

City of Quincy Retirement System

October 31, 2022

Interim Update

Agenda

1. Executive Summary
 - October Market Overview
 - Manager Highlights
2. Interim Update as of October 31, 2022
3. Disclaimer, Glossary & Notes

Executive Summary

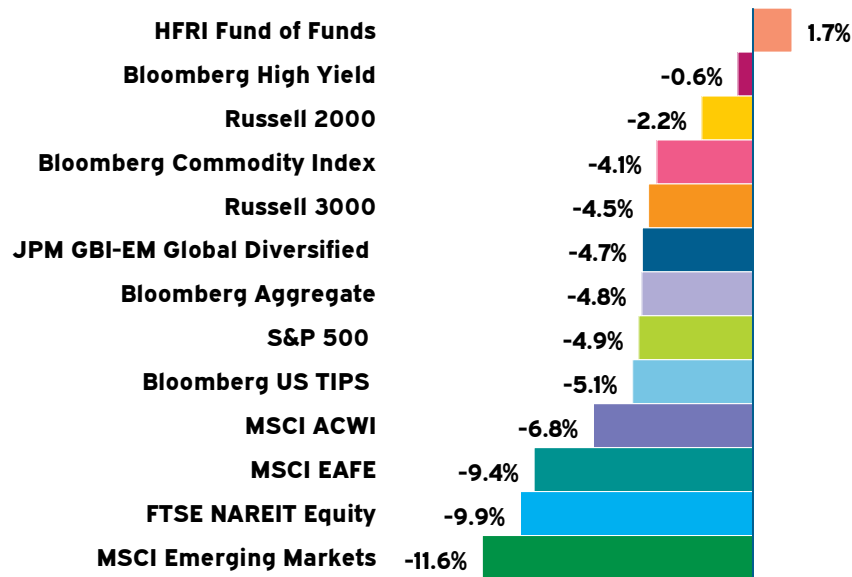
Economic and Market Update
Data as of October 31, 2022

Commentary

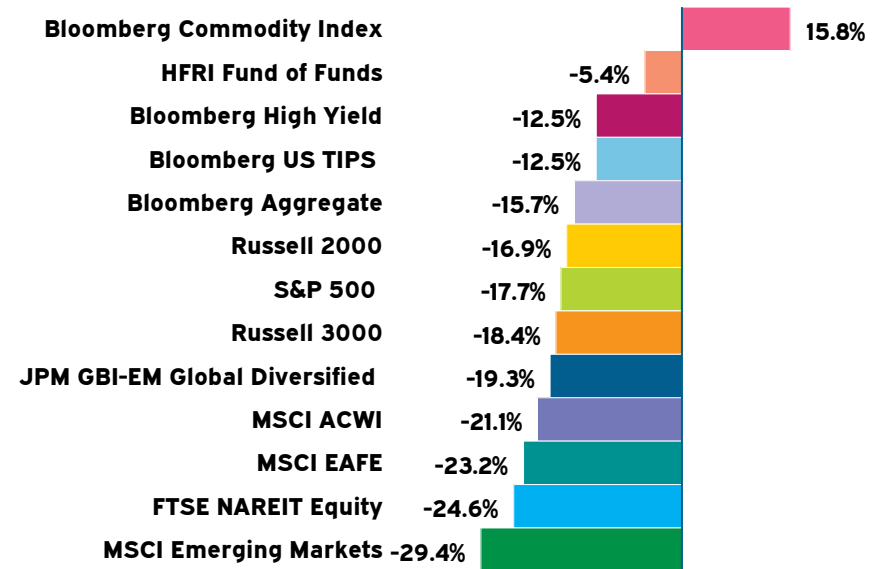
- Investor sentiment improved in October as markets repriced for continued easing of inflation risks, a potential slowing in monetary policy tightening efforts, and hopes for a soft-landing in 2023.
- After month-end, the Federal Reserve continued its aggressive tightening campaign with its fourth consecutive 75 basis point rate hike. Future hikes are expected into next year as US inflation remains high and labor markets tight.
 - In Europe, inflation hit a multi-decade high on energy prices, but manufacturing and service data in some countries surprised to the upside, lifting investor sentiment.
 - In the UK, the appointment of Rishi Sunak as the new prime minister calmed investors nerves to some extent.
 - US and developed equity markets rallied for the month, while emerging markets declined on significant China weakness (-16.8%) driven in part by political developments and continued strict COVID-19 policies.
 - Interest rates further increased across the US yield curve during October, and the curve remained inverted (ten- year yield minus the two-year yield) by 43 basis points. This year has witnessed by far the worst start to a calendar year for bond investors.
- Persistently high inflation and tightening of monetary policy, the war in Ukraine, lingering COVID-19 issues, and lockdowns in China and recent political developments will all continue to have considerable consequences for the global economy.

Index Returns¹

Third Quarter



YTD through October



→ After broad declines in Q3 driven by expectations for further policy tightening, October produced mixed results with developed market equities posting notable gains.

→ Outside of commodities, all other public market asset classes remain significantly negative year-to-date.

¹ Source: Bloomberg and FactSet. Data is as of October 31, 2022.

Domestic Equity Returns¹

Domestic Equity	October (%)	Q3 (%)	YTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
S&P 500	8.1	-4.9	-17.7	-14.6	10.2	10.4	12.8
Russell 3000	8.2	-4.5	-18.4	-16.5	9.8	9.9	12.5
Russell 1000	8.0	-4.6	-18.5	-16.4	10.0	10.2	12.7
Russell 1000 Growth	5.8	-3.6	-26.6	-24.6	11.7	12.6	14.7
Russell 1000 Value	10.3	-5.6	-9.3	-7.0	7.3	7.2	10.3
Russell MidCap	8.9	-3.4	-17.5	-17.2	7.8	7.9	11.3
Russell MidCap Growth	7.9	-0.7	-26.1	-28.9	6.3	8.7	11.9
Russell MidCap Value	9.4	-4.9	-12.8	-10.2	7.5	6.5	10.4
Russell 2000	11.0	-2.2	-16.9	-18.5	7.0	5.6	9.9
Russell 2000 Growth	9.5	0.2	-22.6	-26.0	5.1	5.2	10.1
Russell 2000 Value	12.6	-4.6	-11.2	-10.7	8.1	5.3	9.4

US Equities: Russell 3000 Index rose 8.2% for October.

- US stocks rallied, posting strong monthly returns across all indices, rebounding from a sharp drop in September. Investors demonstrated optimism across the style and market capitalization spectrum as earnings remained resilient despite economic pressures.
- Most sectors rose in October, but there was wide dispersion. Energy's 24.8% gain led all sectors, driven by strong earnings, while consumer discretionary experienced a slightly positive gain (0.2%) given the impact of inflationary pressures on consumers.
- Value stocks continued to outperform growth stocks across the market capitalization spectrum. The rally in energy stocks and the relative underperformance of technology and consumer discretionary stocks has driven this dynamic.

¹ Source: Bloomberg. Data is as of October 31, 2022.

Foreign Equity Returns¹

Foreign Equity	October (%)	Q3 (%)	YTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
MSCI ACWI ex. US	3.0	-9.9	-24.3	-24.7	-1.7	-0.6	3.3
MSCI EAFE	5.4	-9.4	-23.2	-23.0	-1.3	-0.1	4.1
MSCI EAFE (Local Currency)	5.3	-3.6	-9.9	-8.4	3.7	3.3	7.9
MSCI EAFE Small Cap	4.2	-9.8	-29.2	-30.3	-2.3	-1.3	5.6
MSCI Emerging Markets	-3.1	-11.6	-29.4	-31.0	-4.4	-3.1	0.8
MSCI Emerging Markets (Local Currency)	-2.6	-8.2	-22.8	-24.2	-0.8	-0.2	4.2
MSCI China	-16.8	-22.5	-42.8	-47.9	-13.8	-9.7	-0.1

Developed International equities (MSCI EAFE) rose 5.4%, while emerging markets (MSCI EM) returned -3.1% in October, driven largely by declines in China.

- Developed markets outside of the US had a strong month in October, posting gains in Europe, the UK, and Japan. Energy and industrials led broad-sectoral gains in the Eurozone, while the UK markets reacted positively to the appointment of the new prime minister, Rishi Sunak. The Bank of Japan’s continued dovish policy stance and early signs of resilient Q3 earnings supported Japanese equities.
- China dominated headlines this month across the non-US landscape. Rising geopolitical tensions, particularly after events from the 20th Communist Party Congress, on top of the continuation of the zero COVID-19 policies, drove sharp declines for the month.

¹ Source: Bloomberg. Data is as of October 31, 2022.

Fixed Income Returns¹

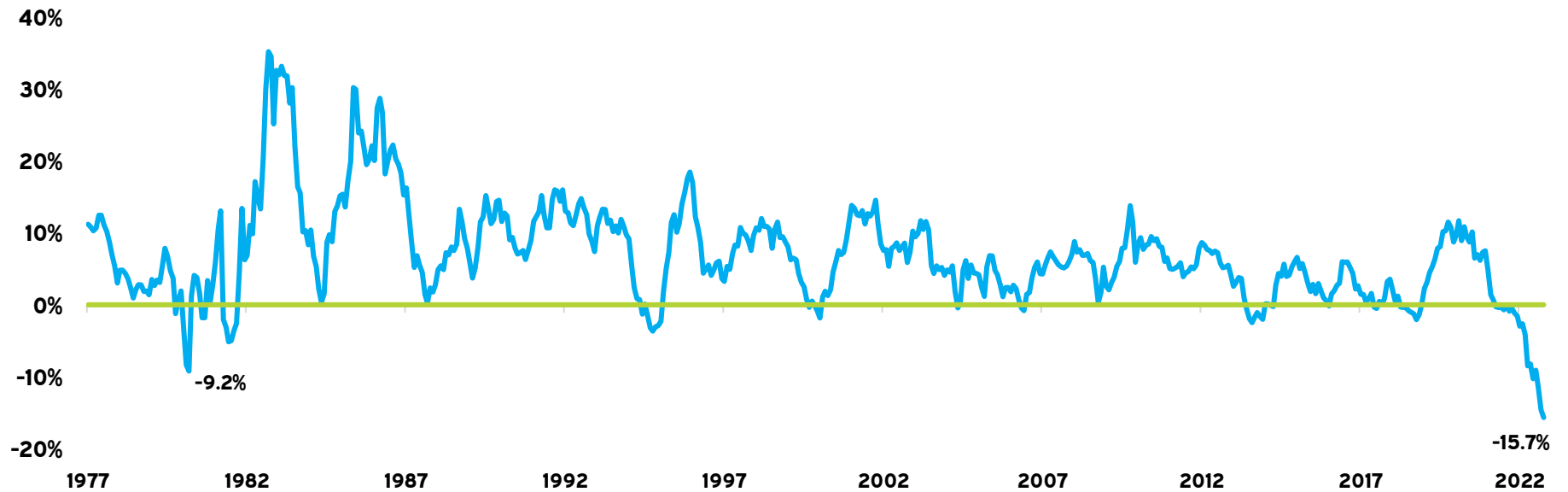
Fixed Income	October (%)	Q3 (%)	YTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)	Current Yield (%)	Duration (Years)
Bloomberg Universal	-1.1	-4.5	-15.8	-15.8	-3.6	-0.4	1.0	5.5	6.1
Bloomberg Aggregate	-1.3	-4.8	-15.7	-15.7	-3.8	-0.5	0.7	5.0	6.3
Bloomberg US TIPS	1.2	-5.1	-12.5	-11.5	1.1	2.2	1.0	4.6	6.9
Bloomberg High Yield	2.6	-0.6	-12.5	-11.8	0.3	2.0	4.1	9.1	4.5
JPM GBI-EM Global Diversified (USD)	-0.9	-5.8	-19.3	-20.3	-8.2	-3.5	-2.6	7.7	4.8

Fixed Income: The Bloomberg Universal declined 1.1% in October.

