA | NA | 16 |
| Real Estate Assets | 3 | 5 | 2-8 | 9 |
| Private Equity | 4 | 5 | 3-7 | 12 |
| Timber/Natural Resources | NA | NA | NA | 4 |
| Cash | <1 | <1 | 0-5 | <1 |

¹ PRIT asset allocation as of December 31, 2019. TIPS and Emerging Market Debt are reflected in PRIT's Core and Value-Added Fixed Income Sleeves, respectively.

| Asset Class Performance Summary | | | | | | | | | | |
|--|----------------------|-------------------|-------------|-------------|--------------|--------------|---------------|---------------|------------------|-------------------|
| | Market Value (\$) | % of Portfolio | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | 20 Yrs (%) | Inception (%) | Inception Date |
| Total Retirement System (net) | 187,625,561 | 100.0 | 4.4 | 17.5 | 8.2 | 6.6 | 7.8 | 6.2 | 7.7 | Jul-88 |
| 55% MSCI World & 45% Barclays Aggregate | | | 4.7 | 19.1 | 8.8 | 6.3 | 7.1 | 5.1 | 7.1 | Jul-88 |
| Consumer Price Index | | | 0.1 | 2.3 | 2.1 | 1.8 | 1.8 | 2.1 | 2.5 | Jul-88 |
| PRIT Core Fund (net) | | | 4.6 | 16.5 | 10.1 | 7.7 | 8.6 | 6.2 | 8.6 | Jul-88 |
| InvMetrics Public DB \$50mm-\$250mm Net Median | | | 5.3 | 19.1 | 9.2 | 6.8 | 7.9 | 5.9 | 8.4 | Jul-88 |
| InvMetrics Public DB \$50mm-\$250mm Net Rank | | | 92 | 77 | 84 | 68 | 59 | 31 | 69 | Jul-88 |
| Domestic Equity Assets (net) | 64,573,826 | 34.4 | 8.0 | 27.6 | 12.6 | 10.0 | 12.7 | 5.7 | 8.5 | Oct-06 |
| Russell 3000 | | | 9.1 | 31.0 | 14.6 | 11.2 | 13.4 | 6.4 | 9.2 | Oct-06 |
| PRIT Domestic Equity | | | 8.3 | 30.1 | 14.2 | 11.0 | 13.2 | 6.0 | 8.0 | Oct-06 |
| International Developed Markets Equity Assets (net) | 17,481,489 | 9.3 | 8.1 | 22.3 | 9.7 | 5.8 | 4.8 | -- | 3.1 | Oct-06 |
| MSCI EAFE | | | 8.2 | 22.0 | 9.6 | 5.7 | 5.5 | 3.3 | 3.4 | Oct-06 |
| International Emerging Markets Equity Assets (net) | 6,571,809 | 3.5 | 10.9 | 20.7 | 12.6 | 6.4 | -- | -- | 6.4 | Jan-15 |
| MSCI Emerging Markets | | | 11.8 | 18.4 | 11.6 | 5.6 | 3.7 | 6.7 | 5.6 | Jan-15 |
| Investment Grade Bonds Assets (net) | 40,897,935 | 21.8 | 0.2 | 8.7 | 4.0 | 3.1 | 3.8 | 5.0 | 6.1 | Jul-88 |
| BBgBarc US Aggregate TR | | | 0.2 | 8.7 | 4.0 | 3.0 | 3.7 | 5.0 | 6.2 | Jul-88 |
| PRIT Core Fixed Income | | | -1.2 | 11.2 | 5.1 | 3.4 | 5.0 | 5.5 | 6.9 | Jul-88 |
| High Yield Bond Assets (net) | 19,629,557 | 10.5 | 2.3 | 14.0 | 6.1 | 5.6 | 6.8 | -- | 6.8 | Sep-03 |
| BBgBarc US High Yield TR | | | 2.6 | 14.3 | 6.4 | 6.1 | 7.6 | 7.1 | 7.8 | Sep-03 |
| PRIT Public Value-Added Fixed Income | | | 2.2 | 10.7 | 5.4 | 4.3 | 5.1 | -- | 6.4 | Sep-03 |
| TIPS Assets (net) | 19,158,842 | 10.2 | 0.8 | 8.4 | 3.3 | 2.6 | 3.3 | -- | 3.8 | Oct-05 |
| BBgBarc US TIPS TR | | | 0.8 | 8.4 | 3.3 | 2.6 | 3.4 | 5.5 | 3.8 | Oct-05 |

| | Market Value (\$) | % of Portfolio | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | 20 Yrs (%) | Inception (%) | Inception Date |
|---|----------------------|-------------------|------------|-------------|--------------|--------------|---------------|---------------|------------------|-------------------|
| Emerging Market Debt Assets (net) | 5,580,081 | 3.0 | 3.0 | 16.5 | 6.7 | 6.1 | -- | -- | 6.1 | Jan-15 |
| <i>JP Morgan EMBI Global Diversified</i> | | | <i>1.8</i> | <i>15.0</i> | <i>6.7</i> | <i>6.2</i> | <i>6.9</i> | <i>8.9</i> | <i>6.2</i> | <i>Jan-15</i> |
| Open-Ended Real Estate (net) | 5,796,523 | 3.1 | 2.0 | 7.3 | 7.9 | 9.7 | 12.3 | 7.2 | 8.2 | Oct-95 |
| <i>NCREIF ODCE</i> | | | <i>1.5</i> | <i>5.3</i> | <i>7.1</i> | <i>9.0</i> | <i>11.4</i> | <i>8.2</i> | <i>9.0</i> | <i>Oct-95</i> |
| Total Closed End Real Estate (net) | 54,609 | 0.0 | | | | | | | | |
| Private Equity Assets (net) | 7,631,210 | 4.1 | | | | | | | | |
| Cash (net) | 249,681 | 0.1 | | | | | | | | |

Cash Balance is preliminary.

| Trailing Performance | | | | | | | | | | | |
|--|----------------------|-------------------|----------------|------------|-------------|--------------|--------------|---------------|---------------|------------------|-------------------|
| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | 20 Yrs (%) | Inception (%) | Inception Date |
| Total Retirement System | 187,625,561 | 100.0 | -- | 4.4 | 17.6 | 8.3 | 6.7 | 7.9 | 6.2 | 7.7 | Jul-88 |
| <i>55% MSCI World & 45% Barclays Aggregate</i> | | | | 4.7 | 19.1 | 8.8 | 6.3 | 7.1 | 5.1 | 7.1 | Jul-88 |
| <i>Consumer Price Index</i> | | | | 0.1 | 2.3 | 2.1 | 1.8 | 1.8 | 2.1 | 2.5 | Jul-88 |
| <i>PRIT Core Fund (net)</i> | | | | 4.6 | 16.6 | 10.5 | 8.0 | 9.0 | 6.6 | 8.9 | Jul-88 |
| Domestic Equity Assets | 64,573,826 | 34.4 | 34.4 | 8.0 | 27.9 | 12.8 | 10.1 | 12.8 | 5.7 | 8.6 | Oct-06 |
| <i>Russell 3000</i> | | | | 9.1 | 31.0 | 14.6 | 11.2 | 13.4 | 6.4 | 9.2 | Oct-06 |
| <i>PRIT Domestic Equity</i> | | | | 8.3 | 30.2 | 14.3 | 11.1 | 13.3 | 6.2 | 8.2 | Oct-06 |
| RhumbLine S&P 500 Index | 19,614,469 | 10.5 | 30.4 | 9.0 | 31.4 | 15.2 | 11.7 | 13.5 | 6.1 | 6.8 | Mar-99 |
| <i>S&P 500</i> | | | | 9.1 | 31.5 | 15.3 | 11.7 | 13.6 | 6.1 | 6.7 | Mar-99 |
| Fiduciary Large Cap Equity | 26,005,351 | 13.9 | 40.3 | 5.8 | 23.8 | 12.4 | 9.6 | -- | -- | 12.5 | Sep-12 |
| <i>Russell 3000</i> | | | | 9.1 | 31.0 | 14.6 | 11.2 | 13.4 | 6.4 | 14.1 | Sep-12 |
| Frontier Capital Appreciation | 18,954,006 | 10.1 | 29.4 | 10.1 | 29.9 | 10.4 | 8.7 | -- | -- | 12.4 | Feb-13 |
| <i>Russell 2500 Growth</i> | | | | 10.6 | 32.7 | 15.2 | 10.8 | 14.0 | 6.7 | 13.2 | Feb-13 |
| International Developed Markets Equity Assets | 17,481,489 | 9.3 | 9.3 | 8.1 | 22.3 | 9.7 | 5.8 | 4.8 | -- | 3.1 | Oct-06 |
| <i>MSCI EAFE</i> | | | | 8.2 | 22.0 | 9.6 | 5.7 | 5.5 | 3.3 | 3.4 | Oct-06 |
| Rhumblin MSCI EAFE Index | 17,481,489 | 9.3 | 100.0 | 8.1 | 22.3 | 9.7 | 5.8 | -- | -- | 3.9 | Aug-14 |
| <i>MSCI EAFE</i> | | | | 8.2 | 22.0 | 9.6 | 5.7 | 5.5 | 3.3 | 3.7 | Aug-14 |

Total Retirement System | As of December 31, 2019

| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | 20 Yrs (%) | Inception (%) | Inception Date |
|---|----------------------|-------------------|----------------|-------------|-------------|--------------|--------------|---------------|---------------|------------------|-------------------|
| International Emerging Markets Equity Assets | 6,571,809 | 3.5 | 3.5 | 10.9 | 20.7 | 12.6 | 6.4 | -- | -- | 6.4 | Jan-15 |
| <i>MSCI Emerging Markets</i> | | | | 11.8 | 18.4 | 11.6 | 5.6 | 3.7 | 6.7 | 5.6 | Jan-15 |
| DFA Emerging Markets | 3,108,552 | 1.7 | 47.3 | 10.6 | 16.0 | 10.3 | 5.1 | -- | -- | 5.1 | Jan-15 |
| <i>MSCI Emerging Markets</i> | | | | 11.8 | 18.4 | 11.6 | 5.6 | 3.7 | 6.7 | 5.6 | Jan-15 |
| Driehaus Emerging Market Equity | 3,463,257 | 1.8 | 52.7 | 11.3 | 25.3 | 14.8 | 7.6 | -- | -- | 7.6 | Jan-15 |
| <i>MSCI Emerging Markets</i> | | | | 11.8 | 18.4 | 11.6 | 5.6 | 3.7 | 6.7 | 5.6 | Jan-15 |
| Investment Grade Bonds Assets | 40,897,935 | 21.8 | 21.8 | 0.2 | 8.7 | 4.1 | 3.1 | 3.8 | 5.0 | 6.1 | Jul-88 |
| <i>BBgBarc US Aggregate TR</i> | | | | 0.2 | 8.7 | 4.0 | 3.0 | 3.7 | 5.0 | 6.2 | Jul-88 |
| <i>PRIT Core Fixed Income</i> | | | | -1.2 | 11.3 | 5.2 | 3.5 | 5.1 | 5.7 | 7.0 | Jul-88 |
| SSgA U.S. Aggregate Bond Index | 40,897,935 | 21.8 | 100.0 | 0.2 | 8.7 | 4.1 | 3.1 | 3.8 | -- | 4.7 | May-01 |
| <i>BBgBarc US Aggregate TR</i> | | | | 0.2 | 8.7 | 4.0 | 3.0 | 3.7 | 5.0 | 4.6 | May-01 |
| High Yield Bond Assets | 19,629,557 | 10.5 | 10.5 | 2.4 | 14.5 | 6.6 | 5.9 | 7.0 | -- | 6.9 | Sep-03 |
| <i>BBgBarc US High Yield TR</i> | | | | 2.6 | 14.3 | 6.4 | 6.1 | 7.6 | 7.1 | 7.8 | Sep-03 |
| <i>PRIT Public Value-Added Fixed Income</i> | | | | 2.3 | 11.2 | 5.9 | 4.8 | 5.5 | -- | 6.8 | Sep-03 |
| Shenkman Capital | 19,629,557 | 10.5 | 100.0 | 2.4 | 14.5 | 6.6 | 5.9 | 7.0 | -- | 6.9 | Apr-06 |
| <i>BBgBarc US High Yield TR</i> | | | | 2.6 | 14.3 | 6.4 | 6.1 | 7.6 | 7.1 | 7.4 | Apr-06 |
| TIPS Assets | 19,158,842 | 10.2 | 10.2 | 0.8 | 8.4 | 3.3 | 2.6 | 3.3 | -- | 3.8 | Oct-05 |
| <i>BBgBarc US TIPS TR</i> | | | | 0.8 | 8.4 | 3.3 | 2.6 | 3.4 | 5.5 | 3.8 | Oct-05 |
| SSgA TIPS Index-NL | 19,158,842 | 10.2 | 100.0 | 0.8 | 8.4 | 3.3 | 2.6 | 3.3 | -- | 3.8 | Oct-05 |
| <i>BBgBarc US TIPS TR</i> | | | | 0.8 | 8.4 | 3.3 | 2.6 | 3.4 | 5.5 | 3.8 | Oct-05 |

| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | 20 Yrs (%) | Inception (%) | Inception Date |
|--|----------------------|-------------------|----------------|------------|-------------|--------------|--------------|---------------|---------------|------------------|-------------------|
| Emerging Market Debt Assets | 5,580,081 | 3.0 | 3.0 | 3.0 | 16.5 | 6.7 | 6.1 | -- | -- | 6.1 | Jan-15 |
| <i>JP Morgan EMBI Global Diversified</i> | | | | <i>1.8</i> | <i>15.0</i> | <i>6.7</i> | <i>6.2</i> | <i>6.9</i> | <i>8.9</i> | <i>6.2</i> | <i>Jan-15</i> |
| Payden Emerging Market Bond | 5,580,081 | 3.0 | 100.0 | 3.0 | 16.5 | 6.7 | 6.1 | -- | -- | 6.1 | Jan-15 |
| <i>JP Morgan EMBI Global Diversified</i> | | | | <i>1.8</i> | <i>15.0</i> | <i>6.7</i> | <i>6.2</i> | <i>6.9</i> | <i>8.9</i> | <i>6.2</i> | <i>Jan-15</i> |
| Open-Ended Real Estate | 5,796,523 | 3.1 | 3.1 | 2.0 | 7.3 | 7.9 | 9.7 | 12.3 | 7.2 | 8.2 | Oct-95 |
| <i>NCREIF ODCE</i> | | | | <i>1.5</i> | <i>5.3</i> | <i>7.1</i> | <i>9.0</i> | <i>11.4</i> | <i>8.2</i> | <i>9.0</i> | <i>Oct-95</i> |
| Clarion Partners | 5,796,523 | 3.1 | 100.0 | 2.0 | 7.3 | 7.9 | 9.7 | 12.3 | -- | 7.4 | Oct-02 |
| <i>NCREIF ODCE</i> | | | | <i>1.5</i> | <i>5.3</i> | <i>7.1</i> | <i>9.0</i> | <i>11.4</i> | <i>8.2</i> | <i>8.1</i> | <i>Oct-02</i> |
| Total Closed End Real Estate | 54,609 | 0.0 | 0.0 | | | | | | | | |
| Colony Realty Partners IV | 21,529 | 0.0 | 39.4 | | | | | | | | |
| Rockwood Capital Real Estate Partners Fund XI, L.P. | 33,080 | 0.0 | 60.6 | | | | | | | | |

