

# Oakland Police and Fire Retirement System

February 22, 2023

Quarterly Performance Report  
as of December 31, 2022

## Agenda

1. Executive Summary
2. Economic and Market Update as of December 31, 2022
3. 4Q 2022 Performance as of December 31, 2022
4. Manager Monitoring / Probation Status
5. Disclaimer, Glossary, and Notes

## **Executive Summary**

### Total Portfolio Review

The Oakland Police and Fire Retirement System (OPFRS) portfolio finished the 2022 calendar year with a market value of \$398.4 million. This represents a \$21.2 million capital appreciation in investment value after \$5.2 million in net outflows over the quarter. In the calendar year 2022, the OPFRS Total Portfolio faced a \$69.1 million depreciation, after withdrawals totaling \$15.7 million for net outflows including benefit payments.

→ As of 12/31/2022, all the asset classes were within acceptable allocation ranges relative to policy targets.<sup>1</sup>

### Investment Performance

→ During the most recent quarter, the OPFRS portfolio generated an absolute return of 5.6%, gross of fees, underperforming its policy benchmark<sup>2</sup> by (-0.4%). It kept pace with the benchmark over the trailing 1- and 3-year periods, though it has maintained a slight outperformance over the 5-year period.

	Quarter	FYTD	1 Year	3 Year	5 Year
Total Portfolio (Gross)	5.6	0.7	(-14.5)	2.3	4.3
Policy Benchmark	6.0	1.1	(-14.5)	2.3	4.0
Excess Return	(-0.4)	(-0.4)	0	0	0.1
Reference: Total Portfolio (Net) <sup>3</sup>	5.5	0.6	(-14.7)	2.0	4.0

<sup>1</sup> Asset allocation as of 12/31/2022. Target weightings reflect the interim phase (where Crisis Risk Offset component is set to 10%) of the Plan's previously approved asset allocation (effective 5/31/2017).

<sup>2</sup> Evolving Policy Benchmark consists of 40% Russell 3000, 12% MSCI ACWI ex U.S., 33% Bloomberg Universal, 5% CBOE BXM, 6.7% SG Multi Asset Risk Premia, 3.3% Bloomberg Long Treasury from 1/1/2019 through 5/31/2022; and 40% Russell 3000 / 12% MSCI ACWI ex USA / 31% Bloomberg US Universal TR / 5% CBOE BXM / 10% SG Multi Alternative Risk Premia Index / 2% Bloomberg US High Yield thereafter.

<sup>3</sup> Longer-term (>1 year) Net of fee returns include estimates based on OPFRS manager fee schedule (approximately 34 bps).

### Total Portfolio Review (Continued)

The primary factors of the Total Plan’s underperformance against the Policy Benchmark during the quarter were the underperformance within the Crisis Risk Offset segment, which surpassed the positive contributions made by the Domestic and International Equity segments.

#### Peer Comparison

→ In comparison to its peer group<sup>1</sup>, the portfolio has lagged the median fund’s return over the quarter as well as the 1-, 3-, and 5-year periods.

	Quarter	FYTD	1 Year	3 Year	5 Year
Total Portfolio (Gross)	5.6	0.7	(-14.5)	2.3	4.3
Peer Group Median Fund	5.8	1.2	(-13.4)	4.0	5.2
vs. Peer Median Fund	(-0.2)	(-0.5)	(-1.1)	(-1.7)	(-0.9)
<i>Reference: Total Portfolio (Net)</i> <sup>2</sup>	5.5	0.6	(-14.7)	2.0	4.0

<sup>1</sup> Source: Investment Metrics peer universe, Public Defined Benefit plans with \$250 million to \$1 billion in assets as of 12/31/2022.

<sup>2</sup> Longer-term (>1 year) Net of fee returns include estimates based on OPFRS manager fee schedule (approximately 34 bps).

### Asset Class & Manager Highlights

- **Domestic equity** outperformed the Russell 3000 Index for all periods measured except for the longer 5-year trailing period.
- Among the active managers, **Earnest Partners** and **Rice Hall James** trailed their respective benchmarks for the quarter while maintaining outperformance over the 1-year and longer periods. **Wellington Select Quality** and **Brown Advisory** both outperformed their benchmarks for all the available time periods.<sup>1</sup>
- **International equity** outperformed the MSCI ACWI ex US Index for all time periods measured. Reflecting the positive market conditions during the fourth quarter, both managers—one active and one passive—generated double-digit positive absolute returns for the quarter.
- The Plan’s active international equity manager, **SGA MSCI ACWI ex US**, outperformed its benchmark for all time periods available.<sup>1</sup>
  - The passive **Vanguard** posted underperformance over the 1- and 3-year periods, due to a large deviation from its tracked index in December. This is due to Vanguard’s fair-value pricing methodology, that may cause deviations from its tracked index that are expected to equalize over the longer term.

<sup>1</sup> Due to their recent inception, Wellington Select Quality has less than 1-year of performance history and Brown Fundamental Small Cap Value has less than 3-year of performance history. SGA MSCI ACWI ex US and Vanguard Developed Markets ETF have less than 5-year of performance history.

### Asset Class & Manager Highlights (Continued)

- **Fixed income** trailed the Bloomberg Universal Index over the quarter, while it outperformed the benchmark across all other time periods. The managers' quarterly relative performance is mixed.
  - **Ramirez** underperformed, **Reams** outperformed, and **Wellington Core Bond** tracked their respective benchmarks for the quarter. **Ramirez** and **Reams**, which have longer 3- and 5-year performance history, both maintained their outperformance over their respective benchmarks for these periods.
- The **Credit** segment, with **Polen Capital** as its only manager, underperformed the asset class's benchmark, Bloomberg US High Yield Index, during the quarter though it has maintained their excess return above their respective benchmarks over the 1-, 3-, and 5-year periods.
- **Covered Calls** and both of its underlying strategies outperformed its CBOE S&P 500 Buy-Write Index over the quarter and the longer 3- and 5-year periods, while trailing in the 1-year period.
- The **Crisis Risk Offset** segment trailed its benchmark SG Multi Alternative Risk Premia Index over the quarter as well as other time periods measured.
  - Even though the portfolio has trailed across all time periods, as a long-term-oriented segment of the Plan and given the recency of funding for two<sup>1</sup> of the three underlying managers, the underperformance ought not to be overly scrutinized.
  - Due to the addition of Kepos and Versor as Alternative Risk Premia and Systematic Trend Following managers within this segment in 2022, the current benchmark does not accurately reflect its components. We will be recommending an update to this benchmark for the Committee to consider in the following meetings.

<sup>1</sup> Kepos Alternative Risk Premia and Versor Trend Following were incepted within the first half of 2022 and therefore have less than 1-year of performance history.

# **Economic and Market Update**

## Data as of December 31, 2022

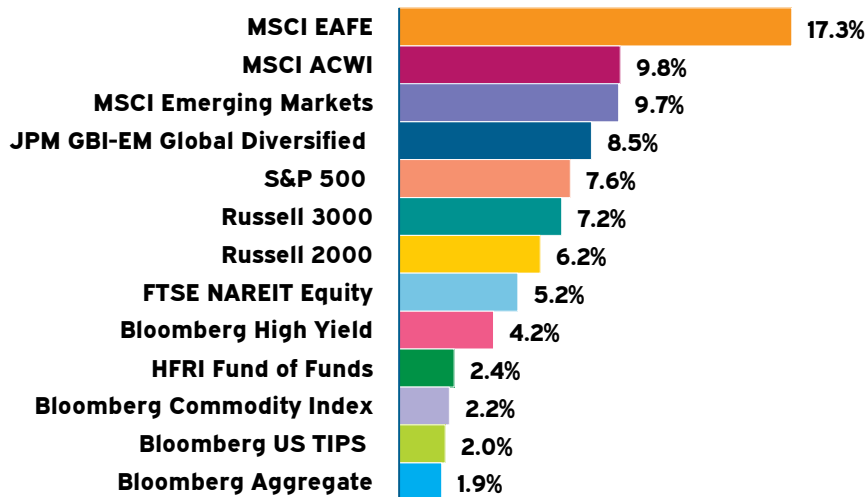


## Commentary

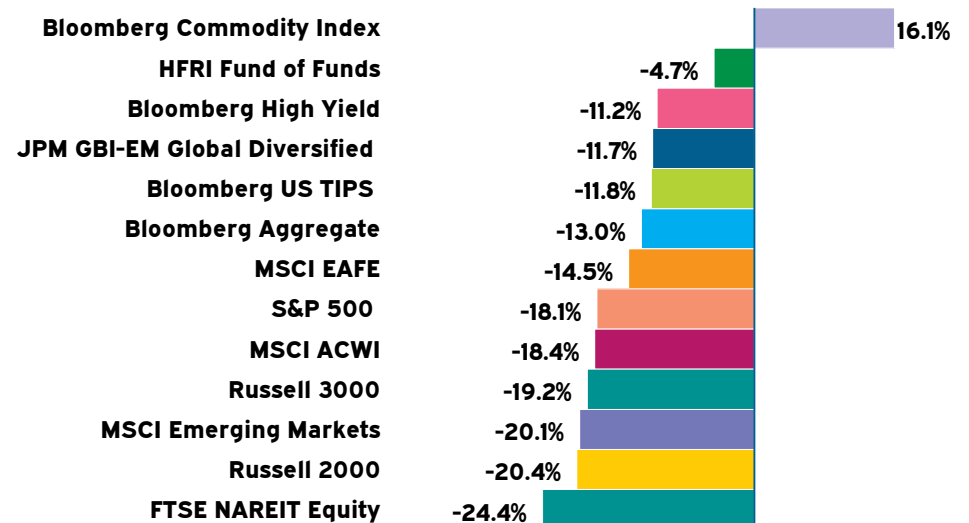
- Ending a very tough year, most asset classes posted gains in the fourth quarter on signs that policy tightening would slow given cooling inflation.
- Chairman Powell's testimony in November reiterated previous messaging on persistent and high inflation and the need for an extended period of monetary tightening weighing on assets in December. Markets remained focused though on signs that inflation is falling and that the size of future Fed rate hikes could be lower.
  - US equity markets sold off (-5.9%) in December but returned 7.2% in the fourth quarter as investors balanced the Fed's caution with improving inflation data.
  - In developed equity markets outside the US, sentiment deteriorated somewhat in December, but they posted a strong fourth quarter return of 17.3% driven by a falling US dollar and results in Europe where inflation started to slow.
  - Emerging market equities declined in December too (-1.4%) but less than the US and also had a strong fourth quarter (+9.7%). A weaker US dollar, declining inflation globally, and signs of China reopening its economy all contributed to the results.
  - Bonds experienced one of the worst years on record given inflation levels and the rapid rise in interest rates. Optimism over declining inflation and a slower pace of policy tightening benefited bonds overall in the fourth quarter though.
- Looking to 2023, the path of inflation and monetary policy, slowing growth globally, China reopening its economy, and the war in Ukraine will all be key.

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

#### Fourth Quarter



#### 2022



→ After broad declines in Q3 driven by expectations for further policy tightening, most major asset classes were up in the fourth quarter on hopes of inflation and policy tightening peaking.

→ Outside of commodities, all other public market asset classes declined in 2022. It was the first time since the 1960s that both stocks and bonds declined together in a calendar year.

<sup>1</sup> Source: Bloomberg and FactSet. Data is as of December 31, 2022.

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

Domestic Equity	December (%)	Q4 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
S&P 500	-5.8	7.6	-18.1	7.7	9.4	12.6
Russell 3000	-5.9	7.2	-19.2	7.1	8.8	12.1
Russell 1000	-5.8	7.2	-19.1	7.3	9.1	12.4
Russell 1000 Growth	-7.7	2.2	-29.1	7.8	11.0	14.1
Russell 1000 Value	-4.0	12.4	-7.5	6.0	6.7	10.3
Russell MidCap	-5.4	9.2	-17.3	5.9	7.1	11.0
Russell MidCap Growth	-6.0	6.9	-26.7	3.9	7.6	11.4
Russell MidCap Value	-5.1	10.5	-12.0	5.8	5.7	10.1
Russell 2000	-6.5	6.2	-20.4	3.1	4.1	9.0
Russell 2000 Growth	-6.4	4.1	-26.4	0.6	3.5	9.2
Russell 2000 Value	-6.6	8.4	-14.5	4.7	4.1	8.5

**US Equities: Russell 3000 Index declined 5.9% for December but gained 7.2% for the quarter. Historic inflation and rapidly rising interest rates led to significant declines (-19.2%) for the full year.**

- US stocks fell broadly in December on the Federal Reserve signaling its continued resolve to raise rates but gained overall for the quarter on hopes that interest rates could be peaking soon given slowing inflation.
- All sectors declined during December, led by consumer discretionary and technology with defensive sectors declining less. For the quarter though, most sectors were up led by energy and industrials.
- In a continuation on the overall trend in 2022 value stocks outperformed growth stocks in the fourth quarter given higher interest rates and slowing growth.

<sup>1</sup> Source: Bloomberg. Data is as of December 31, 2022.

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

Foreign Equity	December (%)	Q4 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
MSCI ACWI ex. US	-0.7	14.3	-16.0	0.1	0.9	3.8
MSCI EAFE	0.1	17.3	-14.5	0.9	1.5	4.7
MSCI EAFE (Local Currency)	-3.0	8.7	-7.0	3.6	3.8	7.6
MSCI EAFE Small Cap	1.1	15.8	-21.4	-0.9	0.0	6.2
MSCI Emerging Markets	-1.4	9.7	-20.1	-2.7	-1.4	1.4
MSCI Emerging Markets (Local Currency)	-2.0	6.6	-15.5	0.1	1.3	4.6
MSCI China	5.2	13.5	-21.9	-7.5	-4.5	2.4

Developed international equities (MSCI EAFE) rose 0.1% in December and an impressive 17.3% in the fourth quarter. Emerging markets (MSCI EM) fell -1.4% in December but gained 9.7% for the quarter. Inflation and rising rates also weighed on international equities last year, as well as a strong US dollar for most of the year.

- International developed market equities, specifically Europe, held up better relative to the rest of the world in December with the MSCI EAFE up 0.1%. In the fourth quarter, they returned a significant 17.3% due in part to the recent weakness in the US dollar (they returned only 8.7% in local terms) leading to lower declines for the year.
- In December emerging markets outperformed the US but trailed developed market equities as China’s rally was not enough to offset weakness elsewhere (e.g., India -5.5%). For the quarter, a weakening US dollar and China reopening led to strong results (+9.7%), but emerging markets remained the weakest for 2022 due to China.
- Like the US, value outpaced growth globally in 2022.

<sup>1</sup> Source: Bloomberg. Data is as of December 31, 2022.

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

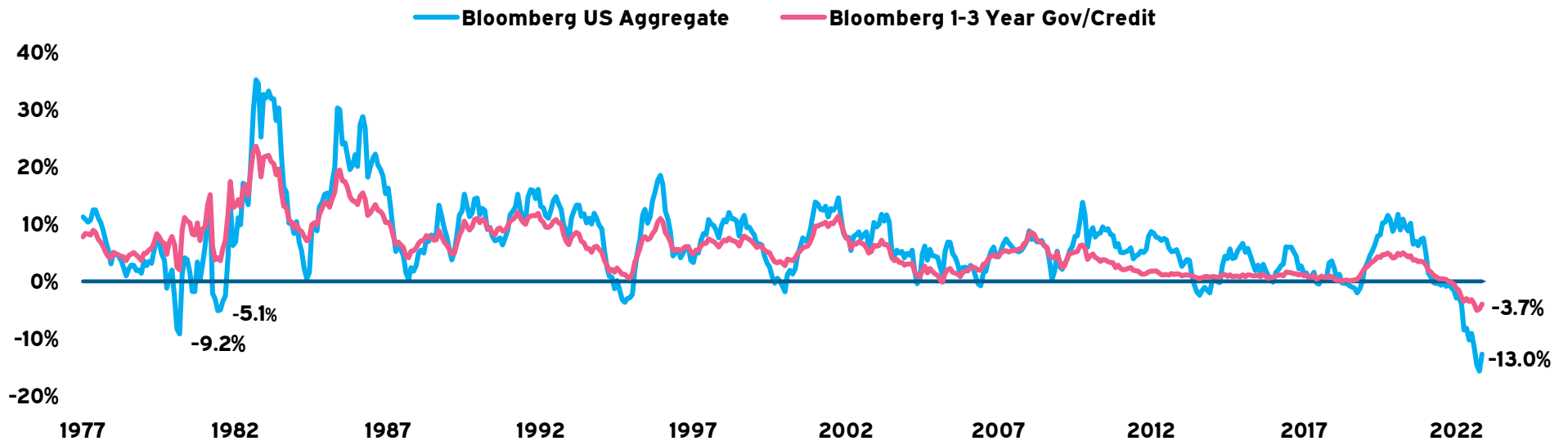
Fixed Income	December (%)	Q4 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)	Current Yield (%)	Duration (Years)
Bloomberg Universal	-0.3	2.2	-13.0	-2.5	0.2	1.3	5.1	6.2
Bloomberg Aggregate	-0.5	1.9	-13.0	-2.7	0.0	1.1	4.7	6.4
Bloomberg US TIPS	-1.0	2.0	-11.8	1.2	2.1	1.1	4.4	6.7
Bloomberg High Yield	-0.6	4.2	-11.2	0.0	2.3	4.0	9.0	4.4
JPM GBI-EM Global Diversified (USD)	2.2	8.5	-11.7	-6.1	-2.5	-2.0	5.8	4.9

**Fixed Income: The Bloomberg Universal fell -0.3% in December but rose 2.2% for the fourth quarter. Last year was one of the worst on record, with the broad bond market declining 13%.**

- The Federal Reserve reconfirming its commitment to tighten policy in the face of high inflation weighed on US fixed income in December. For the quarter though the broad US bond market (Bloomberg Aggregate) was up 1.9% on hopes that inflation would continue to decline and corresponding expectations for the slowing of policy rate hikes.
- TIPS produced similar results to the broad US bond market for the quarter but outperformed for the year given their inflation adjustment.
- Riskier bonds outperformed for the quarter due to improving risk sentiment with emerging market bonds performing particularly well.

<sup>1</sup> Source: Bloomberg. JPM GBI-EM data is from InvestorForce. Data is as of December 31, 2022. The yield and duration data from Bloomberg is defined as the index's yield to worst and modified duration respectively.

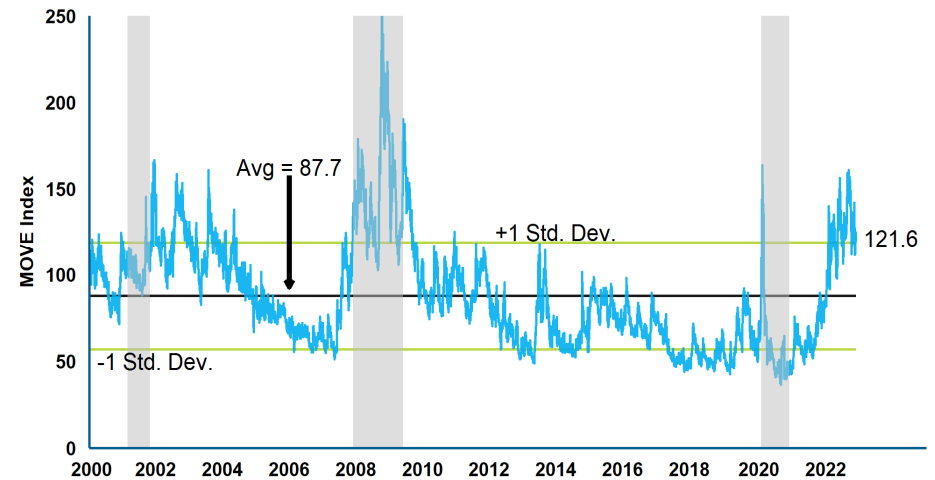
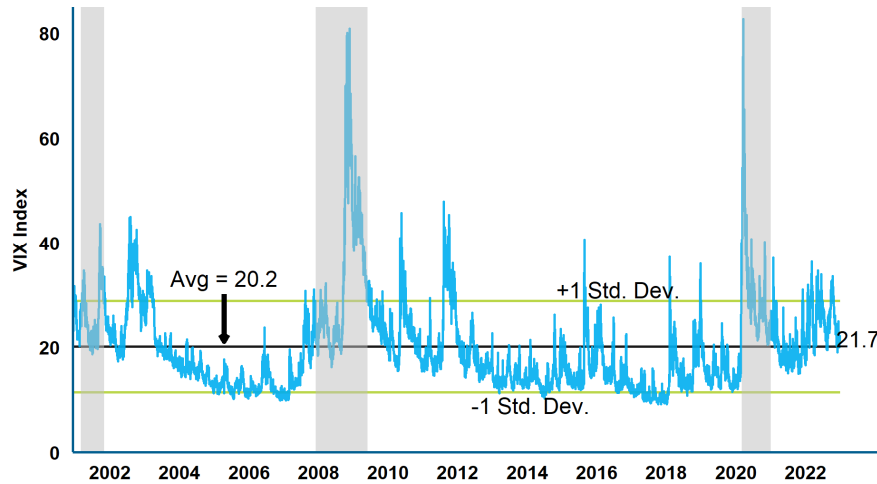
**Fixed Income  
Rolling One-year Returns<sup>1</sup>**



- Last year was one of the worst return periods for the US bond market given the historic inflation levels and the corresponding rapid rise in interest rates.
- The broad bond market (Bloomberg US Aggregate) declined 13% in 2022 making it one of the worst periods on record.
- Short-term bond declines were far smaller (-3.7%) last year, but also were one of the worst on record.

<sup>1</sup> Source: Bloomberg. Data is as of December 31, 2022.