- A continued rise in bond yields in the US driven by the Fed reinforcing its commitment to fight inflation weighed on fixed income markets for the month. Year-to-date, the US bond market (Bloomberg Aggregate) performance is the worst on record.
- TIPS appreciated for the month but remain down double-digits for the year as real rates have experienced a steep increase too. The inflation adjustment has led to a 320 basis points smaller decline than the broad US bond market though.
- Riskier US bonds, as represented by the high yield index, produced the best fixed income results for the month (+2.6%) in the risk-on environment. Emerging market bonds finished down 0.9% in October adding to the significant declines year-to-date.

¹ Source: Bloomberg. JPM GBI-EM is from InvestorForce. Data is as of October 31, 2022.

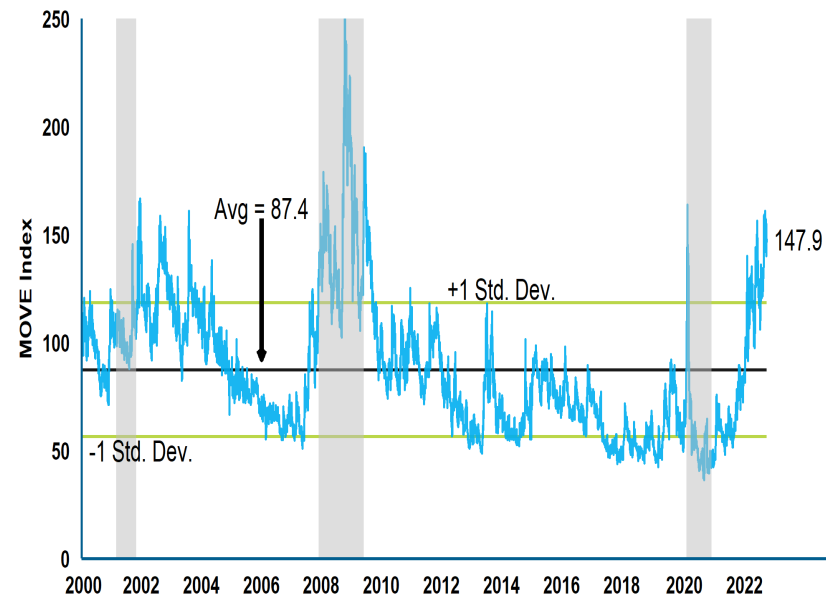
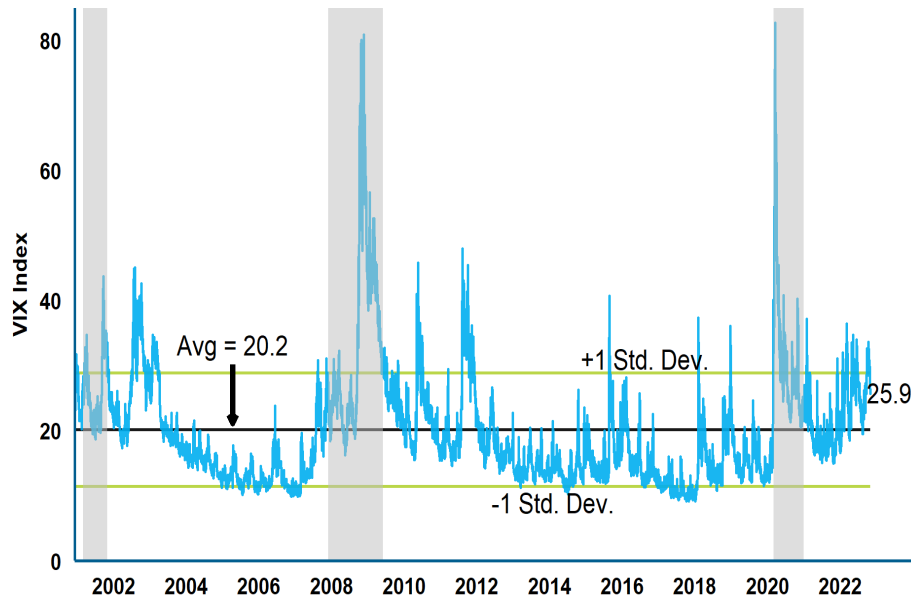
Bloomberg US Aggregate Rolling One-year Returns¹



- This has been the worst rolling one-year return period for the US bond market given the historic inflation levels and the corresponding rapid rise in interest rates.
- Through October the trailing year return was -15.7% well ahead of the number two spot (-9.2%) from the early 1980s.

¹ Source: Bloomberg. Data is as of 10/31/2022.

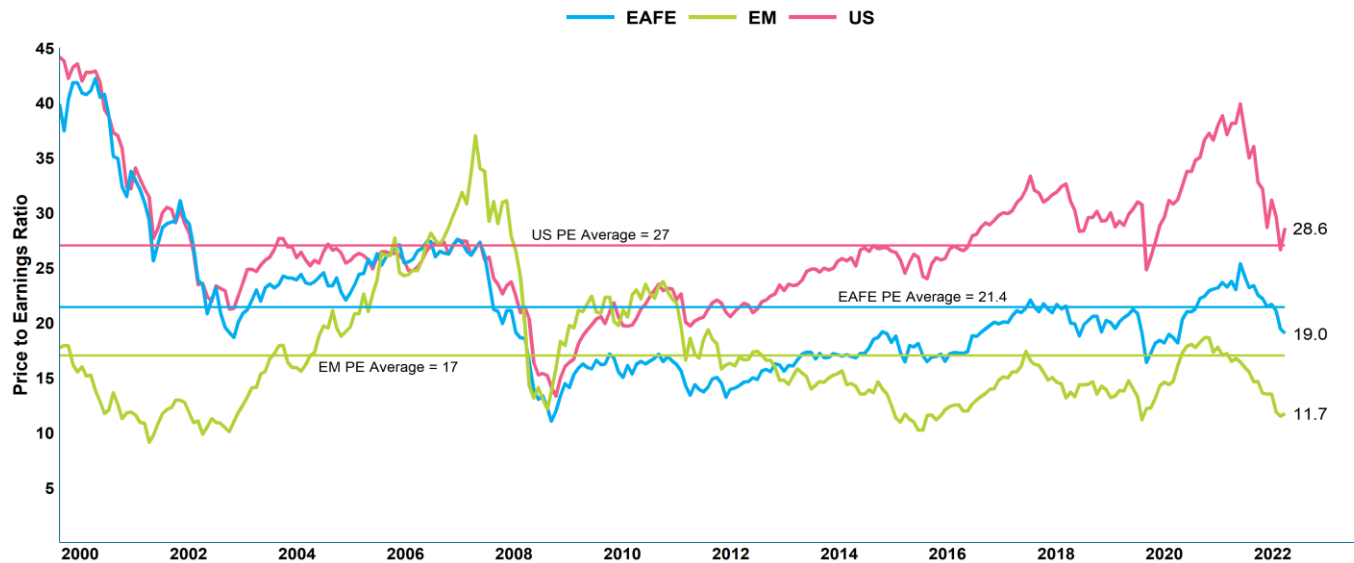
Equity and Fixed Income Volatility¹



- Volatility in equities (VIX) and fixed income (MOVE) remained above their long-run averages in October.
- Fixed income volatility was particularly high due to the uncertain path of US interest rates as the Federal Reserve continued its hawkish stance on inflation.

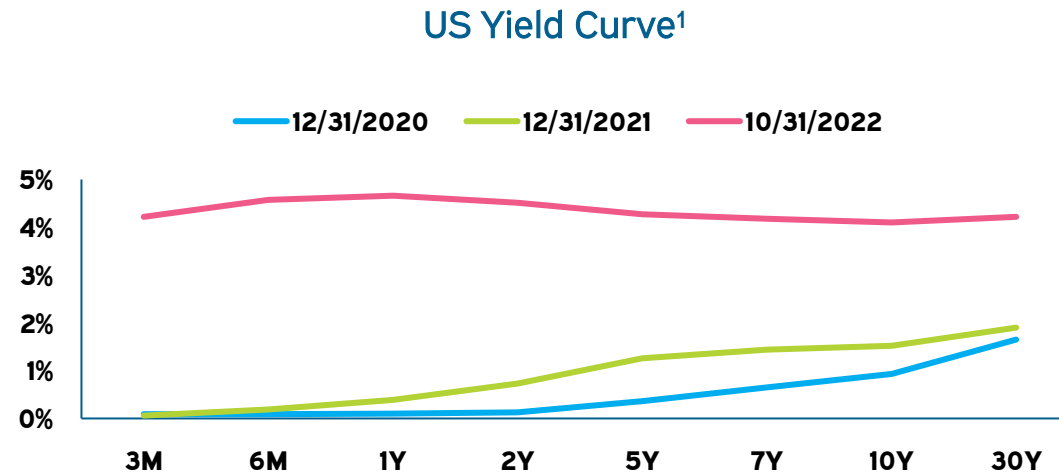
¹ Equity and Fixed Income Volatility – Source: Bloomberg. Implied volatility as measured using VIX Index for equity markets and the MOVE Index to measure interest rate volatility for fixed income markets. Data is as of October 2022. The average line indicated is the average of the VIX and MOVE values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

Equity Cyclically Adjusted P/E Ratios¹



- October’s US equity rally brought the market’s price-to-earnings ratio to slightly above the long-term (21st century) average.
- International developed market valuations remain below the US and are below their own long-term average, with those for emerging markets the lowest and well under the long-term average.
- Price declines have been the main driver of recent multiple compression as earnings have remained resilient. Concerns remain over whether earnings strength will continue in the face of slowing growth.

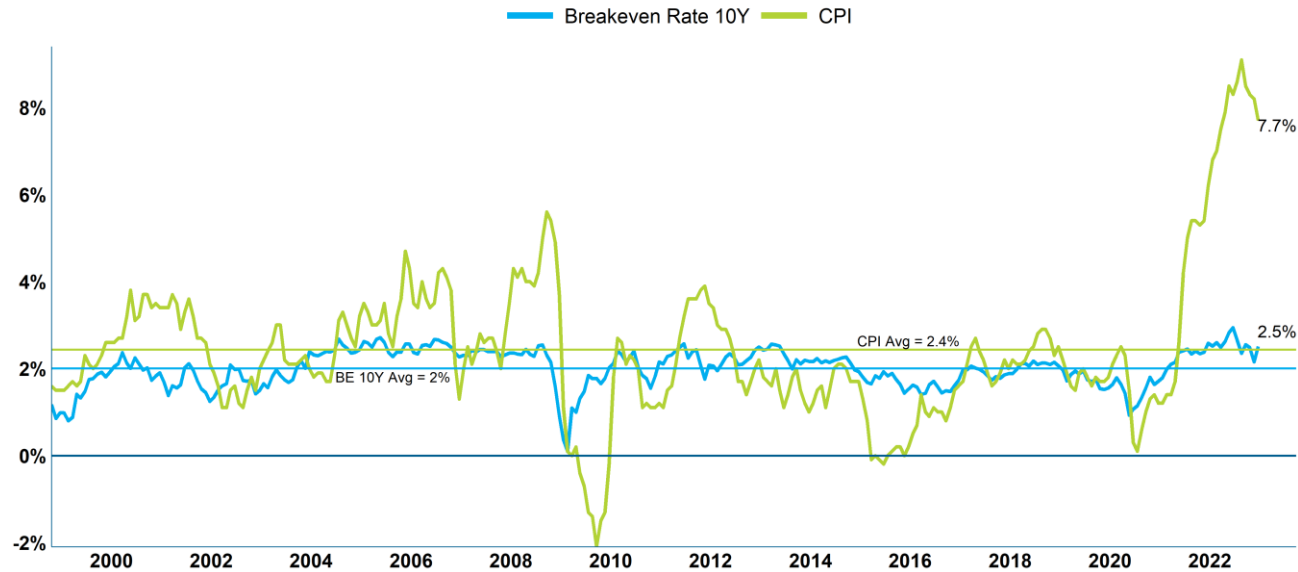
¹ US Equity Cyclically Adjusted P/E on S&P 500 Index. Source: Robert Shiller, Yale University, and Meketa Investment Group. Developed and Emerging Market Equity (MSCI EAFE and EM Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly “as reported” earnings over the previous ten years. Data is as of October 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 far higher than at the start of the year.
- In October, interest rates continued to increase across the yield curve, particularly at the front-end where there is more sensitivity to policy changes. Two-year Treasury yields rose from 4.3% to 4.5% for the month, while ten-year Treasury yields climbed from 3.8% to 4.1%.
- The Fed remains strongly committed to fighting inflation, as it increased rates another 75 basis points to a range of 3.75% to 4.0% at its November meeting. This was the sixth increase this year and the fourth consecutive increase of this amount.
- The yield spread between two-year and ten-year Treasuries remained negative, finishing October at -0.42%. The more closely watched measure by the Fed of three-month and ten-year Treasuries also inverted. Historically, inversions in the yield curve have often preceded recessions.

