

# City of Marlborough Contributory Retirement System

Meeting Materials  
July 26, 2022

## Fund Evaluation Report

## Agenda

1. Economic and Market Update Data as of June 30, 2022
2. Second Quarter 2022 Investment Review
  - Retirement System Summary
  - Retirement System Detail
  - Portfolio Reviews
3. Current Issues
  - Asset Allocation Update
  - City of Marlborough Contributory Retirement System Custody Service Review
4. Appendices
  - Meketa Investment Group Corporate Update
  - Disclaimer, Glossary, and Notes

## **Economic and Market Update**

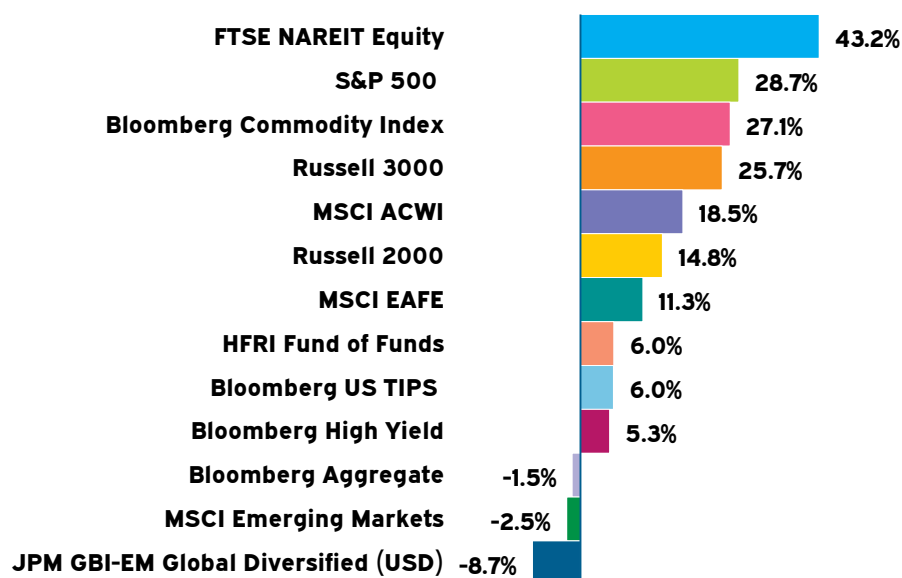
Data as of June 30, 2022

### Commentary

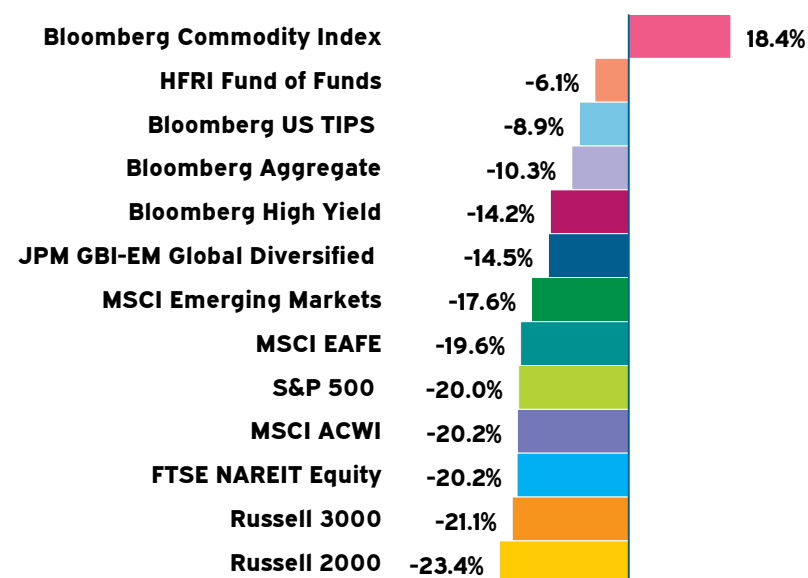
- Global markets resumed their sell-off in June as inflation surged in the US and Europe.
- In response, the US Federal Reserve increased interest rates 75 basis points (above prior expectations). Markets also repriced the growth outlook downward.
  - All major equity indices suffered steep declines in June. Emerging markets proved slightly more resilient than developed markets on a partial re-opening in China from pandemic related lockdowns.
  - In a reversal of the prior trend growth stocks outperformed value stocks in June.
  - The global bond selloff resumed, as inflation fears, and policy expectations weighed on all major bond markets.
- Persistently high inflation and the expected policy response, the war in Ukraine, lingering COVID-19 issues, and lockdowns in China will all have considerable economic and financial consequences for the global economy.

### Index Returns<sup>1</sup>

#### 2021



#### 2022 Through June



→ Outside of emerging markets and the broad US investment grade bond market (Bloomberg Aggregate), most asset classes appreciated in 2021.

→ In June all major asset classes posted negative returns on renewed inflation and economic growth fears, with equities experiencing the largest declines.

<sup>1</sup> Source: Bloomberg and FactSet. Data is as of June 30, 2022.

### Domestic Equity Returns<sup>1</sup>

Domestic Equity	June (%)	Q2 (%)	YTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
S&P 500	-8.3	-16.1	-20.0	-10.6	10.6	11.3	12.9
Russell 3000	-8.4	-16.7	-21.1	-13.9	9.8	10.6	12.6
Russell 1000	-8.4	-16.7	-20.9	-13.0	10.2	11.0	12.8
Russell 1000 Growth	-7.9	-20.9	-28.1	-18.8	12.6	14.3	14.8
Russell 1000 Value	-8.7	-12.2	-12.9	-6.8	6.9	7.2	10.5
Russell MidCap	-10.0	-16.8	-21.6	-17.3	6.6	8.0	11.3
Russell MidCap Growth	-7.5	-21.1	-31.0	-29.6	4.3	8.9	11.5
Russell MidCap Value	-11.0	-14.7	-16.2	-10.0	6.7	6.3	10.6
Russell 2000	-8.2	-17.2	-23.4	-25.2	4.2	5.2	9.4
Russell 2000 Growth	-6.2	-19.3	-29.5	-33.4	1.4	4.8	9.3
Russell 2000 Value	-9.9	-15.3	-17.3	-16.3	6.2	4.9	9.0

**US Equities: Russell 3000 Index declined 8.3%, and growth indices outperformed value in June.**

- US stocks experienced steep losses for the month, led by the energy and materials sectors.
- Growth indices outperformed their value counterparts for the month but remain well behind for the year-to-date period.
- Small company stocks slightly outperformed large company stocks in June but remain behind their larger peers year-to-date.

<sup>1</sup> Source: Bloomberg. Data is as of June 30, 2022.

### Foreign Equity Returns<sup>1</sup>

Foreign Equity	June (%)	Q2 (%)	YTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
MSCI ACWI ex. US	-8.6	-13.7	-18.4	-19.4	1.3	2.5	4.8
MSCI EAFE	-9.3	-14.5	-19.6	-17.8	1.1	2.2	5.4
MSCI EAFE (Local Currency)	-6.3	-7.8	-11.3	-6.6	4.4	4.3	8.3
MSCI EAFE Small Cap	-11.0	-17.7	-24.7	-24.0	1.1	1.7	7.2
MSCI Emerging Markets	-6.6	-11.5	-17.6	-25.3	0.6	2.2	3.1
MSCI Emerging Markets (Local Currency)	-4.6	-8.1	-13.7	-20.2	3.3	4.4	6.0
MSCI China	6.6	3.4	-11.3	-31.8	-0.6	2.1	5.5

**International Equities (MSCI EAFE) declined 9.3% and Emerging Markets (MSCI EM) declined 6.6% in June.**

- Non-US developed market stocks slightly trailed the US for the month, while emerging markets stocks had better results due to China gaining 6.6%. Both remain notably negative for the year-to-date period, but ahead of the US.
- The war in Ukraine, high inflation and the likely monetary policy response, and slowing growth continue to weigh on sentiment.
- As in the US, growth stocks outperformed value stocks across developed and emerging markets.

<sup>1</sup> Source: Bloomberg. Data is as of June 30, 2022.

### Fixed Income Returns<sup>1</sup>

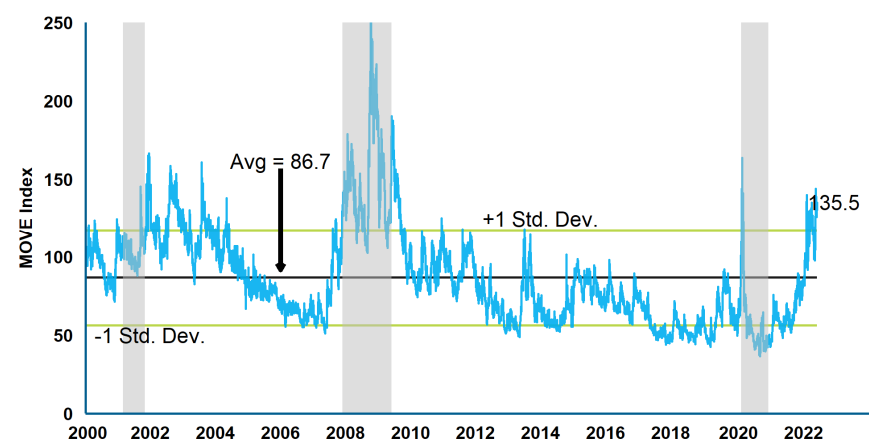
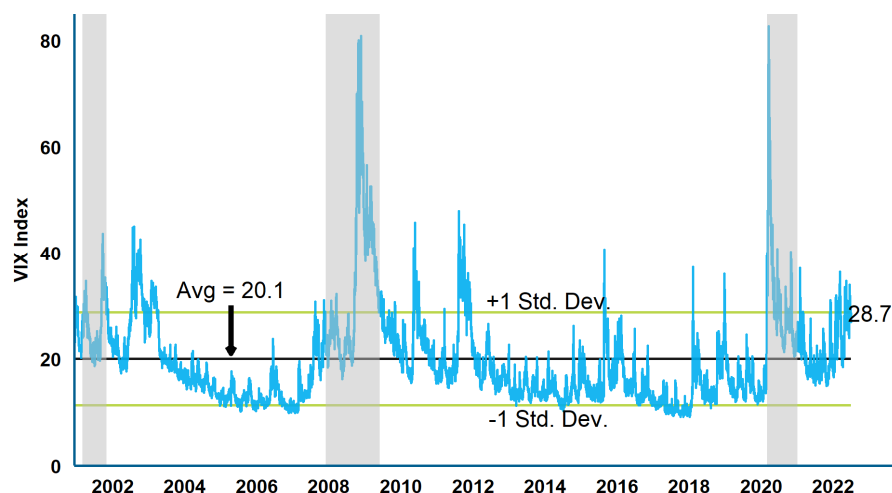
Fixed Income	June (%)	Q2 (%)	YTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)	Current Yield (%)	Duration (Years)
Bloomberg Universal	-2.0	-5.1	-10.9	-10.9	-0.9	0.9	1.8	4.2	6.4
Bloomberg Aggregate	-1.6	-4.7	-10.3	-10.3	-0.9	0.9	1.5	3.7	6.6
Bloomberg US TIPS	-3.2	-6.1	-8.9	-5.1	3.0	3.2	1.7	3.4	7.0
Bloomberg High Yield	-6.7	-9.8	-14.2	-12.8	0.2	2.1	4.5	8.9	4.8
JPM GBI-EM Global Diversified (USD)	-4.5	-8.6	-14.5	-19.3	-5.8	-2.3	-1.5	7.4	4.9

### Fixed Income: The Bloomberg Universal declined 2.0% in June.

- The above expectations CPI print led to renewed inflation fears driving interest rates higher and weighing on the broad US investment grade bond market (Bloomberg Aggregate).
- Despite the above expectation CPI prints, breakeven inflation rates have continued to move down driven by the decline in nominal rates. The nominal 10-year Treasury yield peaked at 3.47% before declining to 3.01% by month-end, while the 2-year Treasury yield declined from 3.43% to 2.95%.
- US credit spreads widened, particularly for high yield debt, leading to it having the worst results among bonds for the month.
- Emerging market debt also declined for the month.

<sup>1</sup> Source: Bloomberg. JPM GBI-EM is from InvestorForce. Data is as of June 30, 2022.

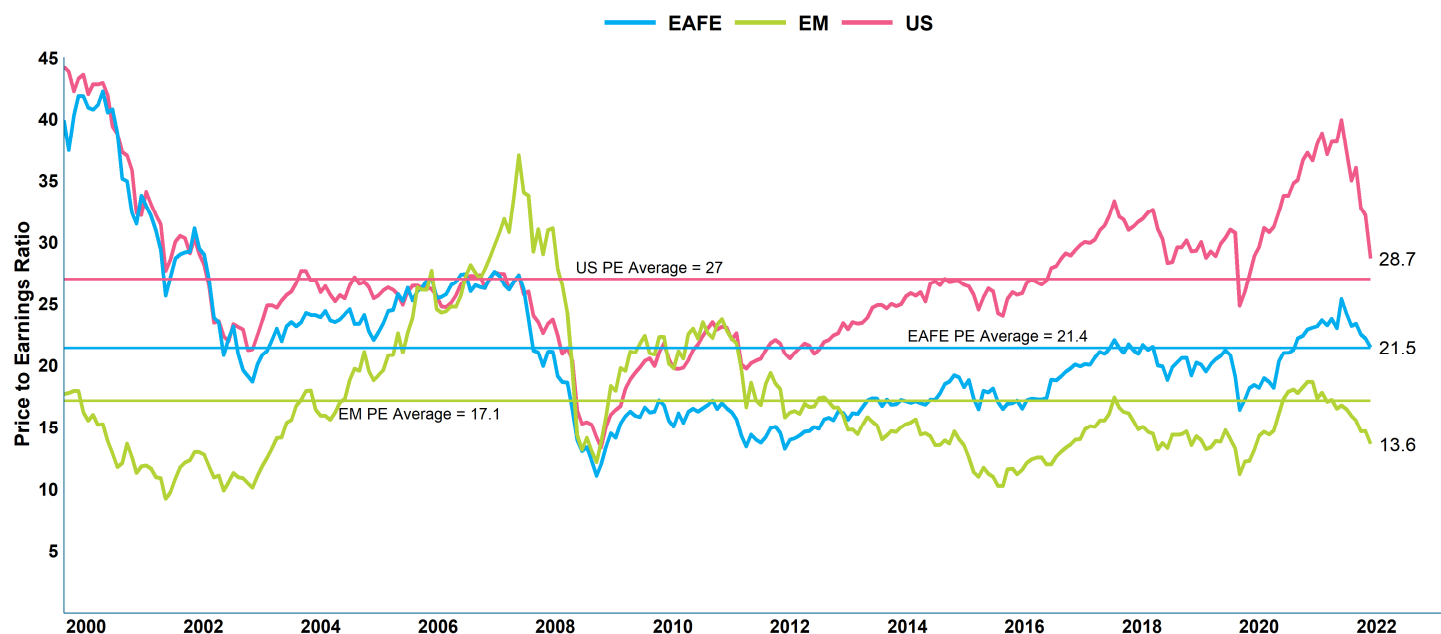
### Equity and Fixed Income Volatility<sup>1</sup>



- Volatility in equities (VIX) and fixed income (MOVE) rose in June on renewed inflation fears and on building signs of weakness in economic growth.
- Fixed income volatility remains particularly high due to the uncertain path of short-term interest rates.

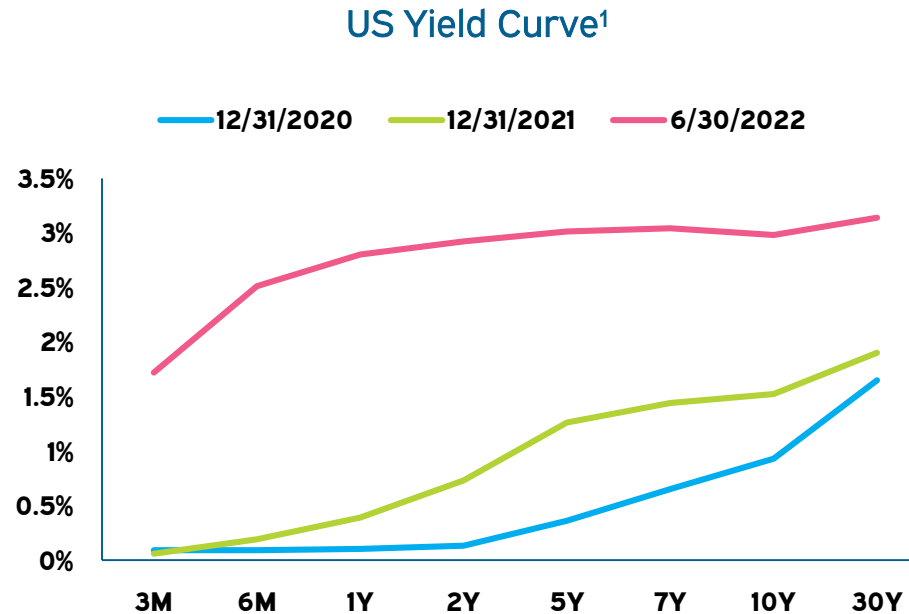
<sup>1</sup> Equity and Fixed Income Volatility – Source: Bloomberg. Implied volatility as measured using VIX Index for equity markets and the MOVE Index to measure interest rate volatility for fixed income markets. Data is as of June 2022. The average line indicated is the average of the VIX and MOVE values between January 2000 and the recent month-end respectively.

### Equity Cyclically Adjusted P/E Ratios<sup>1</sup>



- The steep decline in June in US equities pushed valuations lower, approaching the level of the long-term (post-2000) average.
- International developed market valuations remain below the US and are slightly above their own long-term average, with those for emerging markets the lowest and under the long-term average.

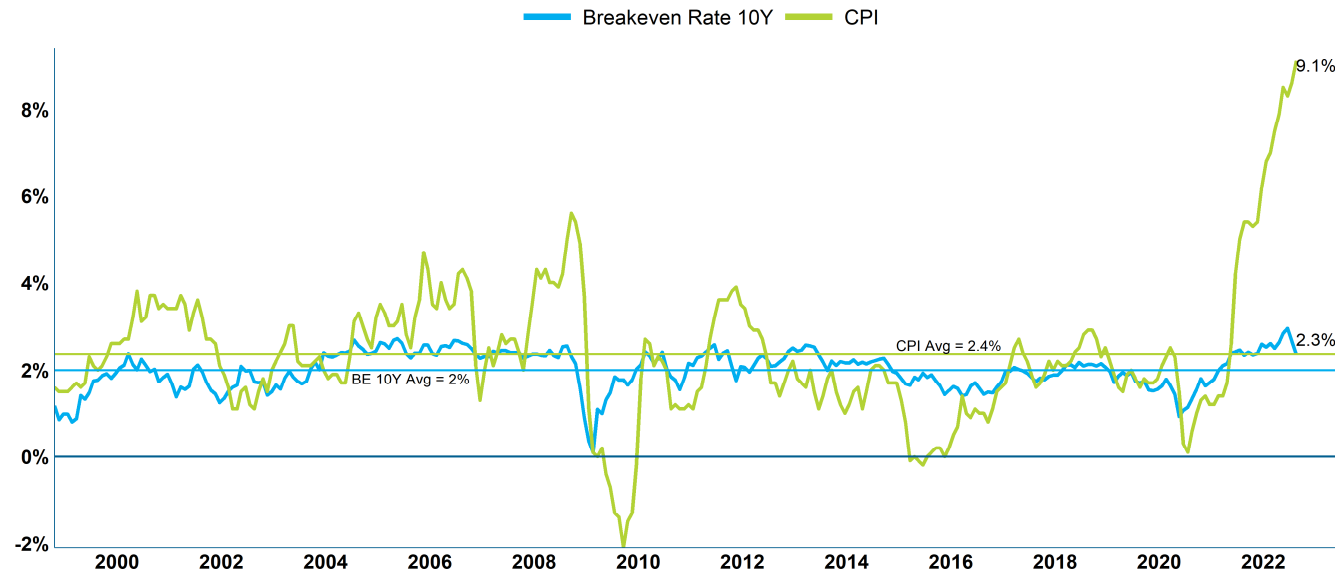
<sup>1</sup> US Equity Cyclically Adjusted P/E on S&P 500 Index. Source: Robert Shiller, Yale University, and Meketa Investment Group. Developed and Emerging Market Equity (MSCI EAFE and EM Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly “as reported” earnings over the previous ten years. Data is as of June 30, 2022. The average line is the long-term average of the US, EM, and EAFE PE values from December 1999 to the recent month-end respectively.