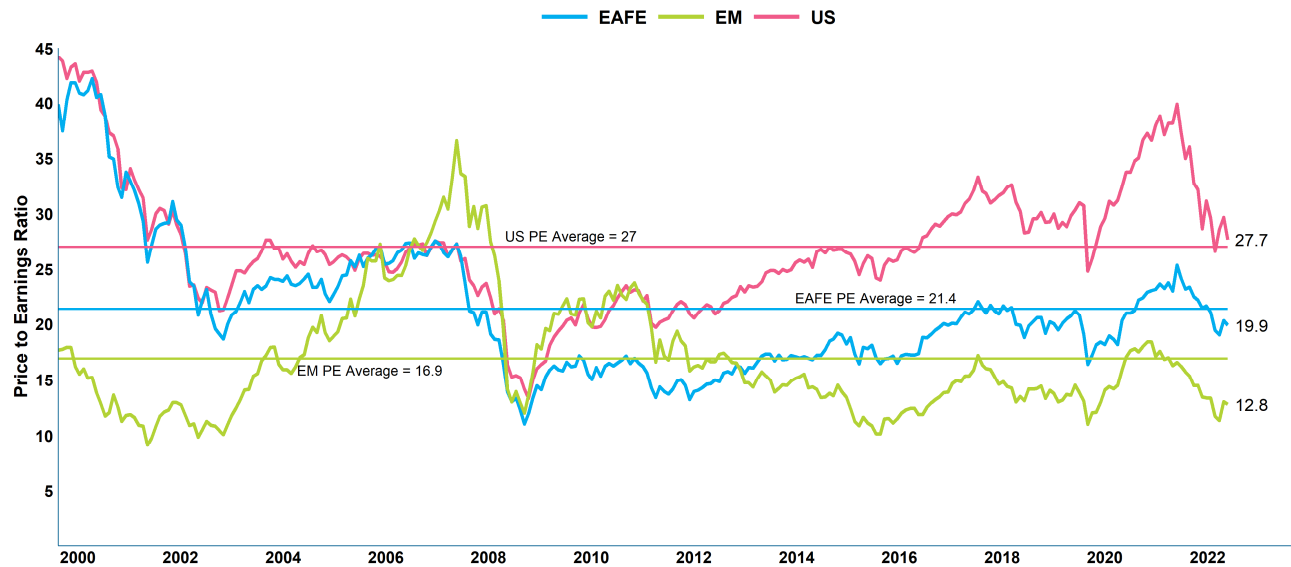
**Equity and Fixed Income Volatility<sup>1</sup>**



- Volatility in equities (VIX) finished the year down from its highs and near its long run average as investors anticipated the potential end of Fed rate hikes this year.
- Fixed income (MOVE) remained elevated and well above its long-run average at year-end due to the uncertain path of US interest rates as the Federal Reserve continues its hawkish stance on inflation.

<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 December 2022. The average line indicated is the average of the VIX and MOVE values between January 2000 and the recent month-end respectively.

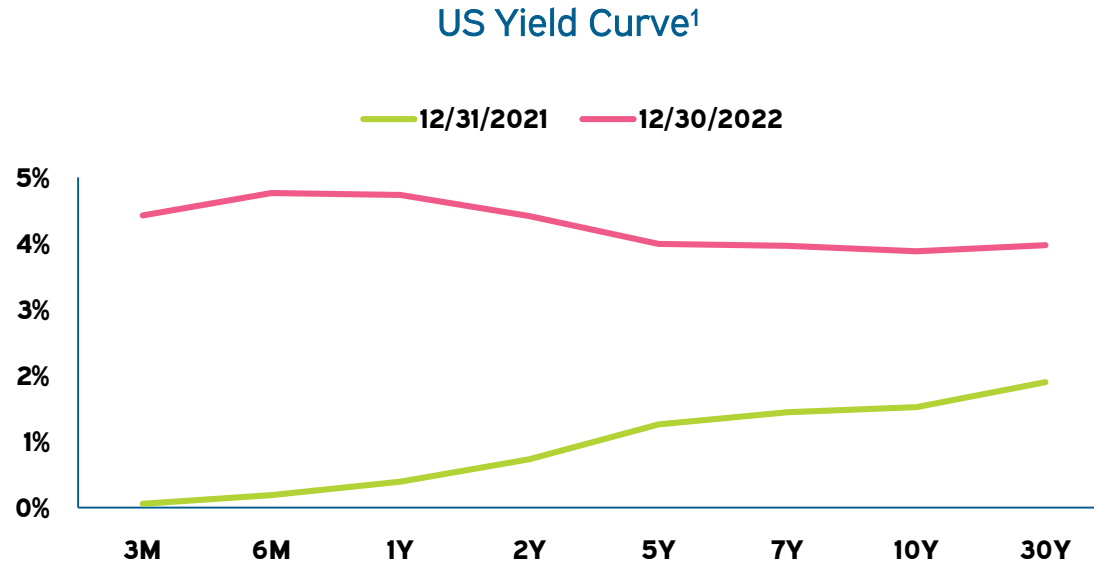
**Equity Cyclically Adjusted P/E Ratios<sup>1</sup>**



- After December’s sell-off, US equity price-to-earnings ratio finished the year near its long-term (21st century) average.
- International developed market valuations rose but remain 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.

<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 December 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.

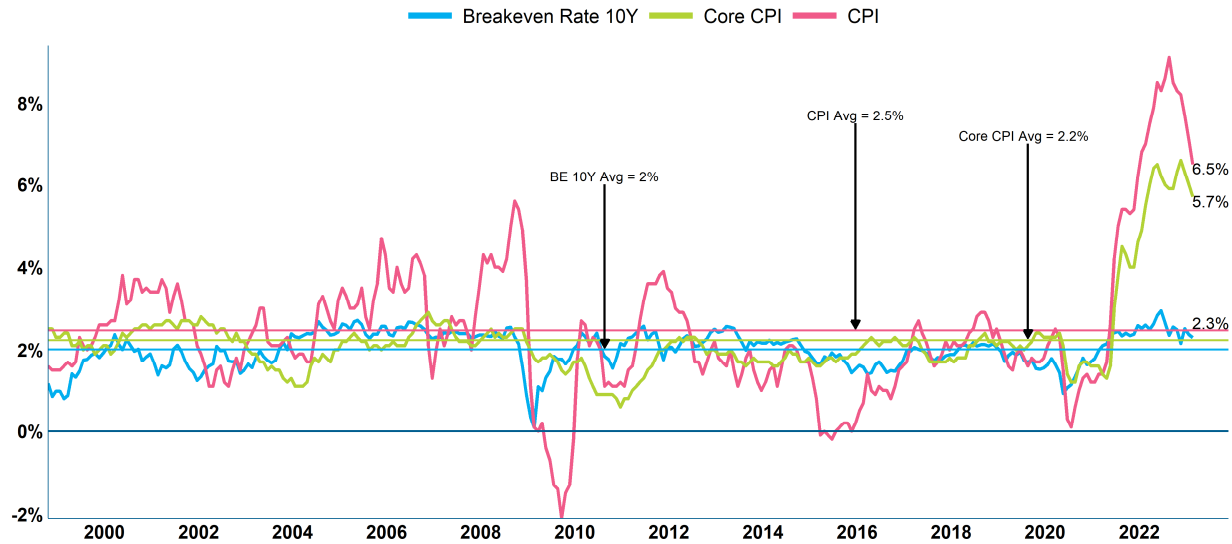




- In December, policy-sensitive interest rates at the front-end of the curve continued to rise with the two-year Treasury yield increasing from 4.3% to 4.4%. Longer dated ten-year Treasury yields also increased (3.6% to 3.9%). For the year, the yield curve rose dramatically across maturities and moved from steep to inverted.
- The Fed remains strongly committed to fighting inflation, as it increased rates another 50 basis points to a range of 4.0% to 4.5% at its December meeting. This brought the total number of increases for 2022 to seven.
- The yield spread between two-year and ten-year Treasuries narrowed somewhat to -0.54% after finishing November at -0.70%. The more closely watched measure by the Fed of three-month and ten-year Treasuries also remained inverted. Historically, inversions in the yield curve have often preceded recessions.

<sup>1</sup> Source: Bloomberg. Data is as of December 31, 2022.

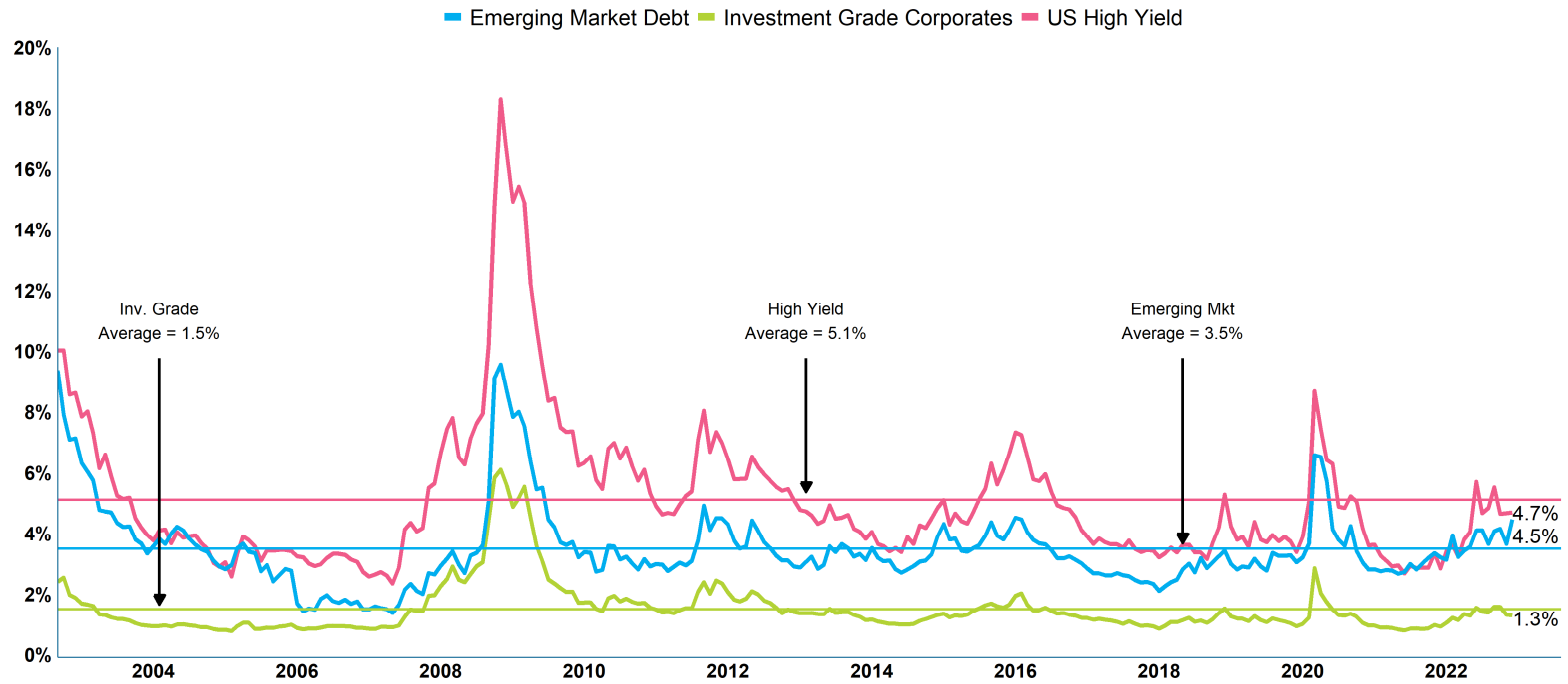
**Ten-Year Breakeven Inflation and CPI<sup>1</sup>**



- In December inflation continued to decline (6.5% versus 7.1%) matching expectations and providing support for the Fed to slow the pace of policy tightening. Energy prices fell again for the month but remain up 7.3% from a year prior, while food prices fell slightly, and stickier service prices continued to increase.
- Core inflation – excluding food and energy – also continued to decline in December (5.7% versus 6.0%) and matched estimates.
- Inflation expectations (breakevens) declined slightly for the month (2.3% versus 2.4%) and remain well below current inflation levels as investors anticipate a significant moderation in inflation.

<sup>1</sup> Source: Bloomberg. Data is as of December 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.

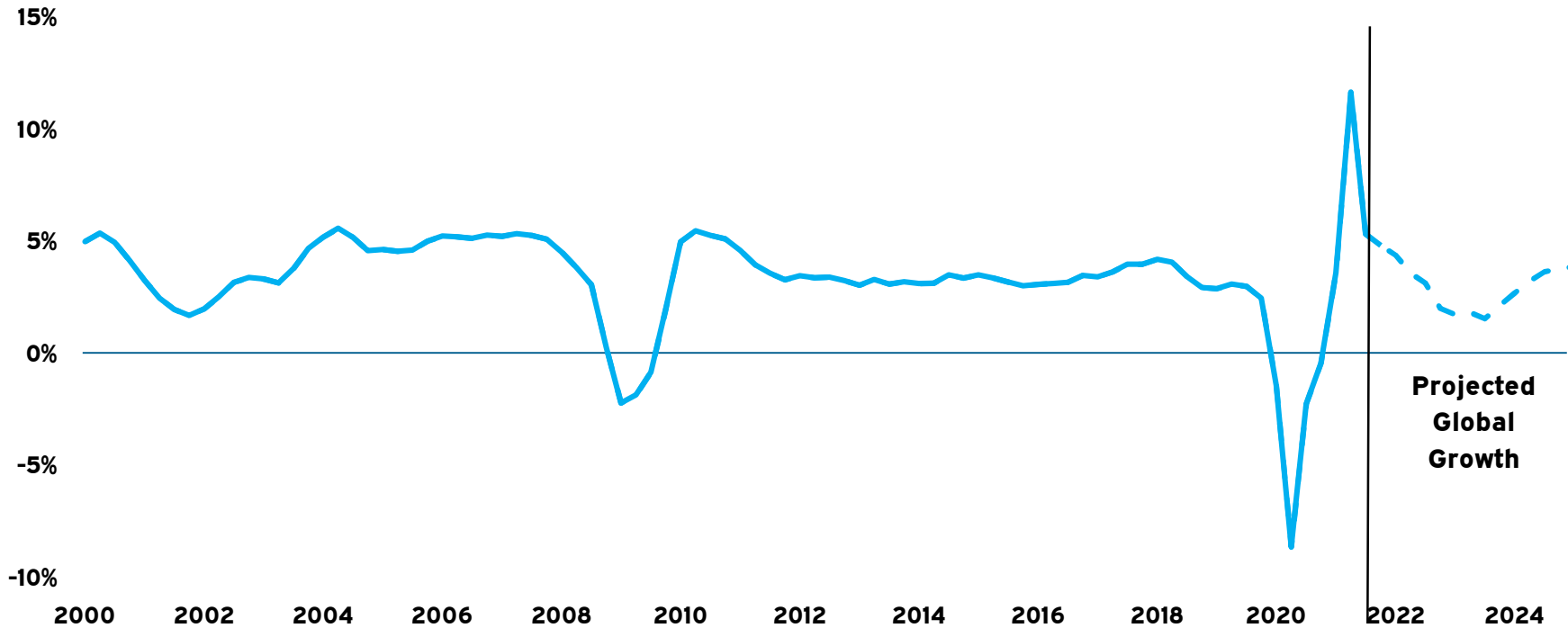
**Credit Spreads vs. US Treasury Bonds<sup>1</sup>**



- High yield spreads (the added yield above a comparable maturity Treasury) finished December at 4.7% (the same as the end of November) remaining below their long-run average.
- Investment grade spreads also held steady at 1.3% as attractive yields and strong balance sheets continued to attract investors, while emerging market spreads rose (4.5% versus 3.6%) due to concerns regarding slower growth and lower commodity prices.

<sup>1</sup> Sources: Bloomberg. Data is as of December 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 Real Gross Domestic Product (GDP) Growth<sup>1</sup>**

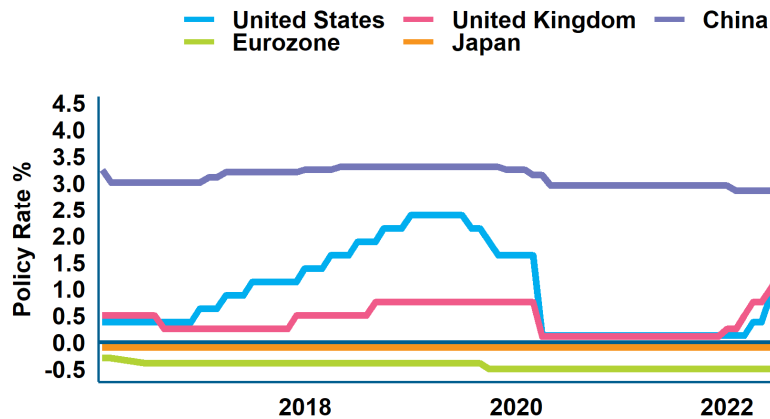


- Global economies are expected to slow in 2023 compared to 2022, with risks of recession increasing given persistently high inflation and related tighter monetary policy.
- The delicate balancing act of central banks trying to reduce inflation without dramatically impacting growth will remain key.

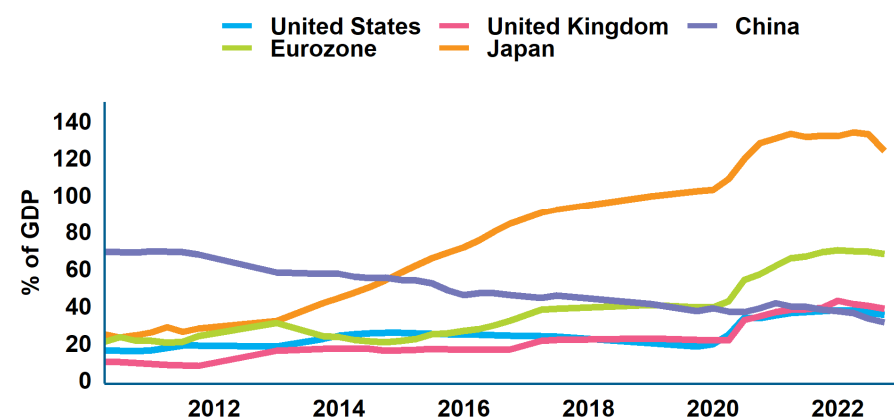
<sup>1</sup> Source: Oxford Economics (World GDP, US\$ prices & PPP exchange rate, real, % change YoY). Updated December 2022.

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

#### Policy Rates



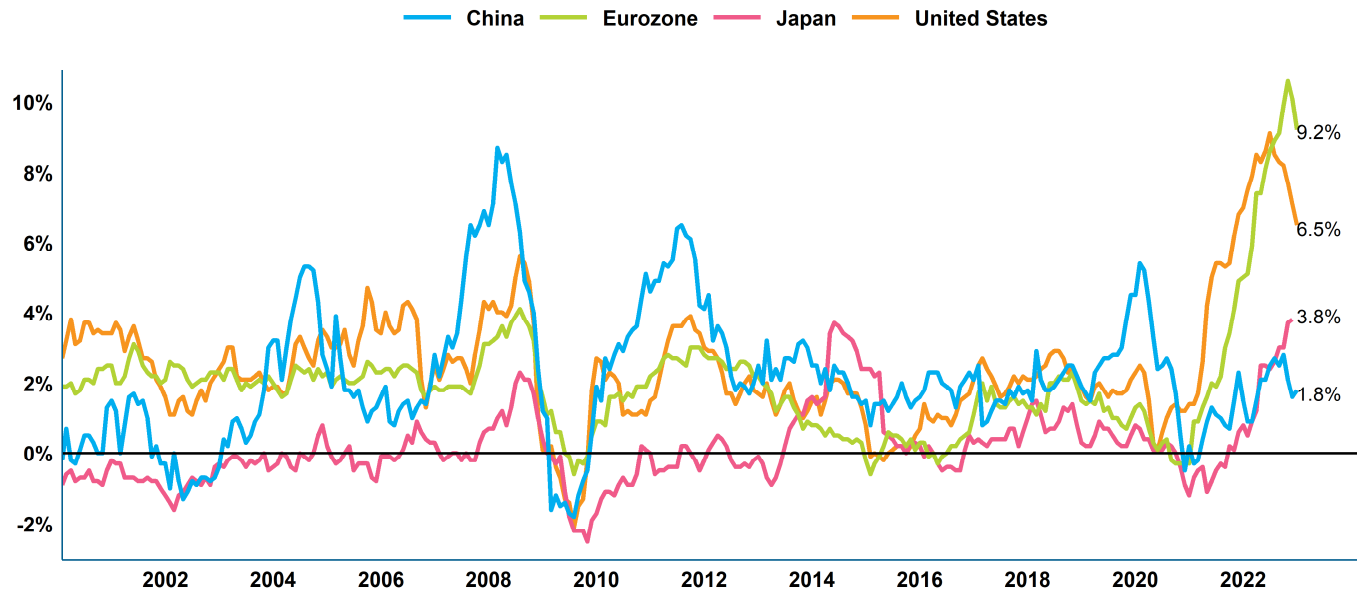
#### Balance Sheet as % of GDP



- In 2022 many central banks aggressively reduced pandemic-era policy support in the face of high inflation with the US taking a more aggressive approach.
- In December, the Bank of Japan relaxed its target yield for the 10-year bond which may mark an incremental step toward policy normalization after eight years of quantitative easing.
- 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 and aggressive tightening to date could heavily weigh on global growth. The Federal Reserve's policy rate path could diverge from others this year given their strong early start to tightening.

<sup>1</sup> Source: Bloomberg. Policy rate data is as of December 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 December 31, 2022.