Colony market value is as of September 30, 2019 and adjusted for subsequent flows

| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | 20 Yrs (%) | Inception (%) | Inception Date |
|--|----------------------|-------------------|----------------|------------|-------------|--------------|--------------|---------------|---------------|------------------|-------------------|
| Private Equity Assets | 7,631,210 | 4.1 | 4.1 | | | | | | | | |
| North American Strategic Partners 2006 | 623,610 | 0.3 | 8.2 | | | | | | | | |
| Ironsides Partnership Fund IV | 1,574,679 | 0.8 | 20.6 | | | | | | | | |
| Ironsides Direct Investment Fund IV | 3,098,461 | 1.7 | 40.6 | | | | | | | | |
| Ironsides Direct Investment Fund V, L.P. | 2,134,461 | 1.1 | 28.0 | | | | | | | | |
| HarbourVest 2019 Global Fund | 200,000 | 0.1 | 2.6 | | | | | | | | |
| Cash | 249,681 | 0.1 | 0.1 | | | | | | | | |

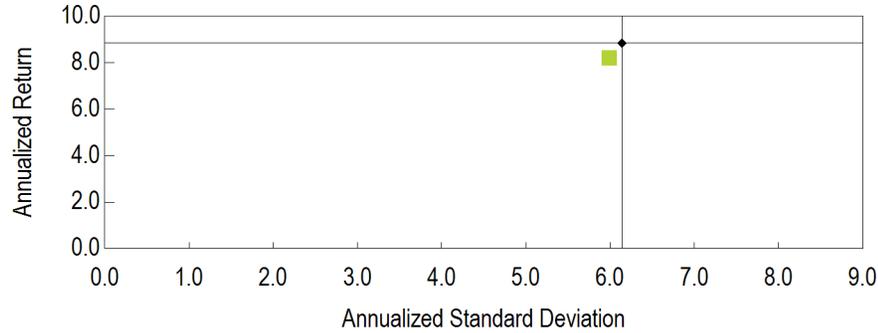
Private Equity market values are as of September 30, 2019 and adjusted for subsequent flows

| | Calendar Year Performance | | | | | | | | | |
|--|---------------------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|
| | 2019 (%) | 2018 (%) | 2017 (%) | 2016 (%) | 2015 (%) | 2014 (%) | 2013 (%) | 2012 (%) | 2011 (%) | 2010 (%) |
| Total Retirement System | 17.6 | -4.4 | 13.1 | 8.7 | -0.2 | 6.3 | 14.0 | 10.9 | 2.4 | 12.3 |
| <i>55% MSCI World & 45% Barclays Aggregate</i> | 19.1 | -4.6 | 13.6 | 5.5 | 0.0 | 5.5 | 13.0 | 10.7 | 0.7 | 10.0 |
| <i>Consumer Price Index</i> | 2.3 | 1.9 | 2.1 | 2.1 | 0.7 | 0.8 | 1.5 | 1.7 | 3.0 | 1.5 |
| <i>PRIT Core Fund (net)</i> | 16.6 | -1.8 | 17.7 | 8.0 | 1.1 | 8.1 | 15.2 | 13.9 | 0.1 | 13.6 |
| Domestic Equity Assets | 27.9 | -6.7 | 20.3 | 14.6 | -1.6 | 13.1 | 33.1 | 15.3 | 0.0 | 18.8 |
| <i>Russell 3000</i> | 31.0 | -5.2 | 21.1 | 12.7 | 0.5 | 12.6 | 33.6 | 16.4 | 1.0 | 16.9 |
| <i>PRIT Domestic Equity</i> | 30.2 | -5.1 | 20.8 | 12.9 | 0.3 | 11.7 | 33.7 | 16.9 | 1.1 | 16.8 |
| RhumbLine S&P 500 Index | 31.4 | -4.4 | 21.8 | 11.9 | 1.4 | 13.6 | 32.2 | 16.0 | 2.1 | 15.0 |
| <i>S&P 500</i> | 31.5 | -4.4 | 21.8 | 12.0 | 1.4 | 13.7 | 32.4 | 16.0 | 2.1 | 15.1 |
| Fiduciary Large Cap Equity (net) | 23.8 | -3.7 | 19.2 | 13.8 | -2.4 | 12.4 | 30.5 | -- | -- | -- |
| <i>Russell 3000</i> | 31.0 | -5.2 | 21.1 | 12.7 | 0.5 | 12.6 | 33.6 | 16.4 | 1.0 | 16.9 |
| Frontier Capital Appreciation (net) | 28.9 | -13.9 | 19.1 | 20.5 | -6.5 | 12.4 | -- | -- | -- | -- |
| <i>Russell 2500 Growth</i> | 32.7 | -7.5 | 24.5 | 9.7 | -0.2 | 7.1 | 40.6 | 16.1 | -1.6 | 28.9 |
| International Developed Markets Equity Assets | 22.3 | -13.5 | 24.9 | 1.4 | -0.8 | -8.7 | 21.2 | 15.0 | -14.1 | 10.6 |
| <i>MSCI EAFE</i> | 22.0 | -13.8 | 25.0 | 1.0 | -0.8 | -4.9 | 22.8 | 17.3 | -12.1 | 7.8 |
| Rhumblin MSCI EAFE Index (net) | 22.3 | -13.5 | 24.9 | 1.4 | -0.8 | -- | -- | -- | -- | -- |
| <i>MSCI EAFE</i> | 22.0 | -13.8 | 25.0 | 1.0 | -0.8 | -4.9 | 22.8 | 17.3 | -12.1 | 7.8 |

| | 2019 (%) | 2018 (%) | 2017 (%) | 2016 (%) | 2015 (%) | 2014 (%) | 2013 (%) | 2012 (%) | 2011 (%) | 2010 (%) |
|---|-------------|--------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|
| International Emerging Markets Equity Assets | 20.7 | -15.4 | 39.7 | 9.4 | -12.7 | -- | -- | -- | -- | -- |
| <i>MSCI Emerging Markets</i> | 18.4 | -14.6 | 37.3 | 11.2 | -14.9 | -2.2 | -2.6 | 18.2 | -18.4 | 18.9 |
| DFA Emerging Markets (net) | 16.0 | -15.2 | 36.6 | 12.4 | -14.9 | -- | -- | -- | -- | -- |
| <i>MSCI Emerging Markets</i> | 18.4 | -14.6 | 37.3 | 11.2 | -14.9 | -2.2 | -2.6 | 18.2 | -18.4 | 18.9 |
| Driehaus Emerging Market Equity (net) | 25.3 | -15.6 | 43.0 | 6.5 | -10.6 | -- | -- | -- | -- | -- |
| <i>MSCI Emerging Markets</i> | 18.4 | -14.6 | 37.3 | 11.2 | -14.9 | -2.2 | -2.6 | 18.2 | -18.4 | 18.9 |
| Investment Grade Bonds Assets | 8.7 | 0.0 | 3.6 | 2.6 | 0.6 | 6.0 | -2.0 | 4.3 | 7.8 | 6.6 |
| <i>BBgBarc US Aggregate TR</i> | 8.7 | 0.0 | 3.5 | 2.6 | 0.5 | 6.0 | -2.0 | 4.2 | 7.8 | 6.5 |
| <i>PRIT Core Fixed Income</i> | 11.3 | -0.8 | 5.4 | 4.0 | -2.0 | 15.2 | -2.8 | 6.4 | 8.1 | 7.5 |
| SSgA U.S. Aggregate Bond Index | 8.7 | 0.0 | 3.6 | 2.6 | 0.6 | 6.0 | -2.0 | 4.3 | 7.8 | 6.6 |
| <i>BBgBarc US Aggregate TR</i> | 8.7 | 0.0 | 3.5 | 2.6 | 0.5 | 6.0 | -2.0 | 4.2 | 7.8 | 6.5 |
| High Yield Bond Assets | 14.5 | -1.3 | 7.1 | 12.7 | -2.3 | 2.9 | 6.4 | 12.4 | 6.0 | 12.8 |
| <i>BBgBarc US High Yield TR</i> | 14.3 | -2.1 | 7.5 | 17.1 | -4.5 | 2.5 | 7.4 | 15.8 | 5.0 | 15.1 |
| <i>PRIT Public Value-Added Fixed Income</i> | 11.2 | -2.1 | 9.0 | 11.7 | -4.7 | -0.2 | -1.5 | 14.7 | 5.3 | 13.6 |
| Shenkman Capital | 14.5 | -1.3 | 7.2 | 12.7 | -2.3 | 2.9 | 6.4 | 12.4 | 6.0 | 12.8 |
| <i>BBgBarc US High Yield TR</i> | 14.3 | -2.1 | 7.5 | 17.1 | -4.5 | 2.5 | 7.4 | 15.8 | 5.0 | 15.1 |
| TIPS Assets | 8.4 | -1.3 | 3.0 | 4.7 | -1.4 | 3.6 | -8.6 | 6.9 | 13.5 | 6.3 |
| <i>BBgBarc US TIPS TR</i> | 8.4 | -1.3 | 3.0 | 4.7 | -1.4 | 3.6 | -8.6 | 7.0 | 13.6 | 6.3 |
| SSgA TIPS Index-NL | 8.4 | -1.3 | 3.0 | 4.7 | -1.4 | 3.6 | -8.6 | 6.9 | 13.5 | 6.3 |
| <i>BBgBarc US TIPS TR</i> | 8.4 | -1.3 | 3.0 | 4.7 | -1.4 | 3.6 | -8.6 | 7.0 | 13.6 | 6.3 |

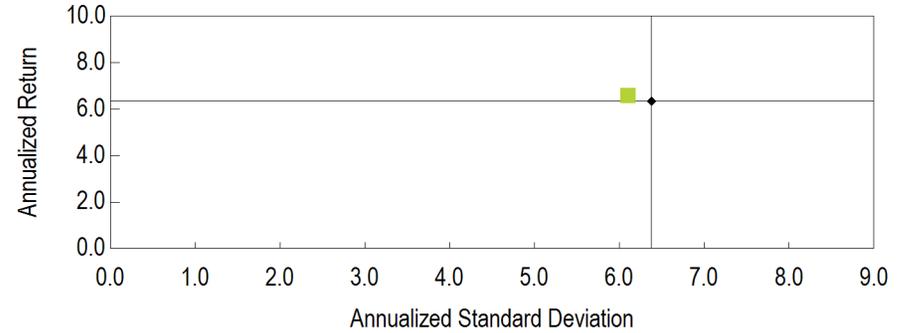
| | 2019 (%) | 2018 (%) | 2017 (%) | 2016 (%) | 2015 (%) | 2014 (%) | 2013 (%) | 2012 (%) | 2011 (%) | 2010 (%) |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Emerging Market Debt Assets | 16.5 | -7.0 | 12.0 | 11.5 | -0.8 | -- | -- | -- | -- | -- |
| <i>JP Morgan EMBI Global Diversified</i> | 15.0 | -4.3 | 10.3 | 10.2 | 1.2 | 7.4 | -5.3 | 17.4 | 7.3 | 12.2 |
| Payden Emerging Market Bond (net) | 16.5 | -7.0 | 12.0 | 11.5 | -0.8 | -- | -- | -- | -- | -- |
| <i>JP Morgan EMBI Global Diversified</i> | 15.0 | -4.3 | 10.3 | 10.2 | 1.2 | 7.4 | -5.3 | 17.4 | 7.3 | 12.2 |
| Open-Ended Real Estate | 7.3 | 8.6 | 7.9 | 9.1 | 15.7 | 13.2 | 12.8 | 10.9 | 18.7 | 19.2 |
| <i>NCREIF ODCE</i> | 5.3 | 8.3 | 7.6 | 8.8 | 15.0 | 12.5 | 13.9 | 10.9 | 16.0 | 16.4 |
| Clarion Partners | 7.3 | 8.6 | 7.9 | 9.1 | 15.7 | 13.2 | 12.8 | 10.9 | 18.7 | 19.2 |
| <i>NCREIF ODCE</i> | 5.3 | 8.3 | 7.6 | 8.8 | 15.0 | 12.5 | 13.9 | 10.9 | 16.0 | 16.4 |
| Total Closed End Real Estate | | | | | | | | | | |
| Colony Realty Partners IV | | | | | | | | | | |
| Rockwood Capital Real Estate Partners Fund XI, L.P. (net) | | | | | | | | | | |
| Private Equity Assets | | | | | | | | | | |
| North American Strategic Partners 2006 (net) | | | | | | | | | | |
| Ironsidess Partnership Fund IV (net) | | | | | | | | | | |
| Ironsidess Direct Investment Fund IV (net) | | | | | | | | | | |
| Ironsidess Direct Investment Fund V, L.P. (net) | | | | | | | | | | |
| HarbourVest 2019 Global Fund (net) | | | | | | | | | | |
| Cash | | | | | | | | | | |

**Annualized Return vs. Annualized Standard Deviation
3 Years Ending December 31, 2019**



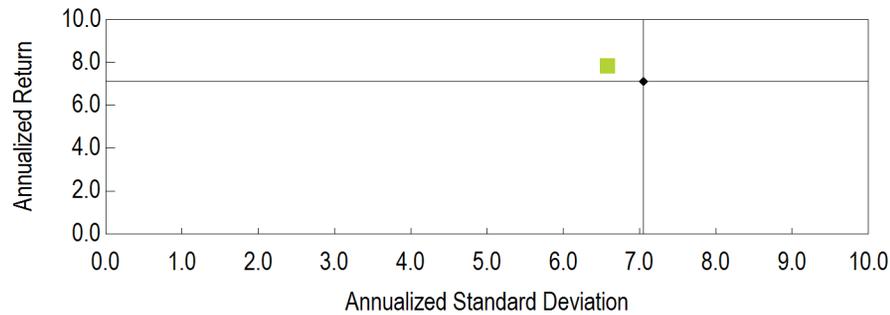
- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate

**Annualized Return vs. Annualized Standard Deviation
5 Years Ending December 31, 2019**



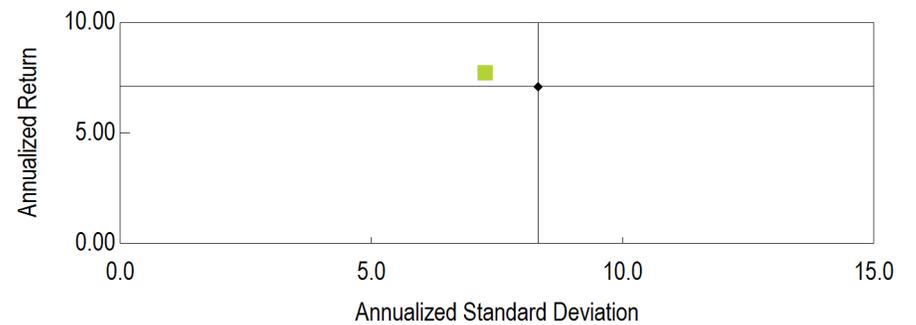
- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate

**Annualized Return vs. Annualized Standard Deviation
10 Years Ending December 31, 2019**



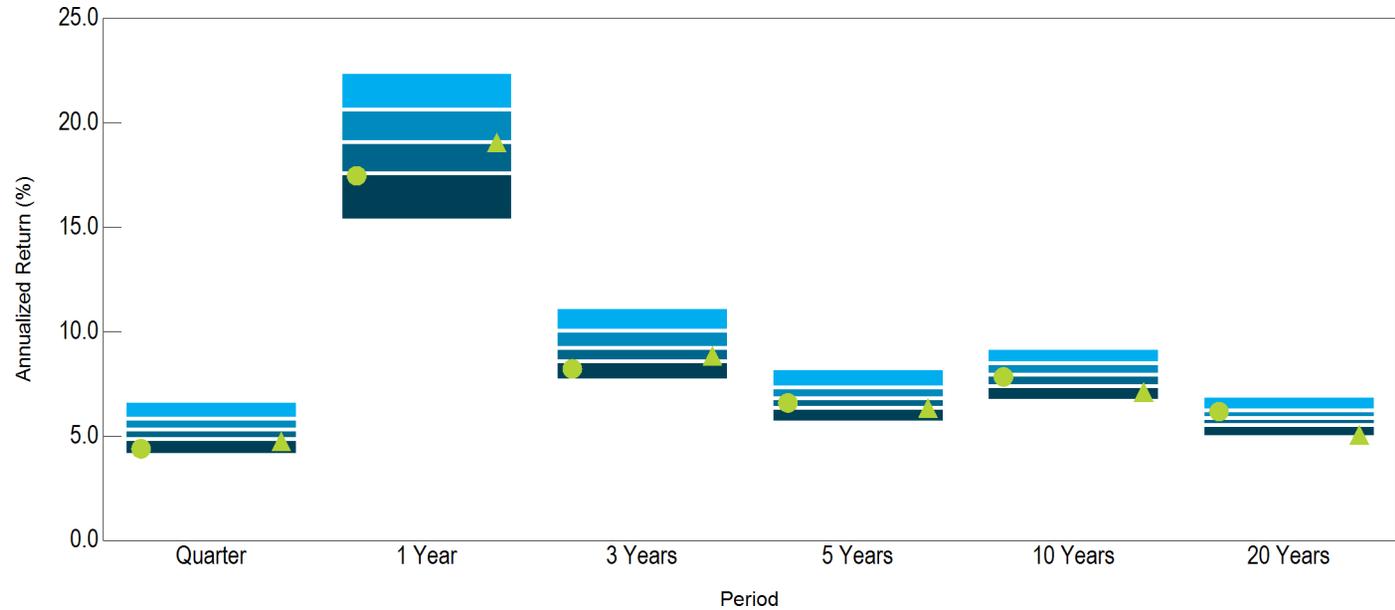
- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate

**Annualized Return vs. Annualized Standard Deviation
Since Inception**



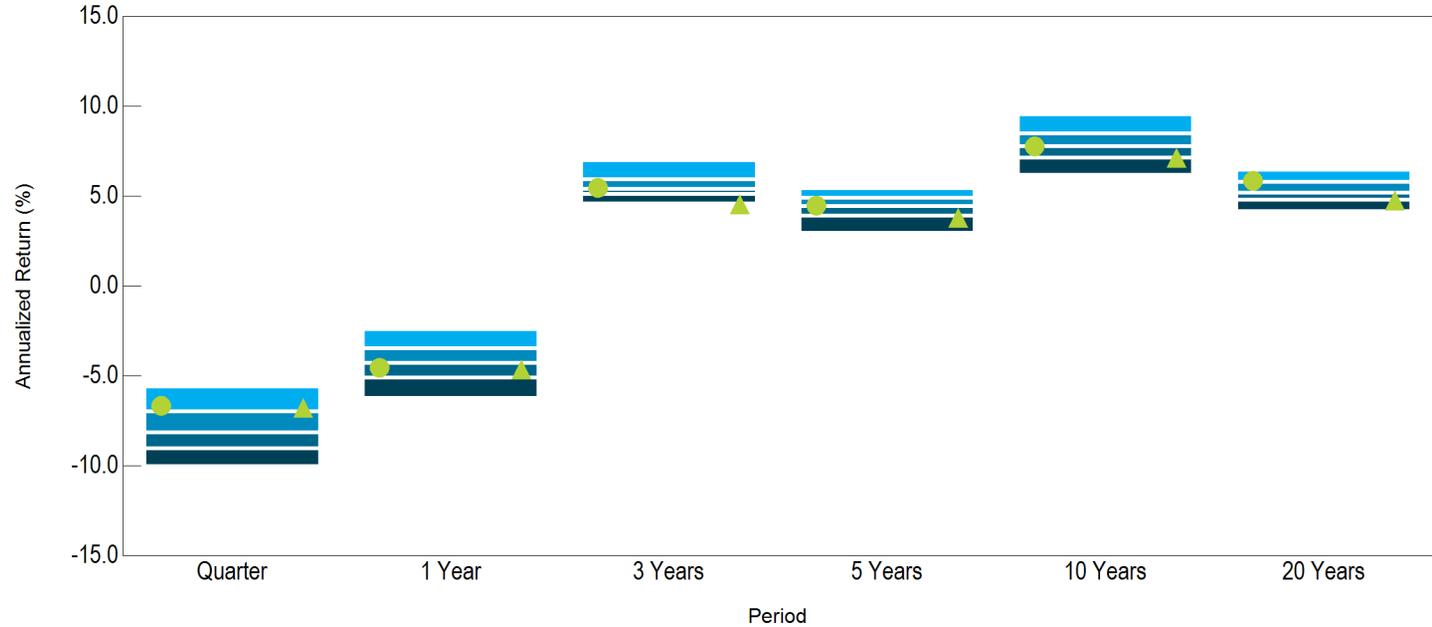
- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate

**InvMetrics Public DB \$50mm-\$250mm Net Return Comparison
Ending December 31, 2019**



| | Return (Rank) | | | | | |
|---|---------------|-----------|----------|----------|----------|----------|
| | Quarter | 1 Year | 3 Years | 5 Years | 10 Years | 20 Years |
| 5th Percentile | 6.7 | 22.4 | 11.2 | 8.2 | 9.2 | 6.9 |
| 25th Percentile | 5.8 | 20.6 | 10.1 | 7.3 | 8.5 | 6.2 |
| Median | 5.3 | 19.1 | 9.2 | 6.8 | 7.9 | 5.9 |
| 75th Percentile | 4.9 | 17.6 | 8.6 | 6.4 | 7.4 | 5.5 |
| 95th Percentile | 4.1 | 15.3 | 7.7 | 5.7 | 6.7 | 5.0 |
| # of Portfolios | 157 | 157 | 149 | 137 | 113 | 44 |
| ● Total Retirement System | 4.4 (92) | 17.5 (77) | 8.2 (84) | 6.6 (68) | 7.8 (59) | 6.2 (31) |
| ▲ 55% MSCI World & 45% Barclays Aggregate | 4.7 (82) | 19.1 (51) | 8.8 (62) | 6.3 (77) | 7.1 (86) | 5.1 (91) |

InvMetrics Public DB \$50mm-\$250mm Net Return Comparison
Ending December 31, 2018



| | Quarter | | 1 Year | | 3 Years | | 5 Years | | 10 Years | | 20 Years | |
|--|---------|------|--------|------|---------|------|---------|------|----------|------|----------|------|
| 5th Percentile | -5.6 | | -2.4 | | 7.0 | | 5.4 | | 9.5 | | 6.4 | |
| 25th Percentile | -7.0 | | -3.4 | | 5.9 | | 4.9 | | 8.5 | | 5.8 | |
| Median | -8.1 | | -4.3 | | 5.4 | | 4.5 | | 7.8 | | 5.2 | |
| 75th Percentile | -9.0 | | -5.1 | | 5.1 | | 3.9 | | 7.2 | | 4.8 | |
| 95th Percentile | -10.0 | | -6.2 | | 4.6 | | 3.0 | | 6.2 | | 4.2 | |
| # of Portfolios | 146 | | 146 | | 140 | | 130 | | 101 | | 39 | |
| ● Total Retirement System | -6.7 | (19) | -4.5 | (57) | 5.5 | (50) | 4.5 | (50) | 7.8 | (51) | 5.9 | (24) |
| ▲ 55% MSCI World & 45% Barclays Aggregate | -6.8 | (22) | -4.6 | (61) | 4.5 | (96) | 3.8 | (79) | 7.1 | (77) | 4.8 | (77) |

Statistics Summary

5 Years Ending December 31, 2019

| | Anlzd Return | Anlzd Standard Deviation | Information Ratio | Beta | Sharpe Ratio | Tracking Error |
|---|--------------|--------------------------|-------------------|------|--------------|----------------|
| Total Retirement System | 6.6% | 6.1% | 0.2 | 0.9 | 0.9 | 1.1% |
| 55% MSCI World & 45% Barclays Aggregate | 6.3% | 6.4% | -- | 1.0 | 0.8 | 0.0% |
| Equity Assets | 8.8% | 11.7% | -1.0 | 0.9 | 0.7 | 2.4% |
| Russell 3000 | 11.2% | 12.2% | -- | 1.0 | 0.8 | 0.0% |
| Domestic Equity Assets | 10.0% | 12.2% | -0.7 | 1.0 | 0.7 | 1.7% |
| Russell 3000 | 11.2% | 12.2% | -- | 1.0 | 0.8 | 0.0% |
| RhumbLine S&P 500 Index | 11.7% | 12.0% | -0.8 | 1.0 | 0.9 | 0.0% |
| S&P 500 | 11.7% | 12.0% | -- | 1.0 | 0.9 | 0.0% |
| Fiduciary Large Cap Equity | 9.6% | 10.7% | -0.5 | 0.8 | 0.8 | 3.7% |
| Russell 3000 | 11.2% | 12.2% | -- | 1.0 | 0.8 | 0.0% |
| Frontier Capital Appreciation | 8.3% | 16.4% | -0.5 | 1.0 | 0.4 | 5.5% |
| Russell 2500 Growth | 10.8% | 15.9% | -- | 1.0 | 0.6 | 0.0% |
| International Developed Markets Equity Assets | 5.8% | 12.1% | 0.7 | 1.0 | 0.4 | 0.3% |
| MSCI EAFE | 5.7% | 12.2% | -- | 1.0 | 0.4 | 0.0% |
| Rhumblin MSCI EAFE Index | 5.8% | 12.1% | 0.7 | 1.0 | 0.4 | 0.3% |
| MSCI EAFE | 5.7% | 12.2% | -- | 1.0 | 0.4 | 0.0% |
| International Emerging Markets Equity Assets | 6.4% | 14.1% | 0.2 | 0.9 | 0.4 | 3.2% |

| | Anlzd Return | Anlzd Standard Deviation | Information Ratio | Beta | Sharpe Ratio | Tracking Error |
|-----------------------------------|--------------|--------------------------|-------------------|------|--------------|----------------|
| MSCI Emerging Markets | 5.6% | 15.8% | -- | 1.0 | 0.3 | 0.0% |
| DFA Emerging Markets | 5.1% | 15.2% | -0.2 | 0.9 | 0.3 | 2.7% |
| MSCI Emerging Markets | 5.6% | 15.8% | -- | 1.0 | 0.3 | 0.0% |
| Driehaus Emerging Market Equity | 7.6% | 13.3% | 0.4 | 0.8 | 0.5 | 4.9% |
| MSCI Emerging Markets | 5.6% | 15.8% | -- | 1.0 | 0.3 | 0.0% |
| Investment Grade Bonds Assets | 3.1% | 3.1% | 0.5 | 1.0 | 0.7 | 0.0% |
| BBgBarc US Aggregate TR | 3.0% | 3.1% | -- | 1.0 | 0.7 | 0.0% |
| SSgA U.S. Aggregate Bond Index | 3.1% | 3.1% | 0.5 | 1.0 | 0.7 | 0.0% |
| BBgBarc US Aggregate TR | 3.0% | 3.1% | -- | 1.0 | 0.7 | 0.0% |
| High Yield Bond Assets | 5.6% | 4.7% | -0.5 | 0.9 | 1.0 | 1.1% |
| BBgBarc US High Yield TR | 6.1% | 5.3% | -- | 1.0 | 1.0 | 0.0% |
| Shenkman Capital | 5.6% | 4.7% | -0.5 | 0.9 | 1.0 | 1.1% |
| BBgBarc US High Yield TR | 6.1% | 5.3% | -- | 1.0 | 1.0 | 0.0% |
| TIPS Assets | 2.6% | 3.4% | -0.7 | 1.0 | 0.4 | 0.0% |
| BBgBarc US TIPS TR | 2.6% | 3.4% | -- | 1.0 | 0.5 | 0.0% |
| SSgA TIPS Index-NL | 2.6% | 3.4% | -0.7 | 1.0 | 0.4 | 0.0% |
| BBgBarc US TIPS TR | 2.6% | 3.4% | -- | 1.0 | 0.5 | 0.0% |
| Emerging Market Debt Assets | 6.1% | 6.3% | -0.1 | 1.1 | 0.8 | 1.8% |
| JP Morgan EMBI Global Diversified | 6.2% | 5.3% | -- | 1.0 | 1.0 | 0.0% |
| Payden Emerging Market Bond | 6.1% | 6.3% | -0.1 | 1.1 | 0.8 | 1.8% |

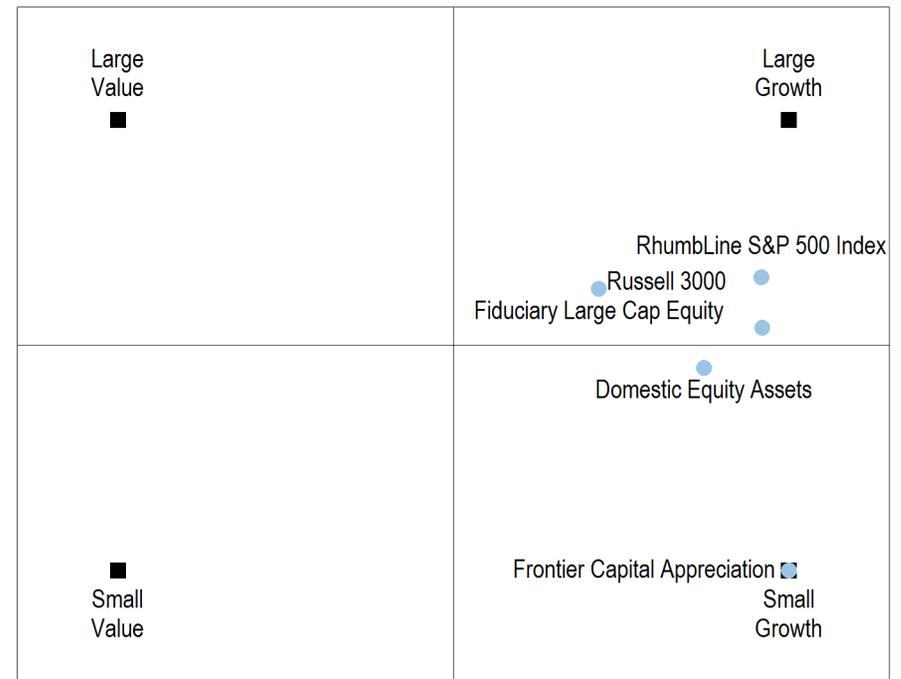
| | Anlzd Return | Anlzd Standard Deviation | Information Ratio | Beta | Sharpe Ratio | Tracking Error |
|-----------------------------------|--------------|--------------------------|-------------------|------|--------------|----------------|
| JP Morgan EMBI Global Diversified | 6.2% | 5.3% | -- | 1.0 | 1.0 | 0.0% |
| Open-Ended Real Estate | 9.7% | 4.2% | 0.8 | 1.1 | 2.0 | 0.9% |
| NCREIF ODCE | 9.0% | 3.9% | -- | 1.0 | 2.0 | 0.0% |
| Clarion Partners | 9.7% | 4.2% | 0.8 | 1.1 | 2.0 | 0.9% |
| NCREIF ODCE | 9.0% | 3.9% | -- | 1.0 | 2.0 | 0.0% |
| Total Closed End Real Estate | -3.0% | 21.6% | -0.6 | 1.1 | -0.2 | 21.2% |
| NCREIF ODCE | 9.0% | 3.9% | -- | 1.0 | 2.0 | 0.0% |
| Colony Realty Partners IV | -3.0% | 21.6% | -0.6 | 1.1 | -0.2 | 21.2% |
| NCREIF ODCE | 9.0% | 3.9% | -- | 1.0 | 2.0 | 0.0% |
| Comerica Short Term Fund | 0.3% | 0.2% | -2.4 | 0.0 | -3.9 | 0.3% |
| 91 Day T-Bills | 1.1% | 0.2% | -- | 1.0 | 0.0 | 0.0% |