¹ Source: Bloomberg. Data is as of October 31, 2022.

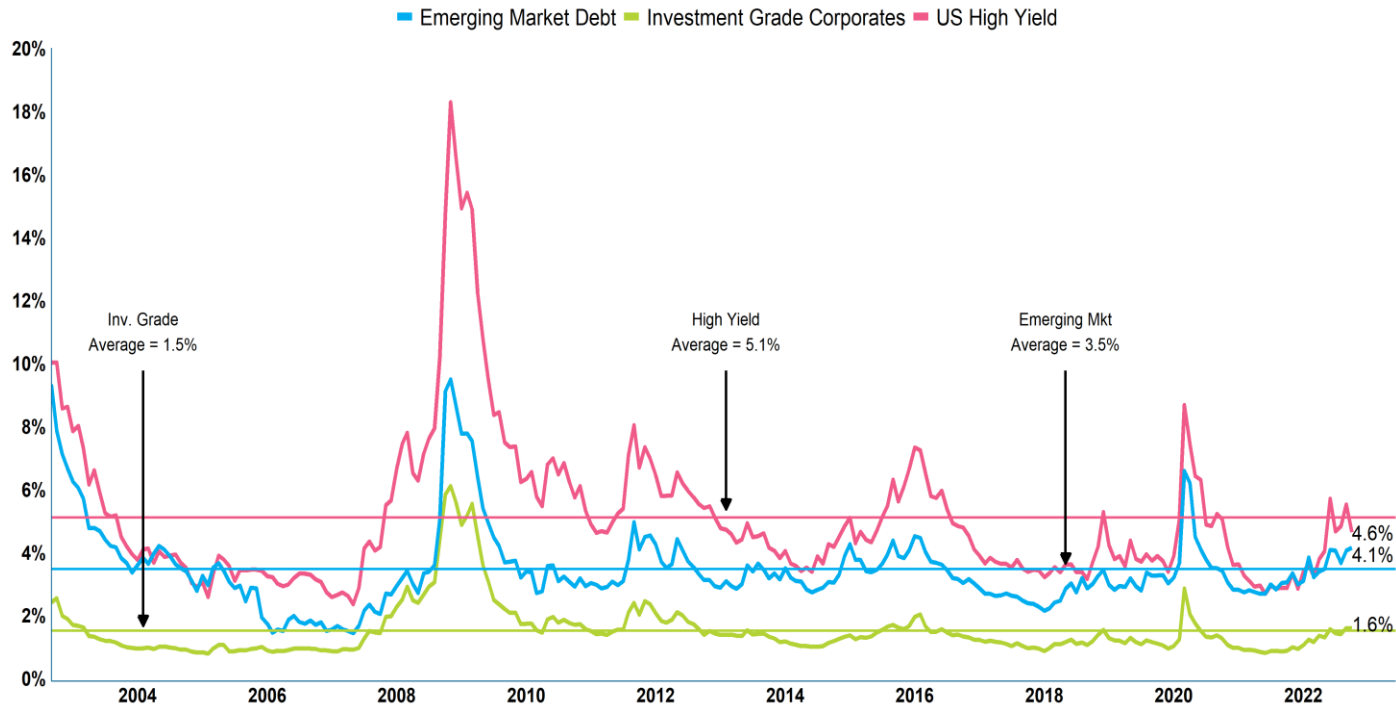
Ten-Year Breakeven Inflation and CPI¹



- Inflation expectations (breakevens) rose slightly in October, remaining above the long-run average.
- Trailing twelve-month CPI declined in October (7.7% versus 8.2%) coming in below expectations of 7.9%. Core inflation (excluding food and energy prices) declined from its recent 40-year peak of 6.6% to 6.3% over the same period.
- Over the last year, rising prices for energy (particularly oil), food, housing, and for new and used cars remain key drivers of inflation.

¹ Source: Bloomberg. Data is as of October 31, 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 Bonds¹



- High yield spreads (the added yield above a comparable maturity Treasury) fell in October to below their long-run average as below investment grade credit largely outperformed Treasuries in the risk-on environment.
- Investment grade spreads stayed the same in the US (1.6%), near the long-run average, while emerging market spreads increased slightly (4.1% versus 4.0%) staying above their average.

¹ Sources: Bloomberg. Data is as of October 31, 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

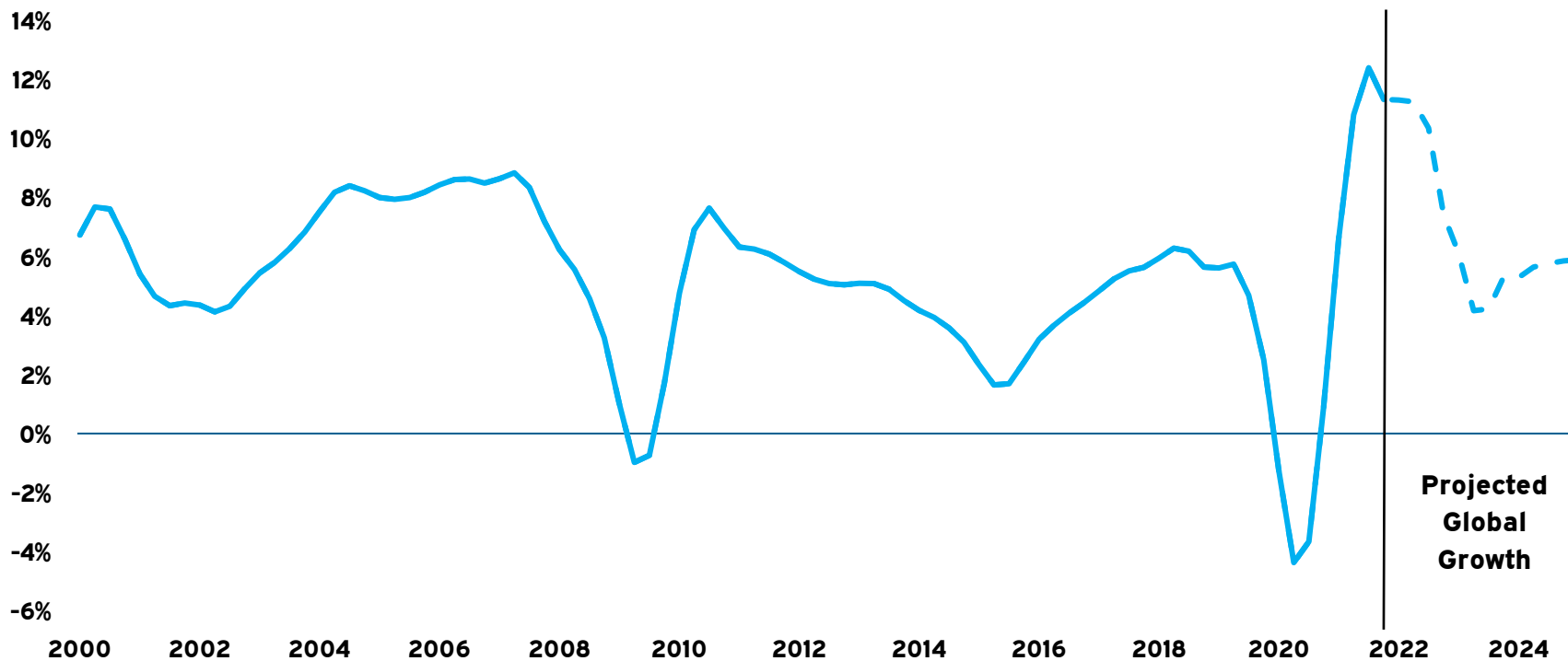
In their October update, the IMF maintained lowered global growth forecasts, driven by the economic impacts of persistent inflation and corresponding tighter policy, as well as issues related to the war in Ukraine and the lingering pandemic.

- The IMF forecasts global GDP growth to come in at 3.2% in 2022 (like the July estimate) and 2.7% in 2023 (0.2% below the prior estimate).
- In advanced economies, GDP is projected to grow 2.4% in 2022 and 1.1% in 2023. The US saw another downgrade in the 2022 (1.6% versus 2.3%) forecast largely due to accelerated policy tightening, given persistently high inflation. The euro area saw an upgrade in expected growth (3.1% versus 2.6%) on substantial fiscal stimulus in 2022 but a downgrade in 2023 (0.5% versus 1.2%) as rising energy prices weigh on the region that is a net importer of energy. The Japanese economy is expected to grow 1.7% this year and 1.6% in 2023.
- Growth projections for emerging markets are higher than developed markets, at 3.7% in 2022 and 2023. China's growth was downgraded for 2022 (3.2% versus 3.3%) and 2023 (4.4% versus 4.6%) given tight COVID-19 restrictions and continued property sector problems.
- The global inflation forecast was significantly increased for 2022 (8.8% versus 7.4%).

	Real GDP (%) ¹			Inflation (%) ¹		
	IMF 2022 Forecast	IMF 2023 Forecast	Actual 10 Year Average	IMF 2022 Forecast	IMF 2023 Forecast	Actual 10 Year Average
World	3.2	2.7	3.2	8.8	6.5	3.6
Advanced Economies	2.4	1.1	1.6	7.2	4.3	1.6
US	1.6	1.0	2.1	8.1	3.5	2.0
Euro Area	3.1	0.5	1.0	8.3	5.7	1.3
Japan	1.7	1.6	0.8	2.0	1.4	0.4
Emerging Economies	3.7	3.7	4.4	9.9	8.1	5.3
China	3.2	4.4	7.3	2.2	2.2	2.4

¹ Source: IMF World Economic Outlook. Real GDP and Inflation forecasts from October 2022 Update. "Actual 10 Year Average" represents data from 2012 to 2021.

Global Nominal Gross Domestic Product (GDP) Growth¹

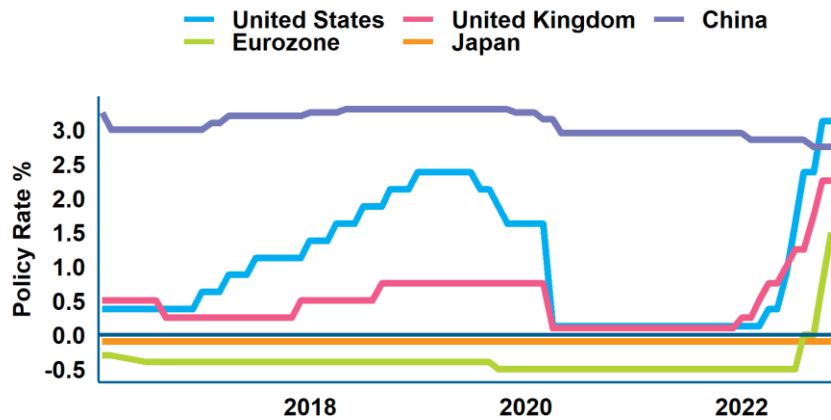


- Global economies are expected to slow in 2022 compared to 2021, with risks of recession increasing given persistently high inflation and related tighter monetary policy.
- The delicate balancing act of central banks trying to reduce inflation without dramatically impacting growth will remain key.

