

Verus⁷⁷⁷

Meeting Date

12/13/2023

Agenda Item

#9a.



**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**



PERIOD ENDING: SEPTEMBER 30, 2023

Investment Performance Review for

Contra Costa County Employees' Retirement Association

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Investment Landscape

TAB I

Investment Performance
Review

TAB II

A decorative overlay consisting of a grid of interconnected triangles in various shades of blue and green, with some triangles containing white or blue geometric shapes, is positioned on the left side of the slide.

**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**

4TH QUARTER 2023
Investment Landscape

Verus business update

Since our last Investment Landscape webinar:

- Verus retained four new clients across the U.S. expanding our coverage in the Pacific, Midwest, Southwest, and Southeast
- Shelly Heier, CFA, CAIA – *President*, was named one of Pensions & Investments' 2023 Influential Women in Institutional Investing
- Eileen Neill, CFA – *Managing Director | Senior Consultant*, was nominated as one of Chief Investment Officer's 2023 Knowledge Brokers
- Sneha Pendyala – *Public Markets Research Analyst* recently passed CFA level III. Christian Reed – *Private Markets Performance Analyst* and Jonah Coffee – *Performance Analyst* passed CFA level II
- Recent research, found at verusinvestments.com/research:
 - ***2023 Private Equity Outlook***
 - ***Hedge funds in 2023: How has the environment changed?***
 - ***The rising rate environment's impact on real estate cap rates***
 - ***Yield curve inversion: recession signal, but why?***
 - ***Credit, distress, default & the long term***



Shelly Heier, CFA, CAIA
President



Eileen Neill, CFA
Managing Director |
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Recent Verus research

Visit: verusinvestments.com/research

Topics of interest

CREDIT, DISTRESS, DEFAULT & THE LONG TERM

As the environment for credit changes and the risks of defaults increase, investors would be well advised to assess their fixed income positioning. This includes considering other opportunities across the credit spectrum beyond traditional core vehicles.

THE RISING RATE ENVIRONMENT'S IMPACT ON REAL ESTATE CAP RATES

The quickly rising interest rate environment has changed the landscape for commercial real estate so much that investors are questioning how the appraised values of their private real estate assets might change in the future. Our latest whitepaper illuminates this question.

YIELD CURVE INVERSION: RECESSION SIGNAL, BUT WHY?

Predicting future market conditions is an incredibly difficult task. One signal that has been a historically accurate predictor preceding a U.S. recession is the yield curve inversion. We examine what drives curve inversion, allowing investors a framework regarding the implications of this type of event.

HEDGE FUNDS IN 2023: HOW HAS THE ENVIRONMENT CHANGED?

For those clients who are comfortable embracing the complexity of hedge funds, we continue to believe that these strategies can play an important role. Furthermore, the justifications for these strategies may be strengthening as we enter a much different market regime.

Annual research

2023 PRIVATE EQUITY OUTLOOK

In the 2023 Private Equity Outlook, we focus on the impact of a “higher rate for longer” scenario on the asset class. We also examine how the rising-rate environment has affected private markets so far.

3rd quarter summary

THE ECONOMIC CLIMATE

- Real GDP increased at a 2.9% pace from a year ago in Q3 (4.9% QoQ annualized rate). The large uptick was driven by consumption, which continues to show resiliency. A combination of pandemic related excess savings and a strong decade of household wealth expansion is likely providing a cushion against an economic slowdown.
- The unemployment rate increased slightly during the quarter from 3.6% to 3.8%, though this appears to be due to more workers rejoining the labor force and seeking employment (a positive rather than negative development). The total size of the U.S. workforce grew by 580,000 in Q3.

PORTFOLIO IMPACTS

- The U.S. consumer has shown resiliency, with ongoing moderate spending activity. However, personal savings rates are nearly the lowest on record. We believe depressed savings activity without a commensurate surge in spending, and very poor sentiment, suggests high inflation is squeezing household budgets.
- The Cboe VIX implied volatility index remained below-average for most of the third quarter, before rising to 17.5 to end September. Market risk has been falling fairly consistently throughout the year, which may be at least partly attributed to the perception that certain risks, such as regional bank contagion and near-term recession, have eased.

THE INVESTMENT CLIMATE

- The 10-year U.S. Treasury yield increased during the quarter to 4.58%—a level not seen since 2007—likely supported by *higher for longer* interest rate expectations. This led to a flattening of the yield curve.
- U.S. headline inflation ticked up from 3.1% to 3.7% year-over-year. Core CPI (ex-food & energy) continued to fall from 4.9% to 4.1%. Shelter costs jumped unexpectedly in September showing the largest rise since May, and along with rising energy prices have generated concerns of renewed inflation. A material weakening of the job market and U.S. economy will likely be needed to bring inflation down to a 2% level.

ASSET ALLOCATION ISSUES

- Nearly all asset classes produced materially negative performance during the quarter, including global equities (-3.4%), U.S. core fixed income (-3.2%) and U.S. Treasuries (-3.1%). Highly correlated markets created difficulties for investors, as diversification produced limited value. **p. 48**
- U.S. investors continue to face a difficult environment for style factor investing. Over the past year, mega cap growth stocks have propelled the U.S. market higher, leading to dramatic outperformance of growth stocks and large cap stocks. However, value investing has delivered exceptional results in international developed markets, outperforming growth stocks by 11.5%.

Nearly all asset classes produced materially negative performance during the quarter

A material weakening of the job market and/or U.S. economy will likely be needed to bring inflation down to a 2% level

What drove the market in Q3?

“Fed Signals Higher-for-Longer Rates with Hikes Almost Finished”

10-YEAR U.S. TREASURY YIELDS

Apr	May	June	July	Aug	Sep
3.42%	3.64%	3.84%	3.96%	4.11%	4.57%

Article Source: Bloomberg, September 20th, 2023

“U.S. Inflation Rises in August as Petrol Prices Jump”

WTI CRUDE OIL PRICES (PER BARREL)

Apr	May	June	July	Aug	Sep
\$76.78	\$68.09	\$70.64	\$81.80	\$83.63	\$90.79

Article Source: Financial Times, September 13th, 2023

“U.S. Growth Trimmed on Inventories; Retains Underlying Momentum”

FEDERAL RESERVE BANK OF ATLANTA Q3 2023 GDPNOW FORECAST

July 28 th	Aug 15 th	Aug 31 st	Sept 15 th	Sept 29 th	Oct 10 th
3.5%	5.0%	5.6%	4.9%	4.9%	5.1%

Article Source: Reuters, August 30th, 2023

“S&P 500 Q2 2023 Earnings Beat Wall Street Expectations”

S&P 500 YEAR-OVER-YEAR EARNINGS GROWTH (DECLINE)

Q1 22	Q2 22	Q3 22	Q4 22	Q1 23	Q2 23
9.0%	6.0%	2.4%	(4.9%)	(6.6%)	(4.1%)

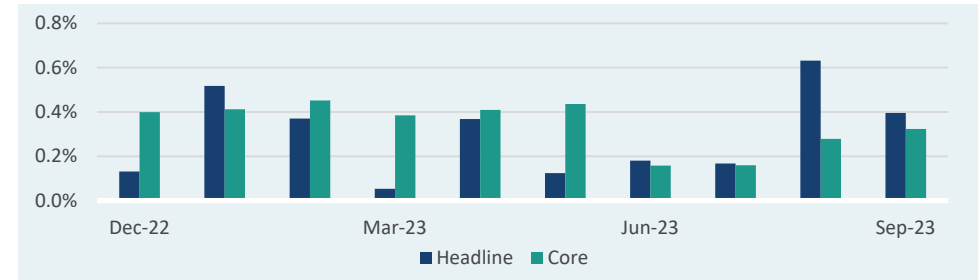
Article Source: Axios, August 18th, 2023

U.S. TREASURY YIELDS (YEAR-TO-DATE)



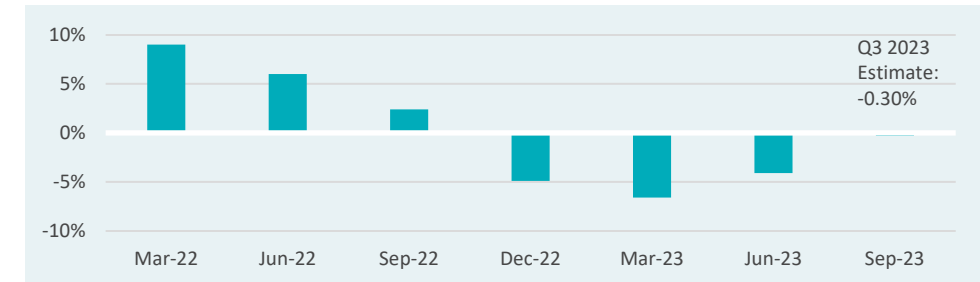
Source: Bloomberg, as of 9/30/23

HEADLINE VS. CORE CPI (MONTH-OVER-MONTH)



Source: BLS, as of 9/30/23

S&P 500 YEAR-OVER-YEAR EARNINGS GROWTH (DECLINE)



Source: FactSet, as of 9/30/23

Economic environment

U.S. economics summary

- Real GDP increased at a 2.9% pace from a year ago in the third quarter (4.9% quarter-over-quarter annualized rate). The large uptick was driven by consumption, which continues to show resiliency. While many investors have expected high inflation and weaker wage growth to impact spending, a combination of pandemic related excess savings and a strong decade of household wealth expansion is likely providing a cushion against an economic slowdown.
- U.S. headline inflation ticked up during the quarter, from 3.1% to 3.7% year-over-year in September. Core CPI (ex-food & energy) continued to fall from 4.9% to 4.1%. Shelter costs jumped unexpectedly in September, which along with rising energy prices have generated fresh concerns of renewed inflation.
- The U.S. consumer has shown resiliency, with continued moderate spending levels. However, personal savings rates are nearly the lowest on record. We believe depressed savings activity, along with mild household spending and very poor sentiment, suggests high inflation is squeezing household budgets.
- The unemployment rate increased slightly during the quarter from 3.6% to 3.8%, though this appears to be due to more workers rejoining the labor force and seeking employment (a positive rather than negative development). The total size of the U.S. workforce grew by 580,000 in Q3.
- Consumer sentiment readings were mixed during Q3 but remain poor. According to the Conference Board survey, the future outlook for income, business, and labor conditions fell very sharply and are now at levels that historically have signaled recession within a year.

	Most Recent	12 Months Prior
Real GDP (YoY)	2.9% 9/30/23	1.7% 9/30/22
Inflation (CPI YoY, Core)	4.1% 9/30/23	8.2% 9/30/22
Expected Inflation (5yr-5yr forward)	2.4% 9/30/23	2.1% 9/30/22
Fed Funds Target Range	5.25–5.50% 9/30/23	3.00–3.25% 9/30/22
10-Year Rate	4.58% 9/30/23	3.83% 9/30/22
U-3 Unemployment	3.8% 9/30/23	3.5% 9/30/22
U-6 Unemployment	7.0% 9/30/23	6.7% 9/30/22

Inflation

U.S. headline inflation ticked up during the quarter, from 3.1% to 3.7% year-over-year in September. Core CPI (ex-food & energy) continued to fall from 4.9% to 4.1%. Shelter costs jumped unexpectedly in September showing the largest rise since May, which along with rising energy prices have generated concerns of renewed inflation. Oil in particular saw material gains over the quarter (+24.3% for Brent, +28.5% for WTI), largely driven by supply dynamics.

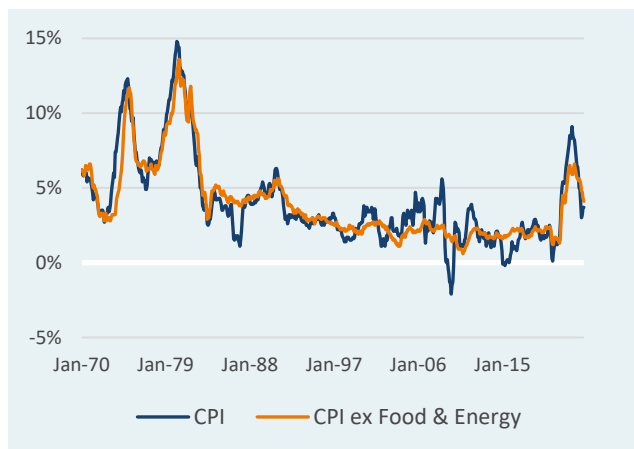
The attack of Hamas on Israel in early October led to upward movement in oil prices on the risk of escalation into a broader conflict involving Iran. Nearly one-fifth of global oil

supply is shipped through the Strait of Hormuz, on Iran's border, which means that a larger conflict would likely have major implications for inflation, and interest rates, and therefore the domestic economy.

Shorter-term inflation trends illustrate that the rate of inflation is still materially higher than the Federal Reserve's 2% target. Inflation appears to be stabilizing at a 3-4% range, and may not reach the Fed's 2% target without a material weakening of the job market and/or the U.S. economy.

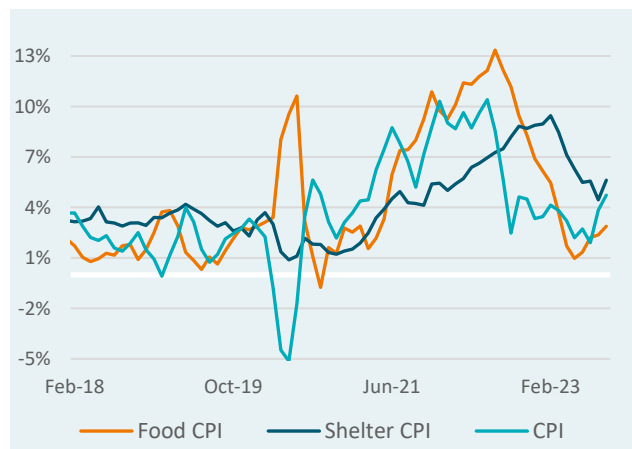
The recent jump in energy prices has reignited inflation concerns

U.S. CPI (YOY)



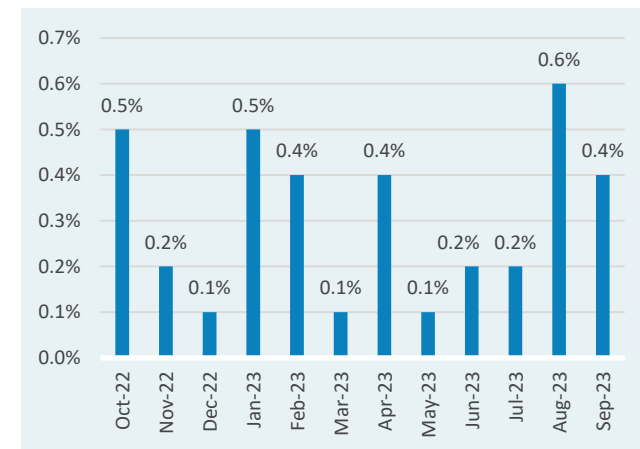
Source: BLS, as of 9/30/23

3-MONTH ANNUALIZED INFLATION RATE



Source: FRED, Verus, as of 9/30/23

MONTHLY PRICE MOVEMENT



Source: BLS, as of 9/30/23

GDP growth

Real GDP increased at a 2.9% pace from a year ago in the third quarter (4.9% quarter-over-quarter annualized rate). The large uptick was driven by consumption, which continues to show resiliency. While many investors have expected high inflation and weaker wage growth to impact spending, a combination of pandemic related excess savings and a strong decade of household wealth expansion is likely providing a cushion against an economic slowdown. Outside of consumption, all major categories, besides net exports, positively contributed to GDP growth.

A strong economy continues to support the *higher for longer*

interest rate narrative. This has also contributed to markets reacting negatively to positive economic news, as strong growth increases the likelihood of Federal Reserve hawkishness.

Despite healthy overall GDP growth, weakness is beginning to appear in the economy. Savings rates remain on the lower end of historical trends at 3.9%, while transitions into delinquency across credit card, auto, and mortgage lending has all moved higher. As savings and debt-driven consumption begins to recede, expectations are for weaker consumption in the fourth quarter.

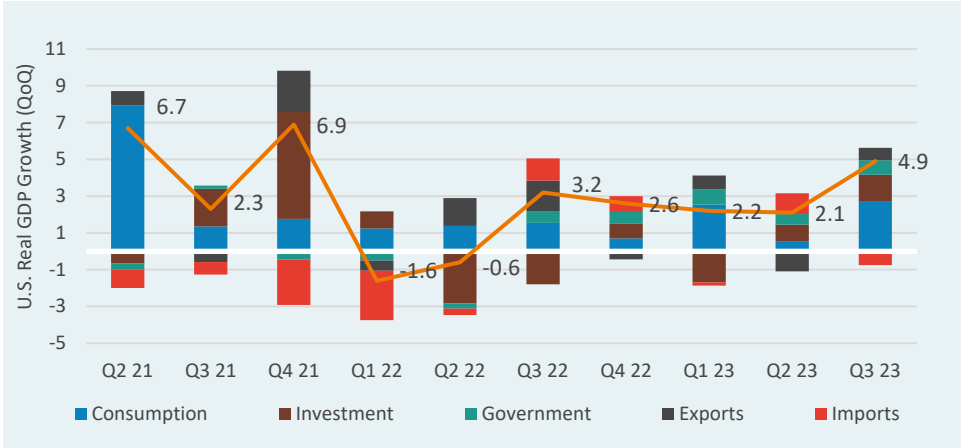
The U.S. economy continues to show resilience despite aggressive monetary tightening & low consumer confidence

U.S. REAL GROSS DOMESTIC PRODUCT



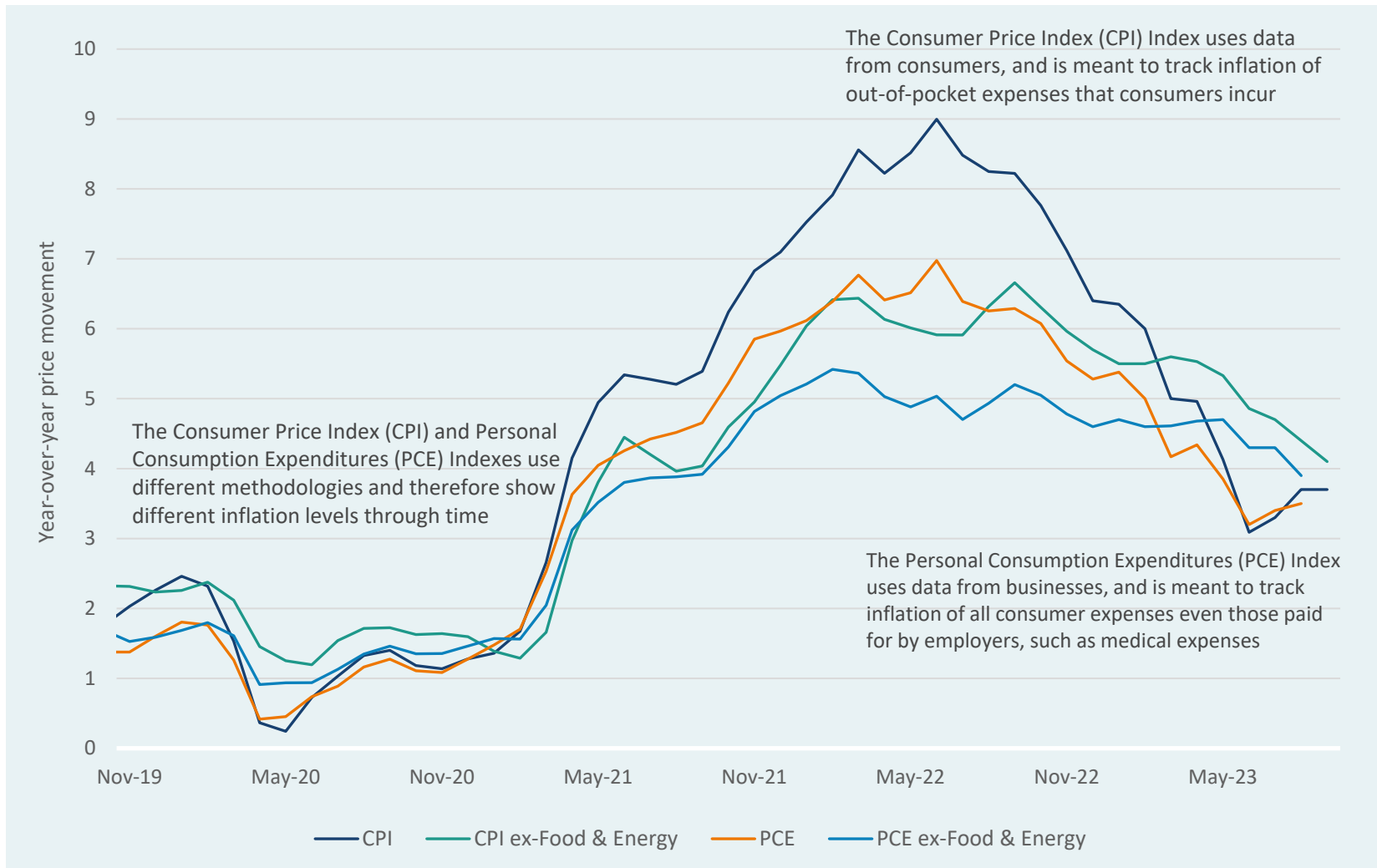
Source: FRED, as of 9/30/23

U.S. REAL GDP COMPONENTS (QOQ)



Source: FRED, as of 9/30/23

How are inflation conditions evolving?



U.S. inflation appears to be stabilizing at a 3-4% level, materially above the Fed's 2% target

The recent jump in energy prices has reignited inflation concerns

Source: FRED, Verus, PCE data as of 8/31/23, CPI data as of 9/30/23

Labor market

The unemployment rate increased slightly during the quarter from 3.6% to 3.8%, though this appears to be due to more workers rejoining the labor force and seeking employment (a positive rather than negative development). The total size of the U.S. workforce grew by 580,000 in Q3.

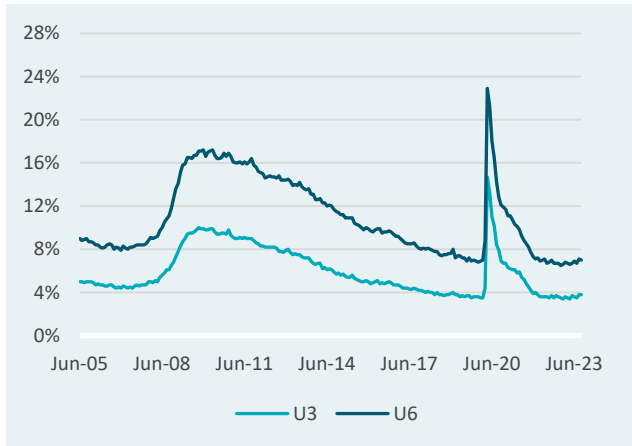
Rebalancing within the labor market continued, though there remains a mismatch between the number of *workers available* and the *available jobs*. The labor participation rate has improved across all age groups, while wage growth slowly receded—at 4.2% year-over-year in September—compared to ~3% pre-pandemic. Deceleration of wage growth is of course

not a welcome development for American workers, but should help to moderate inflation pressures, all else equal.

A short supply of workers relative to demand for staffing has placed more bargaining power with workers. Recent contract negotiations between employers and labor unions have been widely publicized and contentious at times. The United Auto Workers (UAW) strike against General Motors, Ford, and Stellantis serves as a recent example, affecting more than 400,000 workers. With households feeling the damaging effects of inflation on wages and budgets, and a large ongoing mismatch in the labor market regarding supply and demand, these disputes are likely to persist.

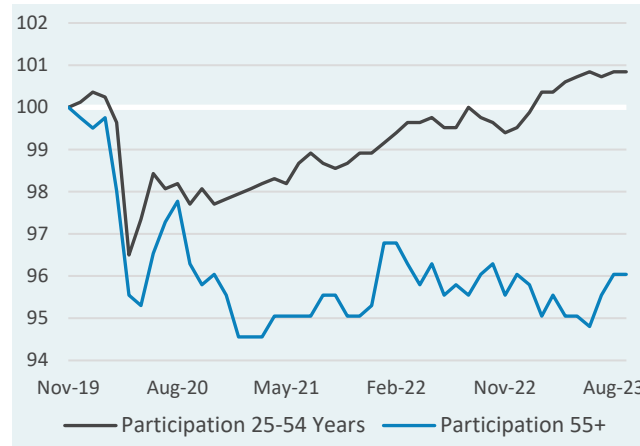
A short supply of workers relative to demand for staffing has placed more bargaining power with workers

U.S. UNEMPLOYMENT



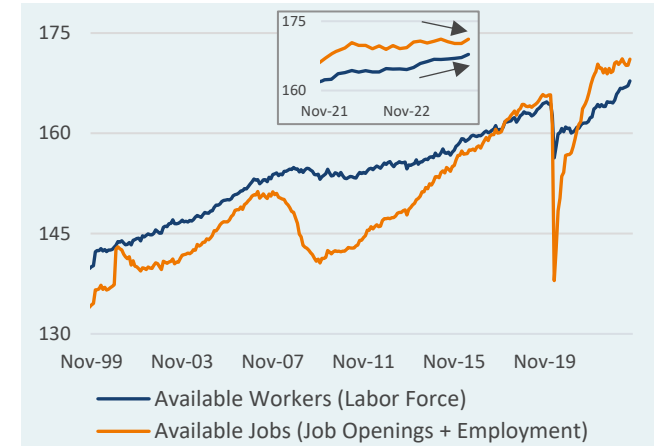
Source: FRED, as of 9/30/23

LABOR FORCE PARTICIPATION RATE BY AGE



Source: FRED, as of 9/30/23

WORKERS AVAILABLE VS. AVAILABLE JOBS



Source: BLS, Verus, as of 8/31/23

The consumer

The U.S. consumer has shown resiliency, with real (inflation-adjusted) personal consumption expenditures moving along at a moderate pace—coming in at 2.3% year-over-year in August. However, much of this resilience appears to have been possible through the spending down of household savings accumulated during the pandemic. Recent estimates seem to suggest that this *excess savings* has now been mostly (or all) spent, which could lead to a downturn in spending in future months.

Personal savings rates have deteriorated further—now at 3.9%—nearly half the pre-pandemic savings level and one of the lowest levels on record. We believe depressed savings activity without a commensurate surge in spending, and very

poor sentiment, suggests high inflation is squeezing household budgets.

As mentioned last quarter, tighter household budgets should be contrasted with the fact that Americans have experienced a vast boom in wealth and prosperity over the past decade, fueled by a substantial bull market in stocks and in residential real estate, among other assets. This wealth may serve as somewhat of a unique buffer against economic weakness. A large portion of this wealth was created by the housing boom during the pandemic, which suggests more economic sensitivity than usual to downward house and asset price moves.

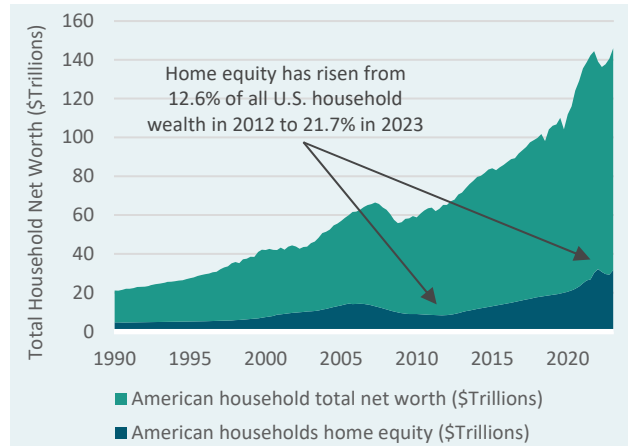
Higher home prices have played a major role in America's booming wealth over the past decade

REAL PERSONAL SPENDING



Source: FRED, as of 8/31/23

AVERAGE HOUSEHOLD NET WORTH



Source: FRED, Verus, as of 6/30/23

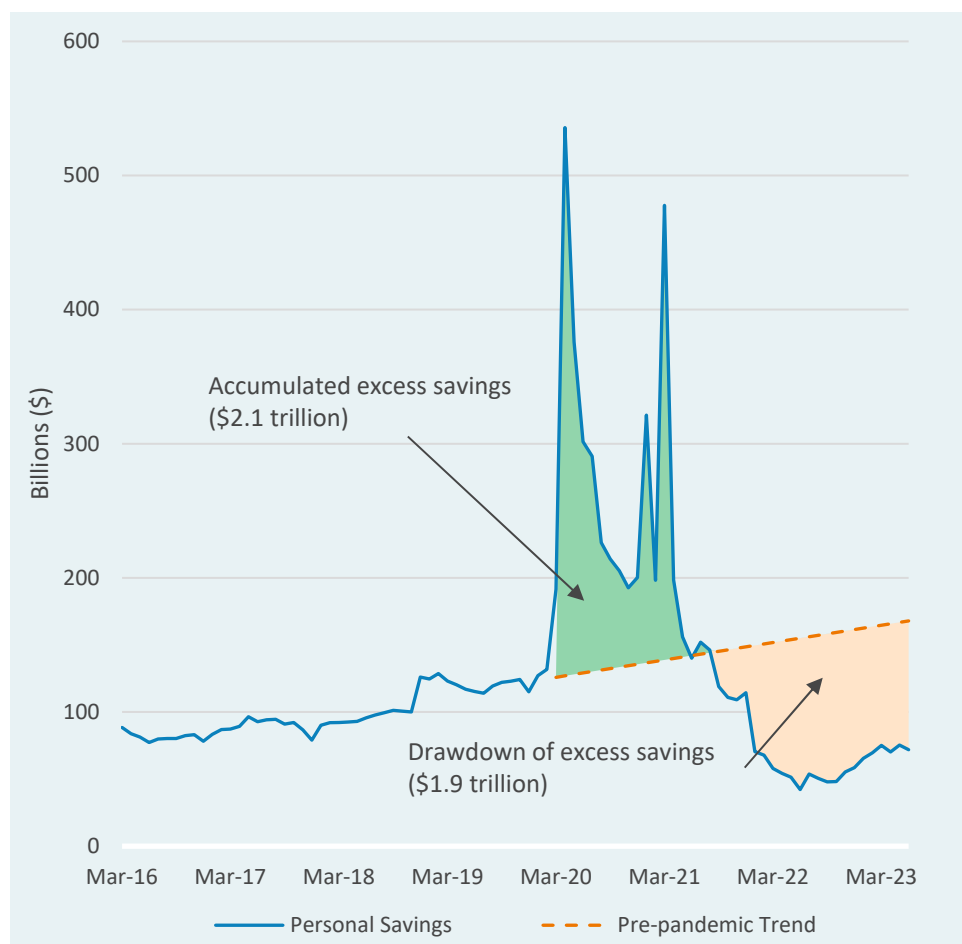
PERSONAL SAVINGS RATE



Source: BEA, as of 8/31/23

The consumer - excess savings wearing off

ACCUMULATED PERSONAL SAVINGS ABOVE PRE-PANDEMIC TREND



The resilience of U.S. consumer spending has been driven at least partly by *excess household savings*, which accumulated during the pandemic as Americans were limited in their ability to spend (on vacations and dining, for example). While these excess savings have recently helped to fuel a stronger economy, savings drawdown rates across the past three, six, or even twelve months suggest that these excess savings were fully depleted by the end of Q3.

Above-average inflation continues to be a drag on the domestic consumer, which can be seen in economic data. Second quarter metrics from the New York Fed's Household Debt and Credit report show an uptick in credit delinquencies, which is likely to show an even higher rate at the Q3 2023 release on November 7th if the trend persists. Although delinquency rates have moved higher, these are at average levels relative to history.

Going forward, many expect consumer conditions to worsen, especially under a *higher for longer* interest rate environment. This would likely act as a headwind to future economic growth, and negatively impact markets in a variety of ways, ranging from corporate earnings to mortgage transactions.

Source: BEA and San Francisco Federal Reserve, as of 8/16/23

Sentiment

Consumer sentiment readings were mixed in the third quarter but by most measures remain pessimistic.

The University of Michigan Consumer Sentiment survey improved, reporting that expectations around personal finances have weakened, though this was offset by better business conditions. Americans feel uncertain about the future of the economy.

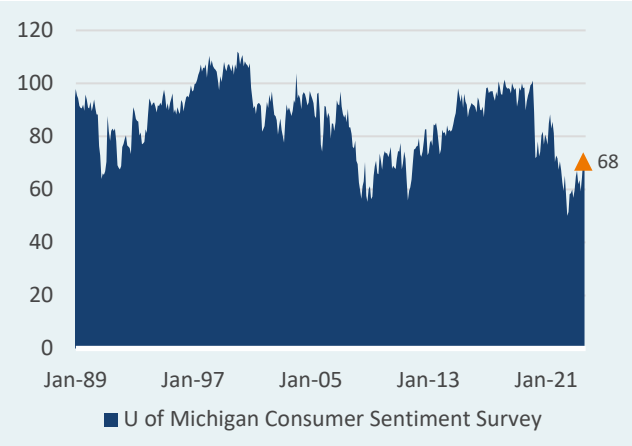
Consumer confidence as indicated by the Conference Board weakened. According to the Conference Board survey, current labor market and business conditions improved moderately,

while the future outlook for income, business, and labor conditions fell very sharply. Consumer expectations are depressed and at levels that historically have signaled recession within one year.

The NFIB Small Business Optimism index was stable during the quarter, but further indicated a dire outlook for business conditions. Sales growth has reportedly slowed, profit margins are being squeezed, inflation continues to be a major concern, and qualified employees are difficult to find. A majority of businesses plan to raise prices, though fewer businesses expect sales revenues to keep up with inflation.

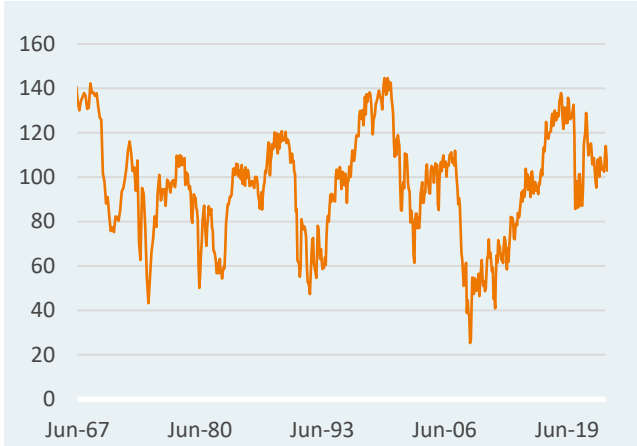
Sentiment was mixed during the quarter but remains poor by most measures

CONSUMER SENTIMENT



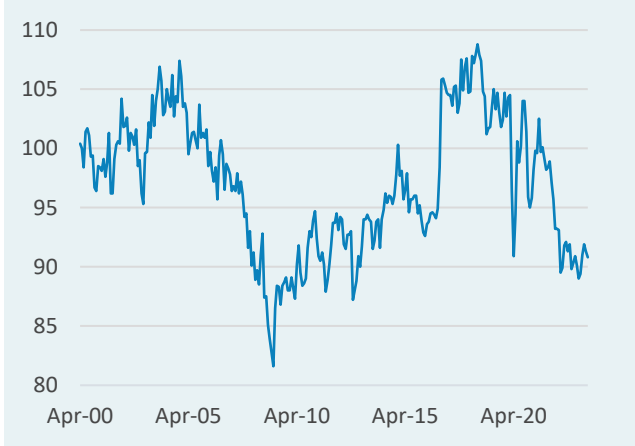
Source: University of Michigan, as of 9/30/23

CONFERENCE BOARD CONSUMER CONFIDENCE



Source: Conference Board, as of 9/30/23

NFIB SMALL BUSINESS SENTIMENT



Source: NFIB, as of 9/30/23

Housing

Housing market conditions have deteriorated even further since last quarter. In late September mortgage rates climbed to a new 23-year high of 7.3%. Existing home sales have fallen -15.3% over the past year, as of August, while affordability remains the worst on record.

Despite higher mortgage rates and extremely poor affordability, home values have held up. This appears to be due to depressed housing inventories resulting from many years of underinvestment in new home construction following the 2000s U.S. housing bubble, an upward trend in U.S. homeownership, and an unwillingness of potential home sellers to sacrifice their existing low mortgage interest rates. Overall,

very low supply seems to be balancing low demand and, for now, providing an ongoing support to elevated prices.

Despite higher interest rates, existing homeowners in this environment are, on average, well-capitalized. Many homeowners refinanced at ultra-low mortgage interest rates in recent years or purchased their homes with a low rate. Mortgage delinquency levels of single-family homeowners were materially below-average at 1.7%, as of Q2. However, borrowers with variable-rate loans, which is a small portion of borrowers overall, may face difficulties in covering much larger monthly mortgage payments.

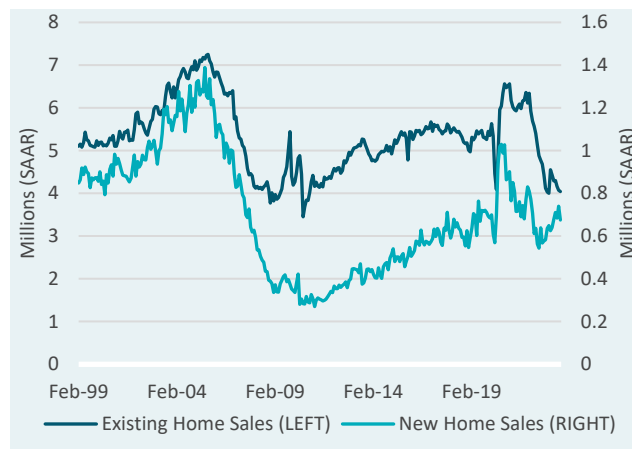
Home sales have slowed to a crawl as affordability is poor, and potential sellers don't want to lose their low interest rates

30-YEAR MORTGAGE RATE



Source: FRED, as of 9/30/23

HOME SALES: NEW & EXISTING (MILLIONS)



Source: FRED, as of 8/31/23

HOUSING AFFORDABILITY



Source: FRED, as of 6/30/23 – Housing affordability is calculated as the cost of a median priced single-family home at the current mortgage rate, as a percentage of the median family income

International economics summary

- Countries struggling to control inflation—primarily advanced economies—face a challenging path. Many central banks are grappling with high prices and slow growth, and the balancing act of fighting inflation but also trying to avoid recession. In contrast, most emerging economies are exceeding growth expectations, outside of China. Some of this strength has come from trade rotation as tensions remain between the U.S. and China and businesses rethink their trade partners.
- The IMF’s October World Economic Outlook was little changed from July Projections, as global growth is still expected to slow in 2024. Regional divergences remained an emphasis, as emerging economies are projected to drive global output. India is expected to outpace all other countries with growth forecasts above 6% for both 2023 and 2024.
- Inflation in the Eurozone and United Kingdom has remained sticky, with inflation in September coming in at 4.3% and 6.7% year-over-year, respectively. Monetary policy is expected to be tighter for both the ECB and BOE, although rate decisions diverged at their respective September meetings, as the ECB raised rates by another 25 bps, while the BOE voted 5-4 to maintain their bank rate at 5.25%.
- Japan was a bright spot amongst developed economies, driven by strong exports in the second quarter. While growth was positive, the potential for an early end to ultra loose Bank of Japan (BOJ) monetary policy presents a potential headwind. A weak Japanese Yen adds to this story, as the currency has been greatly devalued, largely due to the BOJ’s contrarian monetary policy relative to other major central banks.

Area	GDP (Real, YoY)	Inflation (CPI, YoY)	Unemployment
United States	2.9% 9/30/23	3.7% 9/30/23	3.8% 9/30/23
Eurozone	0.5% 6/30/23	4.3% 9/30/23	6.4% 8/31/23
Japan	1.6% 6/30/23	2.8% 9/30/23	2.7% 8/31/23
BRICS Nations	6.1% 6/30/23	1.7% 9/30/23	4.8% 12/31/22
Brazil	3.4% 6/30/23	5.2% 9/30/23	7.8% 8/31/23
Russia	4.9% 6/30/23	6.0% 9/30/23	3.0% 8/31/23
India	7.8% 6/30/23	5.0% 9/30/23	7.1% 9/30/23
China	4.9% 9/30/23	0.0% 9/30/23	5.0% 9/30/23

NOTE: India lacks reliable government unemployment data. Unemployment rate shown above is estimated from the Centre for Monitoring Indian Economy. The Chinese unemployment rate represents the monthly surveyed urban unemployment rate in China.

International economics

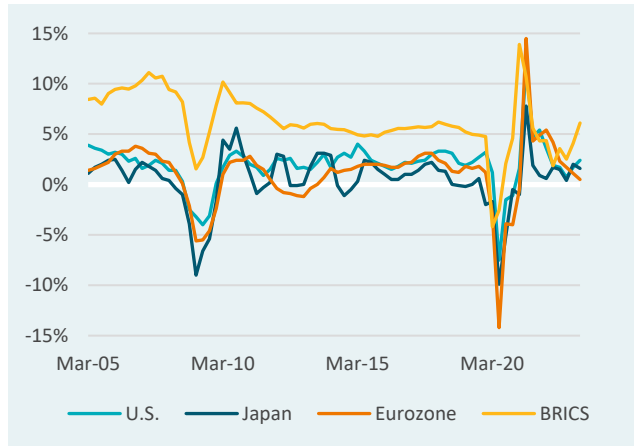
International economies showed signs of slowing during the third quarter. While growth decelerated, economies have shown greater resilience to inflation and higher interest rate headwinds than originally expected.

Countries struggling to control inflation—primarily advanced economies—face a challenging path. Many central banks are grappling with high prices and slow growth, and the balancing act of fighting inflation but also trying to avoid recession. In contrast, most emerging economies are exceeding growth expectations, outside of China. Some of this strength has come

from trade rotation as tensions remain between the U.S. and China and businesses rethink their trade partners.

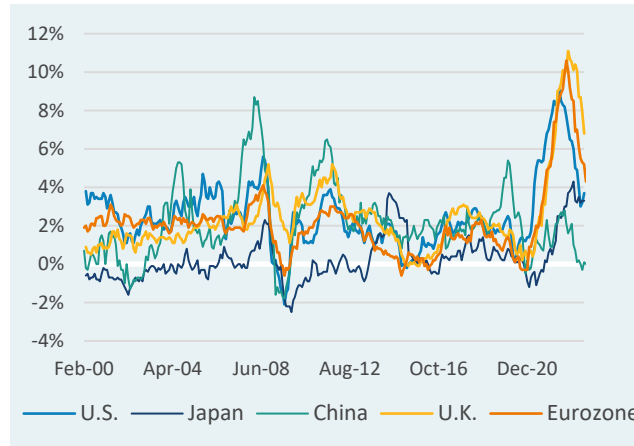
The outlook remains uncertain. Strong growth driven by services has started to wear off, while manufacturing activity remains depressed. Developed economies within the Eurozone and United Kingdom struggle with inflation, while China deals with its own domestic issues. Japan and India showed signs of strength, but are likely unable to buoy global economic growth, especially if the current issues plaguing larger nations persist.

REAL GDP GROWTH (YOY)



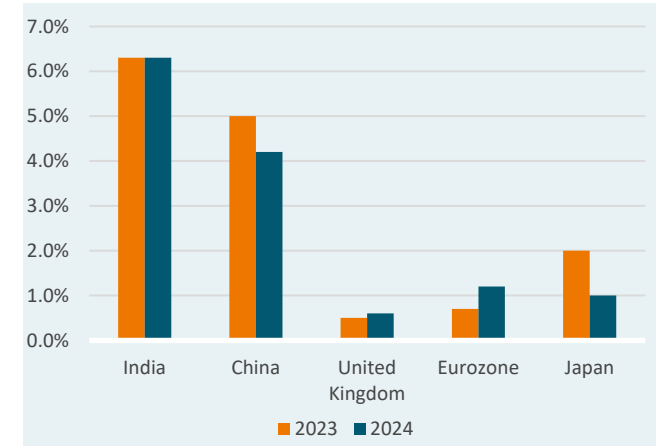
Source: Bloomberg, as of 6/30/23

INFLATION (CPI YOY)



Source: Bloomberg, as of 9/30/23 – or most recent release

IMF WEO REAL GROWTH FORECASTS



Source: IMF World Economic Outlook Oct. 2023, as of 10/10/23

International economics

	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23
Manufacturing													
Global	50.3	49.8	49.4	48.8	48.7	49.1	49.9	49.6	49.6	49.5	48.7	48.6	49.0
Developed	50.2	50.1	48.8	47.8	47.3	48.0	48.1	48.4	48.5	47.6	46.3	47.1	46.8
US	52.9	51.0	50.0	49.0	48.4	47.4	47.7	46.3	47.1	46.9	46.0	46.4	47.6
UK	47.3	48.4	46.2	46.5	45.3	47.0	49.3	47.9	47.8	47.1	46.5	45.3	43.0
Eurozone	49.6	48.4	46.4	47.1	47.8	48.8	48.5	47.3	45.8	44.8	43.4	42.7	43.5
Germany	49.1	47.8	45.1	46.2	47.1	47.3	46.3	44.7	44.5	43.2	40.6	38.8	39.1
Japan	51.5	50.8	50.7	49.0	48.9	48.9	47.7	49.2	49.5	50.6	49.8	49.6	49.6
EM	50.2	49.3	49.8	49.7	49.8	49.9	51.6	50.7	50.5	51.4	51.1	50.2	51.4
Services													
Global	49.3	50.0	49.2	48.1	48.0	50.1	52.6	54.4	55.4	55.5	53.9	52.7	51.1
Developed	46.7	49.6	48.8	47.5	47.2	48.7	51.8	53.4	54.6	54.9	53.6	51.9	50.2
US	56.1	55.9	54.5	55.5	49.2	55.2	55.1	51.2	51.9	50.3	53.9	52.7	54.5
UK	50.9	50.0	48.8	48.8	49.9	48.7	53.5	52.9	55.9	55.2	53.7	51.5	49.5
Eurozone	49.8	48.8	48.6	48.5	49.8	50.8	52.7	55.0	56.2	55.1	52.0	50.9	47.9
Germany	47.7	45.0	46.5	46.1	49.2	50.7	50.9	53.7	56.0	57.2	54.1	52.3	47.3
Japan	49.5	52.2	53.2	50.3	51.1	52.3	54.0	55.0	55.4	55.9	54.0	53.8	54.3
EM	54.9	50.6	49.9	49.2	50.1	53.1	54.5	56.7	57.2	56.7	54.6	54.5	53.1

Service sectors – which have recently driven global strength – are now showing signs of moderation, while manufacturing sectors remains depressed

European markets seem to reflect the weakest future business conditions

Source: Bloomberg, as of 8/31/23 – The Purchasing Managers' Index (PMI) is an index based on a broad survey of supply chain managers across nineteen industries in each country. The survey gauges business sentiment, with a reading of below 50 indicating that businesses expect business conditions to worsen in the near-future. A reading of 50 indicates no expected change in business conditions. A reading above 50 indicates expectations for stronger (expanding) future business conditions.

Fixed income rates & credit

Fixed income environment

- The 10-year U.S. Treasury yield increased during the quarter from 3.81% to 4.58%—a level not seen since 2007—likely supported by *higher for longer* interest rate expectations. This has led to a flattening of the yield curve, though the curve remains inverted at -0.5% (defined as the 10-year Treasury yield minus 2-year Treasury yield).
- Rising interest rates combined with lower inflation have brought real (inflation-adjusted, based on the U.S. TIPS Inflation Breakeven Rate) 10- and 30-year Treasury yields to the highest levels in over a decade. Real yields for 10- and 30-year Treasuries finished the month at 2.24% and 2.33%, respectively. In March of 2022 these rates were negative.
- The Federal Reserve hiked interest rates by 0.25% in July but held rates steady at the September meeting as inflation moderated. Importantly, Chairman Powell signaled that additional rate hikes may be warranted if the economy remains strong and inflation above target.
- During Q3, higher quality bonds and U.S. Treasuries saw mild losses due primarily to their longer duration profile. Riskier credit performed well, with larger coupons and shorter duration contributing to positive performance.
- Longer duration investment grade corporate bonds (Bloomberg U.S. Long Corporate Credit) performed very poorly, falling by -7.3% during the quarter as rising interest rates acted as a headwind.
- With inflation moderating during the quarter, investors expressed optimism that the Federal Reserve would soon pause interest rate hikes. However, interest rate volatility increased during the period as concerns related to the U.S. government's budget deficit and the amount of expected issuance contributed to higher long-term bond yields.

	QTD Total Return	1 Year Total Return
Core Fixed Income (Bloomberg U.S. Aggregate)	(3.2%)	0.6%
Core Plus Fixed Income (Bloomberg U.S. Universal)	(2.9%)	1.6%
U.S. Treasuries (Bloomberg U.S. Treasury)	(3.1%)	(0.8%)
U.S. Treasuries: Long (Bloomberg U.S. Treasury 20+)	(13.0%)	(10.7%)
U.S. High Yield (Bloomberg U.S. Corporate HY)	0.5%	10.3%
Bank Loans (S&P/LSTA Leveraged Loan)	3.4%	13.0%
Emerging Market Debt Local (JPM GBI-EM Global Diversified)	(3.3%)	13.1%
Emerging Market Debt Hard (JPM EMBI Global Diversified)	(2.2%)	10.0%
Mortgage-Backed Securities (Bloomberg MBS)	(4.1%)	(0.2%)

Source: Bloomberg, as of 9/30/23

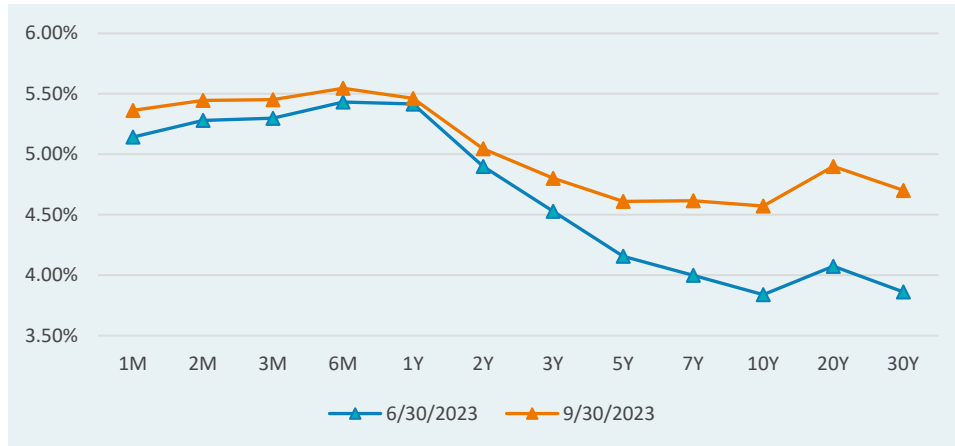
A higher for longer rate environment

The “higher for longer” narrative gained steam throughout the quarter, driven by better-than-expected economic and labor metrics, above target inflation, and rising energy costs. The bond market saw the largest impact, as yields on the 10-year Treasury rose from 3.84% to 4.57% throughout the quarter, resulting in a -13.0% loss for longer-term U.S. Treasuries (Bloomberg U.S. Treasury 20+ Year Index).