Retirement System Detail

Asset Allocation on December 31, 2019

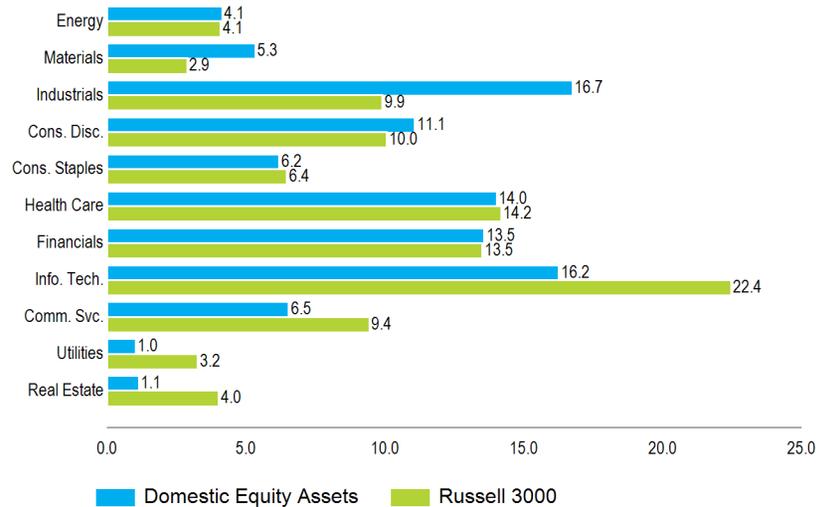
| | Actual | Actual |
|-------------------------------|---------------------|---------------|
| Fiduciary Large Cap Equity | \$26,005,351 | 40.3% |
| Frontier Capital Appreciation | \$18,954,006 | 29.4% |
| RhumbLine S&P 500 Index | \$19,614,469 | 30.4% |
| Total | \$64,573,826 | 100.0% |

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



| Domestic Equity Assets Characteristics | | | |
|--|--------------------|----------------|--------------------|
| | Portfolio Q4-19 | Index Q4-19 | Portfolio Q3-19 |
| Market Value | | | |
| Market Value (\$M) | 64.6 | -- | 60.4 |
| Number Of Holdings | 630 | 2992 | 631 |
| Characteristics | | | |
| Weighted Avg. Market Cap. (\$B) | 129.9 | 230.5 | 112.6 |
| Median Market Cap (\$B) | 18.3 | 1.8 | 17.0 |
| P/E Ratio | 20.7 | 22.8 | 18.9 |
| Yield | 1.5 | 1.8 | 1.6 |
| EPS Growth - 5 Yrs. | 9.3 | 13.1 | 9.7 |
| Price to Book | 3.5 | 3.6 | 3.2 |
| Beta (holdings; domestic) | 1.1 | 1.0 | 1.1 |

Sector Allocation (%) vs Russell 3000



Top 10 Holdings

| | |
|------------------------|--------------|
| CASH - USD | 4.2% |
| BERKSHIRE HATHAWAY 'B' | 2.7% |
| UNITEDHEALTH GROUP | 2.5% |
| JP MORGAN CHASE & CO. | 2.4% |
| MASCO | 2.0% |
| DOLLAR GENERAL | 1.9% |
| HONEYWELL INTL. | 1.9% |
| QUEST DIAGNOSTICS | 1.6% |
| ACCENTURE CLASS A | 1.5% |
| PEPSICO | 1.5% |
| Total | 22.1% |

Asset Allocation on December 31, 2019

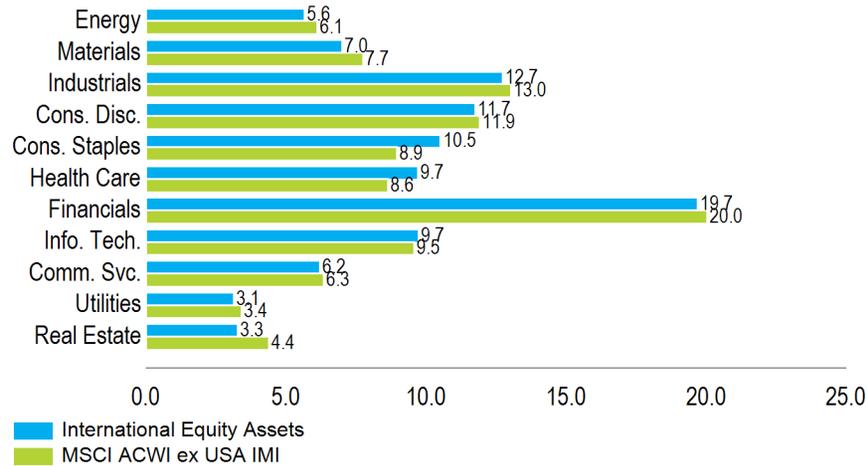
| | Actual | Actual |
|---------------------------------|---------------------|---------------|
| DFA Emerging Markets | \$3,108,552 | 12.9% |
| Driehaus Emerging Market Equity | \$3,463,257 | 14.4% |
| Rhumblin MSCI EAFE Index | \$17,481,489 | 72.7% |
| Total | \$24,053,298 | 100.0% |

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



| International Equity Characteristics | | | |
|--------------------------------------|--------------------|----------------|--------------------|
| | Portfolio Q4-19 | Index Q4-19 | Portfolio Q3-19 |
| Market Value | | | |
| Market Value (\$M) | 24.1 | -- | 22.6 |
| Number Of Holdings | 5738 | 6587 | 5832 |
| Characteristics | | | |
| Weighted Avg. Market Cap. (\$B) | 69.6 | 64.5 | 62.1 |
| Median Market Cap (\$B) | 0.7 | 1.7 | 0.6 |
| P/E Ratio | 16.7 | 16.2 | 15.7 |
| Yield | 2.9 | 3.0 | 3.1 |
| EPS Growth - 5 Yrs. | 8.3 | 9.3 | 8.3 |
| Price to Book | 2.5 | 2.4 | 2.4 |
| Beta (holdings; domestic) | 1.0 | 1.0 | 1.0 |

Sector Allocation (%) vs MSCI ACWI ex USA IMI



Top 10 Holdings

| | |
|-------------------------------|--------------|
| NESTLE 'N' | 1.6% |
| SAMSUNG ELECTRONICS | 1.3% |
| ROCHE HOLDING | 1.2% |
| NOVARTIS 'R' | 1.0% |
| ALIBABA GROUP HOLDING ADR 1:8 | 0.9% |
| AIA GROUP | 0.9% |
| TENCENT HOLDINGS | 0.8% |
| TAIWAN SEMICON.SPN.ADR 1:5 | 0.8% |
| TOYOTA MOTOR | 0.8% |
| HSBC HOLDINGS | 0.8% |
| Total | 10.1% |

Country Allocation Report

As of 12/31/2019

| Region | % of Total | % of Bench | % Diff |
|------------------------|---------------|---------------|-------------|
| North America ex U.S. | 0.2% | 6.7% | -6.5% |
| United States | 1.9% | 0.0% | 1.9% |
| Europe Ex U.K. | 34.7% | 30.3% | 4.4% |
| United Kingdom | 11.7% | 11.2% | 0.5% |
| Pacific Basin Ex Japan | 12.1% | 7.9% | 4.2% |
| Japan | 18.1% | 17.0% | 1.1% |
| Emerging Markets | 20.8% | 25.4% | -4.6% |
| Other | 0.6% | 1.5% | -1.0% |
| Total | 100.0% | 100.0% | 0.0% |

International Equity Country Allocation

vs MSCI ACWI ex USA IMI

| Country | % of Total | % of Bench | % Diff |
|----------------|------------|------------|--------|
| ARGENTINA | 0.0% | 0.1% | -0.1% |
| AUSTRALIA | 5.0% | 4.6% | 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% | 0.0% |
| BRAZIL | 2.2% | 2.1% | 0.1% |
| CANADA | 0.2% | 6.7% | -6.5% |
| CHILE | 0.1% | 0.2% | -0.1% |
| CHINA | 3.3% | 8.3% | -5.0% |
| COLOMBIA | 0.2% | 0.1% | 0.1% |
| 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% | 0.0% | 0.1% |
| ESTONIA | 0.0% | 0.0% | 0.0% |
| FINLAND | 0.7% | 0.7% | 0.0% |
| FRANCE | 8.3% | 6.9% | 1.4% |
| GERMANY | 6.2% | 5.5% | 0.7% |
| GREECE | 0.2% | 0.1% | 0.1% |
| HONG KONG | 5.8% | 2.2% | 3.6% |
| HUNGARY | 0.3% | 0.1% | 0.2% |
| INDIA | 3.1% | 2.4% | 0.7% |
| INDONESIA | 0.6% | 0.5% | 0.1% |

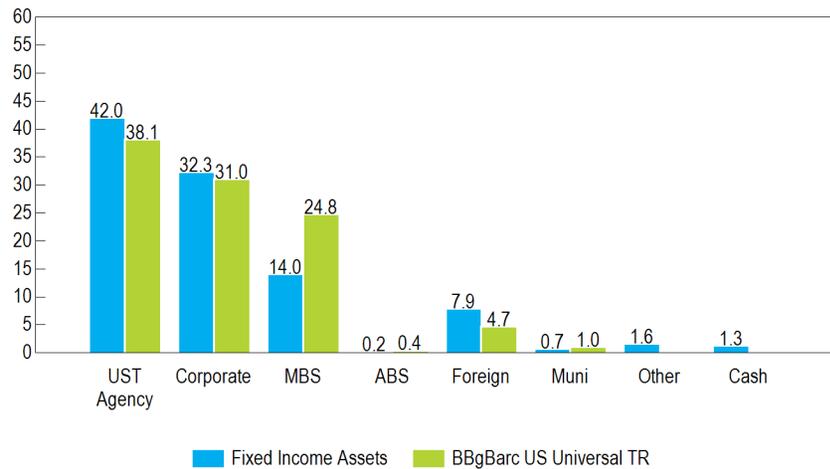
| Country | % of Total | % of Bench | % Diff |
|-------------|------------|------------|--------|
| IRELAND | 0.4% | 0.4% | 0.0% |
| ISRAEL | 0.3% | 0.5% | -0.2% |
| ITALY | 1.7% | 1.7% | 0.0% |
| JAPAN | 18.1% | 17.0% | 1.1% |
| JORDAN | 0.0% | 0.0% | 0.0% |
| KAZAKHSTAN | 0.0% | 0.0% | 0.0% |
| KENYA | 0.0% | 0.0% | 0.0% |
| KOREA | 2.9% | 3.2% | -0.4% |
| 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% | 0.5% | 0.0% |
| MAURITIUS | 0.0% | 0.0% | 0.0% |
| MEXICO | 0.6% | 0.6% | 0.0% |
| MOROCCO | 0.0% | 0.0% | 0.0% |
| NETHERLANDS | 3.5% | 2.5% | 0.9% |
| NEW ZEALAND | 0.2% | 0.2% | 0.0% |
| NIGERIA | 0.0% | 0.0% | 0.0% |
| NORWAY | 0.5% | 0.6% | -0.1% |
| OMAN | 0.0% | 0.0% | 0.0% |
| OTHER | 0.3% | 0.0% | 0.3% |
| PAKISTAN | 0.0% | 0.0% | 0.0% |
| PERU | 0.0% | 0.1% | -0.1% |
| PHILIPPINES | 0.3% | 0.3% | 0.0% |
| POLAND | 0.2% | 0.2% | 0.0% |
| PORTUGAL | 0.1% | 0.1% | 0.0% |

| Country | % of Total | % of Bench | % Diff |
|----------------------|---------------|---------------|-------------|
| QATAR | 0.0% | 0.2% | -0.2% |
| ROMANIA | 0.0% | 0.0% | 0.0% |
| RUSSIA | 0.9% | 1.0% | 0.0% |
| SAUDI ARABIA | 0.0% | 0.7% | -0.7% |
| SERBIA | 0.0% | 0.0% | 0.0% |
| SINGAPORE | 1.2% | 0.9% | 0.3% |
| SLOVENIA | 0.0% | 0.0% | 0.0% |
| SOUTH AFRICA | 1.1% | 1.3% | -0.2% |
| SPAIN | 2.1% | 1.8% | 0.3% |
| SRI LANKA | 0.0% | 0.0% | 0.0% |
| SWEDEN | 1.9% | 2.1% | -0.2% |
| SWITZERLAND | 6.9% | 5.8% | 1.1% |
| TAIWAN | 3.4% | 3.4% | 0.1% |
| THAILAND | 0.6% | 0.7% | -0.1% |
| TUNISIA | 0.0% | 0.0% | 0.0% |
| TURKEY | 0.2% | 0.2% | 0.0% |
| UNITED ARAB EMIRATES | 0.1% | 0.2% | -0.1% |
| UNITED KINGDOM | 11.7% | 11.2% | 0.5% |
| UNITED STATES | 1.9% | 0.0% | 1.9% |
| VIETNAM | 0.0% | 0.0% | 0.0% |
| Total | 100.0% | 100.0% | 0.0% |

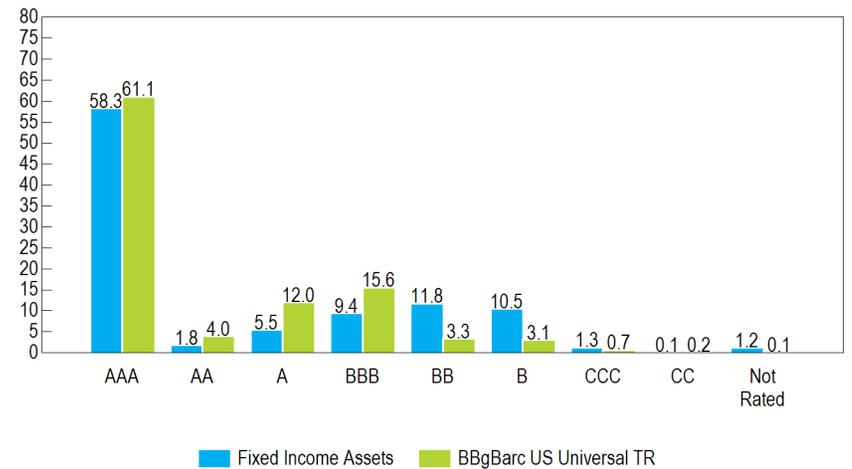
| Asset Allocation on December 31, 2019 | | |
|---------------------------------------|---------------------|---------------|
| | Actual | Actual |
| Payden Emerging Market Bond | \$5,580,081 | 6.5% |
| Shenkman Capital | \$19,629,557 | 23.0% |
| SSgA TIPS Index-NL | \$19,158,842 | 22.5% |
| SSgA U.S. Aggregate Bond Index | \$40,897,935 | 48.0% |
| Total | \$85,266,414 | 100.0% |

| Fixed Income Characteristics vs. BBgBarc US Universal TR | | | |
|--|-----------------|-------------|-----------------|
| | Portfolio Q4-19 | Index Q4-19 | Portfolio Q3-19 |
| Fixed Income Characteristics | | | |
| Yield to Maturity | 3.2 | 2.8 | 3.2 |
| Average Duration | 4.9 | 6.1 | 4.1 |
| Average Quality | A | AA | A |
| Weighted Average Maturity | 7.7 | 12.2 | 7.8 |