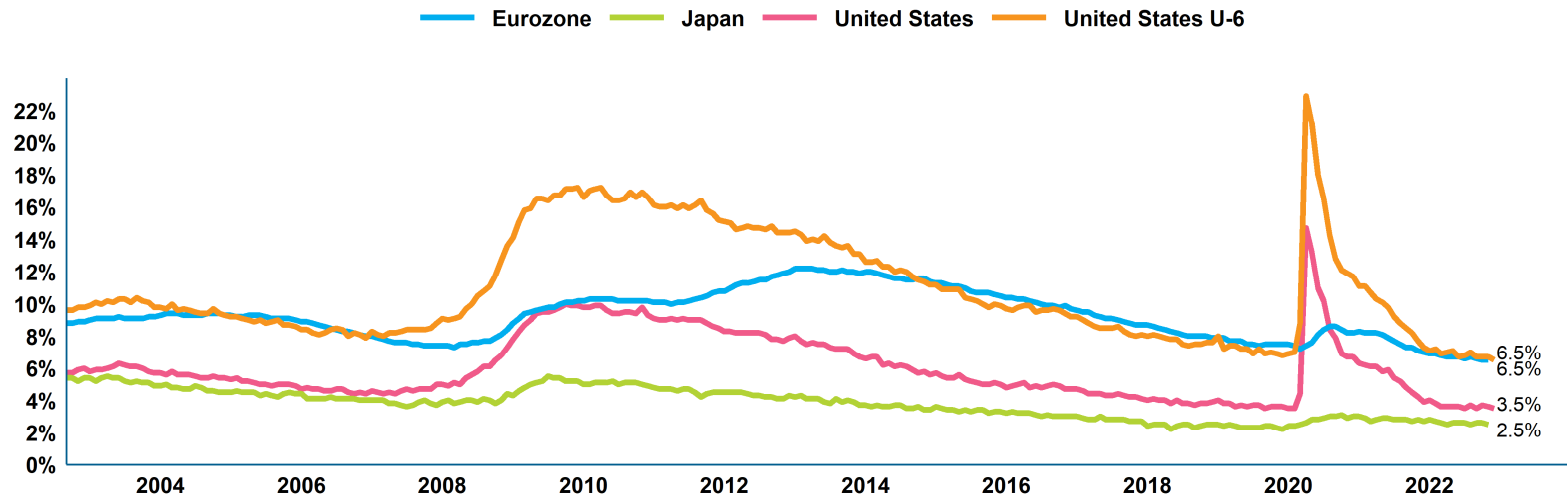
**Inflation (CPI Trailing Twelve Months)<sup>1</sup>**



- 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.
- Inflation pressures are slowly declining in the US, but they remain elevated, while in Europe they have reached 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.

<sup>1</sup> Source: Bloomberg. Data is as of December 2022. The most recent Japanese inflation data is as of November 2022.

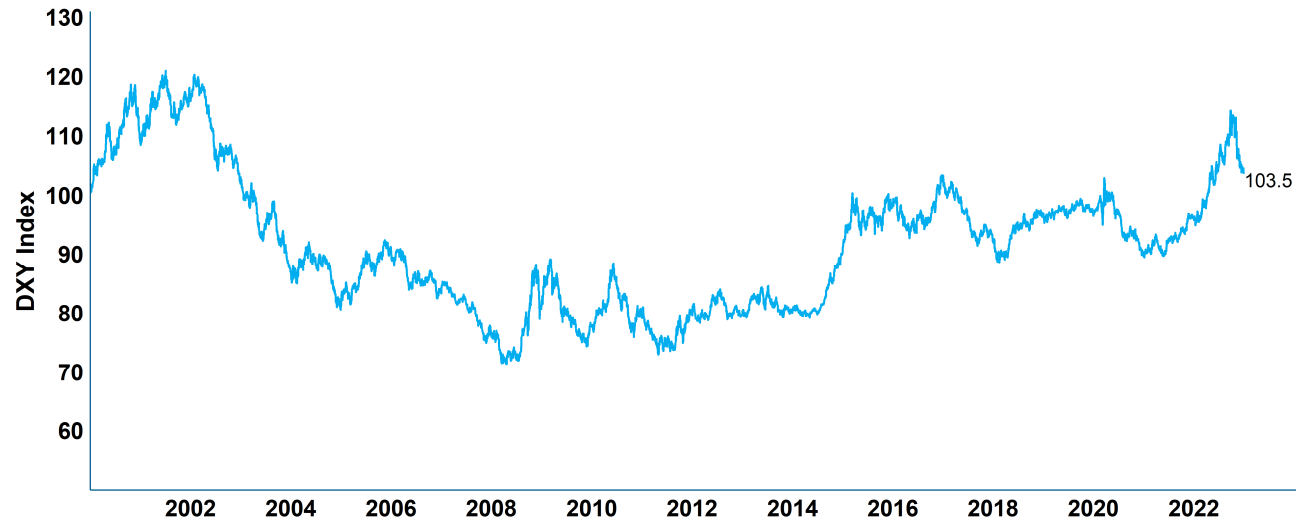
**Unemployment<sup>1</sup>**



- 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 strong labor market and higher wages, although beneficial for workers, motivates the Fed's efforts to fight inflation, likely leading to higher unemployment.

<sup>1</sup> Source: Bloomberg. Data is as December 31, 2022, for the US. The most recent data for Eurozone and Japanese unemployment is as of November 30, 2022.

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



- Overall, the US dollar continued to weaken from its recent peak in December as declining inflation supported the case for the Federal Reserve to slow its tightening.
- The dollar finished the year much higher than it started though due to the increased pace of policy tightening, stronger relative growth, and safe-haven flows.
- As we look to 2023, the track of inflation across economies and the corresponding monetary policy will likely be key drivers of currency moves.

<sup>1</sup> Source: Bloomberg. Data as of December 31, 2022.

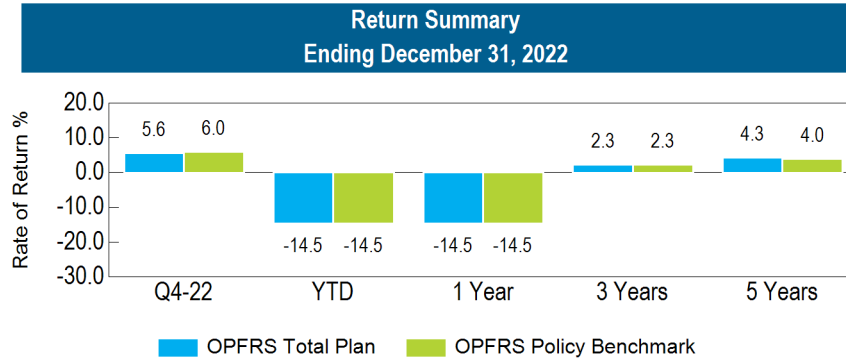


## Summary

### Key Trends:

- The impacts of record high inflation will remain key, with market volatility likely to stay high.
- Monetary policy could diverge in 2023 with the Fed pausing and others continuing to tighten. The risk of policy errors in both directions remains.
- Growth will continue to slow globally next year, with many economies likely falling into recessions. 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 could weigh on consumer spending.
- Valuations have significantly declined in the US to around 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 risks remain, including potential continued strength in the US dollar, higher inflation particularly weighing on Europe, and China's rushed exit from COVID-19 restrictions and on-going weakness in the real estate sector.

**4Q 2022 Performance**  
as of December 31, 2022



#### Summary of Cash Flows

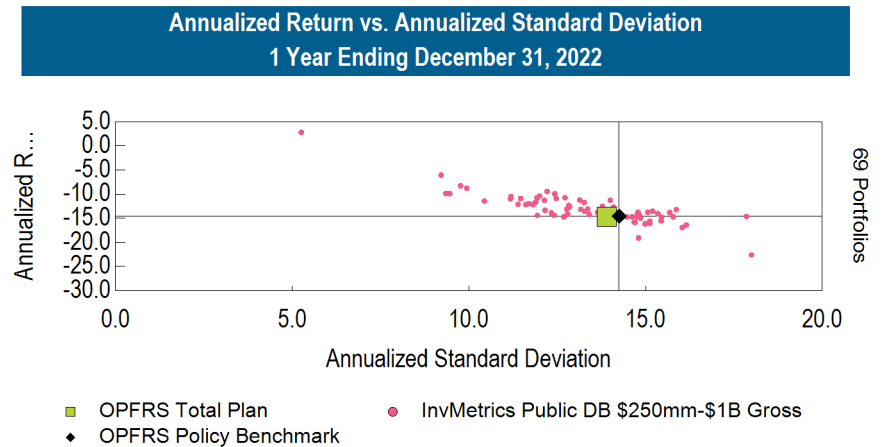
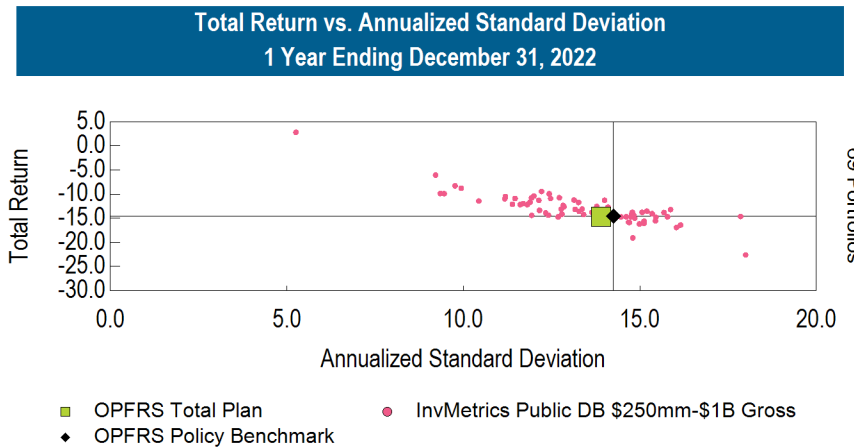
	Quarter-To-Date	One Year
Beginning Market Value	\$382,458,040	\$483,220,978
Net Cash Flow	-\$5,217,746	-\$15,709,585
Capital Appreciation	\$21,195,418	-\$69,075,682
Ending Market Value	\$398,435,711	\$398,435,711

#### YTD Ending December 31, 2022

	Total Return	Anlzd Standard Deviation
OPFRS Total Plan	-14.5%	13.9%
OPFRS Policy Benchmark	-14.5%	14.3%

#### 1 Year Ending December 31, 2022

	Anlzd Return	Anlzd Standard Deviation
OPFRS Total Plan	-14.5%	13.9%
OPFRS Policy Benchmark	-14.5%	14.3%

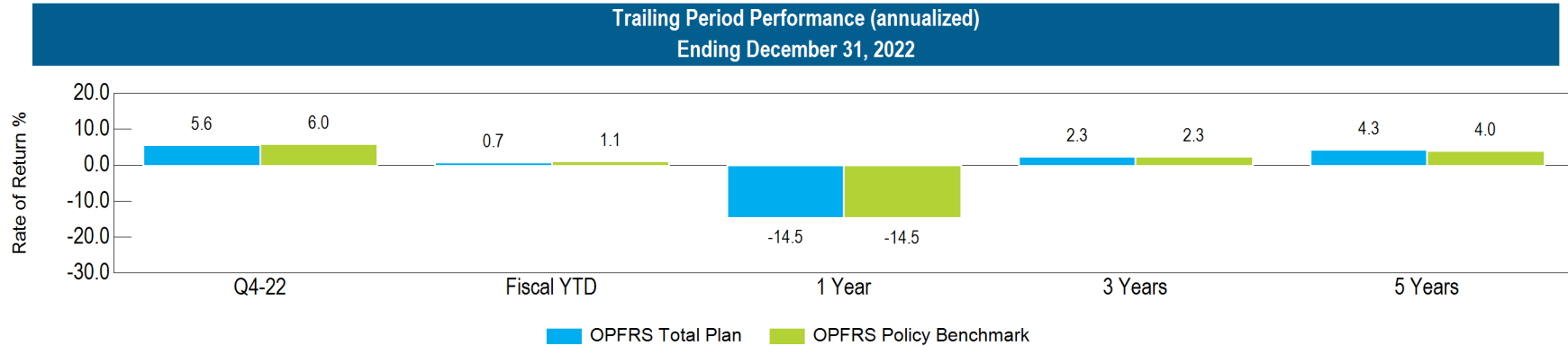


Performance shown is Gross-of-Fees.

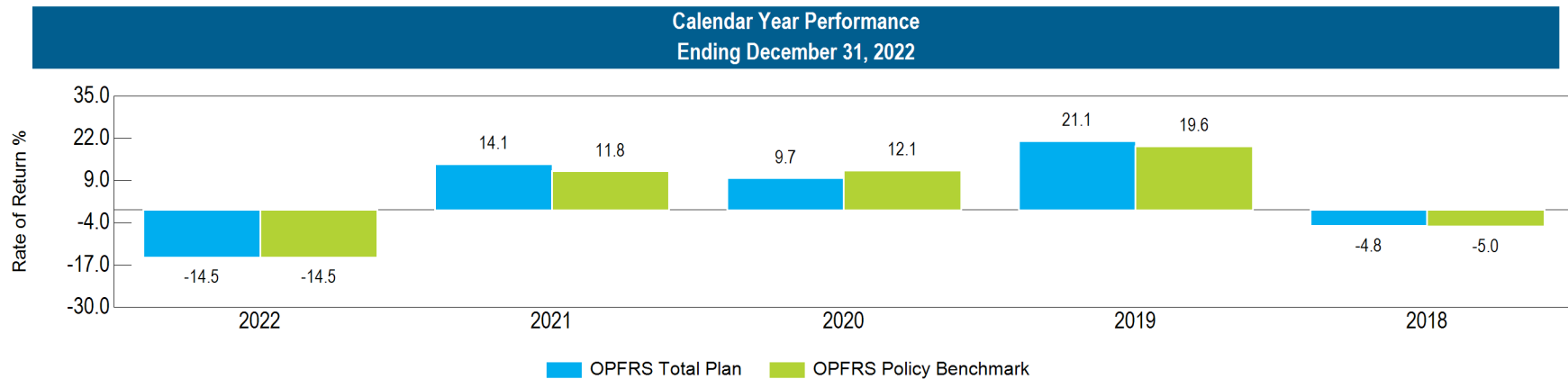
### Asset Class Performance (gross of fees) | As of December 31, 2022

	Market Value (\$)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	7 Yrs (%)	10 Yrs (%)
<b>OPFRS Total Plan</b>	<b>398,435,711</b>	<b>5.6</b>	<b>0.7</b>	<b>-14.5</b>	<b>2.3</b>	<b>4.3</b>	<b>6.8</b>	<b>7.0</b>
<i>OPFRS Policy Benchmark</i>		<u>6.0</u>	<u>1.1</u>	<u>-14.5</u>	<u>2.3</u>	<u>4.0</u>	<u>6.5</u>	<u>6.5</u>
Excess Return		-0.4	-0.4	0.0	0.0	0.3	0.3	0.5
<i>InvMetrics Public DB \$250mm-\$1B Gross Median</i>		5.8	1.2	-13.4	4.0	5.2	7.1	7.3
<b>Domestic Equity</b>	<b>159,779,185</b>	<b>8.2</b>	<b>3.0</b>	<b>-16.7</b>	<b>7.2</b>	<b>8.5</b>	<b>11.0</b>	<b>12.0</b>
<i>Russell 3000 (Blend)</i>		<u>7.2</u>	<u>2.4</u>	<u>-19.2</u>	<u>7.1</u>	<u>8.8</u>	<u>11.0</u>	<u>12.1</u>
Excess Return		1.0	0.6	2.5	0.1	-0.3	0.0	-0.1
<b>International Equity</b>	<b>49,851,663</b>	<b>15.1</b>	<b>4.1</b>	<b>-15.7</b>	<b>0.3</b>	<b>1.7</b>	<b>5.6</b>	<b>5.2</b>
<i>MSCI ACWI ex US (Blend)</i>		<u>14.3</u>	<u>3.0</u>	<u>-16.0</u>	<u>0.1</u>	<u>0.9</u>	<u>4.8</u>	<u>3.8</u>
Excess Return		0.8	1.1	0.3	0.2	0.8	0.8	1.4
<b>Fixed Income</b>	<b>101,552,915</b>	<b>2.1</b>	<b>-2.6</b>	<b>-12.9</b>	<b>-2.1</b>	<b>0.5</b>	<b>1.8</b>	<b>1.6</b>
<i>Bloomberg Universal (Blend)</i>		<u>2.2</u>	<u>-2.3</u>	<u>-13.0</u>	<u>-2.5</u>	<u>0.2</u>	<u>1.3</u>	<u>1.3</u>
Excess Return		-0.1	-0.3	0.1	0.4	0.3	0.5	0.3
<b>Credit</b>	<b>8,603,832</b>	<b>1.9</b>	<b>1.5</b>	<b>-7.6</b>	<b>3.0</b>	<b>3.0</b>	<b>6.0</b>	<b>--</b>
<i>Bloomberg US High Yield TR</i>		<u>4.2</u>	<u>3.5</u>	<u>-11.2</u>	<u>0.0</u>	<u>2.3</u>	<u>5.0</u>	<u>--</u>
Excess Return		-2.3	-2.0	3.6	3.0	0.7	1.0	--
<b>Covered Calls</b>	<b>27,503,720</b>	<b>7.7</b>	<b>2.2</b>	<b>-12.5</b>	<b>6.7</b>	<b>7.2</b>	<b>8.8</b>	<b>--</b>
<i>CBOE S&amp;P 500 BuyWrite USD</i>		<u>6.8</u>	<u>-1.3</u>	<u>-11.4</u>	<u>1.3</u>	<u>2.9</u>	<u>4.9</u>	<u>--</u>
Excess Return		0.9	3.5	-1.1	5.4	4.3	3.9	--
<b>Crisis Risk Offset</b>	<b>39,452,288</b>	<b>-4.9</b>	<b>-4.9</b>	<b>-14.5</b>	<b>-14.6</b>	<b>-8.2</b>	<b>--</b>	<b>--</b>
<i>SG Multi Alternative Risk Premia Index</i>		<u>1.5</u>	<u>2.4</u>	<u>4.8</u>	<u>-1.3</u>	<u>--</u>	<u>--</u>	<u>--</u>
Excess Return		-6.4	-7.3	-19.3	-13.3	--	--	--
<b>Cash</b>	<b>11,692,108</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.4</b>	<b>1.1</b>	<b>1.0</b>	<b>0.7</b>
<i>FTSE T-Bill 3 Months TR</i>		<u>0.9</u>	<u>1.3</u>	<u>1.5</u>	<u>0.7</u>	<u>1.2</u>	<u>1.0</u>	<u>0.7</u>
Excess Return		-0.9	-1.3	-1.5	-0.3	-0.1	0.0	0.0

Performance shown is gross-of-fees. Fiscal year begins on July 1.



	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	2018 (%)	2019 (%)	2020 (%)	2021 (%)	2022 (%)
<b>OPFRS Total Plan</b>	<b>5.6</b>	<b>0.7</b>	<b>-14.5</b>	<b>2.3</b>	<b>4.3</b>	<b>-4.8</b>	<b>21.1</b>	<b>9.7</b>	<b>14.1</b>	<b>-14.5</b>
<i>OPFRS Policy Benchmark</i>	<i>6.0</i>	<i>1.1</i>	<i>-14.5</i>	<i>2.3</i>	<i>4.0</i>	<i>-5.0</i>	<i>19.6</i>	<i>12.1</i>	<i>11.8</i>	<i>-14.5</i>
<i>InvMetrics Public DB \$250mm-\$1B Gross Median</i>	<i>5.8</i>	<i>1.2</i>	<i>-13.4</i>	<i>4.0</i>	<i>5.2</i>	<i>-4.1</i>	<i>18.6</i>	<i>13.1</i>	<i>13.6</i>	<i>-13.4</i>

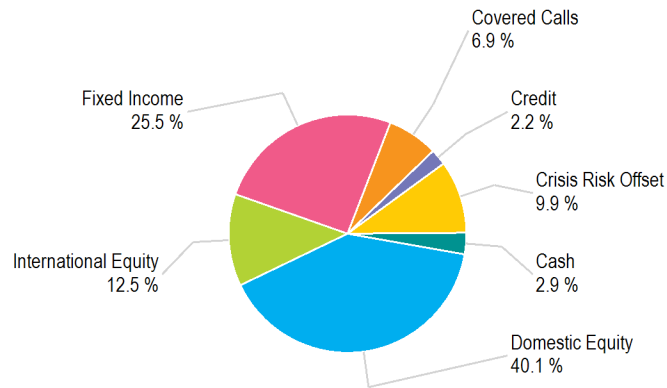


Fiscal year begins on July 1.

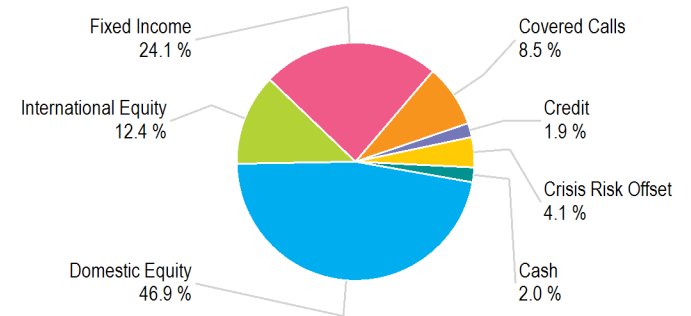
#### Asset Allocation vs. Target As Of December 31, 2022

	Current	%	Policy	Difference*
Domestic Equity	\$159,779,185	40.1%	40.0%	0.1%
International Equity	\$49,851,663	12.5%	12.0%	0.5%
Fixed Income	\$101,552,915	25.5%	31.0%	-5.5%
Covered Calls	\$27,503,720	6.9%	5.0%	1.9%
Credit	\$8,603,832	2.2%	2.0%	0.2%
Crisis Risk Offset	\$39,452,288	9.9%	10.0%	-0.1%
Cash	\$11,692,108	2.9%	0.0%	2.9%
<b>Total</b>	<b>\$398,435,711</b>	<b>100.0%</b>	<b>100.0%</b>	

December 31, 2022: \$382,458,040



December 31, 2021: \$449,834,415



Cash account market value includes cash balances held in ETF accounts at the custodian and residuals from terminated managers.

Target weightings reflect the Plan's evolving asset allocation (effective 5/31/2017.)