- Rates across the yield curve remain much higher than at the start of the year.
- In June, rates rose across maturities (particularly short-dated), as markets continue to reflect elevated inflation and rate expectations.
- The curve continued to flatten in June with the spread between two-year and ten-year Treasuries falling from 30 basis points at the end of May to just 5 basis points by the end of June.
- Since month-end, the spread between two-year and ten-year Treasuries became negative which historically has often signaled a coming recession.

<sup>1</sup> Source: Bloomberg. Data is as of June 30, 2022.

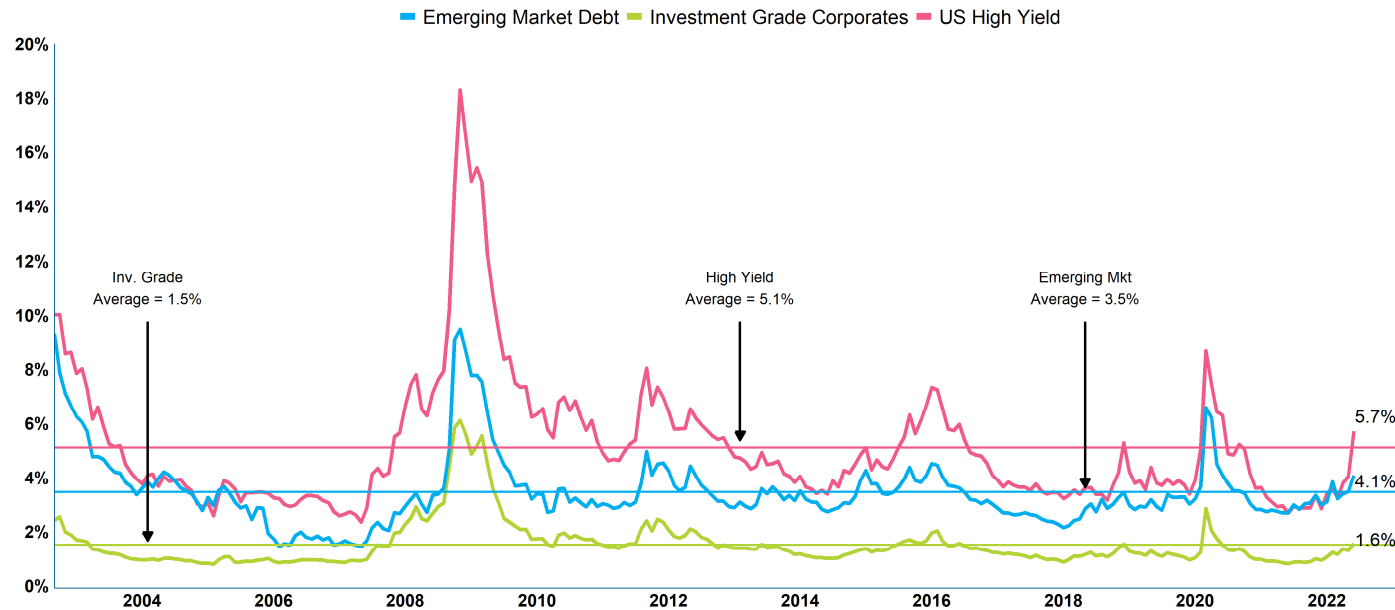
### Ten-Year Breakeven Inflation and CPI<sup>1</sup>



- Inflation expectations (breakevens) fell further in June on declining growth expectations and anticipated tighter monetary policy.
- Trailing twelve-month CPI rose in June (9.1% versus 8.6%) and notably came in above expectations. Inflation levels in the US remain well above the long-term average of 2.4%.
- Rising prices for energy (particularly oil), food, housing, and for new and used cars, remain key drivers of higher inflation.

<sup>1</sup> Source: Bloomberg. Data is as of June 30, 2022. The CPI and 10 Year Breakeven average lines denote the average values from August 1998 to the present month-end respectively. Breakeven values represent month-end values for comparative purposes.

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



- Credit spreads (the spread above a comparable maturity Treasury) rose in June with high yield and investment grade corporate bonds breaking above their long-run averages.
- In the US, spreads for high yield significantly increased from 4.0% to 5.7% in the risk-off environment, while investment grade spreads experienced a more modest increase (1.3% to 1.6%). Emerging market spreads also rose (3.5% to 4.1% during the month) but finished much lower than US high yield spreads.

<sup>1</sup> Sources: Bloomberg. Data is as of June 30, 2022. Average lines denote the average of the investment grade, high yield, and emerging market spread values from August 2000 to the recent month-end respectively.

### Global Economic Outlook

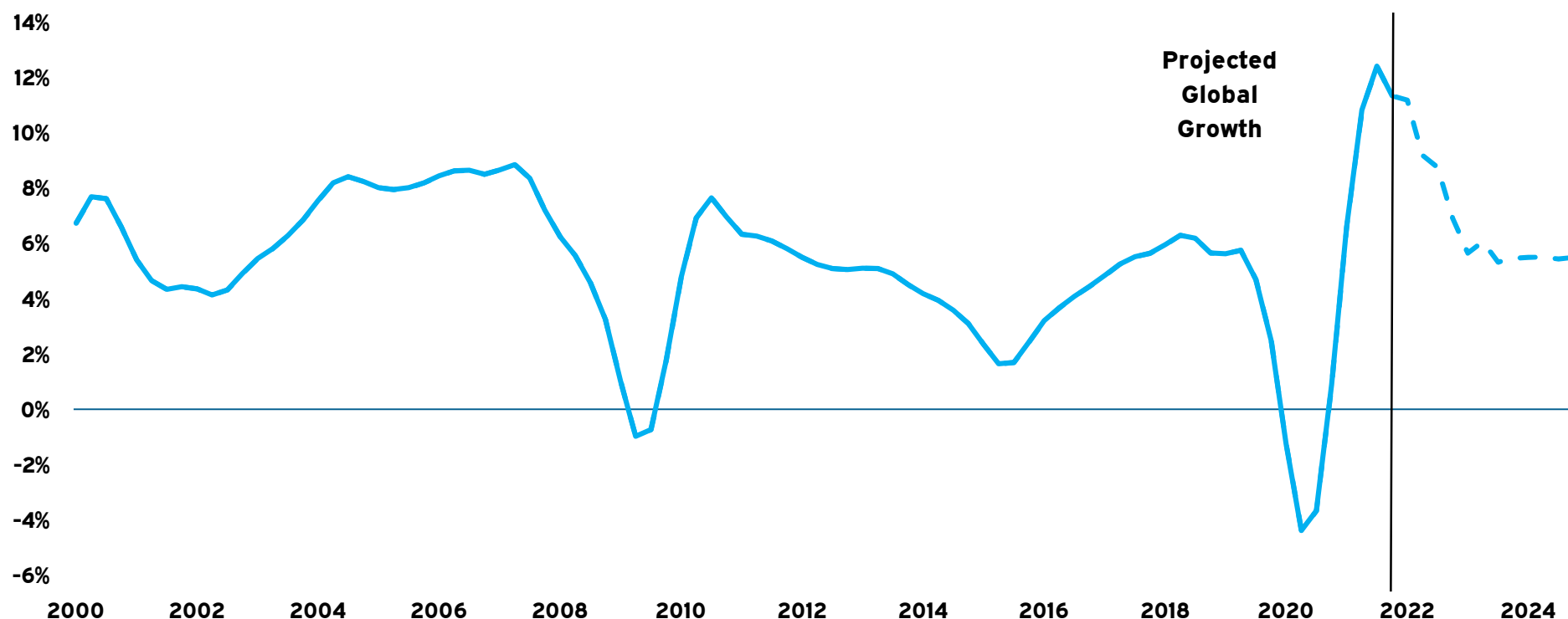
The IMF significantly lowered global growth forecasts in their latest projections, driven by the economic impacts of the war in Ukraine.

- The IMF forecasts final global GDP growth to come in at 6.1% in 2021 and 3.6% in 2022 (0.8% below the prior 2022 estimate), both still above the past ten-year 3.0% average.
- In advanced economies, GDP is projected to increase 3.3% in 2022 and 2.4% in 2023. The US has limited economic ties with Russia but saw another downgrade in the 2022 growth forecast (3.7% versus 4.0%) largely due to policy tightening happening faster than previously expected. The euro area saw a significant downgrade in expected growth (2.8% versus 3.9%) in 2022 as rising energy prices particularly weigh on the region that is a net importer of energy. The Japanese economy is expected to grow 2.4% this year.
- Growth projections for emerging markets are higher than developed markets, at 3.8% in 2022 and 4.4% in 2023. China's growth was downgraded (4.4% versus 4.8%) for 2022 given tight COVID-19 restrictions and continued property sector problems.
- The global inflation forecast was significantly increased for 2022 (7.4% versus 3.8%).

	Real GDP (%) <sup>1</sup>			Inflation (%) <sup>1</sup>		
	IMF 2022 Forecast	IMF 2023 Forecast	Actual 10 Year Average	IMF 2022 Forecast	IMF 2023 Forecast	Actual 10 Year Average
World	3.6	3.6	3.0	7.4	4.8	3.5
Advanced Economies	3.3	2.4	1.6	5.7	2.5	1.5
US	3.7	2.3	2.1	7.7	2.9	1.9
Euro Area	2.8	2.3	0.9	5.3	2.3	1.2
Japan	2.4	2.3	0.5	1.0	0.8	0.5
Emerging Economies	3.8	4.4	4.2	8.7	6.5	5.1
China	4.4	5.1	6.7	2.1	1.8	2.1

<sup>1</sup> Source: IMF World Economic Outlook. Real GDP forecasts from April WEO Update. Inflation forecasts are as of the April 2022 Update. "Actual 10 Year Average" represents data from 2012 to 2021.

### Global Nominal Gross Domestic Product (GDP) Growth<sup>1</sup>

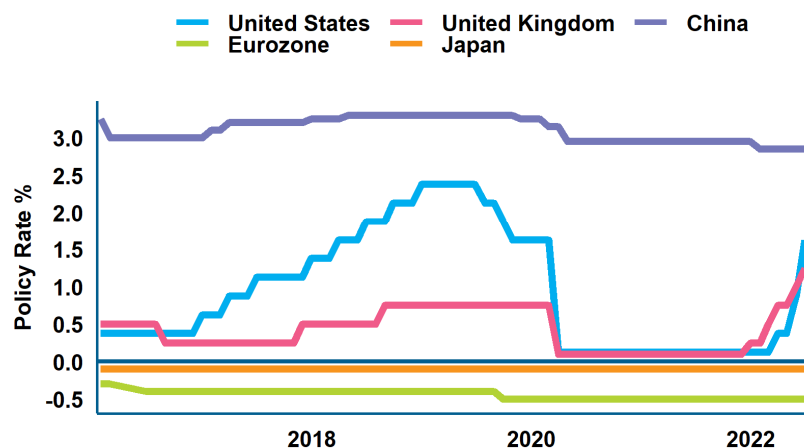


- Global economies are expected to slow in 2022 compared to 2021 with fears of potential recessions in areas increasing recently given persistently high inflation and related tighter monetary policy.
- Looking forward, the delicate balancing act of central banks trying to reduce inflation without dramatically impacting growth will remain key.

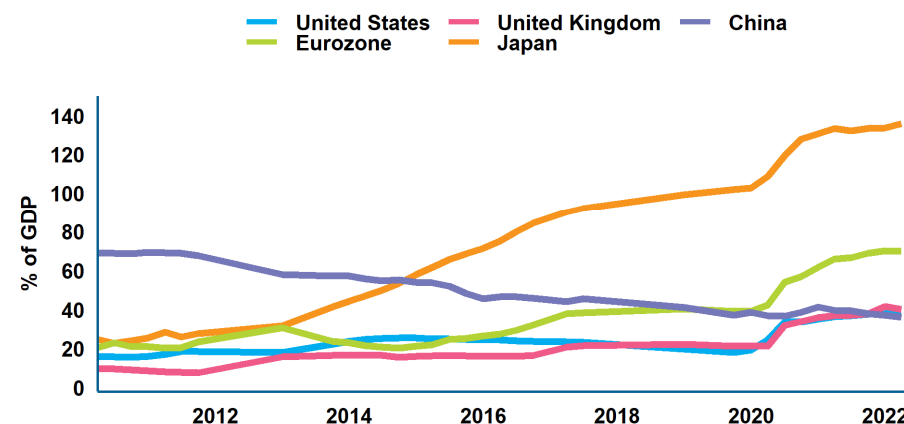
<sup>1</sup> Source: Oxford Economics (World GDP, US\$ prices & PPP exchange rate, nominal, % change YoY). Updated June 2022.

### Central Bank Response<sup>1</sup>

**Policy Rates**



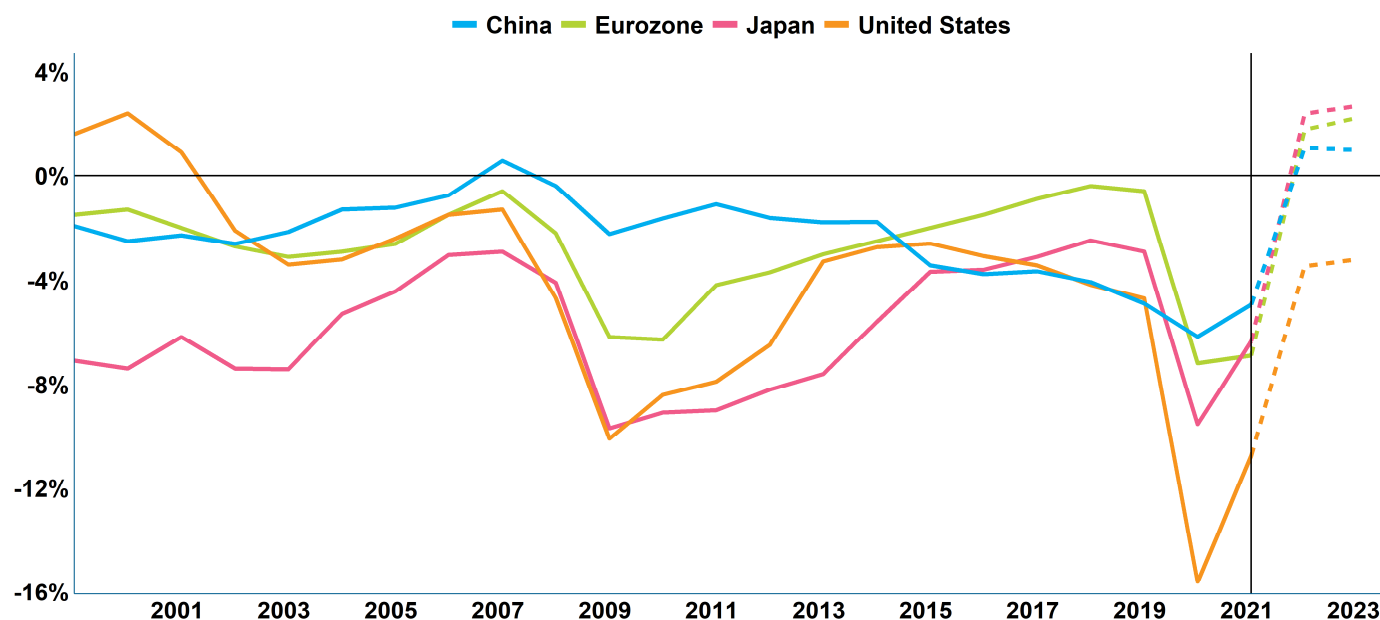
**Balance Sheet as % of GDP**



- After global central banks took extraordinary action to support economies during the pandemic, including policy rate cuts and emergency stimulus through quantitative easing (QE), many are reducing or considering reducing support, in the face of high inflation.
- The pace of withdrawing support will likely vary across central banks with the US expected to take a more aggressive approach. The risk remains for a policy error, particularly overtightening, as record inflation, the war in Ukraine, and a tough COVID-19 policy in China could suppress global growth.
- The one notable central bank outlier is China, where the central bank recently lowered rates and reserve requirements in response to slowing growth.

<sup>1</sup> Source: Bloomberg. Policy rate data is as of June 30, 2022. China policy rate is defined as the medium-term lending facility 1 year interest rate. Balance sheet as % of GDP is based on quarterly data and is as of June 30, 2022.