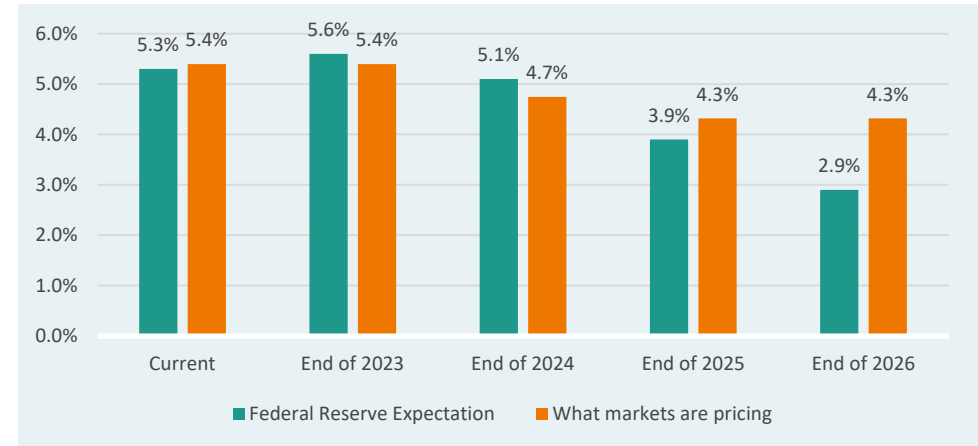
The yield of cash is expected to remain elevated for years into the future

A floor regarding how far inflation can fall, given price dynamics of certain goods and services, has set inflation expectations closer to levels around three to four percent, outpacing the Federal Reserve’s two-percent mandate. This has brought rates higher, while also extending the expected timeline for higher rates. Implied rates on Fed Funds Futures contracts show rates remaining above four percent throughout the start of 2025.

U.S. TREASURY YIELD CURVE – CHANGE THROUGH Q3 2023



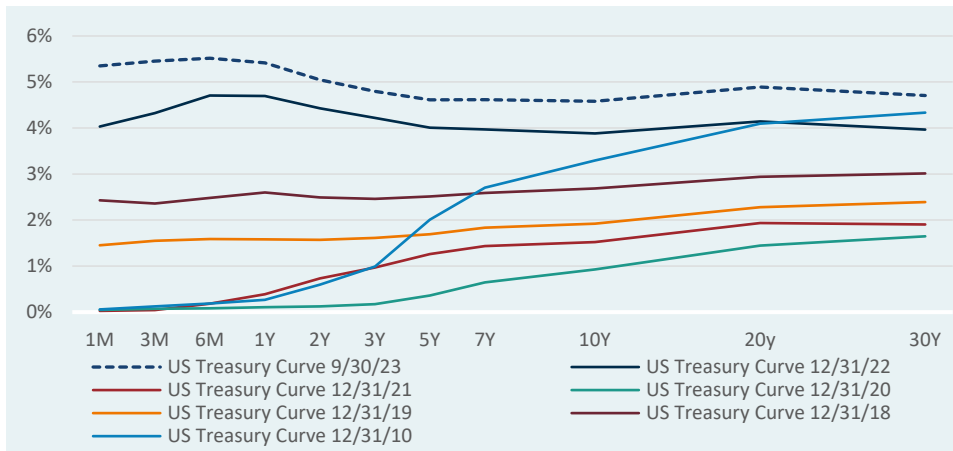
FUTURE EXPECTATIONS FOR THE % YIELD OF CASH



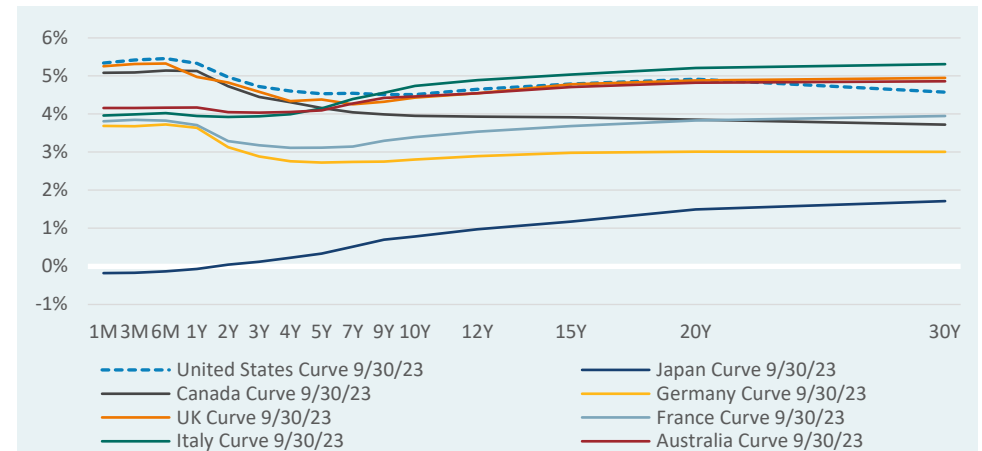
Source: Bloomberg, as of 9/30/23

Yield environment

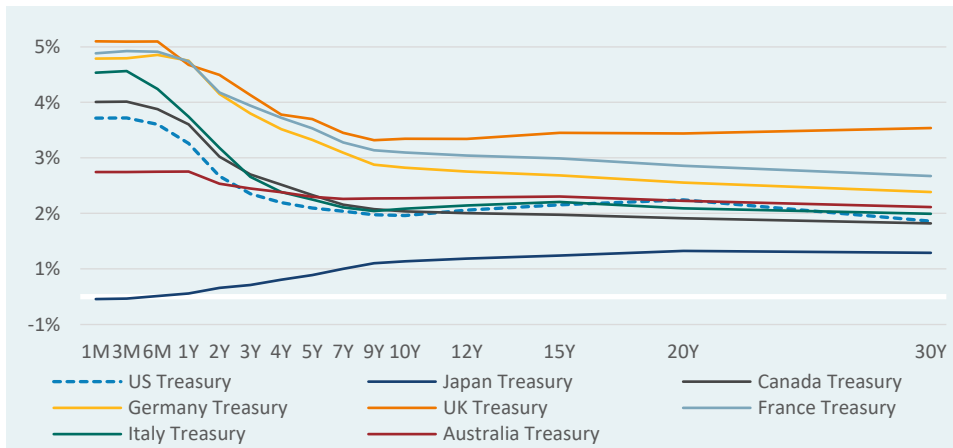
U.S. YIELD CURVE



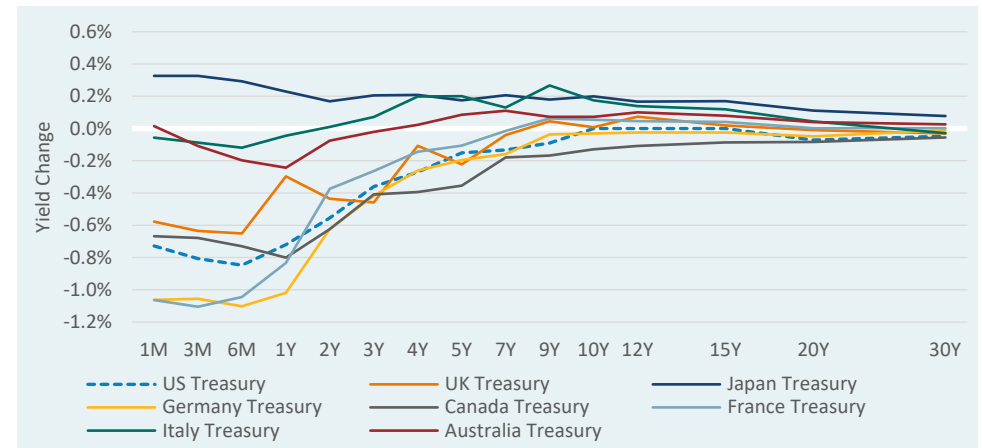
GLOBAL GOVERNMENT YIELD CURVES



YIELD CURVE CHANGES OVER LAST FIVE YEARS



IMPLIED CHANGES OVER NEXT YEAR



Source: Bloomberg, as of 9/30/23

Credit environment

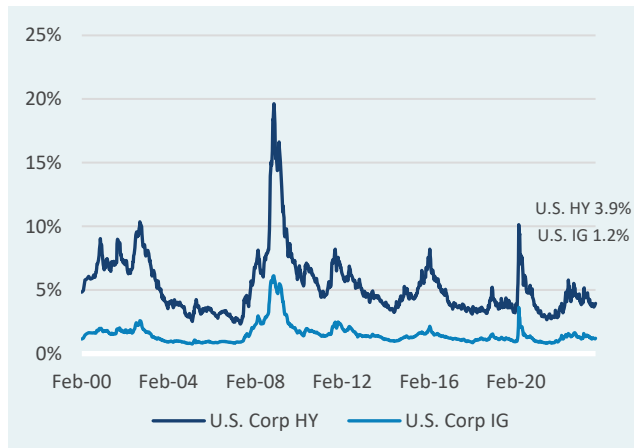
During the third quarter, fixed income markets delivered positive results with lower-quality credits such as high yield bonds and bank loans outperforming higher-quality credits. High yield bonds returned 0.5% (Bbg U.S. Corporate High Yield), while bank loans delivered a stronger 3.4% (CS Leveraged Loans), aided primarily by the lower duration of these bonds. Longer duration investment grade corporate bonds (Bloomberg U.S. Long Corporate Credit) performed poorly, falling by -7.3% during the quarter as rising interest rates acted as a headwind.

Similar to Q2, lower quality CCC-rated bonds outperformed BB- and B-rated bonds during the period. CCC-rated bonds returned 2.8% for the quarter compared to 1.0% and -0.3% for B-rated and BB-rated bonds, respectively. Bank loans also delivered an impressive 3.4% return,

with rising interest rates providing a mild tailwind to performance (floating rate bonds reprice as rates are rising, improving returns).

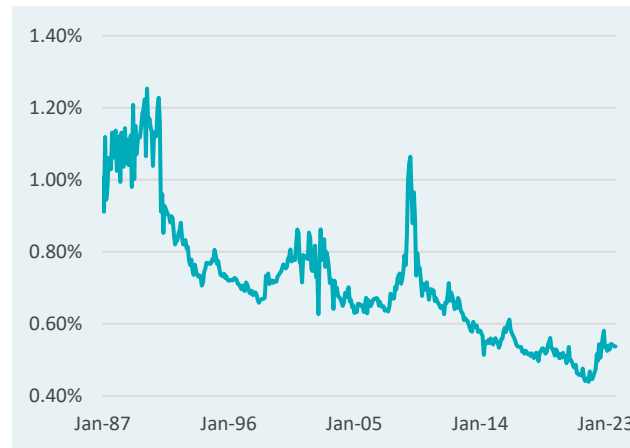
Credit spreads were broadly unchanged during the quarter despite concerns related to an economic slowdown, the potential for higher interest rates, increased credit stress, and lower equity prices. Lower-quality, CCC-rated high-yield bond spreads fell by 0.2% to 9.2%, while investment grade spreads decreased by roughly 0.1% to 1.3%. Broadly, spreads remain slightly below their long-term historical averages, which suggests that investors remain confident about the ability of those companies to service their debt. That said, should the U.S. economy begin to weaken, credit spreads could move higher as confidence fades.

SPREADS



Source: Barclays, Bloomberg, as of 9/30/23

HIGH YIELD BONDS MONTHLY INCOME RETURN



Source: Bloomberg, as of 9/30/23

CREDIT SPREAD (OAS)

Market	9/30/23	9/30/22
Long U.S. Corp	1.3%	2.0%
U.S. Inv Grade Corp	1.2%	1.6%
U.S. High Yield	3.9%	5.5%
U.S. Bank Loans*	5.2%	6.0%

Source: Barclays, Credit Suisse, Bloomberg, as of 9/30/23

*Discount margin (4-year life)

Default & issuance

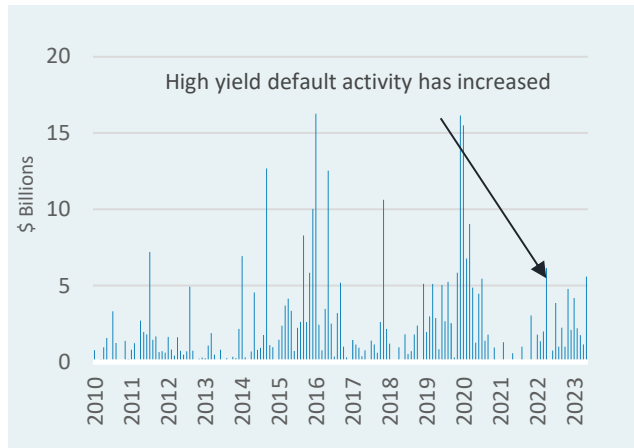
Default activity declined during Q3, to the lowest quarterly levels of 2023. Fourteen companies defaulted, which were concentrated in the Retail, Autos, Media, Technology, and Gaming sectors. A total of \$11.5 billion of bank loans and high yield bonds were affected by default or distressed exchanges, down from \$17.9 billion in the prior quarter. Notable company defaults included Carvana (Autos), Digital Media Solutions (Media), Exela Intermed (Technology), and Maverick (Gaming).

However, year-to-date default rates for both high-yield bonds and bank loans were higher than the first three quarters of 2022, totaling \$63 billion. High yield bond default rates have increased to roughly 2.5%, but are still below the long-term annual average of roughly 3.2%. High-yield

default recovery rates rose slightly to 35%, up from 33% during the previous quarter.

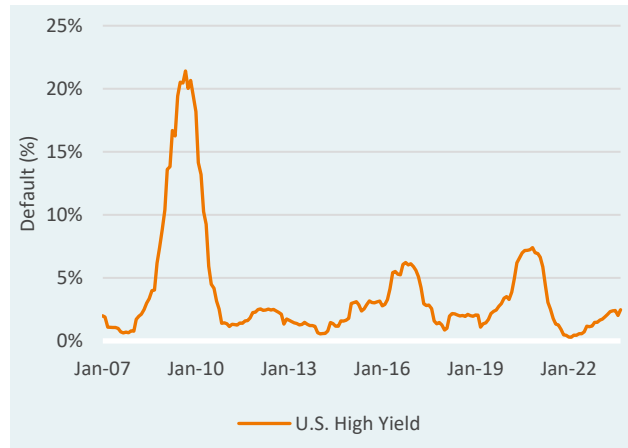
The issuance of investment-grade credit slowed from the prior quarter, down to roughly \$275 billion versus \$333 billion. Similarly, fewer lower quality companies issued new debt. High-yield bond issuance fell to \$40 billion, down from \$56 billion in Q2. As borrowing costs have jumped, the pace of both investment-grade and high yield issuance has been impacted. Although issuance overall remains dampened relative to history, high-yield issuance year-to-date is already greater than the total of 2022, and investment-grade bonds appear on track to match 2022 activity levels. It appears that a significant portion of issuance has moved into the private markets, creating opportunities for private allocations.

U.S. HY MONTHLY DEFAULTS (PAR WEIGHTED)



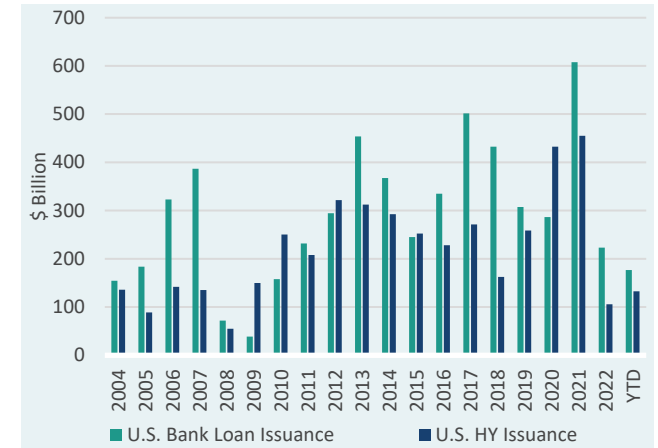
Source: BofA Merrill Lynch, as of 9/30/23

U.S. HY SECTOR DEFAULTS (LAST 12 MONTHS)



Source: BofA Merrill Lynch, as of 9/30/23 – par weighted

DEVELOPED MARKET ISSUANCE (\$ BILLIONS)



Source: BofA Merrill Lynch, all developed markets, as of 9/30/23

Equity

Equity environment

- Global equities delivered negative performance during the quarter (MSCI ACWI -3.4%). Weakness in markets was broad-based, with international developed (MSCI EAFE -4.1%) slightly underperforming domestic and emerging market equities (S&P 500 -3.3%, MSCI EM -2.9%).
- Over the quarter, the valuation gap between domestic and international equities grew even larger. An analysis of international developed Price/Earnings ratios shows that all sectors currently hold a valuation discount relative to U.S. shares, and that those discounts are generally much wider than the historical average.
- Currency movements dragged portfolio performance lower for investors with unhedged foreign currency exposure. Investors with unhedged international developed equity exposure saw losses of -

3.6% due to currency volatility during the quarter.

- U.S. investors continue to face a difficult environment for style factor investing. Over the past year, mega cap growth stocks have propelled the U.S. market higher, leading to dramatic outperformance of growth stocks and large cap stocks. However, value investing has delivered exceptional results in international developed markets, with value stocks outperforming growth by 11.5%.
- The Cboe VIX implied volatility index remained below-average for most of the third quarter, before rising to 17.5% to end September. Market risk has been falling fairly consistently throughout the year.

	QTD TOTAL RETURN		1 YEAR TOTAL RETURN	
	(unhedged)	(hedged)	(unhedged)	(hedged)
U.S. Large Cap (S&P 500)	(3.3%)		21.6%	
U.S. Small Cap (Russell 2000)	(5.1%)		8.9%	
U.S. Equity (Russell 3000)	(3.3%)		20.5%	
U.S. Large Value (Russell 1000 Value)	(3.2%)		14.4%	
US Large Growth (Russell 1000 Growth)	(3.1%)		27.7%	
Global Equity (MSCI ACWI)	(3.4%)	(2.3%)	20.8%	20.4%
International Large (MSCI EAFE)	(4.1%)	(0.5%)	25.6%	24.1%
Eurozone (EURO STOXX 50)	(7.7%)	(4.3%)	39.4%	33.0%
U.K. (FTSE 100)	(1.9%)	2.2%	25.3%	16.0%
Japan (TOPIX)	(1.0%)	4.0%	25.7%	36.6%
Emerging Markets (MSCI Emerging Markets)	(2.9%)	(1.3%)	11.7%	11.1%

Source: Russell Investments, MSCI, STOXX, FTSE, JPX, as of 9/30/23

Domestic equity

Domestic equities finished lower to end the quarter, breaking the previous three consecutive quarters of gains. The S&P 500 Index ended September down -3.3%, alongside losses across all other regional equity groups. Strong gains in July—influenced by better-than-expected earnings—were pared by losses in August and September as the *higher for longer* narrative raised recession fears while also helping to push Treasury yields significantly higher.

Early Q3 gains were driven by a continued rally across mega-cap technology names and better-than-expected earnings. Second quarter earnings marked the third straight quarter of year-over-year declines, yet the -4.1% fall was much better than the initially feared -7.0% projection

by FactSet. From a sector perspective, equity movements were less concentrated relative to the prior quarter. Energy was an outlier, where the sector’s +12.2% gain was a function of higher oil prices due primarily to supply related issues.

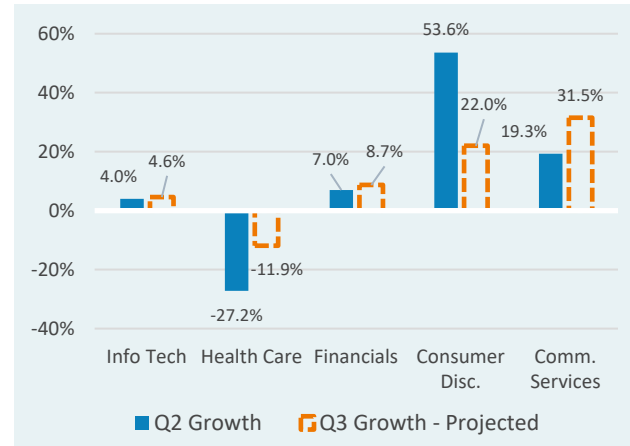
Going forward, domestic equities remain challenged on both the earnings and valuations front. Earnings growth is expected to decline for the fourth straight quarter, although stable expectations amongst the S&P 500’s largest sectors could provide an anchor. Earnings stability of some of the largest index names may also be contributing to higher valuations, which remain expensive relative to international developed and emerging market equities.

S&P 500 PRICE INDEX



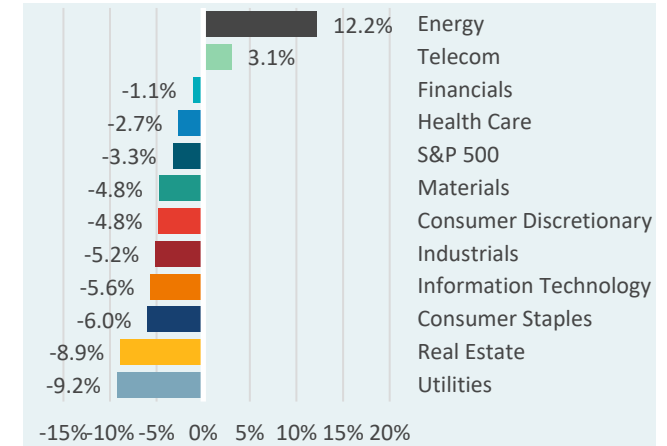
Source: Bloomberg, as of 9/30/23

FIVE LARGEST SECTORS EPS GROWTH YOY



Source: FactSet, as of 9/30/23

Q3 2023 SECTOR PERFORMANCE



Source: Morningstar, as of 9/30/23

Domestic equity size & style

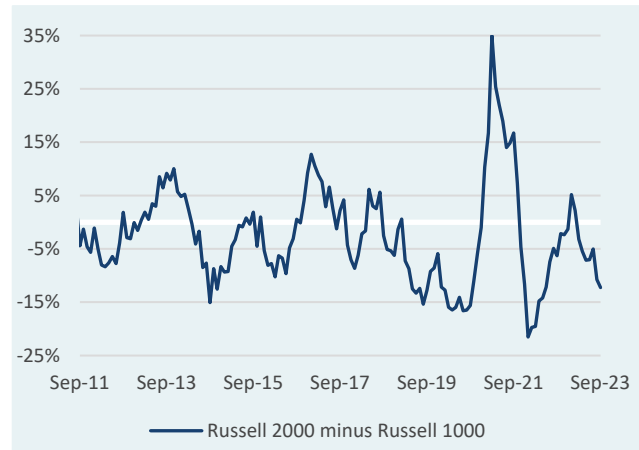
Investors continue to face a difficult environment for style factor investing. Value underperformed growth mildly during the quarter (-3.2% vs. -3.1%), with sector trends appearing to have had less of an impact on value vs. growth stocks during Q2. Small cap equities materially lagged large caps (-5.1% vs -3.3%). *Higher for longer* rate expectations likely contributed to a repricing of growth-focused assets that are more sensitive to interest rate fluctuations.

Over the past year, mega cap growth stocks have propelled the U.S. market higher, leading to dramatic outperformance

of growth stocks and large cap stocks. Many of these market-leading stocks are concentrated in the Information Technology and Telecom sectors, which have outperformed the overall index (+41.1% and 38.5%, respectively).

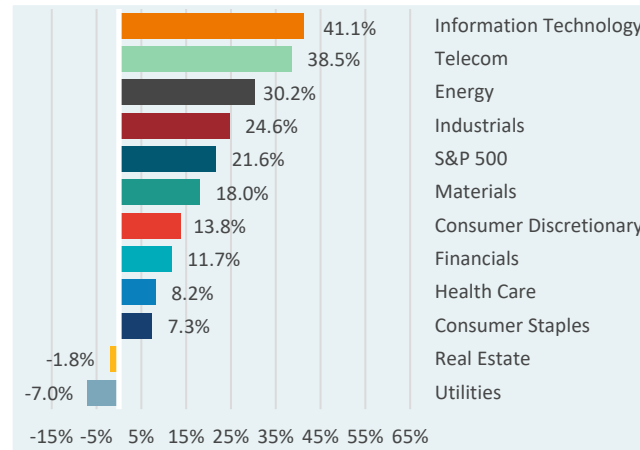
In recent years value stocks have been extremely cheap. Value has rarely been this discounted relative to growth, and during the few historical periods when this was the case, value outperformed significantly. However, value has failed to deliver similar outperformance during the current period.

SMALL CAP VS LARGE CAP (YOY)



Source: FTSE, as of 9/30/23

VALUE VS GROWTH (YOY)



Source: Morningstar, as of 9/30/23

1-YEAR SIZE & STYLE PERFORMANCE

	Value	Core	Growth
Large Cap	14.4%	21.2%	27.7%
Mid Cap	11.0%	13.4%	17.5%
Small Cap	7.8%	8.9%	9.6%

Source: FTSE, as of 9/30/23

International developed equity

International developed shares fell -4.1% during Q3 in unhedged currency terms, underperforming U.S. and emerging markets. However, international developed equities in hedged currency terms were the best performing markets (returning -0.5%), as currency hedging would have avoided the U.S. dollar surge fueled by a *higher for longer* interest rate narrative.

Underperformance within the Eurozone dragged the overall index lower, with the STOXX 50 Index falling -7.7% over the quarter in unhedged terms—the worst performer across regional indices. The broader bloc continues to struggle to bring down inflation, while policymakers also deal with stagnant economic growth. In contrast to weakness seen from European

shares, Japanese equities delivered another quarter of positive performance in unhedged terms (TOPIX -1.0%), and significant outperformance in currency hedged terms (+4.0%). While a weaker Japanese Yen (JPY) hurt performance in U.S. dollar terms, the weak JPY has boosted local corporate earnings. These currency movements combined with meaningful inflation and equity reforms—meant to spark investment in wages, higher growth, and therefore shareholder value—have been a tailwind to strong year-over-year Japanese equity performance.

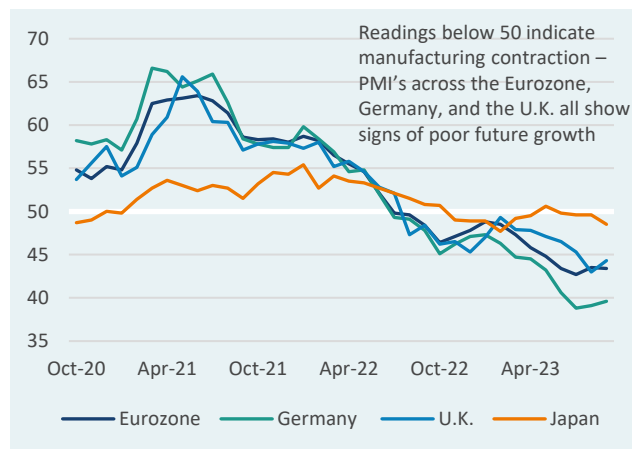
Overall, we believe international developed equities are less attractive in the near-term, specifically due to the economic headwinds facing the U.K. and broader Eurozone.

INTERNATIONAL DEVELOPED EQUITY



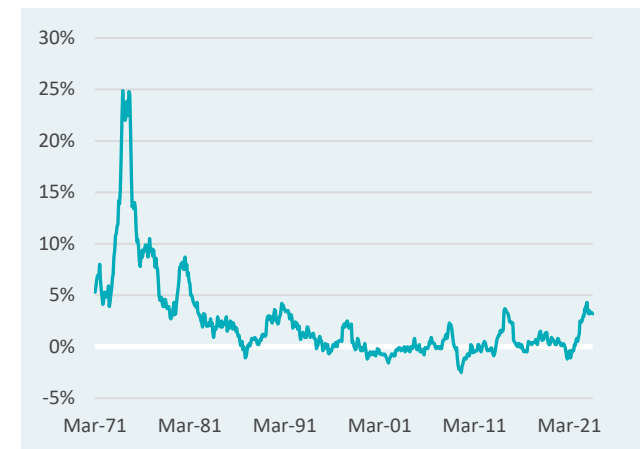
Source: MSCI, as of 9/30/23

MANUFACTURING PMI



Source: S&P Global, as of 9/30/23

JAPANESE CPI



Source: Japan MIC, as of 8/31/23

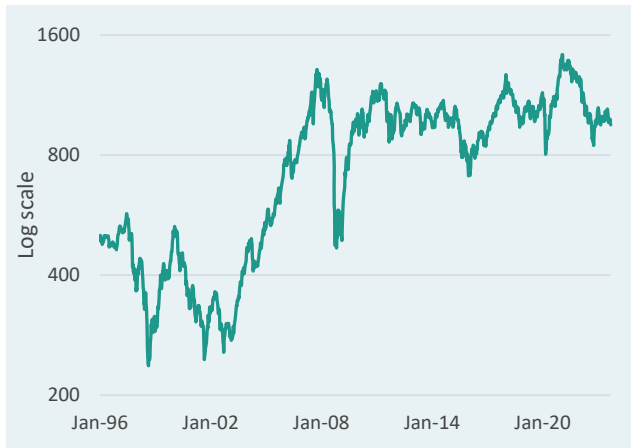
Emerging market equity

Emerging market equities outperformed domestic equities and international developed equities in Q3. The MSCI EM Index fell -2.9%, while the S&P 500 was -3.3% lower and the MSCI EAFE Index dropped -4.1%. Emerging markets have provided only a 2.1% annualized return over the past decade.

From an individual country perspective, the two largest weights in the index—China and India—outperformed, although Chinese equities were still -1.9% lower. This impact counterbalanced losses across other markets, since the combined weight of both countries makes up approximately 45% of the MSCI Emerging Markets Index.

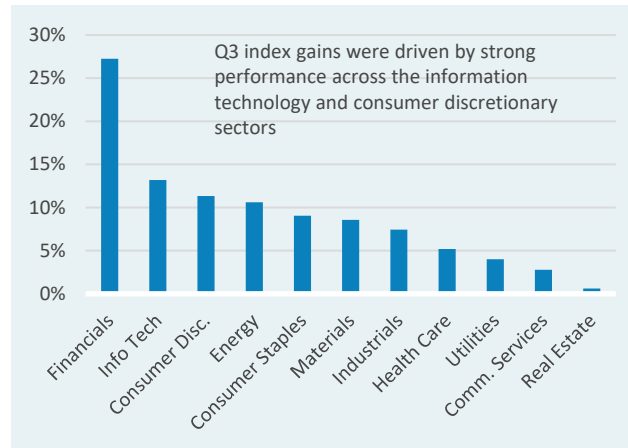
Emerging market equities continue to offer fairly cheap valuations, yet sentiment has grown negative, especially as concerns around China are now mainstream. Outside of geopolitical tensions, the Chinese economy continues to show signs of struggle despite some small government stimulus efforts. The property market remains a large pain point, evidenced by credit stress and falling contracted sales amongst large property developers such as Country Garden and Evergrande.

EMERGING MARKET EQUITY



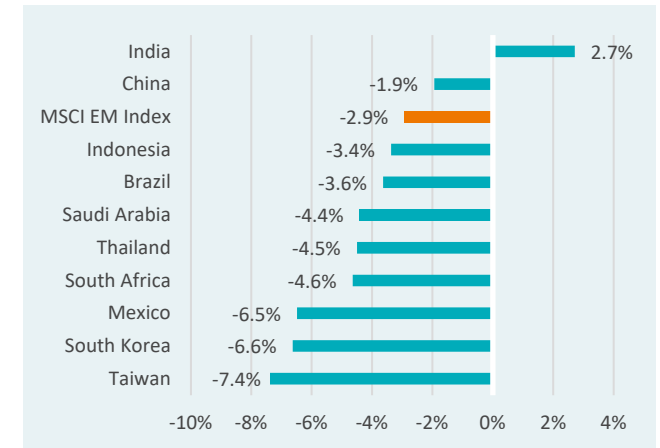
Source: MSCI, as of 9/30/23

MSCI INDIA SECTOR WEIGHTS



Source: MSCI, as of 9/30/23

Q3 2023 MSCI EM COUNTRY RETURNS (USD)



Source: Bloomberg, MSCI, as of 9/30/23

Equity valuations

Equity valuation disparities have grown even wider. U.S. equities are now priced at more than a 60% valuation premium (Price/Earnings) over international developed, averaging 22.5 and 13.8, respectively, during the quarter. Some of this gap can be explained by the greater concentration of U.S. markets in the technology sector, which tends to command higher valuations. However, as we see on the next slide, nearly all sectors are materially more expensive in U.S. markets relative to international developed markets.

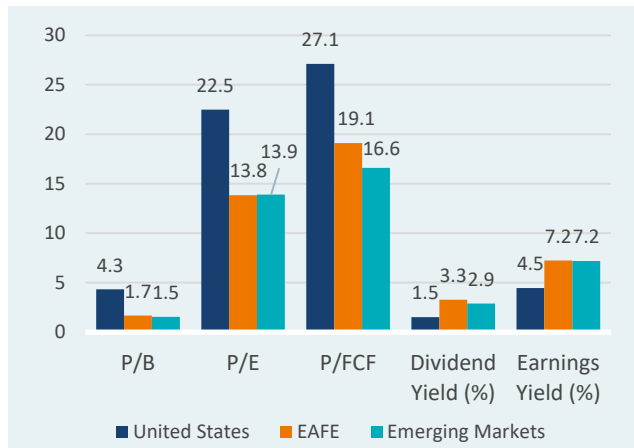
Despite very large valuation differences, we believe international developed equities currently provide lower

growth potential and unique challenges which may lead to further near-term underperformance relative to U.S. equities.

Core fixed income now offers a yield greater than U.S. equities for the first time in more than two decades. Quickly rising interest rates should have theoretically resulted in a sharp fall in equity valuations in order to maintain the “equity risk premium” of stock returns over bond returns. This effect has not yet occurred, which may lead many investors to view bonds as relatively attractive (and stocks relatively less attractive) in the current environment.

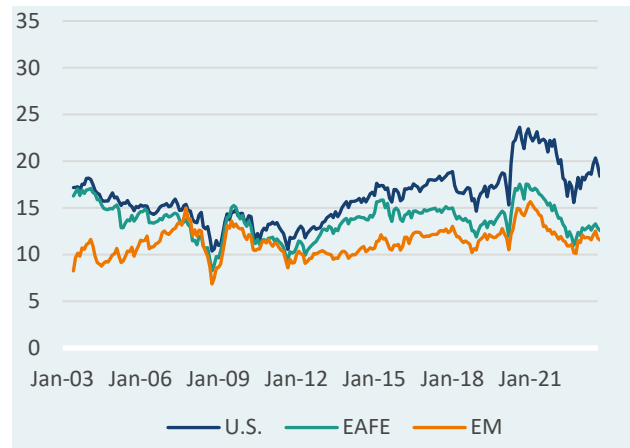
Core fixed income is yielding more than equities for the first time in two decades

MSCI VALUATION METRICS (3-MONTH AVG)



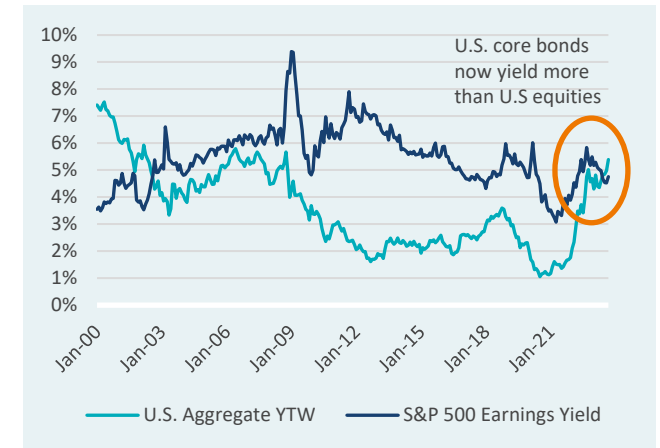
Source: Bloomberg, as of 9/30/23

FORWARD PRICE/EARNINGS RATIO



Source: MSCI, Bloomberg, as of 9/30/23

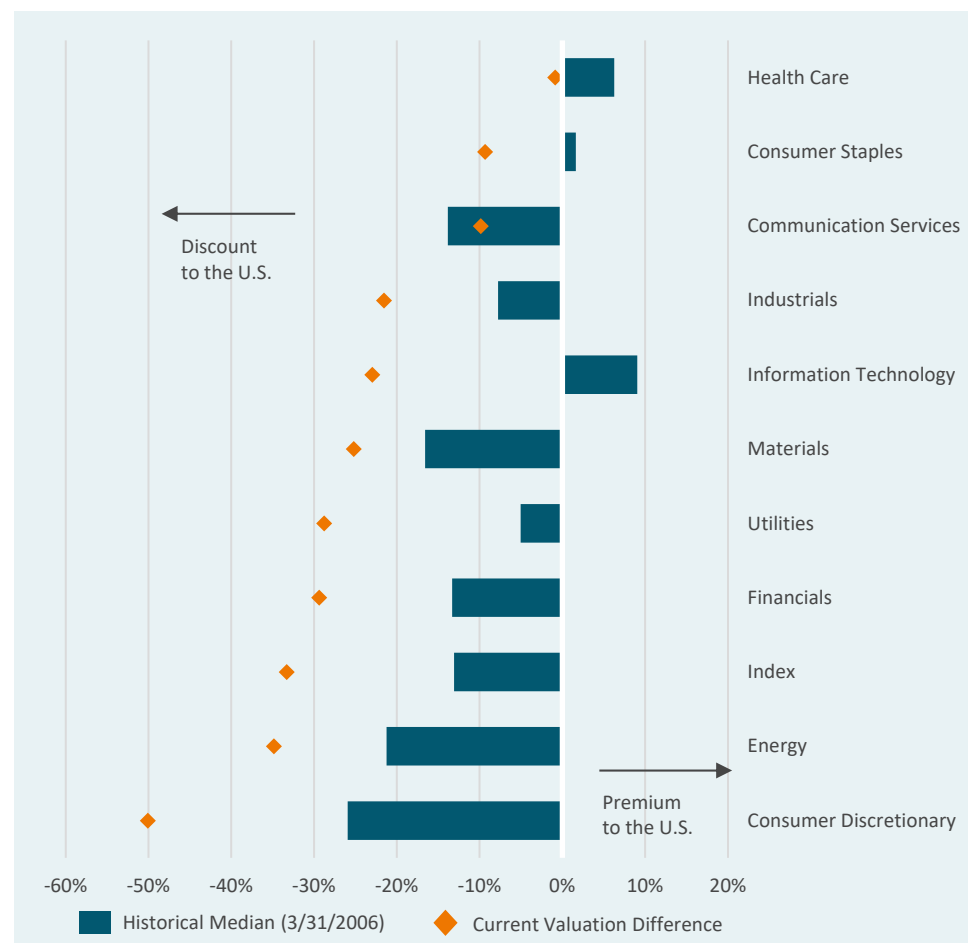
U.S. VALUATIONS: BONDS VS. STOCKS



Source: Bloomberg, Standard & Poor's, as of 9/30/23

International developed valuations

MSCI EAFE VALUATIONS RELATIVE TO U.S. VALUATIONS



Over the quarter, the valuation gap between domestic and international equities grew even larger. Sector weightings play a large role when evaluating the broader indices, as the U.S. holds a larger weight in growth-focused sectors such as Information Technology which tends to command a higher valuation.

The valuation disparity between U.S. and international developed equities has been a topic of interest recently, since historically these markets have shown a much smaller discount relative to one another.

An analysis of international developed Price/Earnings ratios shows that all sectors currently hold a valuation discount relative to U.S. shares, and that those discounts are generally much wider than the historical average.

Despite very large valuation differences, we believe international developed equities currently provide lower growth potential and unique challenges which may lead to further near-term underperformance relative to U.S. equities. Specifically, stagnant economic growth and higher inflation in the Eurozone and U.K. may result in headwinds.

Source: Bloomberg, MSCI, as of 9/30/23

Market volatility

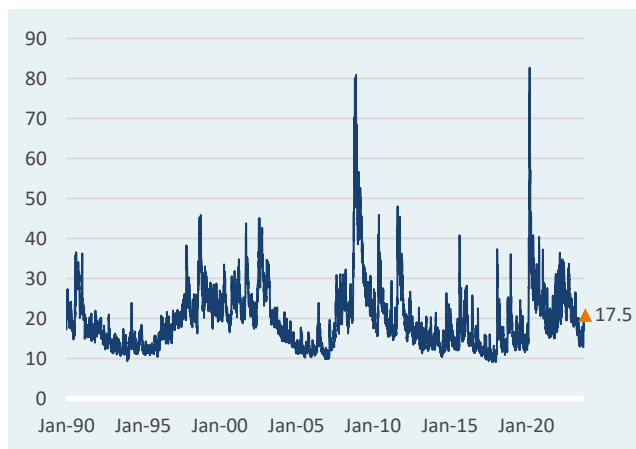
The Cboe VIX implied volatility index remained below-average for most of the third quarter, before rising to 17.5 to end September. Market risk has been falling fairly consistently throughout the year, which may be at least partly attributed to the perception that certain risks, such as regional bank contagion and near-term recession, seem to have eased.

Realized volatility of global equity markets has moderated, and is around average on a one-year basis. Emerging markets are an exception, displaying persistent elevated volatility. In contrast to recent years when emerging market volatility was

lower than that of developed markets—an uncommon occurrence historically speaking—this trend has now reversed.

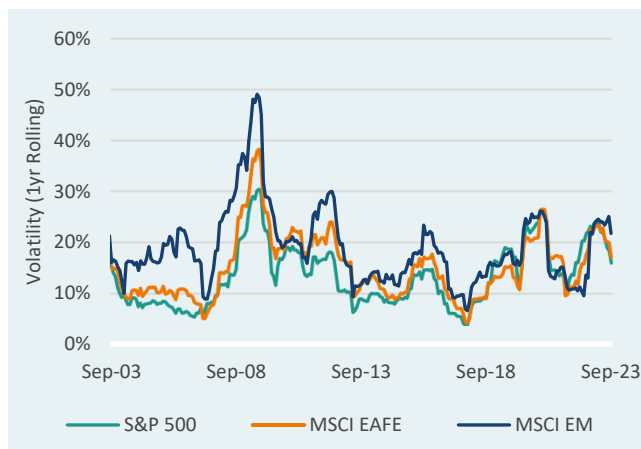
Bond markets have shown some shakiness, as indicated by the “MOVE” Index—which calculates the implied volatility of U.S. Treasury securities. This index has risen to levels not seen since the 2020 COVID-19 market selloff. Uncertainty around the Federal Reserve’s interest rate path, potential recession, and the worsening U.S. fiscal situation, are likely contributing to greater Treasury market volatility.

U.S. IMPLIED VOLATILITY (VIX)



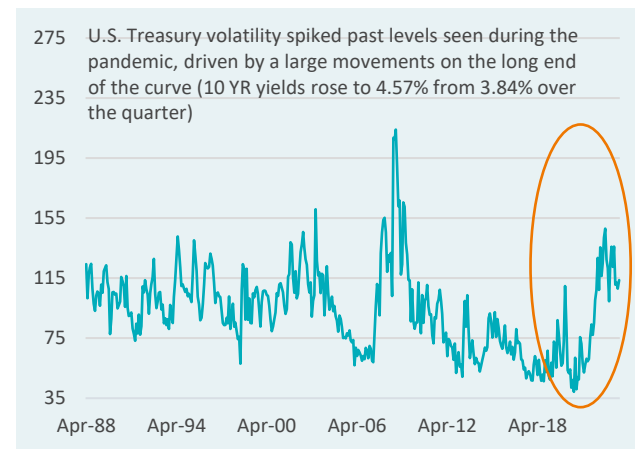
Source: Cboe, as of 9/30/23

REALIZED VOLATILITY



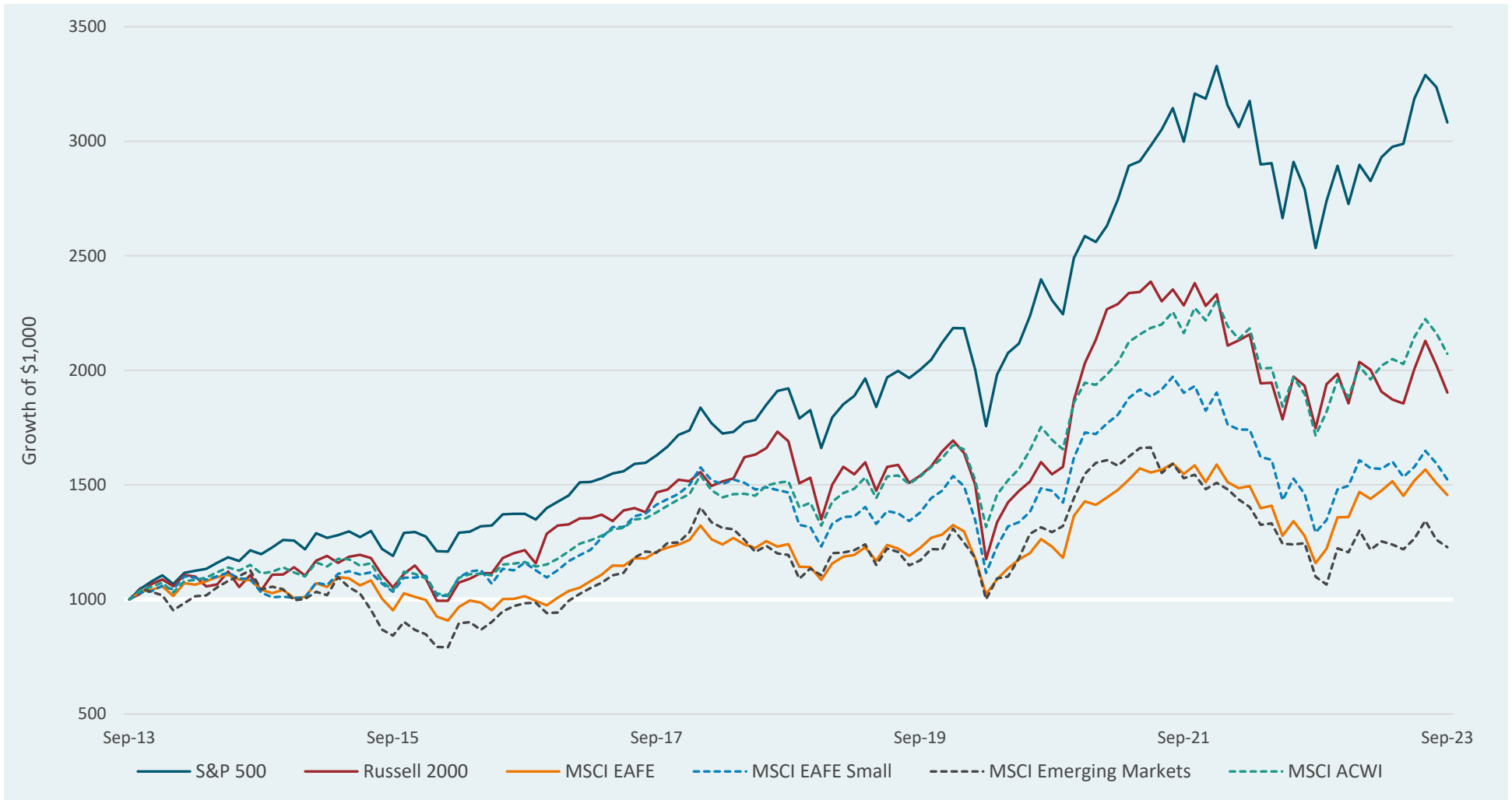
Source: S&P, MSCI, as of 9/30/23

U.S. TREASURY IMPLIED VOL (“MOVE” INDEX)



Source: Bloomberg, as of 9/30/23

Long-term equity performance



Source: MPI, as of 9/30/23

Other assets

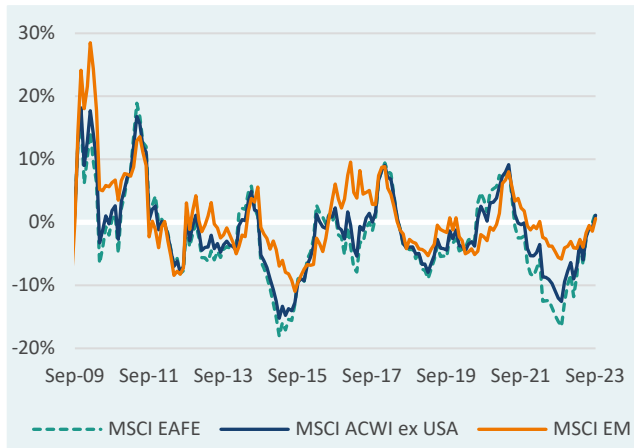
Currency

Currency movements dragged portfolio performance lower for investors with unhedged foreign exposure. On a trade-weighted basis, the value of the U.S. dollar shot higher as investors questioned the falling inflation story and bond yields rose on the *higher for longer* interest rate narrative.