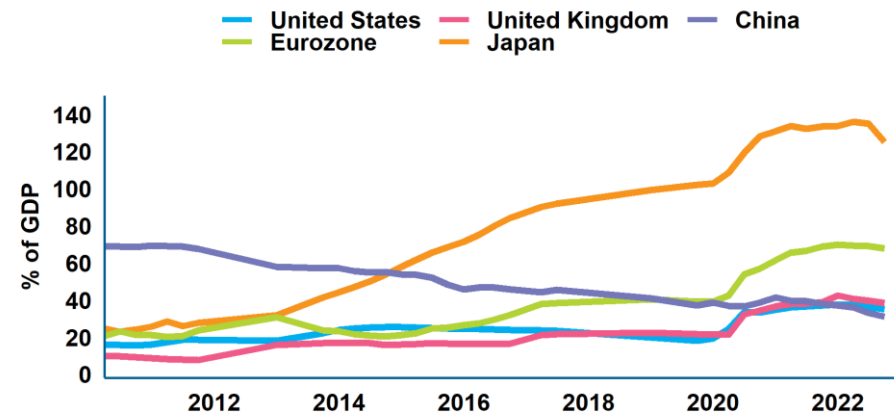
¹ Source: Oxford Economics (World GDP, US\$ prices & PPP exchange rate, nominal, % change YoY). Updated October 2022. Nominal expectations for GDP remain much higher than real GDP expectations given the elevated inflation levels.

Central Bank Response¹

Policy Rates



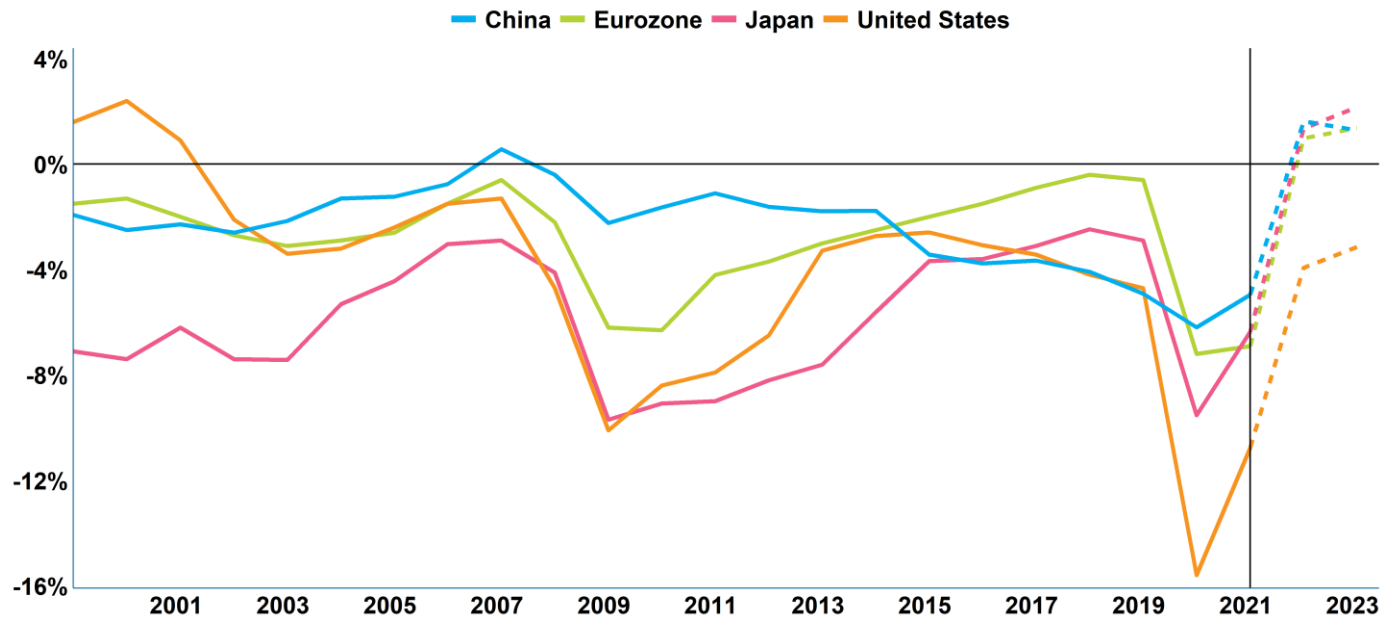
Balance Sheet as % of GDP



- 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 now aggressively reducing support in the face of high inflation.
- The pace of withdrawing support varies across central banks with the US taking a more aggressive approach.
- The one notable central bank outlier is China, where the central bank has lowered rates and reserve requirements in response to slowing growth.
- 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.

¹ Source: Bloomberg. Policy rate data is as of October 31, 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 September 30, 2022.

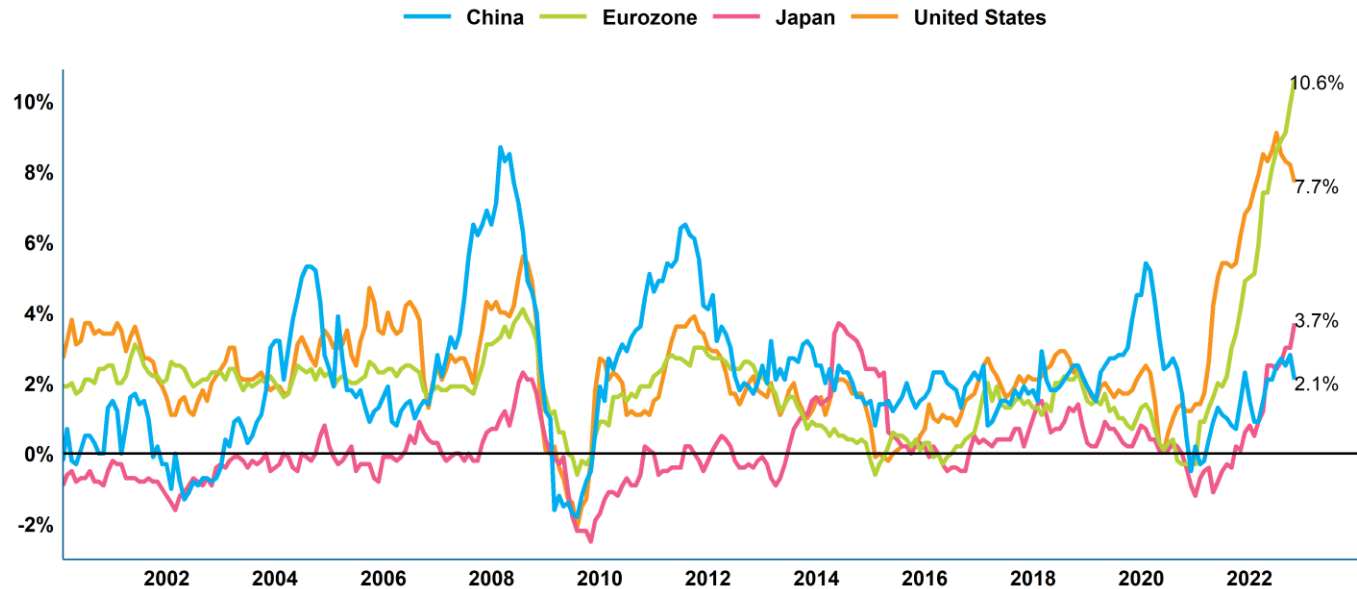
Budget Surplus / Deficit as a Percentage of GDP¹



- 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.
- Questions remain about how some countries will respond fiscally as inflation, particularly energy prices, weigh on consumers. Policies that undermine central banks' efforts to fight inflation could lead to additional market volatility like was seen recently in the UK.

¹ Source: Bloomberg. Data is as of October 31, 2022. Projections via IMF Forecasts from October 2022 Report. Dotted lines represent 2022 and 2023 forecasts.

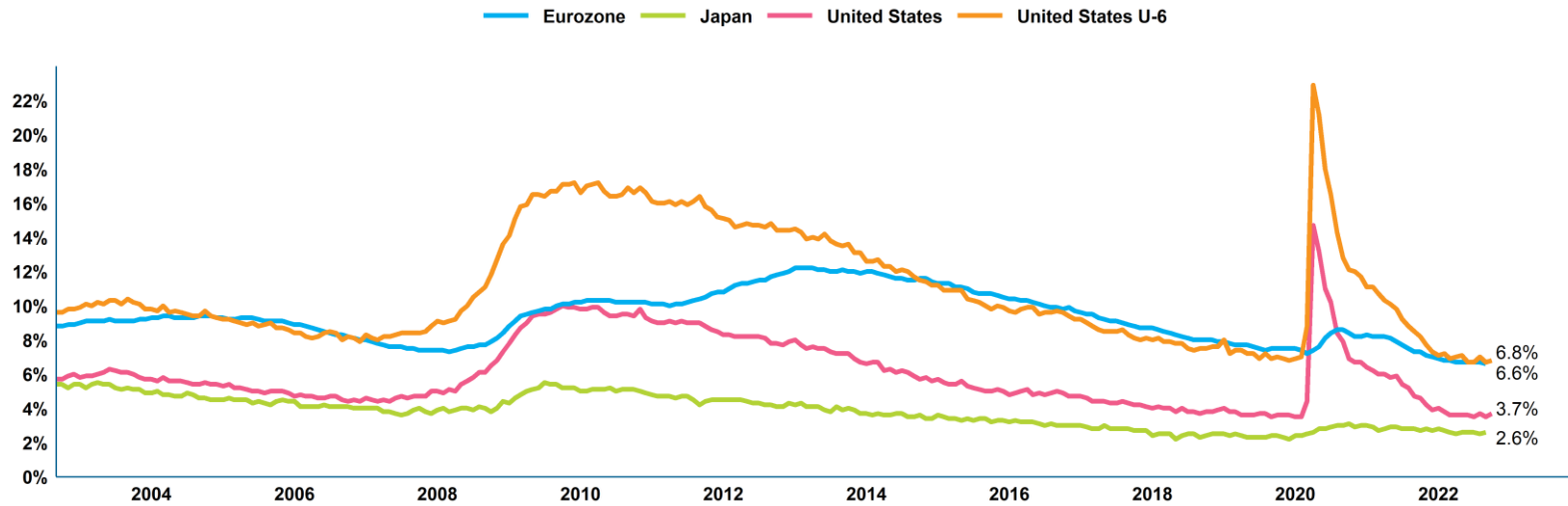
Inflation (CPI Trailing Twelve Months)¹



- 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.
- Inflation pressures continue to grow in Europe, reaching historic levels due to skyrocketing energy prices and a weak euro.
- Supply issues related to the pandemic, record monetary and fiscal stimulus, strict COVID-19 restrictions in China, and higher commodity prices driven by the war in Ukraine have been key global drivers of inflation.

¹ Source: Bloomberg. Data is as of October 2022.