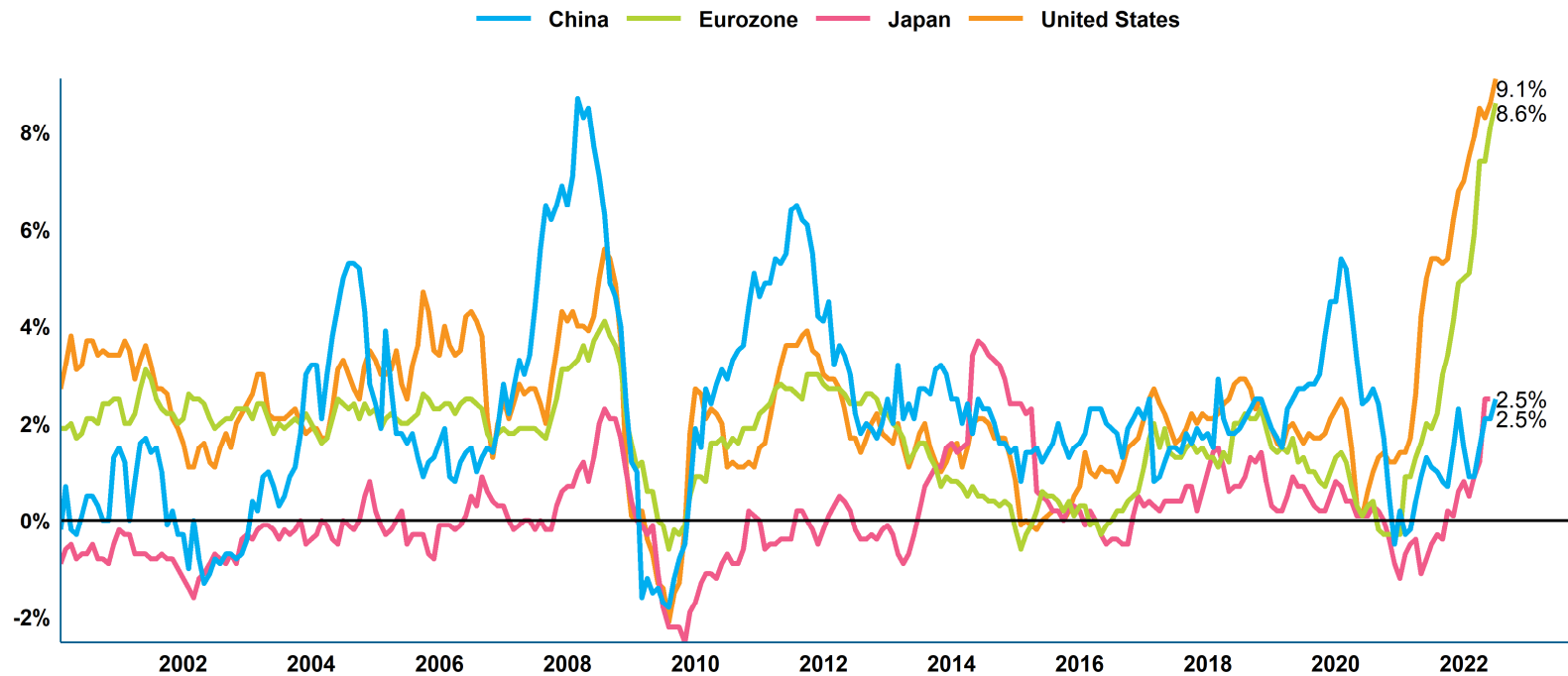
### Budget Surplus / Deficit as a Percentage of GDP<sup>1</sup>



- Budget deficits as a percentage of GDP drastically increased for major world economies, particularly the US, due to massive fiscal support and the severe economic contraction's effect on tax revenue in 2020 and 2021.
- As fiscal stimulus programs end, and economic recoveries continue, deficits should improve in the coming years.

<sup>1</sup> Source: Bloomberg. Data is as of June 30, 2022. Projections via IMF Forecasts from April 2022 Report. Dotted lines represent 2022 and 2023 forecasts.

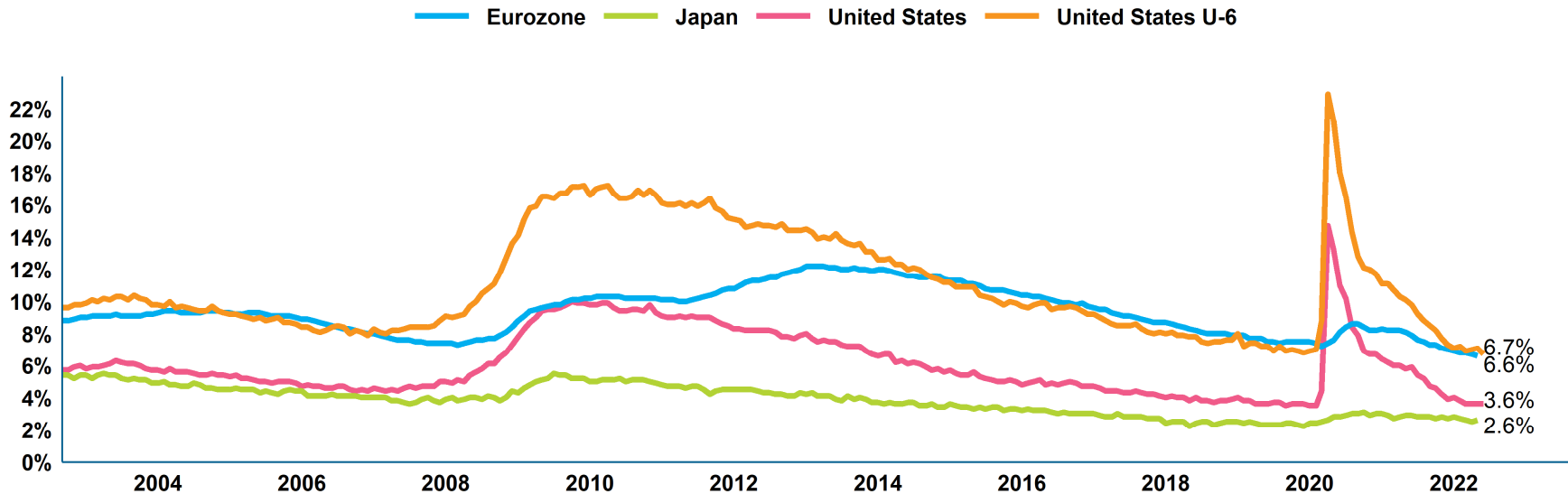
### Inflation (CPI Trailing Twelve Months)<sup>1</sup>



- Inflation increased dramatically from the lows of the pandemic, particularly in the US and Eurozone where it has reached levels not seen in many decades.
- Supply issues related to the pandemic, record monetary and fiscal stimulus, strict COVID-19 restrictions in China, and higher prices in many commodities driven by the war in Ukraine have been key drivers of inflation globally.

<sup>1</sup> Source: Bloomberg. Data is as of June 2022, except for Japan, where the most recent data available is as of May 31, 2022.

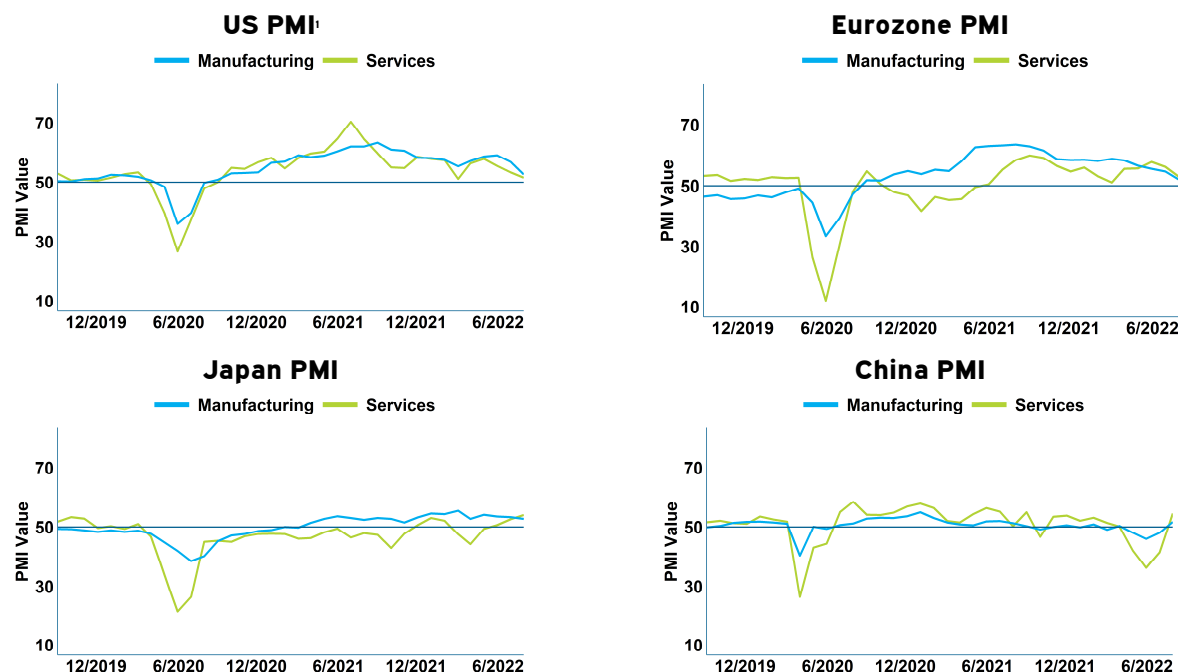
### Unemployment<sup>1</sup>



- As economies have largely reopened, helped by vaccines for the virus, improvements have been seen in the labor market.
- US unemployment, which experienced the steepest rise from the pandemic, declined back to pre-pandemic levels. The broader measure (U-6) that includes discouraged and underemployed workers declined but is much higher at 6.7%.

<sup>1</sup> Source: Bloomberg. Data is as of June 2022, for the US. The most recent data for Eurozone and Japanese unemployment is as of May 31, 2022.

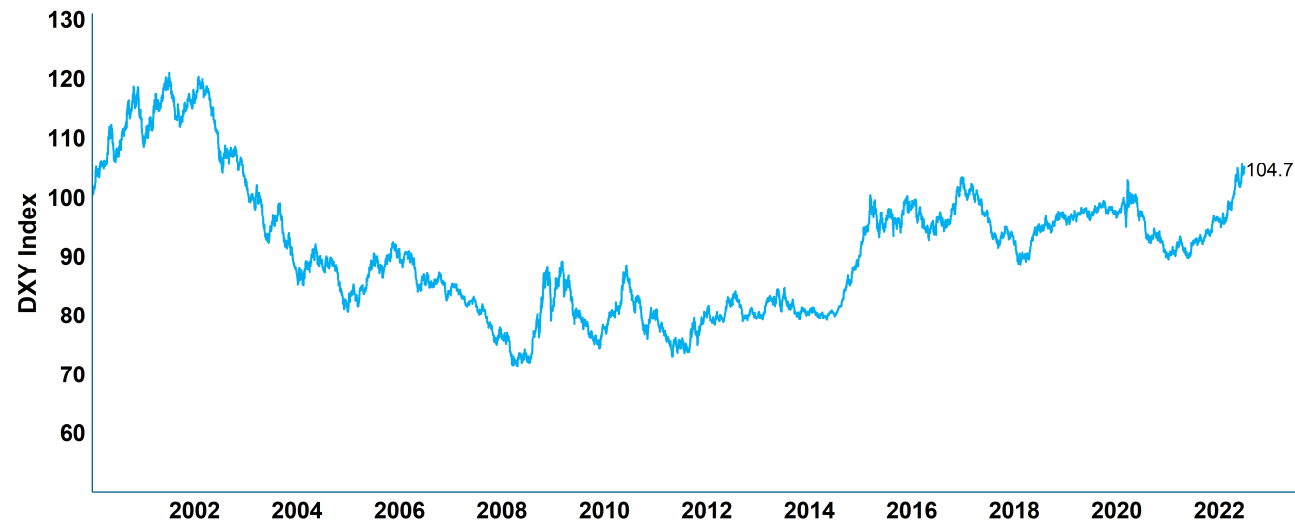
### Global PMIs



- After improvements from the lows of the pandemic, Purchasing Managers Indices (PMI), based on surveys of private sector companies, have experienced some pressures recently.
- Service sector PMIs in the US and Europe have recently declined due to higher prices and supply issues, while they continue to improve in Japan as pandemic restrictions ease. In China the services PMI surged to expansion territory on an easing in lockdown measures.
- Manufacturing PMIs are in expansion territory as pandemic-related production issues ease and orders increase. China also moved to expansion levels here on partial reopening.

<sup>1</sup> Source: Bloomberg. US Markit Services and Manufacturing PMI, Caixin Services and Manufacturing PMI, Eurozone Markit Services and Manufacturing PMI, Jibun Bank Services and Manufacturing PMI. Data is as of June 2022. Readings below 50 represent economic contractions.

### US Dollar versus Broad Currencies<sup>1</sup>



- The US dollar continued higher in June on safe-haven flows, relatively strong growth, and higher interest rates.
- The euro, yen, and yuan have all experienced significant declines versus the dollar, adding to inflation and slowing growth concerns.

<sup>1</sup> Source: Bloomberg. Data as of June 30, 2022.

## Summary

### Key Trends in 2022:

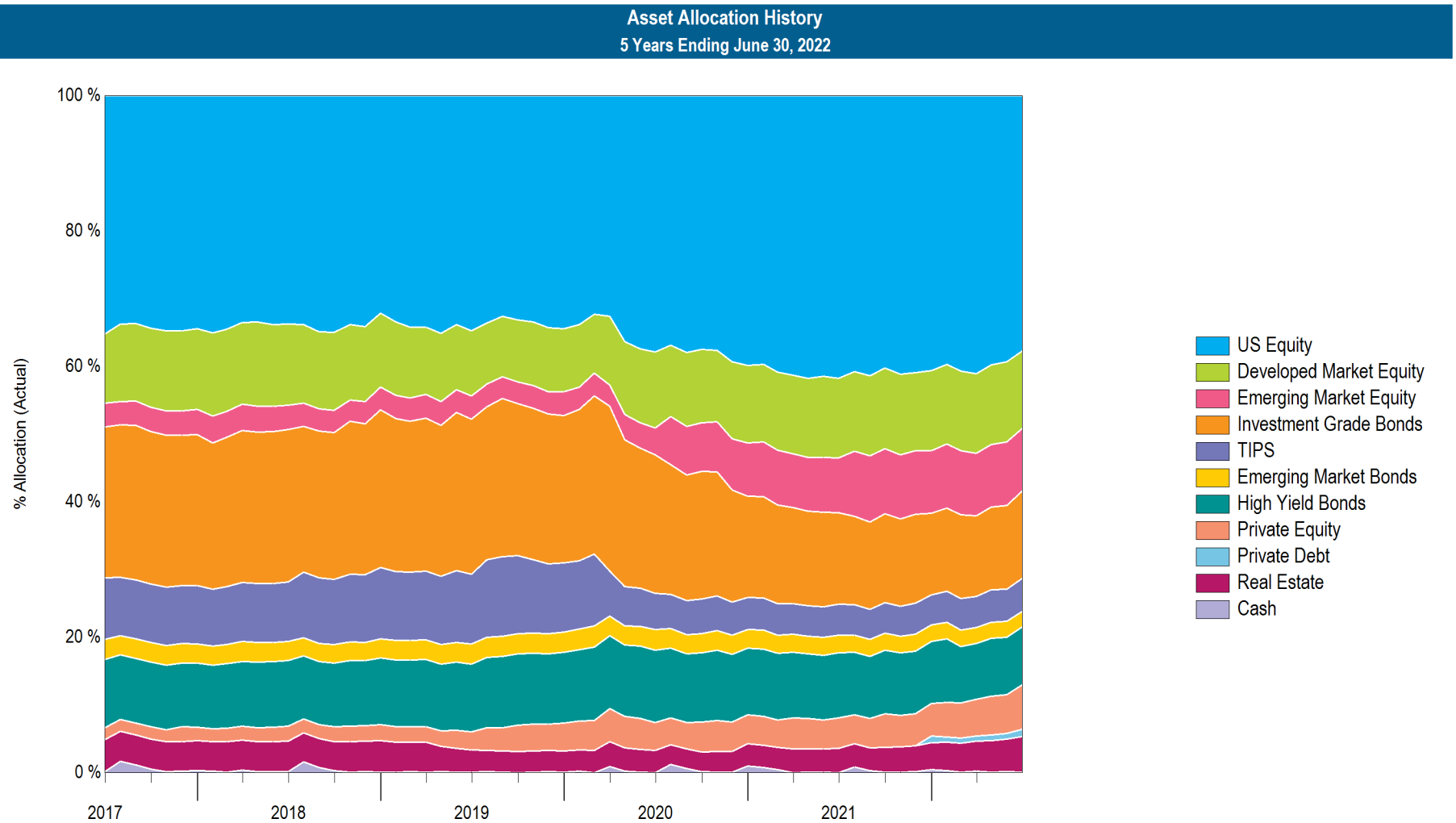
- The impacts of record high inflation will remain key going forward, with volatility likely to remain high.
- The war in Ukraine has created significant uncertainty, with a wide range of potential outcomes.
- Expect growth to slow globally in 2022 to the long-term trend or below. Inflation, monetary policy, and the war will all be key.
- The end of many fiscal programs is expected to put the burden of continued growth on consumers. Higher energy and food prices will depress consumers' spending in other areas.
- Monetary policy will likely tighten globally but will remain relatively accommodative. The risk of overtightening policy remains.
- Valuations have significantly declined in the US, approaching long-term averages.
- Outside the US, equity valuations remain lower in both emerging and developed markets, but risks remain, including continued strength in the US dollar, higher inflation particularly weighing on Europe, and China maintaining its restrictive COVID-19 policies

## **Second Quarter 2022 Investment Review**

## Retirement System Summary

Allocation vs. Targets and Policy				
	Current Balance	Current Allocation	Policy	Policy Range
US Equity	\$74,596,104	38%	38%	28% - 42%
Developed Market Equity	\$22,628,258	11%	12%	5% - 15%
Emerging Market Equity	\$18,348,652	9%	10%	1% - 12%
Investment Grade Bonds	\$25,569,127	13%	12%	10% - 25%
TIPS	\$9,638,033	5%	0%	0% - 10%
Emerging Market Bonds	\$4,566,749	2%	2%	1% - 5%
High Yield Bonds	\$16,842,035	9%	5%	5% - 12%
Private Equity	\$13,084,130	7%	5%	3% - 7%
Private Debt	\$2,034,198	1%	4%	0% - 5%
Real Estate	\$10,558,963	5%	7%	2% - 10%
Infrastructure	--	--	5%	0% - 5%
Cash	\$133,848	0%	0%	0% - 5%
<b>Total</b>	<b>\$198,000,097</b>	<b>100%</b>	<b>100%</b>	

New policy will be reflected in the Q3 2022 report.