## Oakland Police and Fire Retirement System Total Plan

### Manager Performance - Gross of Fees | As of December 31, 2022

	Market Value	% of Portfolio	QTD	1 Yr	3 Yrs	5 Yrs	S.I.	S.I. Date
<b>Domestic Equity</b>	<b>159,779,185</b>	<b>100.0</b>	<b>8.2</b>	<b>-16.7</b>	<b>7.2</b>	<b>8.5</b>	<b>8.6</b>	<b>Jun-97</b>
<i>Russell 3000 (Blend)</i>			<i>7.2</i>	<i>-19.2</i>	<i>7.1</i>	<i>8.8</i>	<i>8.7</i>	<i>Jun-97</i>
Excess Return			1.0	2.5	0.1	-0.3	-0.1	
Northern Trust Russell 1000	69,741,287	43.6	7.2	-19.4	7.2	9.1	12.6	Jun-10
<i>Russell 1000</i>			<i>7.2</i>	<i>-19.1</i>	<i>7.3</i>	<i>9.1</i>	<i>12.6</i>	<i>Jun-10</i>
Excess Return			0.0	-0.3	-0.1	0.0	0.0	
EARNEST Partners	43,615,104	27.3	7.8	-15.3	8.9	10.0	10.0	Apr-06
<i>Russell MidCap</i>			<i>9.2</i>	<i>-17.3</i>	<i>5.9</i>	<i>7.1</i>	<i>8.3</i>	<i>Apr-06</i>
Excess Return			-1.4	2.0	3.0	2.9	1.7	
<i>eV US Mid Cap Core Equity Gross Rank</i>			<i>80</i>	<i>60</i>	<i>17</i>	<i>21</i>	<i>32</i>	<i>Apr-06</i>
Wellington Select Quality Equity	22,198,719	13.9	13.7	--	--	--	0.9	May-22
<i>Russell 1000</i>			<i>7.2</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>-6.4</i>	<i>May-22</i>
Excess Return			6.5				7.3	
<i>eV US Large Cap Core Equity Gross Rank</i>			<i>3</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>8</i>	<i>May-22</i>
Brown Fundamental Small Cap Value	10,924,340	6.8	12.5	-6.9	--	--	1.8	Apr-21
<i>Russell 2000 Value</i>			<i>8.4</i>	<i>-14.5</i>	<i>--</i>	<i>--</i>	<i>-5.5</i>	<i>Apr-21</i>
Excess Return			4.1	7.6			7.3	
<i>eV US Small Cap Value Equity Gross Rank</i>			<i>29</i>	<i>22</i>	<i>--</i>	<i>--</i>	<i>22</i>	<i>Apr-21</i>
Rice Hall James	13,299,736	8.3	3.3	-23.7	3.4	4.2	6.1	Jul-17
<i>Russell 2000 Growth</i>			<i>4.1</i>	<i>-26.4</i>	<i>0.6</i>	<i>3.5</i>	<i>5.2</i>	<i>Jul-17</i>
Excess Return			-0.8	2.7	2.8	0.7	0.9	
<i>eV US Small Cap Growth Equity Gross Rank</i>			<i>62</i>	<i>25</i>	<i>70</i>	<i>91</i>	<i>89</i>	<i>Jul-17</i>

Performance shown is gross-of-fees.

	Market Value	% of Portfolio	QTD	1 Yr	3 Yrs	5 Yrs	S.I.	S.I. Date
<b>International Equity</b>	<b>49,851,663</b>	<b>100.0</b>	<b>15.1</b>	<b>-15.7</b>	<b>0.3</b>	<b>1.7</b>	<b>5.0</b>	<b>Jan-98</b>
<i>MSCI ACWI ex US (Blend)</i>			<i>14.3</i>	<i>-16.0</i>	<i>0.1</i>	<i>0.9</i>	<i>4.7</i>	<i>Jan-98</i>
Excess Return			0.8	0.3	0.2	0.8	0.3	
Vanguard Developed Markets ETF	14,054,284	28.2	16.8	-15.4	1.3	--	4.6	Sep-19
<i>FTSE Developed All Cap Ex US TR USD</i>			<i>16.3</i>	<i>-15.3</i>	<i>1.5</i>	--	<i>4.8</i>	<i>Sep-19</i>
Excess Return			0.5	-0.1	-0.2		-0.2	
SGA ACWI ex-U.S. Equity	35,797,379	71.8	14.4	-15.6	0.2	--	0.4	Dec-19
<i>MSCI ACWI ex USA</i>			<i>14.3</i>	<i>-16.0</i>	<i>0.1</i>	--	<i>1.5</i>	<i>Dec-19</i>
Excess Return			0.1	0.4	0.1		-1.1	
<i>eV ACWI ex-US All Cap Core Eq Gross Rank</i>			<i>52</i>	<i>36</i>	<i>83</i>	--	<i>95</i>	<i>Dec-19</i>

Performance shown is gross-of-fees.



	Market Value	% of Portfolio	QTD	1 Yr	3 Yrs	5 Yrs	S.I.	S.I. Date
<b>Fixed Income</b>	<b>101,552,915</b>	<b>100.0</b>	<b>2.1</b>	<b>-12.9</b>	<b>-2.1</b>	<b>0.5</b>	<b>4.7</b>	<b>Dec-93</b>
<i>Bloomberg Universal (Blend)</i>			<u>2.2</u>	<u>-13.0</u>	<u>-2.5</u>	<u>0.2</u>	<u>4.5</u>	<u>Dec-93</u>
Excess Return			-0.1	0.1	0.4	0.3	0.2	
Ramirez	69,021,211	68.0	1.7	-13.0	-2.4	0.4	1.2	Jan-17
<i>Bloomberg US Aggregate TR</i>			<u>1.9</u>	<u>-13.0</u>	<u>-2.7</u>	<u>0.0</u>	<u>0.6</u>	<u>Jan-17</u>
Excess Return			-0.2	0.0	0.3	0.4	0.6	
<i>eV US Core Fixed Inc Gross Rank</i>			66	67	78	64	37	Jan-17
Wellington Core Bond	6,531,106	6.4	1.9	-14.4	--	--	-7.5	Apr-21
<i>Bloomberg US Aggregate TR</i>			<u>1.9</u>	<u>-13.0</u>	--	--	<u>-6.7</u>	<u>Apr-21</u>
Excess Return			0.0	-1.4			-0.8	
<i>eV US Core Fixed Inc Gross Rank</i>			50	96	--	--	98	Apr-21
Reams	26,000,599	25.6	3.2	-12.0	1.4	2.8	5.1	Feb-98
<i>Bloomberg Universal (Blend)</i>			<u>2.2</u>	<u>-13.0</u>	<u>-2.5</u>	<u>0.2</u>	<u>4.1</u>	<u>Feb-98</u>
Excess Return			1.0	1.0	3.9	2.6	1.0	
<i>eV US Core Plus Fixed Inc Gross Rank</i>			10	21	1	2	40	Feb-98

Performance shown is gross-of-fees.

## Oakland Police and Fire Retirement System Total Plan

### Manager Performance - Gross of Fees | As of December 31, 2022

	Market Value	% of Portfolio	QTD	1 Yr	3 Yrs	5 Yrs	S.I.	S.I. Date
<b>Credit</b>	<b>8,603,832</b>	<b>100.0</b>	<b>1.9</b>	<b>-7.6</b>	<b>3.0</b>	<b>3.0</b>	<b>4.7</b>	<b>Feb-15</b>
<i>Bloomberg US High Yield TR</i>			<i>4.2</i>	<i>-11.2</i>	<i>0.0</i>	<i>2.3</i>	<i>3.8</i>	<i>Feb-15</i>
Excess Return			-2.3	3.6	3.0	0.7	0.9	
Polen Capital	8,603,832	100.0	1.9	-7.6	3.0	3.0	4.7	Feb-15
<i>ICE BofA High Yield Master TR</i>			<i>4.0</i>	<i>-11.2</i>	<i>-0.2</i>	<i>2.1</i>	<i>3.7</i>	<i>Feb-15</i>
Excess Return			-2.1	3.6	3.2	0.9	1.0	
<i>eV US High Yield Fixed Inc Gross Rank</i>			<i>93</i>	<i>26</i>	<i>6</i>	<i>36</i>	<i>14</i>	<i>Feb-15</i>

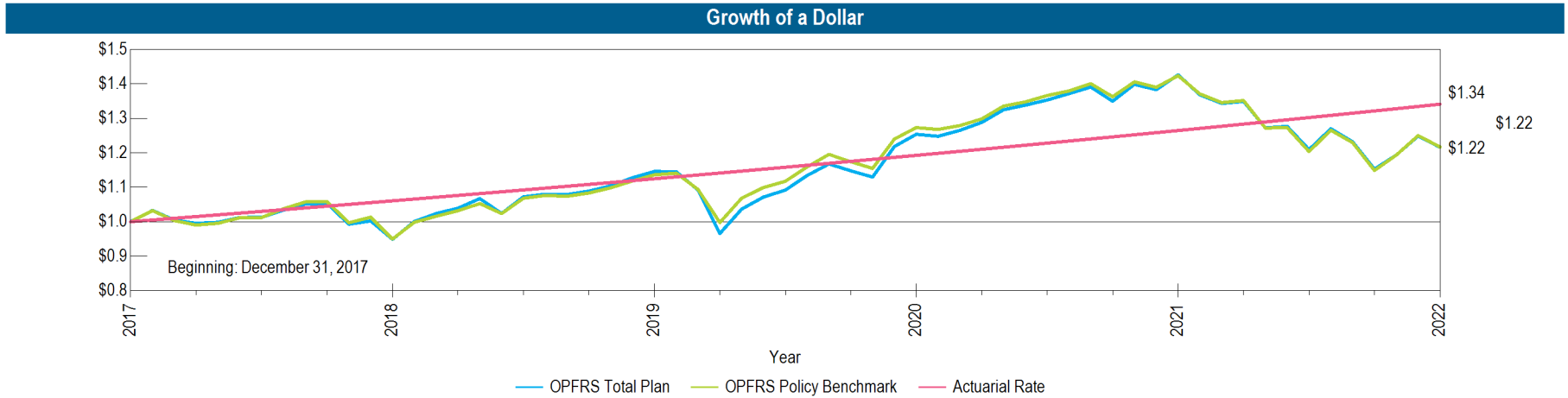
Performance shown is gross-of-fees.

	Market Value	% of Portfolio	QTD	1 Yr	3 Yrs	5 Yrs	S.I.	S.I. Date
<b>Covered Calls</b>	<b>27,503,720</b>	<b>100.0</b>	<b>7.7</b>	<b>-12.5</b>	<b>6.7</b>	<b>7.2</b>	<b>8.1</b>	<b>Apr-14</b>
<i>CBOE S&amp;P 500 BuyWrite USD</i>			<i>6.8</i>	<i>-11.4</i>	<i>1.3</i>	<i>2.9</i>	<i>4.9</i>	<i>Apr-14</i>
Excess Return			0.9	-1.1	5.4	4.3	3.2	
Parametric BXM	13,942,810	50.7	7.1	-9.7	4.5	5.1	6.4	Apr-14
<i>CBOE S&amp;P 500 BuyWrite USD</i>			<i>6.8</i>	<i>-11.4</i>	<i>1.3</i>	<i>2.9</i>	<i>4.9</i>	<i>Apr-14</i>
Excess Return			0.3	1.7	3.2	2.2	1.5	
Parametric DeltaShift	13,560,909	49.3	8.3	-15.1	8.4	9.1	10.0	Apr-14
<i>CBOE S&amp;P 500 BuyWrite USD</i>			<i>6.8</i>	<i>-11.4</i>	<i>1.3</i>	<i>2.9</i>	<i>4.9</i>	<i>Apr-14</i>
Excess Return			1.5	-3.7	7.1	6.2	5.1	
<i>eV US Large Cap Core Equity Gross Rank</i>			<i>56</i>	<i>42</i>	<i>38</i>	<i>58</i>	<i>65</i>	<i>Apr-14</i>

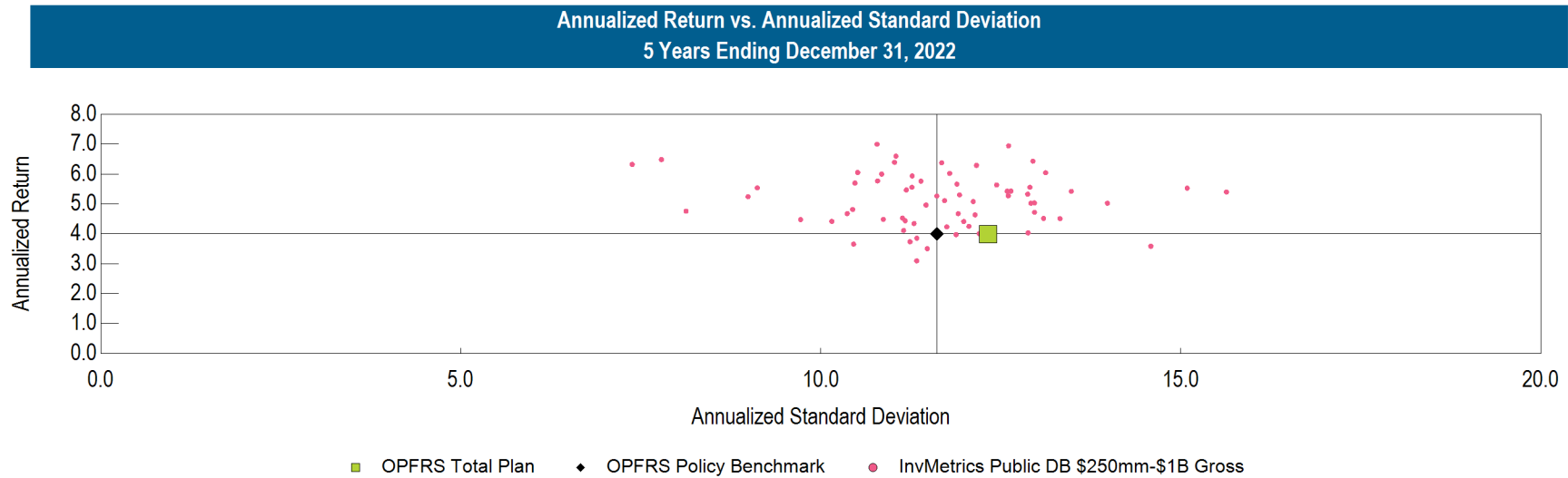
Performance shown is gross-of-fees.

	Market Value	% of Portfolio	QTD	1 Yr	3 Yrs	5 Yrs	S.I.	S.I. Date
<b>Crisis Risk Offset</b>	<b>39,452,288</b>	<b>100.0</b>	<b>-4.9</b>	<b>-14.5</b>	<b>-14.6</b>	<b>-8.2</b>	<b>-9.3</b>	<b>Aug-18</b>
<i>SG Multi Alternative Risk Premia Index</i>			<i>1.5</i>	<i>4.8</i>	<i>-1.3</i>	<i>--</i>	<i>-0.5</i>	<i>Aug-18</i>
Excess Return			-6.4	-19.3	-13.3		-8.8	
Versor Trend Following	15,908,714	40.3	-11.2	--	--	--	6.1	Apr-22
<i>SG Trend Index</i>			<i>-6.1</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>15.6</i>	<i>Apr-22</i>
Excess Return			-5.1				-9.5	
Vanguard Long-Term Treasury ETF	13,706,568	34.7	-1.1	-29.4	-7.6	--	-5.7	Jul-19
<i>Bloomberg US Govt Long TR</i>			<i>-0.6</i>	<i>-29.2</i>	<i>-7.4</i>	<i>--</i>	<i>-5.5</i>	<i>Jul-19</i>
Excess Return			-0.5	-0.2	-0.2		-0.2	
Kepos Alternative Risk Premia	9,837,006	24.9	1.1	--	--	--	-1.0	Feb-22
<i>SG Multi Alternative Risk Premia Index</i>			<i>1.5</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>3.9</i>	<i>Feb-22</i>
Excess Return			-0.4				-4.9	

Performance shown is gross-of-fees.

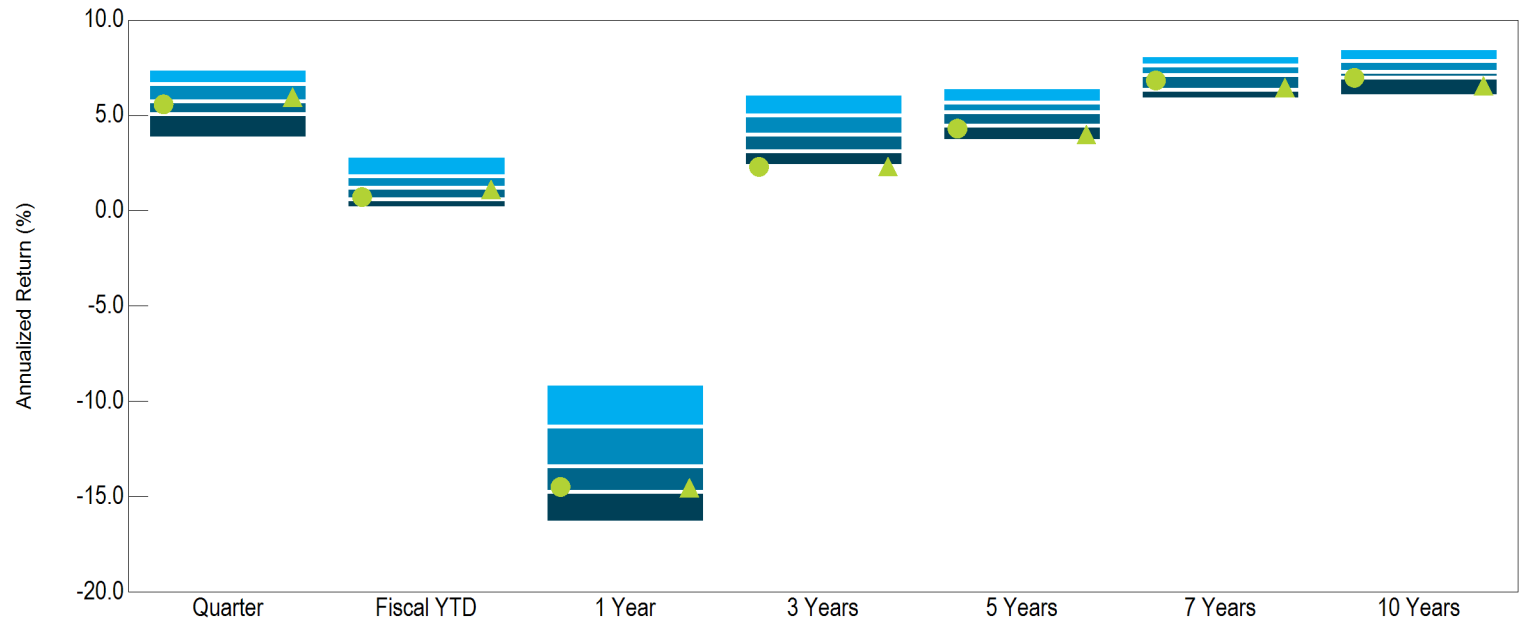


The actuarial expected rate of return was 8% through 6/30/2009, 7.5% through 6/30/2010, 7% through 6/30/2011, 6.75% through 6/30/2014, 6.5% through 2/31/2017 and 6.0% currently



Performance shown is gross-of-fees.

InvMetrics Public DB \$250mm-\$1B Gross Return Comparison



	Return (Rank)													
	Quarter		Fiscal YTD		1 Year		3 Years		5 Years		7 Years		10 Years	
5th Percentile	7.4	2.9	-9.1	6.1	6.5	8.1	8.5							
25th Percentile	6.6	1.8	-11.3	5.0	5.7	7.6	7.9							
Median	5.8	1.2	-13.4	4.0	5.2	7.1	7.3							
75th Percentile	5.1	0.6	-14.7	3.1	4.5	6.4	7.0							
95th Percentile	3.8	0.1	-16.3	2.4	3.7	5.9	6.0							
# of Portfolios	69	69	69	68	66	64	61							
● OPFRS Total Plan	5.6	(56)	0.7	(71)	-14.5	(73)	2.3	(98)	4.3	(83)	6.8	(63)	7.0	(77)
▲ OPFRS Policy Benchmark	6.0	(43)	1.1	(54)	-14.5	(73)	2.3	(97)	4.0	(90)	6.5	(72)	6.5	(79)

Fiscal year begins on July 1.

## **Manager Monitoring / Probation Status**

### Manager Monitoring/Probation Status

#### Return vs. Benchmark since Corrective Action

Portfolio	Status	Concern Triggering the Watch Status	Months Since Corrective Action	Performance <sup>1</sup> Since Corrective Action	Peer Group Percentile Ranking <sup>2</sup>	Date of Corrective Action <sup>3</sup>
Polen Capital <sup>4</sup>	On Watch	Performance/Organization	42	2.8	32	5/29/2019
ICE BofAML US High Yield				1.6		
Rice Hall James	On Watch	Performance/Organization	42	6.1	72	5/29/2019
Russell 2000 Growth				4.5		

#### Investment Performance Criteria for Manager Monitoring/Probation Status

Asset Class	Short-term (Rolling 12 months)	Medium-term (Rolling 36 months)	Long-term (60 + months)
Active Domestic Equity	Fund return < benchmark return by 3.5%	Annualized Fund return < benchmark return by 1.75% for 6 consecutive months	VRR <sup>5</sup> < 0.97 for 6 consecutive months
Active International Equity	Fund return < benchmark return by 4.5%	Annualized Fund return < benchmark return by 2.0% for 6 consecutive months	VRR < 0.97 for 6 consecutive months
Passive International Equity	Tracking Error > 0.50%	Tracking Error > 0.45% for 6 consecutive months	Annualized Fund return < benchmark return by 0.4% for 6 consecutive months
Fixed Income	Fund return < benchmark return by 1.5%	Annualized Fund return < benchmark return by 1.0% for 6 consecutive months	VRR < 0.98 for 6 consecutive months

<sup>1</sup> Annualized performance if over one year. Performance shown is gross-of-fees.

<sup>2</sup> Ranking over most recent quarter if on watch for less than 1 year, or over 1 year if on watch for more than a year. Peer group comparison is gross-of-fees.