Investors with unhedged international developed equity exposure saw losses of -3.6% due to currency movements in Q3. After recently experiencing deep losses over multiple years from unhedged foreign currency exposure, along with ongoing volatility, many investors may be interested in exploring more thoughtful approaches to currency. A currency hedging program can reduce the uncompensated risk of unhedged foreign

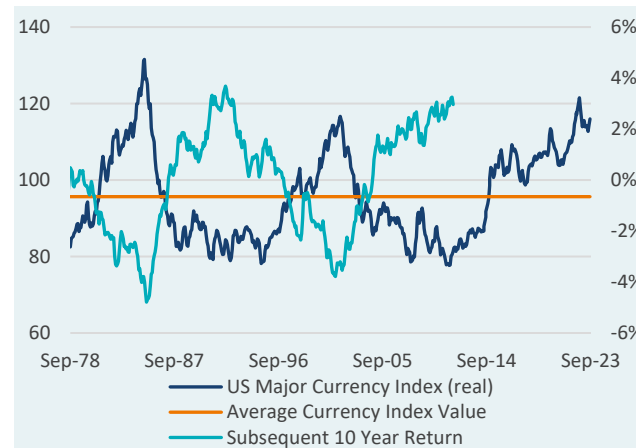
currency exposure (what we call “embedded currency” risk). Additionally, the MSCI Currency Factor Mix Index—a representation of a passive investment in the currency market, by investing in currencies with higher interest rates, currencies that are undervalued, and currencies that are showing positive price momentum—has shown a positive one-year rolling return over most periods with low volatility. This is an approach to thoughtfully gain exposure to the currency market with the objective of generating a moderate positive return. A currency hedging program along with a passive investment in the currency market may allow investors to reduce overall portfolio risk while moderately increasing total portfolio expected returns.

EFFECT OF CURRENCY (1-YEAR ROLLING)



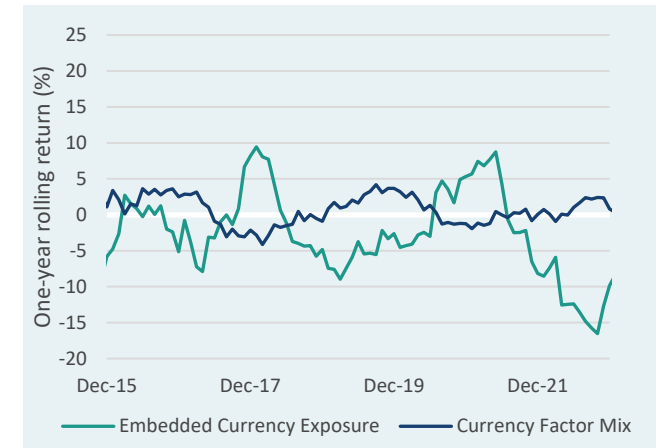
Source: MSCI, as of 9/30/23

BLOOMBERG DOLLAR SPOT INDEX



Source: Bloomberg, as of 9/30/23

EMBEDDED CURRENCY VS CURRENCY FACTORS



Source: Bloomberg, MSCI, as of 9/30/23

Commodities

Data pointing towards resilient economic growth was widely viewed as the initial driver of the “higher for longer” rate environment. Adding to this narrative in the third quarter was a tick up in energy costs due to supply side dynamics. This brought an increased focus to energy prices, as the four-decade high inflation experienced during 2022 was partly fueled by a rapid spike in oil and natural gas prices. As inflation has moderated back to levels closer to target, energy price movements have raised concerns of another potential catalyst for higher inflation, and therefore higher rates.

Oil was the largest contributor, as WTI and Brent Crude prices rose 24.3% and 28.5%, respectively. These significant price increases were driven by a combination of supply cuts by Saudi Arabia and Russia. A slowing economic outlook provides little motivation for oil companies to increase production.

A large jump in energy prices – specifically oil – has raised concerns over potentially higher inflation

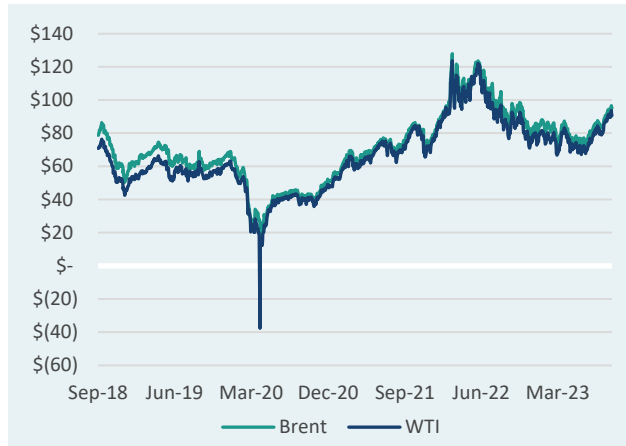
From a performance standpoint, the outsized gain of the Bloomberg Commodity Energy Index (+19.6%) lifted the broader index, with the Bloomberg Commodity Index finishing the quarter up 4.7%.

ENERGY YEAR-OVER-YEAR CPI CHANGES



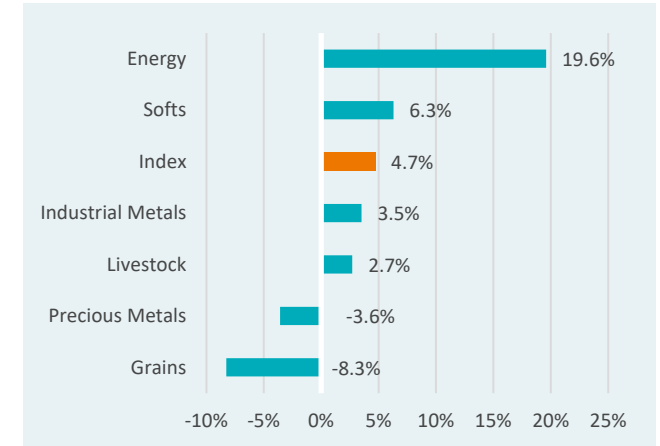
Source: BLS, as of 9/30/23

BRENT AND WTI CRUDE OIL PRICES



Source: Bloomberg, as of 9/30/23

BCOM SECTOR PERFORMANCE – Q3 2023



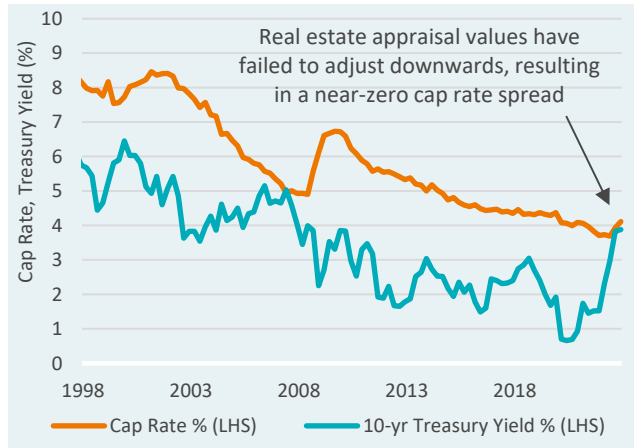
Source: Bloomberg, as of 9/30/23

Private real estate stalemate?

As summer ends, the real estate market looks much like it did as it began. Real estate transaction activity continues to be frozen, as buyers and sellers disagree about pricing, leading to a very large bid-ask spread. Private valuations remain higher than public, and write-downs should continue over the next several quarters. While movement has been slow thus far, opportunities may pick up as a wall of low interest rate loan maturities will be coming due and asset owners will need to either refinance at much higher rates, provide additional capital, and/or sell assets.

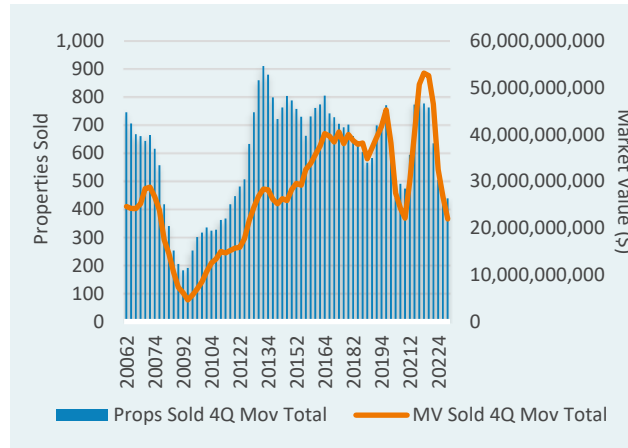
New capital should find a compelling environment to deploy in over the next several years at lower entry pricing. We are favoring managers experienced with investing in stressed and distressed environments and those with flexibility to invest across the debt and equity capital spectrum.

REAL ESTATE CAP RATE VS U.S. TREASURY YIELD



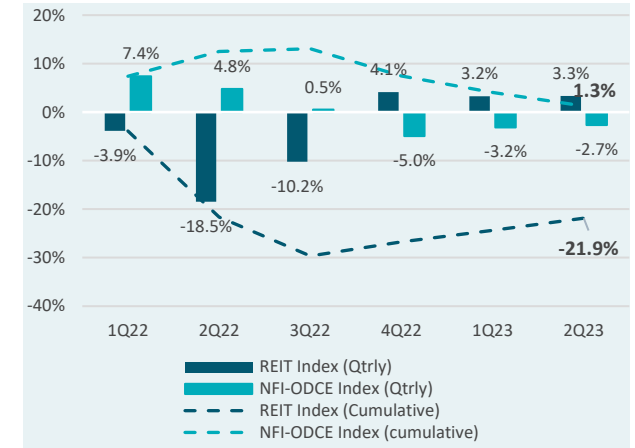
Source: NCREIF trends Report Q2

PROPERTY SALES (ANNUALIZED)



Source: NCREIF trends Report Q2 2023

PUBLIC VS PRIVATE REAL ESTATE PERFORMANCE



Source: NCREIF, Wilshire REIT Index

Hedge funds outperform, CTAs shine again

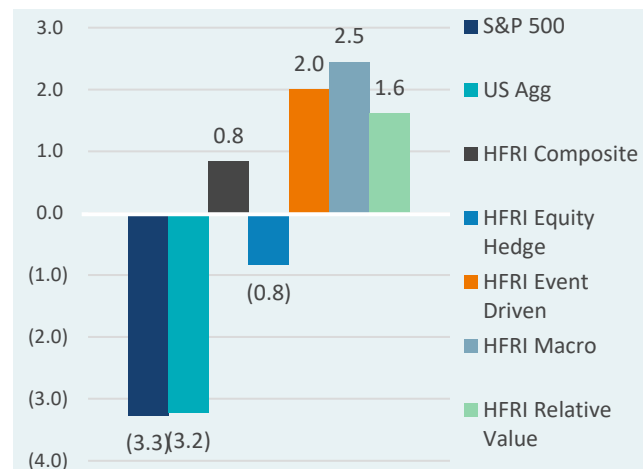
Hedge funds enjoyed broad outperformance vs markets in the third quarter as both stocks and bonds declined more than 3%. Most hedge fund strategies were actually positive on the quarter, reflected in the 0.8% return from the HFRI Composite Index.

Gains were led by Macro strategies while Event Driven was buoyed by a very strong quarter from Merger Arbitrage, rebounding after seeing spreads widen out earlier in the year. Popular Macro trades like short bonds and yield curve steepener paid off handsomely. Four of the last 7 quarters

have seen simultaneous declines in the S&P 500 and the Bloomberg US Aggregate – in all of those, including the most recent one, CTAs have been positive.

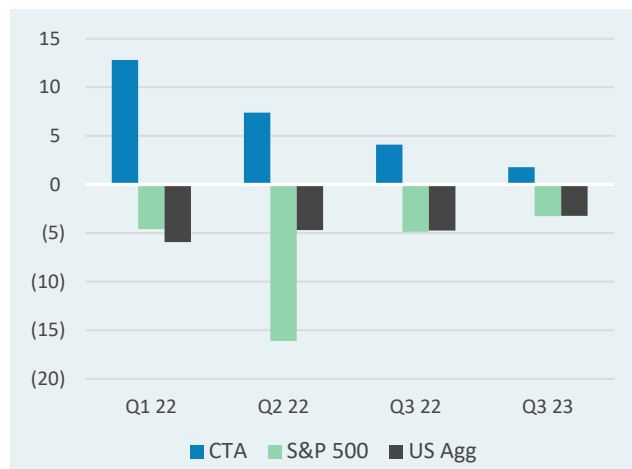
Credit-focused strategies also outperformed high yield as duration impacts were hedged and higher, typically floating rate coupons in areas like asset-backed offset any credit deterioration.

3Q 2023 QUARTERLY RETURNS



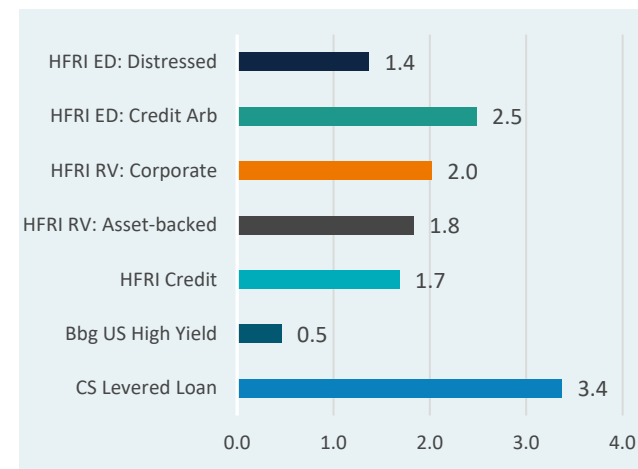
Source: HFR, MPI, as of 9/30/23

CTAS VS STOCKS/BONDS WHEN BOTH DECLINE



Source: MPI, SocGen. as of 9/30/23

3Q RETURNS FOR CREDIT STRATEGIES



Source: HFR, MPI, as of 9/30/23

Appendix

Periodic table of returns

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	YTD	5-Year	10-Year
Large Cap Growth	56.3	26.0	34.5	32.6	39.8	5.2	79.0	29.1	14.3	18.6	43.3	13.5	13.3	31.7	37.3	6.7	36.4	38.5	28.3	16.1	25.0	12.4	14.5
Large Cap Equity	48.5	22.2	21.4	26.9	16.2	1.4	37.2	26.9	7.8	18.1	38.8	13.2	5.7	21.3	30.2	1.9	31.4	34.6	27.6	9.4	13.0	9.6	11.6
International Equity	47.3	20.7	20.1	23.5	15.8	-6.5	34.5	24.5	2.6	17.9	34.5	13.0	0.9	17.3	25.0	0.0	28.5	21.0	27.1	1.5	7.1	6.2	8.4
Small Cap Growth	46.0	18.3	14.0	22.2	11.8	-21.4	32.5	19.2	1.5	17.5	33.5	11.8	0.6	12.1	22.2	-1.5	26.5	20.0	26.5	-4.7	5.2	6.1	7.8
60/40 Global Portfolio	39.2	16.5	7.5	18.4	11.6	-25.9	28.4	16.8	0.4	16.4	33.1	6.0	0.0	11.8	21.7	-3.5	25.5	18.3	25.2	-7.5	5.1	5.9	6.7
Cash	30.0	14.5	7.1	16.6	10.9	-28.9	27.2	16.7	0.1	16.3	32.5	5.6	-0.4	11.3	17.1	-4.8	22.4	14.0	17.7	-13.0	3.6	3.5	6.6
Hedge Funds of Funds	29.9	14.3	6.3	15.5	10.3	-33.8	23.3	16.1	-2.1	15.3	23.3	4.9	-0.8	11.2	14.6	-6.0	22.0	10.3	14.8	-14.5	3.0	3.4	6.2
Small Cap Equity	29.7	12.9	5.3	15.1	7.0	-35.6	20.6	15.5	-2.9	14.6	12.1	4.2	-1.4	8.0	13.7	-8.3	18.6	7.8	11.3	-14.5	2.5	3.2	4.5
Emerging Markets Equity	25.2	11.4	4.7	13.3	7.0	-36.8	19.7	13.1	-4.2	11.5	11.0	3.4	-2.5	7.1	7.8	-9.3	18.4	7.5	8.9	-17.3	1.8	2.6	3.8
Large Cap Value	23.9	9.1	4.6	10.4	5.8	-37.6	18.9	10.2	-5.5	10.5	9.0	2.8	-3.8	5.7	7.7	-11.0	8.7	4.6	6.5	-19.1	1.8	2.4	3.3
Small Cap Value	11.6	6.9	4.6	9.1	4.4	-38.4	11.5	8.2	-5.7	4.8	0.1	0.0	-4.4	2.6	7.0	-11.2	7.8	2.8	2.8	-20.1	-0.5	1.6	2.1
US Bonds	9.0	6.3	4.2	4.8	-0.2	-38.5	5.9	6.5	-11.7	4.2	-2.0	-1.8	-7.5	1.0	3.5	-12.9	7.7	0.5	0.0	-20.4	-1.2	1.6	1.1
Commodities	4.1	4.3	3.2	4.3	-1.6	-43.1	0.2	5.7	-13.3	0.1	-2.3	-4.5	-14.9	0.5	1.7	-13.8	6.4	0.5	-1.5	-26.4	-3.4	0.6	1.1
Real Estate	1.0	1.4	2.4	2.1	-9.8	-53.2	-16.9	0.1	-18.2	-1.1	-9.5	-17.0	-24.7	0.3	0.9	-14.6	2.1	-3.1	-2.5	-29.1	-3.8	0.1	-0.7

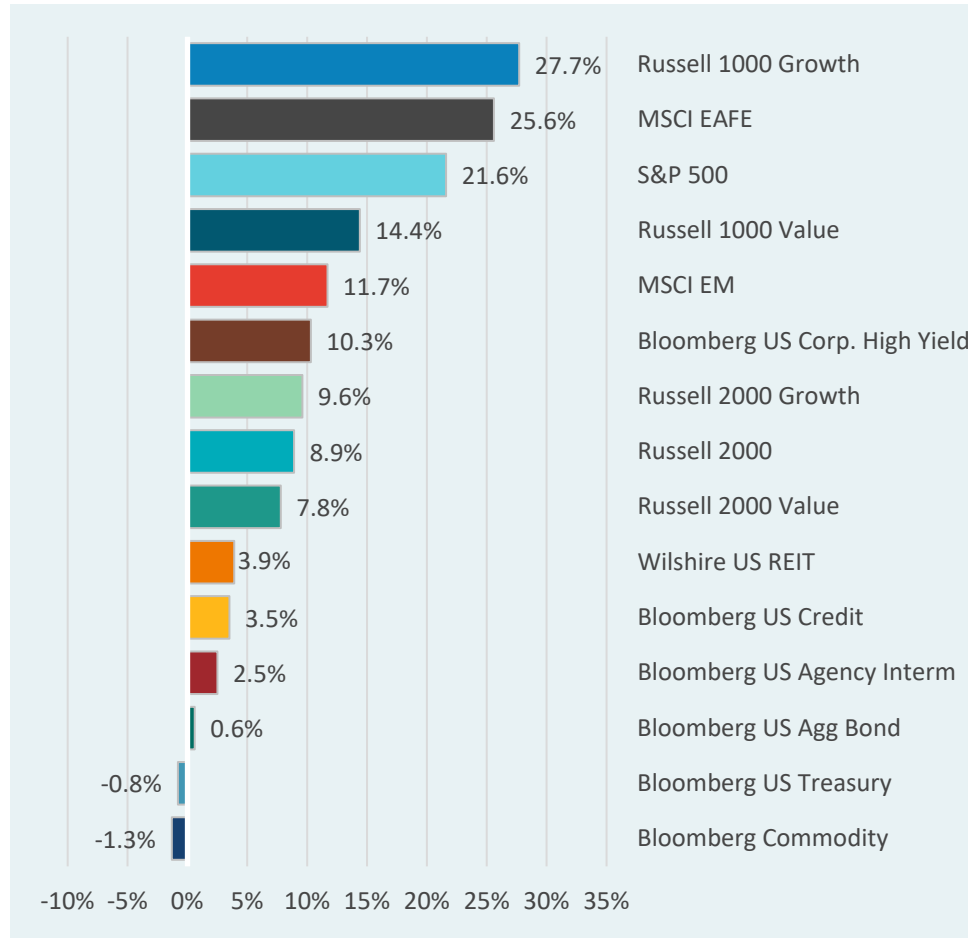
BEST
↑
↓
WORST

 Large Cap Equity	 Small Cap Growth	 Commodities
 Large Cap Value	 International Equity	 Real Estate
 Large Cap Growth	 Emerging Markets Equity	 Hedge Funds of Funds
 Small Cap Equity	 US Bonds	 60% MSCI ACWI/40% Bloomberg Global Bond
 Small Cap Value	 Cash	

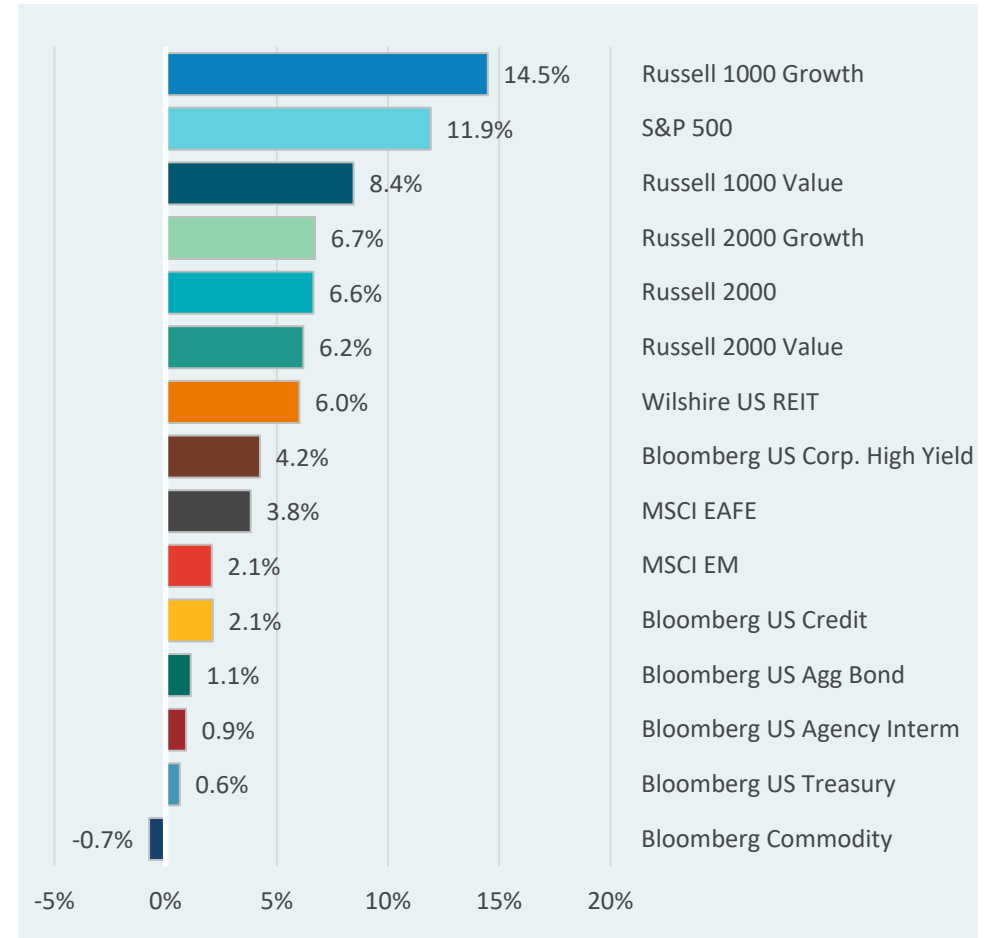
Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Growth, Russell 2000, Russell 2000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, Bloomberg US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, Bloomberg Global Bond. NCREIF Property Index performance data as of 6/30/23.

Major asset class returns

ONE YEAR ENDING SEPTEMBER



TEN YEARS ENDING SEPTEMBER



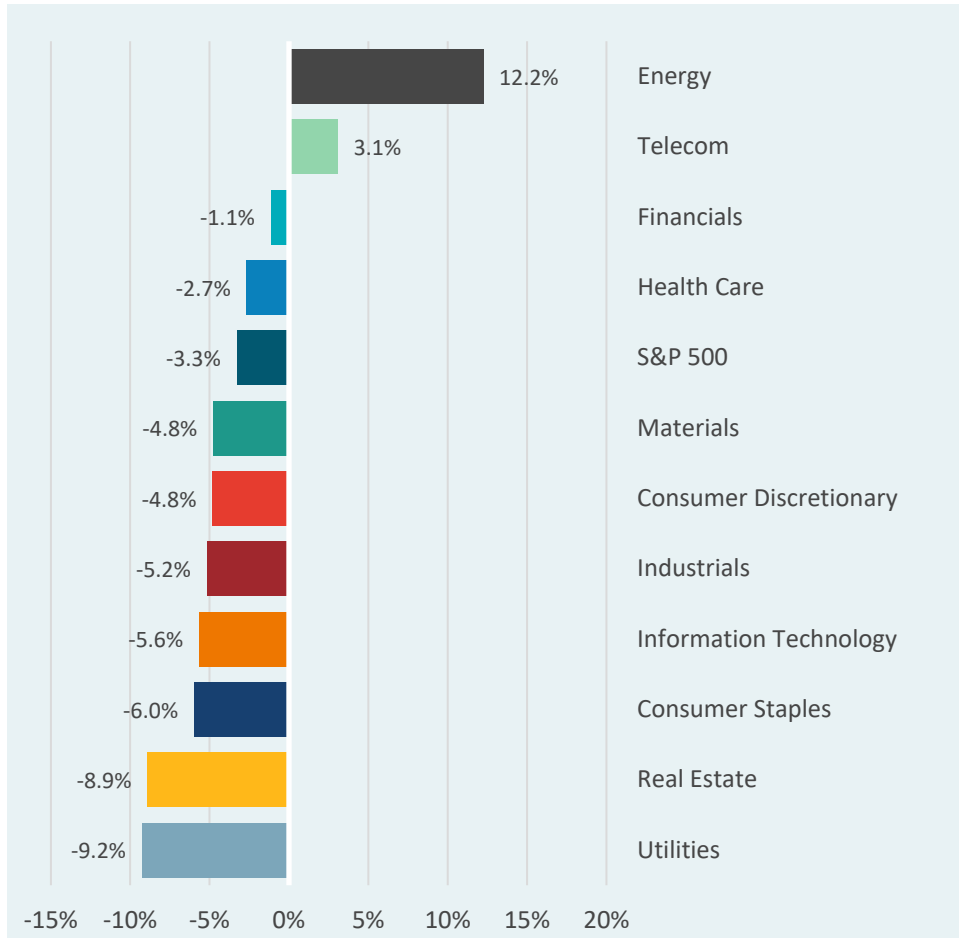
*Only publicly traded asset performance is shown here. Performance of private assets is typically released with a 3- to 6-month delay.

Source: Morningstar, as of 9/30/23

Source: Morningstar, as of 9/30/23

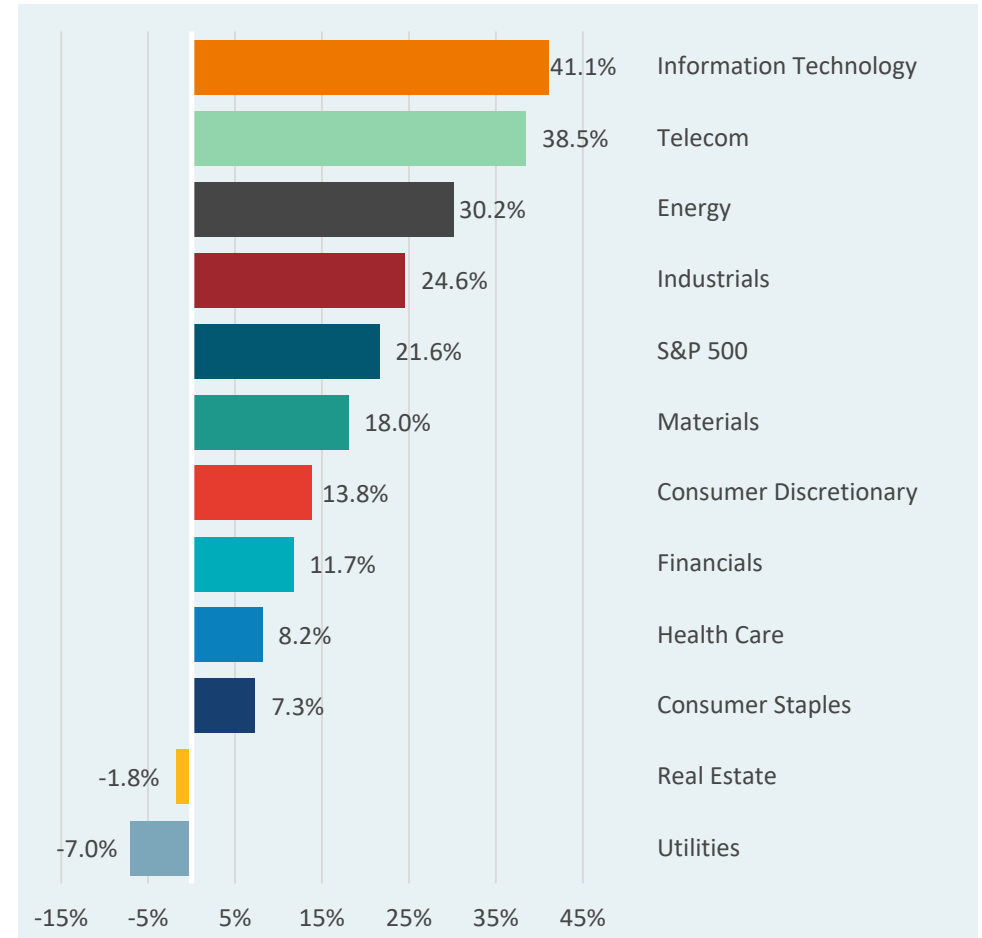
S&P 500 sector returns

QTD



Source: Morningstar, as of 9/30/23

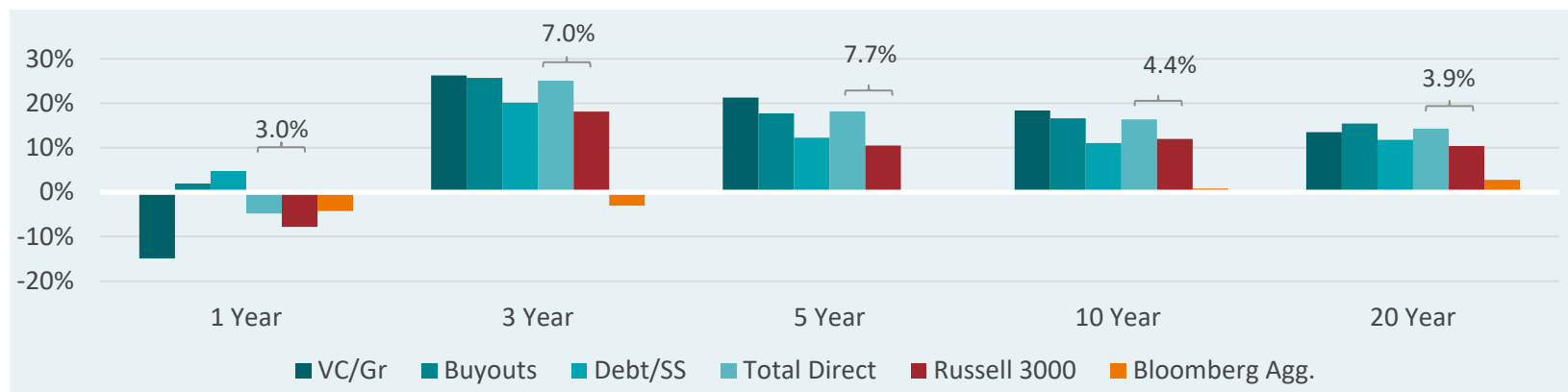
ONE YEAR ENDING AUGUST



Source: Morningstar, as of 9/30/23

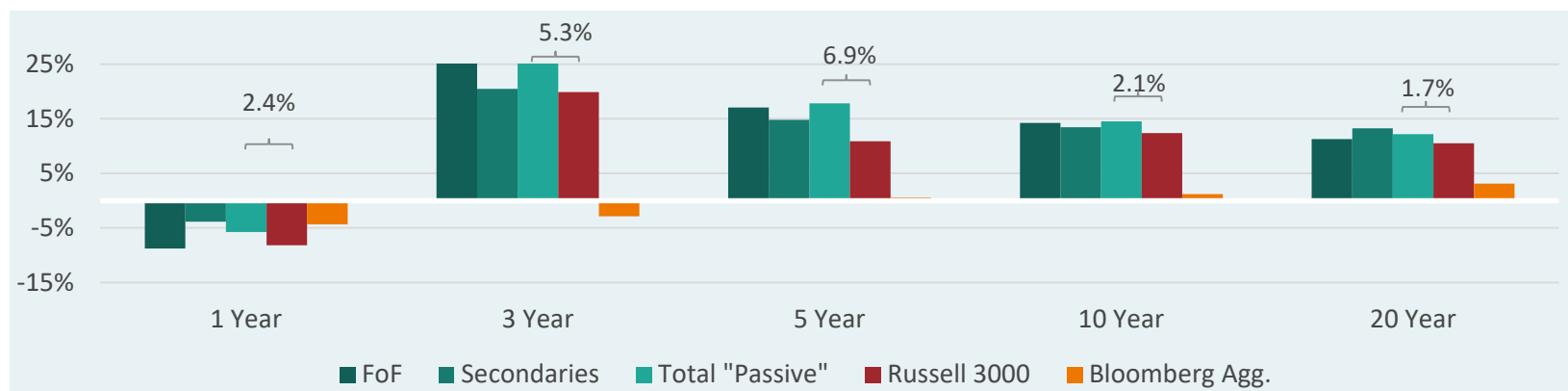
Private equity vs. traditional assets performance

DIRECT PRIVATE EQUITY FUND INVESTMENTS



Direct P.E Fund Investments outperformed comparable public equities across all time periods.

“PASSIVE” STRATEGIES

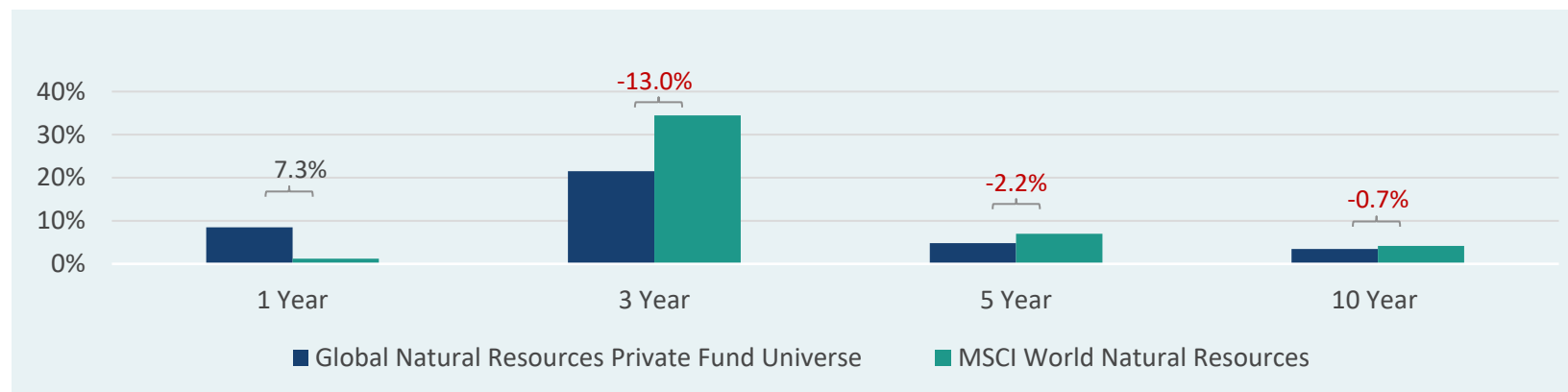


“Passive” strategies outperformed comparable public equities across all time periods.

Sources: Refinitiv PME: U.S. Private Equity Funds sub asset classes as of March 31, 2023. Public Market Equivalent returns resulted from “Total Passive” and Total Direct’s identical cash flows invested into and distributed from respective traditional asset comparable.

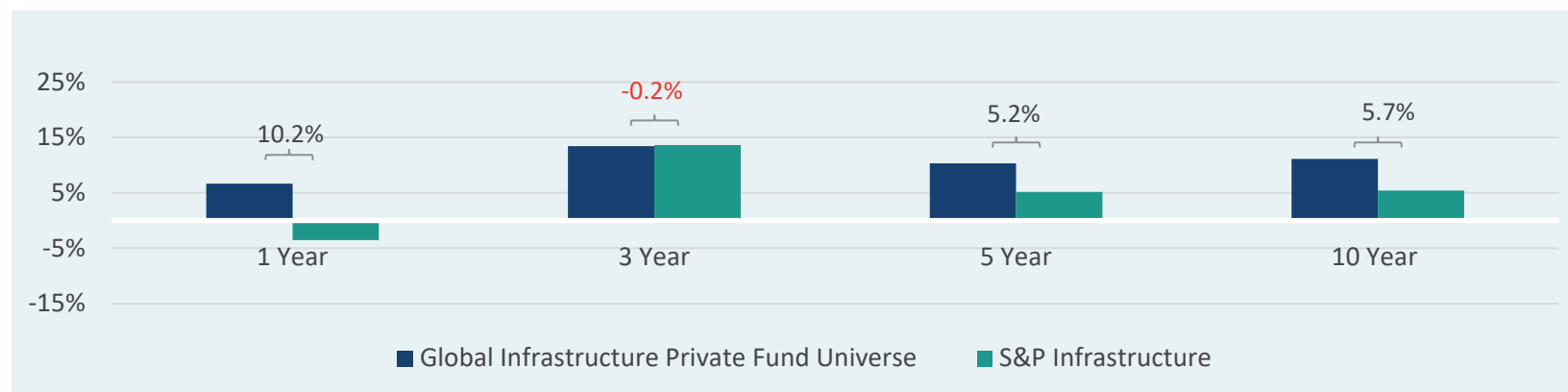
Private vs. liquid real assets performance

GLOBAL NATURAL RESOURCES FUNDS



N.R. funds underperformed the MSCI World Natural Resources benchmark across all periods, aside the 1-year basis.

GLOBAL INFRASTRUCTURE FUNDS

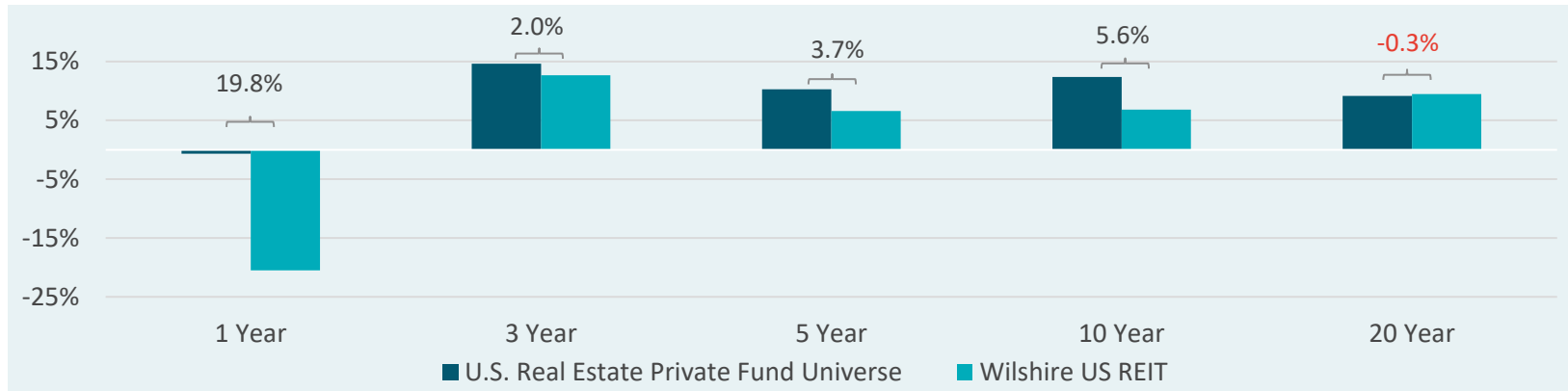


Infra. funds outperformed the S&P Infra. across all periods, aside the 3-year basis.

Sources: Refinitiv PME: Global Natural Resources (vintage 1999 and later, inception of MSCI World Natural Resources benchmark) and Global Infrastructure (vintage 2002 and later, inception of S&P Infrastructure benchmark) universes as of March 31, 2023. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real assets universes.

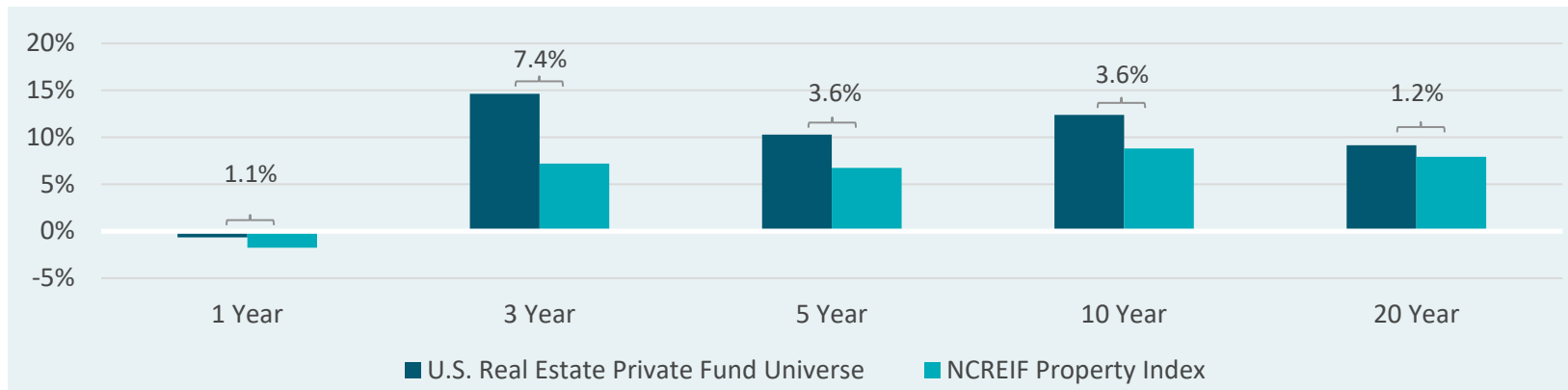
Private vs. liquid and core real estate performance

U.S. PRIVATE REAL ESTATE FUNDS VS. LIQUID UNIVERSE



U.S. Private R.E. funds have underperformed the Wilshire U.S. REIT Index over the past 20 years, but outperformed more recently

U.S. PRIVATE REAL ESTATE FUNDS VS. CORE FUNDS



U.S. Private R.E. Funds outperformed the NCREIF Property Index across all time periods.

Sources: Refinitiv PME: U.S. Real Estate universes as of March 31, 2023. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real estate universes.

Detailed index returns

DOMESTIC EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Core Index							
S&P 500	(4.8)	(3.3)	13.1	21.6	10.2	9.9	11.9
S&P 500 Equal Weighted	(5.1)	(4.9)	1.8	13.6	11.4	8.0	10.2
DJ Industrial Average	(3.4)	(2.1)	2.7	19.2	8.6	7.1	10.8
Russell Top 200	(4.6)	(2.7)	16.3	23.9	10.0	10.8	12.6
Russell 1000	(4.7)	(3.1)	13.0	21.2	9.5	9.6	11.6
Russell 2000	(5.9)	(5.1)	2.5	8.9	7.2	2.4	6.6
Russell 3000	(4.8)	(3.3)	12.4	20.5	9.4	9.1	11.3
Russell Mid Cap	(5.0)	(4.7)	3.9	13.4	8.1	6.4	9.0
Style Index							
Russell 1000 Growth	(5.4)	(3.1)	25.0	27.7	8.0	12.4	14.5
Russell 1000 Value	(3.9)	(3.2)	1.8	14.4	11.1	6.2	8.4
Russell 2000 Growth	(6.6)	(7.3)	5.2	9.6	1.1	1.6	6.7
Russell 2000 Value	(5.2)	(3.0)	(0.5)	7.8	13.3	2.6	6.2

INTERNATIONAL EQUITY

Broad Index							
MSCI ACWI	(4.1)	(3.4)	10.1	20.8	6.9	6.5	7.6
MSCI ACWI ex US	(3.2)	(3.8)	5.3	20.4	3.7	2.6	3.3
MSCI EAFE	(3.4)	(4.1)	7.1	25.6	5.8	3.2	3.8
MSCI EM	(2.6)	(2.9)	1.8	11.7	(1.7)	0.6	2.1
MSCI EAFE Small Cap	(4.4)	(3.5)	1.8	17.9	1.1	0.8	4.3
Style Index							
MSCI EAFE Growth	(6.0)	(8.6)	4.3	20.0	0.4	3.2	4.4
MSCI EAFE Value	(0.8)	0.6	9.9	31.5	11.1	2.8	3.0
Regional Index							
MSCI UK	(0.8)	(1.5)	6.8	24.9	12.1	2.9	2.5
MSCI Japan	(2.1)	(1.6)	11.2	25.9	2.8	2.1	4.4
MSCI Euro	(5.4)	(7.5)	10.9	36.4	7.3	3.7	3.8
MSCI EM Asia	(2.6)	(2.9)	1.0	11.9	(3.5)	1.0	3.8
MSCI EM Latin American	(2.3)	(4.7)	12.9	19.4	15.1	2.8	0.2

FIXED INCOME

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
Bloomberg US TIPS	(1.8)	(2.6)	(0.8)	1.2	(2.0)	2.1	1.7
Bloomberg US Treasury Bills	0.4	1.3	3.6	4.6	1.7	1.7	1.1
Bloomberg US Agg Bond	(2.5)	(3.2)	(1.2)	0.6	(5.2)	0.1	1.1
Bloomberg US Universal	(2.4)	(2.9)	(0.6)	1.6	(4.7)	0.3	1.4
Duration							
Bloomberg US Treasury 1-3 Yr	(0.0)	0.7	1.7	2.4	(0.9)	1.0	0.8
Bloomberg US Treasury Long	(7.3)	(11.8)	(8.6)	(9.1)	(15.7)	(2.8)	0.8
Bloomberg US Treasury	(2.2)	(3.1)	(1.5)	(0.8)	(5.8)	(0.1)	0.6
Issuer							
Bloomberg US MBS	(3.2)	(4.1)	(2.3)	(0.2)	(5.1)	(0.8)	0.6
Bloomberg US Corp. High Yield	(1.2)	0.5	5.9	10.3	1.8	3.0	4.2
Bloomberg US Agency Interm	(0.3)	0.2	1.6	2.5	(2.0)	0.7	0.9
Bloomberg US Credit	(2.6)	(3.0)	0.0	3.5	(4.8)	0.9	2.1

OTHER

Index							
Bloomberg Commodity	(0.7)	4.7	(3.4)	(1.3)	16.2	6.1	(0.7)
Wilshire US REIT	(6.5)	(6.4)	(0.2)	3.9	5.7	2.9	6.0
CS Leveraged Loans	0.9	3.4	9.9	12.5	5.9	4.3	4.3
S&P Global Infrastructure	(4.7)	(7.3)	(3.7)	6.9	7.3	4.1	5.1
Alerian MLP	2.4	9.4	20.2	32.7	43.5	6.4	1.7
Regional Index							
JPM EMBI Global Div	(2.6)	(2.2)	1.8	10.0	(4.6)	(0.4)	2.5
JPM GBI-EM Global Div	(3.4)	(3.3)	4.3	13.1	(2.7)	(0.0)	(0.8)
Hedge Funds							
HFRI Composite	(0.2)	0.8	4.3	6.7	6.9	5.0	4.6
HFRI FOF Composite	(0.2)	0.7	3.0	4.8	3.8	3.4	3.3
Currency (Spot)							
Euro	(2.5)	(3.0)	(0.8)	8.1	(3.4)	(1.8)	(2.4)
Pound Sterling	(3.7)	(4.0)	1.5	9.3	(1.9)	(1.3)	(2.8)
Yen	(2.4)	(3.1)	(11.6)	(3.0)	(10.9)	(5.3)	(4.1)

Source: Morningstar, HFRI, as of 9/30/23.

Definitions

Bloomberg US Weekly Consumer Comfort Index - tracks the public's economic attitudes each week, providing a high-frequency read on consumer sentiment. The index, based on cell and landline telephone interviews with a random, representative national sample of U.S. adults, tracks Americans' ratings of the national economy, their personal finances and the buying climate on a weekly basis, with views of the economy's direction measured separately each month. (www.lanqerresearch.com)

University of Michigan Consumer Sentiment Index - A survey of consumer attitudes concerning both the present situation as well as expectations regarding economic conditions conducted by the University of Michigan. For the preliminary release approximately three hundred consumers are surveyed while five hundred are interviewed for the final figure. The level of consumer sentiment is related to the strength of consumer spending. (www.Bloomberg.com)

NFIB Small Business Outlook - Small Business Economic Trends (SBET) is a monthly assessment of the U.S. small-business economy and its near-term prospects. Its data are collected through mail surveys to random samples of the National Federal of Independent Business (NFIB) membership. The survey contains three broad question types: recent performance, near-term forecasts, and demographics. The topics addressed include: outlook, sales, earnings, employment, employee compensation, investment, inventories, credit conditions, and single most important problem. (<http://www.nfib-sbet.org/about/>)

NAHB Housing Market Index - the housing market index is a weighted average of separate diffusion indices for three key single-family indices: market conditions for the sale of new homes at the present time, market conditions for the sale of new homes in the next six months, and the traffic of prospective buyers of new homes. The first two series are rated on a scale of Good, Fair, and Poor and the last is rated on a scale of High/Very High, Average, and Low/Very Low. A diffusion index is calculated for each series by applying the formula $(\text{Good-Poor} + 100)/2$ to the present and future sales series and $(\text{High/Very High-Low/Very Low} + 100)/2$ to the traffic series. Each resulting index is then seasonally adjusted and weighted to produce the HMI. Based on this calculation, the HMI can range between 0 and 100.