Asset Class Performance Summary											
	Market Value (\$)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
<b>Total Retirement System (net)</b>	<b>198,000,097</b>	<b>100.0</b>	<b>-10.5</b>	<b>-14.2</b>	<b>-10.1</b>	<b>5.6</b>	<b>5.8</b>	<b>7.0</b>	<b>6.7</b>	<b>7.5</b>	<b>Jul-88</b>
55% MSCI World & 45% Barclays Aggregate			-11.1	-16.0	-12.3	3.7	4.9	6.1	5.9	6.7	Jul-88
60% MSCI World & 40% Barclays Aggregate			-11.7	-16.5	-12.5	4.1	5.2	6.5	6.1	6.8	Jul-88
InvMetrics Public DB \$50mm-\$250mm Net Median			-10.2	-14.2	-9.9	5.4	6.1	7.1	6.4	7.5	Jul-88
<b>Domestic Equity Assets (net)</b>	<b>74,596,104</b>	<b>37.7</b>	<b>-15.7</b>	<b>-20.0</b>	<b>-12.4</b>	<b>7.1</b>	<b>8.2</b>	<b>11.3</b>	<b>8.2</b>	<b>8.0</b>	<b>Oct-06</b>
Russell 3000			-16.7	-21.1	-13.9	9.8	10.6	12.6	9.1	8.9	Oct-06
<b>International Developed Markets Equity Assets (net)</b>	<b>22,628,258</b>	<b>11.4</b>	<b>-14.3</b>	<b>-19.2</b>	<b>-17.4</b>	<b>1.3</b>	<b>2.4</b>	<b>4.9</b>	<b>--</b>	<b>2.4</b>	<b>Oct-06</b>
MSCI EAFE			-14.5	-19.6	-17.8	1.1	2.2	5.4	5.3	2.6	Oct-06
<b>International Emerging Markets Equity Assets (net)</b>	<b>18,348,652</b>	<b>9.3</b>	<b>-11.4</b>	<b>-16.9</b>	<b>-22.3</b>	<b>3.4</b>	<b>4.2</b>	<b>--</b>	<b>--</b>	<b>4.6</b>	<b>Jan-15</b>
MSCI Emerging Markets			-11.4	-17.6	-25.3	0.6	2.2	3.1	8.4	3.0	Jan-15
<b>Investment Grade Bonds Assets (net)</b>	<b>25,569,127</b>	<b>12.9</b>	<b>-4.7</b>	<b>-10.4</b>	<b>-10.4</b>	<b>-1.0</b>	<b>0.8</b>	<b>1.5</b>	<b>3.6</b>	<b>5.5</b>	<b>Jul-88</b>
Bloomberg US Aggregate TR			-4.7	-10.3	-10.3	-0.9	0.9	1.5	3.6	5.5	Jul-88
<b>High Yield Bond Assets (net)</b>	<b>16,842,035</b>	<b>8.5</b>	<b>-8.9</b>	<b>-12.0</b>	<b>-11.1</b>	<b>0.4</b>	<b>2.1</b>	<b>4.0</b>	<b>--</b>	<b>5.7</b>	<b>Sep-03</b>
Bloomberg US High Yield TR			-9.8	-14.2	-12.8	0.2	2.1	4.5	7.3	6.6	Sep-03
<b>TIPS Assets (net)</b>	<b>9,638,033</b>	<b>4.9</b>	<b>-6.1</b>	<b>-9.0</b>	<b>-5.2</b>	<b>2.9</b>	<b>3.1</b>	<b>1.7</b>	<b>--</b>	<b>3.6</b>	<b>Oct-05</b>
Bloomberg US TIPS TR			-6.1	-8.9	-5.1	3.0	3.2	1.7	4.4	3.6	Oct-05
<b>Emerging Market Debt Assets (net)</b>	<b>4,566,749</b>	<b>2.3</b>	<b>-13.7</b>	<b>-21.1</b>	<b>-22.7</b>	<b>-5.5</b>	<b>-1.4</b>	<b>--</b>	<b>--</b>	<b>1.3</b>	<b>Jan-15</b>
JP Morgan EMBI Global Diversified			-11.4	-20.3	-21.2	-5.2	-1.2	2.2	6.6	1.5	Jan-15
<b>Open-Ended Real Estate (net)</b>	<b>7,685,939</b>	<b>3.9</b>	<b>7.3</b>	<b>14.9</b>	<b>31.4</b>	<b>14.5</b>	<b>12.0</b>	<b>11.9</b>	<b>8.5</b>	<b>8.9</b>	<b>Oct-95</b>
NCREIF ODCE			0.0	7.4	23.6	10.9	9.5	10.7	8.6	9.3	Oct-95
<b>Total Closed End Real Estate (net)</b>	<b>2,873,024</b>	<b>1.5</b>	<b>4.0</b>	<b>7.4</b>	<b>24.6</b>	<b>7.9</b>	<b>-5.2</b>	<b>--</b>	<b>--</b>	<b>4.2</b>	<b>Jan-13</b>
<b>Private Equity Assets (net)</b>	<b>13,084,130</b>	<b>6.6</b>	<b>4.6</b>	<b>11.0</b>	<b>26.0</b>	<b>27.7</b>	<b>18.6</b>	<b>11.4</b>	<b>--</b>	<b>8.9</b>	<b>Oct-06</b>
<b>Private Debt Assets (net)</b>	<b>2,034,198</b>	<b>1.0</b>	<b>3.2</b>	<b>6.2</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>6.2</b>	<b>Dec-21</b>
<b>Cash (net)</b>	<b>133,848</b>	<b>0.1</b>									

	Trailing Performance											Inception Date
	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	
<b>Total Retirement System</b>	<b>198,000,097</b>	<b>100.0</b>	<b>--</b>	<b>-10.5</b>	<b>-14.2</b>	<b>-10.1</b>	<b>5.6</b>	<b>5.8</b>	<b>7.0</b>	<b>6.7</b>	<b>7.5</b>	<b>Jul-88</b>
55% MSCI World & 45% Barclays Aggregate				-11.1	-16.0	-12.3	3.7	4.9	6.1	5.9	6.7	Jul-88
60% MSCI World & 40% Barclays Aggregate				-11.7	-16.5	-12.5	4.1	5.2	6.5	6.1	6.8	Jul-88
InvMetrics Public DB \$50mm-\$250mm Net Median				-10.2	-14.2	-9.9	5.4	6.1	7.1	6.4	7.5	Jul-88
<b>Domestic Equity Assets</b>	<b>74,596,104</b>	<b>37.7</b>	<b>37.7</b>	<b>-15.7</b>	<b>-20.0</b>	<b>-12.4</b>	<b>7.1</b>	<b>8.2</b>	<b>11.3</b>	<b>8.2</b>	<b>8.0</b>	<b>Oct-06</b>
Russell 3000				-16.7	-21.1	-13.9	9.8	10.6	12.6	9.1	8.9	Oct-06
RhumbLine S&P 500 Index	25,523,984	12.9	34.2	-16.1	-20.0	-10.7	10.5	11.2	12.9	9.1	6.9	Mar-99
S&P 500				-16.1	-20.0	-10.6	10.6	11.3	13.0	9.1	6.9	Mar-99
eV US Passive S&P 500 Equity Net Median				-16.1	-20.0	-10.7	10.5	11.2	12.9	9.0	6.8	Mar-99
Frontier Capital Appreciation	20,495,107	10.4	27.5	-18.9	-22.6	-20.2	5.7	5.5	--	--	9.7	Feb-13
Russell 2500 Growth				-19.6	-29.4	-31.8	3.7	7.5	10.9	9.6	10.0	Feb-13
eV US Small-Mid Cap Growth Equity Net Median				-20.8	-30.3	-28.1	5.1	9.7	11.4	10.0	10.5	Feb-13
RhumbLine HEDI	28,577,013	14.4	38.3	-12.8	-18.2	-8.3	--	--	--	--	9.4	Nov-20
Russell 1000 HEDI Moderate GR USD				-12.8	-18.1	-8.3	10.2	12.5	13.7	10.4	9.5	Nov-20
eV US Large Cap Core Equity Gross Median				-14.8	-18.9	-10.3	10.1	11.0	12.7	9.6	10.9	Nov-20

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
<b>International Developed Markets Equity Assets</b>	<b>22,628,258</b>	<b>11.4</b>	<b>11.4</b>	<b>-14.3</b>	<b>-19.2</b>	<b>-17.4</b>	<b>1.3</b>	<b>2.4</b>	<b>4.9</b>	<b>--</b>	<b>2.4</b>	<b>Oct-06</b>
<i>MSCI EAFE</i>				<i>-14.5</i>	<i>-19.6</i>	<i>-17.8</i>	<i>1.1</i>	<i>2.2</i>	<i>5.4</i>	<i>5.3</i>	<i>2.6</i>	<i>Oct-06</i>
RhumbLine MSCI EAFE Index	22,628,258	11.4	100.0	-14.3	-19.2	-17.4	1.3	2.4	--	--	2.3	Aug-14
<i>MSCI EAFE</i>				<i>-14.5</i>	<i>-19.6</i>	<i>-17.8</i>	<i>1.1</i>	<i>2.2</i>	<i>5.4</i>	<i>5.3</i>	<i>2.1</i>	<i>Aug-14</i>
<i>eV EAFE All Cap Equity Net Median</i>				<i>-13.6</i>	<i>-19.8</i>	<i>-18.5</i>	<i>1.4</i>	<i>2.1</i>	<i>5.9</i>	<i>6.0</i>	<i>2.8</i>	<i>Aug-14</i>
<b>International Emerging Markets Equity Assets</b>	<b>18,348,652</b>	<b>9.3</b>	<b>9.3</b>	<b>-11.4</b>	<b>-16.9</b>	<b>-22.3</b>	<b>3.4</b>	<b>4.2</b>	<b>--</b>	<b>--</b>	<b>4.6</b>	<b>Jan-15</b>
<i>MSCI Emerging Markets</i>				<i>-11.4</i>	<i>-17.6</i>	<i>-25.3</i>	<i>0.6</i>	<i>2.2</i>	<i>3.1</i>	<i>8.4</i>	<i>3.0</i>	<i>Jan-15</i>
DFA Emerging Markets	9,534,656	4.8	52.0	-11.8	-15.1	-19.7	2.7	2.9	--	--	3.7	Jan-15
<i>MSCI Emerging Markets</i>				<i>-11.4</i>	<i>-17.6</i>	<i>-25.3</i>	<i>0.6</i>	<i>2.2</i>	<i>3.1</i>	<i>8.4</i>	<i>3.0</i>	<i>Jan-15</i>
<i>eV Emg Mkts All Cap Equity Net Median</i>				<i>-12.1</i>	<i>-19.4</i>	<i>-27.0</i>	<i>0.7</i>	<i>2.3</i>	<i>3.6</i>	<i>8.5</i>	<i>3.2</i>	<i>Jan-15</i>
Driehaus Emerging Market Equity	8,813,995	4.5	48.0	-10.9	-18.8	-25.0	3.6	5.3	--	--	5.3	Jan-15
<i>MSCI Emerging Markets</i>				<i>-11.4</i>	<i>-17.6</i>	<i>-25.3</i>	<i>0.6</i>	<i>2.2</i>	<i>3.1</i>	<i>8.4</i>	<i>3.0</i>	<i>Jan-15</i>
<i>eV Emg Mkts All Cap Equity Net Median</i>				<i>-12.1</i>	<i>-19.4</i>	<i>-27.0</i>	<i>0.7</i>	<i>2.3</i>	<i>3.6</i>	<i>8.5</i>	<i>3.2</i>	<i>Jan-15</i>
<b>Investment Grade Bonds Assets</b>	<b>25,569,127</b>	<b>12.9</b>	<b>12.9</b>	<b>-4.7</b>	<b>-10.4</b>	<b>-10.4</b>	<b>-1.0</b>	<b>0.8</b>	<b>1.5</b>	<b>3.6</b>	<b>5.5</b>	<b>Jul-88</b>
<i>Bloomberg US Aggregate TR</i>				<i>-4.7</i>	<i>-10.3</i>	<i>-10.3</i>	<i>-0.9</i>	<i>0.9</i>	<i>1.5</i>	<i>3.6</i>	<i>5.5</i>	<i>Jul-88</i>
SSgA U.S. Aggregate Bond Index	25,569,127	12.9	100.0	-4.7	-10.4	-10.4	-1.0	0.8	1.5	3.6	3.8	May-01
<i>Bloomberg US Aggregate TR</i>				<i>-4.7</i>	<i>-10.3</i>	<i>-10.3</i>	<i>-0.9</i>	<i>0.9</i>	<i>1.5</i>	<i>3.6</i>	<i>3.8</i>	<i>May-01</i>
<i>eV US Core Fixed Inc Net Median</i>				<i>-4.9</i>	<i>-10.5</i>	<i>-10.5</i>	<i>-0.7</i>	<i>1.1</i>	<i>1.8</i>	<i>3.8</i>	<i>4.0</i>	<i>May-01</i>

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
<b>High Yield Bond Assets</b>	<b>16,842,035</b>	<b>8.5</b>	<b>8.5</b>	<b>-8.9</b>	<b>-12.0</b>	<b>-11.1</b>	<b>0.4</b>	<b>2.1</b>	<b>4.0</b>	<b>--</b>	<b>5.7</b>	<b>Sep-03</b>
Bloomberg US High Yield TR				-9.8	-14.2	-12.8	0.2	2.1	4.5	7.3	6.6	Sep-03
Shenkman Capital	16,842,035	8.5	100.0	-8.9	-11.9	-11.0	0.4	2.2	4.0	--	5.5	Apr-06
Bloomberg US High Yield TR				-9.8	-14.2	-12.8	0.2	2.1	4.5	7.3	6.0	Apr-06
eV US High Yield Fixed Inc Net Median				-9.3	-12.9	-11.7	0.4	2.0	4.2	6.5	5.5	Apr-06
<b>TIPS Assets</b>	<b>9,638,033</b>	<b>4.9</b>	<b>4.9</b>	<b>-6.1</b>	<b>-9.0</b>	<b>-5.2</b>	<b>2.9</b>	<b>3.1</b>	<b>1.7</b>	<b>--</b>	<b>3.6</b>	<b>Oct-05</b>
Bloomberg US TIPS TR				-6.1	-8.9	-5.1	3.0	3.2	1.7	4.4	3.6	Oct-05
SSgA TIPS Index-NL	9,638,033	4.9	100.0	-6.1	-9.0	-5.2	2.9	3.1	1.7	--	3.6	Oct-05
Bloomberg US TIPS TR				-6.1	-8.9	-5.1	3.0	3.2	1.7	4.4	3.6	Oct-05
eV US TIPS / Inflation Fixed Inc Net Median				-6.2	-8.9	-5.5	3.1	3.2	1.7	4.7	3.8	Oct-05
<b>Emerging Market Debt Assets</b>	<b>4,566,749</b>	<b>2.3</b>	<b>2.3</b>	<b>-13.7</b>	<b>-21.1</b>	<b>-22.7</b>	<b>-5.5</b>	<b>-1.4</b>	<b>--</b>	<b>--</b>	<b>1.3</b>	<b>Jan-15</b>
JP Morgan EMBI Global Diversified				-11.4	-20.3	-21.2	-5.2	-1.2	2.2	6.6	1.5	Jan-15
Payden Emerging Market Bond	4,566,749	2.3	100.0	-13.7	-21.1	-22.7	-5.5	-1.4	--	--	1.3	Jan-15
JP Morgan EMBI Global Diversified				-11.4	-20.3	-21.2	-5.2	-1.2	2.2	6.6	1.5	Jan-15
<b>Open-Ended Real Estate</b>	<b>7,685,939</b>	<b>3.9</b>	<b>3.9</b>	<b>7.3</b>	<b>14.9</b>	<b>31.4</b>	<b>14.5</b>	<b>12.0</b>	<b>11.9</b>	<b>8.5</b>	<b>8.9</b>	<b>Oct-95</b>
NCREIF ODCE				0.0	7.4	23.6	10.9	9.5	10.7	8.6	9.3	Oct-95
Clarion Partners	7,685,939	3.9	100.0	7.3	14.9	31.4	14.5	12.0	11.9	--	8.4	Oct-02
NCREIF ODCE				0.0	7.4	23.6	10.9	9.5	10.7	8.6	8.6	Oct-02

## Total Retirement System | As of June 30, 2022

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
<b>Total Closed End Real Estate</b>	<b>2,873,024</b>	<b>1.5</b>	<b>1.5</b>	<b>4.0</b>	<b>7.4</b>	<b>24.6</b>	<b>7.9</b>	<b>-5.2</b>	<b>--</b>	<b>--</b>	<b>4.2</b>	<b>Jan-13</b>
Rockwood Capital Real Estate Partners Fund XI, L.P.	2,873,024	1.5	100.0	4.0	7.4	24.6	--	--	--	--	8.3	Dec-19
<b>Private Equity Assets</b>	<b>13,084,130</b>	<b>6.6</b>	<b>6.6</b>	<b>4.6</b>	<b>11.0</b>	<b>26.0</b>	<b>27.7</b>	<b>18.6</b>	<b>11.4</b>	<b>--</b>	<b>8.9</b>	<b>Oct-06</b>
North American Strategic Partners 2006	18,450	0.0	0.1									
Ironsides Partnership Fund IV	2,757,488	1.4	21.1									
Ironsides Direct Investment Fund IV	2,307,052	1.2	17.6									
Ironsides Partnership Fund V, L.P.	1,382,472	0.7	10.6									
Ironsides Direct Investment Fund V, L.P.	3,343,365	1.7	25.6									
HarbourVest 2019 Global Fund	3,275,302	1.7	25.0									
<b>Private Debt Assets</b>	<b>2,034,198</b>	<b>1.0</b>	<b>1.0</b>	<b>3.2</b>	<b>6.2</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>6.2</b>	<b>Dec-21</b>
NB Private Debt Fund IV	2,034,198	1.0	100.0									
<b>Cash</b>	<b>133,848</b>	<b>0.1</b>	<b>0.1</b>									

Closed End Real Estate, Private Equity, and Private Debt market values are as of March 31, 2022 and adjusted for subsequent flows.

North American Strategic Partners market value is cash adjusted as of December 31, 2021. The fund is currently in the liquidation process and will only be reported on annually (as of December 31).

	Calendar Year Performance									
	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)
<b>Total Retirement System</b>	<b>13.8</b>	<b>14.2</b>	<b>17.5</b>	<b>-4.5</b>	<b>13.0</b>	<b>8.7</b>	<b>-0.2</b>	<b>6.3</b>	<b>14.0</b>	<b>10.9</b>
55% MSCI World & 45% Barclays Aggregate	10.9	12.9	19.1	-4.6	13.6	5.5	0.0	5.5	13.0	10.7
60% MSCI World & 40% Barclays Aggregate	12.0	13.3	20.0	-5.1	14.5	5.7	-0.1	5.4	14.5	11.3
<b>Domestic Equity Assets</b>	<b>24.8</b>	<b>13.4</b>	<b>27.6</b>	<b>-6.9</b>	<b>20.1</b>	<b>14.6</b>	<b>-1.6</b>	<b>13.1</b>	<b>33.1</b>	<b>15.3</b>
Russell 3000	25.7	20.9	31.0	-5.2	21.1	12.7	0.5	12.6	33.6	16.4
RhumbLine S&P 500 Index	28.6	18.3	31.4	-4.4	21.8	11.9	1.4	13.6	32.2	16.0
S&P 500	28.7	18.4	31.5	-4.4	21.8	12.0	1.4	13.7	32.4	16.0
Frontier Capital Appreciation	18.2	18.1	28.9	-13.9	19.1	20.5	-6.5	12.4	--	--
Russell 2500 Growth	5.0	40.5	32.7	-7.5	24.5	9.7	-0.2	7.1	40.6	16.1
RhumbLine HEDI	25.5	--	--	--	--	--	--	--	--	--
Russell 1000 HEDI Moderate GR USD	25.5	18.5	32.7	-0.9	23.4	11.4	4.8	15.4	30.9	13.9
<b>International Developed Markets Equity Assets</b>	<b>11.5</b>	<b>7.9</b>	<b>22.3</b>	<b>-13.5</b>	<b>24.9</b>	<b>1.4</b>	<b>-0.8</b>	<b>-8.7</b>	<b>21.2</b>	<b>15.0</b>
MSCI EAFE	11.3	7.8	22.0	-13.8	25.0	1.0	-0.8	-4.9	22.8	17.3
RhumbLine MSCI EAFE Index	11.5	7.9	22.3	-13.5	24.9	1.4	-0.8	--	--	--
MSCI EAFE	11.3	7.8	22.0	-13.8	25.0	1.0	-0.8	-4.9	22.8	17.3
<b>International Emerging Markets Equity Assets</b>	<b>2.3</b>	<b>21.1</b>	<b>20.7</b>	<b>-15.4</b>	<b>39.7</b>	<b>9.4</b>	<b>-12.7</b>	<b>--</b>	<b>--</b>	<b>--</b>
MSCI Emerging Markets	-2.5	18.3	18.4	-14.6	37.3	11.2	-14.9	-2.2	-2.6	18.2
DFA Emerging Markets	5.8	13.9	16.0	-15.2	36.6	12.4	-14.9	--	--	--
MSCI Emerging Markets	-2.5	18.3	18.4	-14.6	37.3	11.2	-14.9	-2.2	-2.6	18.2
Driehaus Emerging Market Equity	-1.5	28.0	25.3	-15.6	43.0	6.5	-10.6	--	--	--
MSCI Emerging Markets	-2.5	18.3	18.4	-14.6	37.3	11.2	-14.9	-2.2	-2.6	18.2