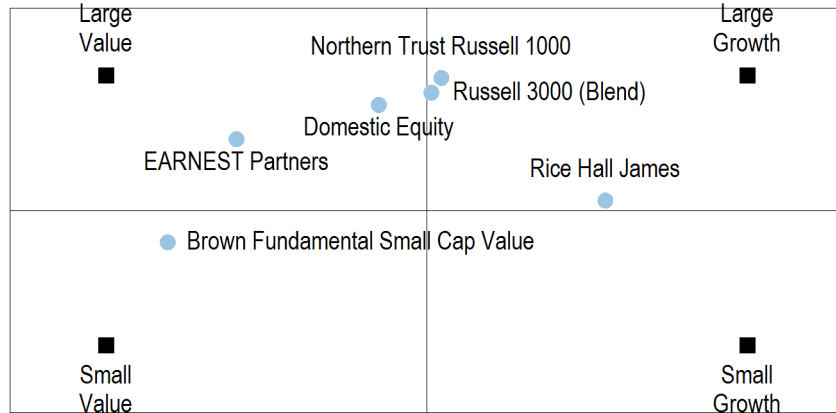
<sup>3</sup> Approximate date based on when the Board voted to either monitor a manager at a heightened level or place it on probation.

<sup>4</sup> Polen Capital High Yield strategy was formerly known as DDJ High Yield prior to 2022.

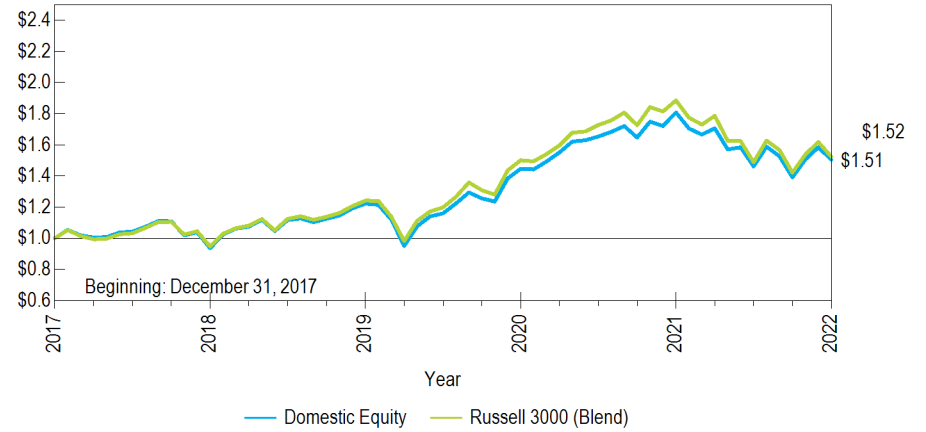
<sup>5</sup> VRR (Value Relative Ratio) is calculated as manager cumulative return/ benchmark return.



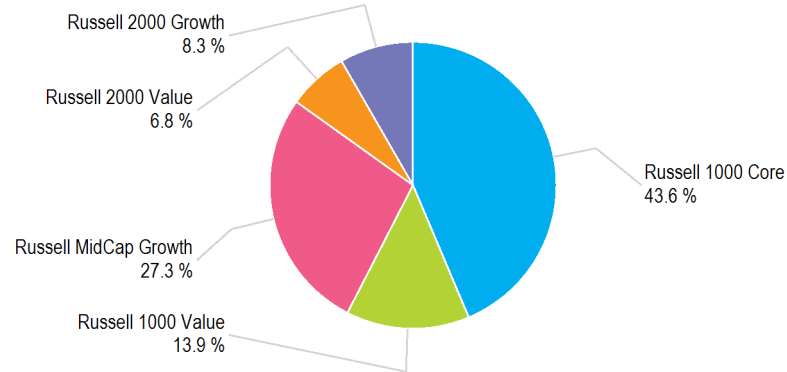
#### U.S. Effective Style Map



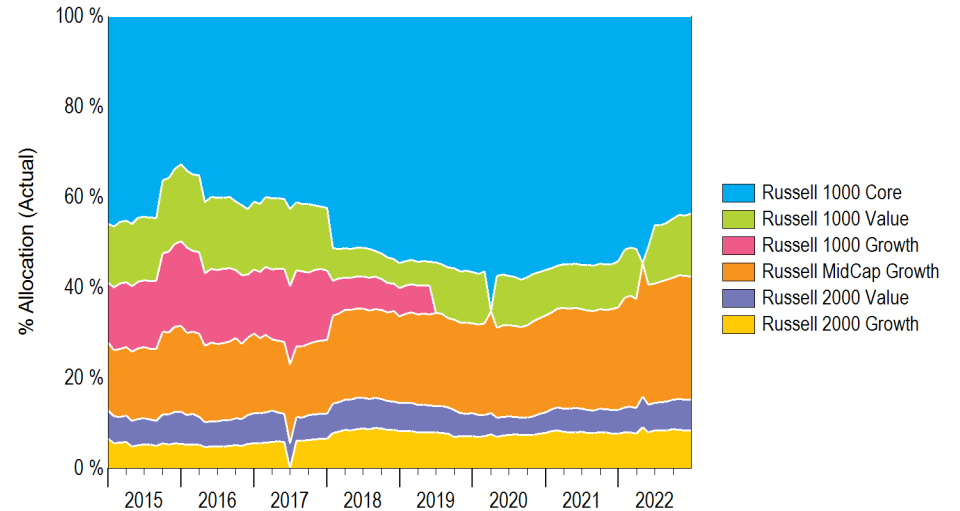
#### Growth of a Dollar



#### Style Exposure

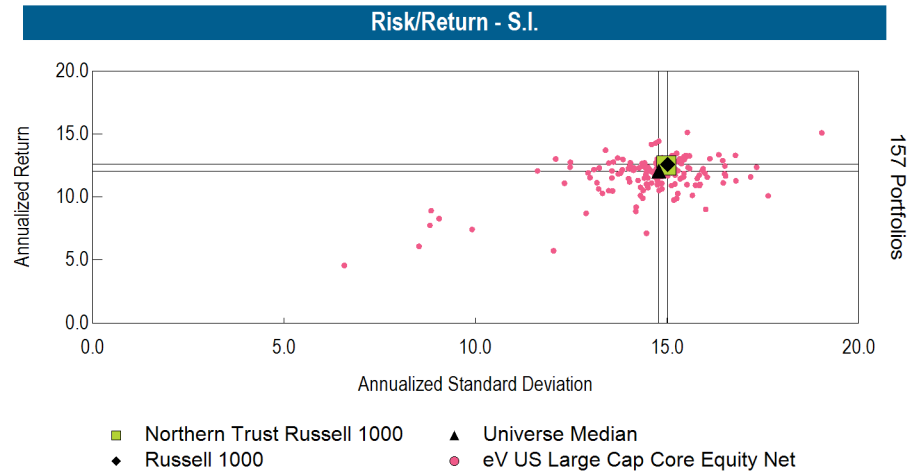
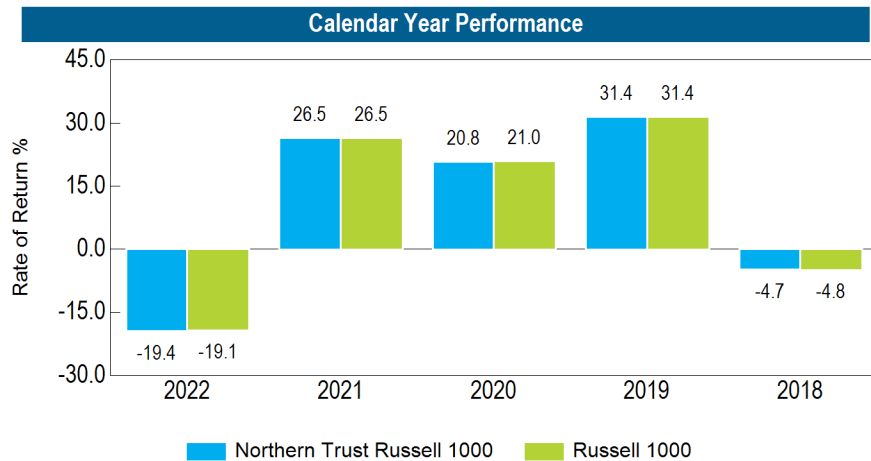
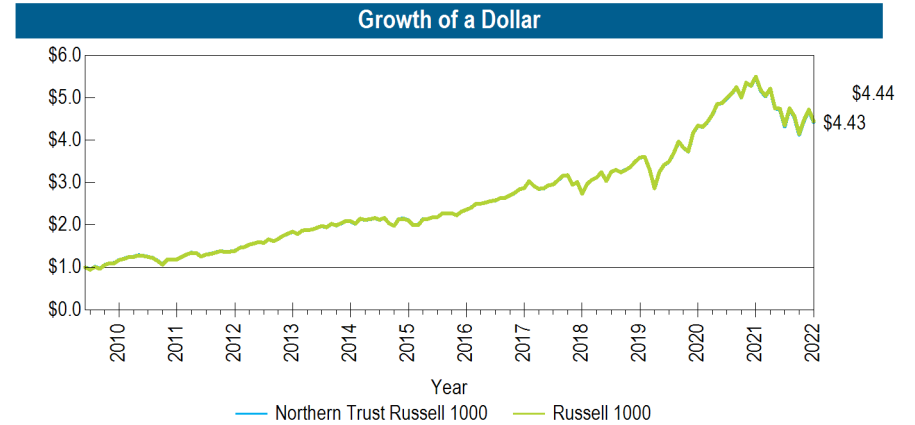
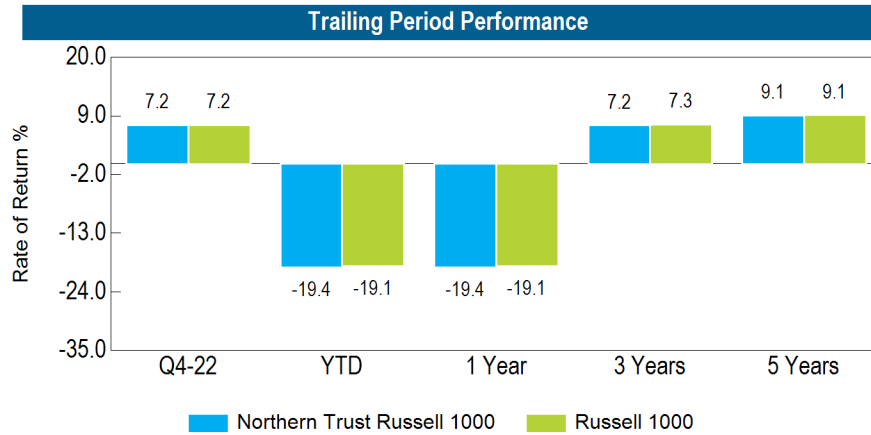


#### Style History (5-Year)



### Northern Trust Russell 1000 | As of December 31, 2022

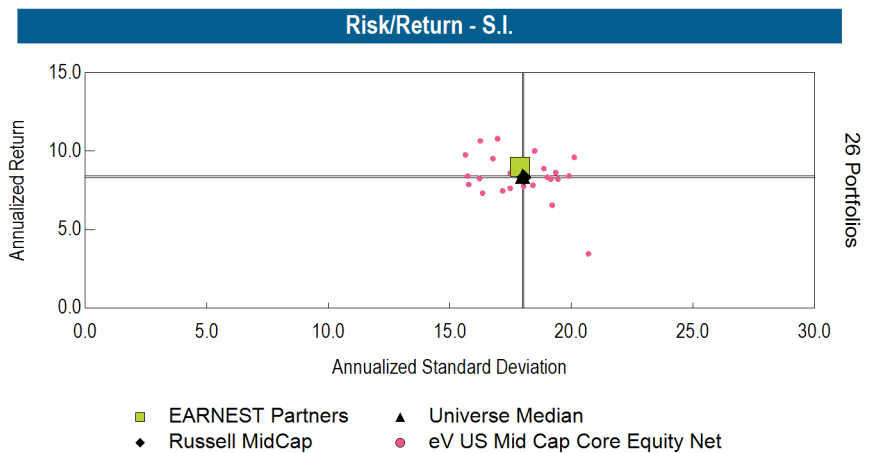
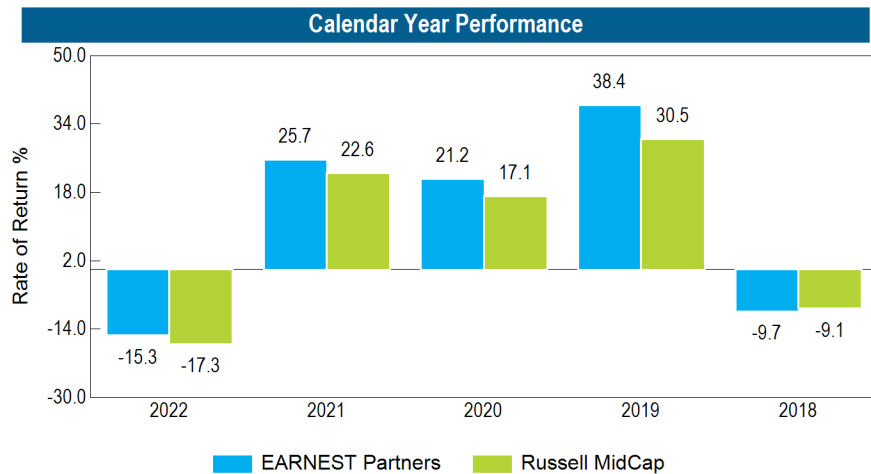
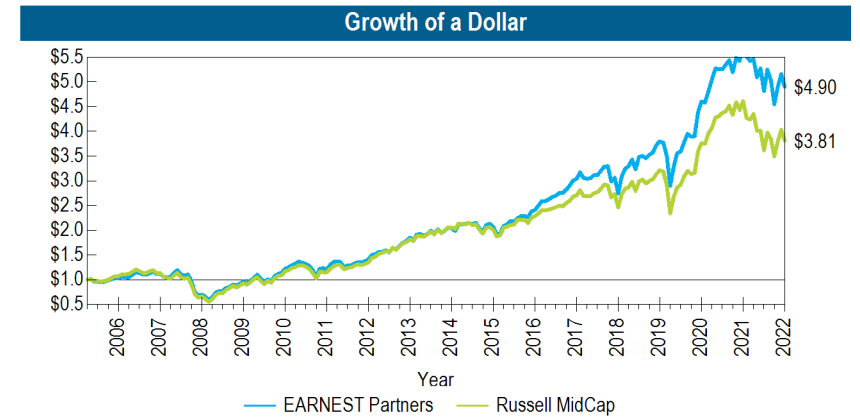
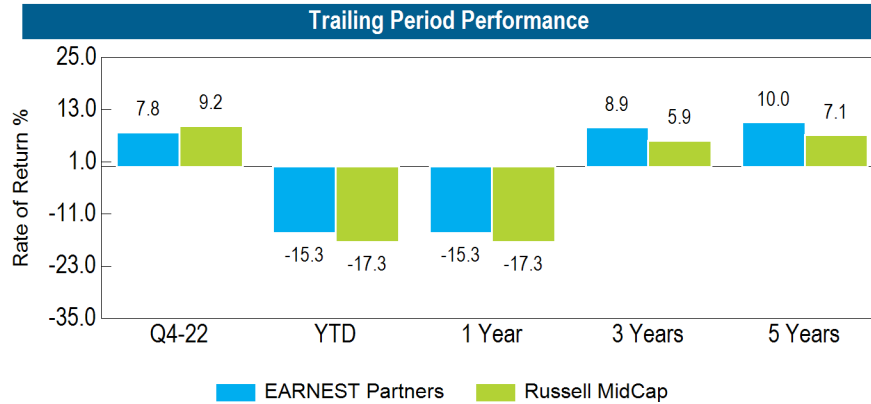
	Anlzd Return	Anlzd Standard Deviation	Alpha	Beta	Information Ratio	Tracking Error	Up Mkt Capture Ratio	Down Mkt Capture Ratio
Northern Trust Russell 1000	12.5%	15.0%	0.0%	1.0	-0.6	0.2%	98.5%	100.0%
Russell 1000	12.6%	15.0%	0.0%	1.0	--	0.0%	100.0%	100.0%



Performance shown is net-of-fees and since inception.

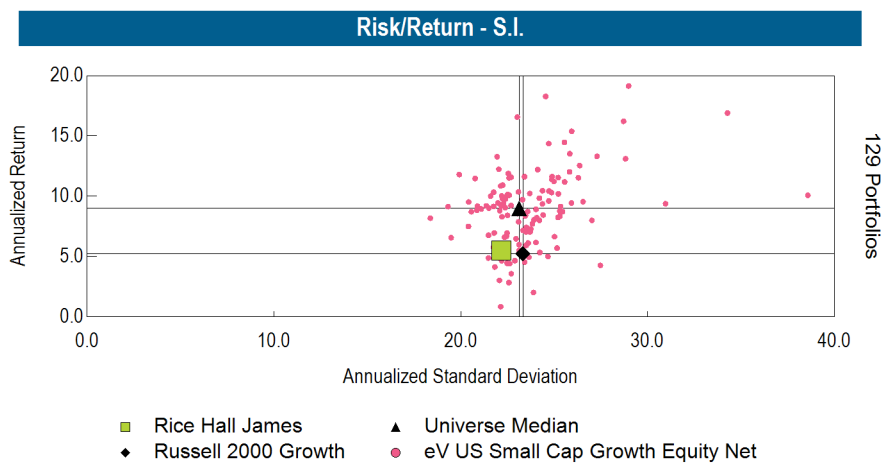
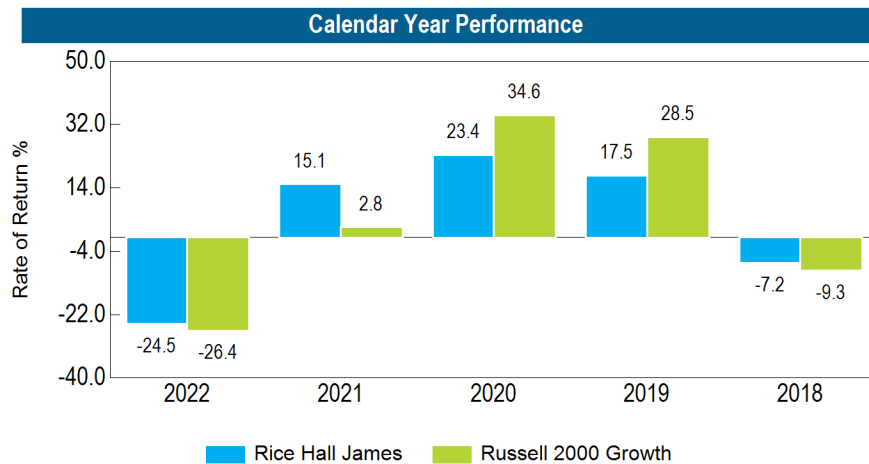
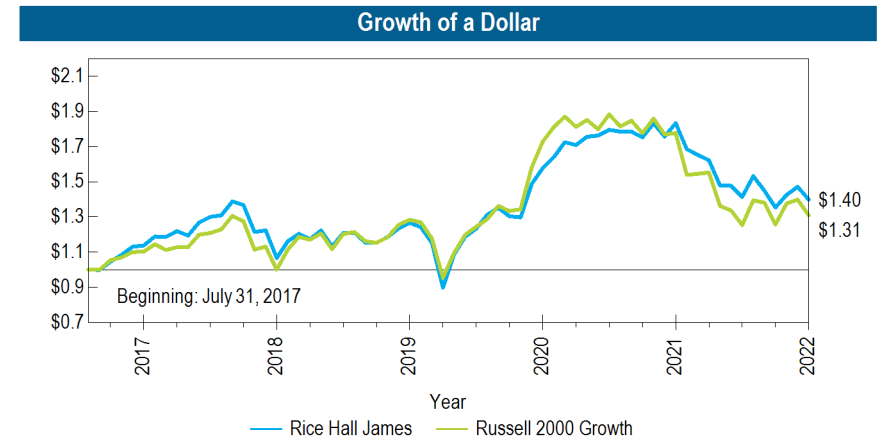
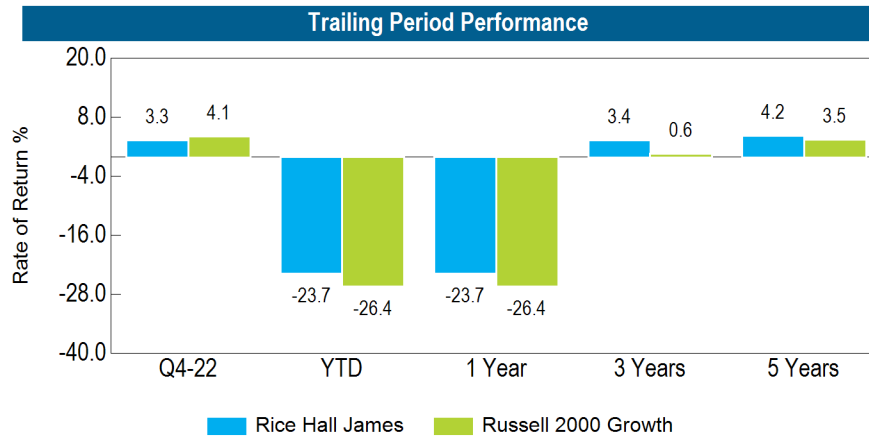
### EARNEST Partners | As of December 31, 2022

	Anlzd Return	Anlzd Standard Deviation	Alpha	Beta	Information Ratio	Tracking Error	Up Mkt Capture Ratio	Down Mkt Capture Ratio
EARNEST Partners	9.0%	17.9%	0.1%	1.0	0.2	3.6%	93.5%	99.2%
Russell MidCap	8.3%	18.0%	0.0%	1.0	--	0.0%	100.0%	100.0%