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Contra Costa County Employees Retirement Association

Investment Performance Review
Period Ending: September 30, 2023



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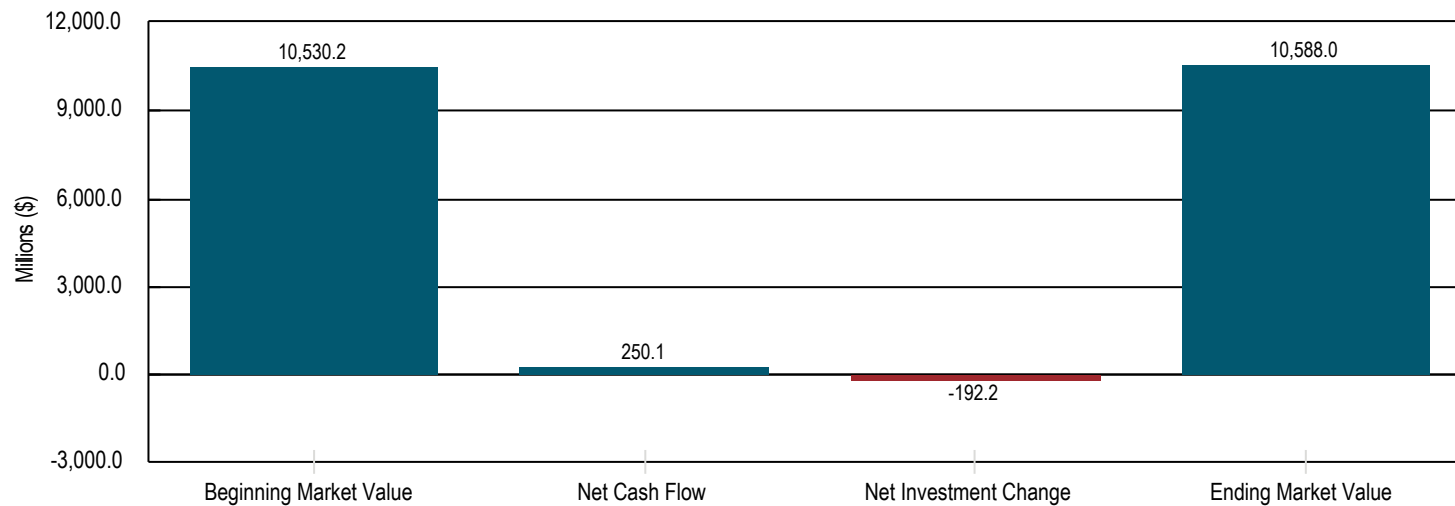
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Portfolio Reconciliation

	Last Three Months	YTD
Beginning Market Value	\$10,530,195,113	\$10,223,348,190
Net Cash Flow	\$250,050,816	\$11,988,647
Net Investment Change	-\$192,214,792	\$352,694,300
Ending Market Value	\$10,588,031,137	\$10,588,031,137

Change in Market Value
Last Three Months

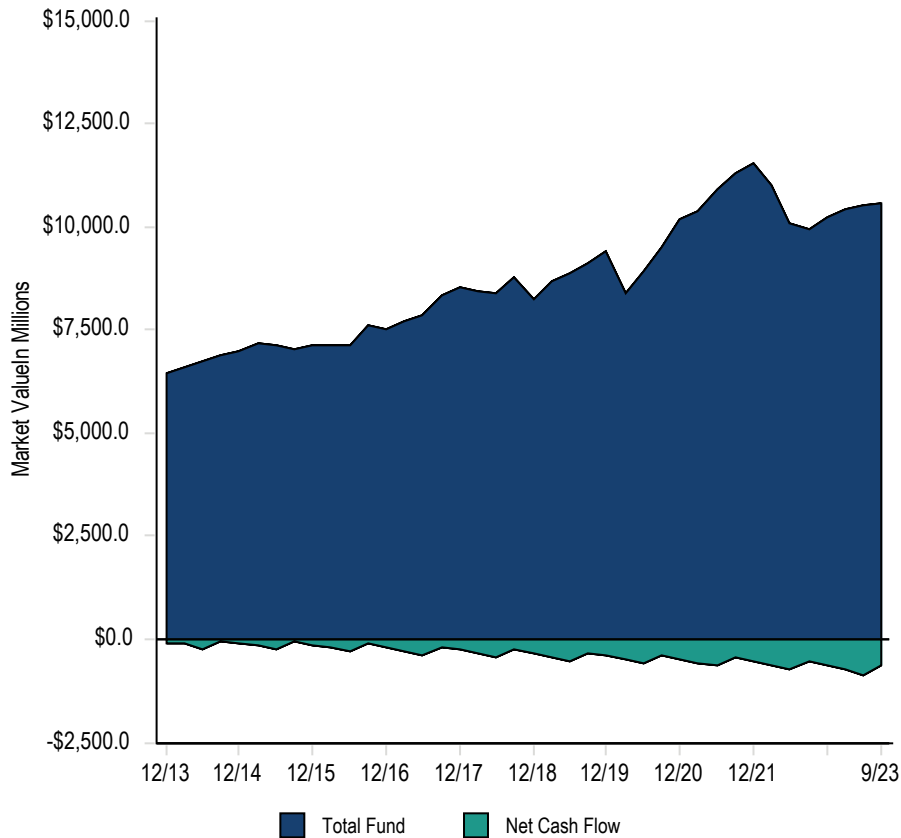


Contributions and withdrawals may include intra-account transfers between managers/funds.

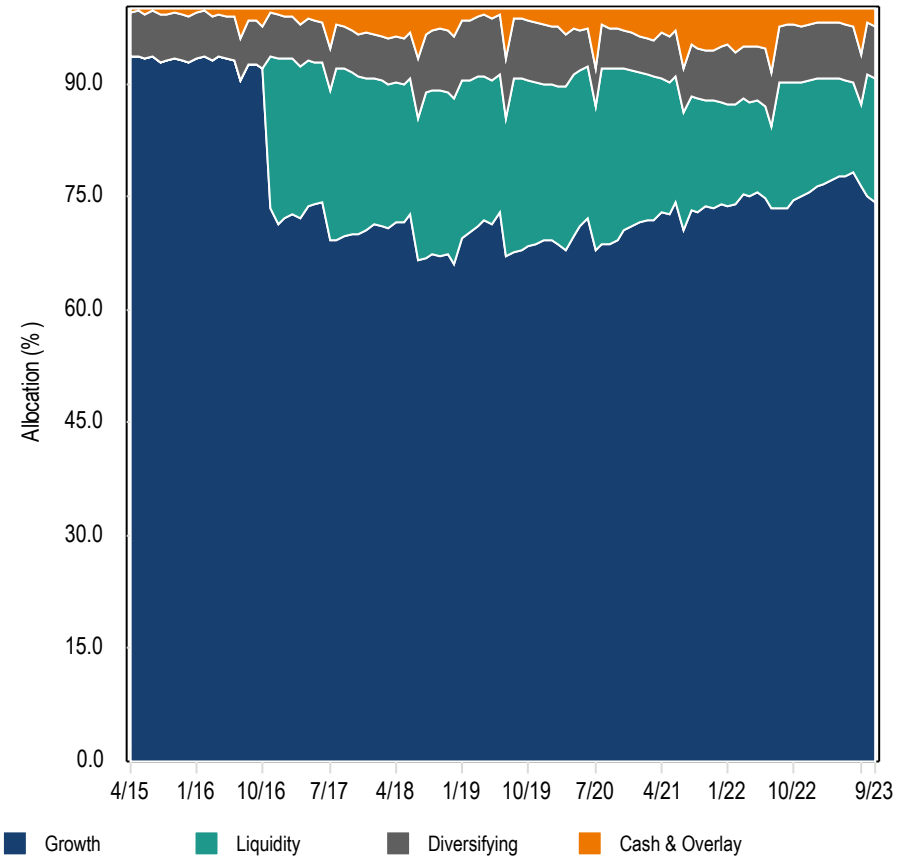
Total Fund
Asset Allocation History

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

Market Value History
Cumulative Cash Flows

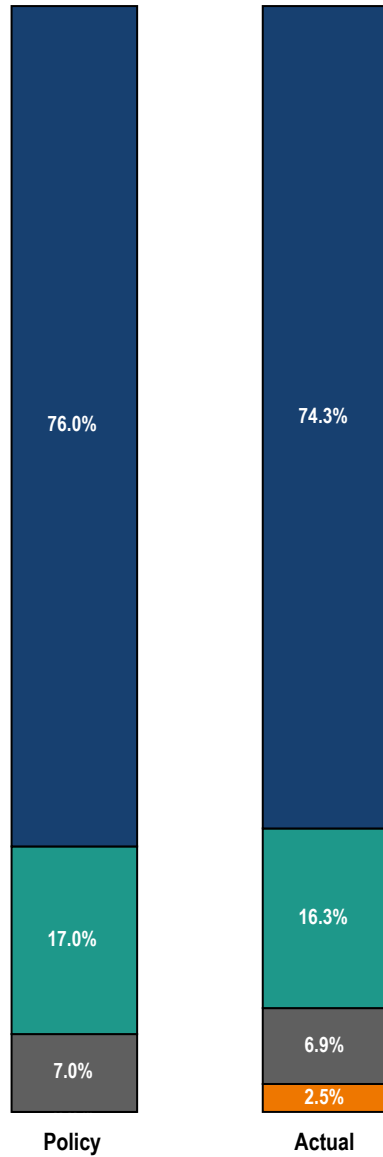


Asset Allocation History



Total Fund
Asset Allocation vs. Policy Target

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023



Allocation vs. Policy Target

	Current Balance	Current Allocation	Policy Target	Difference
Growth	\$7,866,672,835	74.3	76.0	-\$180,230,829
Liquidity	\$1,726,607,314	16.3	17.0	-\$73,357,979
Diversifying	\$734,915,085	6.9	7.0	-\$6,247,094
Cash & Overlay	\$259,835,902	2.5	0.0	\$259,835,902
Total	\$10,588,031,137	100.0	100.0	

Policy Targets approved July 2023.

Total Fund
Executive Summary (Net of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

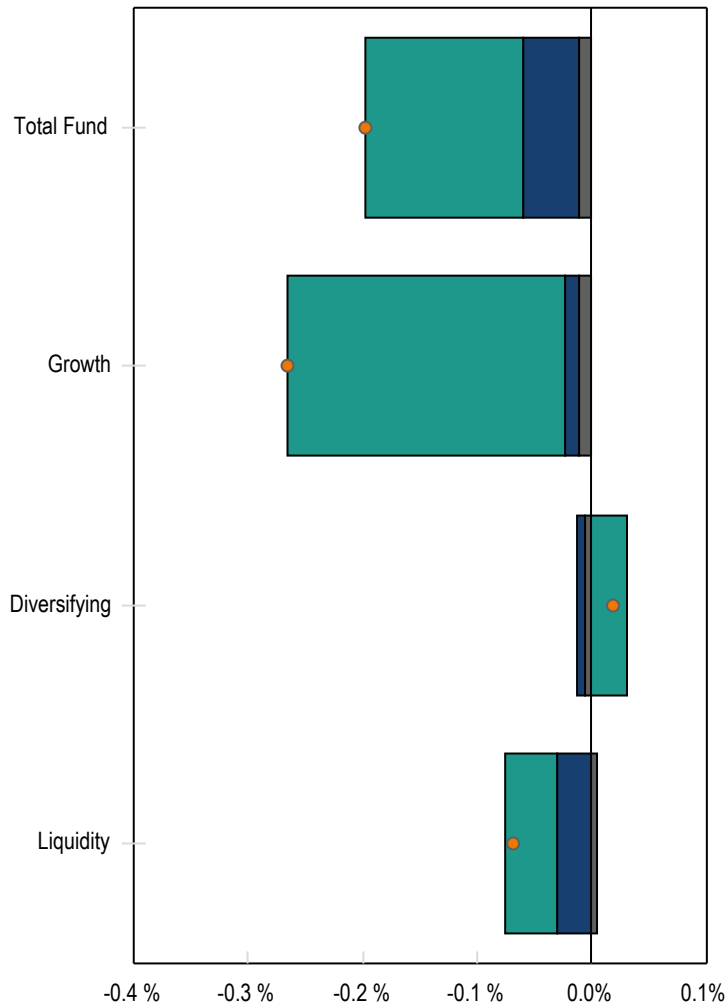
	% of Portfolio	QTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018
Total Fund	100.0	-1.7	7.5	4.4	4.5	6.0	-10.6	13.9	9.2	14.6	-2.7
Policy Index		-1.5	8.7	5.9	6.0	7.0	-8.4	15.3	10.8	14.6	-0.9
Policy Index (Adjusted)		-1.5	8.7	5.8	5.4	6.6	-8.4	15.3	8.5	14.1	-1.5
Growth	74.3	-2.4	8.9	6.7	6.0	7.5	-11.7	19.2	12.0	18.3	-3.9
Custom Growth Benchmark		-2.1	10.6	8.5	7.7	8.6	-10.3	21.6	13.8	19.3	-2.1
Diversifying	6.9	-1.1	-1.6	-1.1	-0.1	0.2	-5.7	1.7	-1.7	6.8	-2.3
Custom Diversifying Benchmark		-1.5	3.7	-0.6	1.6	2.7	-5.7	1.6	4.7	6.1	1.4
Liquidity	16.3	0.5	3.4	-0.4	1.5	-	-3.5	-0.3	3.4	4.8	1.7
Blmbg. 1-3 Year Gov/Credit index		0.7	2.8	-0.7	1.2	-	-3.7	-0.5	3.3	4.0	1.6

*Correlation between the Growth and Diversifying composites is .46 , .51 and .60 over the previous 1, 3, and 5 year periods respectively.

Total Fund
 Attribution Analysis - Asset Class Level (Net of Fees)

Contra Costa County Employees' Retirement Association
 Period Ending: September 30, 2023

Attribution Effects
 3 Months Ending September 30, 2023



■ Selection Effect ■ Allocation Effect
■ Interaction Effect ● Total Effects

Performance Attribution

	3 Mo
Wtd. Actual Return	-1.73
Wtd. Index Return	-1.53
Excess Return	-0.20
Selection Effect	-0.14
Allocation Effect	-0.05
Interaction Effect	-0.01

Attribution Summary
 Last 3 Months

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Growth	-2.4	-2.1	-0.3	-0.2	0.0	0.0	-0.3
Diversifying	-1.1	-1.5	0.4	0.0	0.0	0.0	0.0
Liquidity	0.5	0.7	-0.3	0.0	0.0	0.0	-0.1
Total Fund	-1.7	-1.5	-0.2	-0.1	0.0	0.0	-0.2

Performance attribution calculated from benchmark returns and weightings of each component.

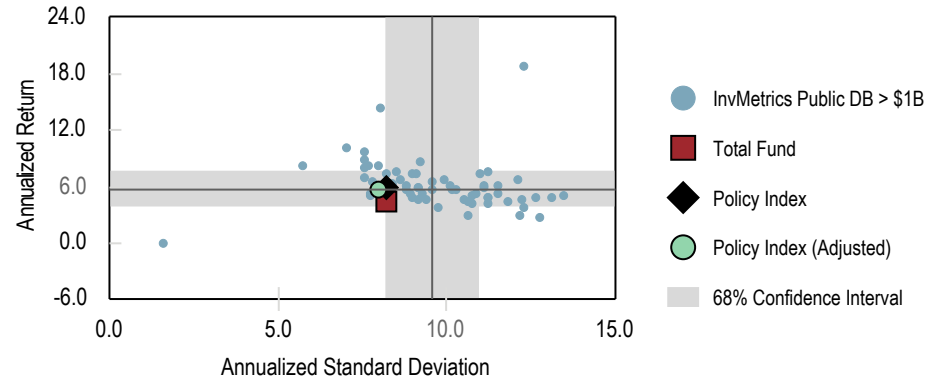
Total Fund
Executive Summary (Net of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

3 Years

	Anlzd Return	Ann Excess Performance	Anlzd Standard Deviation	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Information Ratio	Up Capture	Down Capture
Total Fund	4.42	-1.52	8.23	-1.38	0.99	1.31	0.97	0.36	-1.10	95.06	107.82

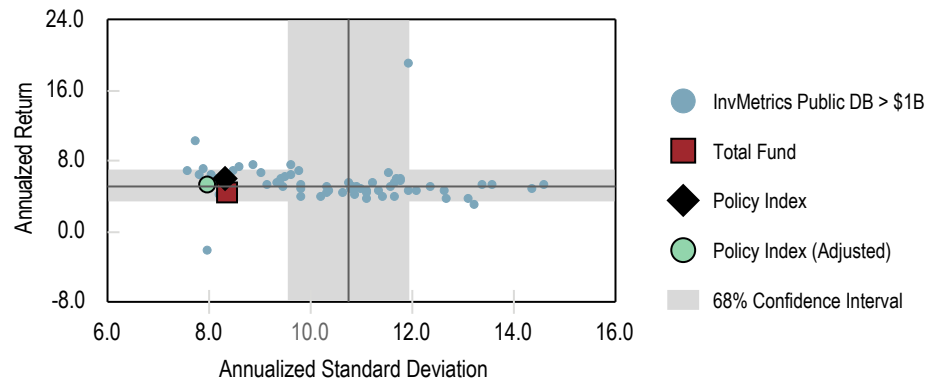
Risk vs. Return



5 Years

	Anlzd Return	Ann Excess Performance	Standard Deviation	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Information Ratio	Up Capture	Down Capture
Total Fund	4.55	-1.44	8.34	-1.23	0.98	1.86	0.95	0.37	-0.74	95.23	107.15

Risk vs. Return



Total Fund
Performance Summary (Gross of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Total Fund	10,588,031,137	100.0	-1.7	7.7	4.7	4.8	6.4	-10.4	14.2	9.5	14.9	-2.5		Oct-92
Policy Index			-1.5	8.7	5.9	6.0	7.0	-8.4	15.3	10.8	14.6	-0.9		
Policy Index (Adjusted)			-1.5	8.7	5.8	5.4	6.6	-8.4	15.3	8.5	14.1	-1.5		
InvMetrics Public DB > \$1B Rank			36	93	81	75	57	45	67	80	90	32		
Total Fund ex Overlay & Cash	10,328,195,234	97.5	-1.7	7.5	5.0	5.0	6.5	-9.9	14.6	9.7	14.7	-2.1		Dec-03
Policy Index			-1.5	8.7	5.9	6.0	7.0	-8.4	15.3	10.8	14.6	-0.9		
Policy Index (Adjusted)			-1.5	8.7	5.8	5.4	6.6	-8.4	15.3	8.5	14.1	-1.5		
InvMetrics Public DB > \$1B Rank			38	94	73	67	49	39	60	75	91	26		
Growth	7,866,672,835	74.3	-2.3	9.1	7.0	6.3	7.9	-11.4	19.6	12.4	18.7	-3.6		Jan-03
Custom Growth Benchmark			-2.1	10.6	8.5	7.7	8.6	-10.3	21.6	13.8	19.3	-2.1		
Total Domestic Equity	1,856,174,493	17.5	-2.8	19.0	8.7	6.9	10.2	-18.3	20.6	22.2	26.7	-7.2		Sep-82
Russell 3000 Index			-3.3	20.5	9.4	9.1	11.3	-19.2	25.7	20.9	31.0	-5.2		
InvMetrics Public DB US Equity Rank			15	58	68	97	77	49	99	15	100	77		
BlackRock Russell 1000 Index	1,079,815,274	10.2	-3.1	21.2	9.5	9.6	-	-19.1	26.5	21.0	31.4	-4.8	11.3	May-17
Russell 1000 Index			-3.1	21.2	9.5	9.6	-	-19.1	26.5	21.0	31.4	-4.8	11.3	
eV US Large Cap Equity Rank			61	40	56	40	-	69	55	35	40	51		
Boston Partners	370,891,941	3.5	0.8	18.6	16.4	8.0	9.9	-3.8	31.3	3.0	24.3	-8.7	10.5	Jun-95
Russell 1000 Value Index			-3.2	14.4	11.1	6.2	8.4	-7.5	25.2	2.8	26.5	-8.3	8.9	
eV US Large Cap Value Equity Rank			3	30	13	41	37	36	18	63	79	58		
Emerald Advisers	202,868,375	1.9	-8.5	10.6	1.7	3.3	8.6	-23.8	5.5	39.0	30.3	-10.1	11.8	Apr-03
Russell 2000 Growth Index			-7.3	9.6	1.1	1.6	6.7	-26.4	2.8	34.6	28.5	-9.3	9.7	
eV US Small Cap Growth Equity Rank			76	51	60	75	65	27	77	57	48	86		
Ceredex	202,598,903	1.9	-1.4	19.8	16.2	4.5	7.6	-8.5	28.4	2.3	18.4	-11.3	9.7	Nov-11
Russell 2000 Value Index			-3.0	7.8	13.3	2.6	6.2	-14.5	28.3	4.6	22.4	-12.9	8.6	
eV US Small Cap Value Equity Rank			35	26	51	68	65	27	60	70	88	29		

Individual closed end funds are not shown in performance summary table.

Total Fund
Performance Summary (Gross of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Total International Equity	1,319,020,751	12.5	-4.6	18.0	3.2	3.5	4.3	-18.2	8.3	15.8	23.7	-14.3		Sep-88
MSCI AC World ex USA Index			-3.7	21.0	4.2	3.1	3.8	-15.6	8.3	11.1	22.1	-13.8		
MSCI EAFE Index			-4.0	26.3	6.3	3.7	4.3	-14.0	11.8	8.3	22.7	-13.4		
InvMetrics Public DB Global ex-US Equity Rank			59	96	62	47	39	68	51	26	42	67		
International Equity	877,470,524	8.3	-6.2	18.3	2.0	4.1	5.0	-18.1	9.0	19.0	27.0	-13.6	5.5	Oct-10
MSCI AC World ex USA Index			-3.7	21.0	4.2	3.1	3.8	-15.6	8.3	11.1	22.1	-13.8	4.2	
InvMetrics Public DB Global ex-US Equity Rank			94	95	73	34	25	65	35	7	15	42		
Pyrford	462,794,387	4.4	-3.7	22.2	5.7	4.2	-	-7.0	7.6	4.7	22.1	-10.1	3.8	May-14
MSCI AC World ex USA Value			-0.1	25.2	9.6	2.3	-	-8.6	10.5	-0.8	15.7	-14.0	1.9	
eV ACWI ex-US Value Equity Rank			83	79	90	46	-	20	84	48	38	6		
William Blair	414,676,137	3.9	-8.8	14.2	-1.7	3.8	5.1	-27.7	10.5	33.3	32.0	-16.8	5.7	Nov-10
MSCI AC World ex USA Growth			-7.3	15.8	-1.9	2.5	3.9	-23.1	5.1	22.2	27.3	-14.4	4.2	
eV ACWI ex-US Growth Equity Rank			79	76	58	50	66	59	43	36	36	72		
Emerging Markets Equity	441,550,226	4.2	-2.6	17.6	5.0	2.8	-	-18.4	7.6	11.4	19.4	-15.3	3.2	Feb-17
MSCI Emerging Markets			-2.9	11.7	-1.7	0.6	-	-20.1	-2.5	18.3	18.4	-14.6	2.7	
InvMetrics Public DB Emerging Markets Equity Rank			81	38	9	9	-	29	28	68	27	67		
PIMCO RAE Emerging Markets	228,149,004	2.2	1.9	30.0	14.8	5.4	-	-9.7	17.1	2.1	14.6	-12.3	5.6	Mar-17
MSCI Emerging Markets Value			-0.8	16.0	4.4	0.4	-	-15.8	4.0	5.5	12.0	-10.7	2.2	
eV Emg Mkts All Cap Value Equity Rank			5	6	3	18	-	34	8	85	77	47		
TT Emerging Markets	213,401,223	2.0	-7.1	5.7	-3.9	0.2	-	-26.4	-0.2	20.8	24.8	-18.4	-0.2	Aug-17
MSCI Emerging Markets			-2.9	11.7	-1.7	0.6	-	-20.1	-2.5	18.3	18.4	-14.6	0.6	
eV Emg Mkts Equity Rank			97	95	83	88	-	90	58	39	24	82		
Total Global Equity	1,053,670,143	10.0	-4.2	18.0	3.4	7.3	8.5	-18.8	14.1	25.3	28.9	-7.8		Dec-03
MSCI AC World Index			-3.4	20.8	6.9	6.5	7.6	-18.4	18.5	16.3	26.6	-9.4		
InvMetrics Public DB Global Equity Rank			76	100	100	30	-	84	61	1	17	20		
Artisan Partners	531,360,106	5.0	-5.1	16.3	-0.5	7.9	10.4	-29.6	15.0	41.7	37.0	-7.9	11.2	Oct-12
MSCI ACWI Growth NR USD			-4.9	24.4	3.8	8.4	9.5	-28.6	17.1	33.6	32.7	-8.1	10.2	
eV Global Growth Equity Rank			38	58	70	29	18	60	55	34	12	60		
First Eagle	522,190,898	4.9	-3.2	19.7	7.8	6.4	6.9	-5.6	13.0	8.5	21.0	-7.6	7.5	Jan-11
MSCI ACWI Value NR USD			-1.8	17.0	9.7	4.0	5.3	-7.5	19.6	-0.3	20.6	-10.8	5.8	
eV Global Value Equity Rank			59	67	72	24	28	21	86	33	64	18		

Individual closed end funds are not shown in performance summary table.

Total Fund
Performance Summary (Gross of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Private Credit	1,093,882,374	10.3	2.8	9.1	10.3	8.7	9.9	10.5	10.0	4.0	7.7	8.3		Sep-06
Total High Yield	147,368,701	1.4	0.0	10.2	1.5	2.7	3.6	-10.6	5.3	5.2	15.3	-3.2		Dec-03
ICE BofA U.S. High Yield Index			0.5	10.2	1.8	2.8	4.2	-11.2	5.4	6.2	14.4	-2.3		
eV US High Yield Fixed Inc Rank			88	51	81	87	88	75	54	72	35	89		
Voya Global Investors	147,368,701	1.4	0.0	10.2	1.5	2.7	3.6	-10.6	5.3	5.2	15.3	-3.2	6.1	May-00
ICE BofA U.S. High Yield Index			0.5	10.2	1.8	2.8	4.2	-11.2	5.4	6.2	14.4	-2.3	6.3	
eV US High Yield Fixed Inc Rank			88	51	81	87	88	75	54	72	35	89		
Total Real Estate	770,087,930	7.3	-4.6	-10.8	1.8	1.0	6.3	-5.2	19.2	-5.9	8.1	7.4		Sep-92
Real Estate Benchmark			-4.4	-10.8	2.1	2.5	5.9	-4.5	19.3	0.6	7.5	6.8		
NCREIF-ODCE			-1.9	-12.1	7.1	5.7	8.2	7.5	22.2	1.2	5.3	8.3		
NCREIF Property Index			-1.4	-8.4	6.0	5.3	7.4	5.5	17.7	1.6	6.4	6.7		
Total Core Real Estate	184,110,260	1.7	-7.3	0.5	6.3	4.4	7.0	-24.8	48.3	-4.6	28.2	-5.0		Jan-01
Adelante	84,432,661	0.8	-6.2	4.2	7.0	4.8	7.3	-26.7	48.3	-4.6	28.2	-5.0	9.1	Oct-01
Wilshire U.S. REIT Index			-6.4	3.9	5.7	2.9	6.0	-26.8	46.2	-7.9	25.8	-4.8	8.5	
Invesco US Fundamental Beta	99,677,600	0.9	-8.2	-2.4	-	-	-	-	-	-	-	-	-13.5	Mar-22
Wilshire U.S. REIT Index			-6.4	3.9	-	-	-	-	-	-	-	-	-12.3	
Total Private Real Estate	585,977,669	5.5	-4.0	-14.5	1.7	0.9	6.3	1.3	15.3	-6.1	6.2	8.8		Sep-92
Private Equity	1,307,556,426	12.3	-0.4	-3.7	19.2	13.6	13.2	-0.5	60.4	8.7	8.4	12.0		Dec-03
Risk Parity	318,912,018	3.0	-4.1	1.6	-2.7	-	-	-21.5	9.7	10.0	18.1	-		Jan-19
60% MSCI ACWI Net/40% Blmbg. Global Aggregate			-3.5	13.2	1.3	-	-	-17.3	8.8	14.0	18.6	-		
AQR Global Risk Premium-EL	165,931,550	1.6	-2.5	3.0	0.0	-	-	-16.3	10.7	6.2	18.7	-	3.4	Jan-19
HFR Risk Parity Vol 10 Index			-3.4	4.1	-2.0	-	-	-18.3	6.8	3.6	18.4	-	1.6	
PanAgora Risk Parity Multi Asset	152,980,468	1.4	-5.8	0.1	-5.3	-	-	-26.1	8.7	14.0	-	-	0.0	Mar-19
HFR Risk Parity Vol 10 Index			-3.4	4.1	-2.0	-	-	-18.3	6.8	3.6	-	-	0.4	

Individual closed end funds are not shown in performance summary table.

Total Fund
Performance Summary (Gross of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Diversifying	734,915,085	6.9	-1.0	-1.2	-0.7	0.3	0.6	-5.4	2.0	-1.3	7.1	-2.0		Dec-03
Custom Diversifying Benchmark			-1.5	3.7	-0.6	1.6	2.7	-5.7	1.6	4.7	6.1	1.4		
Diversifying Fixed Income	210,966,211	2.0	-3.3	-0.3	-5.2	-1.3	0.6	-13.3	-0.7	1.6	8.6	-1.7		Dec-03
Blmbg. U.S. Aggregate Index			-3.2	0.6	-5.2	0.1	1.1	-13.0	-1.5	7.5	8.7	0.0		
eV US Core Fixed Inc Rank			85	99	92	100	100	76	33	100	80	100		
AFL-CIO	210,905,365	2.0	-3.3	-0.3	-5.2	0.0	1.3	-13.3	-0.7	6.6	8.2	0.6	5.0	Jul-91
Blmbg. U.S. Aggregate Index			-3.2	0.6	-5.2	0.1	1.1	-13.0	-1.5	7.5	8.7	0.0	4.8	
eV US Core Fixed Inc Rank			86	99	93	96	93	76	33	95	87	14		
Diversifying Multi-Asset	523,948,875	4.9	0.0	-1.6	1.4	-	-	-1.9	2.8	-	-	-		Aug-20
Custom Diversifying Multi-Asset Benchmark			-0.2	5.8	1.9	-	-	-3.1	4.1	-	-	-		
Acadian Multi-Asset Absolute Return Fund	222,658,418	2.1	2.0	-3.7	1.3	-	-	-0.1	1.7	-	-	-	1.0	Aug-20
FTSE 3-Month T-bill +5%			2.6	9.9	6.9	-	-	6.6	5.0	-	-	-	6.8	
Sit LLCAR	301,290,456	2.8	-1.3	0.6	-	-	-	-3.3	-	-	-	-	1.2	Apr-21
Blmbg. U.S. Aggregate Index +1%			-3.0	1.7	-	-	-	-12.1	-	-	-	-	-4.2	
Liquidity	1,726,607,314	16.3	0.5	3.6	-0.3	1.6	-	-3.4	-0.2	3.5	4.9	1.8		Nov-16
Blmbg. 1-3 Year Gov/Credit Index			0.7	2.8	-0.7	1.2	-	-3.7	-0.5	3.3	4.0	1.6		
eV US Short Duration Fixed Inc Rank			72	45	55	48	-	49	45	75	39	25		
DFA Short Credit	392,323,184	3.7	1.4	5.2	-0.6	1.4	-	-5.3	-0.4	2.9	5.2	1.2	1.3	Dec-16
ICE BofA 1-5 Year U.S. Corp/Govt Index			0.3	2.7	-1.6	1.2	-	-5.5	-0.9	4.6	5.1	1.4	1.1	
eV US Short Duration Fixed Inc Rank			8	12	72	71	-	91	67	89	26	90		
Insight Short Duration	643,860,895	6.1	1.1	4.4	0.9	2.2	-	-1.1	0.1	3.2	4.7	1.7	1.9	Dec-16
Blmbg. 1-3 Year Gov/Credit index			0.7	2.8	-0.7	1.2	-	-3.7	-0.5	3.3	4.0	1.6	1.1	
eV US Short Duration Fixed Inc Rank			19	23	11	14	-	6	31	85	48	38		
Sit Short Duration	690,423,236	6.5	-0.6	1.9	-1.4	1.4	-	-4.8	-0.3	4.6	4.9	2.5	1.3	Dec-16
Blmbg. 1-3 Year Govt Index			0.7	2.5	-0.9	1.0	-	-3.8	-0.6	3.1	3.6	1.6	0.9	
eV US Short Duration Fixed Inc Rank			99	98	96	69	-	80	58	29	40	3		
Total Cash	147,984,408	1.4	1.5	2.4	1.3	1.8	1.0	2.4	0.4	1.3	3.3	1.7		Dec-03
90 Day U.S. Treasury Bill			1.3	4.5	1.7	1.7	1.1	1.5	0.0	0.7	2.3	1.9		
Cash	147,980,104	1.4	1.5	6.0	2.4	2.5	1.8	2.2	0.4	1.3	3.4	1.7	17.6	Apr-98
Northern Trust Transition	4,304	0.0	1.4	-99.2	-80.9	-	-	-4.8	-6.1	104.1	-	-		Feb-19

Individual closed end funds are not shown in performance summary table. Effective 3/1/2019 the custodian of record switched from State Street to Northern Trust. Wellington Real Total Return was liquidated 4/30/2020. \$60,845.58 in residual value is reflected in the Diversifying Fixed Income composite.

Total Fund
Performance Summary (Net of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Total Fund	10,588,031,137	100.0	-1.7	7.5	4.4	4.5	6.0	-10.6	13.9	9.2	14.6	-2.7		Oct-92
Policy Index			-1.5	8.7	5.9	6.0	7.0	-8.4	15.3	10.8	14.6	-0.9		
Policy Index (Adjusted)			-1.5	8.7	5.8	5.4	6.6	-8.4	15.3	8.5	14.1	-1.5		
Total Fund ex Overlay & Cash	10,328,195,234	97.5	-1.8	7.3	4.7	4.8	6.1	-10.1	14.3	9.4	14.3	-2.4		Dec-03
Policy Index			-1.5	8.7	5.9	6.0	7.0	-8.4	15.3	10.8	14.6	-0.9		
Policy Index (Adjusted)			-1.5	8.7	5.8	5.4	6.6	-8.4	15.3	8.5	14.1	-1.5		
Growth	7,866,672,835	74.3	-2.4	8.9	6.7	6.0	7.5	-11.7	19.2	12.0	18.3	-3.9		Jan-03
Custom Growth Benchmark			-2.1	10.6	8.5	7.7	8.6	-10.3	21.6	13.8	19.3	-2.1		
Total Domestic Equity	1,856,174,493	17.5	-2.8	18.8	8.4	6.6	9.8	-18.5	20.2	21.8	26.1	-7.6		Sep-82
Russell 3000 Index			-3.3	20.5	9.4	9.1	11.3	-19.2	25.7	20.9	31.0	-5.2		
BlackRock Russell 1000 Index	1,079,815,274	10.2	-3.1	21.2	9.5	9.6	-	-19.1	26.5	20.9	31.4	-4.8	11.3	May-17
Russell 1000 Index			-3.1	21.2	9.5	9.6	-	-19.1	26.5	21.0	31.4	-4.8	11.3	
Boston Partners	370,891,941	3.5	0.7	18.2	16.1	7.6	9.5	-4.1	31.0	2.6	23.8	-8.9	10.3	Jun-95
Russell 1000 Value Index			-3.2	14.4	11.1	6.2	8.4	-7.5	25.2	2.8	26.5	-8.3	8.9	
Emerald Advisers	202,868,375	1.9	-8.5	10.1	1.2	2.7	8.0	-24.2	4.9	38.2	29.4	-10.7	11.4	Apr-03
Russell 2000 Growth Index			-7.3	9.6	1.1	1.6	6.7	-26.4	2.8	34.6	28.5	-9.3	9.6	
Ceredex	202,598,903	1.9	-1.4	19.3	15.6	3.9	7.0	-9.0	27.7	1.7	17.7	-11.8	9.2	Nov-11
Russell 2000 Value Index			-3.0	7.8	13.3	2.6	6.2	-14.5	28.3	4.6	22.4	-12.9	8.6	
Total International Equity	1,319,020,751	12.5	-4.7	17.7	2.7	3.1	3.9	-18.6	7.8	15.2	23.2	-14.7		Sep-88
MSCI AC World ex USA Index			-3.7	21.0	4.2	3.1	3.8	-15.6	8.3	11.1	22.1	-13.8		
MSCI EAFE Index			-4.0	26.3	6.3	3.7	4.3	-14.0	11.8	8.3	22.7	-13.4		
International Equity	877,470,524	8.3	-6.2	17.9	1.6	3.7	4.6	-18.4	8.6	18.5	26.5	-13.9		Oct-10
MSCI AC World ex USA Index			-3.7	21.0	4.2	3.1	3.8	-15.6	8.3	11.1	22.1	-13.8		
Pyrford	462,794,387	4.4	-3.8	21.7	5.3	3.8	-	-7.4	7.1	4.2	21.6	-10.5	3.4	May-14
MSCI AC World ex USA Value			-0.1	25.2	9.6	2.3	-	-8.6	10.5	-0.8	15.7	-14.0	1.9	
William Blair	414,676,137	3.9	-8.8	13.9	-2.1	3.4	4.7	-28.0	10.1	32.8	31.5	-17.1	5.4	Nov-10
MSCI AC World ex USA Growth			-7.3	15.8	-1.9	2.5	3.9	-23.1	5.1	22.2	27.3	-14.4	4.2	
Emerging Markets Equity	441,550,226	4.2	-2.6	17.4	4.5	2.2	-	-18.9	7.0	10.7	18.7	-15.7		Feb-17
MSCI Emerging Markets			-2.9	11.7	-1.7	0.6	-	-20.1	-2.5	18.3	18.4	-14.6		
PIMCO RAE Emerging Markets	228,149,004	2.2	1.9	29.7	14.3	5.0	-	-10.1	16.5	1.6	14.0	-12.6	5.2	Mar-17
MSCI Emerging Markets Value			-0.8	16.0	4.4	0.4	-	-15.8	4.0	5.5	12.0	-10.7	2.2	
TT Emerging Markets	213,401,223	2.0	-7.1	5.5	-4.3	-0.4	-	-26.8	-0.9	20.0	24.0	-18.9	-0.7	Aug-17
MSCI Emerging Markets			-2.9	11.7	-1.7	0.6	-	-20.1	-2.5	18.3	18.4	-14.6	0.6	

Individual closed end funds are not shown in performance summary table.

Total Fund
Performance Summary (Net of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Total Global Equity	1,053,670,143	10.0	-4.3	17.1	2.7	6.5	7.8	-19.4	13.2	24.4	27.9	-8.5		Dec-03
MSCI AC World Index			-3.4	20.8	6.9	6.5	7.6	-18.4	18.5	16.3	26.6	-9.4		
Artisan Partners	531,360,106	5.0	-5.3	15.4	-1.2	7.1	9.6	-30.1	14.1	40.6	36.0	-8.6	10.4	Oct-12
MSCI ACWI Growth NR USD			-4.9	24.4	3.8	8.4	9.5	-28.6	17.1	33.6	32.7	-8.1	10.2	
First Eagle	522,190,898	4.9	-3.4	18.9	7.0	5.6	6.1	-6.3	12.1	7.7	20.1	-8.3	6.8	Jan-11
MSCI ACWI Value NR USD			-1.8	17.0	9.7	4.0	5.3	-7.5	19.6	-0.3	20.6	-10.8	5.8	
Private Credit	1,093,882,374	10.3	2.8	9.1	10.3	8.7	9.4	10.5	10.0	4.0	7.7	8.3		Sep-06
Total High Yield	147,368,701	1.4	0.0	10.0	1.1	2.3	3.2	-10.9	4.9	4.7	14.7	-3.6		Dec-03
ICE BofA US High Yield Master II			0.5	10.2	1.8	2.8	4.2	-11.2	5.3	6.1	14.4	-2.3		
Voya Global Investors	147,368,701	1.4	0.0	10.0	1.1	2.3	3.2	-10.9	4.9	4.7	14.7	-3.6	5.9	May-00
ICE BofA US High Yield Master II			0.5	10.2	1.8	2.8	4.2	-11.2	5.3	6.1	14.4	-2.3	6.3	
Total Real Estate	770,087,930	7.3	-4.6	-10.9	1.7	1.0	5.9	-5.3	19.2	-6.0	8.1	7.4		Sep-92
Real Estate Benchmark			-4.4	-10.8	2.1	2.5	5.9	-4.5	19.3	0.6	7.5	6.8		
NCREIF-ODCE			-1.9	-12.1	7.1	5.7	8.2	7.5	22.2	1.2	5.3	8.3		
NCREIF Property Index			-1.4	-8.4	6.0	5.3	7.4	5.5	17.7	1.6	6.4	6.7		
Total Core Real Estate	184,110,260	1.7	-7.3	0.2	5.8	3.9	6.5	-25.1	47.5	-5.2	27.5	-5.5		Jan-01
Adelante	84,432,661	0.8	-6.3	3.6	6.4	4.2	6.7	-27.2	47.5	-5.2	27.5	-5.5	8.8	Oct-01
Wilshire U.S. REIT Index			-6.4	3.9	5.7	2.9	6.0	-26.8	46.2	-7.9	25.8	-4.8	8.5	
Invesco US Fundamental Beta	99,677,600	0.9	-8.2	-2.6	-	-	-	-	-	-	-	-	-13.6	Mar-22
Wilshire U.S. REIT Index			-6.4	3.9	-	-	-	-	-	-	-	-	-12.3	
Total Private Real Estate	585,977,669	5.5	-4.0	-14.5	1.7	0.9	5.8	1.3	15.3	-6.1	6.2	8.8		Sep-92
Private Equity	1,307,556,426	12.3	-0.4	-3.7	19.2	13.6	12.7	-0.5	60.4	8.7	8.4	12.0		Dec-03
Risk Parity	318,912,018	3.0	-4.1	1.3	-3.1	-	-	-21.8	9.3	9.6	17.7	-		Jan-19
60% MSCI ACWI Net/40% Blmbg. Global Aggregate			-3.5	13.2	1.3	-	-	-17.3	8.8	14.0	18.6	-		
AQR Global Risk Premium-EL	165,931,550	1.6	-2.5	2.8	-0.3	-	-	-16.6	10.3	5.8	18.3	-	3.1	Jan-19
HFR Risk Parity Vol 10 Index			-3.4	4.1	-2.0	-	-	-18.3	6.8	3.6	18.4	-	1.6	
PanAgora Risk Parity Multi Asset	152,980,468	1.4	-5.8	-0.3	-5.6	-	-	-26.3	8.3	13.6	-	-	-0.3	Mar-19
HFR Risk Parity Vol 10 Index			-3.4	4.1	-2.0	-	-	-18.3	6.8	3.6	-	-	0.4	

Individual closed end funds are not shown in performance summary table.

Total Fund
Performance Summary (Net of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Diversifying	734,915,085	6.9	-1.1	-1.6	-1.1	-0.1	0.2	-5.7	1.7	-1.7	6.8	-2.3		Dec-03
<i>Custom Diversifying Benchmark</i>			-1.5	3.7	-0.6	1.6	2.7	-5.7	1.6	4.7	6.1	1.4		
Diversifying Fixed Income	210,966,211	2.0	-3.4	-0.6	-5.5	-1.6	0.2	-13.5	-1.0	1.2	8.3	-2.0		Dec-03
<i>Blmbg. U.S. Aggregate Index</i>			-3.2	0.6	-5.2	0.1	1.1	-13.0	-1.5	7.5	8.7	0.0		
AFL-CIO	210,905,365	2.0	-3.4	-0.6	-5.5	-0.3	0.9	-13.6	-1.0	6.2	7.8	0.2	4.7	Jul-91
<i>Blmbg. U.S. Aggregate Index</i>			-3.2	0.6	-5.2	0.1	1.1	-13.0	-1.5	7.5	8.7	0.0	4.8	
Diversifying Multi-Asset	523,948,875	4.9	-0.1	-2.0	1.0	-	-	-2.3	2.4	-	-	-		Aug-20
<i>Custom Diversifying Multi-Asset Benchmark</i>			-0.2	5.8	1.9	-	-	-3.1	4.1	-	-	-		
Acadian Multi-Asset Absolute Return Fund	222,658,418	2.1	1.9	-4.2	0.8	-	-	-0.6	1.1	-	-	-	0.5	Aug-20
<i>FTSE 3-Month T-bill +5%</i>			2.6	9.9	6.9	-	-	6.6	5.0	-	-	-	6.8	
Sit LLCAR	301,290,456	2.8	-1.4	0.2	-	-	-	-3.7	-	-	-	-	0.8	Apr-21
<i>Blmbg. U.S. Aggregate +1%</i>			-3.0	1.7	-	-	-	-12.1	-	-	-	-	-4.2	
Liquidity	1,726,607,314	16.3	0.5	3.4	-0.4	1.5	-	-3.5	-0.3	3.4	4.8	1.7		Nov-16
<i>Blmbg. 1-3 Year Gov/Credit Index</i>			0.7	2.8	-0.7	1.2	-	-3.7	-0.5	3.3	4.0	1.6		
DFA Short Credit	392,323,184	3.7	1.3	5.1	-0.7	1.3	-	-5.4	-0.5	2.8	5.2	1.1	1.2	Dec-16
<i>ICE BofA 1-5 Year U.S. Corp/Govt</i>			0.3	2.7	-1.6	1.2	-	-5.5	-0.9	4.6	5.1	1.4	1.1	
Insight Short Duration	643,860,895	6.1	1.1	4.3	0.9	2.1	-	-1.2	0.0	3.1	4.6	1.7	1.9	Dec-16
<i>Blmbg. 1-3 Year Gov/Credit index</i>			0.7	2.8	-0.7	1.2	-	-3.7	-0.5	3.3	4.0	1.6	1.1	
Sit Short Duration	690,423,236	6.5	-0.6	1.8	-1.6	1.2	-	-5.0	-0.5	4.4	4.7	2.3	1.1	Dec-16
<i>Blmbg. 1-3 Year Govt Index</i>			0.7	2.5	-0.9	1.0	-	-3.8	-0.6	3.1	3.6	1.6	0.9	
Total Cash	147,984,408	1.4	1.5	2.4	1.3	1.8	1.0	2.4	0.4	1.3	3.3	1.7		Dec-03
<i>90 Day U.S. Treasury Bill</i>			1.3	4.5	1.7	1.7	1.1	1.5	0.0	0.7	2.3	1.9		
Cash	147,980,104	1.4	1.5	6.0	2.4	2.5	1.8	2.2	0.4	1.3	3.4	1.7		Apr-98
Northern Trust Transition	4,304	0.0	1.4	-99.2	-80.9	-	-	-4.8	-6.1	104.1	-	-		Feb-19

Individual closed end funds are not shown in performance summary table. Effective 3/1/2019 the custodian of record switched from State Street to Northern Trust. Wellington Real Total Return was liquidated 4/30/2020. \$60,845.58 in residual value is reflected in the Diversified Fixed Income composite.

Total Fund
Closed End Funds - IRR Summary

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

Private Equity & Venture Capital	Closing Date	Fund Level (G) ²	CCCERA (G)	Fund Level (N) ^{2,3}	CCCERA (N) ³	IRR Date
Adams Street Partners	2/11/2004	12.0%	13.6%	-	11.7%	6/30/2023
Adams Street Partners II	12/31/2008	16.4%	16.4%	-	13.9%	6/30/2023
Adams Street Partners - Fund 5	12/31/2008	9.5%	9.0%	-	6.5%	6/30/2023
Adams Street Partners Venture	1/18/1996	35.2%	35.3%	-	33.2%	6/30/2023
Adams Street Partners - BPF	3/31/2016	14.2%	14.2%	-	11.6%	6/30/2023
AE Industrial Partners Fund II, LP	5/18/2018	26.9%	-	24.1%	-	6/30/2023
Aether Real Assets III ¹	11/27/2013	0.2%	-	-1.3	-	6/30/2023
Aether Real Assets III Surplus ¹	11/30/2013	1.7%	-	0.7%	-	6/30/2023
Aether Real Assets IV ¹	1/30/2016	6.5%	-	4.8%	-	6/30/2023
Bay Area Equity Fund I ⁹	11/26/2003	31.3%	31.3%	22.9%	22.9%	6/30/2023
Bay Area Equity Fund II ⁹	11/26/2003	8.1%	8.1%	4.2%	4.2%	6/30/2023
CommonFund ¹	6/30/2013	-	-	-	8.2%	12/31/2022
Energy Investor Fund II ⁹	7/15/2005	5.7%	5.3%	2.9%	2.6%	12/31/2022
Energy Investor Fund V	11/28/2016	18.0%	-	12.7%	-	9/30/2023
Genstar Capital Partners IX, L.P.	2/21/2019	44.9%	-	34.7%	-	9/30/2023
Oaktree PIF 2009	2/28/2010	6.8%	-	6.6%	-	9/30/2023
Ocean Avenue II	8/15/2013	-	-	18.9%	-	9/30/2023
Ocean Avenue III	4/15/2016	-	-	25.6%	-	9/30/2023
Paladin III	11/30/2007	20.2%	-	-	-	6/30/2023
Pathway 6	8/22/2011	17.2%	17.2%	14.3%	14.3%	6/30/2023
Benchmark ⁴		14.7%	-	-	-	6/30/2023
Pathway 7	7/10/2013	19.2%	19.2%	16.4%	16.4%	6/30/2023
Benchmark ⁵		15.4%	-	-	-	6/30/2023
Pathway 8	11/23/2015	21.3%	21.3%	19.3%	19.3%	6/30/2023
Benchmark ⁶		17.2%	-	-	-	6/30/2023
Pathway Private Equity Fund	1/19/1999	10.9%	10.9%	8.4%	8.4%	6/30/2023
Benchmark ⁷		10.4%	-	-	-	6/30/2023
Pathway Private Equity Fund 2008	7/31/2009	17.2%	17.2%	14.1%	14.1%	6/30/2023
Benchmark ⁸		13.5%	-	-	-	6/30/2023
Siguler Guff CCCERA Opportunities	6/3/2014	18.6%	19.3%	18.1%	16.9%	6/30/2023
Siguler Guff Secondary Opportunities ⁹	8/31/2013	55.3%	118.4%	49.5%	69.0%	9/30/2020
Siris Partners IV, L.P. ¹	5/18/2018	22.4%	-	17.9%	-	3/31/2023
TPG Healthcare Partners, L.P.	6/28/2019	28.0%	41.0%	-	24.0%	6/30/2023
Trident VIII, L.P.	5/24/2019	17.0%	-	13.0%	-	6/30/2023
Wastewater Opportunity Fund ¹	12/8/2015	8.5%	-	4.5%	-	3/31/2023

¹Manager has yet to report IRR figure.

²Fund level data includes CCCERA and all other fund investors.

³Net IRR calculated after deductions of management fees and carried interest to the General Partner.

⁴Private iQ global all private equity median pooled return for vintage years 2011-2014, as of September 30, 2022.

⁵Private iQ global all private equity median pooled return for vintage years 2012-2016, as of September 30, 2022.

⁶Private iQ global all private equity median pooled return for vintage years 2015-2018, as of September 30, 2022.