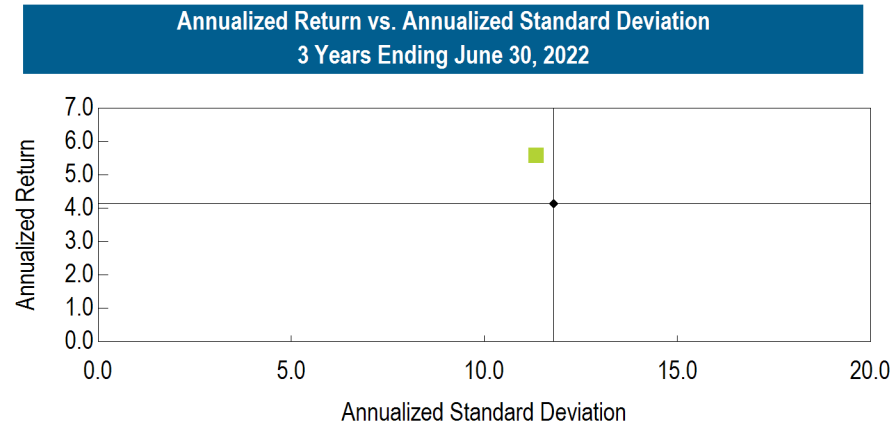
## Total Retirement System | As of June 30, 2022

	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)
<b>Investment Grade Bonds Assets</b>	<b>-1.6</b>	<b>7.5</b>	<b>8.7</b>	<b>0.0</b>	<b>3.6</b>	<b>2.6</b>	<b>0.6</b>	<b>6.0</b>	<b>-2.0</b>	<b>4.3</b>
Bloomberg US Aggregate TR	-1.5	7.5	8.7	0.0	3.5	2.6	0.5	6.0	-2.0	4.2
SSgA U.S. Aggregate Bond Index	-1.6	7.5	8.7	0.0	3.6	2.6	0.6	6.0	-2.0	4.3
Bloomberg US Aggregate TR	-1.5	7.5	8.7	0.0	3.5	2.6	0.5	6.0	-2.0	4.2
<b>High Yield Bond Assets</b>	<b>4.0</b>	<b>6.3</b>	<b>14.0</b>	<b>-1.8</b>	<b>6.5</b>	<b>12.6</b>	<b>-2.3</b>	<b>2.9</b>	<b>6.4</b>	<b>12.4</b>
Bloomberg US High Yield TR	5.3	7.1	14.3	-2.1	7.5	17.1	-4.5	2.5	7.4	15.8
Shenkman Capital	4.0	6.3	14.0	-1.8	6.5	12.6	-2.3	2.9	6.4	12.4
Bloomberg US High Yield TR	5.3	7.1	14.3	-2.1	7.5	17.1	-4.5	2.5	7.4	15.8
<b>TIPS Assets</b>	<b>5.8</b>	<b>10.9</b>	<b>8.4</b>	<b>-1.4</b>	<b>3.0</b>	<b>4.7</b>	<b>-1.4</b>	<b>3.6</b>	<b>-8.6</b>	<b>6.9</b>
Bloomberg US TIPS TR	6.0	11.0	8.4	-1.3	3.0	4.7	-1.4	3.6	-8.6	7.0
SSgA TIPS Index-NL	5.8	10.9	8.4	-1.4	3.0	4.7	-1.4	3.6	-8.6	6.9
Bloomberg US TIPS TR	6.0	11.0	8.4	-1.3	3.0	4.7	-1.4	3.6	-8.6	7.0
<b>Emerging Market Debt Assets</b>	<b>-2.4</b>	<b>6.2</b>	<b>16.5</b>	<b>-7.0</b>	<b>12.0</b>	<b>11.5</b>	<b>-0.8</b>	<b>--</b>	<b>--</b>	<b>--</b>
JP Morgan EMBI Global Diversified	-1.8	5.3	15.0	-4.3	10.3	10.2	1.2	7.4	-5.3	17.4
Payden Emerging Market Bond	-2.4	6.2	16.5	-7.0	12.0	11.5	-0.8	--	--	--
JP Morgan EMBI Global Diversified	-1.8	5.3	15.0	-4.3	10.3	10.2	1.2	7.4	-5.3	17.4
<b>Open-Ended Real Estate</b>	<b>23.4</b>	<b>2.2</b>	<b>7.3</b>	<b>8.6</b>	<b>7.9</b>	<b>9.1</b>	<b>15.7</b>	<b>13.2</b>	<b>12.8</b>	<b>10.9</b>
NCREIF ODCE	22.2	1.2	5.3	8.3	7.6	8.8	15.1	12.5	13.9	10.9
Clarion Partners	23.4	2.2	7.3	8.6	7.9	9.1	15.7	13.2	12.8	10.9
NCREIF ODCE	22.2	1.2	5.3	8.3	7.6	8.8	15.1	12.5	13.9	10.9

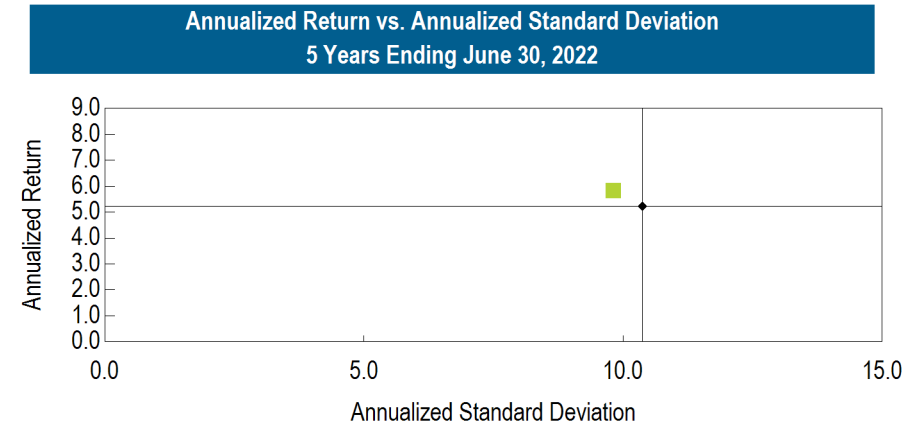
## Total Retirement System | As of June 30, 2022

	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)
<b>Total Closed End Real Estate</b>	<b>14.3</b>	<b>-5.3</b>	<b>-38.2</b>	<b>-1.8</b>	<b>15.1</b>	<b>9.5</b>	<b>23.8</b>	<b>13.3</b>	<b>18.8</b>	<b>--</b>
Rockwood Capital Real Estate Partners Fund XI, L.P.	14.3	0.0	--	--	--	--	--	--	--	--
<b>Private Equity Assets</b>	<b>39.5</b>	<b>22.9</b>	<b>17.7</b>	<b>10.2</b>	<b>-5.3</b>	<b>-2.8</b>	<b>8.6</b>	<b>5.5</b>	<b>9.1</b>	<b>12.2</b>
North American Strategic Partners 2006										
Ironsides Partnership Fund IV										
Ironsides Direct Investment Fund IV										
Ironsides Partnership Fund V, L.P.										
Ironsides Direct Investment Fund V, L.P.										
HarbourVest 2019 Global Fund										
<b>Private Debt Assets</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
NB Private Debt Fund IV										
<b>Cash</b>										

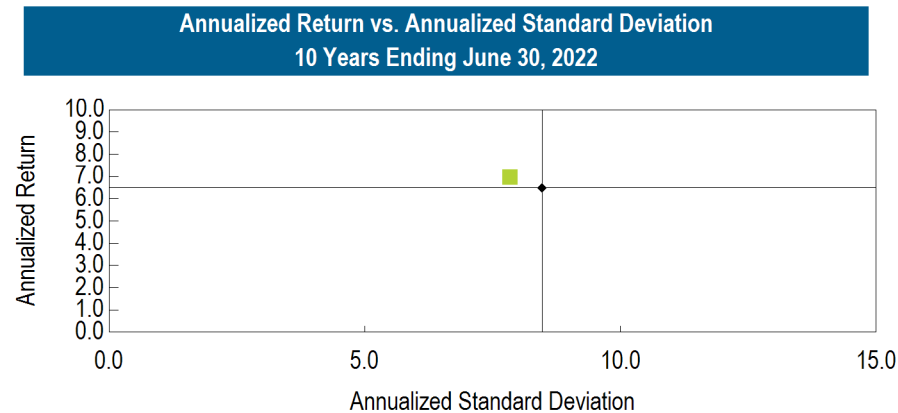
Private Debt Aggregate returns will be shown after the first full year of performance.



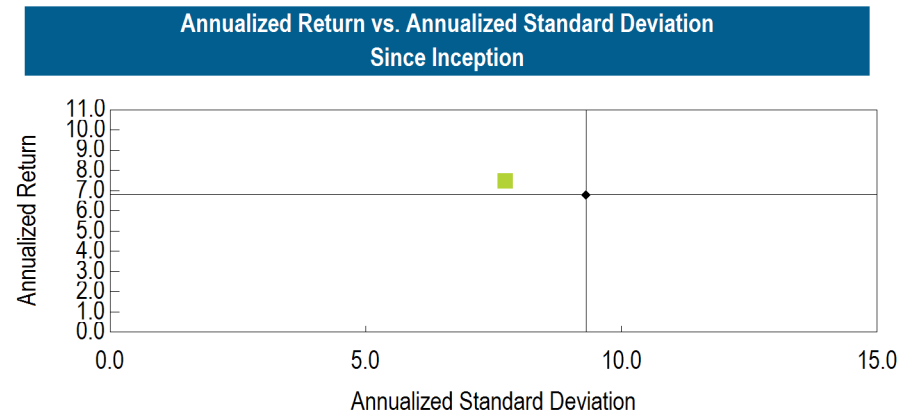
- Total Retirement System
- ◆ 60% MSCI World & 40% Barclays Aggregate



- Total Retirement System
- ◆ 60% MSCI World & 40% Barclays Aggregate

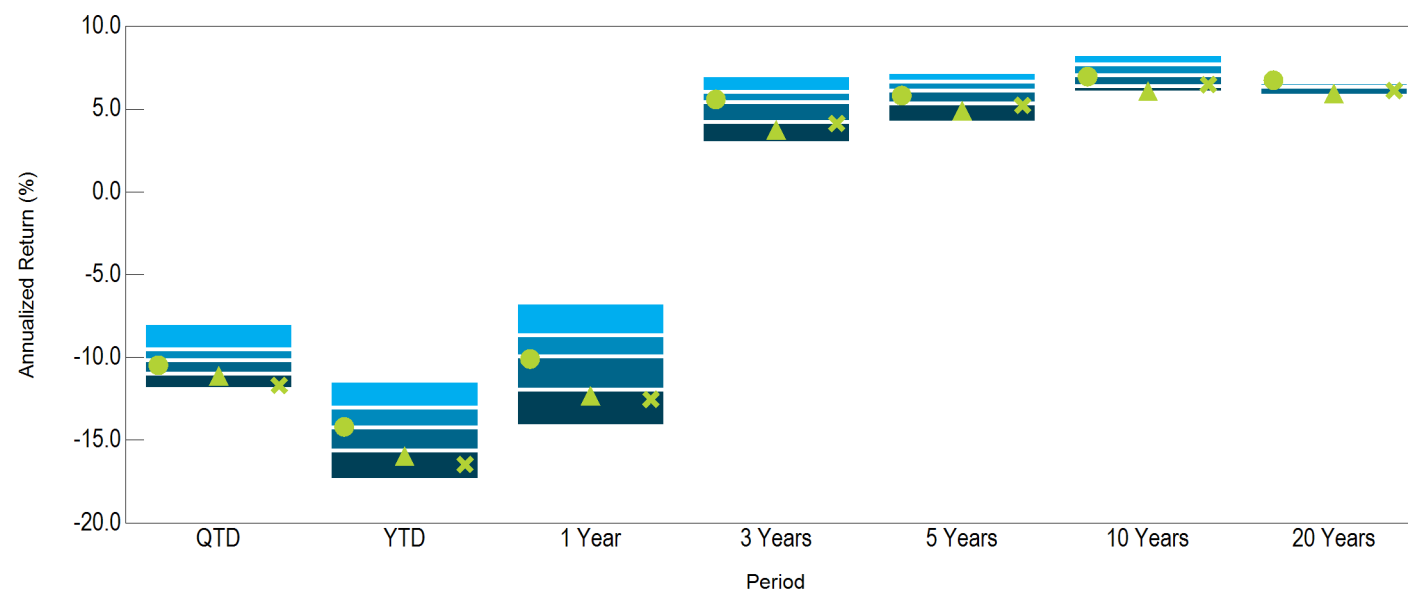


- Total Retirement System
- ◆ 60% MSCI World & 40% Barclays Aggregate



- Total Retirement System
- ◆ 60% MSCI World & 40% Barclays Aggregate

InvMetrics Public DB \$50mm-\$250mm Net Return Comparison  
Ending June 30, 2022



	Return (Rank)						
5th Percentile	-7.9	-11.4	-6.7	7.0	7.2	8.3	6.8
25th Percentile	-9.5	-13.0	-8.6	6.1	6.7	7.7	6.6
Median	-10.2	-14.2	-9.9	5.4	6.1	7.1	6.4
75th Percentile	-10.9	-15.6	-11.9	4.3	5.4	6.4	5.8
95th Percentile	-11.9	-17.4	-14.1	3.0	4.2	6.0	5.6
# of Portfolios	54	54	54	53	50	41	16
● Total Retirement System	-10.5 (61)	-14.2 (48)	-10.1 (55)	5.6 (45)	5.8 (64)	7.0 (55)	6.7 (7)
▲ 55% MSCI World & 45% Barclays Aggregate	-11.1 (82)	-16.0 (85)	-12.3 (81)	3.7 (89)	4.9 (85)	6.1 (91)	5.9 (70)
✕ 60% MSCI World & 40% Barclays Aggregate	-11.7 (94)	-16.5 (90)	-12.5 (84)	4.1 (81)	5.2 (77)	6.5 (71)	6.1 (65)

Statistics Summary						
5 Years Ending June 30, 2022						
	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Total Retirement System	5.8%	9.8%	0.5	1.0	0.5	1.8%
55% MSCI World & 45% Barclays Aggregate	4.9%	9.6%	--	1.0	0.4	0.0%
Equity Assets	6.4%	16.8%	-1.3	0.9	0.3	3.2%
Russell 3000	10.6%	17.5%	--	1.0	0.5	0.0%
Domestic Equity Assets	8.2%	17.9%	-0.9	1.0	0.4	2.7%
Russell 3000	10.6%	17.5%	--	1.0	0.5	0.0%
RhumbLine S&P 500 Index	11.2%	16.9%	-1.4	1.0	0.6	0.0%
S&P 500	11.3%	16.9%	--	1.0	0.6	0.0%
Frontier Capital Appreciation	5.5%	24.1%	-0.2	1.0	0.2	8.8%
Russell 2500 Growth	7.5%	21.8%	--	1.0	0.3	0.0%
RhumbLine HEDI	--	--	--	--	--	--
Russell 1000 HEDI Moderate GR USD	12.5%	15.8%	--	1.0	0.7	0.0%
International Developed Markets Equity Assets	2.4%	15.8%	0.7	1.0	0.1	0.3%
MSCI EAFE	2.2%	15.9%	--	1.0	0.1	0.0%
RhumbLine MSCI EAFE Index	2.4%	15.8%	0.7	1.0	0.1	0.3%
MSCI EAFE	2.2%	15.9%	--	1.0	0.1	0.0%
International Emerging Markets Equity Assets	4.2%	16.8%	0.8	1.0	0.2	2.5%
MSCI Emerging Markets	2.2%	17.1%	--	1.0	0.1	0.0%

RhumbLine HEDI funded on 10/5/2020. Statistics will be reflected after first full five calendar years.

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
DFA Emerging Markets	2.9%	17.8%	0.2	1.0	0.1	3.9%
MSCI Emerging Markets	2.2%	17.1%	--	1.0	0.1	0.0%
Driehaus Emerging Market Equity	5.3%	16.5%	0.8	0.9	0.3	4.0%
MSCI Emerging Markets	2.2%	17.1%	--	1.0	0.1	0.0%
Investment Grade Bonds Assets	0.8%	4.1%	-0.5	1.0	0.0	0.1%
Bloomberg US Aggregate TR	0.9%	4.0%	--	1.0	0.0	0.0%
SSgA U.S. Aggregate Bond Index	0.8%	4.1%	-0.5	1.0	0.0	0.1%
Bloomberg US Aggregate TR	0.9%	4.0%	--	1.0	0.0	0.0%
High Yield Bond Assets	2.1%	7.4%	0.0	0.9	0.1	1.1%
Bloomberg US High Yield TR	2.1%	8.4%	--	1.0	0.1	0.0%
Shenkman Capital	2.2%	7.4%	0.1	0.9	0.2	1.1%
Bloomberg US High Yield TR	2.1%	8.4%	--	1.0	0.1	0.0%
TIPS Assets	3.1%	4.3%	-1.5	1.0	0.5	0.1%
Bloomberg US TIPS TR	3.2%	4.3%	--	1.0	0.5	0.0%
SSgA TIPS Index-NL	3.1%	4.3%	-1.5	1.0	0.5	0.1%
Bloomberg US TIPS TR	3.2%	4.3%	--	1.0	0.5	0.0%
Emerging Market Debt Assets	-1.4%	11.5%	-0.1	1.1	-0.2	2.4%
JP Morgan EMBI Global Diversified	-1.2%	10.1%	--	1.0	-0.2	0.0%
Payden Emerging Market Bond	-1.4%	11.5%	-0.1	1.1	-0.2	2.4%
JP Morgan EMBI Global Diversified	-1.2%	10.1%	--	1.0	-0.2	0.0%

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Open-Ended Real Estate	12.0%	6.9%	0.7	1.0	1.6	3.4%
NCREIF ODCE	9.5%	6.1%	--	1.0	1.4	0.0%
Clarion Partners	12.0%	6.9%	0.7	1.0	1.6	3.4%
NCREIF ODCE	9.5%	6.1%	--	1.0	1.4	0.0%
Total Closed End Real Estate	-5.2%	22.3%	-0.7	0.7	-0.3	21.9%
NCREIF ODCE	9.5%	6.1%	--	1.0	1.4	0.0%
Rockwood Capital Real Estate Partners Fund XI, L.P.	--	--	--	--	--	--
NCREIF-ODCE	--	--	--	--	--	--
Comerica Short Term Fund	0.4%	0.2%	-1.9	0.0	-3.0	0.3%
91 Day T-Bills	1.0%	0.3%	--	1.0	0.0	0.0%

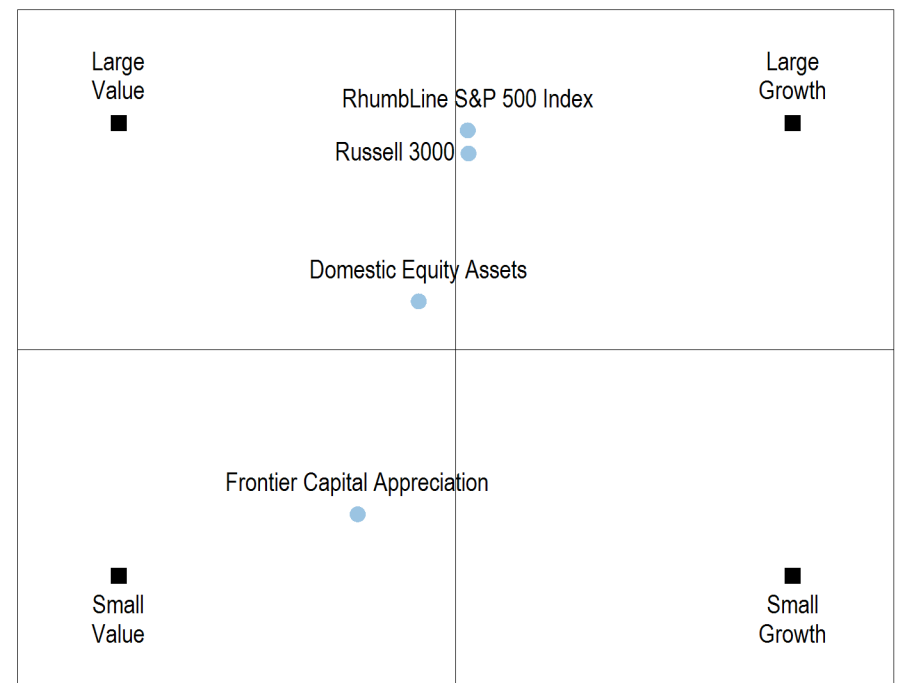
Rockwood Capital XI statistics will be reflected after first full five calendar years.