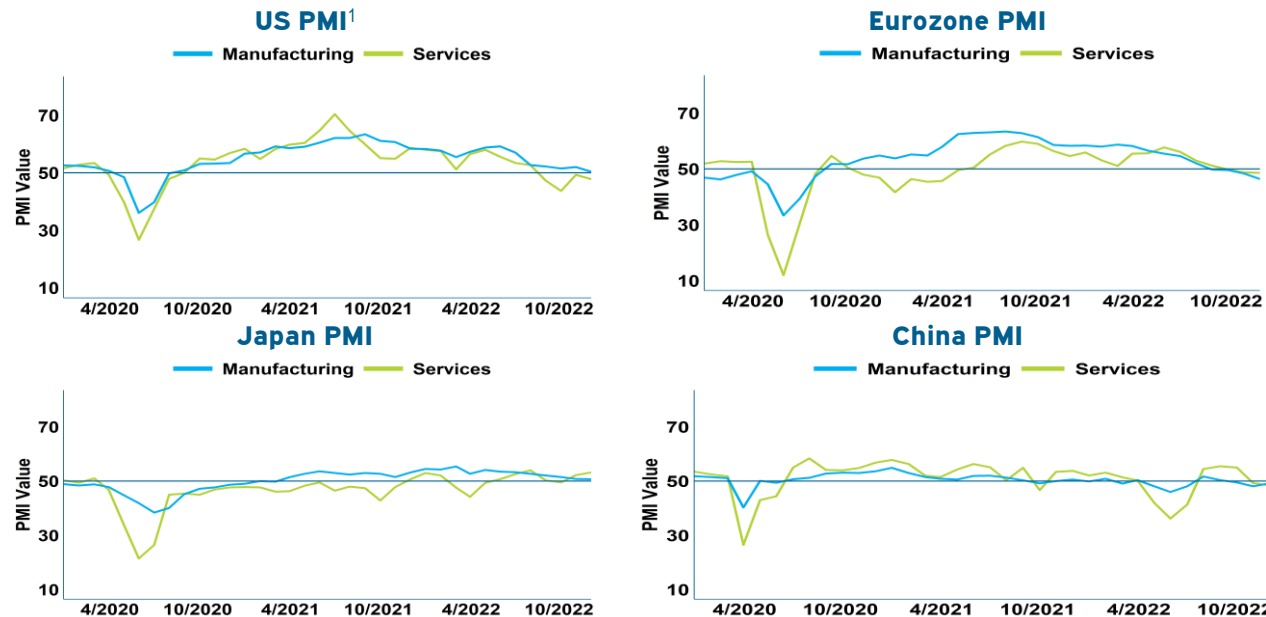
Unemployment¹



- As economies have largely reopened, helped by vaccines for the virus, improvements have been seen in the labor market.
- Despite slowing growth and high inflation the US labor market remains a bright spot. Unemployment in the US, which experienced the steepest rise from the pandemic, has remained in a tight 3.5%-3.7% range for most of the year. The broader measure (U-6) that includes discouraged and underemployed workers remains much higher at 6.8%.
- The strong labor market and higher wages, although beneficial for workers, motivates the Fed’s efforts to fight inflation, likely leading to eventually higher unemployment.

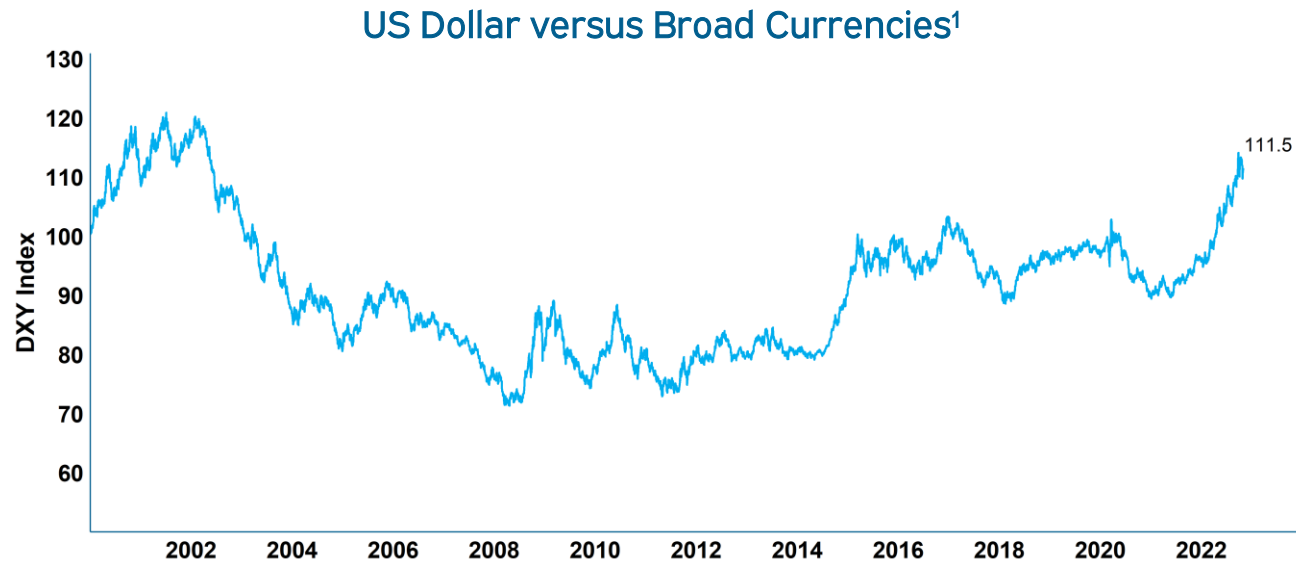
¹ Source: Bloomberg. Data is as October 2022, for the US. The most recent data for Eurozone and Japanese unemployment is as of September 30, 2022.

Global PMIs



- After improvements from the lows of the pandemic, Purchasing Managers Indices (PMI), based on surveys of private sector companies, have largely experienced downward pressure recently.
- Service sector PMIs, except Japan (lifting COVID-19 restrictions and travel incentives have been helpful here), are all in contraction territory. The US service sector declined, remaining in negative territory, due to weak demand both domestically and abroad and softening employment.
- Manufacturing PMIs are also slowing across China and developed markets given declines in demand and inflationary pressures with the Eurozone, and China in contraction territory.

¹ 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 October 2022. Readings below 50 represent economic contractions.



- Overall, the US dollar remained elevated in October but showed some signs of weakening. After month-end, the dollar weakened further.
- The increased pace of policy tightening, stronger relative growth, and safe-haven flows all contributed to the dollar's strength this year.
- The euro, yen, pound, and yuan have all experienced significant declines versus the dollar this year, adding to inflationary pressures in those countries.

¹ Source: Bloomberg. Data as of October 31, 2022.

Summary

Key Trends in 2022:

- The impacts of record high inflation will remain key, with market volatility likely to stay high.
- The pace of monetary tightening globally will be faster than previously expected, with the risk of overtightening.
- Expect growth to slow globally for the rest of 2022 and into 2023 to the long-term trend or below. Inflation, monetary policy, and the war will all be key.
- In the US 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.
- Valuations have significantly declined in the US to below long-term averages, largely driven by price declines. The key going forward will be whether earnings can remain resilient if growth continues to slow.
- Outside the US, equity valuations remain lower in both emerging and developed markets, but major risks remain, including continued strength in the US dollar, higher inflation particularly weighing on Europe, and China maintaining its restrictive COVID-19 policies.

Manager Highlights

Driehaus Emerging Markets Growth

→ Driehaus beat its benchmark by 3.1% in October, posting a return of 0.0% vs the benchmark's -3.1%.

- Positive performance was driven by an underweight to China and stock selection and an overweight position in Brazil. Stock selection in India and stock selection in Mexico, Hong Kong and Thailand also modestly aided excess returns.

→ Since inception, Driehaus has returned 3.0%, well outpacing the benchmark, which has returned -3.3% over that same period, and ranking in the top decile of the peer universe.

Acadian Emerging Markets Small Cap Equity

→ Acadian beat its benchmark by 1.9% in October, posting a return of 1.8% vs the benchmark's -0.1%.

- Key sources of positive active return included a combination of stock selection and an underweight position in Taiwan (+46 bps), a combination of stock selection and an underweight position in China (+45 bps), and an overweight position in Brazil (+32 bps).

→ Since inception, Acadian has returned 4.9%, beating the benchmark's 1.9% return over that same period.

Axiom International Small Cap Equity

→ Axiom trailed its benchmark by 3.2% in October, posting a return of 1.6% vs the benchmark's 4.8%.

- Stock selection in the Information Technology, Consumer Staples, and Health Care sectors were the biggest headwinds to relative performance.

→ Since inception, Axiom has returned 3.5%, lagging the benchmark, which has returned 3.8% over that same period.

Loomis Sayles High Yield

→ Loomis underperformed its benchmark by 0.3% in October, posting a return of 2.3% vs the benchmark's 2.6%.

- The overweight allocation to emerging market credit limited performance for the month. On an absolute basis, performance in the sector had the greatest negative impact in the strategy.
- Exposure to investment grade credit also detracted from overall performance for the period. Credit Suisse Group, Banco Santander, and Morgan Stanley had a negative impact on performance for the one-month period.

→ Since inception, Loomis has returned 4.2%, lagging the benchmark, which has returned 4.7% over that same period, and ranking in the 50th percentile relative to peers.

**Interim Update
As of October 31, 2022**

Total Retirement System | As of October 31, 2022

Allocation vs. Targets and Policy				
	Current Balance	Current Allocation	Policy	Policy Range
US Equity	\$173,234,609	22%	24%	19% - 29%
Developed Market Equity	\$85,505,590	11%	13%	8% - 18%
Emerging Market Equity	\$56,857,397	7%	12%	7% - 17%
Investment Grade Bonds	\$70,029,653	9%	5%	2% - 8%
Long-Term Government Bonds	\$24,064,827	3%	7%	2% - 12%
TIPS	\$15,456,314	2%	4%	1% - 7%
Emerging Market Bonds	--	--	2%	0% - 4%
High Yield Bonds	\$38,446,862	5%	6%	3% - 9%
Bank Loans	\$7,762,988	1%	2%	0% - 4%
Private Equity	\$129,779,217	17%	10%	5% - 15%
Real Estate	\$84,986,967	11%	10%	5% - 15%
Natural Resources	\$17,210,316	2%	3%	0% - 6%
Infrastructure	\$11,337,515	1%	2%	0% - 5%
Opportunistic	\$36,950,815	5%	0%	0% - 5%
Balanced Assets	\$17,363,230	2%	--	--
Cash	\$11,266,860	1%	0%	0% - 5%
Total	\$780,253,162	100%	100%	

	Current Balance	Current Allocation	Policy	Policy Range
Total Equity Including PE	\$445,376,813.00	57%	59%	--
Total Fixed Income	\$155,760,644	20%	26%	--
Real Assets	\$113,574,798	14%	15%	--
Other	\$70,029,653	9%	0%	--