⁷Private iQ global all private equity median pooled return for vintage years 1999-2011, as of September 30, 2022.

⁸Private iQ global all private equity median pooled return for vintage years 2008-2014, as of September 30, 2022.

⁹Capital has been fully called and fund is in redemption.

Total Fund
Closed End Funds - Investment Summary

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

StepStone Group Analysis (*)

Closing Date	Manager Name/Fund Name	Estimated Market Value as of 9/30/2023 ¹	Total Commitment	% Called	Contributed Capital	Current Qtr. Change in Contributed Capital	Current Qtr. Change in Distributed Capital	Total Distributions	Remaining Commitment	Distrib./Paid-In (DPI) ²	Tot. Value/Paid-In (TVPI) ³	Latest Valuation
Private Credit												
8/31/2015	Angelo Gordon Energy Credit Opp. ⁴	\$1,943,985	\$16,500,000	114%	\$18,750,000	\$0	\$0	\$20,410,032	\$2,319,783	1.09	1.19	6/30/2023
12/18/2017	Stepstone CC Opportunities Fund	\$1,080,314,415	\$1,170,000,000	86%	\$1,008,568,397	\$22,612,034	\$18,238,508	\$229,331,986	\$264,007,741	0.23	1.30	6/30/2023
8/1/2012	Torchlight IV	\$4,340,654	\$60,000,000	141%	\$84,866,971	\$0	\$1,327,721	\$109,589,365	\$0	1.29	1.34	6/30/2023
3/12/2015	Torchlight V	\$7,283,320	\$75,000,000	80%	\$60,000,000	\$0	\$0	\$71,460,214	\$15,000,000	1.19	1.31	6/30/2023
Total Private Credit		\$1,093,882,374										
% of Portfolio (Market Value)		10.3%										

*All Data provided by StepStone Group

¹Latest valuation + capital calls - distributions

²(DPI) is equal to (capital returned / capital called)

³(TVPI) is equal to (market value + capital returned) / capital called

⁴Capital has been fully called and fund is in redemption.

Total Fund
Closed End Funds - Investment Summary

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

Verus Internal Analysis												
Inception Date	Manager Name/Fund Name	Estimated Market Value as of 9/30/2023 ¹	Total Commitment	Total % Called	Capital Called	Current Qtr. Capital Called	Current Qtr. Distributions	Total Distributions ⁵	Remaining Commitment	Distrib./Paid-In (DPI) ²	Tot. Value/Paid-In (TVPI) ³	Latest Valuation
Real Estate												
1/23/2012	Angelo Gordon Realty Fund VIII ⁴	\$11,304,234	\$80,000,000	94%	\$75,401,855	\$0	\$0	\$101,711,550	\$12,334,302	1.35	1.50	6/30/2023
12/8/2014	Angelo Gordon Realty Fund IX	\$20,978,005	\$65,000,000	93%	\$60,125,000	\$0	\$1,462,500	\$58,012,501	\$7,572,500	0.96	1.31	6/30/2023
3/24/2023	Blackstone Real Estate Partners X	\$4,093,035	\$100,000,000	5%	\$4,640,226	\$375,000	\$0	\$0	\$95,359,774	0.00	0.88	6/30/2023
3/24/2023	Blackstone Real Estate Partners VIII	\$21,390,003	\$80,000,000	0%	\$0	\$0	\$0	\$0	\$80,000,000	N/A	N/A	N/A
3/25/2022	BlackStone Strategic Partners Real Estate VIII	\$0	\$80,000,000	0%	\$0	\$0	\$0	\$0	\$80,000,000	N/A	N/A	N/A
	N/A Cross Lake RE IV	\$0	\$60,000,000	0%	\$0	\$0	\$0	\$0	\$60,000,000	N/A	N/A	N/A
6/23/2005	DLJ RECP III	\$12,524,664	\$75,000,000	134%	\$100,709,313	\$0	\$0	\$69,364,915	\$4,031,338	0.69	0.81	6/30/2023
2/11/2008	DLJ RECP IV	\$44,238,815	\$100,000,000	130%	\$130,117,329	\$0	\$0	\$99,841,735	\$1,876,084	0.77	1.11	6/30/2023
7/1/2014	DLJ RECP V	\$28,058,358	\$75,000,000	144%	\$108,093,296	\$651,081	\$0	\$100,933,448	\$15,567,682	0.93	1.19	6/30/2023
3/19/2019	DLJ RECP VI	\$30,577,966	\$50,000,000	77%	\$38,496,759	\$3,170,689	\$0	\$11,369,099	\$22,649,572	0.30	1.09	6/30/2023
	N/A EQT Industrial Value VI	\$0	\$60,000,000	0%	\$0	\$0	\$0	\$0	\$60,000,000	N/A	N/A	N/A
	N/A EQT Multifamily Value II	\$0	\$40,000,000	0%	\$0	\$0	\$0	\$0	\$40,000,000	N/A	N/A	N/A
6/30/2014	Invesco Real Estate IV ⁴	\$454,733	\$35,000,000	87%	\$30,546,401	\$0	\$0	\$39,777,325	\$4,453,599	1.30	1.32	9/30/2023
2/20/2019	Invesco Real Estate V	\$77,219,605	\$75,000,000	87%	\$65,318,898	\$4,243,690	\$0	\$9,319,462	\$9,681,102	0.14	1.32	9/30/2023
9/27/2022	Invesco Real Estate VI	\$42,710,901	\$100,000,000	46%	\$45,631,253	\$0	\$0	\$2,230,131	\$66,873,408	0.05	0.98	6/30/2023
7/16/2013	LaSalle Income & Growth VI ⁴	\$12,516,418	\$75,000,000	95%	\$71,428,571	\$0	\$0	\$84,541,423	\$0	1.18	1.36	6/30/2023
2/28/2017	LaSalle Income & Growth VII	\$32,096,370	\$75,000,000	96%	\$72,154,315	\$2,845,685	\$0	\$50,904,014	\$2,845,685	0.71	1.15	6/30/2023
7/3/2013	Long Wharf Fund IV ⁴	\$296,681	\$25,000,000	100%	\$25,000,000	\$0	\$0	\$34,948,087	\$0	1.40	1.41	9/30/2023
9/30/2016	Long Wharf Fund V ⁴	\$29,220,152	\$50,000,000	100%	\$50,000,000	\$0	\$0	\$37,244,373	\$0	0.74	1.33	9/30/2023
6/27/2019	Long Wharf Fund VI	\$34,107,845	\$50,000,000	100%	\$49,999,998	\$594,648	\$1,387,512	\$27,056,490	\$2	0.54	1.22	9/30/2023
5/30/2023	Long Wharf Fund VII	\$4,902,529	\$50,000,000	12%	\$5,931,095	\$987,704	\$0	\$0	\$44,068,905	0.00	0.83	9/30/2023
12/31/2011	Oaktree REOF V ⁴	\$354,706	\$50,000,000	101%	\$50,315,673	\$0	\$0	\$78,780,733	\$5,000,000	1.57	1.57	9/30/2023
9/30/2013	Oaktree REOF VI ⁴	\$18,522,338	\$80,000,000	100%	\$80,000,000	\$0	\$1,200,000	\$84,810,175	\$18,400,000	1.06	1.29	9/30/2023
4/1/2015	Oaktree REOF VII	\$39,299,237	\$65,000,000	100%	\$65,000,000	\$0	\$4,225,000	\$42,829,688	\$18,915,000	0.66	1.26	9/30/2023
11/10/2013	Paulson Real Estate Fund II ⁴	\$12,723,327	\$20,000,000	97%	\$19,345,623	\$0	\$0	\$25,449,660	\$654,377	1.32	1.97	6/30/2023
4/28/2022	PCCP IX	\$55,426,565	\$75,000,000	72%	\$54,176,564	\$3,750,000	\$0	\$0	\$20,823,436	0.00	1.02	6/30/2023
1/25/2012	Siguler Guff DREOF	\$12,989,150	\$75,000,000	93%	\$69,375,000	\$0	\$8,371	\$103,779,482	\$5,625,000	1.50	1.68	6/30/2023
8/31/2013	Siguler Guff DREOF II	\$27,527,046	\$70,000,000	89%	\$61,985,000	\$0	\$15,244	\$55,707,030	\$8,015,000	0.90	1.34	6/30/2023
1/27/2016	Siguler Guff DREOF II Co-Inv	\$12,444,986	\$25,000,000	85%	\$21,277,862	\$362,500	\$0	\$13,871,261	\$3,722,138	0.65	1.24	6/30/2023
Total Closed End Real Estate		\$585,977,669	\$1,760,000,000	77%	\$1,355,070,032	\$16,980,997	\$8,298,628	\$1,132,482,583	\$588,468,903	0.84	1.27	
% of Portfolio (Market Value)		5.5%										

¹Latest valuation + capital calls - distributions
²(DPI) is equal to (capital returned / capital called)
³(TVPI) is equal to (market value + capital returned) / capital called
⁴Capital has been fully called and fund is in redemption.
⁵Total distributions may include recallable distributions
⁶Remianing commitment includes recallable distributions

Total Fund
Closed End Funds - IRR Summary

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

Private Credit	Inception	Fund Level (G) ²	CCCERA (G)	Fund Level (N) ^{2 3}	CCCERA (N) ³	IRR Date
Angelo Gordon Energy Cred Opp. ⁴	9/24/2015	-	-	-	6.9%	6/30/2023
Stepstone CC Opportunities Fund ¹	2/2/2018	-	9.9%	-	9.2%	12/31/2022
Torchlight IV	8/1/2012	11.4%	11.9%	9.2%	10.0%	6/30/2023
Torchlight V	3/12/2015	14.2%	14.3%	10.2%	10.2%	6/30/2023
Real Estate	Inception	Fund Level (G) ²	CCCERA (G)	Fund Level (N) ^{2 3}	CCCERA (N) ³	IRR Date
Angelo Gordon VIII ⁴	1/23/2012	-	-	-	12.3%	6/30/2023
Angelo Gordon IX	12/8/2014	-	-	-	6.3%	6/30/2023
Blackstone Real Estate Partners X ¹	3/24/2023	-	-	-	-	6/30/2023
Blackstone Real Estate Partners VIII ¹	3/24/2023	-	-	-	-	N/A
BlackStone Strategic Partners Real Estate VIII ¹	3/25/2022	-	-	-	-	N/A
Cross Lake RE IV ¹	N/A	-	-	-	-	N/A
DLJ RECP III ¹	6/23/2005	-1.0%	-1.0%	-3.0%	-3.0%	6/30/2023
DLJ RECP IV ¹	2/11/2008	4.0%	4.0%	1.0%	2.0%	6/30/2023
DLJ RECP V ¹	7/1/2014	15.0%	15.0%	9.0%	9.0%	6/30/2023
DLJ RECP VI ¹	3/19/2019	13.0%	13.0%	4.0%	4.0%	6/30/2023
EQT Industrial Value VI ¹	N/A	-	-	-	-	N/A
EQT Multifamily Value II ¹	N/A	-	-	-	-	N/A
Invesco Fund IV ⁴	6/30/2014	13.2%	-	10.5%	-	6/30/2023
Invesco Fund V	2/20/2019	11.9%	-	9.2%	-	6/30/2023
Invesco Fund VI	9/27/2022	-	-	-	-	9/30/2023
LaSalle Income & Growth VI ⁴	7/16/2013	10.8%	10.7%	8.8%	8.8%	9/30/2023
LaSalle Income & Growth VII	2/28/2017	2.9%	2.7%	1.1%	0.9%	9/30/2023
Long Wharf IV ⁴	7/3/2013	14.7%	14.5%	11.1%	11.0%	9/30/2023
Long Wharf V ⁴	9/30/2016	10.1%	10.5%	7.5%	7.8%	9/30/2023
Long Wharf VI	6/27/2019	29.0%	31.1%	17.9%	19.0%	9/30/2023
Oaktree REOF V ⁴	12/31/2011	16.6%	-	12.2%	-	9/30/2023
Oaktree REOF VI ⁴	9/30/2013	10.6%	-	6.8%	-	9/30/2023
Oaktree REOF VII	4/1/2015	17.5%	-	11.2%	-	9/30/2023
Paulson ⁴	11/10/2013	-	-	12.2%	-	12/31/2022
PCCP IX	5/27/2021	8.5%	-	4.2%	-	6/30/2023
Siguler Guff I	1/25/2012	12.4%	15.1%	10.8%	15.1%	6/30/2023
Siguler Guff II	8/31/2013	9.1%	9.3%	7.9%	7.6%	6/30/2023
Siguler Guff DREOF II Co-Inv ¹	1/27/2016	5.8%	6.0%	4.9%	4.7%	6/30/2023

¹Manager has yet to report IRR figure.

²Fund level data includes CCCERA and all other fund investors.

³Net IRR calculated after deductions of management fees and carried interest to the General Partner.

⁴Capital has been fully called and fund is in redemption.

Total Fund
Risk Analysis - 3 Years (Net of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

3 Years

	Anlzd Return	Anlzd Excess Performance	Anlzd Standard Deviation	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Information Ratio	Up Capture	Down Capture
BlackRock Russell 1000 Index	9.52	0.00	17.82	0.00	1.00	0.01	1.00	0.51	-0.40	99.98	100.00
Boston Partners	16.10	5.05	17.59	4.66	1.00	3.23	0.97	0.84	1.40	104.72	84.41
Emerald Advisers	1.18	0.10	21.30	0.14	0.92	5.33	0.95	0.08	-0.03	98.47	98.85
Ceredex	15.60	2.28	20.14	4.02	0.84	7.44	0.90	0.74	0.20	91.43	80.65
Pyrford	5.29	-4.28	14.72	-2.12	0.78	6.31	0.88	0.31	-0.71	80.08	93.23
William Blair	-2.09	-0.24	18.78	0.01	1.02	5.80	0.90	-0.11	0.00	105.55	105.45
PIMCO RAE Emerging Markets	14.32	9.92	18.69	9.70	1.02	6.46	0.88	0.72	1.46	126.06	83.98
TT Emerging Markets	-4.31	-2.59	20.25	-2.13	1.10	6.18	0.91	-0.20	-0.35	116.27	125.41
Artisan Partners	-1.20	-4.96	18.82	-4.60	0.95	4.38	0.95	-0.06	-1.14	82.05	98.26
First Eagle	7.00	-2.73	13.51	-0.64	0.78	5.23	0.92	0.44	-0.57	78.88	82.86
Voya Global Investors	1.15	-0.67	8.10	-0.66	1.00	1.05	0.98	-0.03	-0.62	96.34	102.79
Adelante	6.41	0.67	19.74	0.78	0.96	1.48	1.00	0.33	0.33	97.92	95.51
AQR Global Risk Premium-EL	-0.31	1.66	10.35	1.54	0.93	2.14	0.96	-0.14	0.76	98.27	88.69
PanAgora Risk Parity Multi Asset	-5.64	-3.67	15.09	-2.71	1.36	4.80	0.97	-0.42	-0.68	120.38	138.21
AFL-CIO	-5.54	-0.34	5.70	-0.79	0.92	1.04	0.97	-1.27	-0.36	85.84	95.99
DFA Short Credit	-0.74	0.82	2.64	0.68	0.90	1.03	0.86	-0.96	0.80	103.26	82.81
Insight Short Duration	0.88	1.60	1.61	1.26	0.51	1.59	0.36	-0.54	1.00	73.40	22.22
Sit Short Duration	-1.58	-0.67	2.82	-0.36	1.34	1.38	0.81	-1.15	-0.48	143.62	153.47

Performance Analysis excludes closed end funds and those funds without 3 years of performance.

Total Fund
Risk Analysis - 5 Years (Net of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

5 Years

	Anlzd Return	Anlzd Excess Performance	Standard Deviation	Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Information Ratio	Up Capture	Down Capture
BlackRock Russell 1000 Index	9.62	-0.01	19.20	-0.01	1.00	0.01	1.00	0.49	-0.76	99.96	99.99
Boston Partners	7.62	1.39	19.78	1.27	1.02	3.13	0.98	0.38	0.46	101.49	95.73
Emerald Advisers	2.67	1.11	24.00	1.18	0.96	5.19	0.96	0.16	0.19	101.03	97.96
Ceredex	3.93	1.34	23.14	1.50	0.89	6.80	0.93	0.21	0.13	90.59	86.20
Pyrford	3.76	1.47	14.83	1.79	0.75	6.81	0.89	0.21	0.11	84.43	78.29
William Blair	3.38	0.84	19.27	0.93	1.05	5.16	0.93	0.18	0.22	108.98	105.66
PIMCO RAE Emerging Markets	4.96	4.59	20.63	4.88	1.07	5.83	0.92	0.26	0.84	115.53	95.47
TT Emerging Markets	-0.35	-0.91	22.08	-0.56	1.12	5.84	0.94	0.02	-0.05	114.88	117.42
Artisan Partners	7.14	-1.23	19.22	-0.71	0.95	4.68	0.94	0.37	-0.26	91.62	93.31
First Eagle	5.58	1.61	14.20	2.25	0.76	5.59	0.94	0.33	0.16	82.75	74.32
Voya Global Investors	2.32	-0.48	8.84	-0.29	0.93	1.67	0.97	0.11	-0.31	94.36	97.93
Adelante	4.23	1.36	19.62	1.36	0.96	1.64	1.00	0.22	0.69	99.30	94.68
AFL-CIO	-0.34	-0.45	5.18	-0.44	0.92	1.06	0.97	-0.37	-0.44	87.07	93.14
DFA Short Credit	1.26	0.09	2.50	0.24	0.88	1.29	0.75	-0.17	0.07	87.50	78.42
Insight Short Duration	2.10	0.88	1.99	1.39	0.58	1.86	0.26	0.20	0.47	82.50	17.44
Sit Short Duration	1.25	0.21	2.70	-0.14	1.35	1.34	0.81	-0.16	0.17	144.87	159.00

Performance Analysis excludes closed end funds and those funds without 5 years of performance.

Total Fund
Investment Fund Fee Analysis

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

Name	Asset Class	Fee Schedule	Market Value	Estimated Fee Value	Expense Fee (%)
BlackRock Russell 1000 Index	Growth	0.03 % of Assets	\$1,079,815,274	\$323,945	0.03
Boston Partners	Growth	0.50 % of First \$25 M 0.30 % Thereafter	\$370,891,941	\$1,162,676	0.31
Emerald Advisers	Growth	0.75 % of First \$10 M 0.60 % Thereafter	\$202,868,375	\$1,232,210	0.61
Ceredex	Growth	0.85 % of First \$10 M 0.68 % of Next \$40 M 0.51 % Thereafter	\$202,598,903	\$1,135,254	0.56
Pyrford	Growth	0.70 % of First \$50 M 0.50 % of Next \$50 M 0.35 % Thereafter	\$462,794,387	\$1,869,780	0.40
William Blair	Growth	0.80 % of First \$20 M 0.60 % of Next \$30 M 0.50 % of Next \$50 M 0.45 % of Next \$50 M 0.40 % of Next \$50 M 0.30 % Thereafter	\$414,676,137	\$1,659,028	0.40
PIMCO RAE Emerging Markets	Growth	0.75 % of First \$50 M 0.68 % of Next \$50 M 0.50 % of Next \$100 M 0.45 % Thereafter	\$228,149,004	\$1,339,171	0.59
TT Emerging Markets	Growth	0.70 % of First \$100 M 0.65 % of Next \$100 M 0.60 % Thereafter	\$213,401,223	\$1,430,407	0.67
Artisan Partners	Growth	0.75 % of Assets	\$531,360,106	\$3,985,201	0.75
First Eagle	Growth	0.75 % of Assets	\$522,190,898	\$3,916,432	0.75
Voya Global Investors	Growth	0.50 % of First \$50 M 0.40 % of Next \$50 M 0.35 % Thereafter	\$147,368,701	\$615,790	0.42
Invesco US Fundamental Beta	Growth	0.15 % of Assets	\$99,677,600	\$149,516	0.15
AQR Global Risk Premium-EL	Growth	0.38 % of Assets	\$165,931,550	\$630,540	0.38

Mutual fund fees shown are sourced from Morningstar and are as of the most current prospectus.

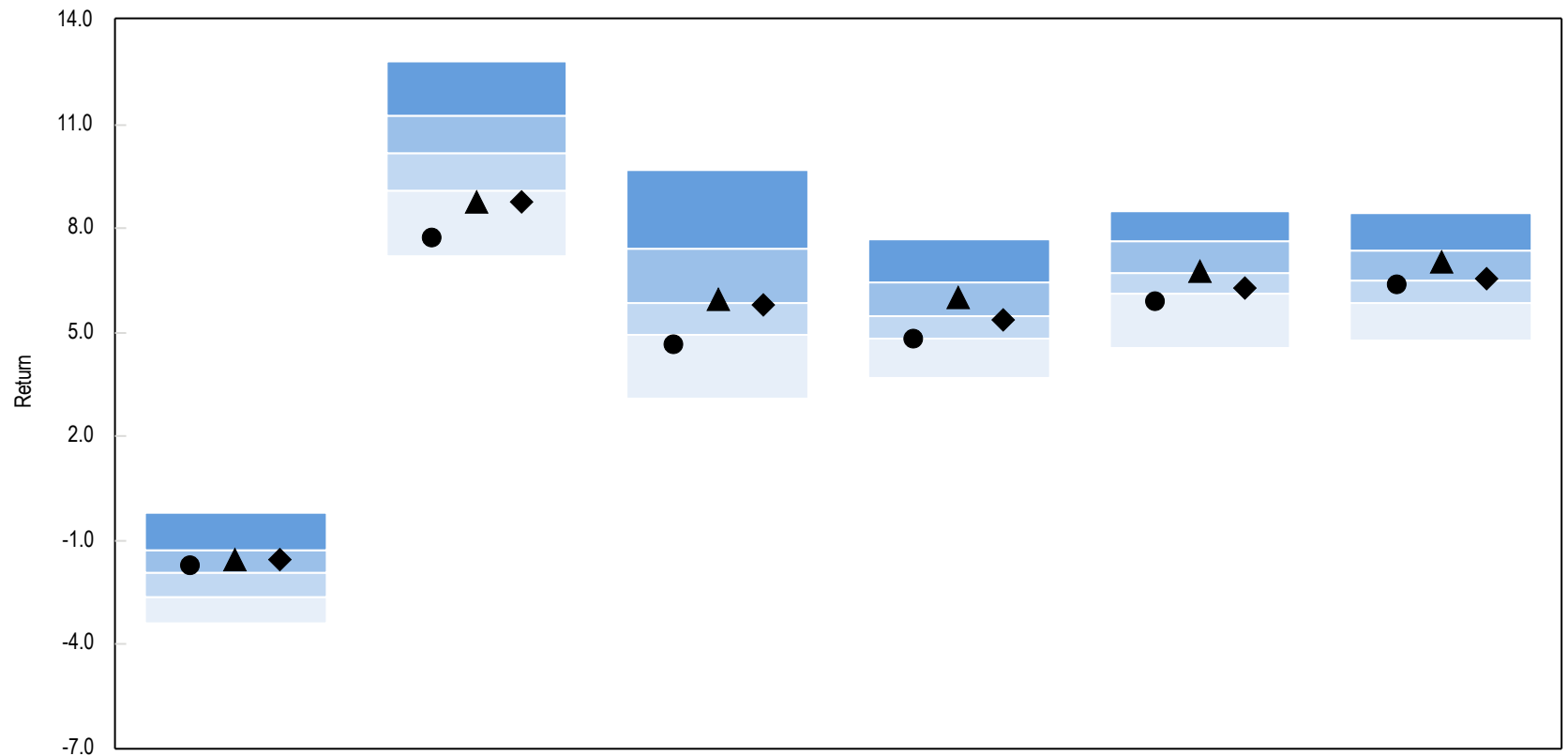
Total Fund
Investment Fund Fee Analysis

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

Name	Asset Class	Fee Schedule	Market Value	Estimated Fee Value	Expense Fee (%)
PanAgora Risk Parity Multi Asset	Growth	0.35 % of Assets	\$152,980,468	\$535,432	0.35
AFL-CIO	Diversifying	0.32 % of Assets	\$210,905,365	\$674,897	0.32
Acadian Multi-Asset Absolute Return Fund	Diversifying	0.50 % of Assets	\$222,658,418	\$1,113,292	0.50
Sit LLCAR	Diversifying	0.39 % of First \$200 M 0.35 % Thereafter	\$301,290,456	\$1,144,904	0.38
DFA Short Credit	Liquidity	0.20 % of First \$25 M 0.10 % Thereafter	\$392,323,184	\$417,323	0.11
Insight Short Duration	Liquidity	0.06 % of First \$500 M 0.05 % of Next \$500 M 0.04 % Thereafter	\$643,860,895	\$371,930	0.06
Sit Short Duration	Liquidity	0.15 % of Assets	\$690,423,236	\$1,035,635	0.15

Mutual fund fees shown are sourced from Morningstar and are as of the most current prospectus.

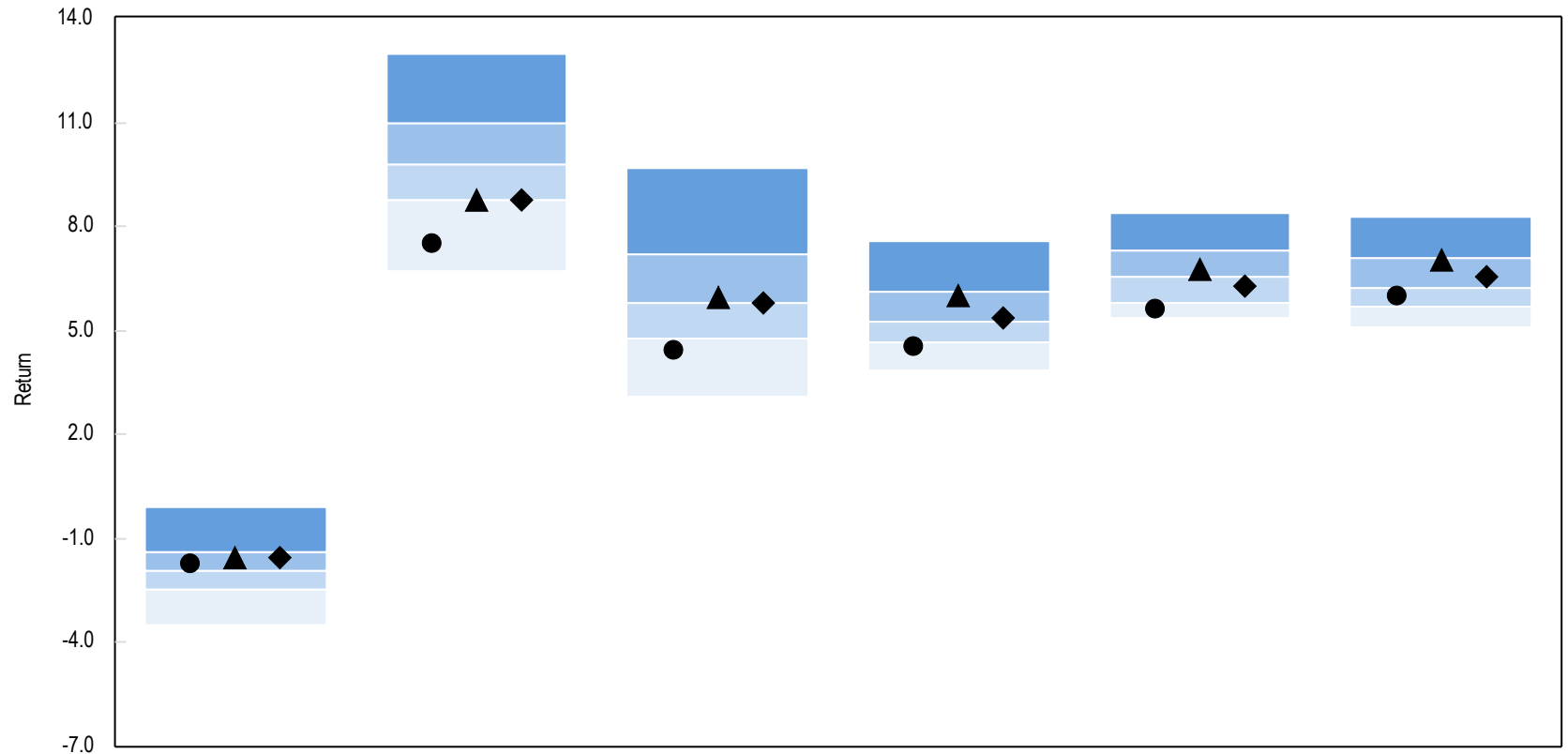
Total Fund Cumulative Performance vs. InvMetrics Public DB >\$1B Gross



	3 Mo	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs
● Total Fund	-1.71 (36)	7.73 (93)	4.67 (81)	4.81 (75)	5.88 (80)	6.41 (57)
▲ Policy Index	-1.54 (29)	8.75 (81)	5.95 (49)	5.99 (34)	6.77 (48)	7.02 (38)
◆ Policy Index (Adjusted)	-1.54 (29)	8.75 (81)	5.77 (52)	5.37 (54)	6.27 (69)	6.56 (49)
5th Percentile	-0.18	12.79	9.70	7.67	8.50	8.42
1st Quartile	-1.27	11.26	7.43	6.42	7.64	7.36
Median	-1.91	10.17	5.82	5.49	6.70	6.51
3rd Quartile	-2.64	9.08	4.93	4.80	6.12	5.82
95th Percentile	-3.37	7.19	3.11	3.72	4.55	4.76
Population	90	82	73	71	70	65

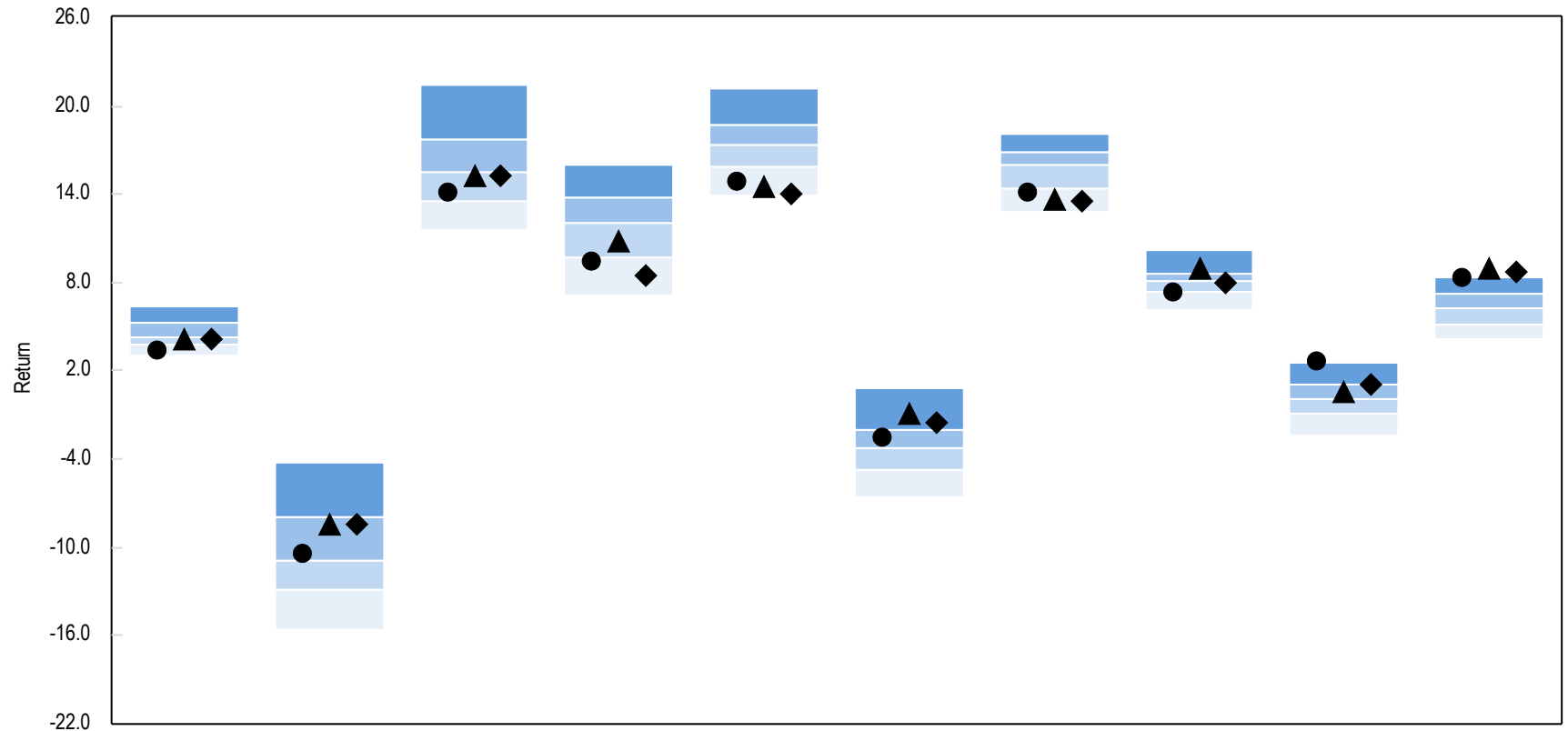
Effective 1/01/2017, only traditional asset class (public equity, public fixed income, REITs) investment management fees will be included in the gross of fee return calculation.

Total Fund Cumulative Performance vs. InvMetrics Public DB >\$1B Net



	3 Mo	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs
● Total Fund	-1.73 (37)	7.53 (93)	4.42 (85)	4.55 (78)	5.61 (89)	6.03 (56)
▲ Policy Index	-1.54 (29)	8.75 (76)	5.95 (47)	5.99 (32)	6.77 (48)	7.02 (29)
◆ Policy Index (Adjusted)	-1.54 (29)	8.75 (76)	5.77 (51)	5.37 (47)	6.27 (60)	6.56 (44)
5th Percentile	-0.11	12.98	9.69	7.57	8.38	8.29
1st Quartile	-1.36	11.00	7.17	6.13	7.32	7.08
Median	-1.92	9.76	5.79	5.27	6.53	6.22
3rd Quartile	-2.46	8.77	4.76	4.68	5.81	5.66
95th Percentile	-3.50	6.72	3.10	3.83	5.38	5.07
Population	80	73	63	61	60	54

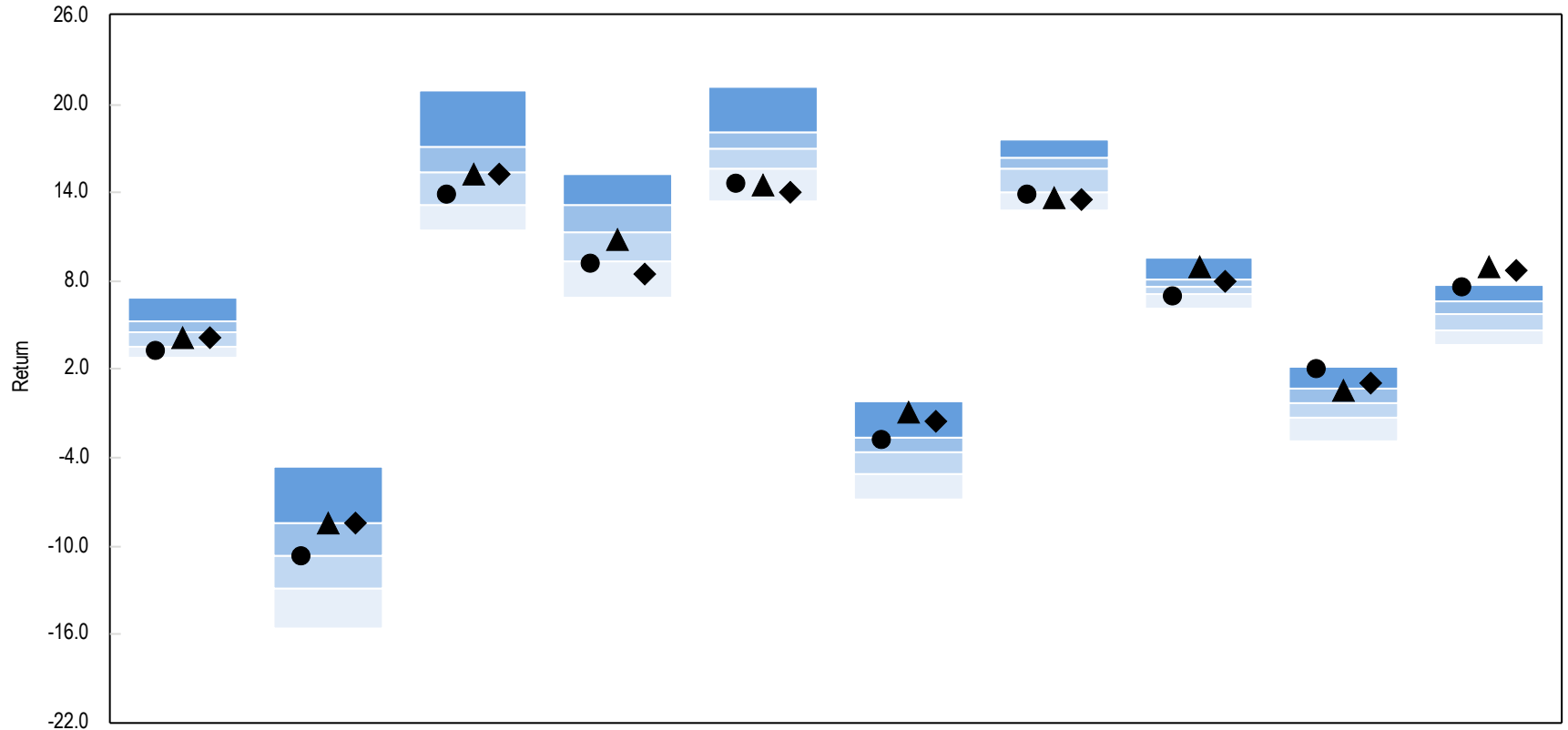
Total Fund Consecutive Periods vs. InvMetrics Public DB >\$1B Gross



	YTD	2022	2021	2020	2019	2018	2017	2016	2015	2014
● Total Fund	3.47 (86)	-10.39 (45)	14.21 (67)	9.52 (80)	14.92 (90)	-2.46 (32)	14.18 (79)	7.43 (74)	2.70 (3)	8.40 (6)
▲ Policy Index	4.15 (55)	-8.38 (26)	15.29 (54)	10.81 (64)	14.58 (91)	-0.94 (12)	13.69 (90)	8.93 (18)	0.58 (35)	9.03 (2)
◆ Policy Index (Adjusted)	4.15 (55)	-8.38 (26)	15.29 (54)	8.49 (91)	14.06 (94)	-1.52 (17)	13.51 (92)	8.03 (54)	1.06 (25)	8.67 (3)
5th Percentile	6.36	-4.27	21.43	16.06	21.23	0.77	18.11	10.15	2.60	8.40
1st Quartile	5.22	-7.96	17.71	13.75	18.69	-2.07	16.81	8.61	1.05	7.26
Median	4.28	-10.84	15.55	12.05	17.31	-3.27	16.02	8.08	0.11	6.23
3rd Quartile	3.75	-12.84	13.51	9.70	15.91	-4.71	14.36	7.38	-0.86	5.18
95th Percentile	3.01	-15.61	11.55	7.16	13.87	-6.57	12.78	6.10	-2.39	4.21
Population	84	121	157	169	132	113	123	127	123	120

Effective 1/01/2017, only traditional asset class (public equity, fixed income, REITs) investment management fees will be included in the gross of fee return calculation.

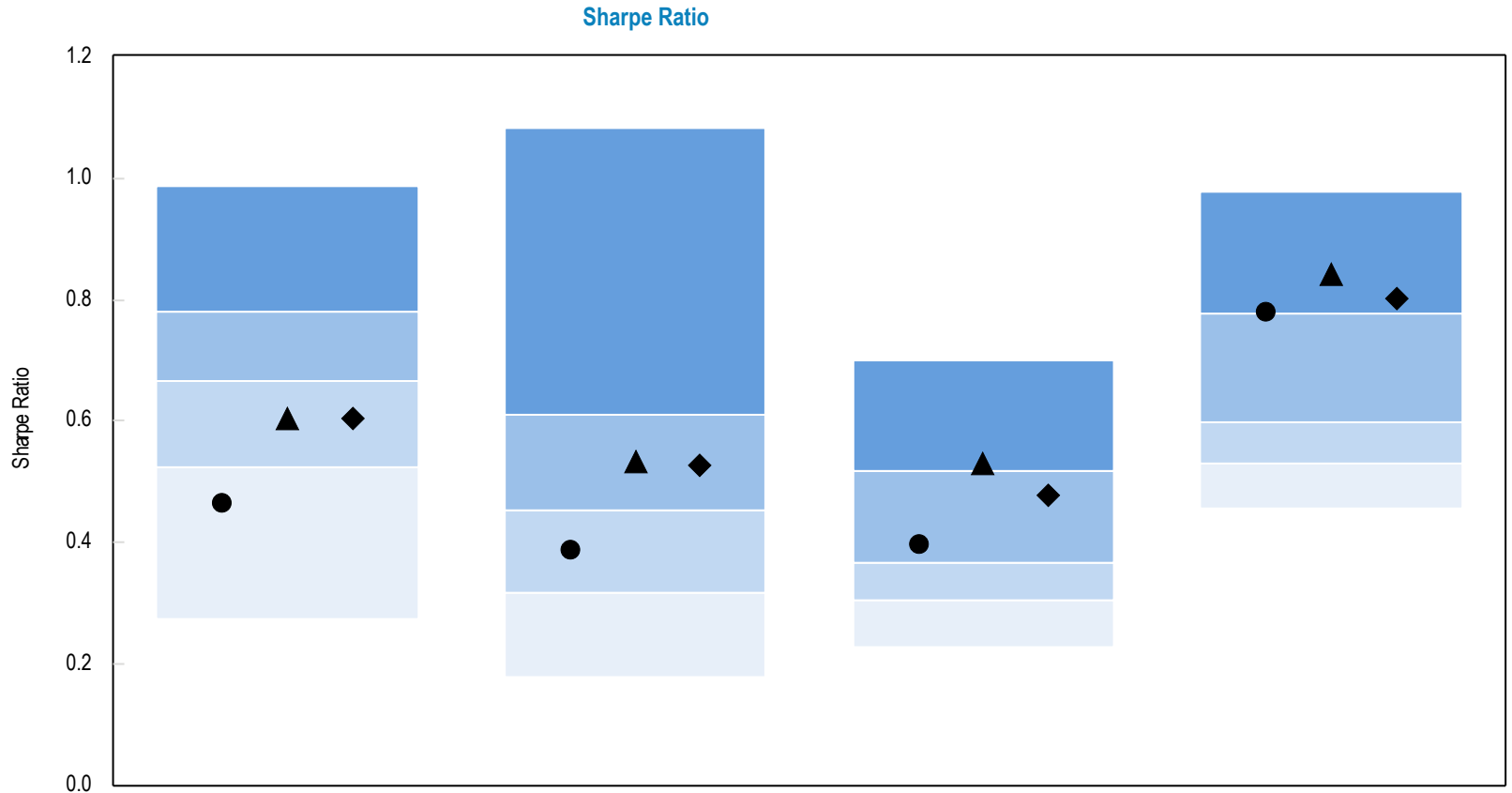
Total Fund Consecutive Periods vs. InvMetrics Public DB >\$1B Net



	YTD	2022	2021	2020	2019	2018	2017	2016	2015	2014
● Total Fund	3.33 (81)	-10.61 (50)	13.90 (66)	9.23 (76)	14.61 (92)	-2.72 (29)	13.86 (80)	6.94 (79)	2.09 (9)	7.67 (7)
▲ Policy Index	4.15 (56)	-8.38 (26)	15.29 (51)	10.81 (60)	14.58 (92)	-0.94 (7)	13.69 (85)	8.93 (14)	0.58 (26)	9.03 (2)
◆ Policy Index (Adjusted)	4.15 (56)	-8.38 (26)	15.29 (51)	8.49 (90)	14.06 (94)	-1.52 (10)	13.51 (87)	8.03 (33)	1.06 (22)	8.67 (2)
5th Percentile	6.83	-4.66	20.99	15.24	21.22	-0.12	17.64	9.59	2.21	7.79
1st Quartile	5.28	-8.38	17.17	13.13	18.15	-2.65	16.42	8.12	0.75	6.59
Median	4.58	-10.61	15.34	11.37	17.04	-3.66	15.65	7.61	-0.32	5.74
3rd Quartile	3.57	-12.83	13.22	9.29	15.66	-5.12	14.02	7.12	-1.28	4.67
95th Percentile	2.79	-15.60	11.39	6.87	13.41	-6.79	12.79	6.17	-2.82	3.69
Population	74	100	133	146	124	104	115	113	110	106

Total Fund
Sharpe Ratio Ranking (Gross of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

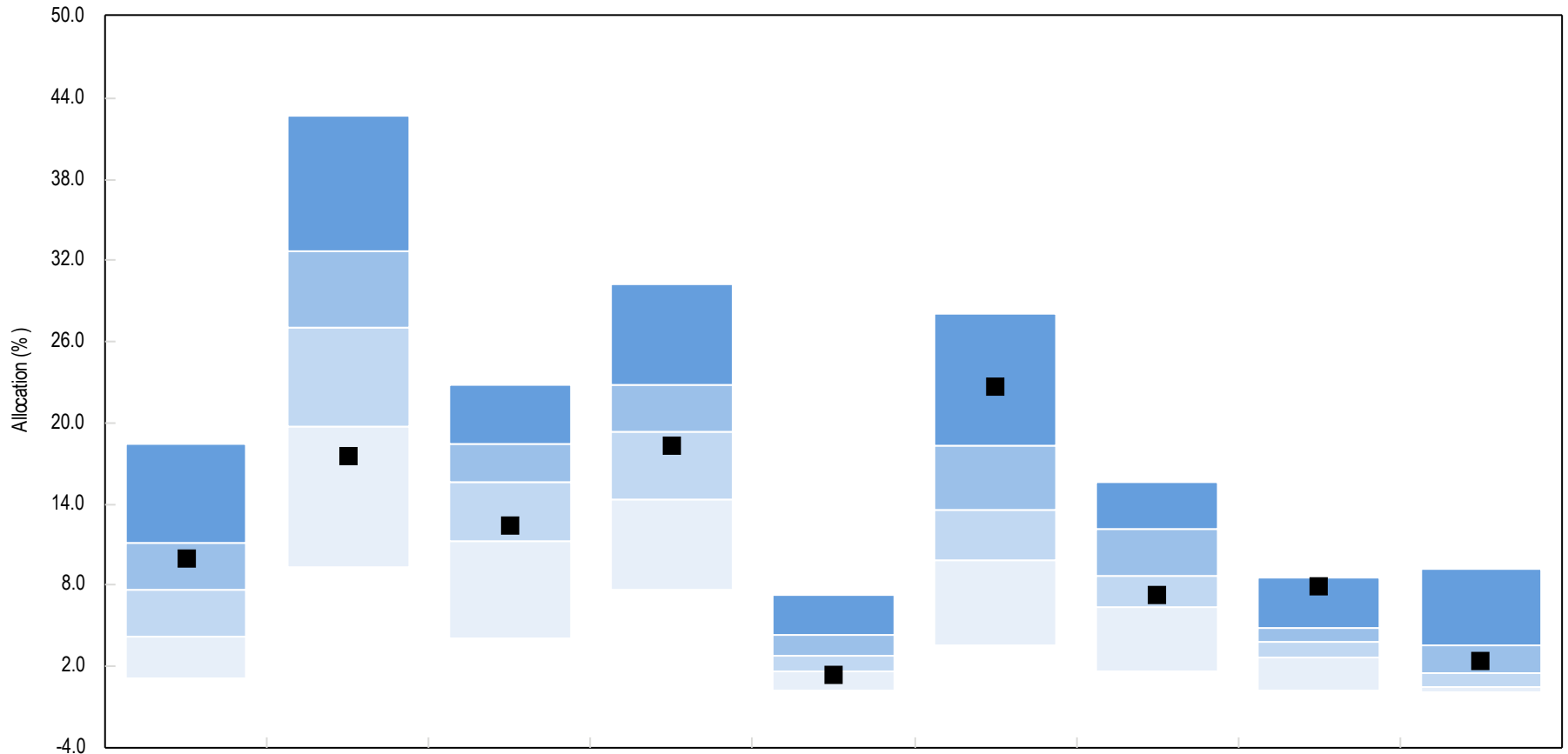


	1 Yr	3 Yrs	5 Yrs	10 Yrs
● Total Fund	0.47 (89)	0.39 (63)	0.40 (39)	0.78 (25)
▲ Policy Index	0.60 (56)	0.54 (35)	0.53 (23)	0.84 (15)
◆ Policy Index (Adjusted)	0.60 (56)	0.53 (37)	0.48 (29)	0.80 (22)
5th Percentile	0.99	1.08	0.70	0.98
1st Quartile	0.78	0.61	0.52	0.78
Median	0.66	0.45	0.37	0.60
3rd Quartile	0.52	0.32	0.31	0.53
95th Percentile	0.27	0.18	0.23	0.46
Population	73	63	61	54

Total Fund
Peer Universe Comparison: Asset Allocation

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

Total Fund vs. InvMetrics Public DB > \$1B



	Global Equity	US Equity	Global ex-US Equity	US Fixed	Global ex-US Fixed	Private Equity	Total Real Estate	Multi-Asset	Cash & Equivalents
■ Total Fund	10.0 (36)	17.5 (80)	12.5 (73)	18.3 (54)	1.4 (79)	22.7 (12)	7.3 (66)	8.0 (8)	2.5 (35)
5th Percentile	18.5	42.7	22.8	30.2	7.3	28.1	15.6	8.5	9.2
1st Quartile	11.2	32.7	18.4	22.8	4.3	18.3	12.2	4.9	3.6
Median	7.7	27.0	15.6	19.4	2.8	13.5	8.7	3.9	1.5
3rd Quartile	4.2	19.7	11.3	14.3	1.6	9.8	6.4	2.7	0.5
95th Percentile	1.1	9.3	4.1	7.7	0.2	3.6	1.6	0.2	0.1
Population	29	78	78	78	27	60	65	28	69