Sector Allocation



Credit Quality Allocation



Portfolio Reviews

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 | 9.0 | 31.4 | 31.4 | 15.2 | 11.7 | 13.5 | 6.8 | Mar-99 |
| S&P 500 | 9.1 | 31.5 | 31.5 | 15.3 | 11.7 | 13.6 | 6.7 | Mar-99 |

Top 10 Holdings

| | |
|------------------------|--------------|
| APPLE | 4.5% |
| MICROSOFT | 4.5% |
| AMAZON.COM | 2.8% |
| FACEBOOK CLASS A | 1.8% |
| BERKSHIRE HATHAWAY 'B' | 1.6% |
| JP MORGAN CHASE & CO. | 1.6% |
| ALPHABET A | 1.5% |
| ALPHABET 'C' | 1.5% |
| JOHNSON & JOHNSON | 1.4% |
| VISA 'A' | 1.2% |
| Total | 22.5% |

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

| | Portfolio Q4-19 | Index Q4-19 | Portfolio Q3-19 |
|---------------------------------|-----------------|-------------|-----------------|
| Market Value | | | |
| Market Value (\$M) | 19.61 | -- | 18.54 |
| Number Of Holdings | 506 | 505 | 507 |
| Characteristics | | | |
| Weighted Avg. Market Cap. (\$B) | 269.49 | 272.00 | 230.58 |
| Median Market Cap (\$B) | 23.61 | 23.59 | 22.53 |
| P/E Ratio | 23.03 | 23.01 | 20.57 |
| Yield | 1.86 | 1.83 | 1.97 |
| EPS Growth - 5 Yrs. | 12.90 | 12.82 | 13.39 |
| Price to Book | 3.87 | 3.87 | 3.67 |
| Beta (holdings; domestic) | 1.00 | 1.00 | 0.99 |
| Sector Distribution | | | |
| Energy | 4.28 | 4.17 | 4.45 |
| Materials | 2.60 | 2.60 | 2.64 |
| Industrials | 8.93 | 8.99 | 9.16 |
| Consumer Discretionary | 9.65 | 10.12 | 9.96 |
| Consumer Staples | 7.12 | 7.81 | 7.48 |
| Health Care | 14.06 | 13.78 | 13.41 |
| Financials | 13.96 | 13.33 | 14.25 |
| Information Technology | 22.95 | 22.80 | 21.61 |
| Communication Services | 10.28 | 10.40 | 10.24 |
| Utilities | 3.28 | 3.16 | 3.52 |
| Real Estate | 2.87 | 2.82 | 3.13 |

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 |

Fund Characteristics as of December 31, 2019

Versus Russell 3000

| | |
|---------------------------|-----------|
| Sharpe Ratio (3 Year) | 1.06 |
| Average Market Cap (\$mm) | 63,476.13 |
| Price/Earnings | 17.98 |
| Price/Book | 3.21 |
| Price/Sales | 1.92 |
| Price/Cash Flow | 14.03 |
| Dividend Yield | 1.64 |
| Number of Equity Holdings | 31 |
| R-Squared (3 Year) | 0.91 |
| Alpha (3 Year) | 0.08% |

Portfolio Performance Summary

| | QTD (%) | YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|----------------------------|---------|---------|----------|-----------|-----------|------------|---------------|----------------|
| Fiduciary Large Cap Equity | 5.8 | 23.8 | 23.8 | 12.4 | 9.6 | -- | 12.5 | Sep-12 |
| Russell 3000 | 9.1 | 31.0 | 31.0 | 14.6 | 11.2 | 13.4 | 14.1 | Sep-12 |

Top Holdings as of December 31, 2019

| | |
|-----------------------------|-------|
| BERKSHIRE HATHAWAY INC B | 6.32% |
| UNITEDHEALTH GROUP INC | 5.53% |
| MASCO CORP | 5.01% |
| DOLLAR GENERAL CORP | 4.98% |
| JPMORGAN CHASE & CO | 4.84% |
| HONEYWELL INTERNATIONAL INC | 4.20% |
| QUEST DIAGNOSTICS INC | 3.85% |
| CHUBB LTD | 3.47% |
| ACCENTURE PLC CLASS A | 3.42% |
| OMNICOM GROUP INC | 3.39% |

Sector Allocation as of December 31, 2019

| | |
|------------------------|--------|
| BASIC MATERIALS | 4.10% |
| COMMUNICATION SERVICES | 5.16% |
| CONSUMER CYCLICAL | 5.72% |
| CONSUMER DEFENSIVE | 18.14% |
| ENERGY | 3.01% |
| FINANCIAL SERVICES | 20.17% |
| HEALTHCARE | 15.67% |
| INDUSTRIALS | 22.03% |
| REAL ESTATE | 0.00% |
| TECHNOLOGY | 6.01% |
| UTILITIES | 0.00% |

Frontier Capital Appreciation | As of December 31, 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 | 9.8 | 28.9 | 28.9 | 9.8 | 8.3 | -- | 12.1 | Feb-13 |
| Russell 2500 Growth | 10.6 | 32.7 | 32.7 | 15.2 | 10.8 | 14.0 | 13.2 | Feb-13 |

Top 10 Holdings

| | |
|--------------------------|--------------|
| CASH - USD | 5.3% |
| UNITED AIRLINES HOLDINGS | 2.9% |
| INSULET | 2.1% |
| TUTOR PERINI | 2.0% |
| PAN AMERICAN SILVER(NAS) | 1.9% |
| KBR | 1.8% |
| MONOLITHIC PWR.SYS. | 1.7% |
| COOPER COS. | 1.7% |
| COGENT COMMS.HOLDINGS | 1.7% |
| DEXCOM | 1.7% |
| Total | 22.6% |

Frontier Capital Appreciation Characteristics

| | Portfolio Q4-19 | Index Q4-19 | Portfolio Q3-19 |
|---------------------------------|-----------------|-------------|-----------------|
| Market Value | | | |
| Market Value (\$M) | 19.0 | -- | 17.3 |
| Number Of Holdings | 140 | 1409 | 140 |
| Characteristics | | | |
| Weighted Avg. Market Cap. (\$B) | 7.0 | 5.9 | 6.3 |
| Median Market Cap (\$B) | 3.1 | 1.3 | 2.7 |
| P/E Ratio | 20.2 | 28.4 | 19.4 |
| Yield | 0.8 | 0.7 | 0.9 |
| EPS Growth - 5 Yrs. | 7.1 | 15.9 | 8.0 |
| Price to Book | 2.9 | 5.5 | 2.6 |
| Beta (holdings; domestic) | 1.4 | 1.2 | 1.3 |
| Sector Distribution | | | |
| Energy | 6.1 | 0.5 | 5.7 |
| Materials | 9.5 | 3.6 | 9.5 |
| Industrials | 22.0 | 17.3 | 22.8 |
| Consumer Discretionary | 7.3 | 12.9 | 6.9 |
| Consumer Staples | 0.6 | 2.2 | 0.5 |
| Health Care | 12.6 | 24.3 | 13.8 |
| Financials | 8.4 | 6.1 | 8.8 |
| Information Technology | 23.6 | 25.0 | 23.1 |
| Communication Services | 3.7 | 3.2 | 3.4 |
| Utilities | 0.0 | 0.8 | 0.0 |
| Real Estate | 0.8 | 4.2 | 0.9 |

Account Information

| | |
|-------------------|----------------------------|
| Account Name | Rhumblin 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 |
|--------------------------|---------|---------|----------|-----------|-----------|------------|---------------|----------------|
| Rhumblin MSCI EAFE Index | 8.1 | 22.3 | 22.3 | 9.7 | 5.8 | -- | 3.9 | Aug-14 |
| MSCI EAFE | 8.2 | 22.0 | 22.0 | 9.6 | 5.7 | 5.5 | 3.7 | Aug-14 |

Top 10 Holdings

| | |
|--------------------------|--------------|
| NESTLE 'N' | 2.2% |
| ROCHE HOLDING | 1.5% |
| NOVARTIS 'R' | 1.4% |
| TOYOTA MOTOR | 1.1% |
| HSBC HOLDINGS | 1.1% |
| SAP | 0.9% |
| ASTRAZENECA | 0.9% |
| TOTAL | 0.9% |
| ROYAL DUTCH SHELL A(LON) | 0.9% |
| LVMH | 0.9% |
| Total | 11.6% |

Rhumblin MSCI EAFE Index Characteristics

| | Portfolio Q4-19 | Index Q4-19 | Portfolio Q3-19 |
|---------------------------------|-----------------|-------------|-----------------|
| Market Value | | | |
| Market Value (\$M) | 17.5 | -- | 16.6 |
| Number Of Holdings | 924 | 918 | 939 |
| Characteristics | | | |
| Weighted Avg. Market Cap. (\$B) | 63.9 | 63.7 | 60.4 |
| Median Market Cap (\$B) | 10.8 | 10.8 | 9.9 |
| P/E Ratio | 17.2 | 17.2 | 15.9 |
| Yield | 3.2 | 3.2 | 3.3 |
| EPS Growth - 5 Yrs. | 7.0 | 7.1 | 7.0 |
| Price to Book | 2.4 | 2.4 | 2.3 |
| Beta (holdings; domestic) | 1.0 | 1.0 | 1.0 |
| Sector Distribution | | | |
| Energy | 4.8 | 4.9 | 5.1 |
| Materials | 7.0 | 7.1 | 6.9 |
| Industrials | 15.0 | 15.1 | 14.7 |
| Consumer Discretionary | 11.6 | 11.6 | 11.5 |
| Consumer Staples | 11.2 | 11.3 | 11.9 |
| Health Care | 12.1 | 12.2 | 11.5 |
| Financials | 18.4 | 18.6 | 18.4 |
| Information Technology | 6.9 | 7.0 | 6.6 |
| Communication Services | 5.2 | 5.2 | 5.3 |
| Utilities | 3.7 | 3.7 | 3.7 |
| Real Estate | 3.4 | 3.4 | 3.5 |

DFA Emerging Markets | As of December 31, 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 Mkts All Cap Equity Net |

Portfolio Performance Summary

| | QTD (%) | YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|-----------------------|---------|---------|----------|-----------|-----------|------------|---------------|----------------|
| DFA Emerging Markets | 10.6 | 16.0 | 16.0 | 10.3 | 5.1 | -- | 5.1 | Jan-15 |
| MSCI Emerging Markets | 11.8 | 18.4 | 18.4 | 11.6 | 5.6 | 3.7 | 5.6 | Jan-15 |

Top 10 Holdings

| | |
|--|--------------|
| SAMSUNG ELECTRONICS | 4.7% |
| TENCENT HOLDINGS | 2.2% |
| TAIWAN SEMICON.SPN.ADR 1:5 | 2.1% |
| TAIWAN SEMICON.MNFG. | 1.5% |
| ALIBABA GROUP HOLDING ADR 1:8 | 1.0% |
| CASH - USD | 1.0% |
| PING AN INSURANCE (GROUP) OF CHINA 'H' | 1.0% |
| SK HYNIX | 1.0% |
| VALE ON | 0.9% |
| RELIANCE INDUSTRIES | 0.8% |
| Total | 16.2% |

DFA Emerging Markets Characteristics

| | Portfolio Q4-19 | Index Q4-19 | Portfolio Q3-19 |
|---------------------------------|-----------------|-------------|-----------------|
| Market Value | | | |
| Market Value (\$M) | 3.1 | -- | 2.8 |
| Number Of Holdings | 4787 | 1371 | 4868 |
| Characteristics | | | |
| Weighted Avg. Market Cap. (\$B) | 58.3 | 106.2 | 45.3 |
| Median Market Cap (\$B) | 0.4 | 5.9 | 0.4 |
| P/E Ratio | 13.9 | 15.0 | 12.8 |
| Yield | 2.9 | 2.7 | 3.1 |
| EPS Growth - 5 Yrs. | 11.4 | 13.1 | 11.0 |
| Price to Book | 2.3 | 2.6 | 2.2 |
| Beta (holdings; domestic) | 1.1 | 1.1 | 1.1 |
| Sector Distribution | | | |
| Energy | 6.9 | 7.4 | 7.0 |
| Materials | 10.3 | 7.3 | 10.3 |
| Industrials | 8.3 | 5.3 | 8.8 |
| Consumer Discretionary | 10.3 | 14.3 | 10.5 |
| Consumer Staples | 6.8 | 6.2 | 7.4 |
| Health Care | 3.0 | 2.7 | 2.9 |
| Financials | 18.4 | 24.5 | 18.3 |
| Information Technology | 19.8 | 15.6 | 19.1 |
| Communication Services | 7.7 | 11.0 | 7.5 |
| Utilities | 3.4 | 2.6 | 3.5 |
| Real Estate | 4.1 | 3.0 | 3.8 |

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 Mkts All Cap Equity Net |

Portfolio Performance Summary

| | QTD (%) | YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|---------------------------------|---------|---------|----------|-----------|-----------|------------|---------------|----------------|
| Driehaus Emerging Market Equity | 11.3 | 25.3 | 25.3 | 14.8 | 7.6 | -- | 7.6 | Jan-15 |
| MSCI Emerging Markets | 11.8 | 18.4 | 18.4 | 11.6 | 5.6 | 3.7 | 5.6 | Jan-15 |

Top 10 Holdings

| | |
|-------------------------------|--------------|
| ALIBABA GROUP HOLDING ADR 1:8 | 5.9% |
| SAMSUNG ELECTRONICS | 4.7% |
| TENCENT HOLDINGS | 4.0% |
| TAIWAN SEMICON.SPN.ADR 1:5 | 4.0% |
| ICICI BK.ADR 1:2 | 2.4% |
| PJSC LUKOIL SPON (LON) ADR | 2.3% |
| HDFC BANK ADR 1:3 | 1.8% |
| AIA GROUP | 1.7% |
| BANK CENTRAL ASIA | 1.7% |
| KOTAK MAHINDRA BANK | 1.7% |
| Total | 30.2% |