Asset Class Performance Summary											
	Market Value (\$)	% of Portfolio	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Total Retirement System (gross)	780,253,162	100.0	2.3	-12.0	-9.3	6.5	6.3	7.2	7.1	8.1	Jan-89
Total Retirement System			2.3	-12.1	-9.4	6.3	6.1	7.0	6.8	7.7	
Domestic Equity Assets	173,234,609	22.2	8.7	-16.5	-13.4	8.7	9.3	12.1	9.9	9.7	Jul-93
<i>Russell 3000</i>			<i>8.2</i>	<i>-18.4</i>	<i>-16.5</i>	<i>9.8</i>	<i>9.9</i>	<i>12.5</i>	<i>9.9</i>	<i>9.6</i>	<i>Jul-93</i>
International Developed Market Equity Assets	85,505,590	11.0	4.6	-25.9	-25.9	-2.3	-1.3	3.6	5.3	4.1	Feb-98
<i>MSCI EAFE</i>			<i>5.4</i>	<i>-23.2</i>	<i>-23.0</i>	<i>-1.3</i>	<i>-0.1</i>	<i>4.1</i>	<i>5.9</i>	<i>3.9</i>	<i>Feb-98</i>
International Emerging Market Equity Assets	56,857,397	7.3	-0.1	-24.6	-26.2	1.8	1.5	2.7	--	5.2	Sep-08
<i>MSCI Emerging Markets</i>			<i>-3.1</i>	<i>-29.4</i>	<i>-31.0</i>	<i>-4.4</i>	<i>-3.1</i>	<i>0.8</i>	<i>8.2</i>	<i>1.6</i>	<i>Sep-08</i>
Investment Grade Bond Assets	70,029,653	9.0	-1.9	-19.3	-19.2	-5.1	-1.4	0.3	2.9	4.0	Jul-93
<i>Bloomberg US Aggregate TR</i>			<i>-1.3</i>	<i>-15.7</i>	<i>-15.7</i>	<i>-3.8</i>	<i>-0.5</i>	<i>0.7</i>	<i>3.0</i>	<i>4.3</i>	<i>Jul-93</i>
Long-Term Government Bond Assets	24,064,827	3.1	-2.1	-20.6	-20.2	-4.1	-0.1	--	--	1.0	Dec-15
<i>PRIT Core Fixed Income</i>			<i>-2.1</i>	<i>-20.6</i>	<i>-20.1</i>	<i>-4.1</i>	<i>-0.1</i>	<i>1.7</i>	<i>3.6</i>	<i>1.0</i>	<i>Dec-15</i>
TIPS Assets	15,456,314	2.0	1.2	-12.5	-11.5	1.1	2.2	1.0	--	3.4	Mar-07
<i>Bloomberg US TIPS TR</i>			<i>1.2</i>	<i>-12.5</i>	<i>-11.5</i>	<i>1.1</i>	<i>2.2</i>	<i>1.0</i>	<i>4.0</i>	<i>3.4</i>	<i>Mar-07</i>
High Yield Bond Assets	38,446,862	4.9	2.0	-10.5	-9.7	1.2	2.3	3.8	--	5.2	Apr-07
<i>Bloomberg US High Yield TR</i>			<i>2.6</i>	<i>-12.5</i>	<i>-11.8</i>	<i>0.3</i>	<i>2.0</i>	<i>4.1</i>	<i>7.6</i>	<i>5.7</i>	<i>Apr-07</i>
Bank Loan Assets	7,762,988	1.0	1.0	-3.8	-3.4	1.6	2.3	--	--	2.7	Aug-14
<i>Credit Suisse Leveraged Loans</i>			<i>0.8</i>	<i>-2.5</i>	<i>-2.0</i>	<i>2.6</i>	<i>3.0</i>	<i>3.7</i>	<i>4.7</i>	<i>3.3</i>	<i>Aug-14</i>
Total Real Estate	84,986,967	10.9	0.2	8.2	14.2	9.0	7.6	9.0	--	--	Jan-89
<i>NCREIF ODCE</i>			<i>0.0</i>	<i>13.1</i>	<i>22.1</i>	<i>12.4</i>	<i>10.2</i>	<i>10.9</i>	<i>8.8</i>	<i>7.7</i>	<i>Jan-89</i>

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	Market Value (\$)	% of Portfolio	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Private Equity Assets	129,779,217	16.6									
Natural Resources Assets	17,210,316	2.2									
Infrastructure Assets	11,337,515	1.5									
Opportunistic Assets	36,950,815	4.7									
Balanced Assets	17,363,230	2.2	2.0	-12.6	-10.3	6.8	6.6	8.1	8.1	8.2	Apr-90
<i>60% Wilshire 5000 & 40% Barclays Aggregate</i>			<i>4.4</i>	<i>-16.9</i>	<i>-15.6</i>	<i>4.8</i>	<i>6.1</i>	<i>8.0</i>	<i>7.5</i>	<i>8.3</i>	<i>Apr-90</i>
Cash	11,266,860	1.4									

	Trailing Net Performance											Inception (%)	Inception Date
	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)			
Total Retirement System (gross)	780,253,162	100.0	--	2.3	-12.0	-9.3	6.5	6.3	7.2	7.1	8.1	Jan-89	
Total Retirement System				2.3	-12.1	-9.4	6.3	6.1	7.0	6.8	7.7		
Domestic Equity Assets	173,234,609	22.2	22.2	8.7	-16.5	-13.4	8.7	9.3	12.1	9.9	9.7	Jul-93	
<i>Russell 3000</i>				<i>8.2</i>	<i>-18.4</i>	<i>-16.5</i>	<i>9.8</i>	<i>9.9</i>	<i>12.5</i>	<i>9.9</i>	<i>9.6</i>	<i>Jul-93</i>	
Rhumbline Russell 1000 Growth Index	20,915,853	2.7	12.1	5.8	-26.6	-24.6	11.8	12.6	14.6	--	10.6	Jun-05	
<i>Russell 1000 Growth</i>				<i>5.8</i>	<i>-26.6</i>	<i>-24.6</i>	<i>11.7</i>	<i>12.6</i>	<i>14.7</i>	<i>10.9</i>	<i>10.7</i>	<i>Jun-05</i>	
<i>Large Growth MStar MF Median</i>				<i>5.6</i>	<i>-28.6</i>	<i>-28.1</i>	<i>8.3</i>	<i>9.9</i>	<i>12.7</i>	<i>9.8</i>	<i>9.4</i>	<i>Jun-05</i>	
<i>Large Growth MStar MF Rank</i>				<i>47</i>	<i>38</i>	<i>36</i>	<i>11</i>	<i>9</i>	<i>8</i>	<i>--</i>	<i>17</i>	<i>Jun-05</i>	
Rhumbline Russell 1000 Value Index	25,786,871	3.3	14.9	10.2	-9.3	-7.0	7.3	7.2	10.2	--	7.4	Jun-05	
<i>Russell 1000 Value</i>				<i>10.3</i>	<i>-9.3</i>	<i>-7.0</i>	<i>7.3</i>	<i>7.2</i>	<i>10.3</i>	<i>8.8</i>	<i>7.4</i>	<i>Jun-05</i>	
<i>Large Value MStar MF Median</i>				<i>10.8</i>	<i>-7.1</i>	<i>-4.2</i>	<i>8.9</i>	<i>8.0</i>	<i>10.6</i>	<i>8.8</i>	<i>7.8</i>	<i>Jun-05</i>	
<i>Large Value MStar MF Rank</i>				<i>67</i>	<i>75</i>	<i>78</i>	<i>79</i>	<i>73</i>	<i>65</i>	<i>--</i>	<i>67</i>	<i>Jun-05</i>	
Rhumbline QSI Index	29,258,028	3.7	16.9	8.3	-15.3	-10.6	8.4	10.0	--	--	11.0	Aug-13	
<i>QSI Index</i>				<i>8.4</i>	<i>-15.3</i>	<i>-10.6</i>	<i>8.5</i>	<i>10.1</i>	<i>12.6</i>	<i>10.3</i>	<i>11.1</i>	<i>Aug-13</i>	
<i>Russell 3000</i>				<i>8.2</i>	<i>-18.4</i>	<i>-16.5</i>	<i>9.8</i>	<i>9.9</i>	<i>12.5</i>	<i>9.9</i>	<i>11.1</i>	<i>Aug-13</i>	
<i>Large Cap MStar MF Median</i>				<i>8.2</i>	<i>-17.7</i>	<i>-14.8</i>	<i>9.0</i>	<i>9.1</i>	<i>11.8</i>	<i>9.5</i>	<i>10.4</i>	<i>Aug-13</i>	
<i>Large Cap MStar MF Rank</i>				<i>48</i>	<i>41</i>	<i>36</i>	<i>62</i>	<i>32</i>	<i>--</i>	<i>--</i>	<i>37</i>	<i>Aug-13</i>	
Brown Small Cap Fundamental Value	16,475,024	2.1	9.5	12.8	-8.0	-4.5	6.1	4.9	--	--	7.8	Jul-16	
<i>Russell 2000 Value</i>				<i>12.6</i>	<i>-11.2</i>	<i>-10.7</i>	<i>8.1</i>	<i>5.3</i>	<i>9.4</i>	<i>9.4</i>	<i>8.8</i>	<i>Jul-16</i>	
<i>Small Value MStar MF Median</i>				<i>12.7</i>	<i>-9.4</i>	<i>-7.4</i>	<i>9.5</i>	<i>5.7</i>	<i>9.9</i>	<i>9.8</i>	<i>8.8</i>	<i>Jul-16</i>	
<i>Small Value MStar MF Rank</i>				<i>48</i>	<i>38</i>	<i>28</i>	<i>90</i>	<i>71</i>	<i>--</i>	<i>--</i>	<i>78</i>	<i>Jul-16</i>	
PRIT General Allocation Domestic Equity	80,798,832	10.4	46.6	8.2	-17.8	--	--	--	--	--	-17.8	Jan-22	
<i>PRIT Domestic Equity Benchmark</i>				<i>8.3</i>	<i>-17.8</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>-17.8</i>	<i>Jan-22</i>	

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	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
International Developed Market Equity Assets	85,505,590	11.0	11.0	4.6	-25.9	-25.9	-2.3	-1.3	3.6	5.3	4.1	Feb-98
<i>MSCI EAFE</i>				5.4	-23.2	-23.0	-1.3	-0.1	4.1	5.9	3.9	Feb-98
SSgA MSCI EAFE Index	33,599,148	4.3	39.3	5.4	-22.9	-22.7	-0.9	0.2	4.4	--	4.0	Oct-09
<i>MSCI EAFE</i>				5.4	-23.2	-23.0	-1.3	-0.1	4.1	5.9	3.7	Oct-09
<i>Foreign MStar MF Median</i>				5.3	-25.5	-25.6	-1.0	-0.4	4.1	6.2	4.2	Oct-09
<i>Foreign MStar MF Rank</i>				49	30	31	50	35	40	--	59	Oct-09
Axiom International Small Cap Equity	9,567,708	1.2	11.2	1.6	-37.7	-38.1	--	--	--	--	3.5	May-20
<i>S&P Developed Ex-U.S. SmallCap</i>				4.8	-29.2	-30.6	-2.1	-1.4	5.2	8.5	3.8	May-20
<i>MSCI EAFE Small Cap</i>				4.2	-29.2	-30.3	-2.3	-1.3	5.6	8.5	3.7	May-20
PRIT General Allocation Int. Equity	42,338,733	5.4	49.5	4.8	-25.3	--	--	--	--	--	-25.3	Jan-22
<i>Custom MSCI World Ex-US IMI Net Divs</i>				5.3	-23.1	--	--	--	--	--	-23.1	Jan-22
International Emerging Market Equity Assets	56,857,397	7.3	7.3	-0.1	-24.6	-26.2	1.8	1.5	2.7	--	5.2	Sep-08
<i>MSCI Emerging Markets</i>				-3.1	-29.4	-31.0	-4.4	-3.1	0.8	8.2	1.6	Sep-08
Driehaus Emerging Markets Growth	33,339,746	4.3	58.6	0.0	-24.6	-27.0	1.0	--	--	--	3.0	Mar-19
<i>MSCI Emerging Markets</i>				-3.1	-29.4	-31.0	-4.4	-3.1	0.8	8.2	-3.3	Mar-19
<i>Diversified Emerging Mkts MStar MF Median</i>				-1.6	-30.5	-32.5	-4.1	-3.0	1.2	8.2	-2.6	Mar-19
<i>Diversified Emerging Mkts MStar MF Rank</i>				26	16	23	14	--	--	--	10	Mar-19
Acadian Emerging Markets Small Cap	8,111,862	1.0	14.3	1.8	-20.5	-18.7	5.8	1.8	--	--	4.9	Jun-14
<i>MSCI Emerging Markets Small Cap</i>				-0.1	-24.3	-23.4	4.2	0.5	3.1	9.8	1.9	Jun-14
<i>Diversified Emerging Mkts MStar MF Median</i>				-1.6	-30.5	-32.5	-4.1	-3.0	1.2	8.2	0.4	Jun-14
<i>Diversified Emerging Mkts MStar MF Rank</i>				13	9	3	1	8	--	--	1	Jun-14
PRIT General Allocation EME	15,405,789	2.0	27.1	-1.2	-26.6	--	--	--	--	--	-26.6	Jan-22
<i>Custom MSCI Emerging Market IMI Net Divs</i>				-2.7	-28.7	--	--	--	--	--	-28.7	Jan-22