Domestic Equity Managers

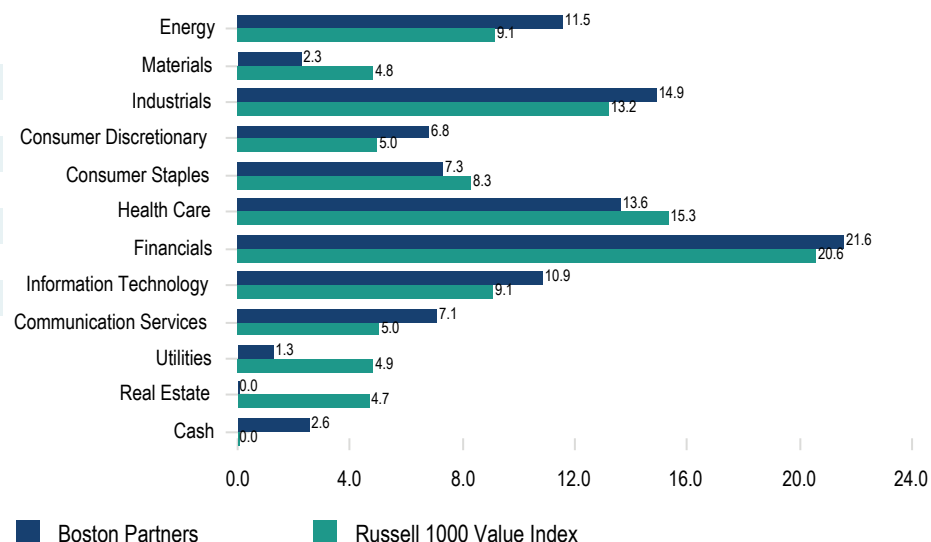
Boston Partners Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: September 30, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	90	845
Wtd. Avg. Mkt. Cap \$M	172,965.22	137,852.79
Median Mkt. Cap \$M	39,484.98	11,541.64
Price/Earnings ratio	15.10	15.28
Price/Book ratio	2.46	2.43
Return on Equity (%)	6.01	3.83
Current Yield (%)	1.88	2.49
Beta (5 Years, Monthly)	1.02	1.00

Sector Allocation (%) vs. Russell 1000 Value Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
JPMorgan Chase & Co	3.68	0.40
Berkshire Hathaway Inc	3.63	2.73
Alphabet Inc	3.37	9.32
Bristol-Myers Squibb Co	2.55	-8.43
Cisco Systems Inc	2.37	4.69
AutoZone Inc	1.87	1.87
Sanofi	1.87	-0.48
Wells Fargo & Co	1.77	-3.52
Unitedhealth Group Inc	1.76	5.31
Marathon Petroleum Corp	1.75	30.48

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Marathon Petroleum Corp	1.47	30.48	0.45
Cenovus Energy Inc	1.32	23.22	0.31
Halliburton Co	1.27	23.25	0.30
Alphabet Inc	3.04	9.32	0.28
Schlumberger Ltd	1.42	19.18	0.27
Dell Technologies Inc	0.95	28.21	0.27
Activision Blizzard Inc	2.00	12.26	0.24
Amgen Inc	1.00	22.03	0.22
Conocophillips	1.25	16.70	0.21
Canadian Natural Resources Ltd	1.28	16.13	0.21

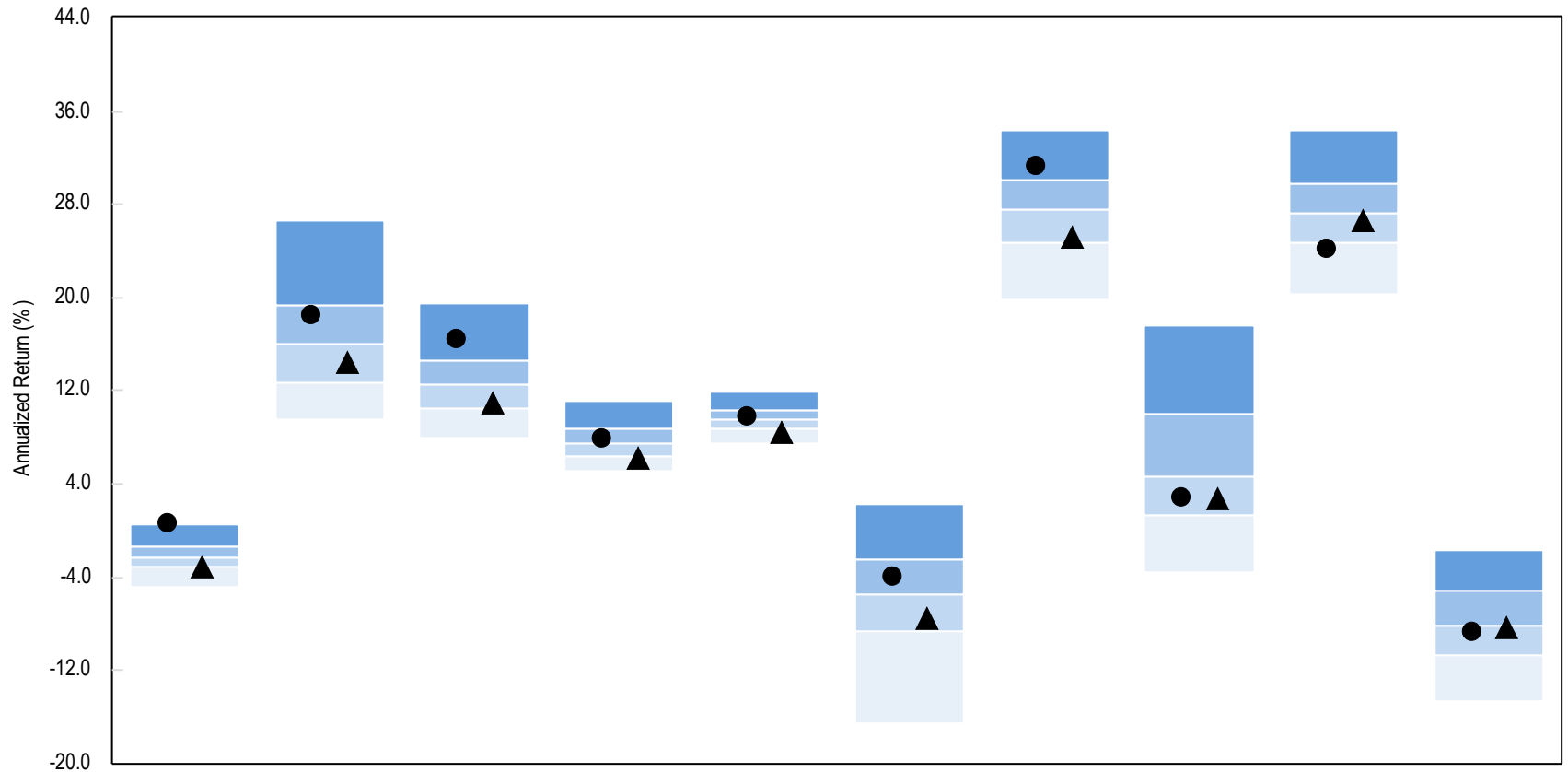
Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Bristol-Myers Squibb Co	2.83	-8.43	-0.24
Omnicom Group Inc	0.85	-20.99	-0.18
Microchip Technology Inc	1.26	-12.44	-0.16
Discover Financial Services	0.58	-25.28	-0.15
Johnson & Johnson	2.68	-5.23	-0.14
LKQ Corporation	0.93	-14.59	-0.14
Advanced Micro Devices Inc	1.23	-9.74	-0.12
Dollar General Corporation	0.31	-37.47	-0.12
US Foods Holding Corp	1.17	-9.77	-0.11
WESCO International Inc	0.59	-19.49	-0.11

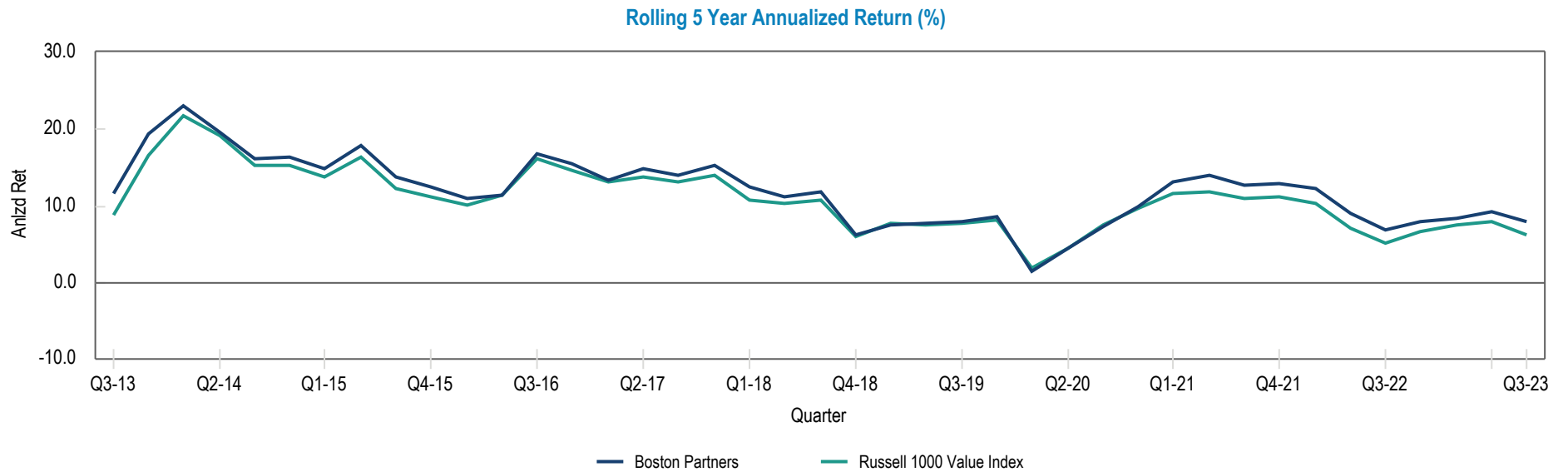
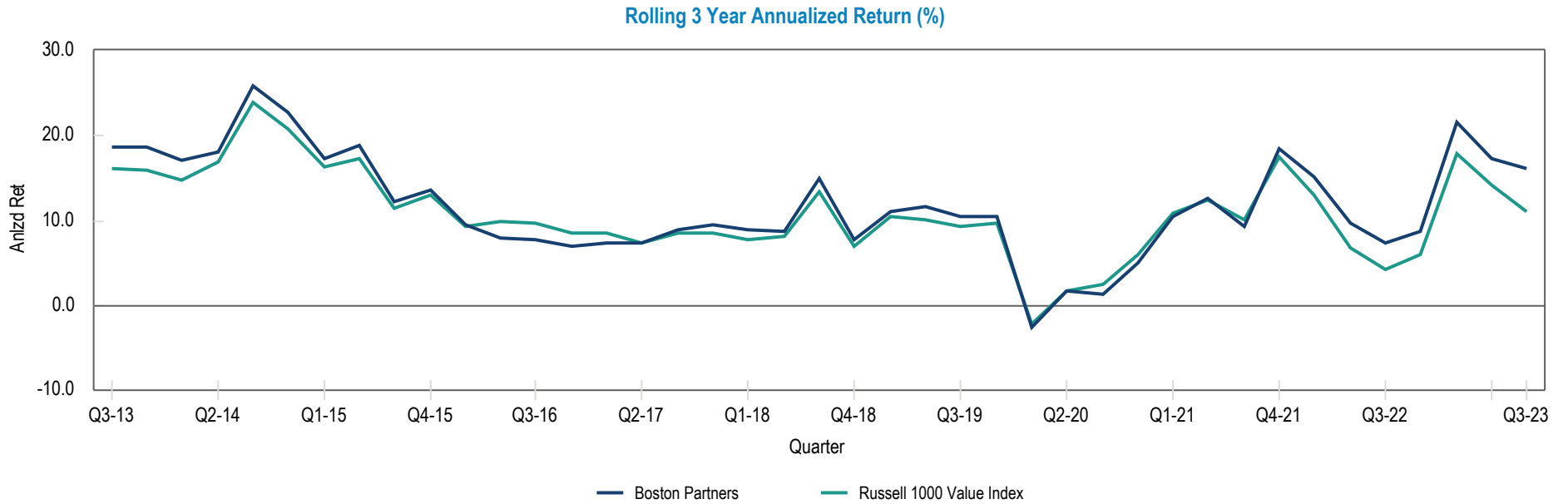
% of Portfolio 15.00 2.75 % of Portfolio 12.43 -1.46

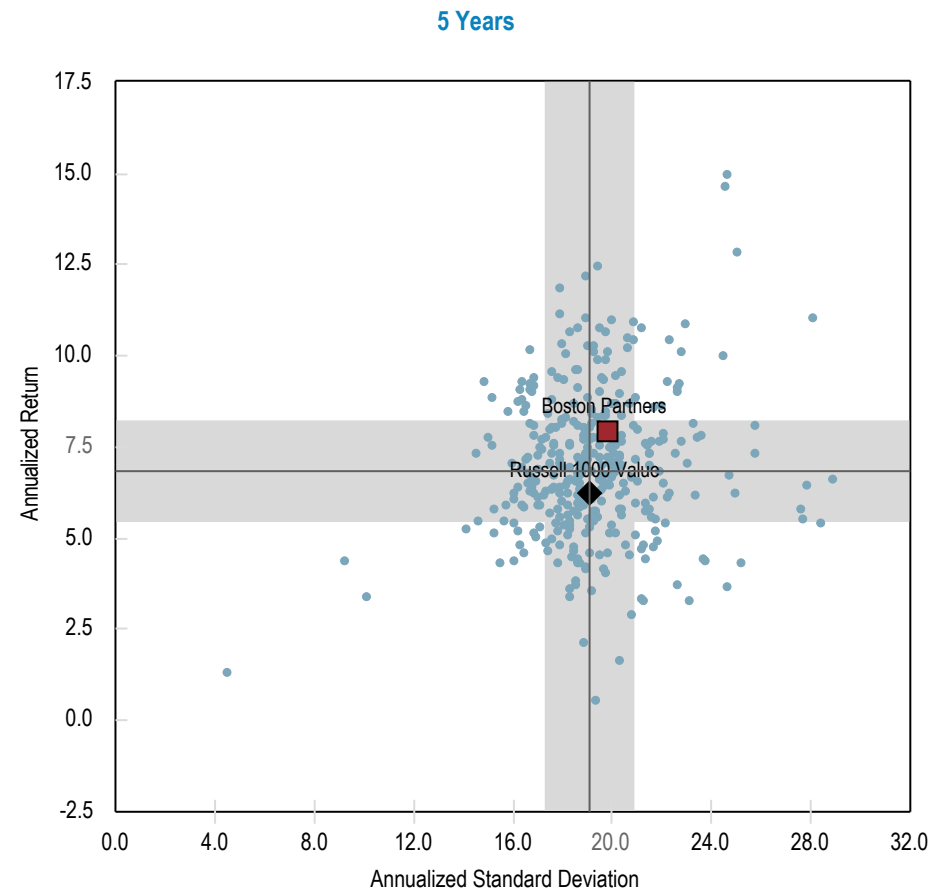
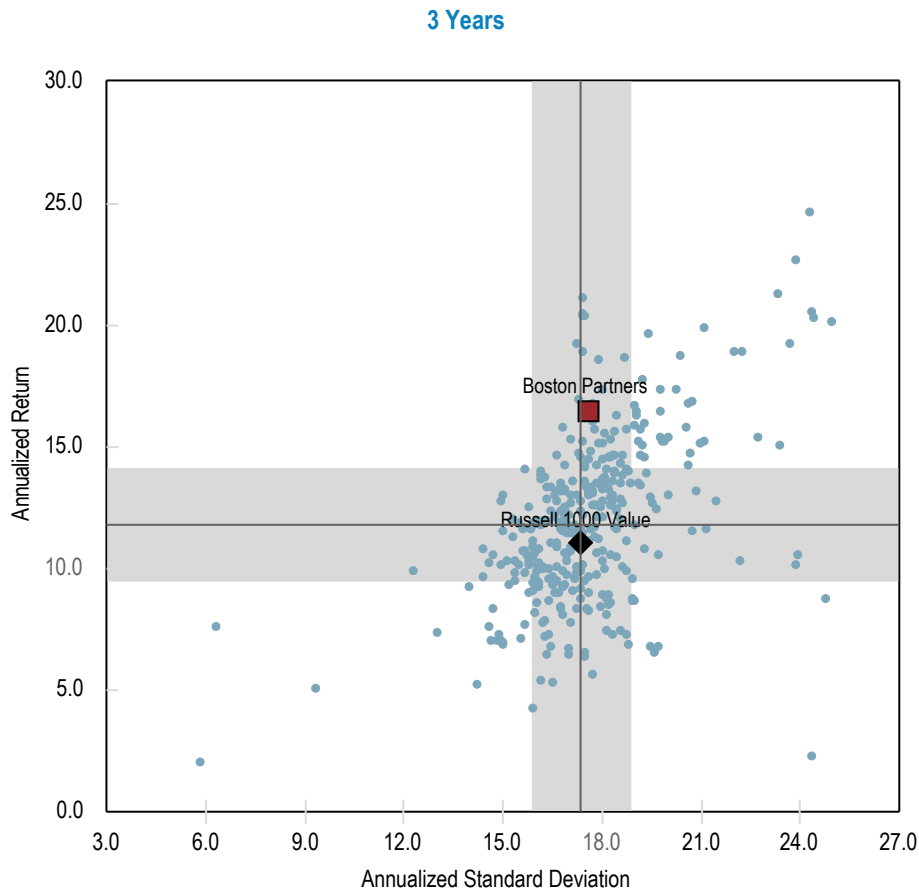
Domestic equity large cap value portfolio exhibiting low turnover in companies with low valuations relative to intrinsic value. Primary personnel include Mark Donovan and David Pyle.

Boston Partners vs. eV US Large Cap Value Equity Gross Universe



	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● Boston Partners	0.78 (3)	18.56 (30)	16.44 (13)	7.96 (41)	9.86 (37)	-3.82 (36)	31.34 (18)	2.96 (63)	24.26 (79)	-8.65 (58)
▲ Russell 1000 Value Index	-3.16 (77)	14.44 (63)	11.05 (68)	6.23 (79)	8.45 (83)	-7.54 (69)	25.16 (73)	2.80 (64)	26.54 (57)	-8.27 (53)
5th Percentile	0.47	26.61	19.46	11.15	11.97	2.35	34.35	17.56	34.32	-1.67
1st Quartile	-1.37	19.31	14.57	8.83	10.27	-2.48	30.14	10.06	29.83	-5.09
Median	-2.27	15.98	12.50	7.45	9.51	-5.43	27.59	4.61	27.19	-8.15
3rd Quartile	-3.12	12.75	10.47	6.42	8.77	-8.57	24.64	1.29	24.73	-10.71
95th Percentile	-4.90	9.55	7.89	5.09	7.53	-16.47	19.87	-3.55	20.37	-14.67
Population	382	381	369	359	324	405	415	422	451	473





3 Years

	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Boston Partners	16.4	17.6	0.9
Russell 1000 Value Index	11.1	17.3	0.6
eV US Large Cap Value Equity Median	12.5	17.4	0.7
Population	369	369	369

5 Years

	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Boston Partners	8.0	19.8	0.4
Russell 1000 Value Index	6.2	19.1	0.3
eV US Large Cap Value Equity Median	7.4	19.1	0.4
Population	359	359	359

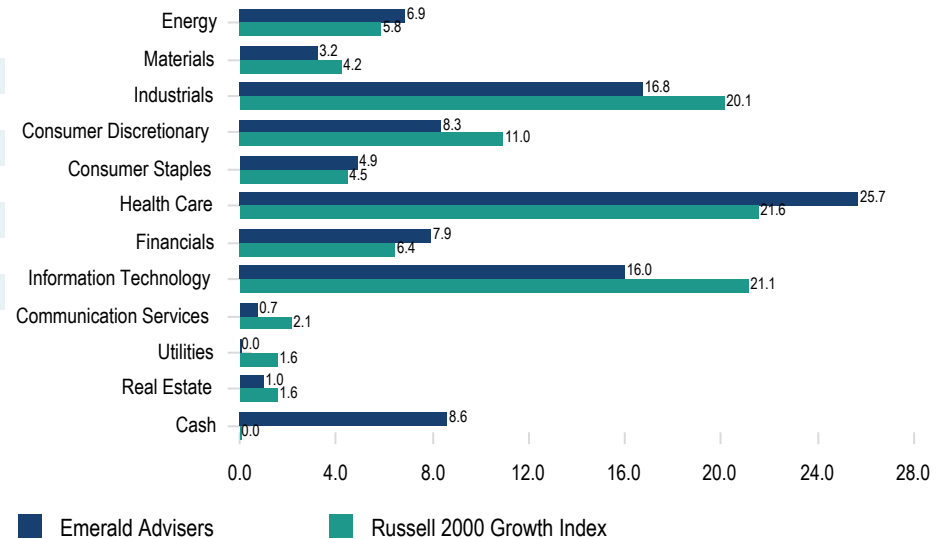
Emerald Advisers
 Manager Portfolio Overview

Contra Costa County Employees' Retirement Association
 Period Ending: September 30, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	113	1,084
Wtd. Avg. Mkt. Cap \$M	3,117.71	3,235.53
Median Mkt. Cap \$M	2,298.00	1,098.42
Price/Earnings ratio	20.35	19.75
Price/Book ratio	3.55	3.66
Return on Equity (%)	2.68	-56.84
Current Yield (%)	0.54	0.70
Beta (5 Years, Monthly)	0.96	1.00

Sector Allocation (%) vs. Russell 2000 Growth Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
Carpenter Technology Corp	2.13	20.16
Chart Industries Inc	1.94	5.84
Super Micro Computer Inc	1.86	10.02
Simply Good Foods Co (The)	1.76	-5.66
Trinet Group Inc	1.72	22.65
Churchill Downs Inc	1.70	-16.62
Tenable Holdings Inc	1.64	2.87
Acadia Pharmaceuticals Inc	1.54	-12.98
Freshpet Inc	1.54	0.11
LivaNova PLC	1.50	2.82

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution To Return (%)
Reata Pharmaceuticals Inc	1.43	69.05	0.98
TETRA Technologies Inc.	0.47	88.76	0.42
Carpenter Technology Corp	1.73	20.16	0.35
Trinet Group Inc	1.37	22.65	0.31
Thorne HealthTech Inc	0.20	116.81	0.24
MACOM Technology Solutions Holdings Inc	0.96	24.49	0.24
Northern Oil and Gas Inc	1.28	18.31	0.23
Super Micro Computer Inc	2.30	10.02	0.23
Cactus Inc	1.10	18.92	0.21
BridgeBio Pharma Inc	0.37	53.31	0.20

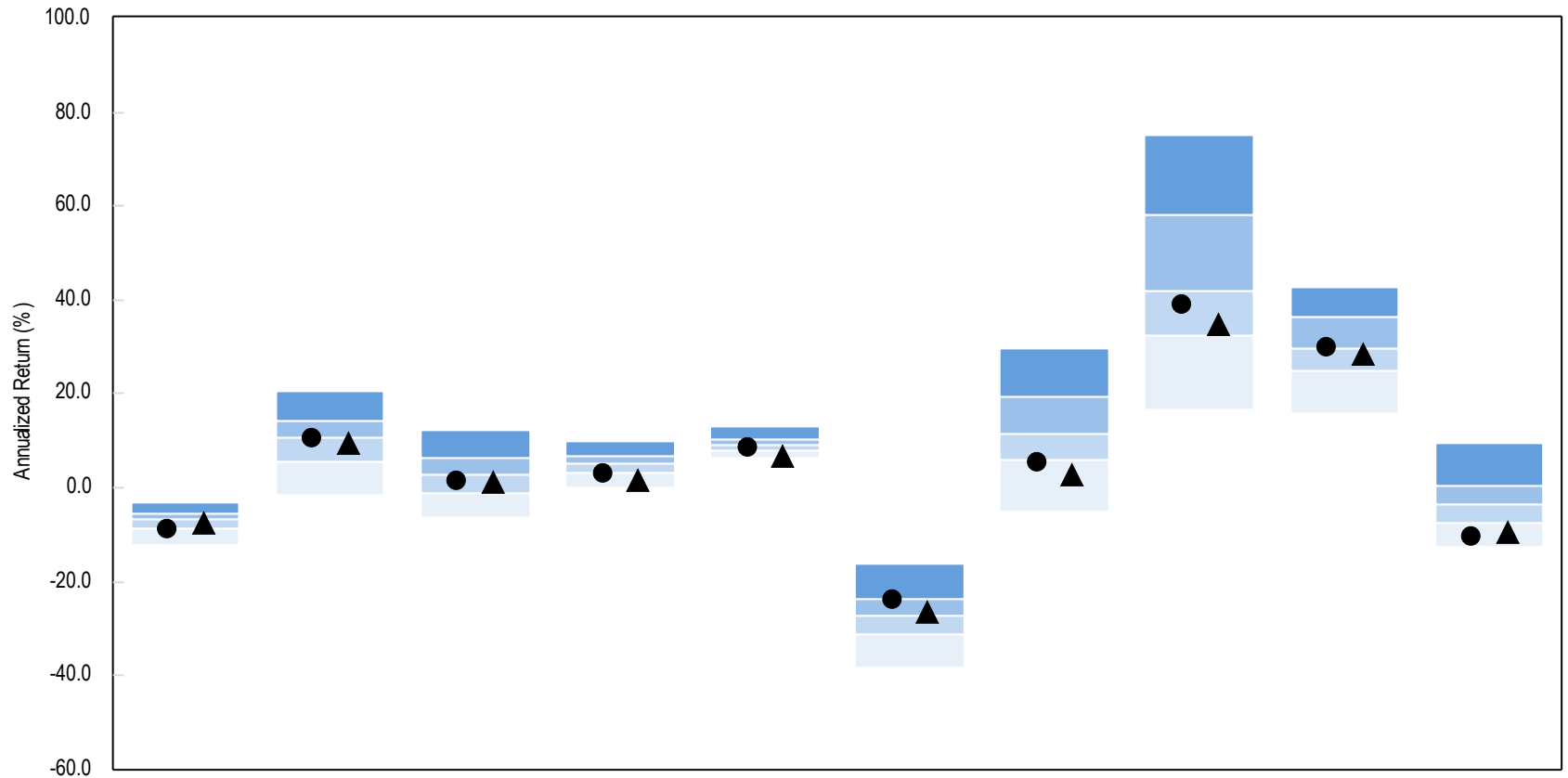
Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution To Return (%)
Treace Medical Concepts Inc	1.58	-48.75	-0.77
Transmedics Group Inc	1.63	-34.81	-0.57
Docgo Inc	0.93	-43.12	-0.40
Model N Inc	1.30	-30.97	-0.40
Petco Health & Wellness Co Inc	0.64	-54.05	-0.35
Sun Country Airlines Holdings Inc	0.99	-33.99	-0.34
Churchill Downs Inc	1.99	-16.62	-0.33
Planet Fitness Inc	1.21	-27.08	-0.33
PDF Solutions Inc	1.16	-28.16	-0.33
ICU Medical Inc	0.94	-33.21	-0.31

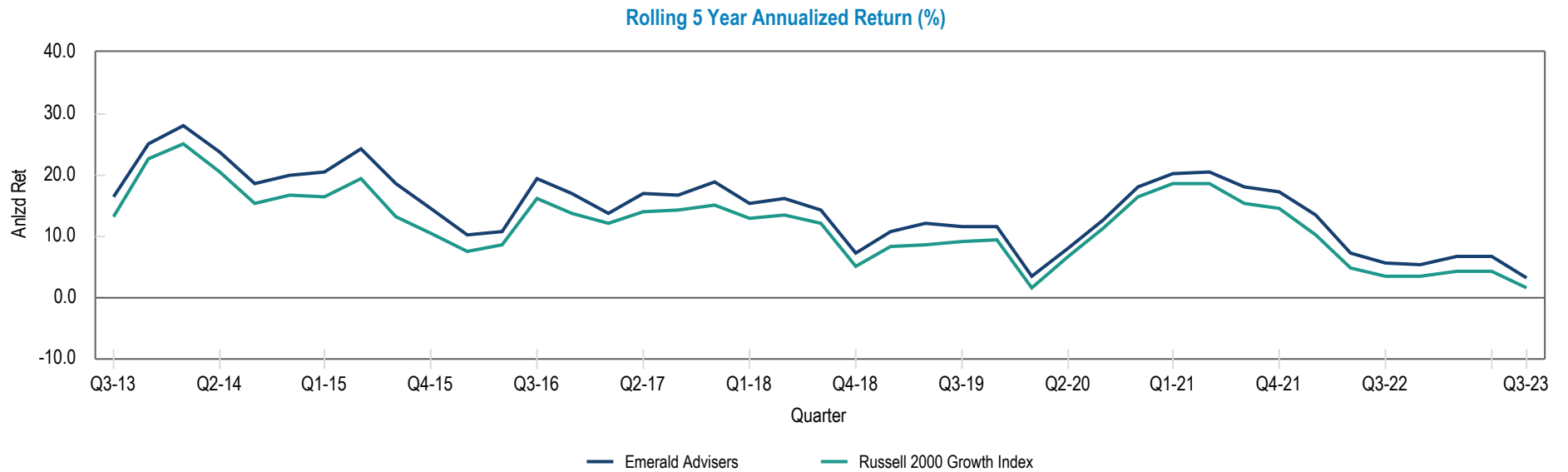
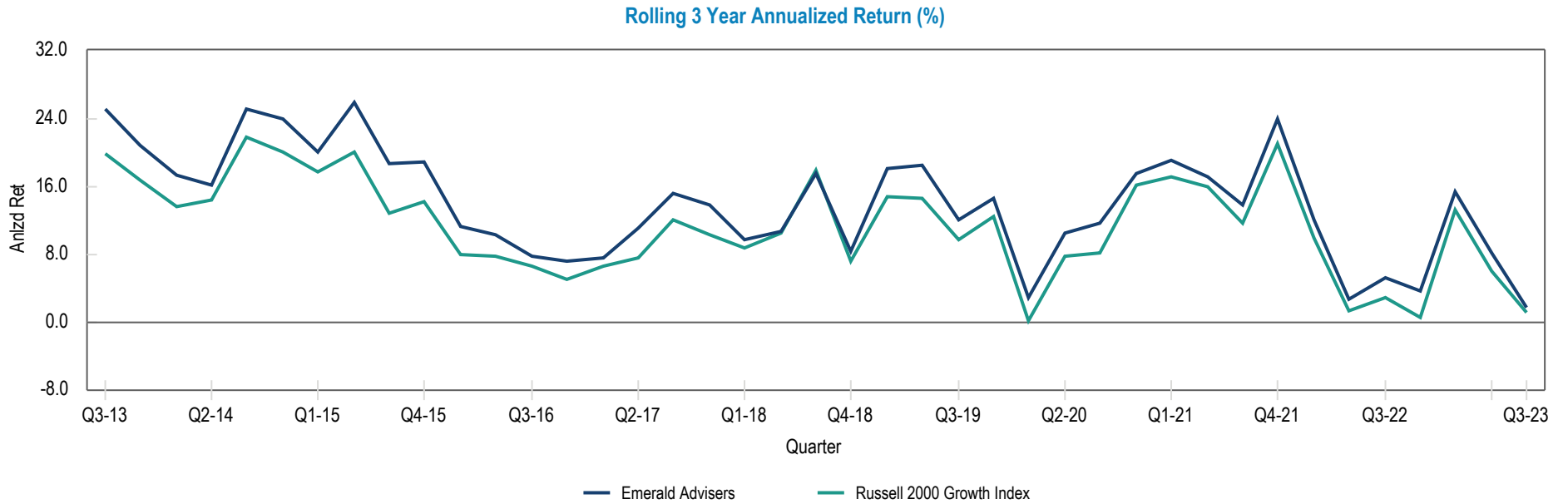
% of Portfolio 11.21 3.40 % of Portfolio 12.37 -4.12

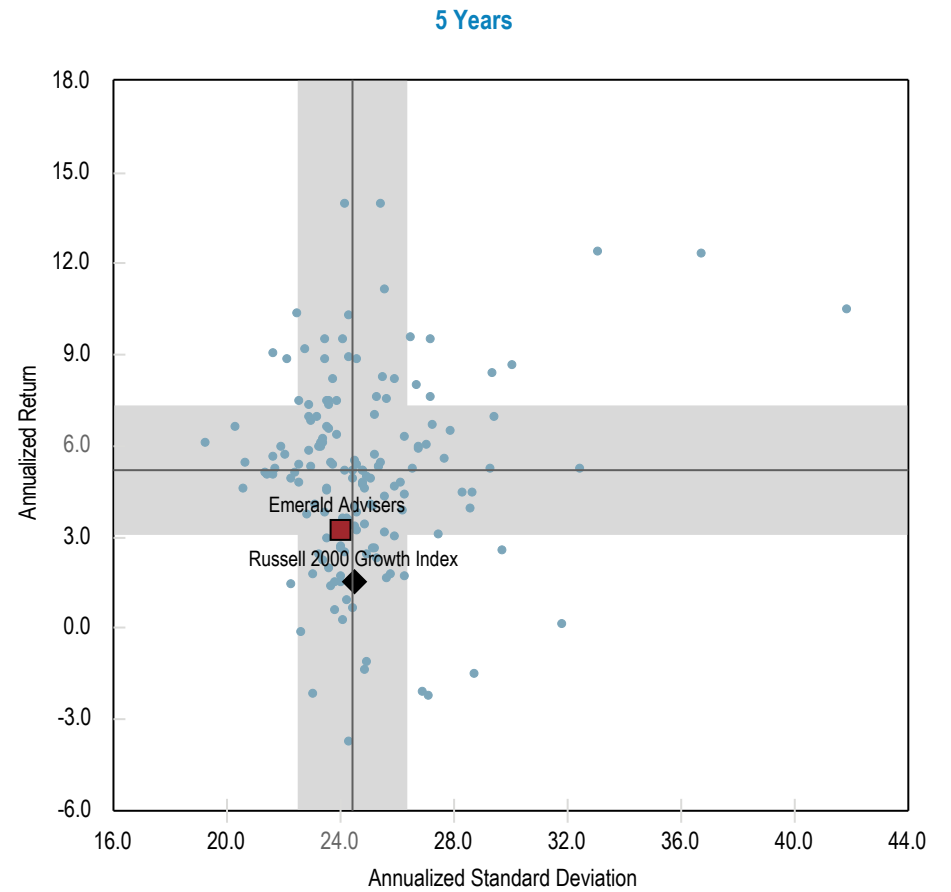
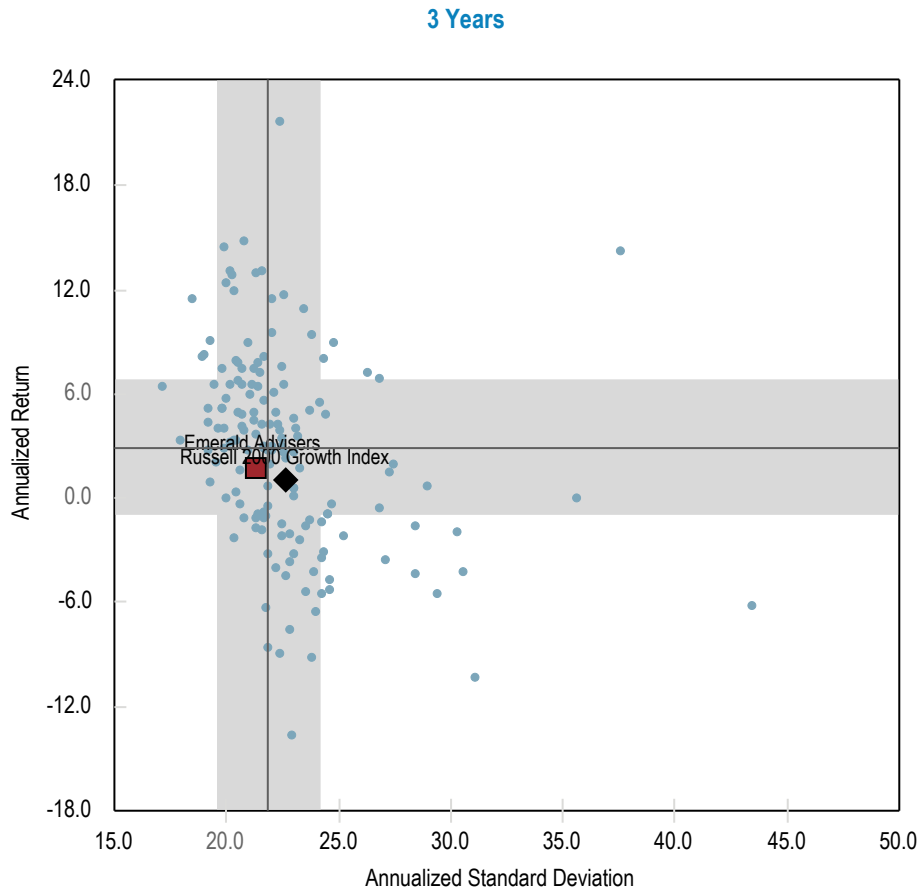
Domestic equity small cap growth portfolio of companies with significantly high growth rates. Primary personnel include Kenneth Mertz, Joseph Garner, and Stacey Sears.

Emerald Advisers vs. eV US Small Cap Growth Equity Gross Universe



	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● Emerald Advisers	-8.50 (76)	10.57 (51)	1.74 (60)	3.27 (75)	8.60 (65)	-23.75 (27)	5.53 (77)	38.96 (57)	30.26 (48)	-10.14 (86)
▲ Russell 2000 Growth Index	-7.32 (63)	9.59 (58)	1.09 (63)	1.55 (89)	6.72 (95)	-26.36 (44)	2.83 (85)	34.63 (67)	28.48 (54)	-9.31 (82)
5th Percentile	-3.26	20.69	12.48	9.88	12.92	-16.19	29.85	74.94	42.84	9.59
1st Quartile	-5.39	14.38	6.45	6.70	10.39	-23.56	19.34	58.29	36.58	0.64
Median	-6.62	10.66	2.91	5.20	9.23	-27.20	11.57	42.06	29.59	-3.65
3rd Quartile	-8.49	5.69	-1.17	3.21	8.13	-31.20	5.90	32.32	24.84	-7.43
95th Percentile	-12.28	-1.72	-6.23	0.07	6.43	-38.40	-5.10	16.54	15.96	-12.50
Population	157	157	156	153	133	170	183	184	191	195





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Emerald Advisers	1.7	21.3	0.1
Russell 2000 Growth Index	1.1	22.6	0.1
eV US Small Cap Growth Equity Median	2.9	21.9	0.2
Population	156	156	156

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Emerald Advisers	3.3	24.0	0.2
Russell 2000 Growth Index	1.6	24.5	0.1
eV US Small Cap Growth Equity Median	5.2	24.4	0.3
Population	153	153	153

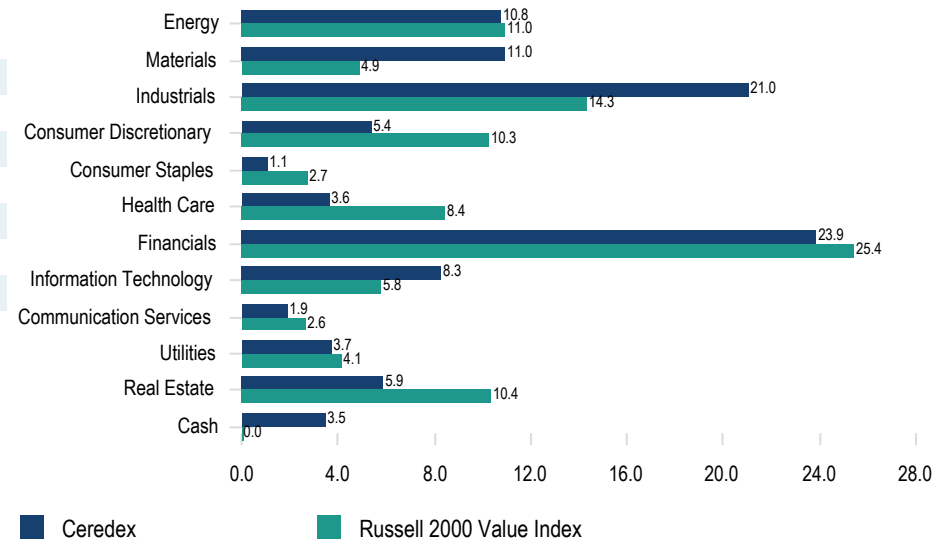
Ceredex
Manager Portfolio Overview

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	70	1,448
Wtd. Avg. Mkt. Cap \$M	4,606.44	2,389.47
Median Mkt. Cap \$M	4,325.93	718.93
Price/Earnings ratio	14.35	9.42
Price/Book ratio	2.12	1.58
Return on Equity (%)	2.23	1.73
Current Yield (%)	2.53	2.58
Beta (5 Years, Monthly)	0.89	1.00

Sector Allocation (%) vs. Russell 2000 Value Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
RB Global Inc	2.37	4.65
Ashland Inc	1.99	-5.61
NOV Inc	1.99	30.61
Kemper Corp	1.93	-12.35
KBR Inc	1.88	-9.21
Littelfuse Inc	1.83	-14.89
Cactus Inc	1.82	18.92
Matador Resources Co	1.82	13.98
Perrigo Co Plc	1.81	-5.18
DENTSPLY SIRONA Inc	1.81	-14.29

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
NOV Inc	1.51	30.61	0.46
Vistra Corp	1.56	27.19	0.42
Ovintiv Inc	1.39	25.73	0.36
Bank of Hawaii Corp	1.45	22.09	0.32
Carpenter Technology Corp	1.49	20.16	0.30
Cactus Inc	1.52	18.92	0.29
Pinnacle Financial Partners Inc	1.49	18.69	0.28
Championx Corp	1.56	15.07	0.23
Autoliv Inc	1.44	14.21	0.21
Perella Weinberg Partners	0.75	23.01	0.17

Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Forward Air Corp	1.29	-34.98	-0.45
Algonquin Power & Utilities Corp	1.61	-27.09	-0.44
Power Integrations Inc	1.96	-19.21	-0.38
Macy's Inc	1.11	-26.61	-0.30
Louisiana-Pacific Corp	1.01	-26.01	-0.26
Valmont Industries Inc	1.49	-17.26	-0.26
Timken Co (The)	1.30	-19.37	-0.25
DENTSPLY SIRONA Inc	1.76	-14.29	-0.25
Littelfuse Inc	1.56	-14.89	-0.23
Agree Realty Corp	1.58	-14.50	-0.23

% of Portfolio

14.16

3.05

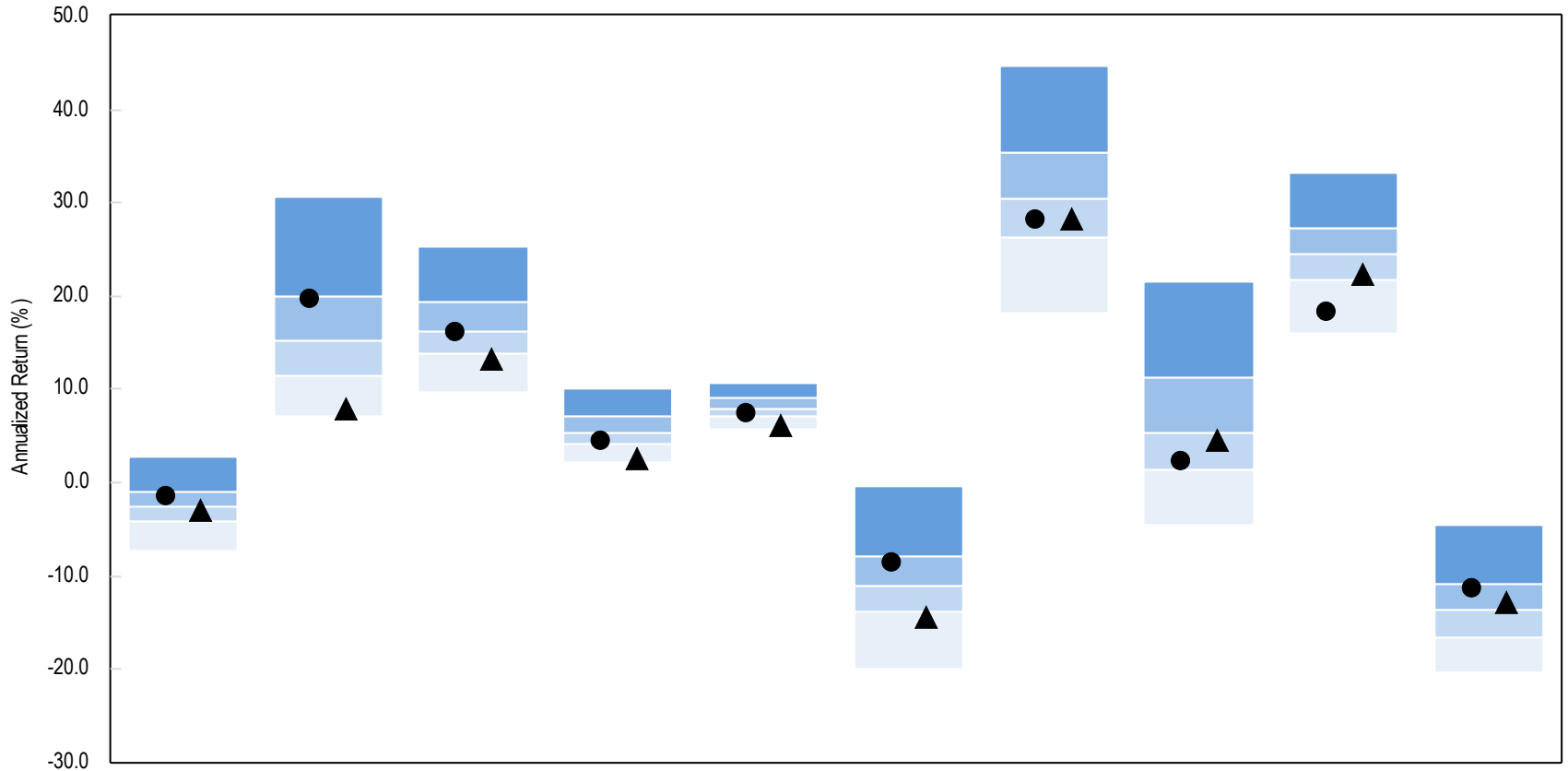
% of Portfolio

14.67

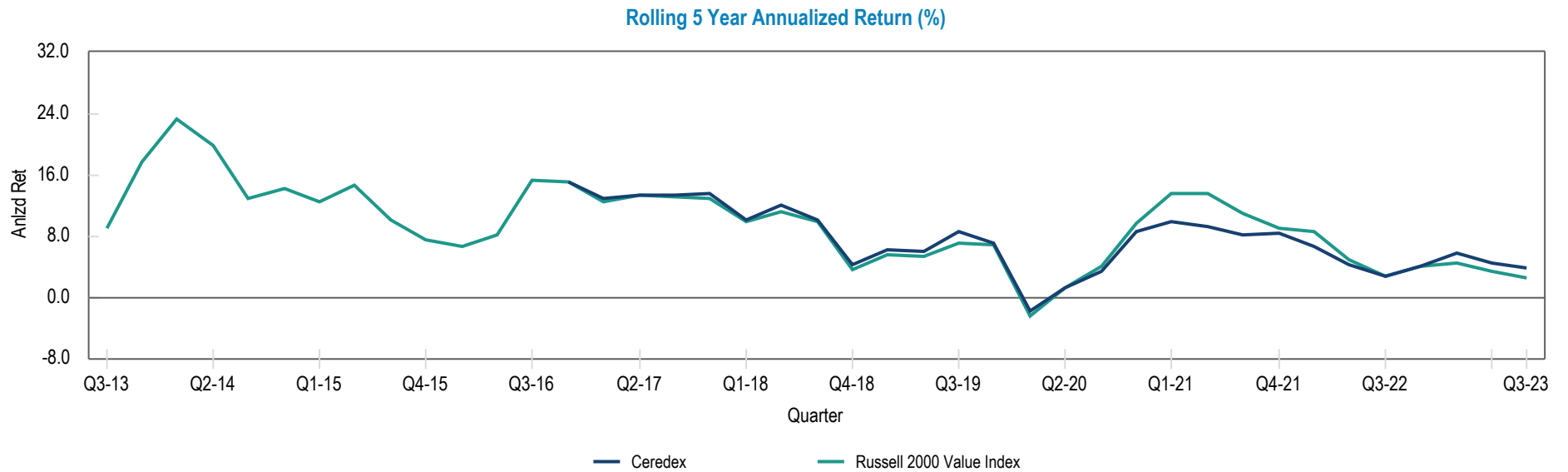
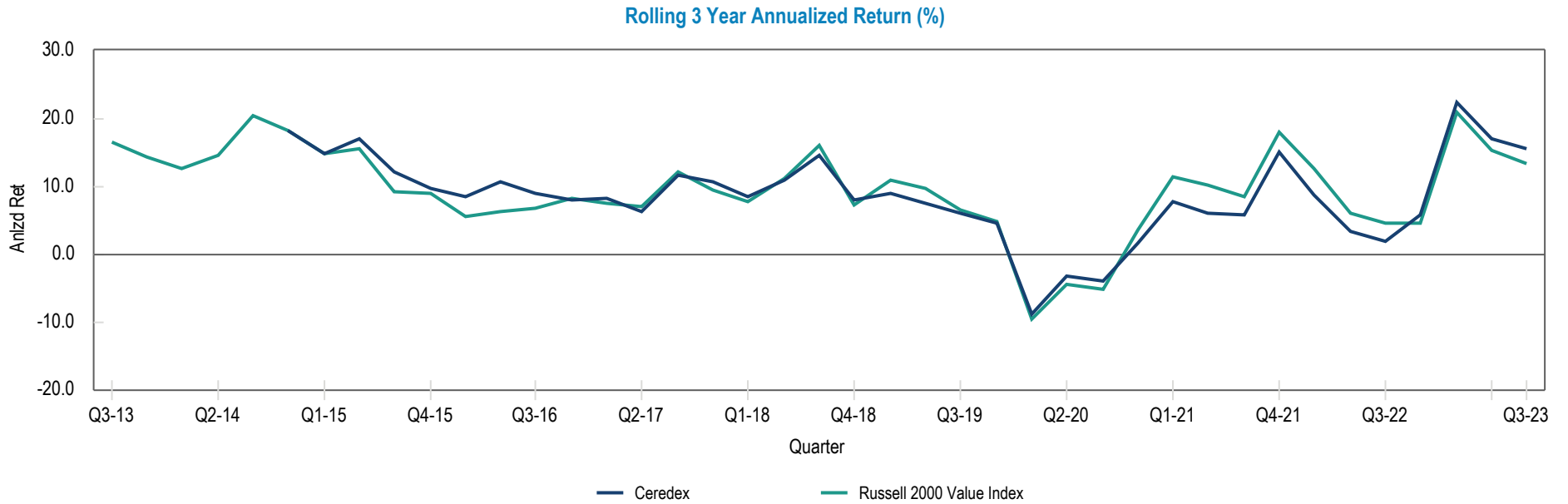
-3.05

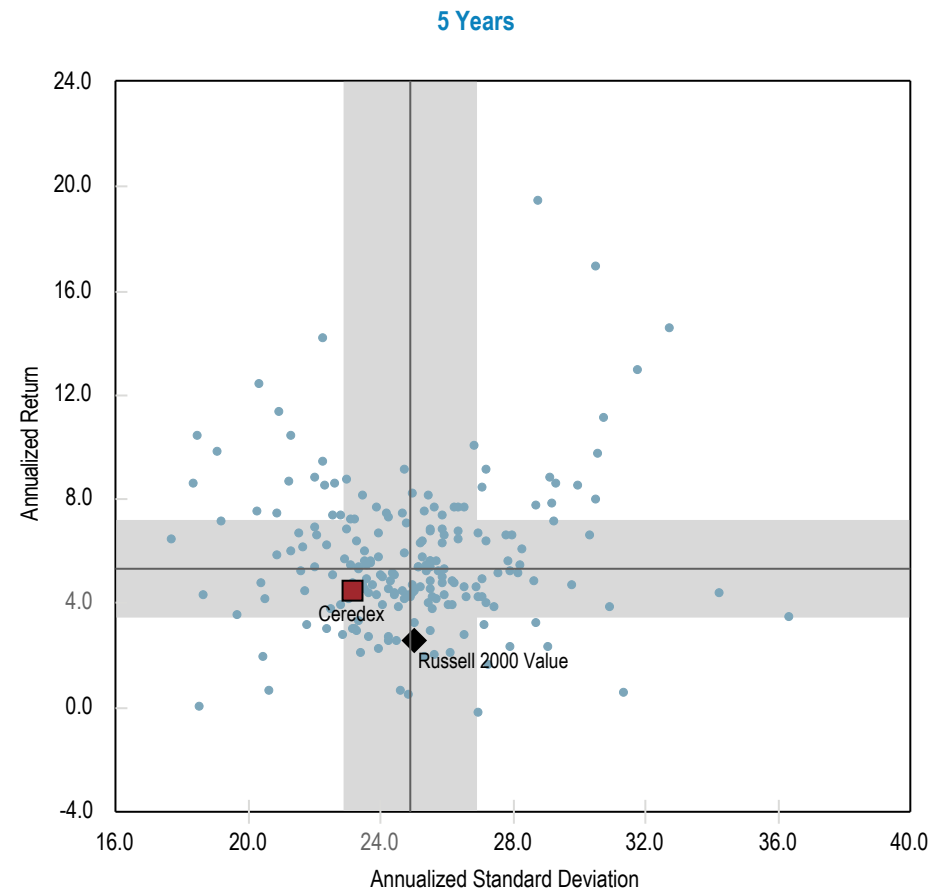
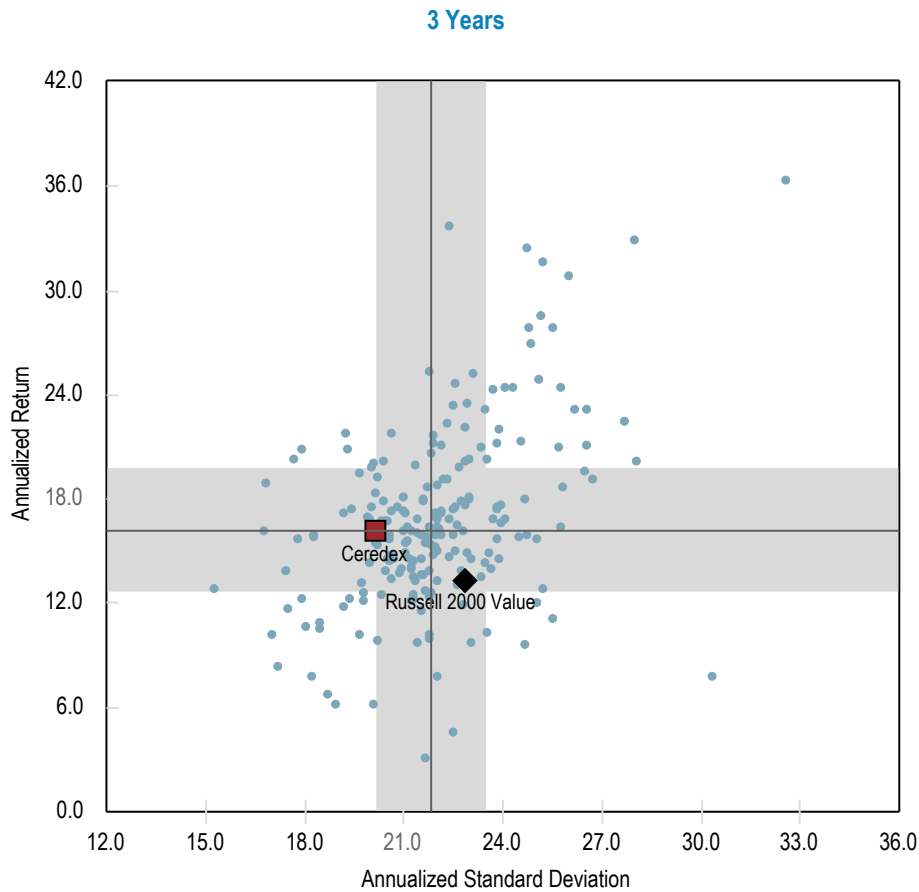
Domestic equity small cap value portfolio of companies with dividend yields and low valuations. Primary personnel include Brett Barner and David Maynard.