## Retirement System Detail

#### Asset Allocation on June 30, 2022

	Actual	Actual
Frontier Capital Appreciation	\$20,495,107	27.5%
RhumbLine HEDI	\$28,577,013	38.3%
RhumbLine S&P 500 Index	\$25,523,984	34.2%
<b>Total</b>	<b>\$74,596,104</b>	<b>100.0%</b>

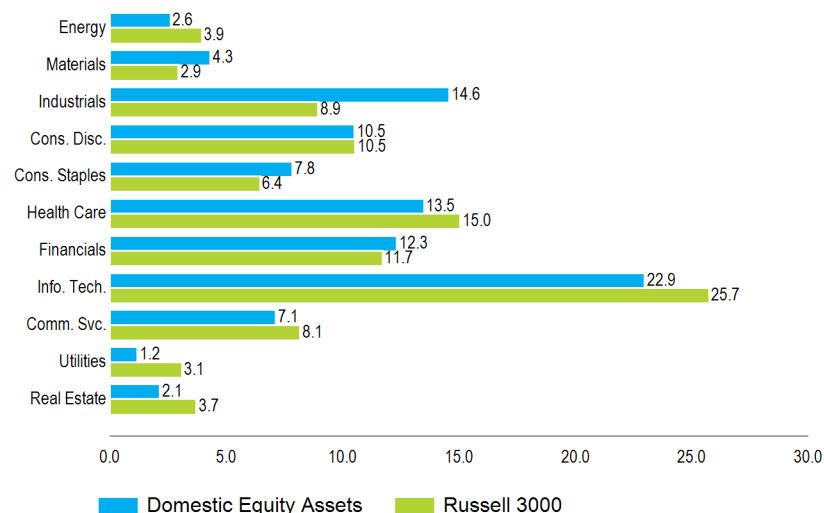
#### Domestic Equity Assets Style Map 3 Years Ending June 30, 2022



### Domestic Equity Assets | As of June 30, 2022

Domestic Equity Assets Characteristics			
	Portfolio Q2-22	Index Q2-22	Portfolio Q1-22
Market Value			
Market Value (\$M)	74.6	--	92.2
Number Of Holdings	668	2960	673
Characteristics			
Weighted Avg. Market Cap. (\$B)	324.5	412.8	450.5
Median Market Cap (\$B)	23.6	2.4	27.5
P/E Ratio	18.7	18.1	22.6
Yield	1.4	1.7	1.1
EPS Growth - 5 Yrs.	18.3	18.8	18.5
Price to Book	3.6	3.6	4.1

#### Sector Allocation (%) vs Russell 3000



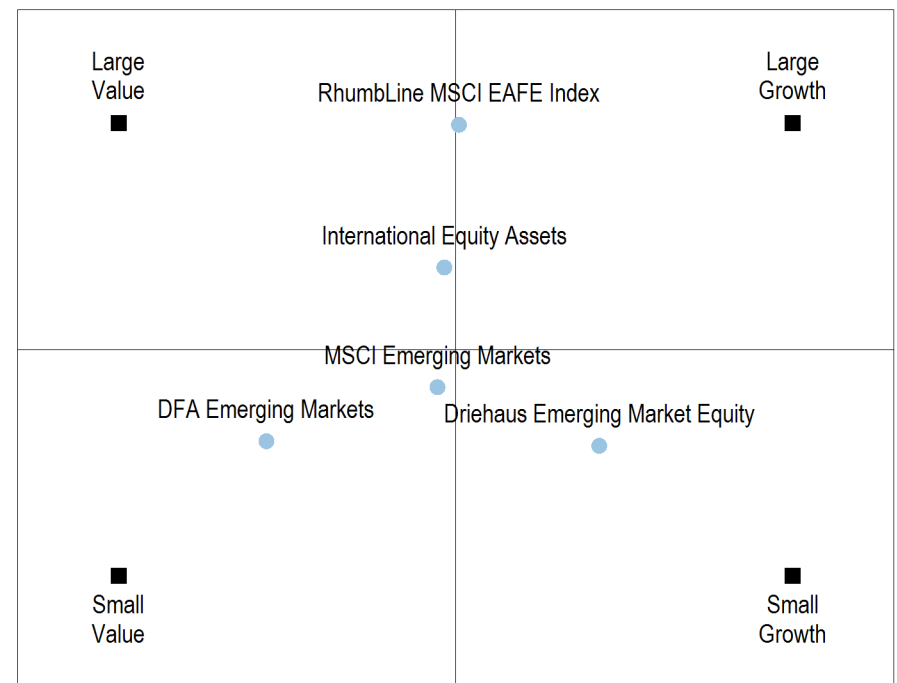
#### Top 10 Holdings

APPLE INC	4.3%
MICROSOFT CORP	4.0%
AMAZON.COM INC	1.8%
ALPHABET INC	1.5%
ALPHABET INC	1.4%
BERKSHIRE HATHAWAY INC	1.1%
JOHNSON & JOHNSON	1.1%
UNITEDHEALTH GROUP INC	1.0%
BROWN-FORMAN CORP	0.8%
PROCTER & GAMBLE CO (THE)	0.8%
<b>Total</b>	<b>17.7%</b>

#### Asset Allocation on June 30, 2022

	Actual	Actual
DFA Emerging Markets	\$9,534,656	23.3%
DrieHaus Emerging Market Equity	\$8,813,995	21.5%
RhumbLine MSCI EAFE Index	\$22,628,258	55.2%
<b>Total</b>	<b>\$40,976,910</b>	<b>100.0%</b>

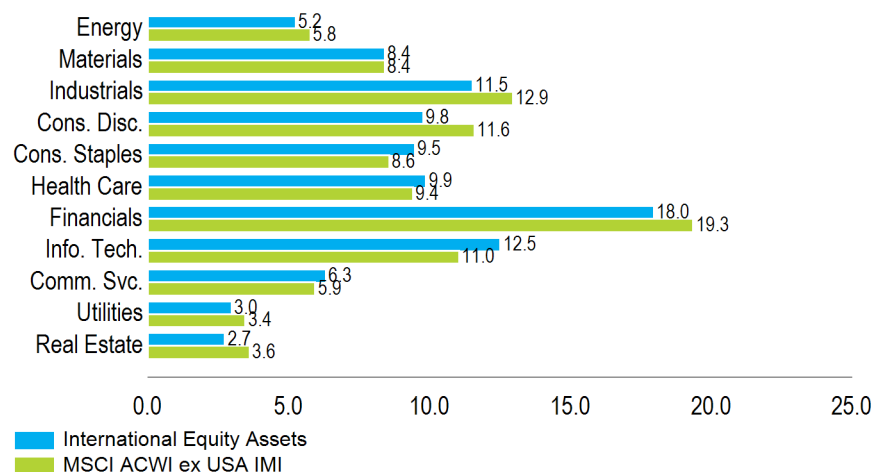
#### International Equity Assets Style Map 3 Years Ending June 30, 2022



### International Equity Assets | As of June 30, 2022

International Equity Characteristics			
	Portfolio Q2-22	Index Q2-22	Portfolio Q1-22
Market Value			
Market Value (\$M)	41.0	--	47.1
Number Of Holdings	7319	6420	6991
Characteristics			
Weighted Avg. Market Cap. (\$B)	88.1	70.7	101.9
Median Market Cap (\$B)	0.6	1.6	0.8
P/E Ratio	12.1	12.1	14.0
Yield	3.5	3.5	2.7
EPS Growth - 5 Yrs.	14.4	13.3	15.6
Price to Book	2.5	2.3	2.6

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



#### Top 10 Holdings

TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	1.8%
SAMSUNG ELECTRONICS CO LTD	1.8%
NORTHERN INSTITUTIONAL U.S. GOVERNMENT SELECT PORTFOLIO	1.7%
NESTLE SA, CHAM UND VEVEY	1.5%
TENCENT HOLDINGS LTD	1.4%
ROCHE HOLDING AG	0.9%
AIA GROUP LTD	0.9%
ASTRAZENECA PLC	0.8%
SHELL PLC	0.8%
ASML HOLDING NV	0.8%
<b>Total</b>	<b>12.4%</b>

### Country Allocation Report

As of 6/30/2022

Region	% of Total	% of Bench	% Diff
North America ex U.S.	0.6%	8.1%	-7.5%
United States	2.7%	0.0%	2.7%
Europe Ex U.K.	29.3%	29.1%	0.2%
United Kingdom	7.3%	10.1%	-2.9%
Pacific Basin Ex Japan	9.0%	8.3%	0.6%
Japan	12.5%	14.9%	-2.4%
Emerging Markets	37.4%	28.6%	8.8%
Other	1.2%	0.9%	0.3%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

International Equity Country Allocation			
vs MSCI ACWI ex USA IMI			
Country	% of Total	% of Bench	% Diff
ARGENTINA	0.1%	0.0%	0.1%
AUSTRALIA	4.1%	5.1%	-1.0%
AUSTRIA	0.1%	0.2%	-0.1%
BAHRAIN	0.0%	0.0%	0.0%
BANGLADESH	0.0%	0.0%	0.0%
BELGIUM	0.5%	0.7%	-0.2%
BRAZIL	2.2%	1.5%	0.7%
CANADA	0.6%	8.1%	-7.5%
CHILE	0.1%	0.2%	0.0%
CHINA	8.9%	9.1%	-0.3%
COLOMBIA	0.0%	0.0%	0.0%
CROATIA	0.0%	0.0%	0.0%
CZECH REPUBLIC	0.0%	0.0%	0.0%
DENMARK	1.5%	1.7%	-0.1%
EGYPT	0.0%	0.0%	0.0%
ESTONIA	0.0%	0.0%	0.0%
FINLAND	0.7%	0.7%	0.0%
FRANCE	6.0%	6.4%	-0.4%
GERMANY	4.2%	4.4%	-0.2%
GREECE	0.1%	0.1%	0.1%
HONG KONG	3.9%	2.0%	1.9%
HUNGARY	0.0%	0.0%	0.0%
INDIA	7.0%	4.0%	3.0%
INDONESIA	1.3%	0.5%	0.7%

Country	% of Total	% of Bench	% Diff
IRELAND	0.5%	0.4%	0.2%
ISRAEL	0.5%	0.7%	-0.2%
ITALY	1.1%	1.5%	-0.4%
JAPAN	12.5%	14.9%	-2.4%
JORDAN	0.0%	0.0%	0.0%
KAZAKHSTAN	0.0%	0.0%	0.0%
KENYA	0.0%	0.0%	0.0%
KOREA	4.7%	3.4%	1.3%
KUWAIT	0.0%	0.3%	-0.3%
LEBANON	0.0%	0.0%	0.0%
LITHUANIA	0.0%	0.0%	0.0%
LUXEMBOURG	0.4%	0.0%	0.4%
MALAYSIA	0.5%	0.5%	0.0%
MAURITIUS	0.0%	0.0%	0.0%
MEXICO	1.2%	0.6%	0.6%
MOROCCO	0.0%	0.0%	0.0%
NETHERLANDS	4.2%	2.3%	1.8%
NEW ZEALAND	0.1%	0.2%	-0.1%
NIGERIA	0.0%	0.0%	0.0%
NORWAY	0.5%	0.7%	-0.2%
OMAN	0.0%	0.0%	0.0%
OTHER	0.6%	0.0%	0.6%
PAKISTAN	0.0%	0.0%	0.0%
PERU	0.0%	0.1%	-0.1%
PHILIPPINES	0.2%	0.2%	0.0%
POLAND	0.2%	0.2%	0.0%
PORTUGAL	0.1%	0.2%	0.0%

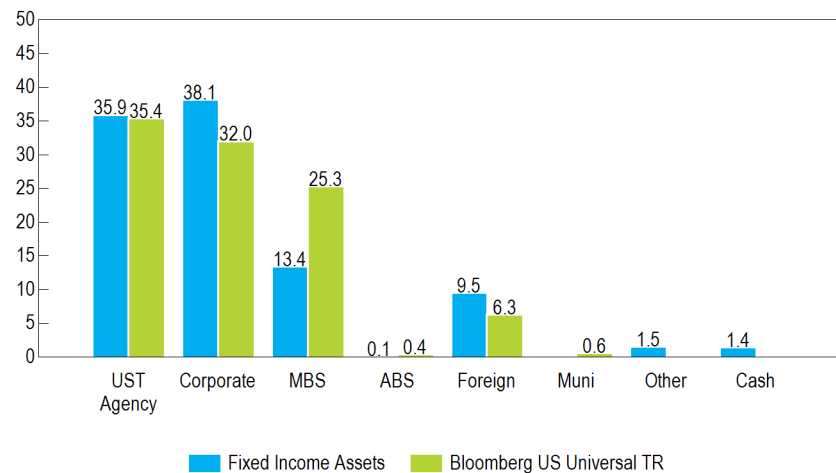
## International Equity Assets | As of June 30, 2022

Country	% of Total	% of Bench	% Diff
QATAR	0.4%	0.3%	0.1%
ROMANIA	0.0%	0.0%	0.0%
SAUDI ARABIA	1.2%	1.2%	-0.1%
SERBIA	0.0%	0.0%	0.0%
SINGAPORE	0.8%	1.0%	-0.2%
SLOVENIA	0.0%	0.0%	0.0%
SOUTH AFRICA	1.7%	1.1%	0.6%
SPAIN	1.4%	1.5%	-0.1%
SRI LANKA	0.0%	0.0%	0.0%
SWEDEN	1.7%	2.3%	-0.6%
SWITZERLAND	6.3%	6.1%	0.2%
TAIWAN	6.1%	4.5%	1.6%
THAILAND	1.1%	0.6%	0.5%
TUNISIA	0.0%	0.0%	0.0%
TURKEY	0.1%	0.1%	0.0%
UKRAINE	0.0%	0.0%	0.0%
UNITED ARAB EMIRATES	0.2%	0.4%	-0.1%
UNITED KINGDOM	7.3%	10.1%	-2.9%
UNITED STATES	2.7%	0.0%	2.7%
VIETNAM	0.1%	0.0%	0.1%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

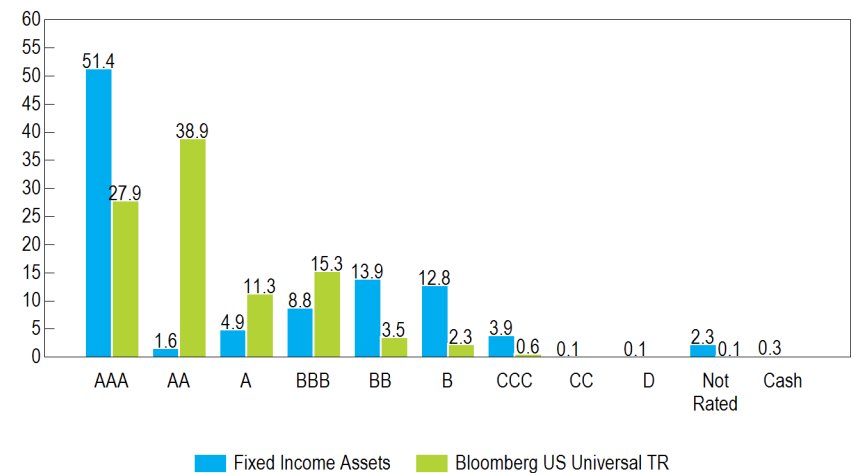
Asset Allocation on June 30, 2022		
	Actual	Actual
Payden Emerging Market Bond	\$4,566,749	8.1%
Shenkman Capital	\$16,842,035	29.7%
SSgA TIPS Index-NL	\$9,638,033	17.0%
SSgA U.S. Aggregate Bond Index	\$25,569,127	45.2%
<b>Total</b>	<b>\$56,615,945</b>	<b>100.0%</b>

Fixed Income Characteristics vs. Bloomberg US Universal TR			
	Portfolio Q2-22	Index Q2-22	Portfolio Q1-22
Fixed Income Characteristics			
Yield to Maturity	5.6	4.1	4.1
Average Duration	5.5	6.4	5.6
Average Quality	A	AA	A
Weighted Average Maturity	7.8	8.5	8.1

#### Sector Allocation



#### Credit Quality Allocation



## Portfolio Reviews

### RhumbLine S&P 500 Index | As of June 30, 2022

#### 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 (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
RhumbLine S&P 500 Index	-16.1	-10.7	10.5	11.2	12.9	6.9	Mar-99
S&P 500	-16.1	-10.6	10.6	11.3	13.0	6.9	Mar-99

#### Top 10 Holdings

APPLE INC	6.5%
MICROSOFT CORP	6.0%
AMAZON.COM INC	2.9%
ALPHABET INC	2.0%
ALPHABET INC	1.9%
TESLA INC	1.8%
BERKSHIRE HATHAWAY INC	1.5%
UNITEDHEALTH GROUP INC	1.5%
JOHNSON & JOHNSON	1.5%
NVIDIA CORPORATION	1.2%
<b>Total</b>	<b>26.7%</b>

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

	Portfolio Q2-22	Index Q2-22	Portfolio Q1-22
<b>Market Value</b>			
Market Value (\$M)	25.5	--	34.1
Number Of Holdings	505	503	507
<b>Characteristics</b>			
Weighted Avg. Market Cap. (\$B)	476.8	480.0	638.5
Median Market Cap (\$B)	28.0	27.8	32.1
P/E Ratio	18.8	18.9	22.7
Yield	1.7	1.7	1.4
EPS Growth - 5 Yrs.	18.3	18.3	19.7
Price to Book	4.0	4.0	4.5
<b>Sector Distribution</b>			
Energy	4.3	4.2	3.8
Materials	2.6	2.5	2.6
Industrials	7.7	7.7	7.8
Consumer Discretionary	10.4	11.0	12.0
Consumer Staples	6.9	7.5	6.0
Health Care	15.0	14.8	13.5
Financials	11.5	11.1	11.3
Information Technology	26.6	26.3	27.9
Communication Services	8.8	9.1	9.3
Utilities	3.0	3.0	2.7
Real Estate	2.9	2.8	2.7

Account Information	
Account Name	RhumbLine HEDI
Account Structure	Separate Account
Investment Style	Passive
Inception Date	11/01/20
Account Type	US Equity
Benchmark	Russell 1000 HEDI Moderate GR USD
Universe	eV US Large Cap Core Equity Gross

Portfolio Performance Summary							
	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
RhumbLine HEDI	-12.8	-8.3	--	--	--	9.4	Nov-20
Russell 1000 HEDI Moderate GR USD	-12.8	-8.3	10.2	12.5	13.7	9.5	Nov-20

Top 10 Holdings	
APPLE INC	5.5%
MICROSOFT CORP	5.1%
ALPHABET INC	2.3%
BROWN-FORMAN CORP	2.1%
AMAZON.COM INC	2.0%
SIRIUS XM HOLDINGS INC	1.9%
ALPHABET INC	1.8%
JOHNSON & JOHNSON	1.5%
BERKSHIRE HATHAWAY INC	1.4%
UNITEDHEALTH GROUP INC	1.3%
<b>Total</b>	<b>24.9%</b>

Rhumbline HEDI Characteristics		
	Portfolio Q2-22	Portfolio Q1-22
Market Value		
Market Value (\$M)	28.6	32.8
Number Of Holdings	226	240
Characteristics		
Weighted Avg. Market Cap. (\$B)	397.2	571.9
Median Market Cap (\$B)	34.0	35.6
P/E Ratio	21.5	24.7
Yield	1.5	1.2
EPS Growth - 5 Yrs.	17.1	18.1
Price to Book	4.8	5.5
Sector Distribution		
Energy	0.7	0.0
Materials	2.7	2.4
Industrials	15.5	14.5
Consumer Discretionary	8.6	9.9
Consumer Staples	14.2	10.4
Health Care	12.2	13.2
Financials	11.3	11.6
Information Technology	23.7	26.8
Communication Services	9.2	8.7
Utilities	0.3	0.6
Real Estate	1.5	1.7

Russell 1000 HEDI benchmark characteristic data is unavailable.