Driehaus Emerging Market Equity Characteristics

| | Portfolio Q4-19 | Index Q4-19 | Portfolio Q3-19 |
|---------------------------------|-----------------|-------------|-----------------|
| Market Value | | | |
| Market Value (\$M) | 3.5 | -- | 3.1 |
| Number Of Holdings | 103 | 1371 | 100 |
| Characteristics | | | |
| Weighted Avg. Market Cap. (\$B) | 111.5 | 106.2 | 88.5 |
| Median Market Cap (\$B) | 16.5 | 5.9 | 14.9 |
| P/E Ratio | 20.4 | 15.0 | 21.0 |
| Yield | 1.7 | 2.7 | 1.9 |
| EPS Growth - 5 Yrs. | 12.7 | 13.1 | 13.1 |
| Price to Book | 3.8 | 2.6 | 3.6 |
| Beta (holdings; domestic) | 1.0 | 1.1 | 1.0 |
| Sector Distribution | | | |
| Energy | 8.9 | 7.4 | 5.6 |
| Materials | 3.5 | 7.3 | 1.9 |
| Industrials | 5.0 | 5.3 | 4.3 |
| Consumer Discretionary | 14.0 | 14.3 | 15.0 |
| Consumer Staples | 10.1 | 6.2 | 11.5 |
| Health Care | 3.5 | 2.7 | 2.3 |
| Financials | 27.7 | 24.5 | 27.5 |
| Information Technology | 15.1 | 15.6 | 13.2 |
| Communication Services | 10.0 | 11.0 | 10.7 |
| Utilities | 0.0 | 2.6 | 0.4 |
| Real Estate | 1.5 | 3.0 | 1.1 |

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 |

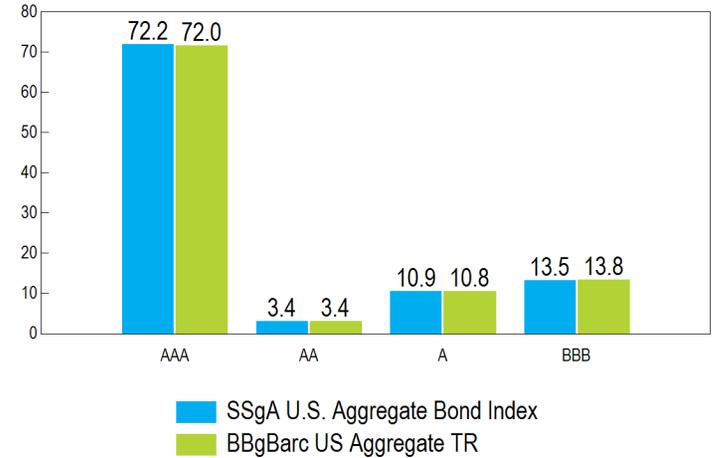
Portfolio Performance Summary

| | QTD (%) | YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|--------------------------------|---------|---------|----------|-----------|-----------|------------|---------------|----------------|
| SSgA U.S. Aggregate Bond Index | 0.2 | 8.7 | 8.7 | 4.0 | 3.1 | 3.8 | 4.7 | May-01 |
| BBgBarc US Aggregate TR | 0.2 | 8.7 | 8.7 | 4.0 | 3.0 | 3.7 | 4.6 | May-01 |

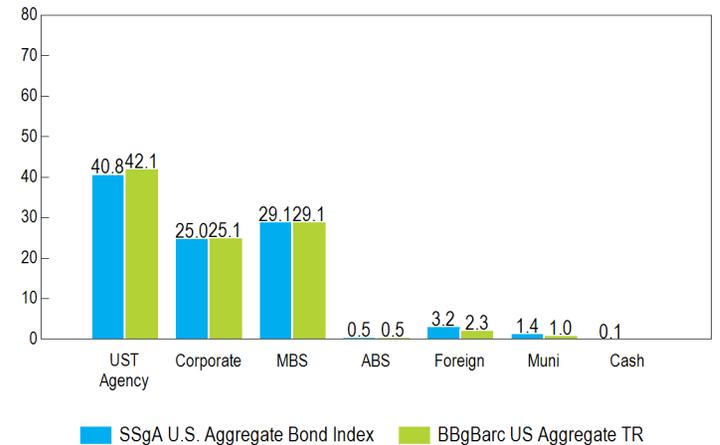
SSgA U.S. Aggregate Bond Index Characteristics vs. BBgBarc US Aggregate TR

| | Portfolio Q4-19 | Index Q4-19 | Portfolio Q3-19 |
|-------------------------------------|-----------------|-------------|-----------------|
| Fixed Income Characteristics | | | |
| Yield to Maturity | 2.3 | 2.3 | 2.5 |
| Average Duration | 5.9 | 5.9 | 5.8 |
| Average Quality | AA | AA | AA |
| Weighted Average Maturity | 7.9 | 8.1 | 7.9 |

Credit Quality Allocation



Sector Allocation



Shenkman Capital | As of December 31, 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 |

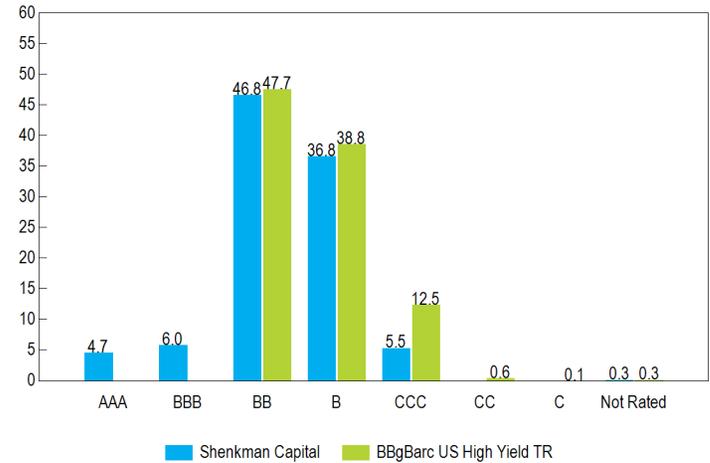
Portfolio Performance Summary

| | QTD (%) | YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|--------------------------|---------|---------|----------|-----------|-----------|------------|---------------|----------------|
| Shenkman Capital | 2.3 | 14.0 | 14.0 | 6.1 | 5.6 | 6.8 | 6.8 | Apr-06 |
| BBgBarc US High Yield TR | 2.6 | 14.3 | 14.3 | 6.4 | 6.1 | 7.6 | 7.4 | Apr-06 |

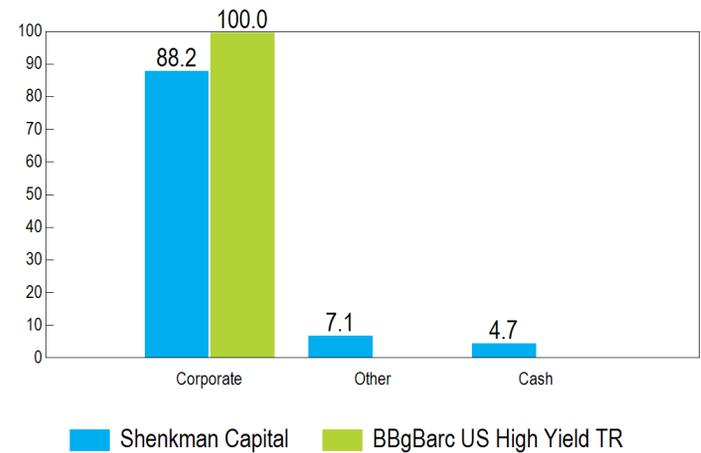
Shenkman Capital Characteristics vs. BBgBarc US High Yield TR

| | Portfolio Q4-19 | Index Q4-19 | Portfolio Q3-19 |
|-------------------------------------|-----------------|-------------|-----------------|
| Fixed Income Characteristics | | | |
| Yield to Maturity | 5.3 | 7.1 | 5.5 |
| Average Duration | 2.3 | 4.6 | 2.9 |
| Average Quality | BB | B | BB |
| Weighted Average Maturity | 5.8 | 5.9 | 5.8 |

Credit Quality Allocation



Sector Allocation



SSgA TIPS Index-NL | As of December 31, 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 |

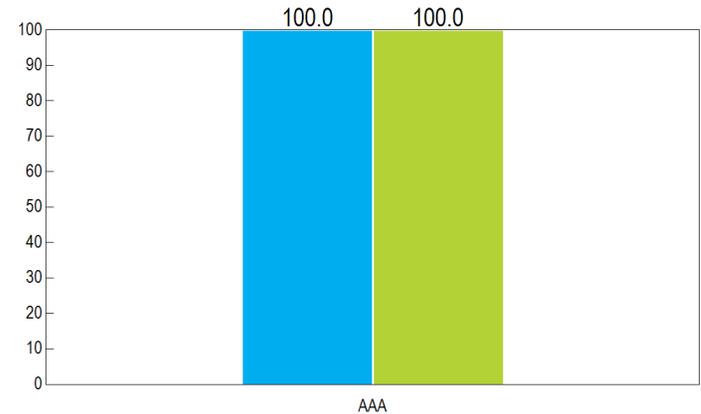
Portfolio Performance Summary

| | QTD (%) | YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|--------------------|---------|---------|----------|-----------|-----------|------------|---------------|----------------|
| SSgA TIPS Index-NL | 0.8 | 8.4 | 8.4 | 3.3 | 2.6 | 3.3 | 3.8 | Oct-05 |
| BBgBarc US TIPS TR | 0.8 | 8.4 | 8.4 | 3.3 | 2.6 | 3.4 | 3.8 | Oct-05 |

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

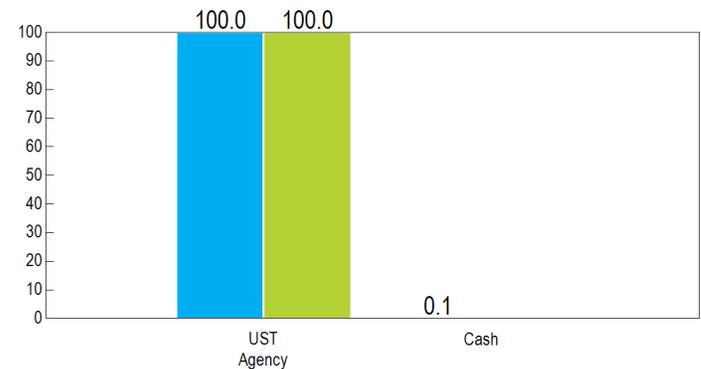
| | Portfolio Q4-19 | Index Q4-19 | Portfolio Q3-19 |
|-------------------------------------|-----------------|-------------|-----------------|
| Fixed Income Characteristics | | | |
| Yield to Maturity | 2.0 | 1.72 | 1.9 |
| Average Duration | 4.7 | 4.7 | 1.2 |
| Average Quality | AAA | AAA | AAA |
| Weighted Average Maturity | 8.0 | 8.0 | 8.4 |

Credit Quality Allocation



SSgA TIPS Index-NL (Blue bar) and BBgBarc US TIPS TR (Green bar)

Sector Allocation



SSgA TIPS Index-NL (Blue bar) and BBgBarc US TIPS TR (Green bar)

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 | |

Portfolio Performance Summary

| | QTD (%) | YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|-----------------------------------|---------|---------|----------|-----------|-----------|------------|---------------|----------------|
| Payden Emerging Market Bond | 3.0 | 16.5 | 16.5 | 6.7 | 6.1 | -- | 6.1 | Jan-15 |
| JP Morgan EMBI Global Diversified | 1.8 | 15.0 | 15.0 | 6.7 | 6.2 | 6.9 | 6.2 | Jan-15 |

Fund Characteristics as of December 31, 2019

Versus JP Morgan EMBI Global Diversified

| | |
|----------------------------|--------|
| Sharpe Ratio (3 Year) | 0.79 |
| Average Duration | 7.51 |
| Average Coupon | 6.48% |
| Average Effective Maturity | 12.29 |
| R-Squared (3 Year) | 0.91 |
| Alpha (3 Year) | -0.12% |
| Beta (3 Year) | 1.22 |

Payden Emerging Market Bond Characteristics vs. JP Morgan EMBI Global Diversified

| | Portfolio Q4-19 | Portfolio Q3-19 |
|-------------------------------------|-----------------|-----------------|
| Fixed Income Characteristics | | |
| Yield to Maturity | 6.1 | 6.3 |
| Average Duration | 7.5 | 7.4 |
| Average Quality | BB | BB |
| Weighted Average Maturity | 12.3 | 12.0 |

Fixed Income Sectors as of December 31, 2019

| | |
|--------------------|--------|
| GOVERNMENT | 70.15% |
| MUNICIPAL | 0.00% |
| CORPORATE | 16.66% |
| SECURITIZED | 0.00% |
| CASH & EQUIVALENTS | 2.96% |
| DERIVATIVE | 10.23% |

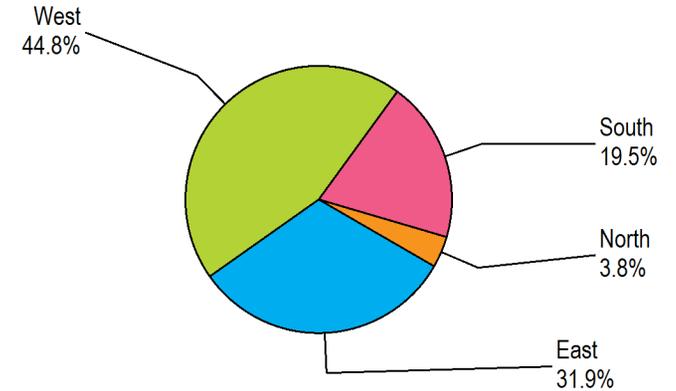
Credit Quality as of December 31, 2019

| | |
|-----------|--------|
| AAA | 2.00% |
| AA | 3.00% |
| A | 5.00% |
| BBB | 27.00% |
| BB | 20.00% |
| B | 31.00% |
| Below B | 9.00% |
| Not Rated | 3.00% |

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 |

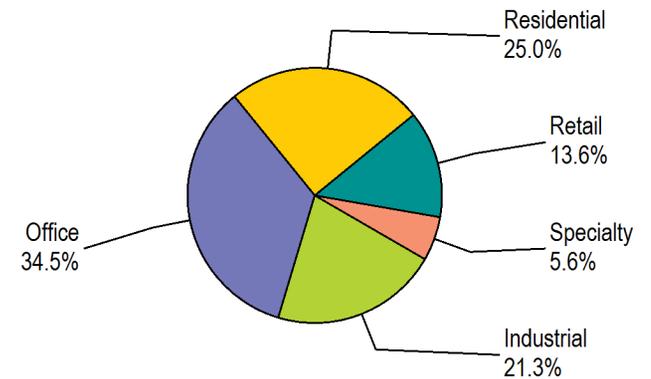
Geographic Diversification



Portfolio Performance Summary

| | QTD (%) | YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|------------------|---------|---------|----------|-----------|-----------|------------|---------------|----------------|
| Clarion Partners | 2.0 | 7.3 | 7.3 | 7.9 | 9.7 | 12.3 | 7.4 | Oct-02 |
| NCREIF ODCE | 1.5 | 5.3 | 5.3 | 7.1 | 9.0 | 11.4 | 8.1 | Oct-02 |

Property Type Allocation



| 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 |

Colony Realty Partners IV no longer has any funds invested in properties. While there is a residual balance in the Fund, it no longer has control over any real estate.

| Non-Marketable Securities Overview | | | | | | |
|--|--------------|-------------|---------------------|--------------------------|-------------|---------|
| As of December 31, 2019 | | | | | | |
| Account | Vintage Year | Commitment | Cumulative Takedown | Cumulative Distributions | Value (RV) | IRR (%) |
| North American Strategic Partners 2006 | 2006 | \$4,539,998 | \$4,387,178 | \$2,609,124 | \$623,610 | 6.8% |
| Ironsides Partnership Fund IV | 2015 | \$2,500,000 | \$1,157,107 | \$0 | \$1,574,679 | 22.5% |
| Ironsides Direct Investment Fund IV | 2015 | \$2,500,000 | \$2,419,534 | \$0 | \$3,098,461 | 15.7% |
| Ironsides Direct Investment Fund V, L.P. | 2019 | \$2,000,000 | \$2,018,030 | \$0 | \$2,134,461 | -- |
| HarbourVest 2019 Global Fund | 2019 | \$4,000,000 | \$200,000 | \$0 | \$200,000 | -- |

IRRs for investments less than 2 years old are not shown.