Ceredex vs. eV US Small Cap Value Equity Gross Universe



	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● Ceredex	-1.41 (35)	19.79 (26)	16.19 (51)	4.49 (68)	7.58 (65)	-8.46 (27)	28.37 (60)	2.32 (70)	18.36 (88)	-11.32 (29)
▲ Russell 2000 Value Index	-2.96 (57)	7.84 (93)	13.32 (80)	2.59 (93)	6.19 (91)	-14.48 (78)	28.27 (60)	4.63 (54)	22.39 (71)	-12.86 (42)
5th Percentile	2.82	30.65	25.31	10.16	10.69	-0.36	44.60	21.48	33.29	-4.55
1st Quartile	-0.90	19.94	19.39	7.14	9.02	-7.91	35.31	11.22	27.36	-10.83
Median	-2.54	15.26	16.20	5.32	7.90	-11.05	30.49	5.33	24.43	-13.65
3rd Quartile	-4.13	11.51	13.86	4.23	7.10	-13.89	26.25	1.35	21.69	-16.61
95th Percentile	-7.29	7.23	9.79	2.11	5.75	-19.92	18.16	-4.59	15.95	-20.38
Population	208	208	207	198	175	218	231	245	253	264





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Ceredex	16.2	20.2	0.8
Russell 2000 Value Index	13.3	22.8	0.6
eV US Small Cap Value Equity Median	16.2	21.8	0.7
Population	207	207	207

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Ceredex	4.5	23.2	0.2
Russell 2000 Value Index	2.6	25.1	0.2
eV US Small Cap Value Equity Median	5.3	24.9	0.3
Population	198	198	198

International Equity Managers

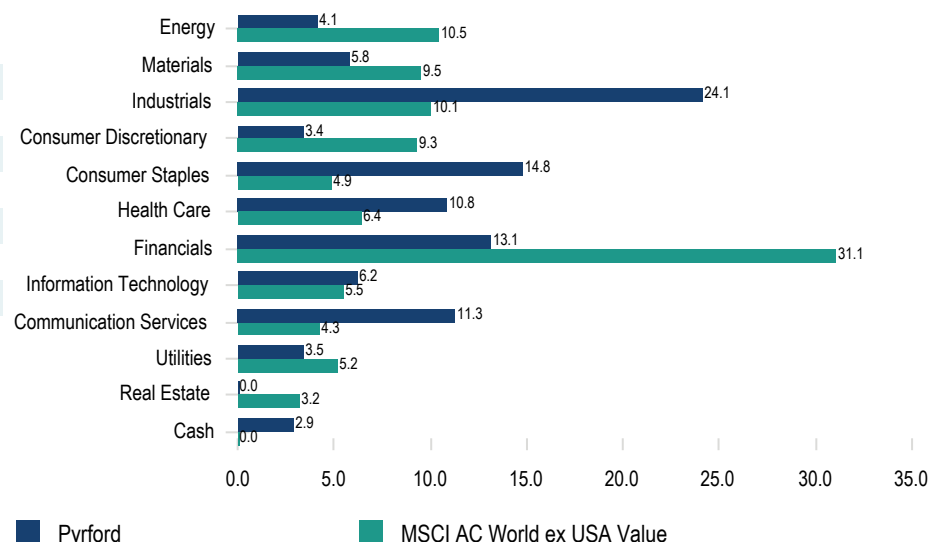
Pyrford Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: September 30, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	76	1,354
Wtd. Avg. Mkt. Cap \$M	53,548.33	63,383.89
Median Mkt. Cap \$M	21,374.72	8,618.28
Price/Earnings ratio	14.72	9.47
Price/Book ratio	2.26	1.67
Return on Equity (%)	4.80	3.12
Current Yield (%)	4.32	4.78
Beta (5 Years, Monthly)	0.75	1.00

Sector Allocation (%) vs. MSCI AC World ex USA Value



Largest Holdings

	End Weight (%)	Quarterly Return (%)
Japan Tobacco Inc	2.74	5.67
Nestle SA, Cham Und Vevey	2.51	-5.71
United Overseas Bank Ltd	2.51	3.90
Kddi Corp	2.31	1.15
Novartis AG	2.28	2.00
Mitsubishi Electric Corp	2.24	-10.70
Telenor ASA	2.21	12.44
Singapore Telecommunications	2.21	-0.98
Brambles Ltd	2.14	-2.23
Roche Holding AG	2.03	-10.44

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Japan Tobacco Inc	3.02	5.67	0.17
Telenor ASA	1.36	12.44	0.17
Toyota Tsusho Corp	0.81	20.76	0.17
Computershare Ltd Cpu	1.78	9.42	0.17
Comfordelgro Corporation Ltd	1.19	13.72	0.16
Sumitomo Rubber Industries Ltd	1.06	14.71	0.16
BP plc	0.82	12.60	0.10
United Overseas Bank Ltd	2.41	3.90	0.09
Woodside Energy Group Ltd	1.37	6.16	0.08
Malayan Banking Bhd Maybank	1.80	4.57	0.08

% of Portfolio

15.62

1.36

Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
AIA Group Ltd	1.60	-18.71	-0.30
Deutsche Post AG	1.77	-16.40	-0.29
Mitsubishi Electric Corp	2.46	-10.70	-0.26
Roche Holding AG	2.19	-10.44	-0.23
Nabtesco Corp	1.09	-17.32	-0.19
Kone OYJ	0.98	-19.01	-0.19
Essity Aktiebolag	0.98	-18.31	-0.18
Fielmann Group AG	1.01	-17.48	-0.18
National Grid plc	1.73	-9.58	-0.17
Taiwan Semiconductor Man.	1.31	-11.92	-0.16

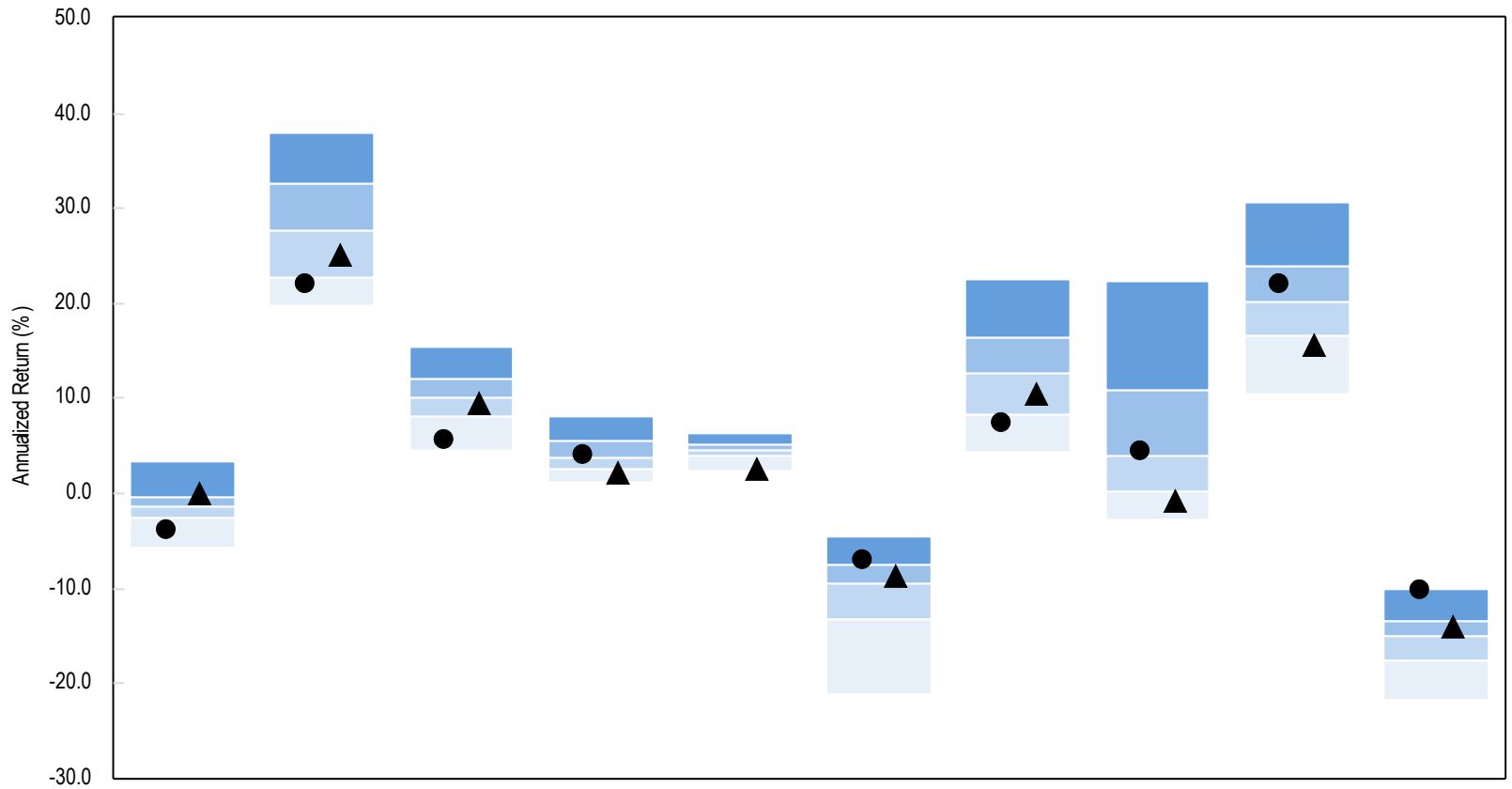
% of Portfolio

15.12

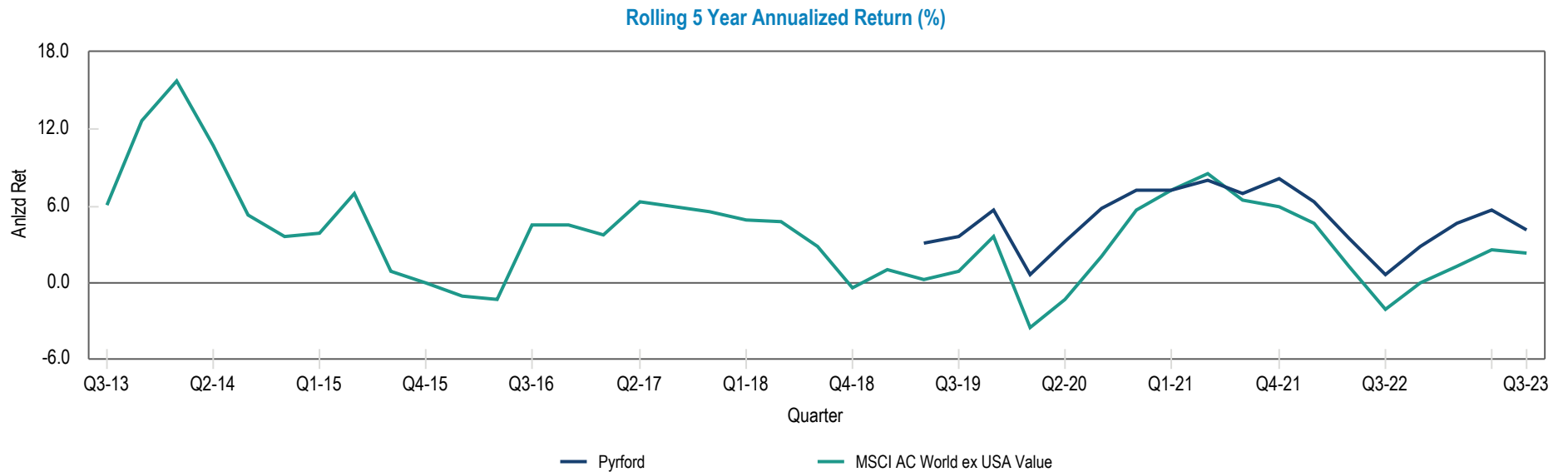
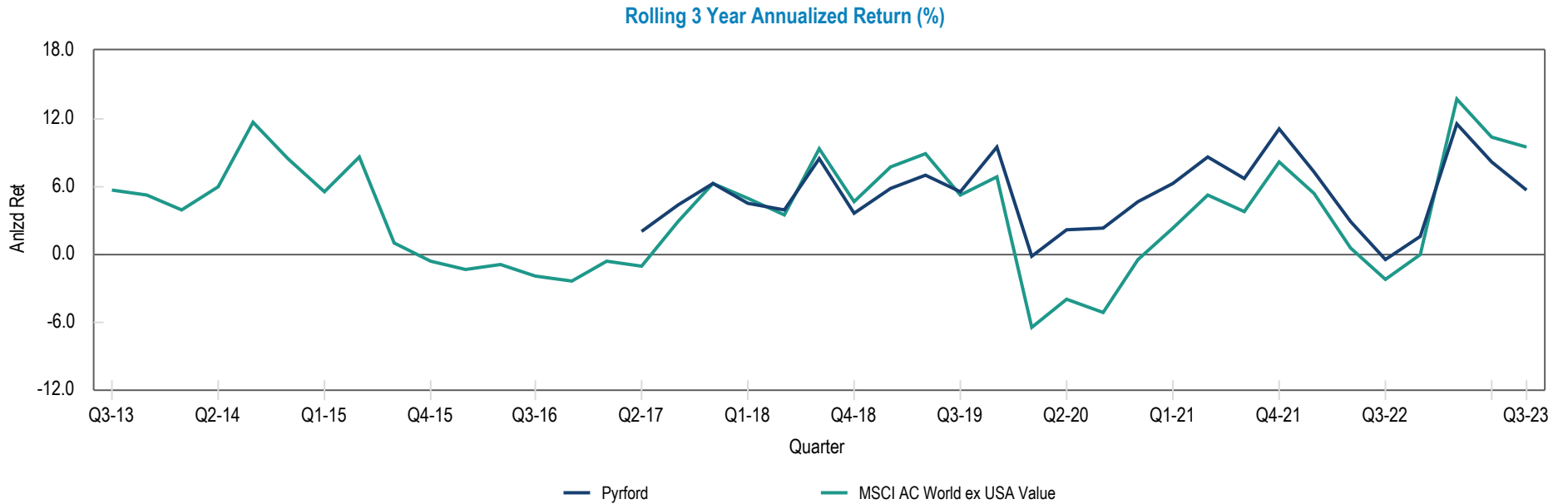
-2.14

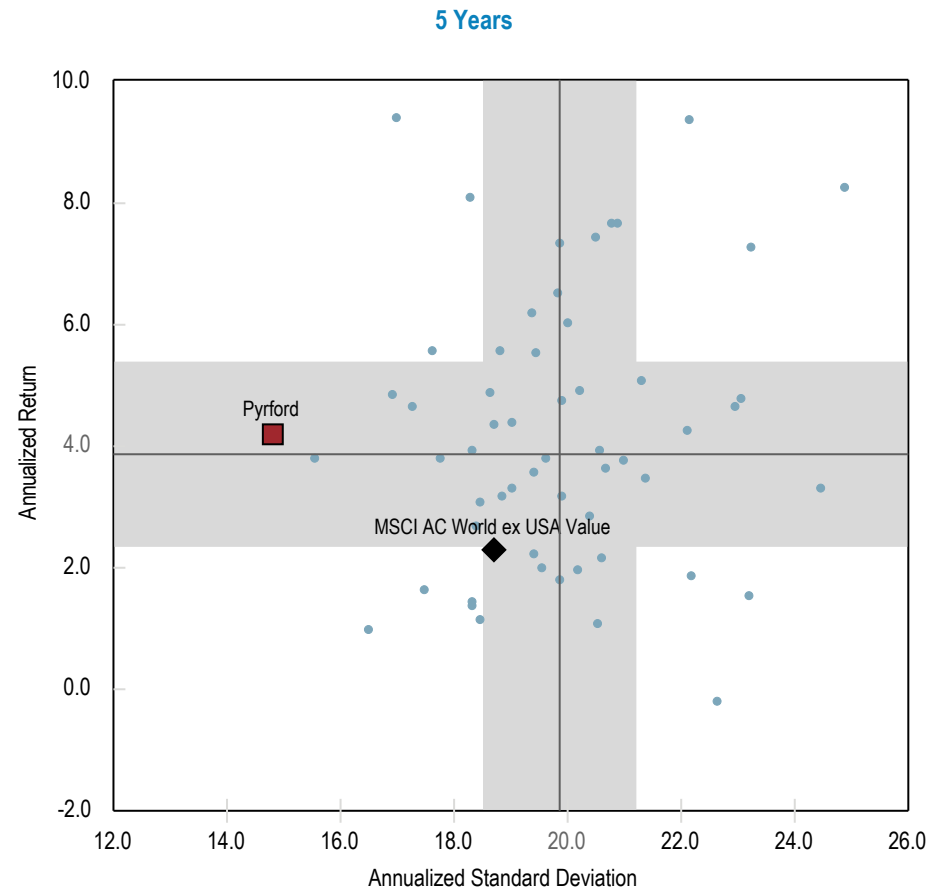
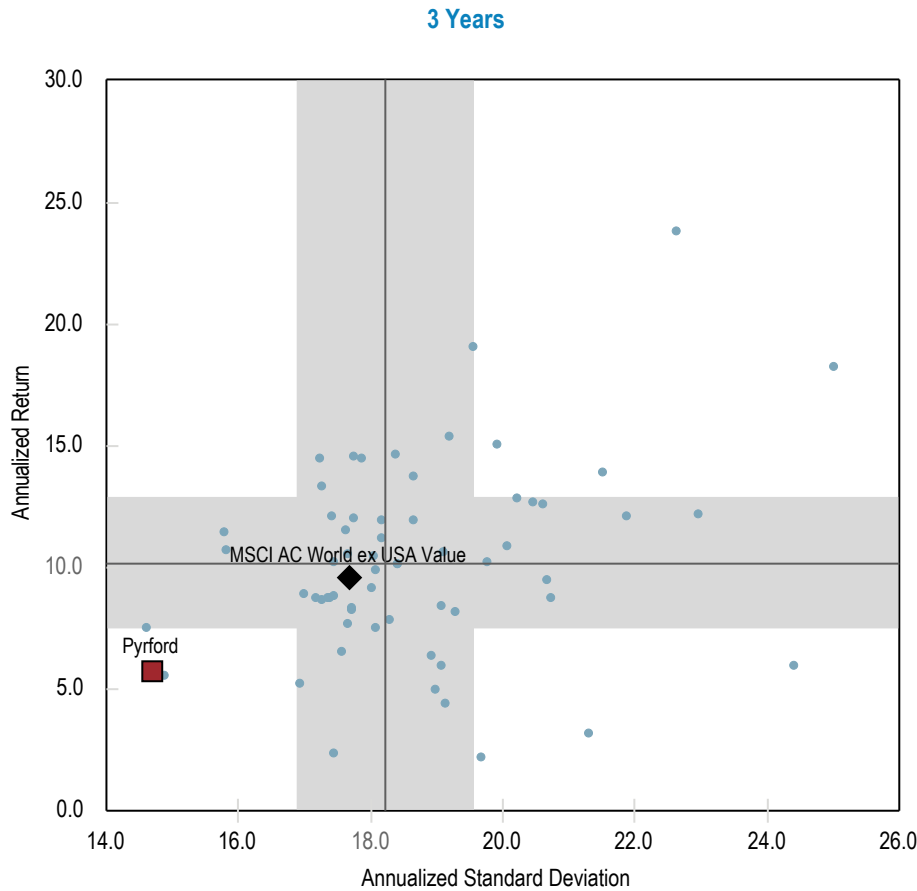
International equity value portfolio of non-US companies with low valuations at the country and stock level. Primary personnel include Tony Cousins, Daniel McDonagh, and Paul Simons.

Pyrford vs. eV ACWI ex-US Value Equity Gross Universe



	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● Pyrford	-3.74 (83)	22.22 (79)	5.72 (90)	4.19 (46)	-	-6.97 (20)	7.57 (84)	4.66 (48)	22.07 (38)	-10.15 (6)
▲ MSCI AC World ex USA Value (Net)	-0.07 (22)	25.17 (62)	9.57 (56)	2.29 (77)	2.58 (88)	-8.59 (40)	10.46 (66)	-0.77 (80)	15.72 (78)	-13.97 (31)
5th Percentile	3.40	37.88	15.41	8.13	6.35	-4.61	22.61	22.27	30.57	-10.04
1st Quartile	-0.34	32.55	12.17	5.54	5.14	-7.53	16.46	10.79	24.00	-13.41
Median	-1.42	27.61	10.20	3.87	4.50	-9.50	12.69	3.91	20.24	-15.08
3rd Quartile	-2.47	22.71	8.21	2.59	3.90	-13.18	8.35	0.30	16.62	-17.58
95th Percentile	-5.67	19.70	4.49	1.13	2.39	-21.01	4.34	-2.66	10.49	-21.69
Population	65	65	62	56	36	66	69	70	68	67





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Pyrford	5.7	14.7	0.3
MSCI AC World ex USA Value (Net)	9.6	17.7	0.5
eV ACWI ex-US Value Equity Median	10.2	18.2	0.5
Population	62	62	62

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Pyrford	4.2	14.8	0.2
MSCI AC World ex USA Value (Net)	2.3	18.7	0.1
eV ACWI ex-US Value Equity Median	3.9	19.8	0.2
Population	56	56	56

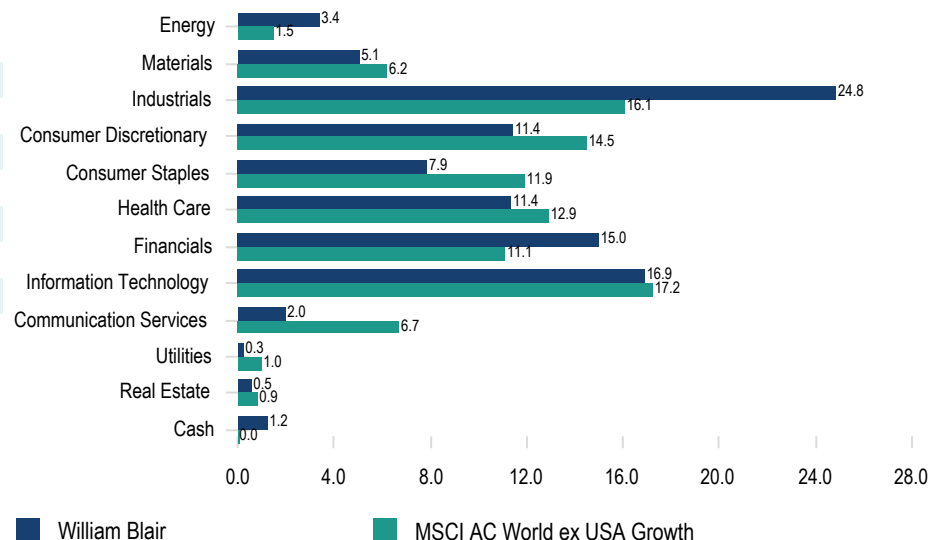
William Blair
Manager Portfolio Overview

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	181	1,304
Wtd. Avg. Mkt. Cap \$M	75,554.92	101,630.96
Median Mkt. Cap \$M	11,524.27	8,944.95
Price/Earnings ratio	21.37	20.10
Price/Book ratio	3.64	3.37
Return on Equity (%)	7.51	7.51
Current Yield (%)	1.90	1.94
Beta (5 Years, Monthly)	1.05	1.00

Sector Allocation (%) vs. MSCI AC World ex USA Growth



Largest Holdings

	End Weight (%)	Quarterly Return (%)
Novo Nordisk A/S	2.14	14.05
Taiwan Semiconductor Man.	1.80	-13.45
ASML Holding NV	1.75	-17.98
Astrazeneca PLC	1.61	-4.87
Linde Plc	1.60	-1.97
DSV A/S	1.53	-10.81
TotalEnergies SE	1.52	16.43
Canadian Pacific Kansas City Ltd	1.48	-7.70
London Stock Exchange Group	1.44	-5.09
Compass Group PLC	1.42	-12.80

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Novo Nordisk A/S	1.77	14.05	0.25
Partners Group AG	0.53	20.21	0.11
TotalEnergies SE	0.46	16.43	0.08
Disco Corp	0.37	18.44	0.07
Kingspan Group PLC	0.48	13.48	0.06
Pro Medicus Ltd	0.23	23.46	0.05
Parkland Corp	0.26	18.85	0.05
DBS Group Holdings Ltd	0.64	7.37	0.05
Kweichow Moutai Co Ltd	0.66	5.78	0.04
MercadoLibre Inc	0.49	7.03	0.03

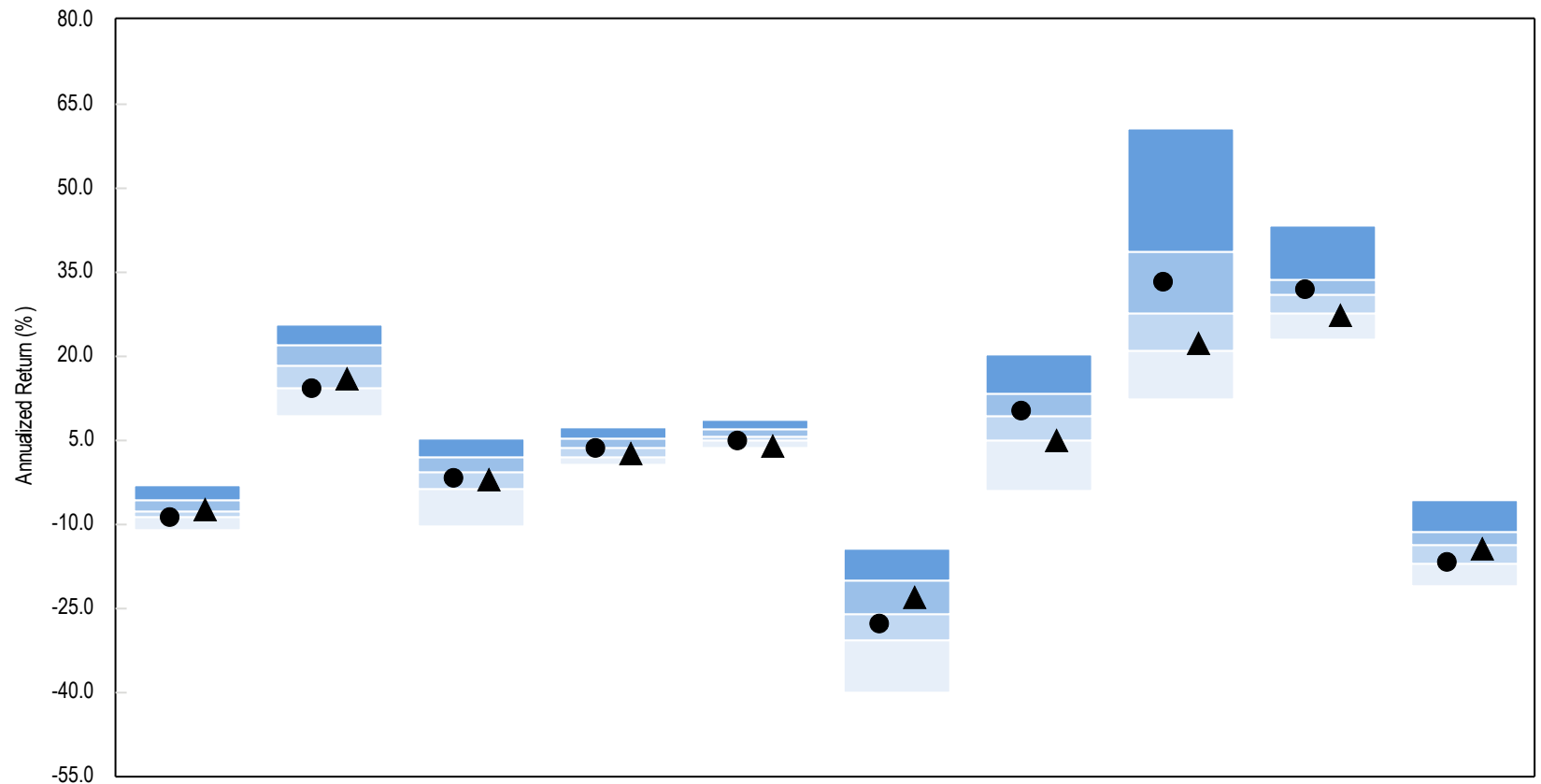
Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
MTU Aero Engines AG	1.39	-29.79	-0.41
ASML Holding NV	2.01	-17.98	-0.36
Adyen N.V	0.58	-56.81	-0.33
Keyence Corp	1.56	-20.57	-0.32
Amadeus IT Group SA	1.57	-19.36	-0.30
Hexagon AB	1.00	-30.07	-0.30
LVMH Moet Hennessy Louis V	1.48	-19.44	-0.29
Daikin Industries Ltd	1.27	-21.91	-0.28
LONZA GROUP AG	1.24	-21.97	-0.27
Taiwan Semiconductor Man.	1.96	-13.45	-0.26

% of Portfolio 5.89 0.79 % of Portfolio 14.06 -3.13

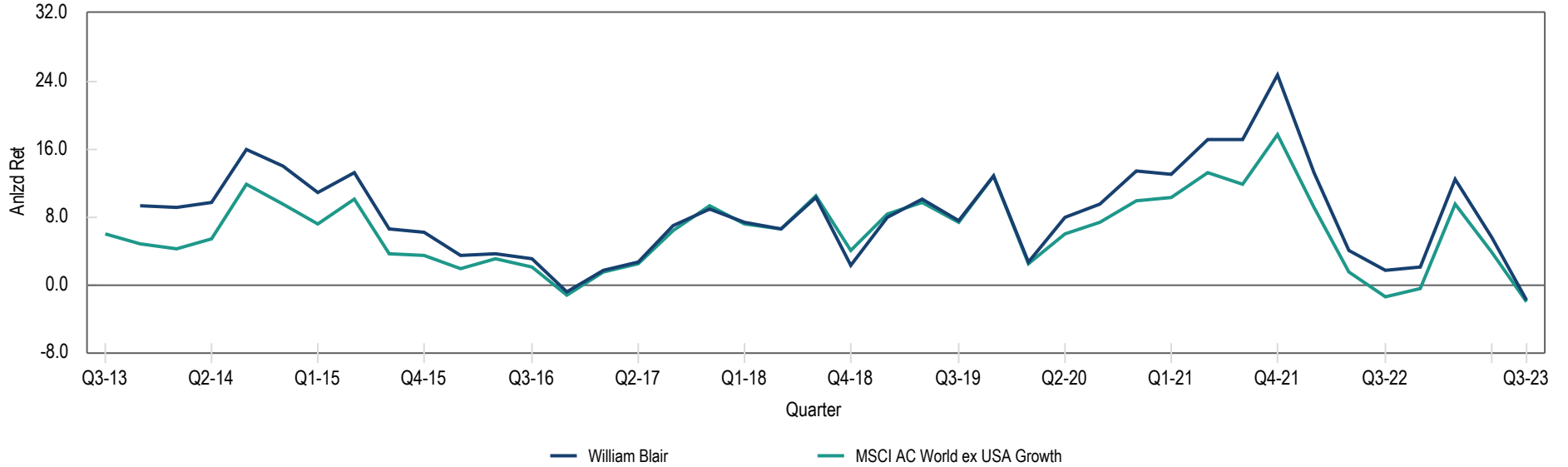
International equity growth portfolio of non-US companies with high growth rates constructed from the security level. Primary personnel include Simon Fennell and Kenneth McAtamney.

William Blair vs. eV ACWI ex-US Growth Equity Gross Universe

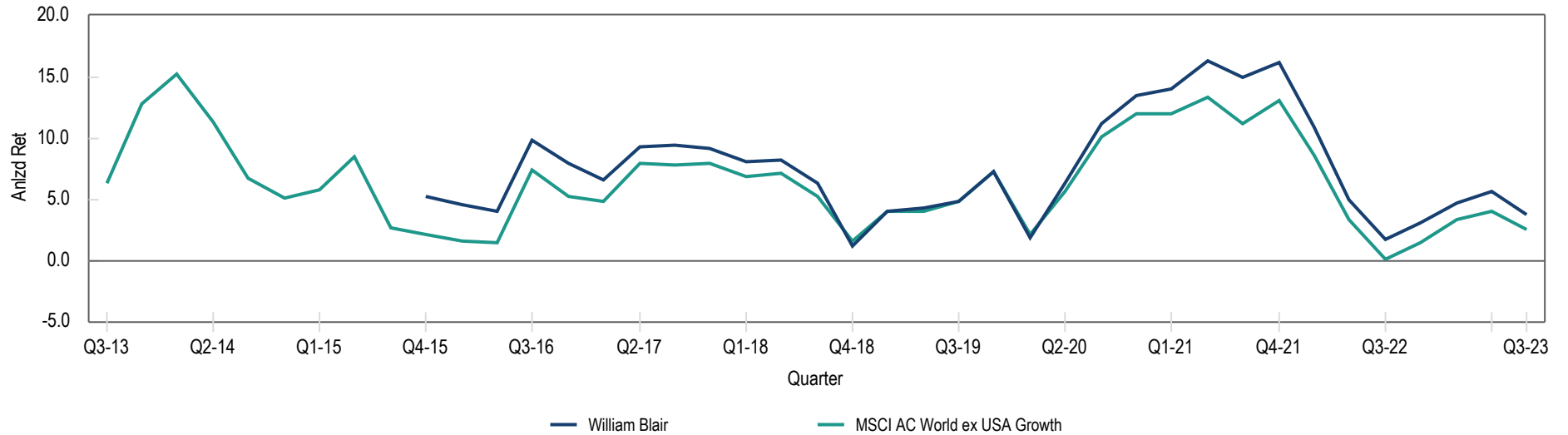


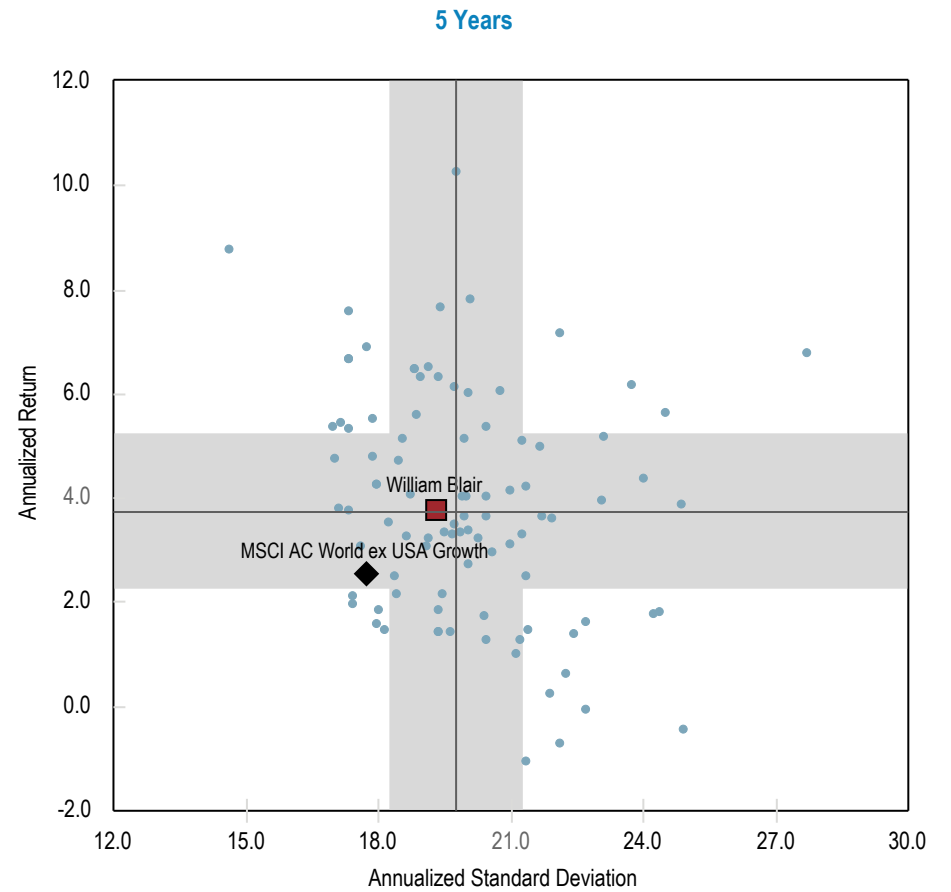
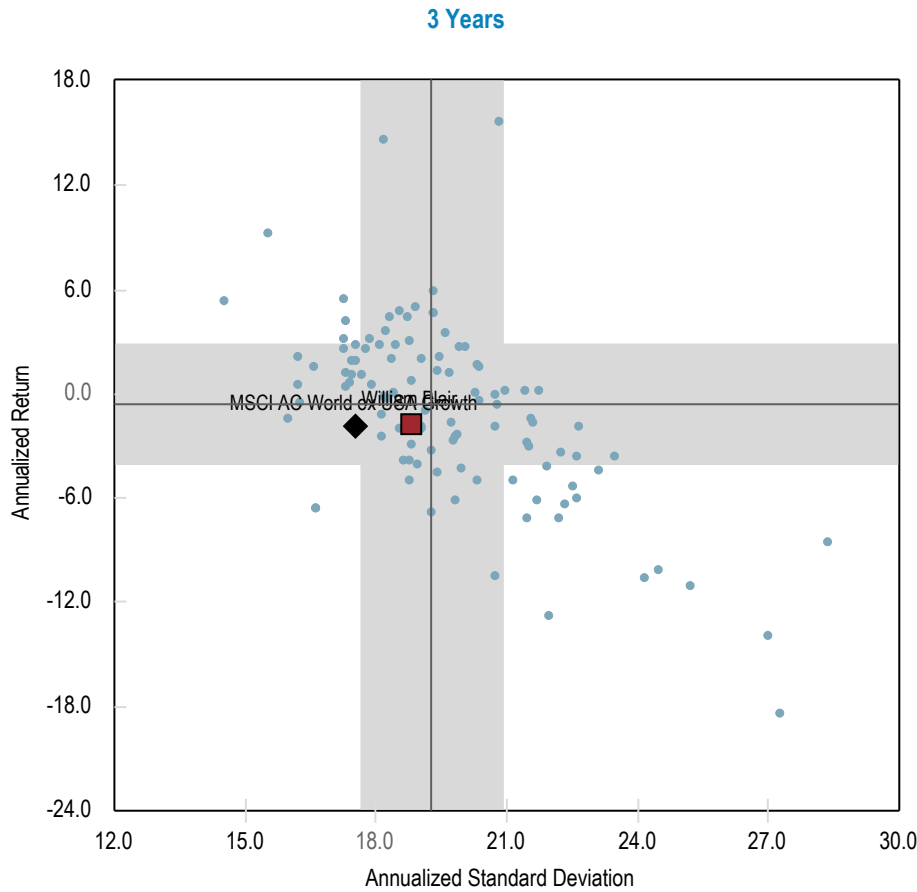
	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● William Blair	-8.78 (79)	14.21 (76)	-1.74 (58)	3.76 (50)	5.07 (66)	-27.75 (59)	10.48 (43)	33.25 (36)	32.01 (36)	-16.78 (72)
▲ MSCI AC World ex USA Growth	-7.31 (46)	15.84 (67)	-1.86 (59)	2.54 (72)	3.92 (91)	-23.05 (35)	5.09 (76)	22.20 (72)	27.34 (78)	-14.43 (55)
5th Percentile	-3.12	25.61	5.28	7.29	8.69	-14.26	20.36	60.81	43.28	-5.69
1st Quartile	-5.61	21.84	2.07	5.39	7.06	-19.93	13.44	38.73	33.55	-11.44
Median	-7.51	18.30	-0.60	3.75	5.50	-26.03	9.35	27.77	30.89	-13.66
3rd Quartile	-8.57	14.23	-3.81	2.15	4.88	-30.69	5.10	21.01	27.81	-16.86
95th Percentile	-10.93	9.19	-10.32	0.55	3.76	-39.86	-4.01	12.34	23.02	-20.93
Population	112	112	109	96	70	114	116	112	110	104

Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
William Blair	-1.7	18.8	-0.1
MSCI AC World ex USA Growth (Net)	-1.9	17.5	-0.1
eV ACWI ex-US Growth Equity Median	-0.6	19.3	0.0
Population	109	109	109

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
William Blair	3.8	19.3	0.2
MSCI AC World ex USA Growth (Net)	2.5	17.7	0.1
eV ACWI ex-US Growth Equity Median	3.8	19.7	0.2
Population	96	96	96

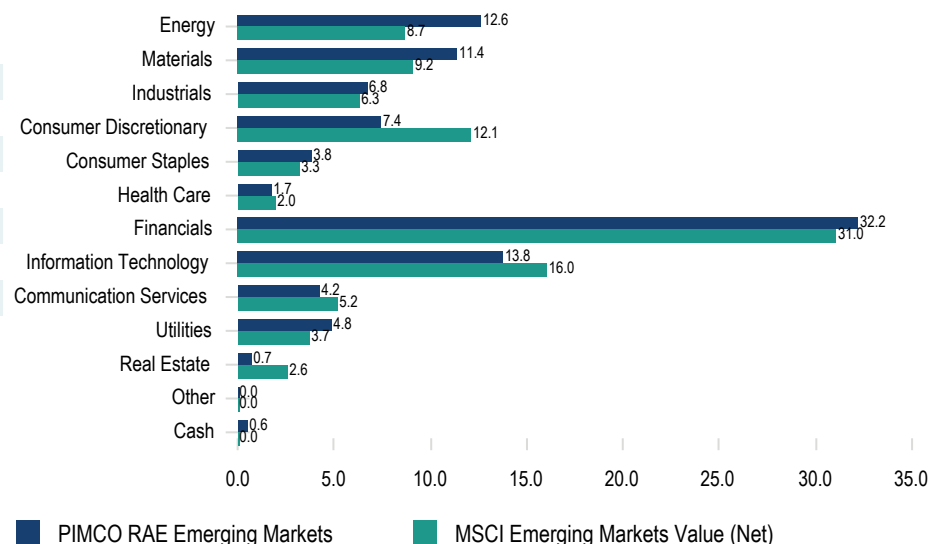
PIMCO RAE Emerging Markets Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: September 30, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	371	828
Wtd. Avg. Mkt. Cap \$M	18,928.25	56,268.99
Median Mkt. Cap \$M	4,174.50	6,052.58
Price/Earnings ratio	7.02	9.17
Price/Book ratio	1.80	1.76
Return on Equity (%)	2.82	2.86
Current Yield (%)	5.69	4.51
Beta (5 Years, Monthly)	1.07	1.00

Sector Allocation (%) vs. MSCI Emerging Markets Value (Net)



Largest Holdings

	End Weight (%)	Quarterly Return (%)
China Construction Bank Corp	4.31	-4.46
POSCO Holdings Inc	3.05	34.64
China Petroleum & Chemical	2.92	-3.45
Bank of China Ltd	2.61	-4.77
Petrochina Co Ltd	2.42	13.47
Quanta Computer Inc	2.05	52.02
Industrial & Comm. Bank of China	2.03	-1.64
Vipshop Holdings Limited	1.74	-2.97
Ping An Insurance Group	1.71	-8.04
SCB X PCL	1.58	-1.96

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Turkiye Is Bankasi AS	1.02	74.09	0.76
Posco International Corp	0.75	74.96	0.57
IS Yatirim Menkul Degerler A.S.	0.27	161.48	0.44
POSCO Holdings Inc	1.14	34.64	0.40
Quanta Computer Inc	0.65	52.02	0.34
Indiabulls Housing Finance Ltd	0.59	49.44	0.29
REC Ltd	0.33	79.51	0.26
Petrochina Co Ltd	1.91	13.47	0.26
Haci Omer Sabanci	1.06	23.36	0.25
Akbank	0.41	57.52	0.24