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	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Investment Grade Bond Assets	70,029,653	9.0	9.0	-1.9	-19.3	-19.2	-5.1	-1.4	0.3	2.9	4.0	Jul-93
<i>Bloomberg US Aggregate TR</i>				-1.3	-15.7	-15.7	-3.8	-0.5	0.7	3.0	4.3	Jul-93
SSgA U.S. Aggregate Bond Index-NL	19,643,660	2.5	28.1	-1.3	-15.7	-15.6	-3.7	-0.5	0.7	--	2.8	Apr-04
<i>Bloomberg US Aggregate TR</i>				-1.3	-15.7	-15.7	-3.8	-0.5	0.7	3.0	2.8	Apr-04
<i>Intermediate Core Bond MStar MF Median</i>				-1.4	-15.9	-15.9	-3.7	-0.5	0.8	3.2	2.9	Apr-04
<i>Intermediate Core Bond MStar MF Rank</i>				35	38	32	57	48	59	--	62	Apr-04
PRIT General Allocation Core FI	50,385,992	6.5	71.9	-2.1	-20.6	--	--	--	--	--	-20.6	Jan-22
<i>PRIT Core Fixed Income</i>				-2.1	-20.6	-20.1	-4.1	-0.1	1.7	3.6	-20.6	Jan-22
Long-Term Government Bond Assets	24,064,827	3.1	3.1	-2.1	-20.6	-20.2	-4.1	-0.1	--	--	1.0	Dec-15
<i>PRIT Core Fixed Income</i>				-2.1	-20.6	-20.1	-4.1	-0.1	1.7	3.6	1.0	Dec-15
PRIT Core Fixed Income	24,064,827	3.1	100.0	-2.1	-20.6	-20.2	-4.1	-0.1	--	--	1.0	Dec-15
<i>PRIT Core Fixed Income</i>				-2.1	-20.6	-20.1	-4.1	-0.1	1.7	3.6	1.0	Dec-15
TIPS Assets	15,456,314	2.0	2.0	1.2	-12.5	-11.5	1.1	2.2	1.0	--	3.4	Mar-07
<i>Bloomberg US TIPS TR</i>				1.2	-12.5	-11.5	1.1	2.2	1.0	4.0	3.4	Mar-07
SSgA TIPS Index	15,456,314	2.0	100.0	1.2	-12.5	-11.5	1.1	2.2	1.0	--	3.4	Mar-07
<i>Bloomberg US TIPS TR</i>				1.2	-12.5	-11.5	1.1	2.2	1.0	4.0	3.4	Mar-07
<i>Inflation-Protected Bond MStar MF Median</i>				1.2	-12.4	-11.4	1.3	2.1	0.9	3.6	3.2	Mar-07
<i>Inflation-Protected Bond MStar MF Rank</i>				36	59	56	60	37	33	--	22	Mar-07

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	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
High Yield Bond Assets	38,446,862	4.9	4.9	2.0	-10.5	-9.7	1.2	2.3	3.8	--	5.2	Apr-07
<i>Bloomberg US High Yield TR</i>				2.6	-12.5	-11.8	0.3	2.0	4.1	7.6	5.7	Apr-07
Loomis Sayles High Yield Conservative	11,154,812	1.4	29.0	2.3	-14.6	-14.1	0.0	1.2	3.4	--	4.2	Feb-12
<i>Bloomberg US High Yield TR</i>				2.6	-12.5	-11.8	0.3	2.0	4.1	7.6	4.7	Feb-12
<i>High Yield Bond MStar MF Median</i>				2.6	-11.9	-11.1	0.1	1.7	3.6	6.6	4.2	Feb-12
<i>High Yield Bond MStar MF Rank</i>				63	92	92	58	75	61	--	50	Feb-12
Columbia High Yield	11,161,283	1.4	29.0	3.3	-11.2	-10.0	0.5	2.2	--	--	3.3	Dec-16
<i>Bloomberg US High Yield TR</i>				2.6	-12.5	-11.8	0.3	2.0	4.1	7.6	3.3	Dec-16
<i>High Yield Bond MStar MF Median</i>				2.6	-11.9	-11.1	0.1	1.7	3.6	6.6	2.8	Dec-16
<i>High Yield Bond MStar MF Rank</i>				7	34	29	37	28	--	--	28	Dec-16
PRIT General Allocation Value Added FI	16,130,767	2.1	42.0	1.0	-7.2	--	--	--	--	--	-7.2	Jan-22
<i>PRIT Public Value-Added Fixed Income</i>				1.0	-10.6	-10.7	-0.5	1.0	1.7	6.3	-10.6	Jan-22
Bank Loan Assets	7,762,988	1.0	1.0	1.0	-3.8	-3.4	1.6	2.3	--	--	2.7	Aug-14
<i>Credit Suisse Leveraged Loans</i>				0.8	-2.5	-2.0	2.6	3.0	3.7	4.7	3.3	Aug-14
Beach Point Loan Fund	7,762,988	1.0	100.0	1.0	-3.8	-3.4	1.6	2.3	--	--	2.7	Aug-14
<i>Credit Suisse Leveraged Loans</i>				0.8	-2.5	-2.0	2.6	3.0	3.7	4.7	3.3	Aug-14
<i>Bank Loan MStar MF Median</i>				1.1	-3.3	-2.9	1.5	2.2	3.0	4.3	2.7	Aug-14
<i>Bank Loan MStar MF Rank</i>				55	62	61	46	36	--	--	44	Aug-14

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	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Total Real Estate	84,986,967	10.9	10.9	0.2	8.2	14.2	9.0	7.6	9.0	--	--	Jan-89
<i>NCREIF ODCE</i>				<i>0.0</i>	<i>13.1</i>	<i>22.1</i>	<i>12.4</i>	<i>10.2</i>	<i>10.9</i>	<i>8.8</i>	<i>7.7</i>	<i>Jan-89</i>
UBS Trumbull Property Income Fund	11,481,039	1.5	13.5	0.0	6.8	12.3	7.5	6.9	7.7	7.6	7.5	Jan-89
<i>NCREIF ODCE (net)</i>				<i>0.0</i>	<i>12.4</i>	<i>21.0</i>	<i>11.4</i>	<i>9.3</i>	<i>9.9</i>	<i>7.8</i>	<i>6.7</i>	<i>Jan-89</i>
UBS Trumbull Property Fund	3,152,569	0.4	3.7	0.0	2.4	7.3	4.0	3.4	5.9	6.3	6.6	Jan-89
<i>NCREIF ODCE (net)</i>				<i>0.0</i>	<i>12.4</i>	<i>21.0</i>	<i>11.4</i>	<i>9.3</i>	<i>9.9</i>	<i>7.8</i>	<i>6.7</i>	<i>Jan-89</i>
JPMCB Strategic Property Fund	11,936,855	1.5	14.0	-0.5	11.0	19.7	11.4	--	--	--	9.5	Jan-19
<i>NCREIF ODCE (net)</i>				<i>0.0</i>	<i>12.4</i>	<i>21.0</i>	<i>11.4</i>	<i>9.3</i>	<i>9.9</i>	<i>7.8</i>	<i>9.7</i>	<i>Jan-19</i>
AEW Partners VII	521,639	0.1	0.6									
Rockwood X	6,727,457	0.9	7.9									
Torchlight Debt Opportunity Fund VI	3,602,641	0.5	4.2									
TerraCap Partners IV (Institutional), L.P.	4,327,530	0.6	5.1									
Rockwood Capital Real Estate Partners Fund XI, L.P.	5,139,627	0.7	6.0									
PRIT General Allocation Real Estate	38,097,610	4.9	44.8	0.6	10.2	--	--	--	--	--	10.2	Jan-22
<i>PRIT Real Estate Benchmark</i>				<i>5.3</i>	<i>17.4</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>17.4</i>	<i>Jan-22</i>

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	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Private Equity Assets	129,779,217	16.6	16.6									
Adams Street Partners 2010	6,332,705	0.8	4.9									
Goldman Sachs Private Equity Partners 2005	481,149	0.1	0.4									
North American Strategic Partners 2006	65,081	0.0	0.1									
Brookfield Capital Partners IV	3,848,617	0.5	3.0									
PRIT Vintage Year 2001	63,971	0.0	0.0									
PRIT Vintage Year 2002	9,427	0.0	0.0									
Ridgemont Equity Partners II	5,389,252	0.7	4.2									
TA XII	3,124,281	0.4	2.4									
LLR Equity Partners V	6,400,494	0.8	4.9									
Wellspring Capital Partners VI	6,292,523	0.8	4.8									
Trilantic Capital Partners VI	5,390,908	0.7	4.2									
Brookfield Capital Partners V, L.P.	4,141,770	0.5	3.2									
FS Equity Partners VIII L.P.	5,656,260	0.7	4.4									
Ridgemont Equity Partners III	8,101,670	1.0	6.2									
Searchlight Capital III	3,927,941	0.5	3.0									
Charlesbank Technology Opportunities Fund	5,163,940	0.7	4.0									
LLR Equity Partners VI, L.P.	2,606,108	0.3	2.0									
PRIT General Allocation Private Equity	62,783,121	8.0	48.4	0.1	-4.2	--	--	--	--	--	-4.2	Jan-22
<i>State Street PE Index (SSPEI) All PE Excluding PD</i>				0.0	-0.6	--	--	--	--	--	-0.6	Jan-22

Total Retirement System | As of October 31, 2022

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Natural Resources Assets	17,210,316	2.2	2.2									
Hancock Timberland IX	3,549,954	0.5	20.6									
PRIT General Allocation Timberland	11,925,893	1.5	69.3	-0.1	-2.5	--	--	--	--	--	-2.5	Jan-22
Oppenheimer Natural Resources	1,734,469	0.2	10.1									
Infrastructure Assets	11,337,515	1.5	1.5									
IFM Global Infrastructure (U.S.), L.P. <i>CPI+5%</i>	8,042,598	1.0	70.9	0.3 0.8	4.3 10.5	8.1 12.8	10.0 10.0	-- 8.9	-- 7.6	-- 7.5	10.3 9.2	Oct-18 Oct-18
Global Infrastructure Partners IV	3,294,917	0.4	29.1									
Opportunistic Assets	36,950,815	4.7	4.7									
HarbourVest Co-Investment Fund V, L.P.	4,745,161	0.6	12.8									
EnTrustPermal Special Opportunities Evergreen Fund, Ltd.	4,946,470	0.6	13.4									
PRIT General Allocation Hedge Funds <i>HFRI FOF Composite Index</i>	27,259,184	3.5	73.8	0.2 0.5	-3.2 -6.7	-- -7.7	-- 4.1	-- 2.9	-- 3.5	-- 3.6	-3.2 -6.7	Jan-22 Jan-22
Balanced Assets	17,363,230	2.2	2.2	2.0	-12.6	-10.3	6.8	6.6	8.1	8.1	8.2	Apr-90
<i>60% Wilshire 5000 & 40% Barclays Aggregate</i>				4.4	-16.9	-15.6	4.8	6.1	8.0	7.5	8.3	Apr-90
PRIT General Allocation <i>60% Wilshire 5000 & 40% Barclays Aggregate</i>	17,363,230	2.2	100.0	2.1 4.4	-12.6 -16.9	-10.3 -15.6	6.8 4.8	6.6 6.1	8.1 8.0	8.1 7.5	8.2 8.3	Apr-90 Apr-90
Cash	11,266,860	1.4	1.4									
Cash Account <i>91 Day T-Bills</i>	8,755,685	1.1	77.7	0.2	0.8	0.8	0.5	1.1	0.7	1.2	1.2	Jan-02
PRIM Cash Account	2,511,176	0.3	22.3									