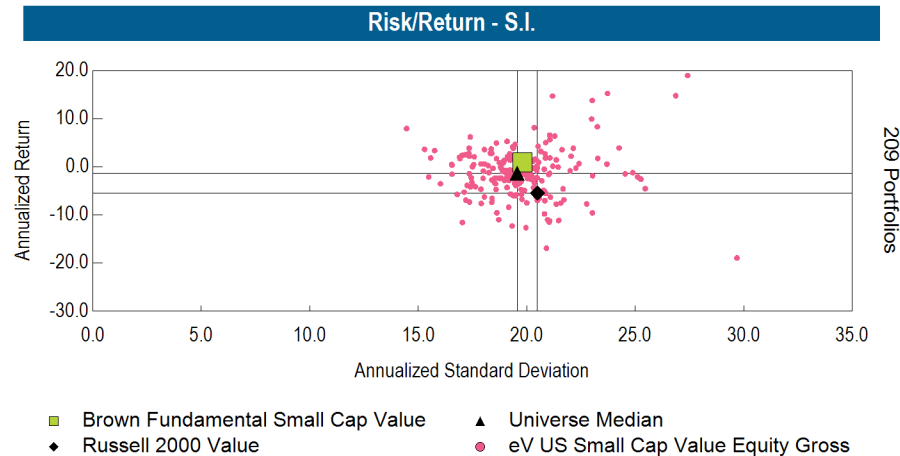
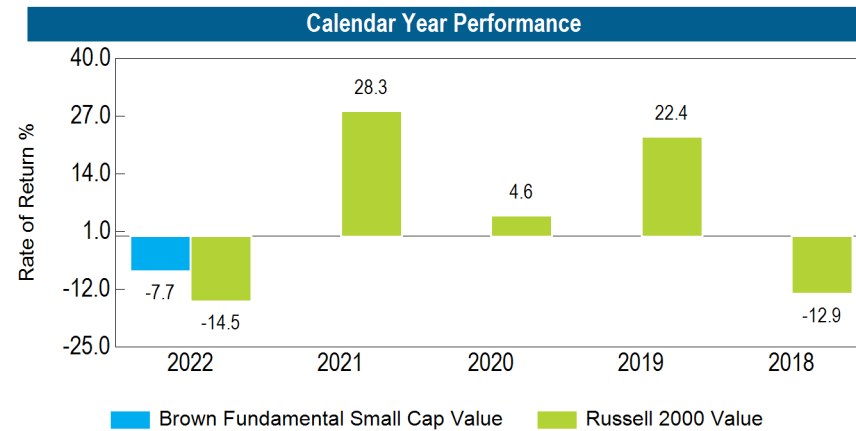
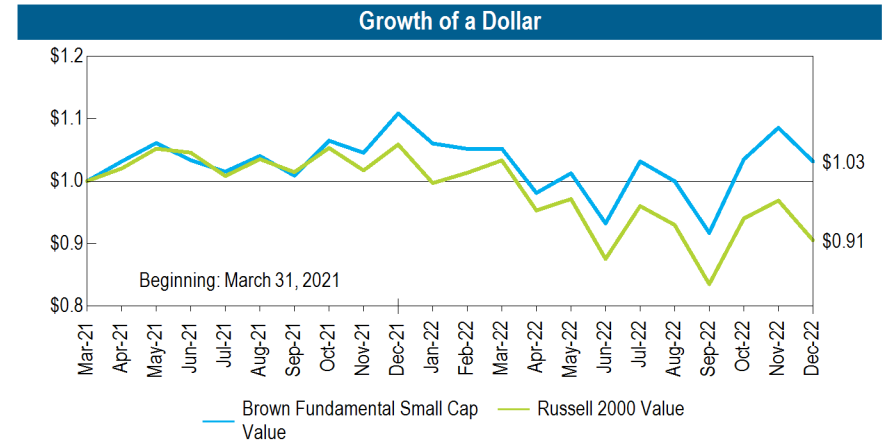
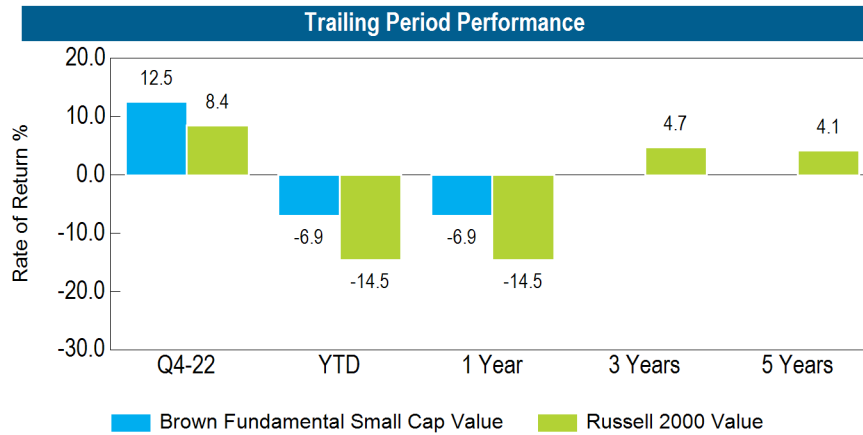
Performance shown is net-of-fees and since inception.

	Anlzd Return	Anlzd Standard Deviation	Alpha	Beta	Information Ratio	Tracking Error	Up Mkt Capture Ratio	Down Mkt Capture Ratio
Rice Hall James	5.3%	22.0%	0.1%	0.9	0.0	7.7%	79.5%	93.6%
Russell 2000 Growth	5.1%	23.1%	0.0%	1.0	--	0.0%	100.0%	100.0%



Performance shown is net-of-fees and since inception.

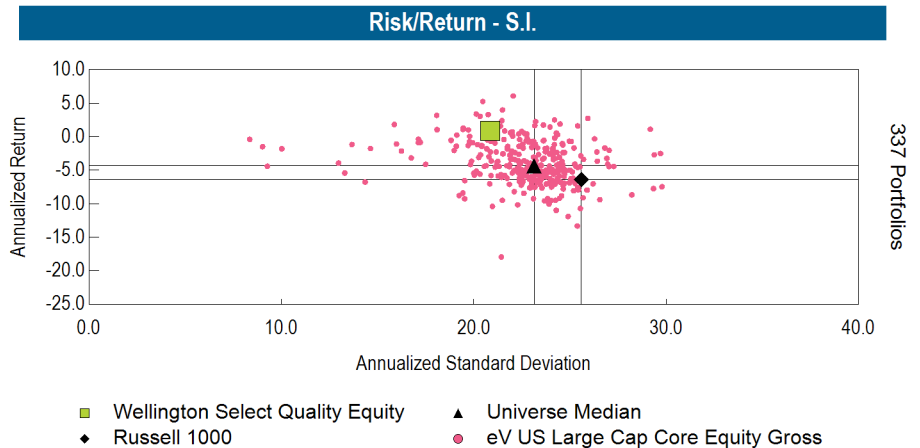
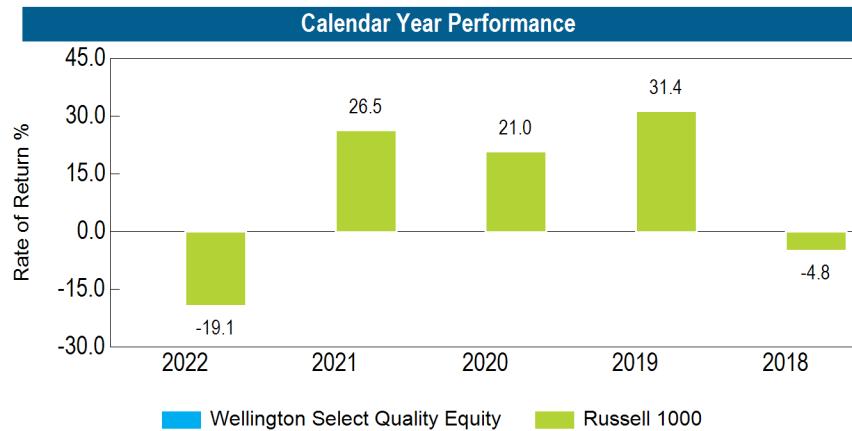
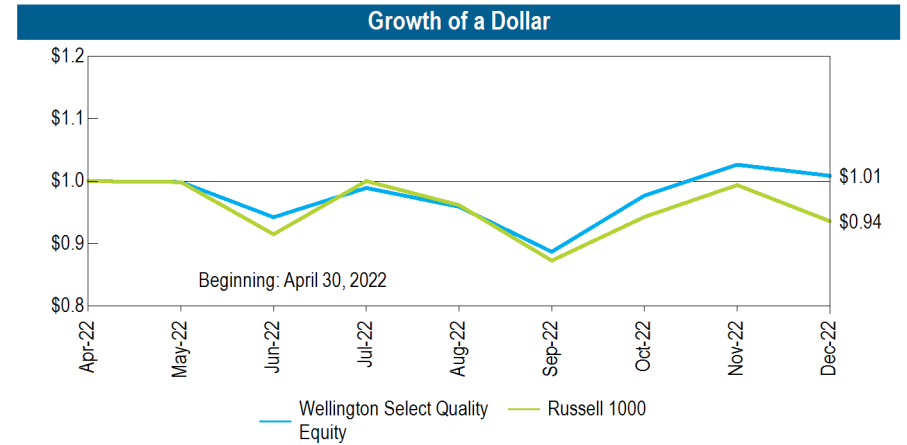
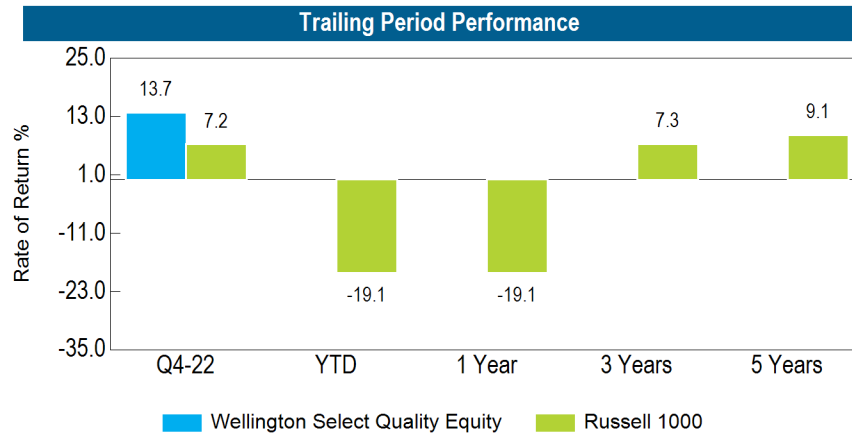
	Anlzd Return	Anlzd Standard Deviation	Alpha	Beta	Information Ratio	Tracking Error	Up Mkt Capture Ratio	Down Mkt Capture Ratio
Brown Fundamental Small Cap Value	0.9%	19.8%	0.5%	0.9	1.3	4.9%	108.9%	88.0%
Russell 2000 Value	-5.5%	20.5%	0.0%	1.0	--	0.0%	100.0%	100.0%



Performance shown is net-of-fees and since inception.

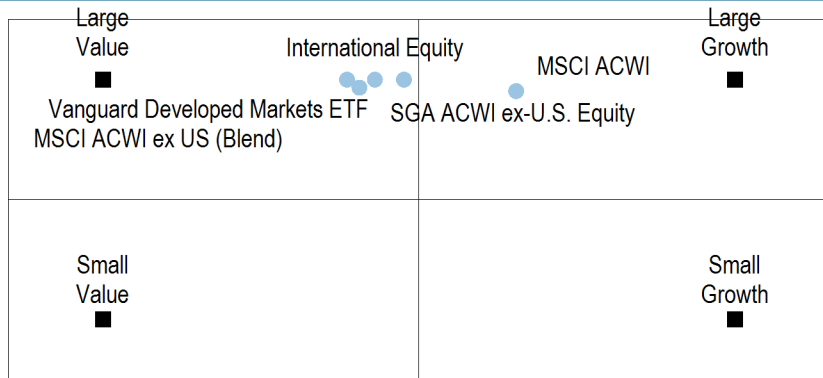
### Wellington Select Quality Equity | As of December 31, 2022

	Anlzd Return	Anlzd Standard Deviation	Alpha	Beta	Information Ratio	Tracking Error	Up Mkt Capture Ratio	Down Mkt Capture Ratio
Wellington Select Quality Equity	0.9%	20.8%	0.7%	0.8	0.8	8.8%	87.8%	68.4%
Russell 1000	-6.4%	25.6%	0.0%	1.0	--	0.0%	100.0%	100.0%

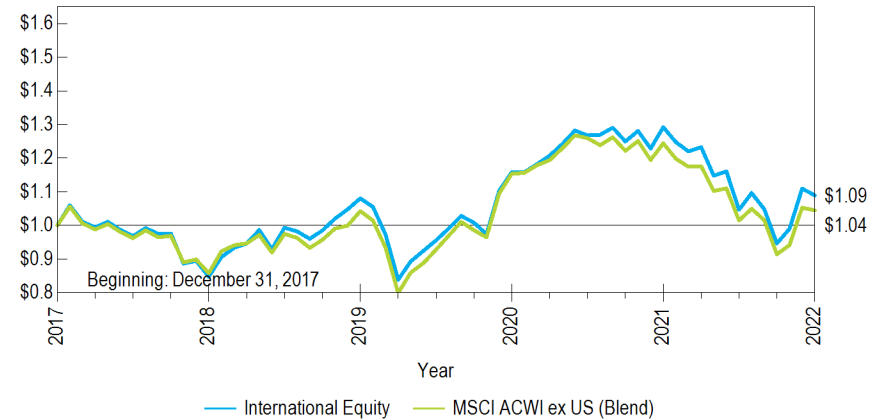


Performance shown is net-of-fees and since inception. Annualized Return is not available for managers without a history longer than one year.

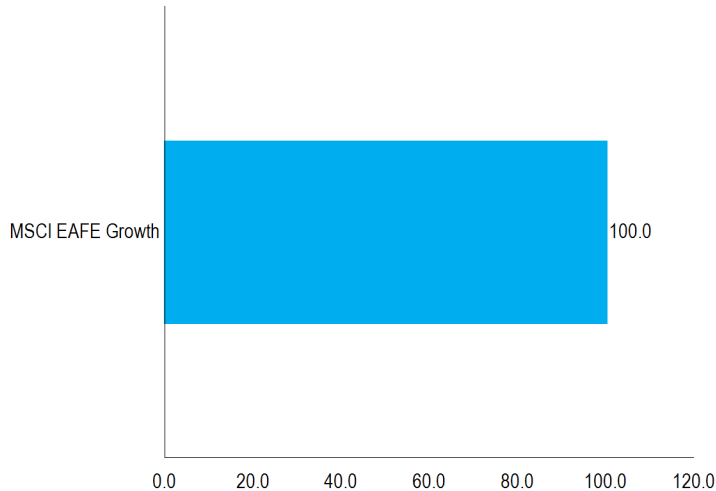
#### Non U.S. Effective Style Map vs. EAFE



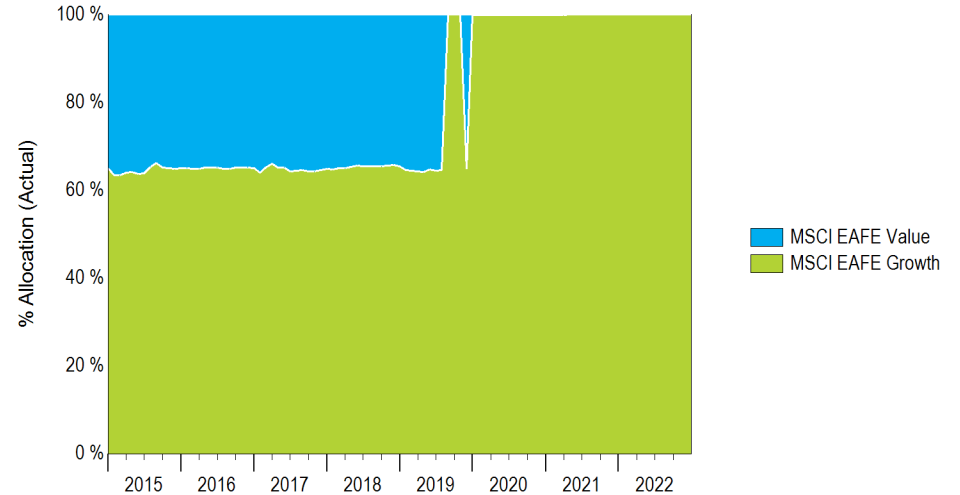
#### Growth of a Dollar 5 Years Ending December 31, 2022



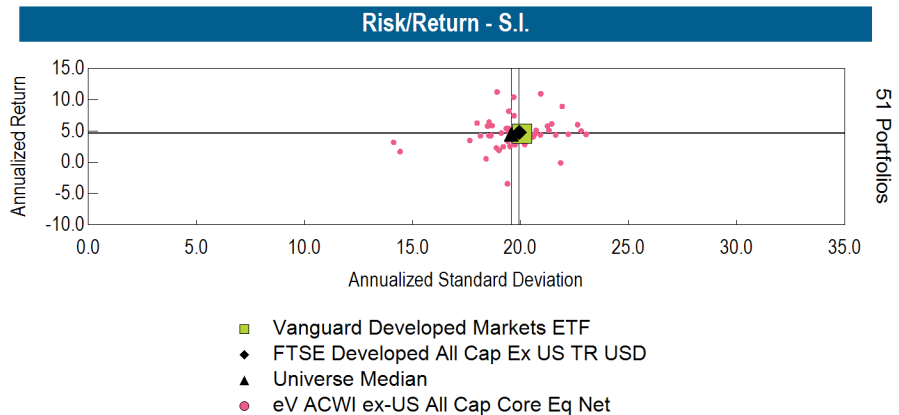
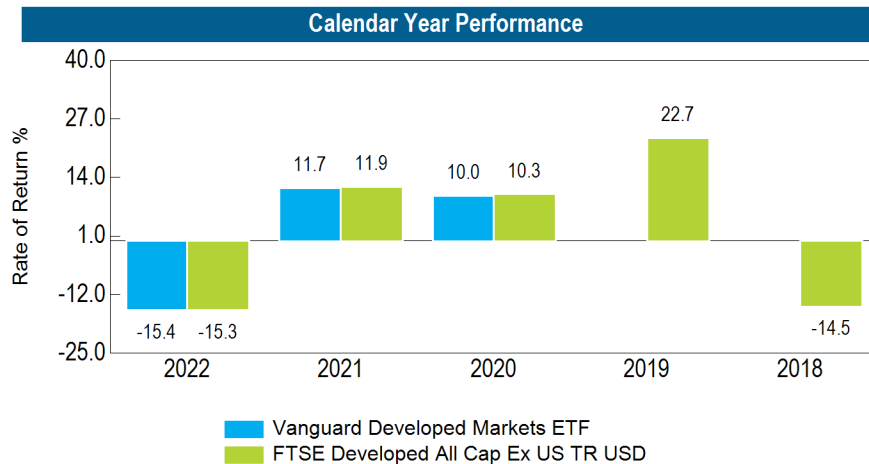
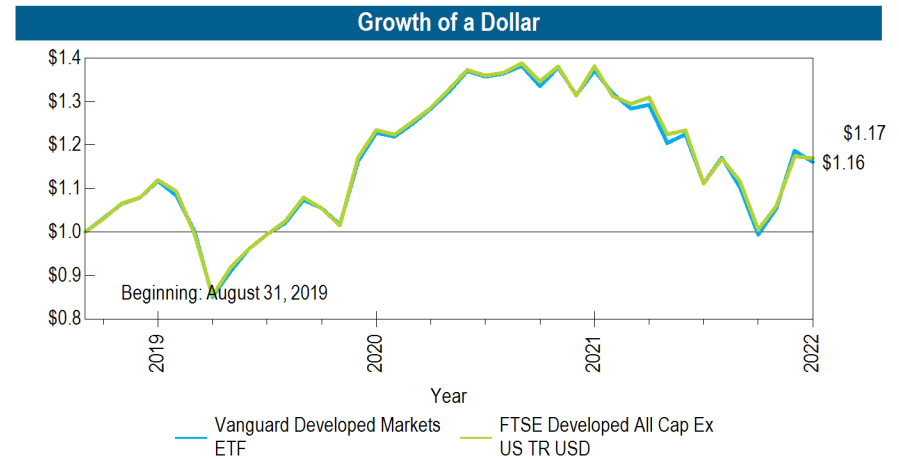
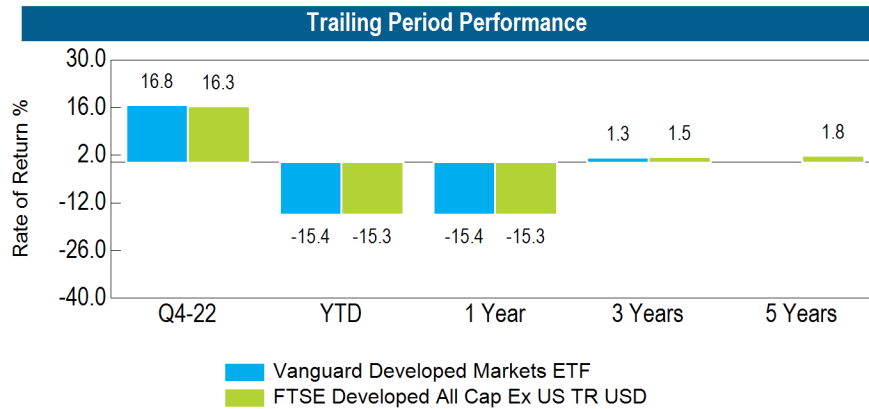
#### Style Exposure



#### Style History (5-Year)



	Anlzd Return	Anlzd Standard Deviation	Alpha	Beta	Information Ratio	Tracking Error	Up Mkt Capture Ratio	Down Mkt Capture Ratio
Vanguard Developed Markets ETF	4.6%	20.1%	0.0%	1.0	-0.1	2.5%	102.4%	101.7%
FTSE Developed All Cap Ex US TR USD	4.8%	19.9%	0.0%	1.0	--	0.0%	100.0%	100.0%