## Frontier Capital Appreciation | As of June 30, 2022

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 (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Frontier Capital Appreciation	-18.9	-20.2	5.7	5.5	--	9.7	Feb-13
Russell 2500 Growth	-19.6	-31.8	3.7	7.5	10.9	10.0	Feb-13

Top 10 Holdings	
BUILDERS FIRSTSOURCE INC	2.0%
LPL FINANCIAL HOLDINGS INC	1.9%
KBR INC	1.8%
MACOM TECHNOLOGY SOLUTIONS HOLDINGS INC	1.7%
INSULET CORP	1.5%
MRC GLOBAL INC	1.5%
BERKLEY (W.R.) CORP	1.5%
CASH - USD	1.4%
MATTEL INC.	1.4%
ALBEMARLE CORP	1.4%
<b>Total</b>	<b>16.2%</b>

Frontier Capital Appreciation Characteristics			
	Portfolio Q2-22	Index Q2-22	Portfolio Q1-22
Market Value			
Market Value (\$M)	20.5	--	25.3
Number Of Holdings	143	1339	140
Characteristics			
Weighted Avg. Market Cap. (\$B)	7.0	5.4	8.1
Median Market Cap (\$B)	3.8	1.7	4.8
P/E Ratio	14.6	19.0	19.5
Yield	0.8	0.8	0.6
EPS Growth - 5 Yrs.	20.4	20.4	15.2
Price to Book	2.4	4.2	2.8
Sector Distribution			
Energy	3.0	5.3	2.4
Materials	8.7	5.2	8.9
Industrials	21.8	17.4	22.1
Consumer Discretionary	13.1	11.8	13.1
Consumer Staples	0.0	3.8	0.0
Health Care	13.4	19.3	13.7
Financials	14.7	6.9	13.8
Information Technology	17.4	24.1	18.3
Communication Services	2.0	1.9	2.3
Utilities	0.0	1.3	0.0
Real Estate	2.0	3.0	2.2

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

Portfolio Performance Summary							
	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
RhumbLine MSCI EAFE Index	-14.3	-17.4	1.3	2.4	--	2.3	Aug-14
MSCI EAFE	-14.5	-17.8	1.1	2.2	5.4	2.1	Aug-14

Top 10 Holdings	
NESTLE SA, CHAM UND VEVEY	2.4%
ROCHE HOLDING AG	1.7%
ASTRAZENECA PLC	1.5%
SHELL PLC	1.4%
ASML HOLDING NV	1.4%
ISHARES MSCI EAFE ETF	1.4%
NOVO NORDISK 'B'	1.3%
NOVARTIS AG	1.3%
LVMH MOET HENNESSY LOUIS VUITTON SE	1.2%
TOYOTA MOTOR CORP	1.2%
<b>Total</b>	<b>14.8%</b>

Rhumbline MSCI EAFE Index Characteristics			
	Portfolio Q2-22	Index Q2-22	Portfolio Q1-22
Market Value			
Market Value (\$M)	22.6	--	26.4
Number Of Holdings	803	792	824
Characteristics			
Weighted Avg. Market Cap. (\$B)	74.3	73.5	84.6
Median Market Cap (\$B)	11.6	11.7	13.0
P/E Ratio	13.3	13.2	14.9
Yield	3.6	3.6	2.9
EPS Growth - 5 Yrs.	12.5	12.1	14.1
Price to Book	2.5	2.4	2.6
Sector Distribution			
Energy	4.6	4.8	4.0
Materials	7.3	7.3	8.1
Industrials	14.5	14.9	15.0
Consumer Discretionary	11.0	11.3	11.3
Consumer Staples	10.6	10.9	10.0
Health Care	13.5	13.9	12.8
Financials	17.2	17.8	17.4
Information Technology	7.6	7.8	8.5
Communication Services	4.8	5.0	4.7
Utilities	3.4	3.5	3.3
Real Estate	2.8	2.9	2.8

## DFA Emerging Markets | As of June 30, 2022

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 (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
DFA Emerging Markets	-11.8	-19.7	2.7	2.9	--	3.7	Jan-15
MSCI Emerging Markets	-11.4	-25.3	0.6	2.2	3.1	3.0	Jan-15

Top 10 Holdings	
TENCENT HOLDINGS LTD	2.9%
SAMSUNG ELECTRONICS CO LTD	2.8%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	2.7%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	1.2%
ALIBABA GROUP HOLDING LTD	1.1%
CHINA CONSTRUCTION BANK CORP	1.0%
VALE SA	0.9%
PING AN INSURANCE GROUP	0.8%
RELIANCE INDUSTRIES LTD	0.8%
INFOSYS LTD	0.6%
<b>Total</b>	<b>14.9%</b>

DFA Emerging Markets Characteristics			
	Portfolio Q2-22	Index Q2-22	Portfolio Q1-22
Market Value			
Market Value (\$M)	9.5	--	10.8
Number Of Holdings	6493	1290	6142
Characteristics			
Weighted Avg. Market Cap. (\$B)	63.4	110.0	80.3
Median Market Cap (\$B)	0.4	6.3	0.5
P/E Ratio	9.2	11.1	10.6
Yield	4.1	3.3	3.1
EPS Growth - 5 Yrs.	15.3	14.3	16.8
Price to Book	2.2	2.5	2.4
Sector Distribution			
Energy	5.0	5.0	4.8
Materials	12.4	8.5	12.6
Industrials	9.3	5.6	8.8
Consumer Discretionary	11.3	14.6	10.0
Consumer Staples	6.4	6.1	6.1
Health Care	4.3	4.2	3.8
Financials	16.4	21.8	17.2
Information Technology	19.4	19.3	21.5
Communication Services	7.6	10.0	7.7
Utilities	3.4	2.9	3.3
Real Estate	3.8	2.1	3.4

### 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 (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Driehaus Emerging Market Equity	-10.9	-25.0	3.6	5.3	--	5.3	Jan-15
MSCI Emerging Markets	-11.4	-25.3	0.6	2.2	3.1	3.0	Jan-15

### Top 10 Holdings

NORTHERN INSTITUTIONAL U.S. GOVERNMENT SELECT PORTFOLIO	8.1%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	7.3%
SAMSUNG ELECTRONICS CO LTD	5.3%
TENCENT HOLDINGS LTD	3.4%
RELIANCE INDUSTRIES LTD	2.6%
PT BANK CENTRAL ASIA TBK	2.5%
ICICI BANK LTD	2.4%
GPO FINANCE BANORTE	2.2%
MEITUAN DIANPING USD0.00001 A B CLASS ISIN KYG596691041	1.7%
AIA GROUP LTD	1.6%
<b>Total</b>	<b>37.3%</b>

### Driehaus Emerging Market Equity Characteristics

	Portfolio Q2-22	Index Q2-22	Portfolio Q1-22
<b>Market Value</b>			
Market Value (\$M)	8.8	--	9.9
Number Of Holdings	88	1290	88
<b>Characteristics</b>			
Weighted Avg. Market Cap. (\$B)	153.3	110.0	171.0
Median Market Cap (\$B)	22.0	6.3	28.7
P/E Ratio	15.1	11.1	18.9
Yield	2.5	3.3	1.8
EPS Growth - 5 Yrs.	16.7	14.3	17.8
Price to Book	3.0	2.5	3.3
<b>Sector Distribution</b>			
Energy	7.0	5.0	7.3
Materials	6.9	8.5	8.0
Industrials	6.2	5.6	5.5
Consumer Discretionary	4.9	14.6	5.4
Consumer Staples	10.0	6.1	8.0
Health Care	6.5	4.2	5.5
Financials	21.6	21.8	23.8
Information Technology	17.6	19.3	21.5
Communication Services	8.8	10.0	9.4
Utilities	1.3	2.9	1.0
Real Estate	1.3	2.1	0.0

### SSgA U.S. Aggregate Bond Index | As of June 30, 2022

#### 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	Bloomberg US Aggregate TR
Universe	eV US Core Fixed Inc Net

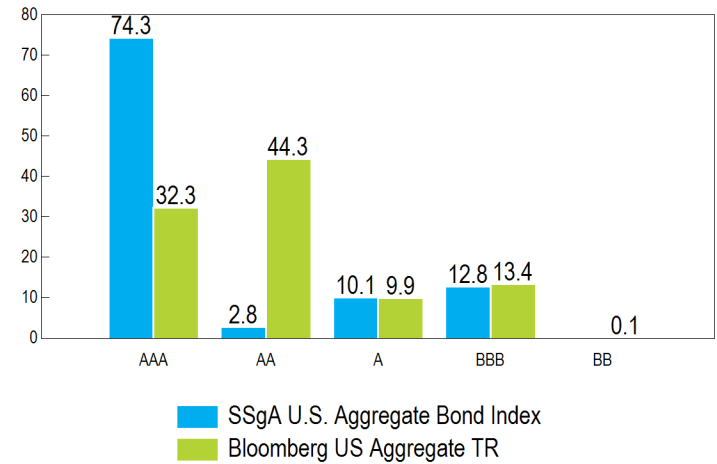
#### Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA U.S. Aggregate Bond Index	-4.7	-10.4	-1.0	0.8	1.5	3.8	May-01
Bloomberg US Aggregate TR	-4.7	-10.3	-0.9	0.9	1.5	3.8	May-01

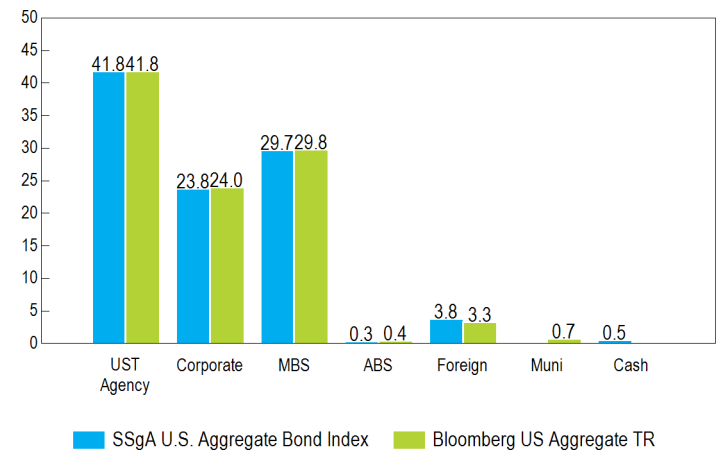
#### SSgA U.S. Aggregate Bond Index Characteristics vs. Bloomberg US Aggregate TR

	Portfolio Q2-22	Index Q2-22	Portfolio Q1-22
<b>Fixed Income Characteristics</b>			
Yield to Maturity	3.7	3.7	2.9
Average Duration	6.4	6.7	6.6
Average Quality	AA	AA	AA
Weighted Average Maturity	8.7	8.6	8.8

#### Credit Quality Allocation



#### Sector Allocation



#### Account Information

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

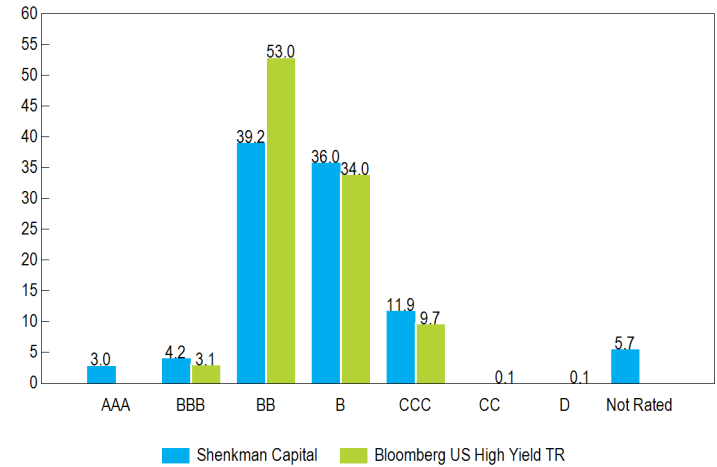
#### Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Shenkman Capital	-8.9	-11.0	0.4	2.2	4.0	5.5	Apr-06
Bloomberg US High Yield TR	-9.8	-12.8	0.2	2.1	4.5	6.0	Apr-06

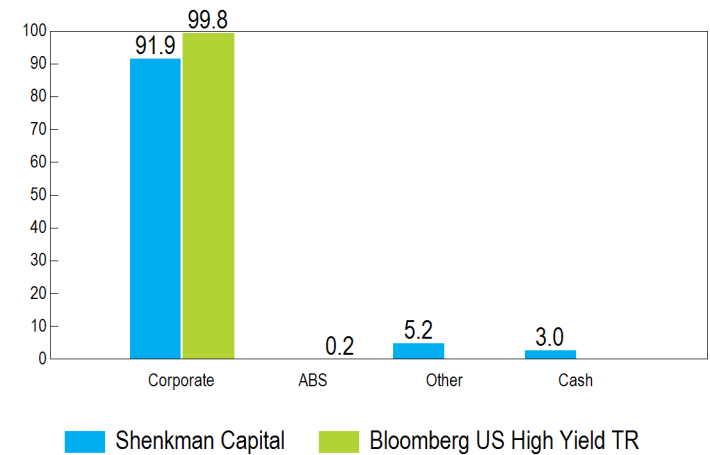
#### Shenkman Capital Characteristics vs. Bloomberg US High Yield TR

	Portfolio Q2-22	Index Q2-22	Portfolio Q1-22
Fixed Income Characteristics			
Yield to Maturity	8.5	8.7	5.6
Average Duration	4.0	4.6	3.5
Average Quality	BB	B	BB
Weighted Average Maturity	5.5	5.9	5.7

#### Credit Quality Allocation



#### Sector Allocation



### SSgA TIPS Index-NL | As of June 30, 2022

#### 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	Bloomberg US TIPS TR
Universe	eV US TIPS / Inflation Fixed Inc Net

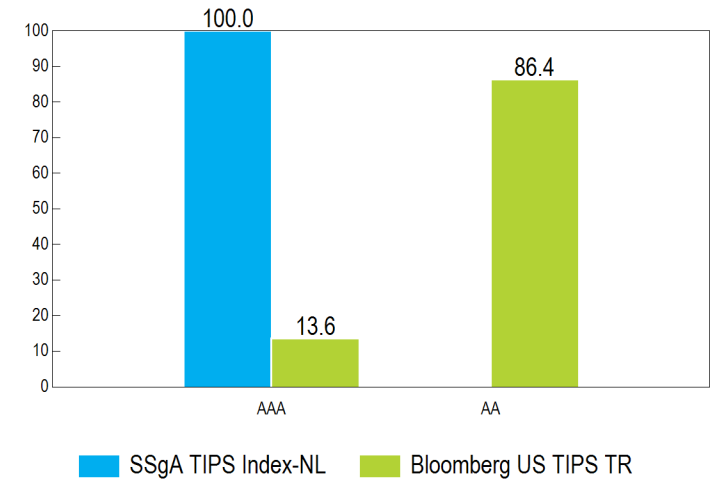
#### Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA TIPS Index-NL	-6.1	-5.2	2.9	3.1	1.7	3.6	Oct-05
Bloomberg US TIPS TR	-6.1	-5.1	3.0	3.2	1.7	3.6	Oct-05

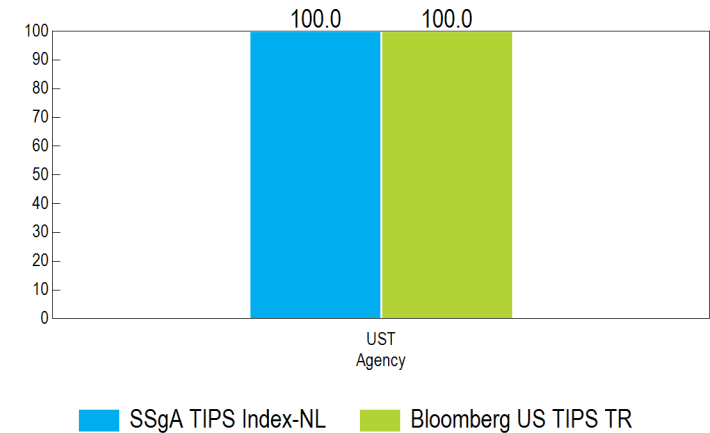
#### SSgA TIPS Index-NL Characteristics vs. Bloomberg US TIPS TR

	Portfolio Q2-22	Index Q2-22	Portfolio Q1-22
Fixed Income Characteristics			
Yield to Maturity	3.4	3.1	2.5
Average Duration	5.1	6.9	5.8
Average Quality	AAA	AA	AAA
Weighted Average Maturity	7.4	7.4	8.0

#### Credit Quality Allocation



#### Sector Allocation



### 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 (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Payden Emerging Market Bond	-13.7	-22.7	-5.5	-1.4	--	1.3	Jan-15
JP Morgan EMBI Global Diversified	-11.4	-21.2	-5.2	-1.2	2.2	1.5	Jan-15