Cash Flow Summary

	Beginning Market Value	Contributions	Withdrawals	Net Investment Change	Ending Market Value	Month Return
Acadian Emerging Markets Small Cap	\$7,962,239	\$0	-\$8,450	\$158,073	\$8,111,862	1.77%
Adams Street Partners 2010	\$6,577,905	\$0	-\$245,200	\$0	\$6,332,705	0.00%
AEW Partners VII	\$521,639	\$0	\$0	\$0	\$521,639	0.00%
Axiom International Small Cap Equity	\$9,414,916	\$0	-\$6,378	\$159,171	\$9,567,708	1.62%
Beach Point Loan Fund	\$7,683,435	\$0	-\$3,235	\$82,789	\$7,762,988	1.04%
Brookfield Capital Partners IV	\$3,848,617	\$0	\$0	\$0	\$3,848,617	0.00%
Brookfield Capital Partners V, L.P.	\$4,161,934	\$0	-\$20,163	\$0	\$4,141,770	0.00%
Brown Small Cap Fundamental Value	\$14,595,451	\$0	-\$15,102	\$1,894,675	\$16,475,024	12.77%
Cash Account	\$10,953,117	\$0	-\$2,197,433	\$0	\$8,755,685	0.00%
Charlesbank Technology Opportunities Fund	\$5,163,940	\$0	\$0	\$0	\$5,163,940	0.00%
Columbia High Yield	\$10,807,500	\$0	-\$3,813	\$357,596	\$11,161,283	3.27%
Driehaus Emerging Markets Growth	\$33,339,494	\$0	\$0	\$252	\$33,339,746	0.00%
EnTrustPermal Special Opportunities Evergreen Fund, Ltd.	\$4,946,470	\$0	\$0	\$0	\$4,946,470	0.00%
FS Equity Partners VIII L.P.	\$5,108,882	\$547,378	\$0	\$0	\$5,656,260	0.00%
Global Infrastructure Partners IV	\$3,294,917	\$0	\$0	\$0	\$3,294,917	0.00%
Goldman Sachs Private Equity Partners 2005	\$481,149	\$0	\$0	\$0	\$481,149	0.00%
Hancock Timberland IX	\$3,549,954	\$0	\$0	\$0	\$3,549,954	0.00%
HarbourVest Co-Investment Fund V, L.P.	\$4,745,161	\$0	\$0	\$0	\$4,745,161	0.00%
IFM Global Infrastructure (U.S.), L.P.	\$8,014,734	\$0	\$0	\$27,864	\$8,042,598	0.35%
JPMCB Strategic Property Fund	\$12,024,100	\$0	-\$30,489	-\$56,756	\$11,936,855	-0.47%
LLR Equity Partners V	\$6,400,494	\$0	\$0	\$0	\$6,400,494	0.00%
LLR Equity Partners VI, L.P	\$2,126,108	\$480,000	\$0	\$0	\$2,606,108	0.00%
Loomis Sayles High Yield Conservative	\$10,896,662	\$0	-\$4,183	\$262,333	\$11,154,812	2.33%
North American Strategic Partners 2006	\$65,081	\$0	\$0	\$0	\$65,081	0.00%

Total Retirement System | As of October 31, 2022

	Beginning Market Value	Contributions	Withdrawals	Net Investment Change	Ending Market Value	Month Return
Oppenheimer Natural Resources	\$1,734,469	\$0	\$0	\$0	\$1,734,469	0.00%
PRIM Cash Account	\$1,007,462	\$3,992,538	-\$2,500,000	\$11,176	\$2,511,176	1.06%
PRIT Core Fixed Income	\$24,593,081	\$0	-\$2,206	-\$526,048	\$24,064,827	-2.15%
PRIT General Allocation	\$17,452,158	\$0	-\$3,992,539	\$3,903,611	\$17,363,230	2.05%
PRIT General Allocation Core FI	\$51,997,376	\$0	\$0	-\$1,611,384	\$50,385,992	-2.14%
PRIT General Allocation Domestic Equity	\$75,410,560	\$0	\$0	\$5,388,272	\$80,798,832	8.22%
PRIT General Allocation EME	\$15,728,488	\$0	\$0	-\$322,699	\$15,405,789	-1.15%
PRIT General Allocation Hedge Funds	\$27,399,170	\$0	\$0	-\$139,986	\$27,259,184	0.18%
PRIT General Allocation Int. Equity	\$40,542,153	\$0	\$0	\$1,796,580	\$42,338,733	4.76%
PRIT General Allocation Private Equity	\$63,129,411	\$0	\$0	-\$346,290	\$62,783,121	0.08%
PRIT General Allocation Real Estate	\$39,177,581	\$0	\$0	-\$1,079,971	\$38,097,610	0.56%
PRIT General Allocation Timberland	\$12,137,509	\$0	\$0	-\$211,616	\$11,925,893	-0.07%
PRIT General Allocation Value Added FI	\$16,123,496	\$0	\$0	\$7,271	\$16,130,767	1.03%
PRIT Vintage Year 2001	\$63,881	\$0	-\$1	\$91	\$63,971	0.14%
PRIT Vintage Year 2002	\$9,347	\$0	\$0	\$80	\$9,427	0.86%
Rhumblin QSI Index	\$27,008,321	\$0	-\$1,707	\$2,251,414	\$29,258,028	8.33%
Rhumblin Russell 1000 Growth Index	\$19,762,850	\$0	-\$1,177	\$1,154,180	\$20,915,853	5.83%
Rhumblin Russell 1000 Value Index	\$23,392,435	\$0	-\$1,451	\$2,395,886	\$25,786,871	10.24%
Ridgemont Equity Partners II	\$5,389,252	\$0	\$0	\$0	\$5,389,252	0.00%
Ridgemont Equity Partners III	\$8,101,670	\$0	\$0	\$0	\$8,101,670	0.00%
Rockwood Capital Real Estate Partners Fund XI, L.P.	\$5,139,627	\$0	\$0	\$0	\$5,139,627	0.00%
Rockwood X	\$6,727,457	\$0	\$0	\$0	\$6,727,457	0.00%
Searchlight Capital III	\$3,927,941	\$0	\$0	\$0	\$3,927,941	0.00%
SSgA MSCI EAFE Index	\$31,878,171	\$0	-\$2,800	\$1,723,777	\$33,599,148	5.40%
SSgA TIPS Index	\$15,267,014	\$0	-\$773	\$190,072	\$15,456,314	1.24%

Total Retirement System | As of October 31, 2022

	Beginning Market Value	Contributions	Withdrawals	Net Investment Change	Ending Market Value	Month Return
SSgA U.S. Aggregate Bond Index-NL	\$19,902,916	\$0	-\$982	-\$258,274	\$19,643,660	-1.30%
TA XII	\$3,353,781	\$0	-\$229,500	\$0	\$3,124,281	0.00%
TerraCap Partners IV (Institutional), L.P.	\$4,327,530	\$0	\$0	\$0	\$4,327,530	0.00%
Torchlight Debt Opportunity Fund VI	\$3,714,708	\$0	-\$112,067	\$0	\$3,602,641	0.00%
Trilantic Capital Partners VI	\$5,275,967	\$114,941	\$0	\$0	\$5,390,908	0.00%
UBS Trumbull Property Fund	\$3,152,569	\$0	\$0	\$0	\$3,152,569	0.00%
UBS Trumbull Property Income Fund	\$11,481,039	\$0	\$0	\$0	\$11,481,039	0.00%
Wellspring Capital Partners VI	\$6,238,065	\$54,458	\$0	\$0	\$6,292,523	0.00%
Total	\$767,231,355	\$5,189,315	-\$9,379,648	\$17,212,140	\$780,253,162	--

Private Market Managers' Performance Overview¹

Managers	Strategy	Vintage Year	Commitment Amount (\$mm)	% called	Median Peer IRR	Quartile Rank	Net IRR	Net Multiple
Real Estate Managers								
AEW Partners VII	Opportunistic	2014	5.0	93%	20.0	4	10.6%	NA
Rockwood X	Value-Added	2016	10.0	94%	15.1	3	10.4%	1.4x
Torchlight Debt Opportunity Fund VI	Opportunistic	2019	5.0	100%	21.9	4	8.7%	1.2x
TerraCap Partners IV	Value-Added	2019	5.0	100%	19.5	3	12.5%	NA
Rockwood XI	Value-Added	2019	8.0	51%	19.5	2	23.3%	1.3x
Private Equity Managers								
Adams Street Partners	Fund of Funds	2010	10.0	89%	9.8	NA	15.2%	2.3x
Goldman Sachs PE Partners	Fund of Funds	2005	10.0	100%	8.0	NA	NA	NA
North American Strategic Partners	Fund of Funds	2006	9.1	88%	NA	NA	NA	NA
PRIT Vintage Year 2001	Fund of Funds	2001	2.5	NA	9.0	NA	NA	NA
PRIT Vintage Year 2002	Fund of Funds	2002	0.5	NA	8.8	NA	NA	NA
Brookfield Capital Partners IV	Buyout	2015	4.0	87%	22.0	1	47.4%	2.8x
LLR Equity Partners V	Buyout	2017	5.0	92%	22.0	2	22.0%	1.7x
Ridgemont Equity Partners II	Buyout	2015	6.0	92%	22.0	3	18.6%	2.6x

¹ As of 6/30/2022.

² NM indicates that a fund is early in its investment period; therefore, the return is not yet meaningful. NA indicates that the relevant data is not available at the time of report generation.

Private Market Managers' Performance Overview (continued)¹

Managers	Strategy	Vintage Year	Commitment Amount (\$mm)	% called	Median Peer IRR	Quartile Rank	Net IRR	Net Multiple
TA XII	Growth Equity	2016	4.0	100%	23.5	1	40.0%	2.9x
Wellspring VI	Buyout	2017	5.0	88%	22.0	2	26.1%	1.5x
Trilantic Capital Partners VI	Buyout	2018	5.0	74%	23.2	3	19.6%	1.4x
Brookfield Capital Partners V	Buyout	2019	4.0	77%	22.7	3	17.6%	1.3x
FS Equity Partners VIII	Buyout	2019	5.0	62%	22.7	2	33.6%	1.5x
Ridgemont Equity Partners III	Buyout	2019	6.0	67%	22.7	1	56.1%	1.8x
Searchlight Capital III	Special Situations	2020	5.0	56%	16.9	1	51.8%	1.7x
Charlesbank Technology Opportunities	Buyout	2019	5.0	38%	NM	NM	NM	NM
LLR Equity Partners VI	Buyout	2020	4.0	54%	NM	NM	NM	NM
Opportunistic Managers								
HarbourVest Co-Investment Fund IV	Opportunistic	2019	4.0	78%	NA	NA	30.3%	1.7x
EnTrustPermal Spec. Opps. Evergreen Fund	Opportunistic	2020	6.0	55%	NM	NM	NM	NM
Infrastructure Managers								
Global Infrastructure Partners IV	Value-Added	2019	5.0	48%	--	--	--	--
Natural Resources Managers								
Hancock Timberland	Timber	2008	8.0	100%	--	--	-0.3%	1.0x
Oppenheimer Natural Resources	Natural Resources	2010	7.0	100%	--	--	-4.3%	0.7x

¹ As of 6/30/2022.

² NM indicates that a fund is early in its investment period; therefore, the return is not yet meaningful. NA indicates that the relevant data is not available at the time of report generation.

Disclaimer, Glossary, and Notes

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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

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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.