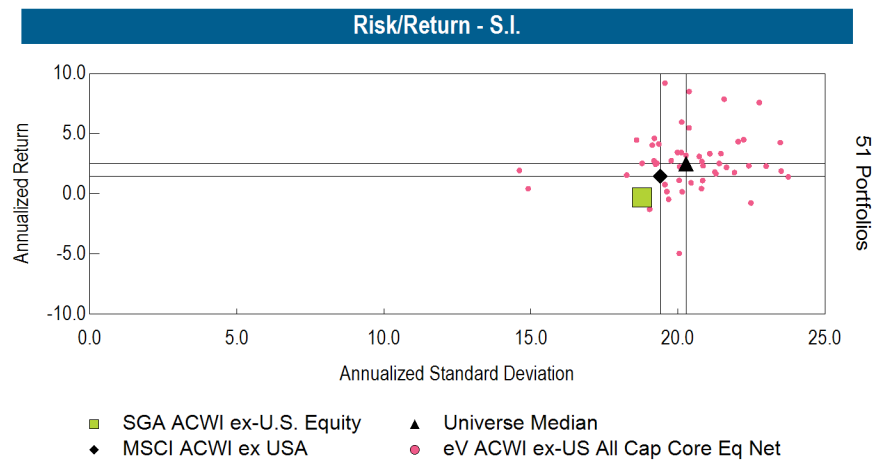
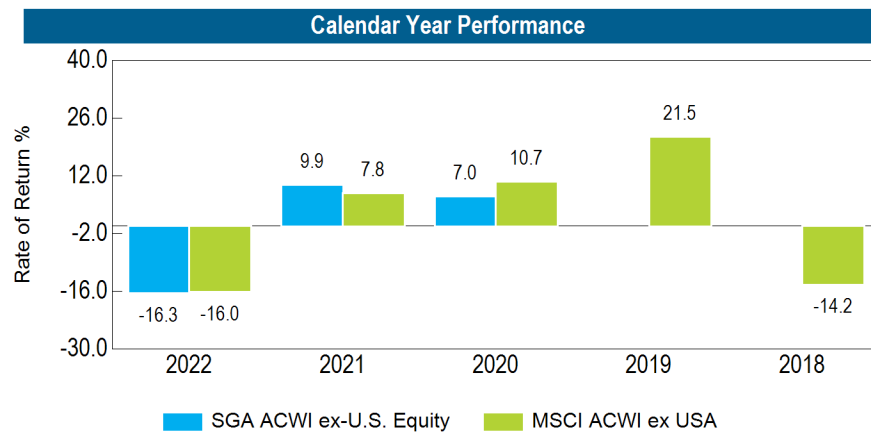
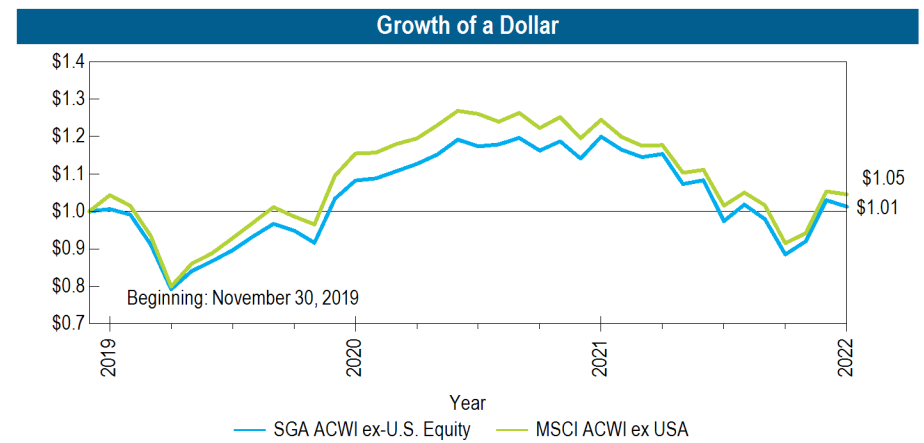
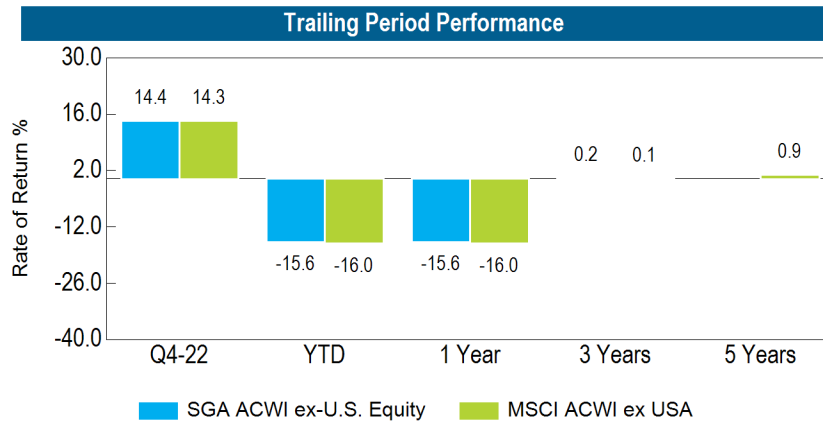


Performance shown is net-of-fees and since inception.



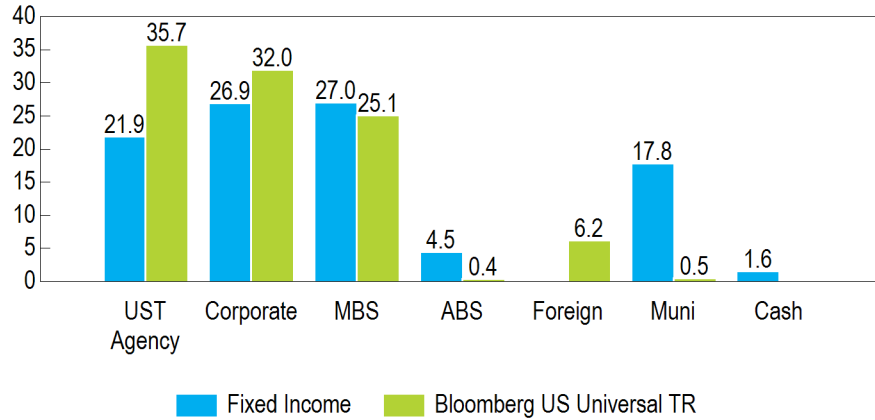
### SGA ACWI ex-U.S. Equity | As of December 31, 2022

	Anlzd Return	Anlzd Standard Deviation	Alpha	Beta	Information Ratio	Tracking Error	Up Mkt Capture Ratio	Down Mkt Capture Ratio
SGA ACWI ex-U.S. Equity	-0.3%	18.8%	-0.1%	1.0	-0.5	3.6%	89.1%	99.2%
MSCI ACWI ex USA	1.5%	19.4%	0.0%	1.0	--	0.0%	100.0%	100.0%



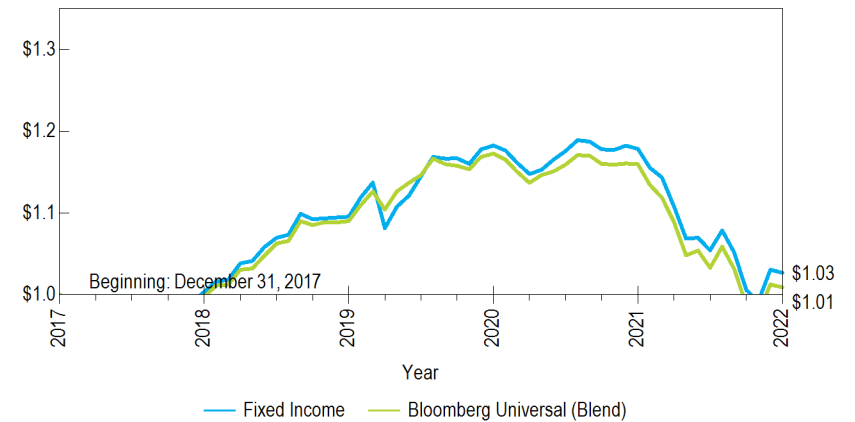
Performance shown is net-of-fees and since inception.

#### US Sector Allocation

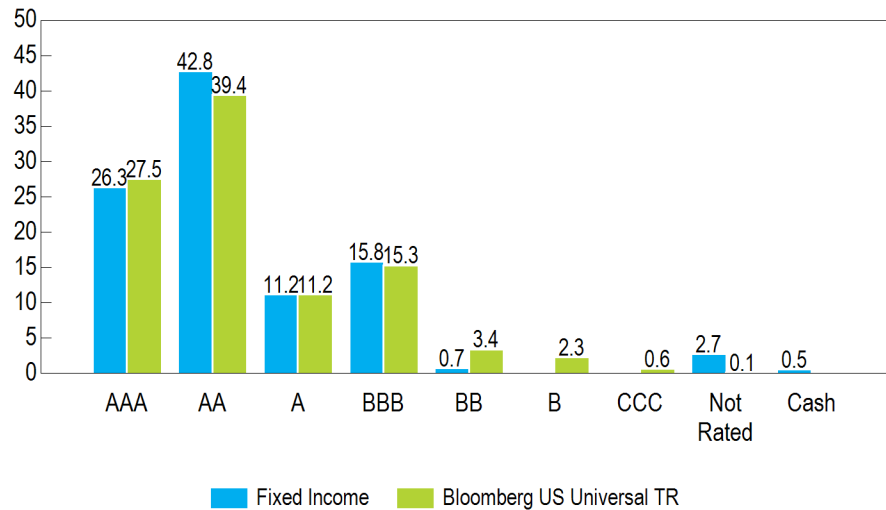


#### Growth of a Dollar

5 Years Ending December 31, 2022



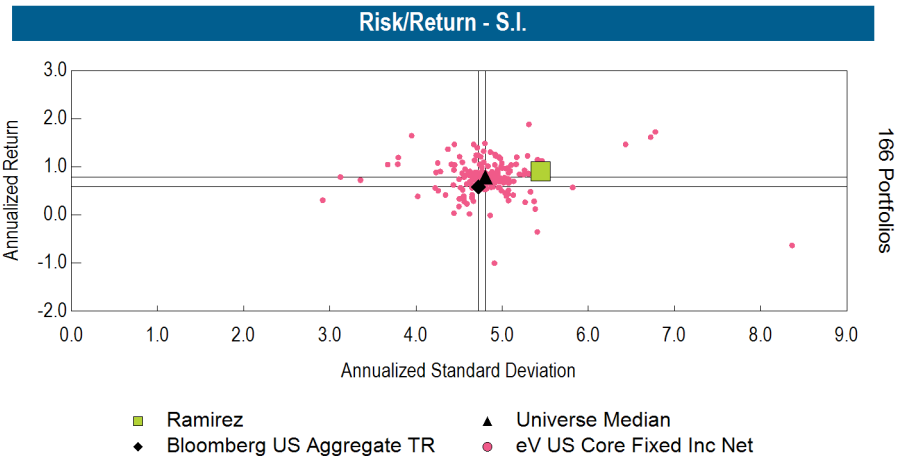
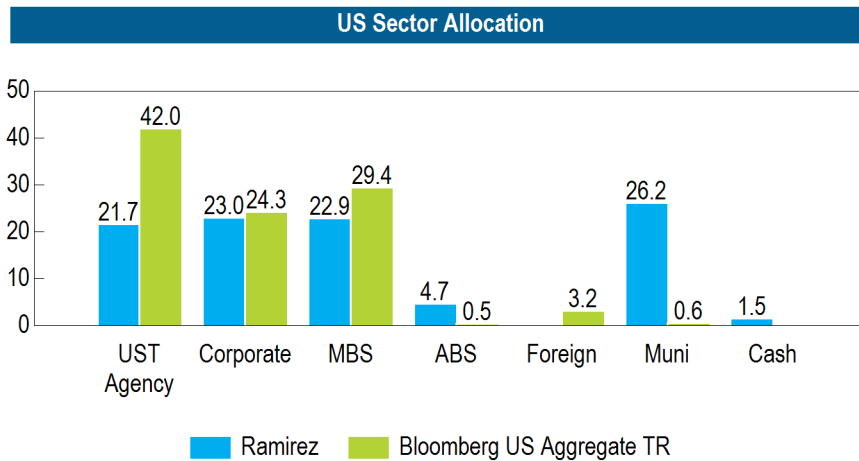
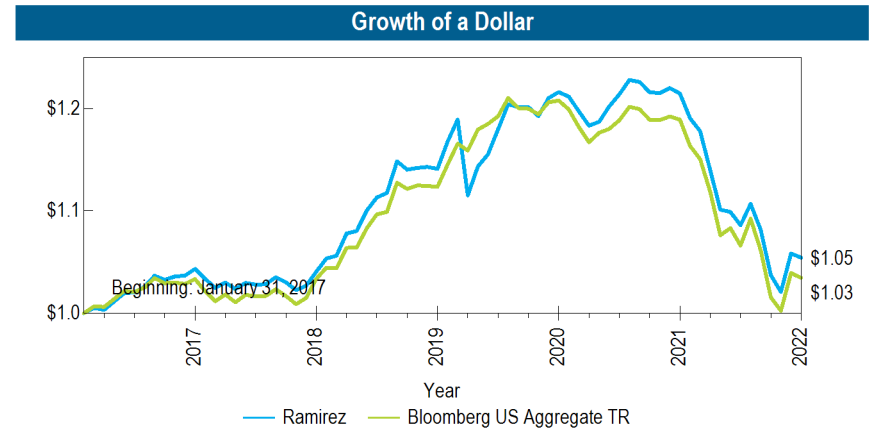
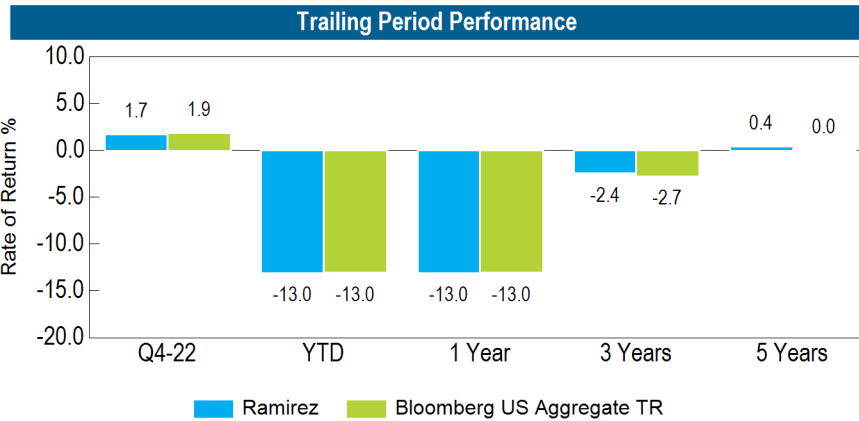
#### Credit Quality Allocation



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

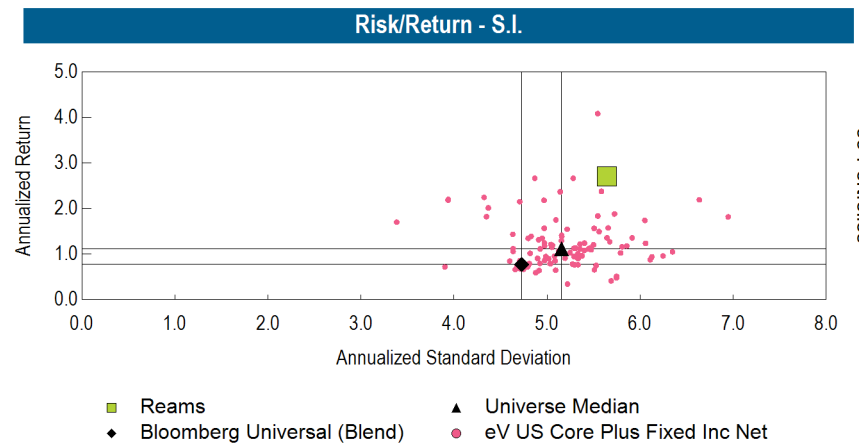
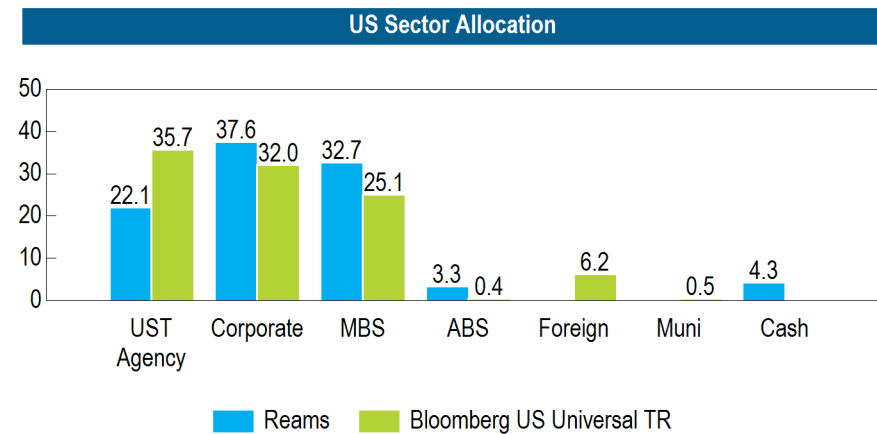
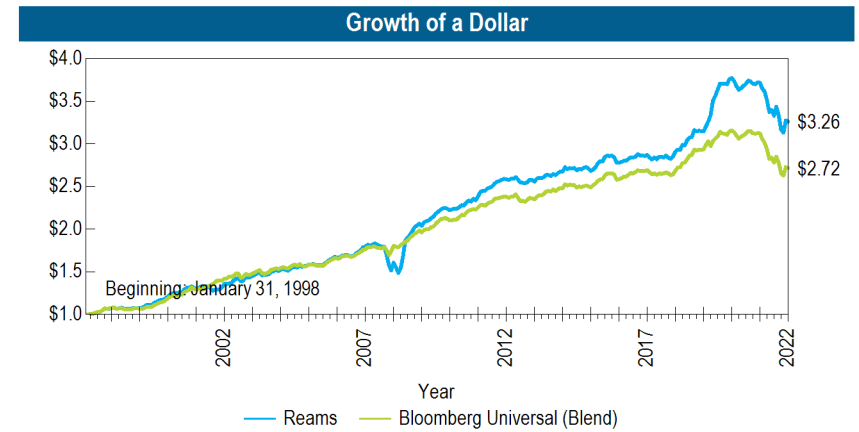
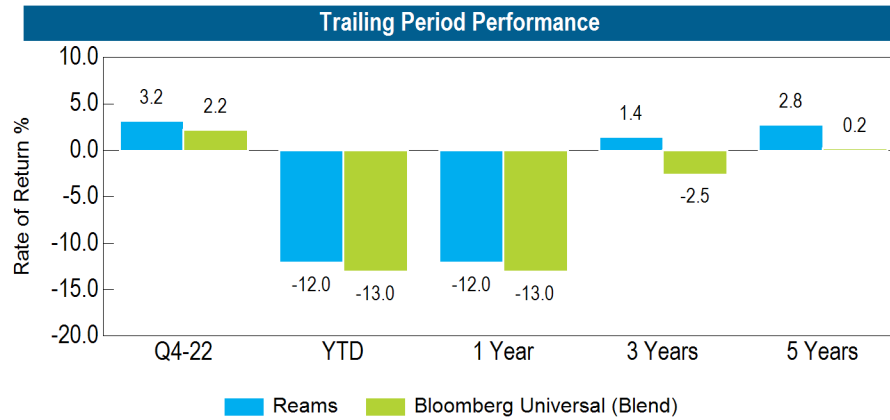
	Portfolio Q4-22	Index Q4-22
<b>Fixed Income Characteristics</b>		
Yield to Maturity	5.25	5.11
Average Duration	6.22	6.00
Average Quality	AA	AA
Weighted Average Maturity	8.99	12.20

	Anlzd Return	Anlzd Standard Deviation	Alpha	Beta	Information Ratio	Tracking Error	Up Mkt Capture Ratio	Down Mkt Capture Ratio
Ramirez	0.9%	5.4%	0.0%	1.0	0.1	2.6%	115.3%	106.7%
Bloomberg US Aggregate TR	0.6%	4.7%	0.0%	1.0	--	0.0%	100.0%	100.0%