### Fund Characteristics as of May 31, 2022

Versus JP Morgan EMBI Global Diversified

Sharpe Ratio (3 Year)	-0.1
Average Duration	7.4
Average Coupon	5.9%
Average Effective Maturity	12.7
R-Squared (3 Year)	1.0
Alpha (3 Year)	0.1%
Beta (3 Year)	1.1

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

	Portfolio Q2-22	Index Q2-22	Portfolio Q1-22
Fixed Income Characteristics			
Yield to Maturity	10.4	7.8	8.0
Average Duration	6.7	6.8	7.4
Average Quality	BB	BBB	BB
Weighted Average Maturity	12.5	11.8	12.7

### Fixed Income Sectors as of May 31, 2022

GOVERNMENT	69.0%
MUNICIPAL	0.0%
CORPORATE	12.8%
SECURITIZED	0.0%
CASH & EQUIVALENTS	4.7%
DERIVATIVE	13.4%

### Credit Quality as of March 31, 2022

AAA	3.0%
AA	4.0%
A	4.0%
BBB	26.0%
BB	27.0%
B	27.0%
Below B	6.0%
Not Rated	3.0%

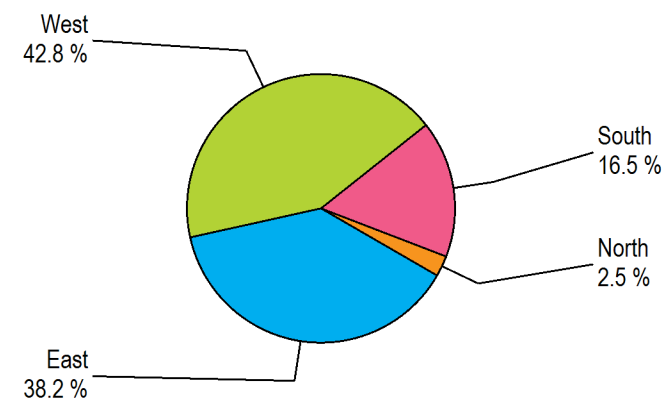
#### Account Information

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

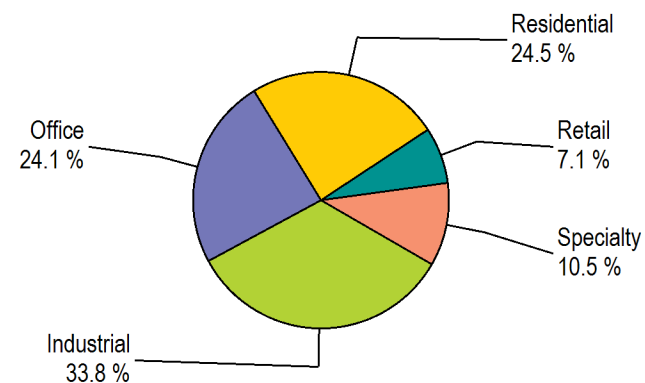
#### Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Clarion Partners	7.3	31.4	14.5	12.0	11.9	8.4	Oct-02
NCREIF ODCE	0.0	23.6	10.9	9.5	10.7	8.6	Oct-02

#### Geographic Diversification



#### Property Type Allocation



Clarion Partners characteristics are as of 3/31/2022.

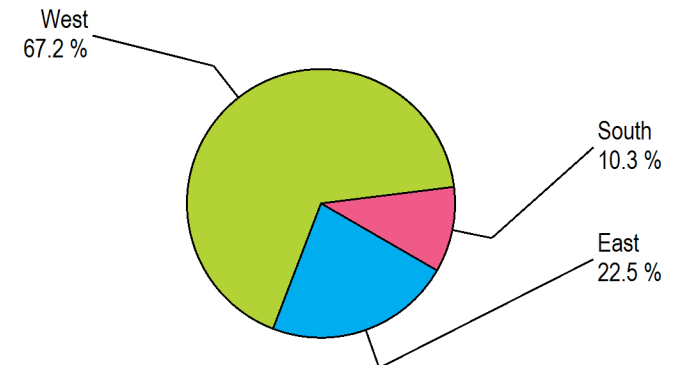
#### Account Information

Account Name	Rockwood Capital Real Estate Partners Fund XI, L.P.
Account Structure	Other
Investment Style	Passive
Inception Date	12/01/19
Account Type	Real Estate
Benchmark	NCREIF-ODCE
Universe	

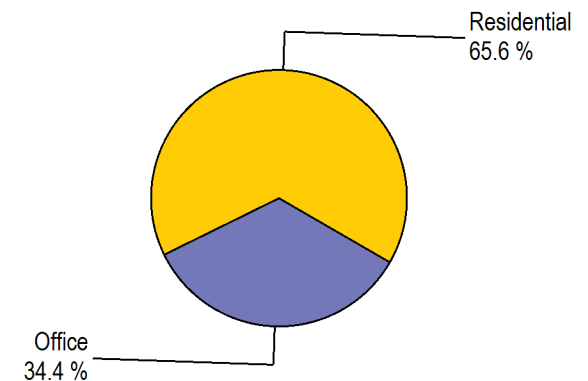
#### Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Rockwood Capital Real Estate Partners Fund XI, L.P.	4.0	24.6	--	--	--	8.3	Dec-19

#### Geographic Diversification



#### Property Type Allocation



Rockwood Real Estate characteristics are as of 3/31/2022.

Non-Marketable Securities Overview						
As of June 30, 2022						
Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	IRR (%)
North American Strategic Partners 2006	2006	\$4,539,998	\$4,411,659	\$2,094,251	\$18,450	6.4
Ironsides Partnership Fund IV	2015	\$2,500,000	\$1,424,191	\$1,168,745	\$2,757,488	36.2
Ironsides Direct Investment Fund IV	2015	\$2,500,000	\$2,419,534	\$2,485,962	\$2,307,052	19.5
Ironsides Partnership Fund V, L.P.	2019	\$2,000,000	\$977,618	\$0	\$1,382,472	52.1
Ironsides Direct Investment Fund V, L.P.	2019	\$2,000,000	\$2,538,377	\$242,967	\$3,343,365	26.5
HarbourVest 2019 Global Fund	2019	\$4,000,000	\$2,200,000	\$447,081	\$3,275,302	53.3
<b>Total Account</b>		<b>\$17,539,998</b>	<b>\$13,971,380</b>	<b>\$2,250,504</b>	<b>\$13,084,130</b>	

IRRs are as of 12/31/2022. Exceptions include HarbourVest 2019 which is as of 3/31/2022.

Non-Marketable Securities Overview							
As of June 30, 2022							
Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	IRR(%)
Private Debt	NB Private Debt Fund IV	2021	\$5,000,000	\$2,750,000	\$826,195	\$2,034,198	--
	<b>Total Account</b>		<b>\$5,000,000</b>	<b>\$2,750,000</b>	<b>\$826,195</b>	<b>\$2,034,198</b>	

IRRs for investments less than 2 years are not shown.

Annual Investment Expense Analysis As Of June 30, 2022				
Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
<b>Equity Assets</b>		<b>\$115,573,014</b>		
<b>Domestic Equity Assets</b>		<b>\$74,596,104</b>		
RhumbLine S&P 500 Index	0.07% of First 25.0 Mil, 0.05% of Next 25.0 Mil, 0.04% Thereafter	\$25,523,984	\$17,762	0.07%
Frontier Capital Appreciation	0.79% of Assets	\$20,495,107	\$161,911	0.79%
RhumbLine HEDI	0.05% of Assets	\$28,577,013	\$14,289	0.05%
<b>International Equity Assets</b>		<b>\$40,976,910</b>		
<b>International Developed Markets Equity Assets</b>		<b>\$22,628,258</b>		
RhumbLine MSCI EAFE Index	0.08% of First 25.0 Mil, 0.07% of Next 25.0 Mil, 0.05% Thereafter	\$22,628,258	\$18,103	0.08%
<b>International Emerging Markets Equity Assets</b>		<b>\$18,348,652</b>		
DFA Emerging Markets	0.33% of Assets	\$9,534,656	\$31,464	0.33%
Driehaus Emerging Market Equity	0.90% of Assets	\$8,813,995	\$79,326	0.90%
<b>Fixed Income Assets</b>		<b>\$56,615,945</b>		
<b>Investment Grade Bonds Assets</b>		<b>\$25,569,127</b>		
SSgA U.S. Aggregate Bond Index	0.04% of Assets	\$25,569,127	\$10,228	0.04%
<b>High Yield Bond Assets</b>		<b>\$16,842,035</b>		
Shenkman Capital	0.45% of Assets	\$16,842,035	\$75,789	0.45%
<b>TIPS Assets</b>		<b>\$9,638,033</b>		
SSgA TIPS Index-NL	0.04% of Assets	\$9,638,033	\$3,855	0.04%
<b>Emerging Market Debt Assets</b>		<b>\$4,566,749</b>		
Payden Emerging Market Bond	0.69% of Assets	\$4,566,749	\$31,511	0.69%

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
<b>Real Estate Assets</b>		<b>\$10,558,963</b>		
<b>Open-Ended Real Estate</b>		<b>\$7,685,939</b>		
Clarion Partners	1.10% of Assets	\$7,685,939	\$84,545	1.10%
<b>Total Closed End Real Estate</b>		<b>\$2,873,024</b>		
Rockwood Capital Real Estate Partners Fund XI, L.P.		\$2,873,024		
<b>Private Equity Assets</b>		<b>\$13,084,130</b>		
North American Strategic Partners 2006	0.8% on drawn and undrawn capital less investments sold or written off   5% carried interest, 8% preferred return	\$18,450		
Ironsides Partnership Fund IV	0% Management fee, 8% Preferred Return, 5% Carried Interest	\$2,757,488		
Ironsides Direct Investment Fund IV	0.5% Management fee, 8% Preferred Return, 15% Carried Interest	\$2,307,052		
Ironsides Partnership Fund V, L.P.		\$1,382,472		
Ironsides Direct Investment Fund V, L.P.	0.5% Management fee, 8% preferred return, 15% carried interest	\$3,343,365		
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	\$3,275,302		
<b>Private Debt Assets</b>		<b>\$2,034,198</b>		
NB Private Debt Fund IV	1.0% on invested capital	\$2,034,198		
<b>Cash</b>		<b>\$133,848</b>		
Comerica Short Term Fund		\$133,848		
<b>Total</b>		<b>\$198,000,097</b>	<b>\$528,783</b>	<b>0.27%</b>

Meketa has negotiated a 50% discount on fees for NB Private Debt Fund IV through June 2022. After June 2022, depending on Meketa's aggregate investment, the fee will become 0.7% or return to 1%.

## Current Issues

## Asset Allocation Update

### Review of Current Positioning<sup>1</sup>

	7/5/2020 Estimates %	Approved Policy Target %	Variance Over / (Under) %
<b>Growth/Equity</b>	<b>65</b>	<b>55</b>	<b>10</b>
US Equity	39	17	22
Developed Market Equity (non-US)	11	14	(3)
Emerging Market Equity	9	14	(5)
Private Equity	6	10	(4)
<b>Credit</b>	<b>12</b>	<b>15</b>	<b>(3)</b>
High Yield Bonds	8	5	3
Private Debt	2	8	(6)
Emerging Market Bonds (major)	2	2	--
<b>Rate Sensitive</b>	<b>19</b>	<b>10</b>	<b>9</b>
Investment Grade Bonds	13	5	8
TIPS	5	5	--
Cash Equivalents	1	--	1
<b>Real Assets</b>	<b>4</b>	<b>20</b>	<b>(16)</b>
Real Estate	4	10	(6)
Infrastructure (Core Private)	0	10	(10)

- Current overweight to US Equity will be reduced to less than 5% over the next six to nine months as the portfolio ramp up exposure to Private Equity, Developed Market Equity, Emerging Market Equity, and Private Debt.
- Current underweight to Infrastructure will be reduced to approximately 5% after August 1<sup>st</sup> capital call of \$10 million.
- We will moderately increase TIPS exposure while Real Assets approach target policy allocation over time.

<sup>1</sup> Expected return and standard deviation are based upon Meketa Investment Group's 2022 Annual Asset Study. Throughout this document, returns for periods longer than one year are annualized.

## City of Marlborough Contributory Retirement System Custody Service Review

## Background

- As required by PERAC, the City of Marlborough Contributory Retirement System must conduct a search for each service provider at least every seven years.
  - Comerica, the incumbent, still has approximately five years of contract remaining.
- In compliance with this mandate, Meketa Investment Group (“MIG”) issued a Request for Proposal (“RFP”) for Master Trust and Custody Services on May 4, 2022 with responses due by May 19, 2022.
- People’s United Bank responded to the RFP.
  - The incumbent custodian Comerica did not.
- Meketa reviewed the services offered, the custody platform, and the cost for this firm.
- A summary of People’s United Bank can be found on the following pages.

#### Selecting a Custodian

- The primary services provided by custodians involve record keeping and providing a platform from which to house separate account assets, account for commingled and mutual fund assets, and trade or rebalance portfolios efficiently. Banking and cash sweep services are also often available. In today's world, these services are highly automated functions. A top-tier custodian will:
- Maintain on-going investment in state-of-the-art computer systems.
  - Work on a direct automated basis with the Pensions money managers.
  - Provide accurate statements and accounting information in a timely manner every month (if desired).
  - Appoint a dedicated team that will respond to client requests in a timely manner.
  - Offer additional services when desired, including performance measurement, banking, and securities lending.
- This document represents our best understanding of proposals to date. Based on client feedback, we can continue to confirm details with each custody provider. Please note that while all the services offered may not be valuable today, it is worth understanding comprehensive costs in case of future needs.

### People's United Bank

Rating Criteria	Rating	Rationale
Overall	Advantageous	
Organization	Advantageous	<p>People's United Bank, N.A., was founded in 1842. Originally a state-chartered bank, in 2006, People's changed to a federally-chartered savings bank. In 2007, People's Bank completed the second-step conversion, raising \$3.44 billion in capital. In February of 2015, the Office of the Comptroller of the Currency approved the conversion of People's United Bank from a federally-chartered savings bank to a national banking association.</p> <p>In April 2022, People's United merged into M&amp;T Bank. The acquisition was valued at \$8.3 billion. The combined company employs more than 22,000 people.</p> <p>The parent bank's long-term debt is rated BBB+/A3/A by S&amp;P, Moody's, and Fitch.</p> <p>Common equity tier 1 capital and total risk-based capital ratios were 11.4 percent and 13.1 percent, respectively.</p>
Team	Highly Advantageous	<p>Team supports 32 Massachusetts Public Pension plans with \$12.5B asset under custody.</p> <p>Lead relationship manager has over 40 years of industry experience and is supported by three experienced client / relationship managers.</p>
Systems	Highly Advantageous	<p>Internally developed system with dedicated internal support staff. Additional use of Workbench interface supported by BNY Mellon. Will continue to use BNY for the foreseeable future. BNY invests over \$600M per year in technology.</p>
Cash Management	Highly Advantageous	<p>Provide availability of a range of STIF vehicles.</p> <p>No STIF issues within the past five years.</p> <p>Ability to forecast cash up to 60 days.</p>
Fees	Advantageous	<p>1.25 bps fee for assets under custody.</p> <p>Additional account level and transaction fees.</p> <p>Flat fee proposal of \$35,000 per year.</p> <p>Fees guaranteed for five years.</p>

Client Servicing

- It is crucial that the Pensions custodian provide excellent client service. This includes a quick response time to client inquiry.
- Each firm assigns clients a dedicated client service team with years of experience in custody services, supported by the entire custody department.

People's United Bank	
Relationship Manager (RM)	Anthony Teberio
Years' Experience (Industry / Company)	40 years / 7 years
How many clients does the RM service?	32 Mass Public Pension Systems
Maximum Number of Clients	40
Worked with Taft-Hartley's?	Yes
Location of Relationship Manager	Andover, MA

### Fee Summary

People's United Bank	
Custody Fees on assets (basis points)	1.25 bps
Separate account portfolios (Domestic equity foreign equity, fixed income)	\$2,500 per account annually
Commingled accounts, Line-item accounts, Limited Partnership accounts	Per account (no limit on number of assets held)
Third Party Mutual Fund Transactions	\$8.00 per transaction
Estimated Total Fees	\$34,800
Flat Fee Structure	\$35,000
Years Guaranteed	5
Performance Reporting fees (optional)	\$5,000

### Summary and Recommendation

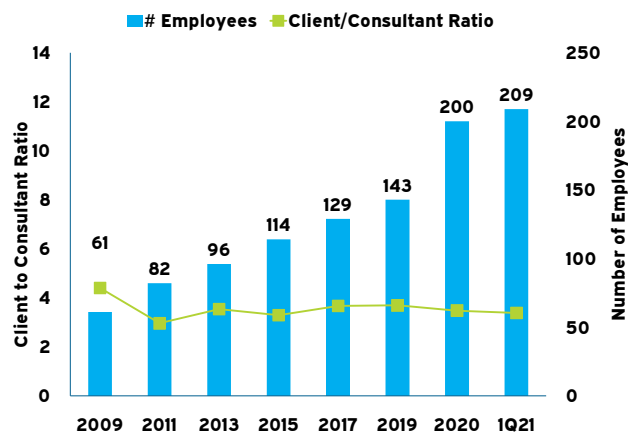
- Top-tier custodians are able to provide highly automated custodial data. It is important to provide accurate and timely statements, preferably with online access.
- Exceptional client service is critical in a custodial relationship, including quick responses to client inquiries, and accuracy in recordkeeping and executing transactions.
  - Additionally, client familiarity with vendors has had increasing importance in the context of cybersecurity and fraud prevention in recent years.
- These critical factors along with the other items discussed in this document, including pricing, should be considered when selecting a custodian to meet the Retirement System needs.

## Appendices

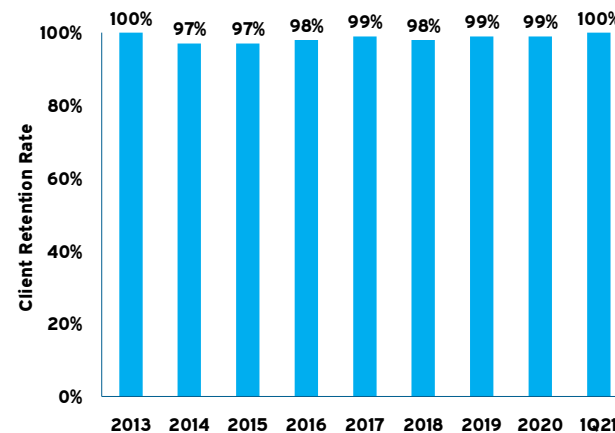
## Meketa Investment Group Corporate Update

- Staff of 215, including 142 investment professionals and 43 CFA Charterholders
- 220 clients, with over 350 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 \$1.6 trillion in client assets
  - Over \$125 billion in assets committed to alternative investments
    - Private Equity      ■ Infrastructure      ■ Natural Resources
    - Real Estate      ■ Hedge Funds      ■ Commodities

**Client to Consultant Ratio<sup>1</sup>**



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



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

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

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

## Asset Classes Followed Intensively by Meketa Investment Group

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

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**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.  $\text{Portfolio Return} - [\text{Risk Free Rate} + \text{Beta} \times (\text{market return} - \text{Risk Free Rate})]$ .

**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

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

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

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