IRRs for all funds are as of 9/30/2019.

| Annual Investment Expense Analysis | | | | |
|--|---|---------------------|---------------------|---------------|
| As Of December 31, 2019 | | | | |
| Name | Fee Schedule | Market Value | Estimated Fee Value | Estimated Fee |
| Equity Assets | | \$88,627,124 | | |
| Domestic Equity Assets | | \$64,573,826 | | |
| RhumbLine S&P 500 Index | 0.07% of First 25.0 Mil, 0.05% of Next 25.0 Mil, 0.04% Thereafter | \$19,614,469 | \$13,730 | 0.07% |
| Fiduciary Large Cap Equity | 0.66% of Assets | \$26,005,351 | \$171,635 | 0.66% |
| Frontier Capital Appreciation | 0.79% of Assets | \$18,954,006 | \$149,737 | 0.79% |
| International Equity Assets | | \$24,053,298 | | |
| International Developed Markets Equity Assets | | \$17,481,489 | | |
| Rhumblin MSCI EAFE Index | 0.08% of First 25.0 Mil, 0.07% of Next 25.0 Mil, 0.05% Thereafter | \$17,481,489 | \$13,985 | 0.08% |
| International Emerging Markets Equity Assets | | \$6,571,809 | | |
| DFA Emerging Markets | 0.52% of Assets | \$3,108,552 | \$16,164 | 0.52% |
| Driehaus Emerging Market Equity | 0.90% of Assets | \$3,463,257 | \$31,169 | 0.90% |
| Fixed Income Assets | | \$85,266,414 | | |
| Investment Grade Bonds Assets | | \$40,897,935 | | |
| SSgA U.S. Aggregate Bond Index | 0.04% of Assets | \$40,897,935 | \$16,359 | 0.04% |
| High Yield Bond Assets | | \$19,629,557 | | |
| Shenkman Capital | 0.45% of Assets | \$19,629,557 | \$88,333 | 0.45% |
| TIPS Assets | | \$19,158,842 | | |
| SSgA TIPS Index-NL | 0.04% of Assets | \$19,158,842 | \$7,664 | 0.04% |
| Emerging Market Debt Assets | | \$5,580,081 | | |
| Payden Emerging Market Bond | 0.69% of Assets | \$5,580,081 | \$38,503 | 0.69% |

| Name | Fee Schedule | Market Value | Estimated Fee Value | Estimated Fee |
|---|---|----------------------|---------------------|---------------|
| Real Estate Assets | | \$5,851,132 | | |
| Open-Ended Real Estate | | \$5,796,523 | | |
| Clarion Partners | 1.10% of Assets | \$5,796,523 | \$63,762 | 1.10% |
| Total Closed End Real Estate | | \$54,609 | | |
| Colony Realty Partners IV | 1.5% management fee based on committed equity during the investment period and invested equity thereafter | \$21,529 | | |
| Rockwood Capital Real Estate Partners Fund XI, L.P. | 1.4% of committed capital during investment period; 1.4% on invested equity thereafter | \$33,080 | | |
| Private Equity Assets | | \$7,631,210 | | |
| North American Strategic Partners 2006 | 0.8% on drawn and undrawn capital less investments sold or written off 5% carried interest, 8% preferred return | \$623,610 | | |
| Ironsides Partnership Fund IV | 0% Management fee, 8% Preferred Return, 5% Carried Interest | \$1,574,679 | | |
| Ironsides Direct Investment Fund IV | 0.5% Management fee, 8% Preferred Return, 15% Carried Interest | \$3,098,461 | | |
| Ironsides Direct Investment Fund V, L.P. | 0.5% Management fee, 8% preferred return, 15% carried interest | \$2,134,461 | | |
| HarbourVest 2019 Global Fund | 0.69% average annual management fee; 8.0% preferred return on secondary and direct investments and with corresponding carried interest of 12.5% on secondary and direct investments | \$200,000 | | |
| Cash | | \$249,681 | | |
| Comerica Short Term Fund | | \$249,681 | | |
| Total | | \$187,625,561 | \$611,041 | 0.33% |

Current Issues

Asset Allocation Review

Introduction

- This document evaluates the current asset allocation policy and presents an alternative asset allocation option for the System.
- The goal of this review is not to declare one portfolio the “right” choice or the only prudent choice, but to highlight the risk and return tradeoffs of different policy portfolios.
- The asset allocation review process highlights the natural tension between long-term goals and short-term risks, and should allow the System to make more informed decisions regarding portfolio positioning.

Asset Allocation

What is Asset Allocation?

- Asset allocation refers to the distribution of assets across a number of asset classes that exhibit different correlations with each other. Each asset class exhibits a unique combination of risk and reward. The expected and realized long-term returns vary by asset class, as does the interim volatility of those returns. Some asset classes, like equities, exhibit high degrees of volatility, but also offer high returns over time. Other asset classes, like cash, experience very little volatility, but offer limited return potential.

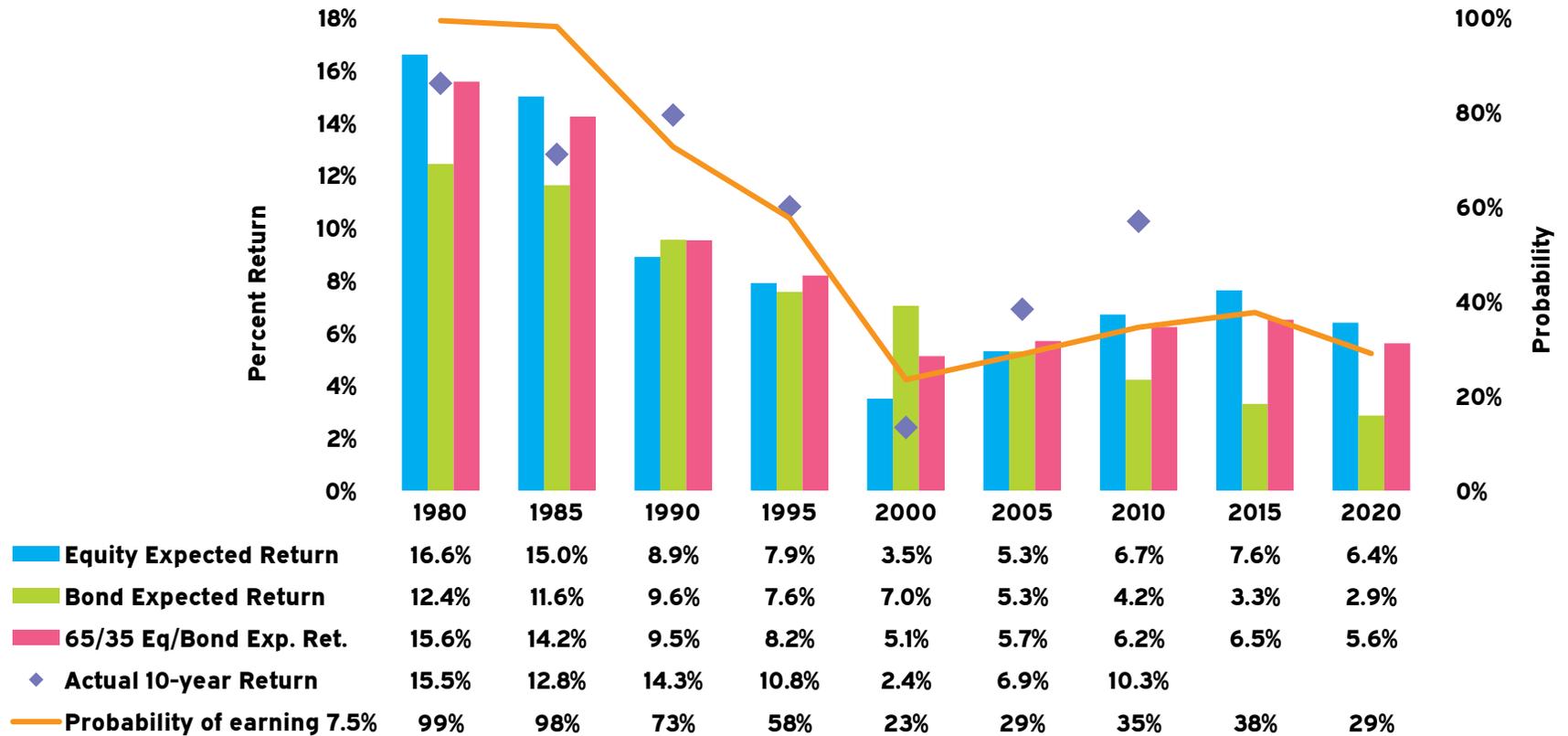
Why is Asset Allocation Important?

- The distribution of assets across various asset classes exerts a major influence on the return behavior of the aggregate pool over short and long time periods.

How does Asset Allocation affect aggregate performance?

- In addition to exhibiting unique characteristics, each asset class interacts differently with other asset classes. Because of low correlations, the likelihood that any two asset classes will move together in the same direction is limited, with the movement of one asset class often offsetting another's. Combining asset classes allows investors to control more fully the aggregate risk and return of their portfolios, and to benefit from the reduction in volatility that stems from diversification.

The Secular Decline in Investment Returns¹



- The chart above illustrates that a portfolio comprising of 65% domestic stocks and 35% investment grade bonds has produced diminishing expected returns as well as actual returns over the past 30 years.

¹ Expected return assumptions for 1) Bonds equals the yield of the ten-year Treasury plus 100 basis points, and 2) Equities equals the dividend yield plus the earnings yield of the S&P 500 index (using the inflation-adjusted trailing 10-year earnings). Probability calculation is for the subsequent ten years.

Asset Allocation and Proposed Policy¹

| | Current Policy (%) | Proposed 1 (%) | Proposed 2 (%) | Proposed Target Ranges (%) |
|---|--------------------|----------------|----------------|----------------------------|
| Growth/Equity | 50 | 57 | 65 | |
| US Equity | 33 | 34 | 38 | 28-42 |
| Developed Market Equity (non-US) | 9 | 10 | 12 | 5-15 |
| Emerging Market Equity | 3 | 8 | 10 | 1-12 |
| Private Equity | 5 | 5 | 5 | 3-7 |
| Credit | 13 | 14 | 11 | |
| High Yield Bonds | 10 | 7 | 5 | 5-12 |
| Private Debt Composite | 0 | 4 | 4 | 0-5 |
| Emerging Market Bonds (major) | 3 | 3 | 2 | 1-5 |
| Rate Sensitive | 32 | 20 | 12 | |
| Investment Grade Bonds | 22 | 18 | 12 | 10-25 |
| TIPS | 10 | 2 | 0 | 0-10 |
| Real Assets | 5 | 9 | 12 | |
| Real Estate | 5 | 7 | 7 | 2-10 |
| Infrastructure (Non-Core Private) | 0 | 2 | 5 | 0-5 |
| Expected Return (20 years) | 6.5 | 7.2 | 7.8 | |
| Standard Deviation | 10.6 | 12.6 | 14.2 | |
| Probability of Achieving 7.5% over 20 Years | 32.5 | 45.4 | 52.6 | |

¹ Expected return and standard deviation are based upon Meketa Investment Group's 2020 Annual Asset Study. Throughout this document, returns for periods longer than one year are annualized.

Infrastructure

Asset Class Description

- The underlying foundation of basic services, facilities, and institutions upon which a community depends.
- Investable infrastructure includes the development and/or ownership of:
 - Transportation -- roads, bridges, airports
 - Environmental -- water, waste, sanitation
 - Energy -- pipelines, power generation and distribution
 - Communication -- cable, internet, phone networks
 - Social -- hospitals, schools, parks
- This is a relatively new asset class to US investors, but it has a longer history in Europe, Canada, and Australia.
- Investors can access infrastructure through public and private markets.

Pros

- Equity-like returns.
- Provides a hedge against inflation.
- Low correlation to other asset classes.

Cons

- Public to private assets may be subject to political pressures in some areas.
- Private market structures are illiquid and can use leverage.

Private Debt

Asset Class Description

- Private debt investments provide alternative financing to businesses and assets in competition with traditional capital market or bank financing.
- Investors are compensated with incremental return in exchange for lower liquidity and serving as solution providers to these businesses.
- Sources of return include interest payments, cash distributions, upfront fees, and original issuance discount.
- Broad opportunity set combines yield-oriented and opportunistic strategies across multiple collateral types (asset-based, consumer, corporate and mortgage-related).
 - Cash flowing assets provide diversification, income, and lower portfolio volatility, while opportunistic provides the opportunity for higher returns.
- Although we are currently late in the credit cycle, this cycle continues to extend.

Pros

- Opportunity for high return.
- Low correlation to other asset classes.
- Better terms than public credit.

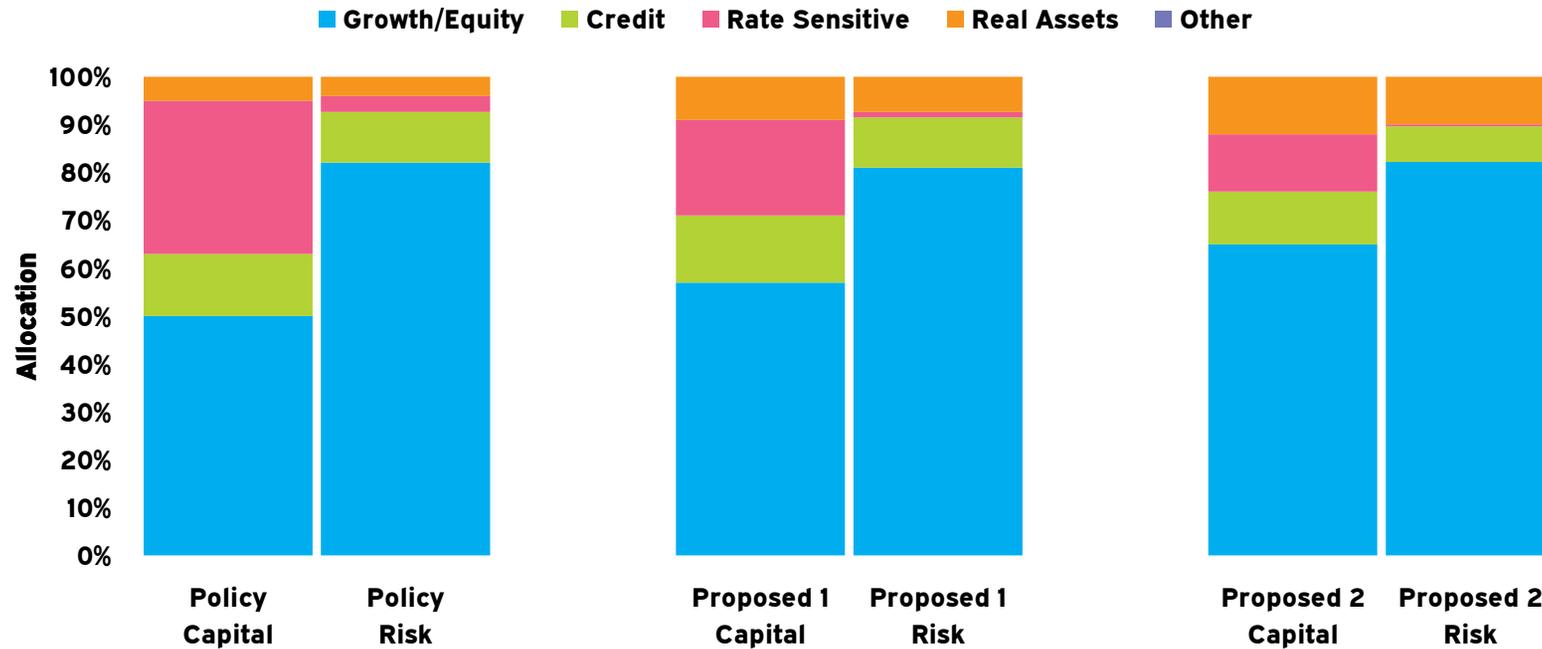
Cons

- Low liquidity.
- Higher risk than public credit counterparts.