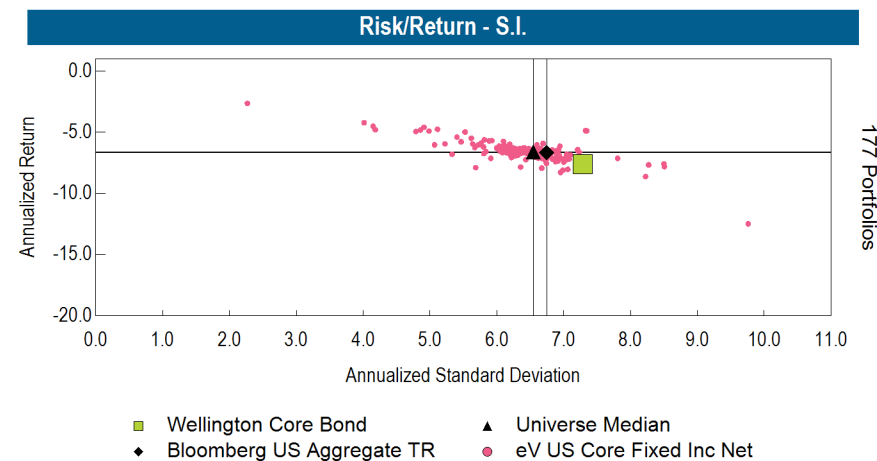
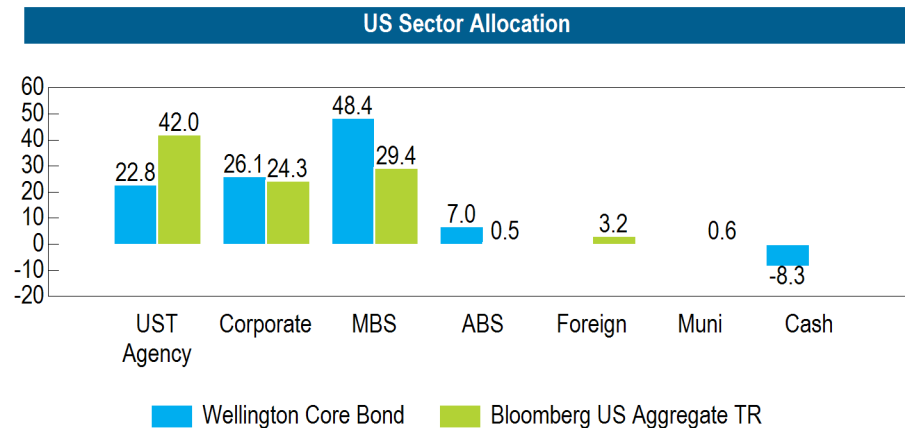
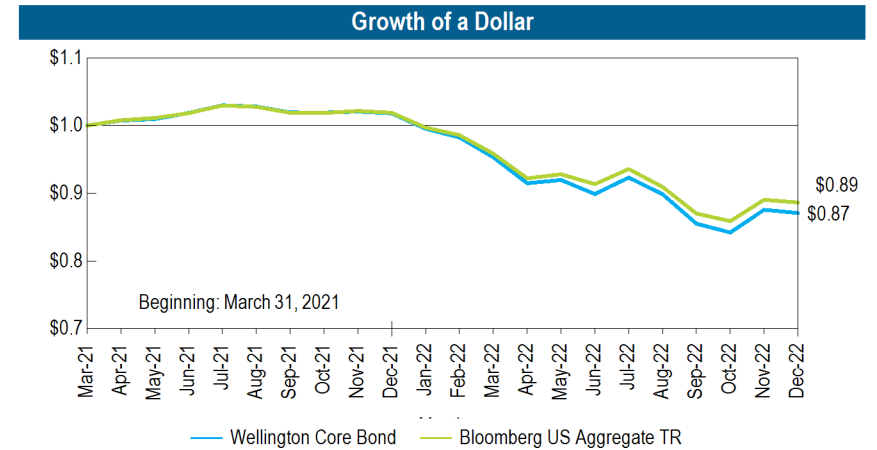
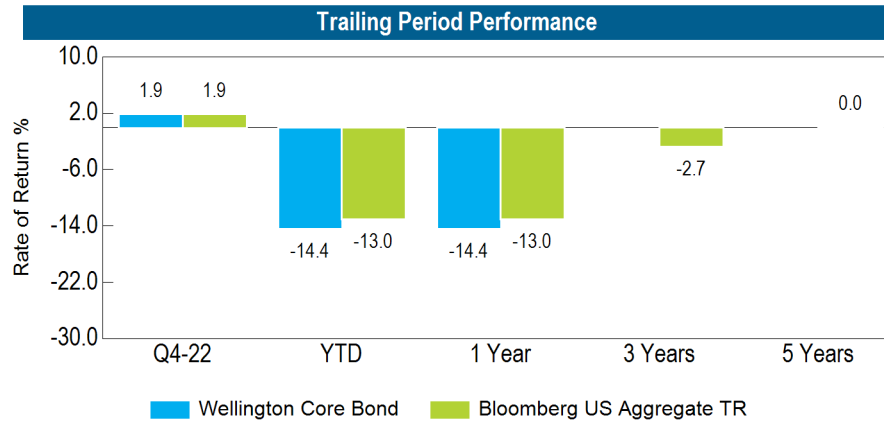
Performance shown is net-of-fees and since inception.

	Anlzd Return	Anlzd Standard Deviation	Alpha	Beta	Information Ratio	Tracking Error	Up Mkt Capture Ratio	Down Mkt Capture Ratio
Reams	4.9%	5.6%	0.0%	1.1	0.2	3.8%	124.3%	100.2%
Bloomberg Universal (Blend)	4.1%	3.8%	0.0%	1.0	--	0.0%	100.0%	100.0%



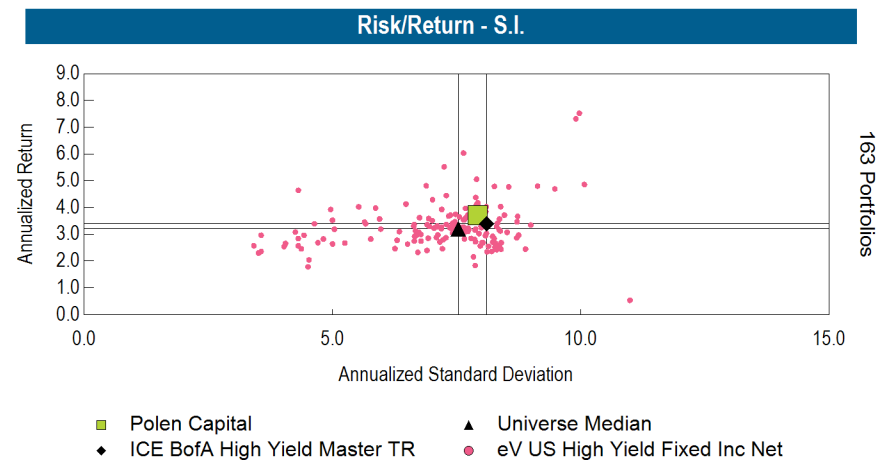
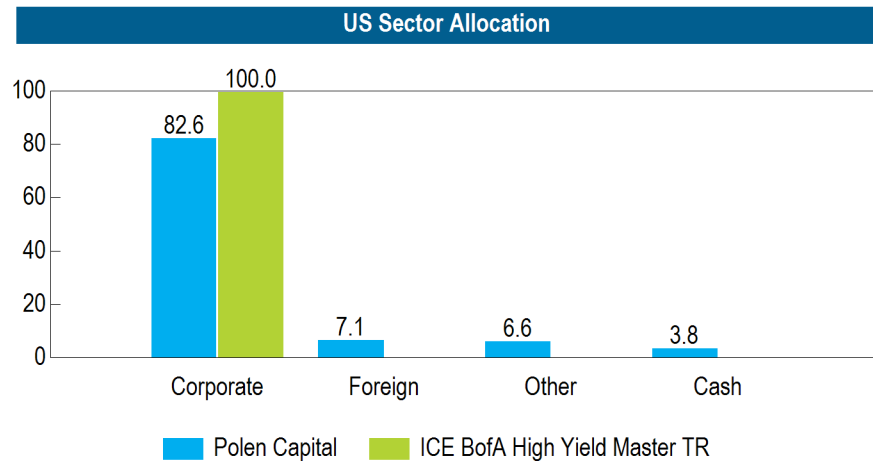
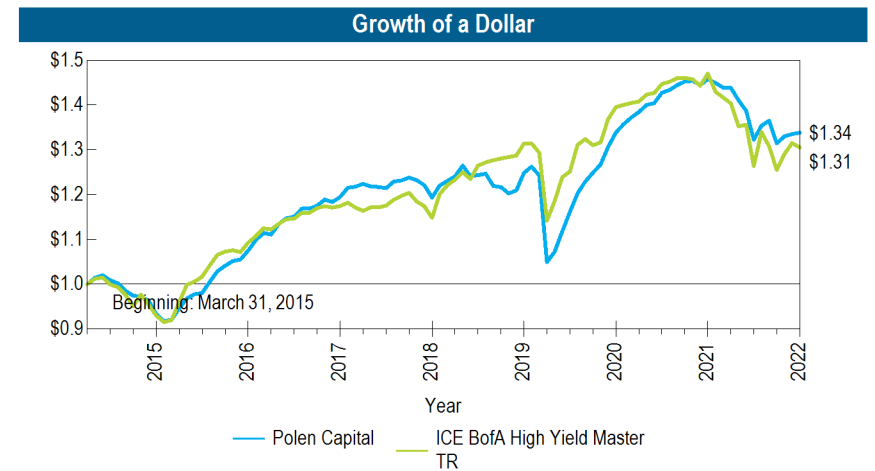
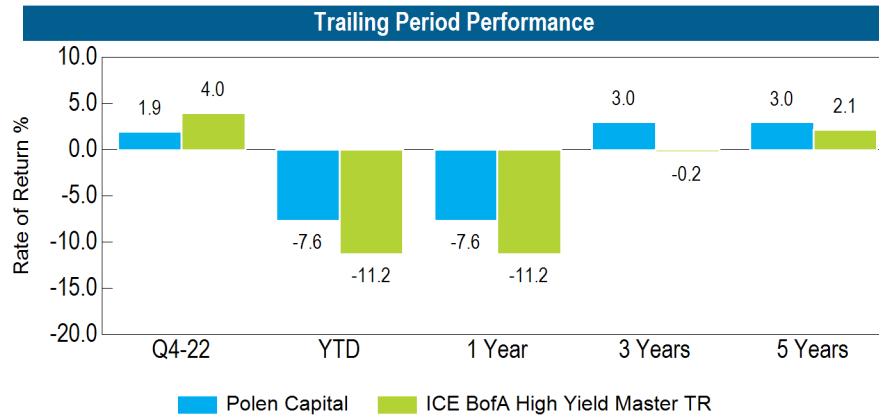
Performance shown is net-of-fees and since inception.

	Anlzd Return	Anlzd Standard Deviation	Alpha	Beta	Information Ratio	Tracking Error	Up Mkt Capture Ratio	Down Mkt Capture Ratio
Wellington Core Bond	-7.6%	7.3%	0.0%	1.1	-1.2	0.8%	103.2%	108.3%
Bloomberg US Aggregate TR	-6.7%	6.7%	0.0%	1.0	--	0.0%	100.0%	100.0%



Performance shown is net-of-fees and since inception.

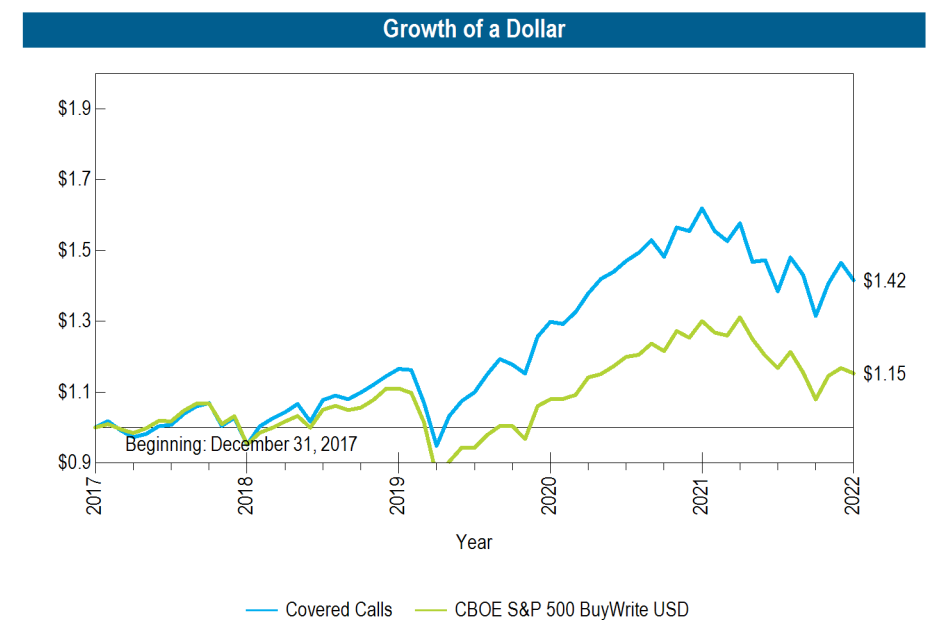
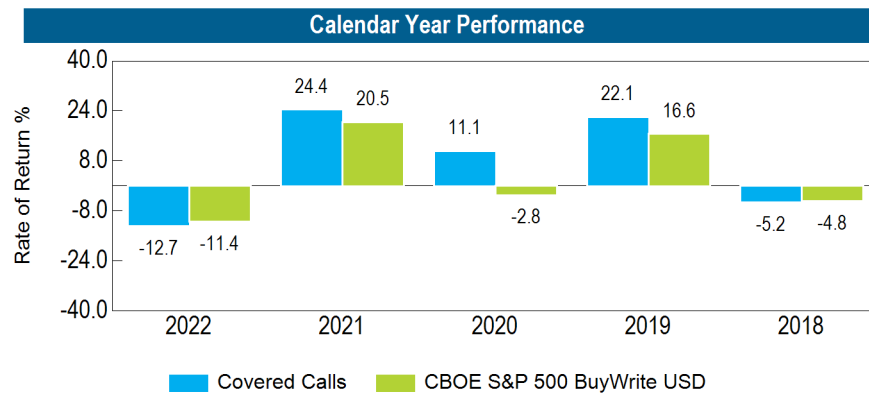
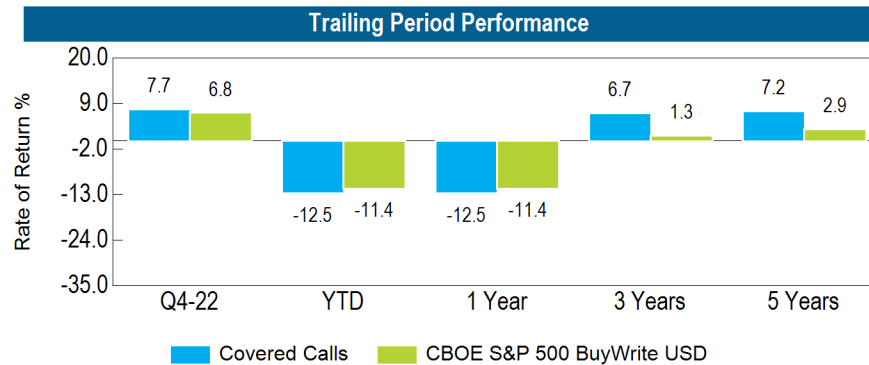
	Anlzd Return	Anlzd Standard Deviation	Alpha	Beta	Information Ratio	Tracking Error	Up Mkt Capture Ratio	Down Mkt Capture Ratio
Polen Capital	4.0%	7.9%	0.1%	0.8	0.1	4.3%	77.7%	78.6%
ICE BofA High Yield Master TR	3.7%	8.1%	0.0%	1.0	--	0.0%	100.0%	100.0%



Performance shown is net-of-fees and since inception.

### Covered Calls | As of December 31, 2022

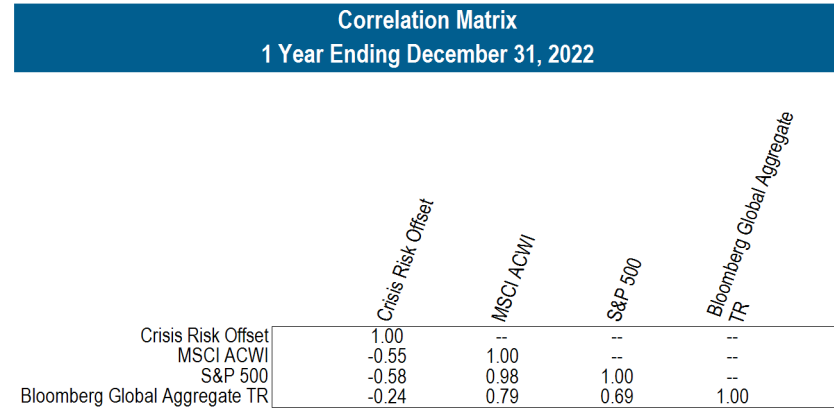
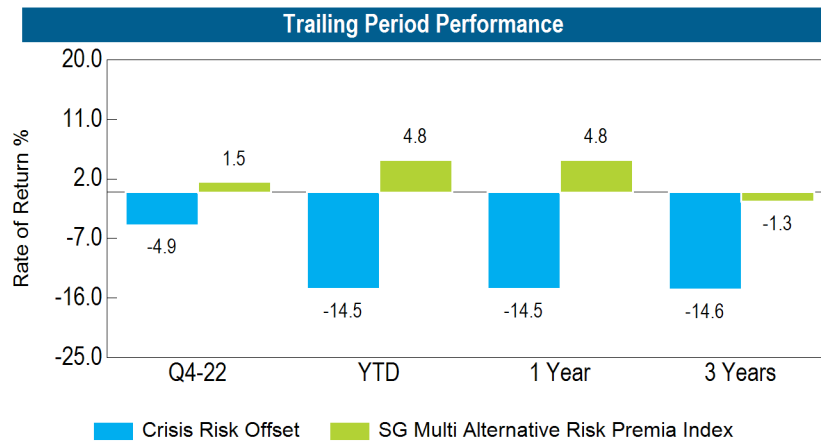
	Anlzd Return	Anlzd Standard Deviation	Alpha	Beta	Information Ratio	Tracking Error	Up Mkt Capture Ratio	Down Mkt Capture Ratio
Covered Calls	7.9%	11.8%	0.2%	1.0	0.7	4.1%	144.2%	102.3%
CBOE S&P 500 BuyWrite USD	4.9%	10.9%	0.0%	1.0	--	0.0%	100.0%	100.0%
Parametric BXM	6.2%	9.7%	0.2%	0.9	0.4	3.3%	96.5%	91.1%
CBOE S&P 500 BuyWrite USD	4.9%	10.9%	0.0%	1.0	--	0.0%	100.0%	100.0%
Parametric DeltaShift	9.7%	14.1%	0.3%	1.2	0.8	6.3%	205.3%	110.5%
CBOE S&P 500 BuyWrite USD	4.9%	10.9%	0.0%	1.0	--	0.0%	100.0%	100.0%



Performance shown is net-of-fees and since inception.

### Crisis Risk Offset | As of December 31, 2022

	Anlzd Return	Anlzd Standard Deviation	Alpha	Beta	Information Ratio	Tracking Error	Up Mkt Capture Ratio	Down Mkt Capture Ratio
Crisis Risk Offset	-10.92%	11.54%	-0.87%	0.57	-0.89	11.31%	-36.38%	98.57%
SG Multi Alternative Risk Premia Index	-0.84%	6.03%	0.00%	1.00	--	0.00%	100.00%	100.00%
Kepos Alternative Risk Premia	--	--	--	--	--	--	--	--
SG Multi Alternative Risk Premia Index	-0.84%	6.03%	0.00%	1.00	--	0.00%	100.00%	100.00%
Versor Trend Following	--	--	--	--	--	--	--	--
SG Trend Index	14.45%	12.82%	0.00%	1.00	--	0.00%	100.00%	100.00%
Vanguard Long-Term Treasury ETF	-5.68%	14.71%	-0.01%	1.01	-0.19	1.17%	101.45%	101.21%
Bloomberg US Govt Long TR	-5.46%	14.52%	0.00%	1.00	--	0.00%	100.00%	100.00%



Performance shown is net-of-fees and since inception.



### Benchmark History

As of December 31, 2022

#### OPFRS Total Plan

6/1/2022	Present	40% Russell 3000 / 12% MSCI ACWI ex USA / 31% Bloomberg US Universal TR / 5% CBOE BXM / 10% SG Multi Alternative Risk Premia Index / 2% Bloomberg US High Yield TR
1/1/2019	5/31/2022	40% Russell 3000 / 12% MSCI ACWI ex USA Gross / 33% Bloomberg US Universal TR / 5% CBOE BXM / 6.7% SG Multi Alternative Risk Premia Index / 3.3% Bloomberg US Treasury Long TR
5/1/2016	12/31/2018	48% Russell 3000 / 12% MSCI ACWI ex USA Gross / 20% Bloomberg US Universal TR / 20% CBOE BXM
10/1/2015	4/30/2016	43% Russell 3000 / 12% MSCI ACWI ex USA Gross / 20% Bloomberg US Universal TR / 15% CBOE BXM / 10% CPI - All Urban Consumers (unadjusted) +3%
1/1/2014	9/30/2015	48% Russell 3000 / 12% MSCI ACWI ex USA Gross / 20% Bloomberg US Universal TR / 10% CBOE BXM / 10% CPI - All Urban Consumers (unadjusted) +3%
3/1/2013	12/31/2013	40% Russell 3000 / 10% MSCI ACWI ex USA Gross / 17% Bloomberg US Universal TR / 33% ICE BofA 3M US Treasury TR USD
8/1/2012	2/28/2013	20% Russell 3000 / 7% MSCI ACWI ex USA Gross / 18% Bloomberg US Universal TR / 55% ICE BofA 3M US Treasury TR USD
10/1/2007	7/31/2012	53% Russell 3000 / 17% MSCI ACWI ex USA Gross / 30% Bloomberg US Universal TR
4/1/2006	9/30/2007	35% Russell 3000 / 15% MSCI ACWI ex USA Gross / 50% Bloomberg US Universal TR
1/1/2005	3/31/2006	35% Russell 3000 / 15% MSCI ACWI ex USA Gross / 50% Bloomberg US Aggregate TR
4/1/1998	12/31/2004	50% Bloomberg US Aggregate TR / 10% Russell 1000 / 20% Russell 1000 Value / 5% Russell MidCap / 15% MSCI EAFE
12/1/1988	3/31/1998	40% S&P 500 / 55% Bloomberg US Aggregate TR / 5% FTSE T-Bill 3 Months TR

### Benchmark History As of December 31, 2022

#### Domestic Equity

1/1/2005	Present	Russell 3000
4/1/1998	12/31/2004	28.57% Russell 1000 / 57.14% Russell 1000 Value / 14.29% Russell MidCap
6/1/1997	3/31/1998	S&P 500

#### International Equity

1/1/2005	Present	MSCI ACWI ex USA
1/1/1998	12/31/2004	MSCI EAFE Gross

#### Fixed Income

4/1/2006	Present	Bloomberg US Universal TR
12/31/1993	3/31/2006	Bloomberg US Aggregate TR

#### Covered Calls

4/1/2014	Present	CBOE S&P 500 BuyWrite USD
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#### Crisis Risk Offset

8/1/2018	Present	SG Multi Alternative Risk Premia Index
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#### Cash

3/1/2011	Present	FTSE T-Bill 3 Months TR
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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.