Proposed Policy Changes

- As demonstrated in the table, we propose a two-step glidepath for the System to transition to a new policy.
 - The two-step process would allow for a gradual transition of assets to a higher risk portfolio, so that the System can better position the assets to align with the current return objectives.
- The proposed policy represents a higher return portfolio compared to the current policy exceeding the System's assumed rate of return of 7.5% and has a higher standard deviation at 14.2% versus the current policy's 10.6%.
- While the glidepath includes the two-step transition, ultimately the total allocation to equities would increase by 15%.
 - US equities would increase by 5%, foreign equities by 3%, and emerging market equity by 7%.
- The System's allocation to high grade bonds assets would decrease by 20%.
 - The decrease would be 10% from investment grade bonds and 10% from TIPS, eliminating the target to the TIPS asset class.
- The System's allocation to Credit assets would decrease by 2%.
 - While high yield bonds would decrease by 5%, and emerging market bonds down by 1%, the new allocation to private debt would be 4%.
- The System's allocation to real assets would increase by 7%. Real estate would increase by 2%, and a new allocation to infrastructure would be 5% of the Total System.

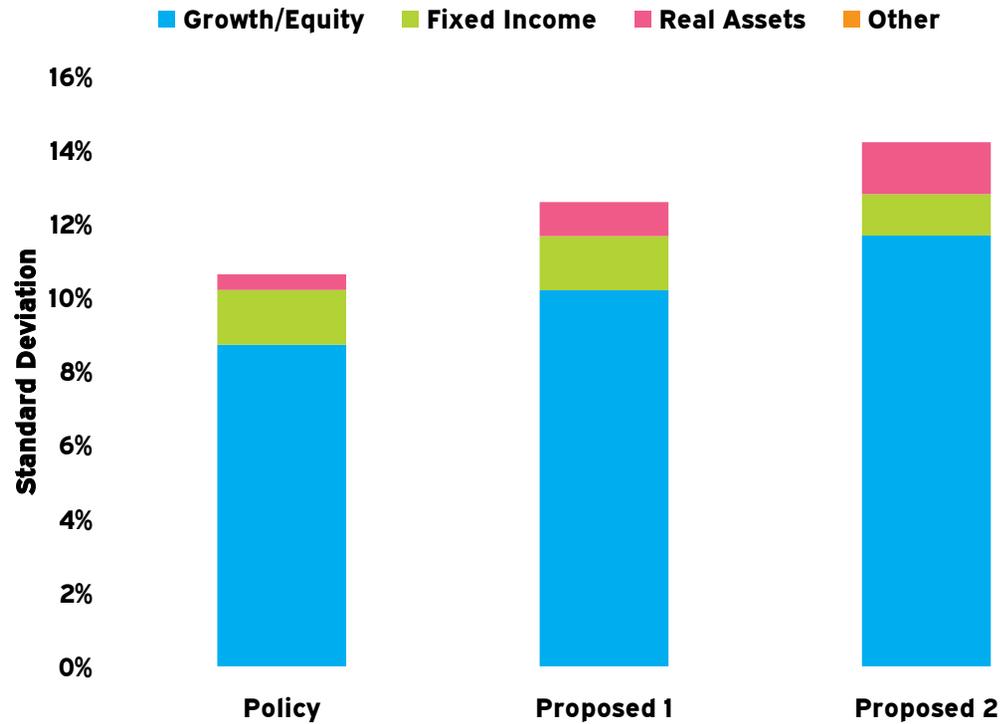
Risk Budgeting Analysis¹ (Capital Allocation vs. Risk Allocation)



- Assets with low relative volatility, such as rate sensitive fixed income, contribute less to risk than their asset weighting implies.

¹ Risk allocation is calculated by multiplying the weight of the asset class by its standard deviation and its correlation with the total portfolio and then dividing this by the standard deviation of the total portfolio.

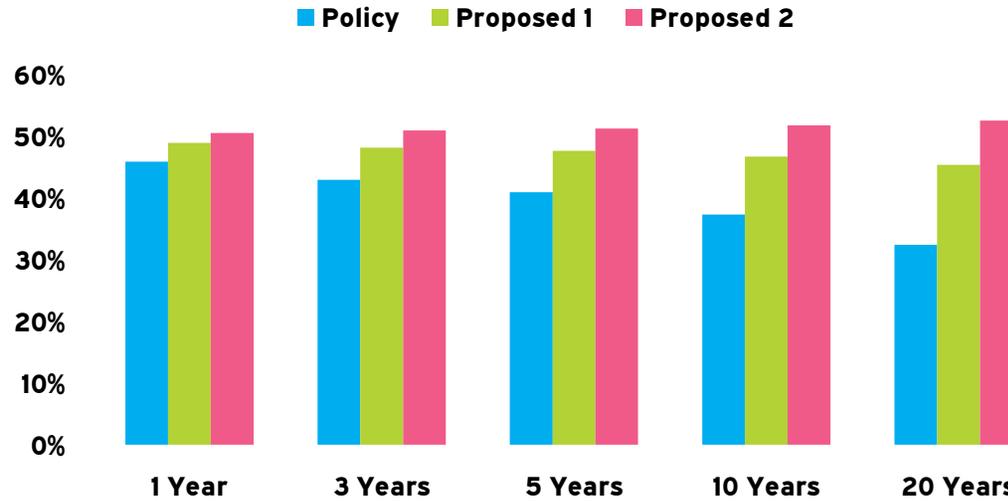
Risk Budgeting Analysis¹
(Absolute Contribution to Risk)



- In each policy option, equity risk dominates the risk profile of the portfolio.

¹ Contribution to risk is calculated by multiplying the weight of the asset class by its standard deviation and its correlation with the total portfolio.

Probability of Achieving Target Return¹



| | Policy (%) | Proposed 1 (%) | Proposed 2 (%) |
|----------|------------|----------------|----------------|
| 1 Year | 45.9 | 49.0 | 50.6 |
| 3 Years | 43.0 | 48.2 | 51.0 |
| 5 Years | 41.0 | 47.7 | 51.3 |
| 10 Years | 37.4 | 46.8 | 51.8 |
| 20 Years | 32.5 | 45.4 | 52.6 |

- Proposed Policy 2 has the highest likelihood of producing the target return over a twenty year period.

¹ Represents the probability of achieving a 7.5% return over the specified time horizon.

Summary and Conclusions

- As returns across asset classes have continued to diminish over the past 30 years, capital markets return assumptions for 2020 continue this decreased trend.
- As a result, in order to achieve the System's return objectives, it may be necessary to in turn increase the System's expected risk.
- The System should consider the addition of private debt and infrastructure in order to diversify the portfolio while increasing return potential.
- The proposed policies would increase the System's standard deviation while increasing expected return.

Meketa Investment Group 2020 Annual Asset Study
 Twenty-Year Annualized Return and Volatility Expectations for Major Asset Classes

| Asset Class | Annualized Compounded Return (%) | Annualized Average Return (%) | Annualized Standard Deviation (%) |
|---|----------------------------------|-------------------------------|-----------------------------------|
| Rate Sensitive | | | |
| Cash Equivalents | 2.4 | 2.4 | 1.0 |
| Investment Grade Bonds | 3.0 | 3.1 | 4.0 |
| Long-term Government Bonds | 3.2 | 3.9 | 12.0 |
| TIPS | 2.9 | 3.1 | 7.0 |
| Credit | | | |
| High Yield Bonds | 5.2 | 5.8 | 11.0 |
| Bank Loans | 5.0 | 5.4 | 9.0 |
| Emerging Market Bonds (major; unhedged) | 4.5 | 5.1 | 11.0 |
| Emerging Market Bonds (local; unhedged) | 4.8 | 5.8 | 14.0 |
| Direct Lending - First Lien | 6.2 | 6.8 | 11.0 |
| Direct Lending - Second Lien | 7.5 | 8.6 | 15.0 |
| Mezzanine Debt | 7.0 | 8.1 | 15.0 |
| Distressed Debt | 7.0 | 9.0 | 20.0 |
| Equities | | | |
| Public US Equity | 7.4 | 8.8 | 17.0 |
| Public Developed Market Equity | 7.9 | 9.7 | 19.0 |
| Public Emerging Market Equity | 9.1 | 12.0 | 24.0 |
| Private Equity Composite | 9.4 | 12.8 | 26.0 |
| Real Assets | | | |
| REITs | 7.0 | 10.4 | 26.0 |
| Core Private Real Estate | 6.3 | 6.9 | 11.0 |
| Value Added Real Estate | 8.4 | 10.0 | 18.0 |
| Opportunistic Real Estate | 9.9 | 12.8 | 24.0 |
| High Yield Real Estate Debt | 6.0 | 7.6 | 18.0 |
| Natural Resources (Private) | 8.8 | 11.0 | 21.0 |
| Commodities | 4.3 | 5.7 | 17.0 |
| Infrastructure (Core) | 6.7 | 7.7 | 14.0 |
| Infrastructure (Non-Core) | 9.1 | 11.5 | 22.0 |
| Other | | | |
| Hedge Funds | 4.9 | 5.1 | 7.0 |

Meketa Investment Group 2020 Annual Asset Study: Correlation Expectations

| | Investment Grade Bonds | TIPS | High Yield Bonds | US Equity | Developed Market Equity | Emerging Market Equity | Private Equity | Real Estate | Natural Resources (private) | Commodities | Core Infrastructure (private) | Hedge Funds |
|-------------------------------|------------------------|------|------------------|-----------|-------------------------|------------------------|----------------|-------------|-----------------------------|-------------|-------------------------------|-------------|
| Investment Grade Bonds | 1.00 | | | | | | | | | | | |
| TIPS | 0.80 | 1.00 | | | | | | | | | | |
| High Yield Bonds | 0.20 | 0.30 | 1.00 | | | | | | | | | |
| US Equity | 0.05 | 0.00 | 0.70 | 1.00 | | | | | | | | |
| Developed Market Equity | 0.05 | 0.15 | 0.70 | 0.90 | 1.00 | | | | | | | |
| Emerging Market Equity | 0.05 | 0.15 | 0.70 | 0.80 | 0.90 | 1.00 | | | | | | |
| Private Equity | 0.05 | 0.05 | 0.65 | 0.85 | 0.80 | 0.75 | 1.00 | | | | | |
| Real Estate | 0.20 | 0.10 | 0.50 | 0.50 | 0.45 | 0.40 | 0.45 | 1.00 | | | | |
| Natural Resources (private) | 0.10 | 0.10 | 0.45 | 0.65 | 0.60 | 0.60 | 0.55 | 0.45 | 1.00 | | | |
| Commodities | 0.05 | 0.30 | 0.40 | 0.35 | 0.55 | 0.60 | 0.30 | 0.15 | 0.65 | 1.00 | | |
| Core Infrastructure (private) | 0.30 | 0.30 | 0.60 | 0.55 | 0.55 | 0.50 | 0.45 | 0.60 | 0.60 | 0.35 | 1.00 | |
| Hedge Funds | 0.05 | 0.20 | 0.70 | 0.80 | 0.85 | 0.85 | 0.65 | 0.45 | 0.65 | 0.65 | 0.60 | 1.00 |

Peer Fee Review

In January, PERAC published its investment fee report for calendar year 2018

- The last version of this report, released in 2017 cover calendar year 2015, had various issues.
 - A close review of the report revealed numerous discrepancies.
 - Full accounting of performance and incentive fees appeared limited, many systems simply did not report them.
 - In some cases, systems reported no fees at all for investments that other systems reported significant fees for.
 - Some systems did not even submit fee schedules or submitted schedules with material errors.
- Meketa and other systems worked together to make PERAC aware of these shortcomings and defend the Board's approach to managing costs.

Data quality in the 2018 report appears to have improved due to a number of factors

- PERAC specifically requests incentive and performance fees be reported separately on Schedule 7.
- More cross checks appear to have been performed to validate reported expenses.

PERAC reports the System's fee at 0.38%, tied with 1 other System for the 5th cheapest fee level.

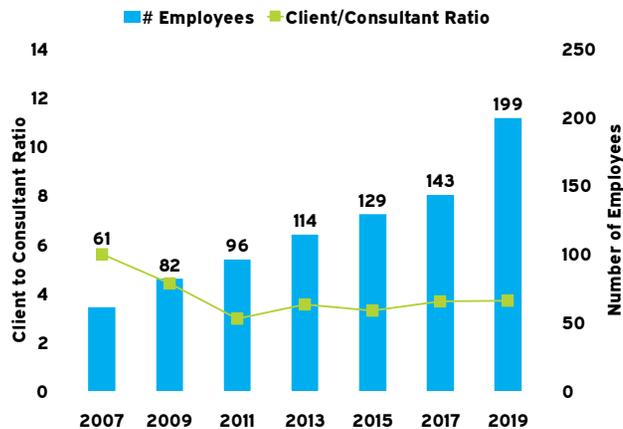
- The System's fee is substantially below the State and Teachers (0.55% each) as well as the median fee for all retirement systems (0.54%) and average fee for all systems (0.58%).
- Fee levels are tightly clustered around the State level – more than 40% of systems are within 0.01% of the State fee level (0.54%-0.56%) while almost 60% are within 0.05% (0.50%-0.60%).
- Multiple ways to help control fees.
 - Renegotiate management fees (RFPs)
 - Relationship Pricing (e.g., Constitution, Payden)
 - Lineup changes
- We continue to believe the System's approach to fees makes sense.
 - Pay for strong managers where strong management is likely to add value.
 - Always negotiate.

Appendices

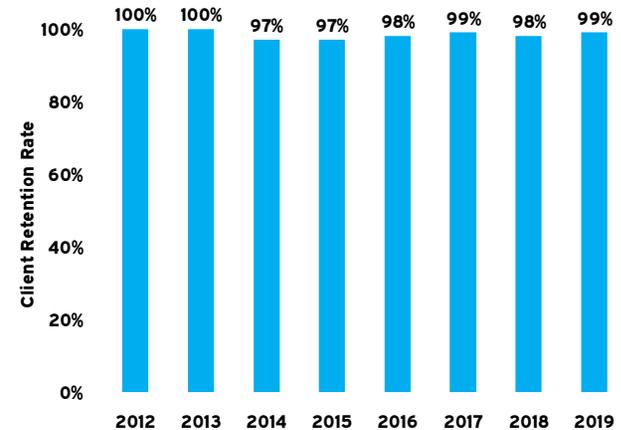
**Meketa Investment Group
Corporate Update**

- Staff of 199, including 132 investment professionals and 40 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 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. $\text{Portfolio Return} - [\text{Risk Free Rate} + \text{Beta} * (\text{market return} - \text{Risk Free Rate})]$.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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