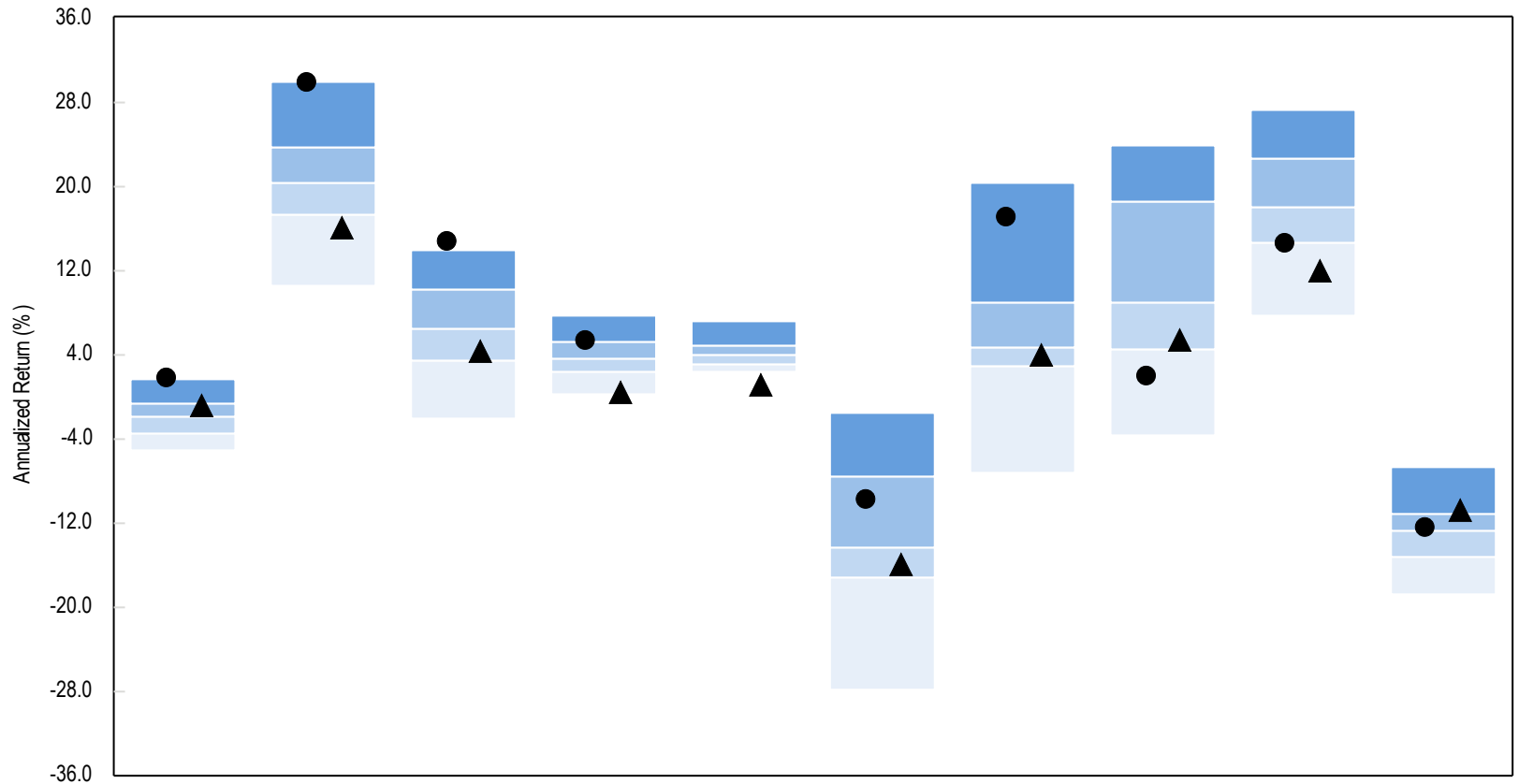
Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Cielo SA	1.39	-26.72	-0.37
Vedanta Ltd	1.58	-20.90	-0.33
Lg Electronics Inc	1.48	-22.24	-0.33
China Construction Bank Corp	4.14	-4.46	-0.18
Bank of China Ltd	3.11	-4.77	-0.15
Korea Electric Power Corp	0.99	-14.58	-0.15
Cemex SAB de CV	1.85	-6.61	-0.12
Hon Hai Precision Industry	1.73	-6.92	-0.12
LG Display Co Ltd	0.58	-18.77	-0.11
China Petroleum & Chemical	3.11	-3.45	-0.11

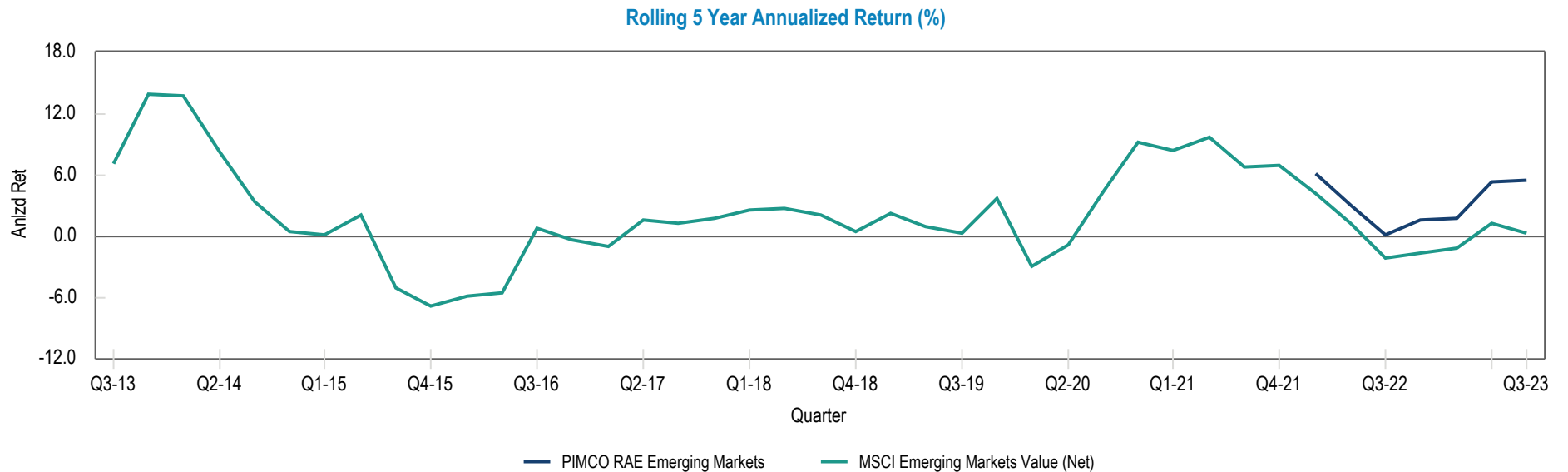
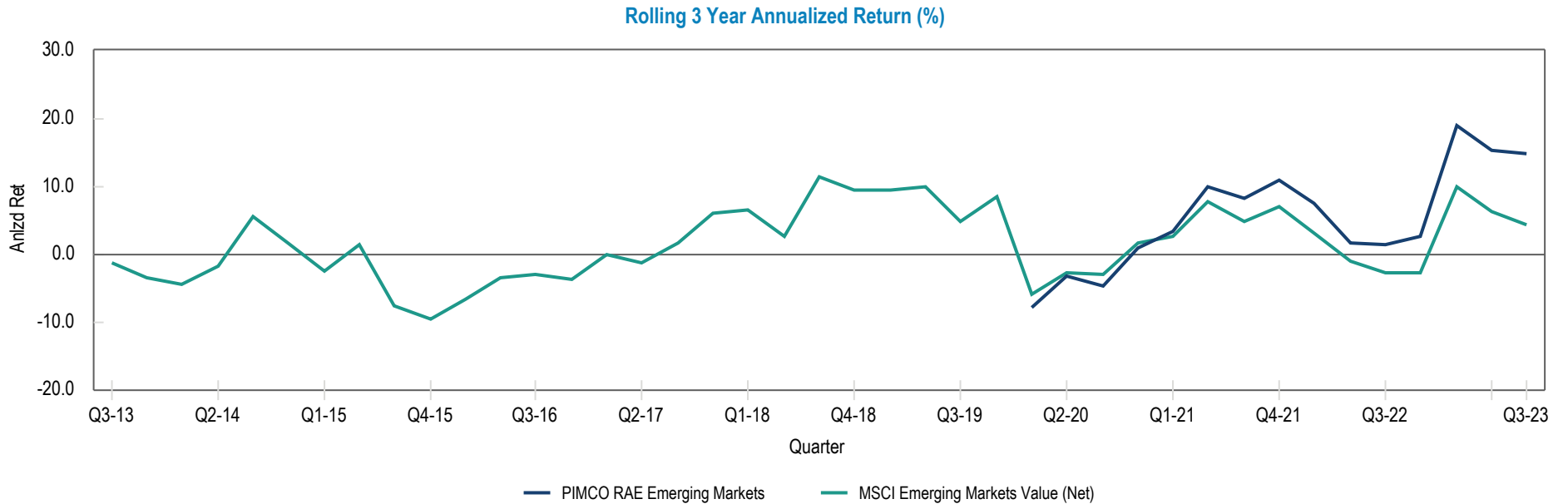
% of Portfolio 8.13 3.79 % of Portfolio 19.96 -1.97

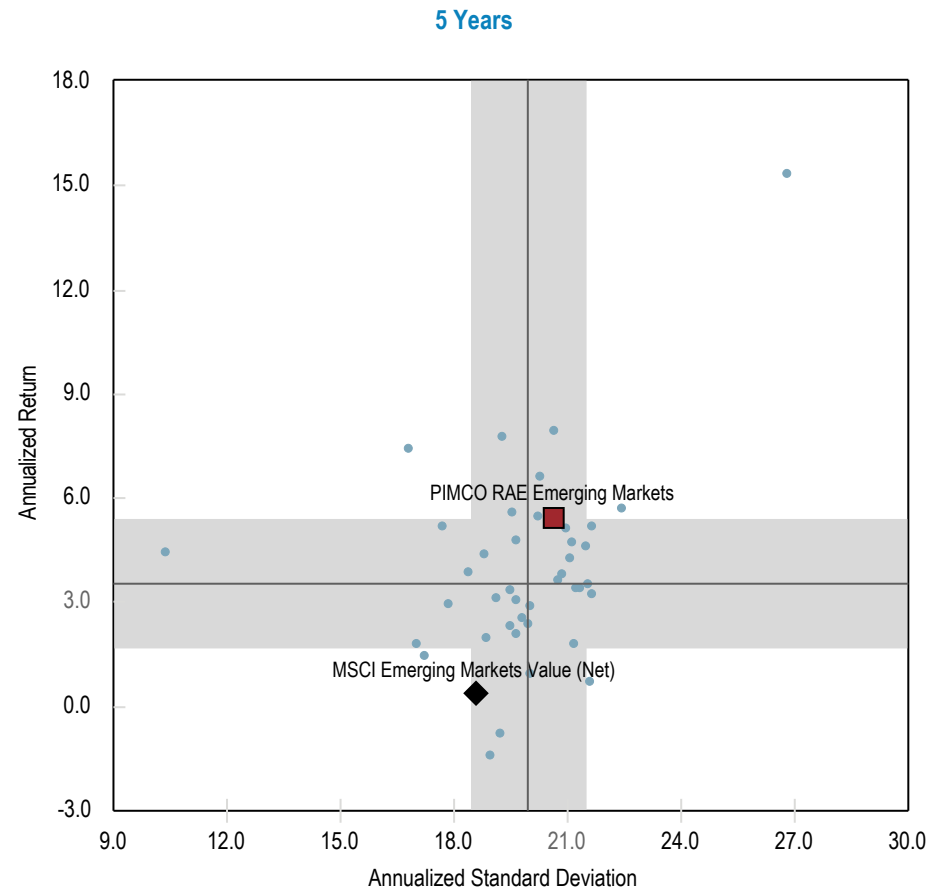
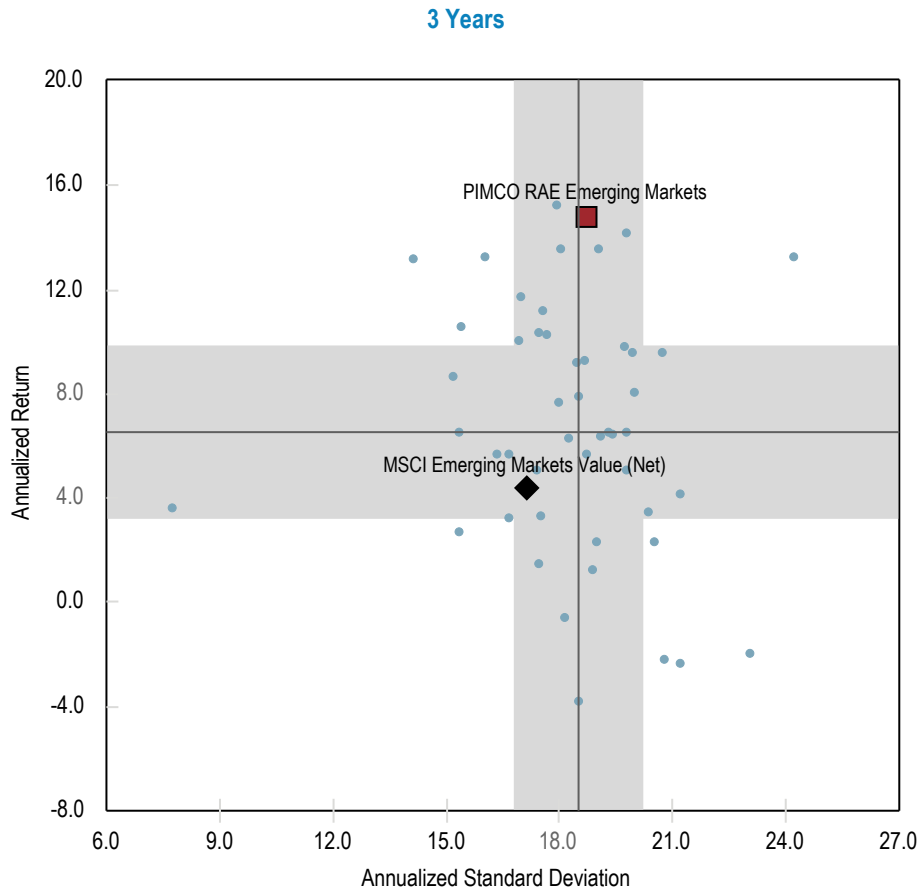
The PIMCO RAE Emerging Markets seeks to invest 80% of its assets in investments that are economically tied to emerging market countries. The portfolio is sub-advised by Research Affiliates, LLC.

PIMCO RAE Emerging Markets vs. eV Emg Mkts All Cap Value Equity Gross Universe



	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● PIMCO RAE Emerging Markets	1.93 (5)	29.98 (6)	14.80 (3)	5.45 (18)	-	-9.66 (34)	17.08 (8)	2.13 (85)	14.63 (77)	-12.30 (47)
▲ MSCI Emerging Markets Value NR	-0.78 (31)	16.03 (85)	4.40 (71)	0.38 (95)	1.21 (100)	-15.83 (61)	4.00 (64)	5.48 (72)	11.96 (91)	-10.74 (23)
5th Percentile	1.77	30.00	13.96	7.75	7.14	-1.44	20.40	23.96	27.29	-6.64
1st Quartile	-0.55	23.77	10.31	5.16	4.90	-7.62	9.02	18.49	22.65	-11.18
Median	-1.90	20.32	6.54	3.56	3.92	-14.26	4.76	8.93	17.98	-12.63
3rd Quartile	-3.38	17.25	3.48	2.38	3.15	-17.13	2.87	4.50	14.73	-15.20
95th Percentile	-5.04	10.57	-2.06	0.27	2.31	-27.86	-7.27	-3.63	7.68	-18.81
Population	55	55	49	43	30	57	56	59	60	57





3 Years

	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
PIMCO RAE Emerging Markets	14.8	18.7	0.7
MSCI Emerging Markets Value (Net)	4.4	17.2	0.2
eV Emg Mkts All Cap Value Equity Median	6.5	18.5	0.3
Population	49	49	49

5 Years

	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
PIMCO RAE Emerging Markets	5.4	20.6	0.3
MSCI Emerging Markets Value (Net)	0.4	18.6	0.0
eV Emg Mkts All Cap Value Equity Median	3.6	20.0	0.2
Population	43	43	43

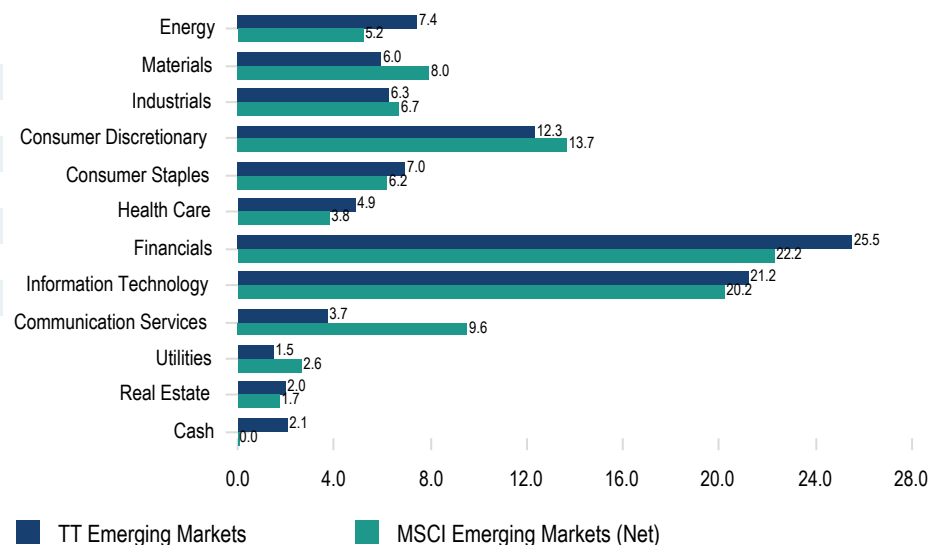
TT Emerging Markets Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: September 30, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	65	1,437
Wtd. Avg. Mkt. Cap \$M	84,714.69	93,495.42
Median Mkt. Cap \$M	10,035.19	6,341.37
Price/Earnings ratio	11.63	12.11
Price/Book ratio	2.31	2.37
Return on Equity (%)	4.57	3.63
Current Yield (%)	2.46	3.08
Beta (5 Years, Monthly)	1.12	1.00

Sector Allocation (%) vs. MSCI Emerging Markets (Net)



Largest Holdings

	End Weight (%)	Quarterly Return (%)
Taiwan Semiconductor Man.	8.41	-11.92
Axis Bank Ltd	5.18	3.82
Grupo Financiero Banorte	4.50	0.59
Nova Ljubljanska Banka d.d	3.67	-2.43
Alibaba Group Holding Ltd	3.24	5.48
Ypf Sociedad Anonima	3.24	-3.88
Samsung Electronics Co Ltd	3.16	-10.56
Icici Bank Ltd	2.89	1.45
Delta Electronics Inc	2.37	-9.12
Hapvida Participacoes	2.24	-0.46

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Emaar Properties	2.95	25.43	0.75
PVR INOX Limited	1.37	23.50	0.32
PT Bank Mandiri TBK	2.11	12.40	0.26
Axis Bank Ltd	5.17	3.82	0.20
Alibaba Group Holding Ltd	3.32	5.48	0.18
Tata Steel Ltd	1.19	13.70	0.16
Varun Beverages Ltd	0.76	16.58	0.13
Absa Group Ltd	1.28	8.54	0.11
Bank of Baroda Limited	0.89	11.04	0.10
Bank of Ningbo Co Ltd	1.21	7.74	0.09

Top Detractors

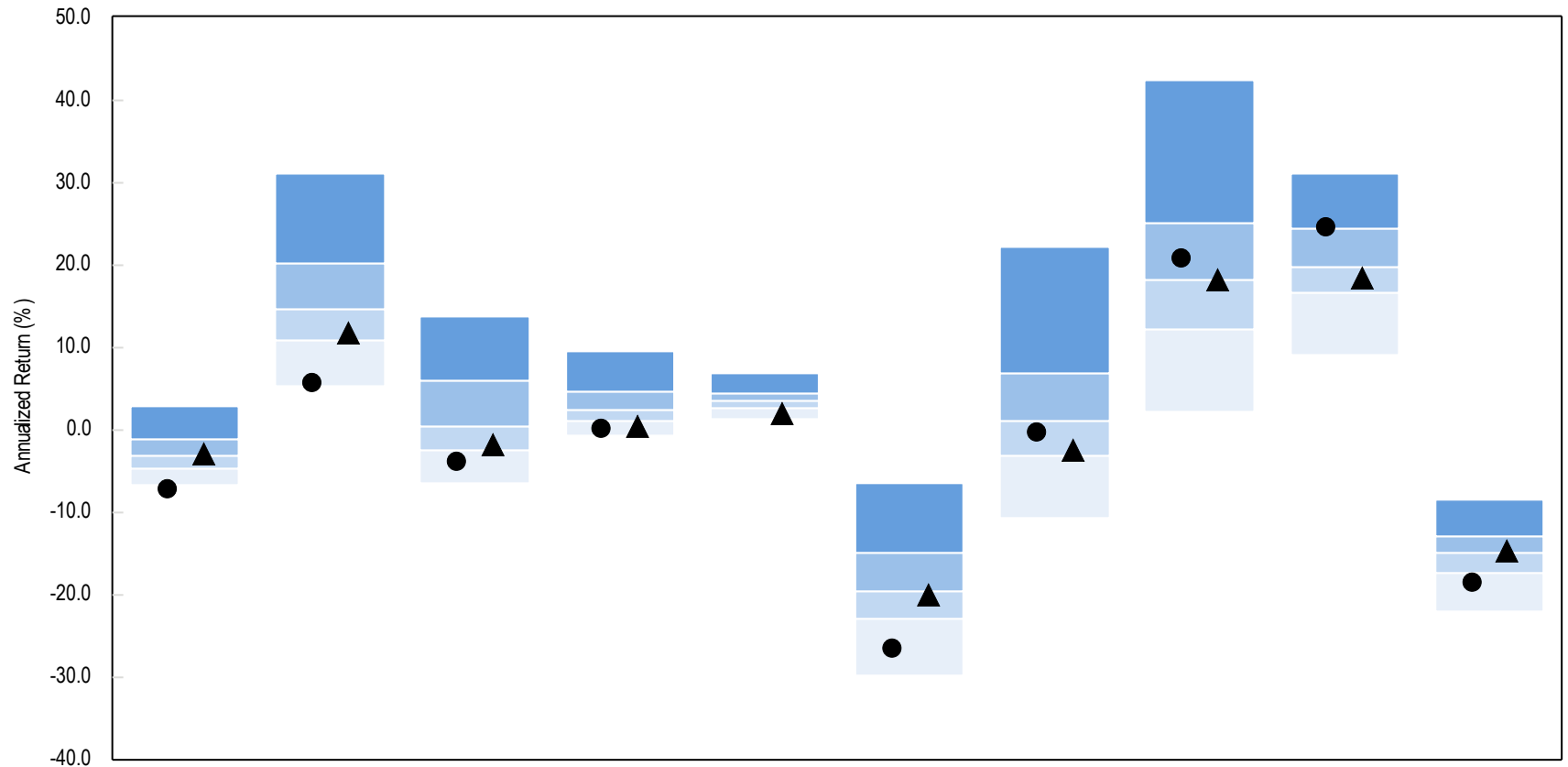
	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Lojas Renner SA	1.68	-34.91	-0.59
Allkem Limited	1.71	-28.82	-0.49
Lg Chem Ltd	1.50	-27.31	-0.41
L & F Co	1.34	-30.32	-0.41
Samsung Electronics Co Ltd	3.82	-10.56	-0.40
Samsung Sdi Co Ltd	1.54	-25.27	-0.39
Vamos Locacao de Caminhos SA	1.61	-23.90	-0.38
Pepco Group N.V.	0.74	-48.83	-0.36
B3 S.A.-Brasil Bolsa Balcao	1.62	-19.22	-0.31
Hansol Chemience Co Ltd	0.95	-31.73	-0.30

% of Portfolio 20.25 2.31

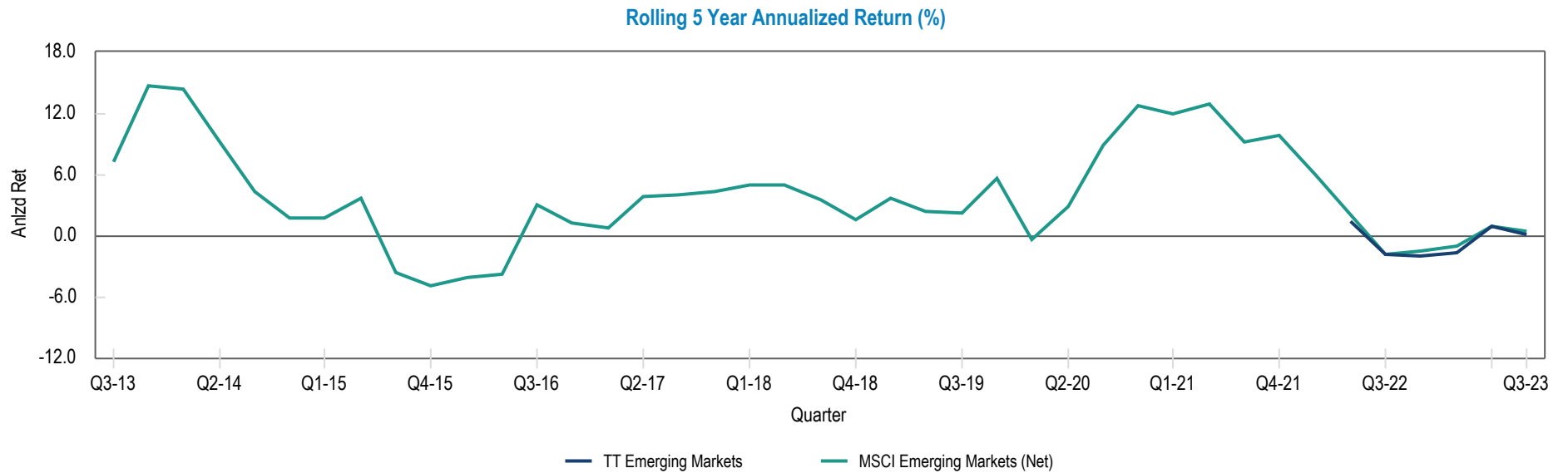
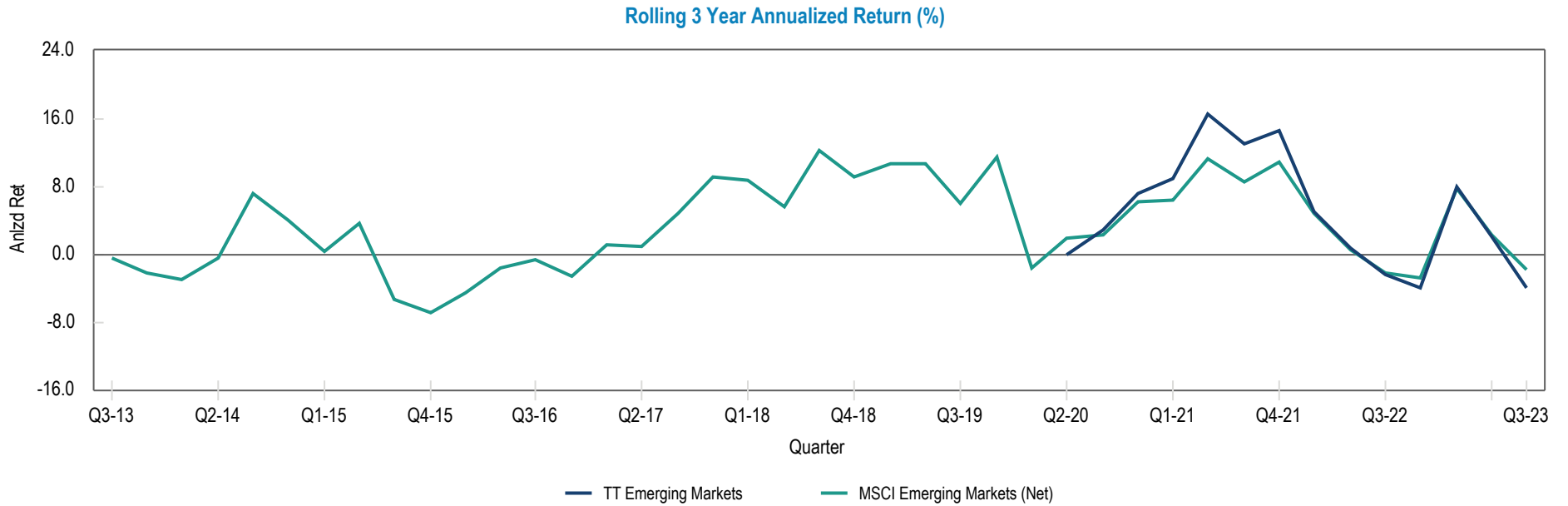
% of Portfolio 16.51 -4.04

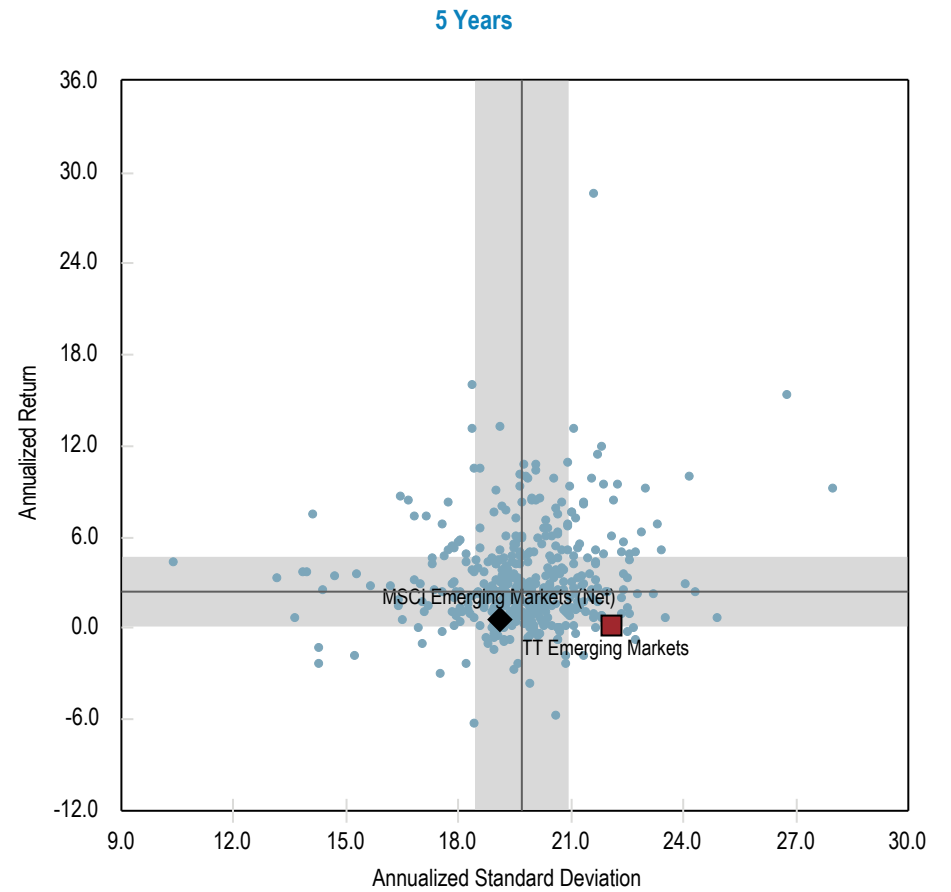
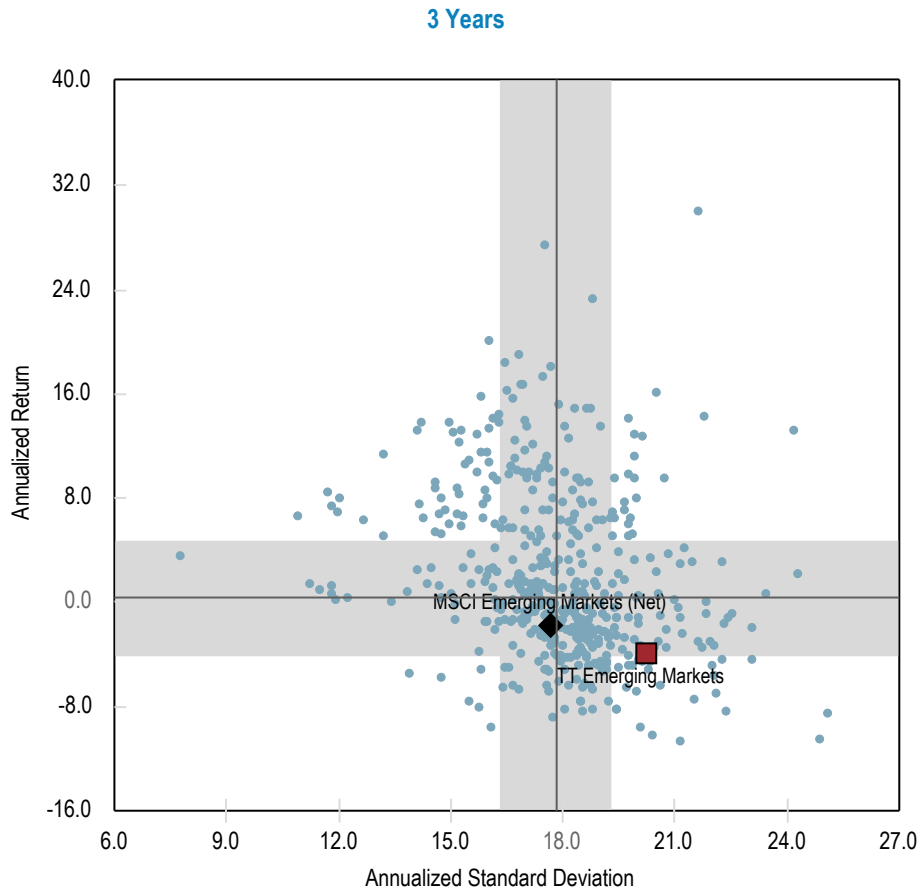
The Emerging Markets Unconstrained strategy aims to outperform its benchmark, MSCI Emerging Markets Index by 5% per annum over a three-year rolling period. It targets high returns and long term capital growth by investing in a focused portfolio of primarily equity and equity-related securities traded in the Emerging Markets.

TT Emerging Markets vs. eV Emg Mkts Equity Gross Universe



	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● TT Emerging Markets	-7.09 (97)	5.71 (95)	-3.85 (83)	0.19 (88)	-	-26.36 (90)	-0.23 (58)	20.79 (39)	24.77 (24)	-18.39 (82)
▲ MSCI Emerging Markets	-2.93 (46)	11.70 (68)	-1.73 (67)	0.55 (82)	2.07 (89)	-20.09 (56)	-2.54 (72)	18.31 (51)	18.42 (63)	-14.57 (45)
5th Percentile	2.80	31.20	13.85	9.45	6.91	-6.47	22.27	42.46	31.17	-8.51
1st Quartile	-1.05	20.33	6.01	4.63	4.45	-14.93	6.86	25.13	24.36	-12.79
Median	-3.10	14.57	0.36	2.43	3.51	-19.54	1.02	18.33	19.72	-14.88
3rd Quartile	-4.57	10.99	-2.48	1.03	2.64	-22.96	-3.09	12.28	16.61	-17.35
95th Percentile	-6.74	5.29	-6.55	-0.65	1.24	-29.67	-10.69	2.12	9.13	-22.01
Population	530	530	488	436	304	560	576	577	600	588





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
TT Emerging Markets	-3.9	20.3	-0.2
MSCI Emerging Markets (Net)	-1.7	17.6	-0.1
eV Emg Mkts Equity Median	0.4	17.8	0.0
Population	488	488	488

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
TT Emerging Markets	0.2	22.1	0.0
MSCI Emerging Markets (Net)	0.6	19.1	0.0
eV Emg Mkts Equity Median	2.4	19.7	0.1
Population	436	436	436

Global Equity Managers

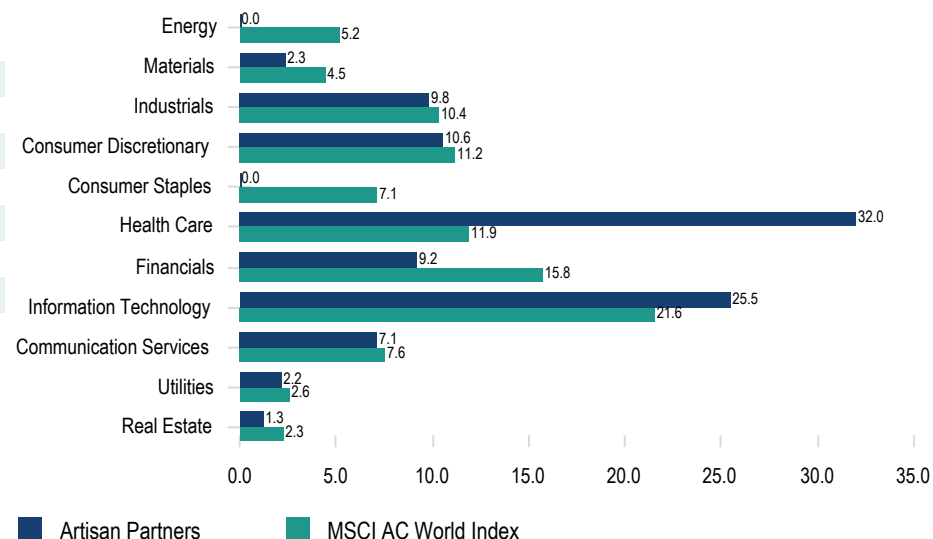
Artisan Partners Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: September 30, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	43	2,947
Wtd. Avg. Mkt. Cap \$M	199,198.66	401,761.58
Median Mkt. Cap \$M	65,675.00	11,768.97
Price/Earnings ratio	25.12	17.44
Price/Book ratio	4.70	3.38
Return on Equity (%)	4.05	8.96
Current Yield (%)	0.70	2.27
Beta (5 Years, Monthly)	0.99	1.00

Sector Allocation (%) vs. MSCI AC World Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
Veeva Systems Inc	6.84	2.89
Novo Nordisk A/S	5.13	14.05
Advanced Micro Devices Inc	4.80	-9.74
Boston Scientific Corp	4.78	-2.38
Atlassian Corp	4.02	20.08
ON Semiconductor Corp	3.67	-1.72
Intuit Inc.	3.53	11.71
Techtronic Industries Co Ltd	3.52	-9.62
LONZA GROUP AG	3.32	-21.97
Astrazeneca PLC	3.30	-4.87

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Novo Nordisk A/S	4.28	14.05	0.60
Atlassian Corp	2.97	20.08	0.60
Intuit Inc.	3.02	11.71	0.35
arGEN-X SE	1.28	26.15	0.33
UBS Group AG	1.26	22.63	0.28
Alphabet Inc	2.54	9.32	0.24
Arista Networks Inc	1.49	13.50	0.20
Veeva Systems Inc	6.26	2.89	0.18
Airbnb Inc	1.63	7.06	0.12
Danaher Corp	2.28	3.38	0.08

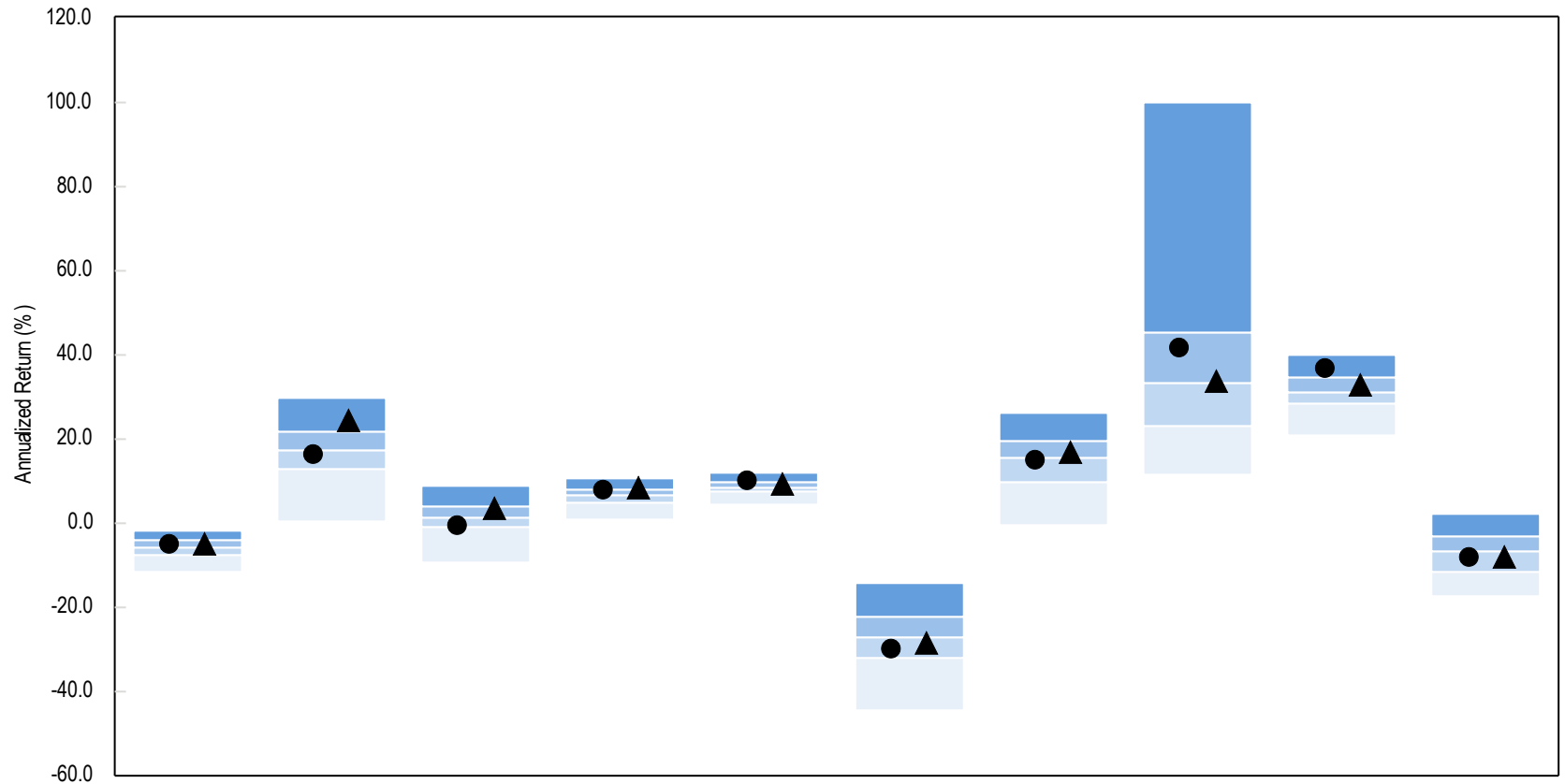
Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
LONZA GROUP AG	4.07	-21.97	-0.89
Adyen N.V	1.46	-56.81	-0.83
Hexagon AB	2.19	-30.07	-0.66
NextEra Energy Inc	2.73	-22.26	-0.61
Keyence Corp	2.73	-20.57	-0.56
Advanced Micro Devices Inc	4.59	-9.74	-0.45
Chipotle Mexican Grill Inc	2.97	-14.36	-0.43
Cie Financiere Richemont	1.65	-25.58	-0.42
Netflix Inc	2.64	-14.28	-0.38
Techtronic Industries Co Ltd	3.76	-9.62	-0.36

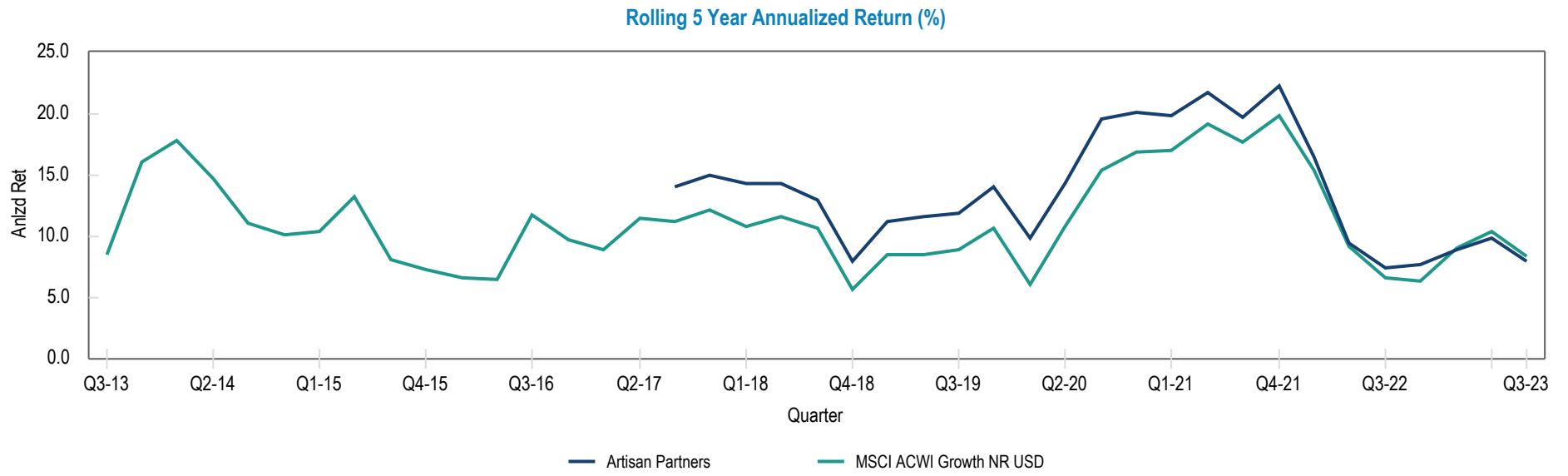
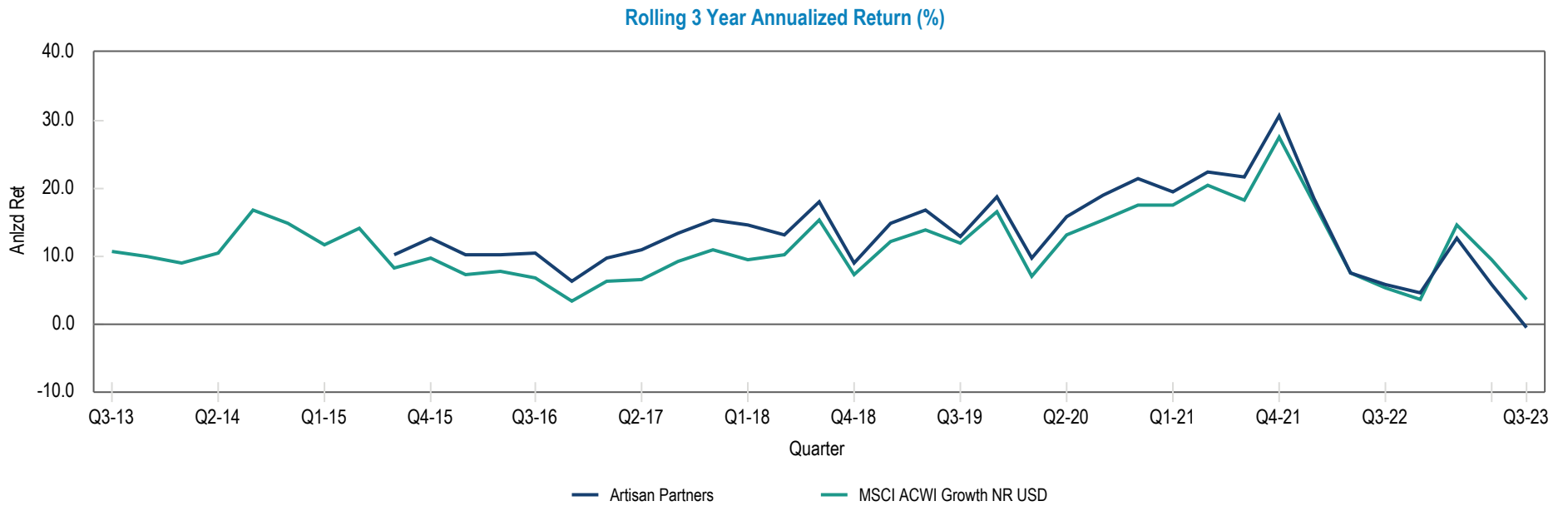
% of Portfolio 27.01 2.98 % of Portfolio 28.79 -5.58

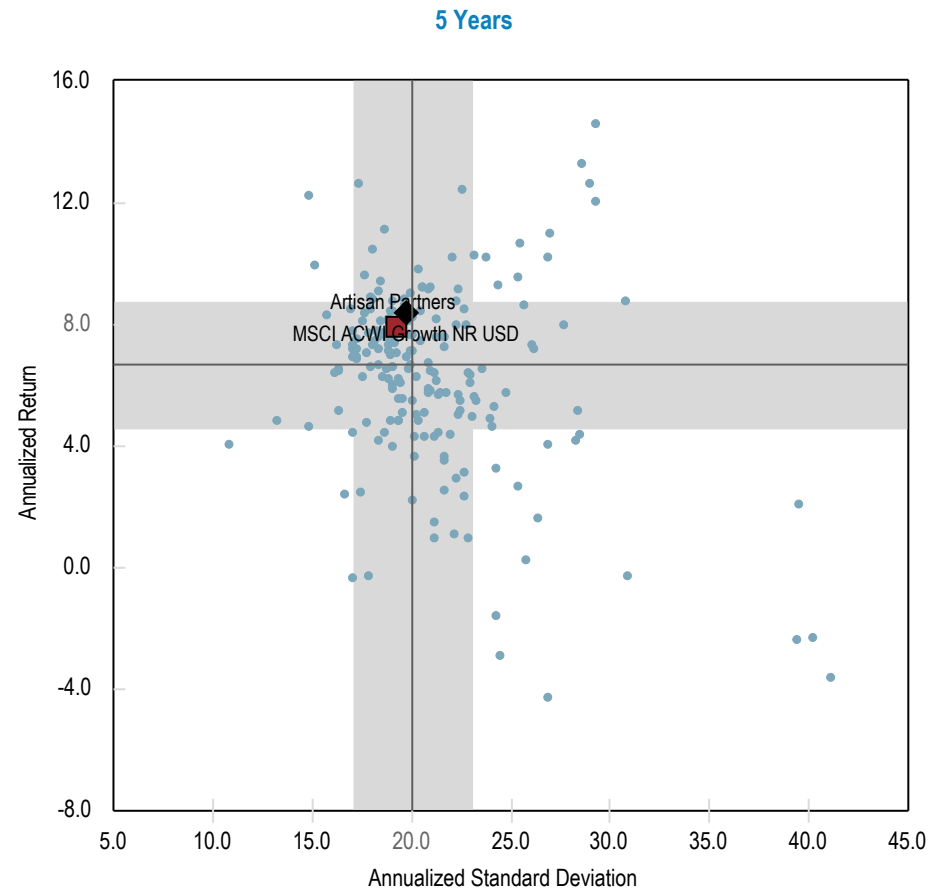
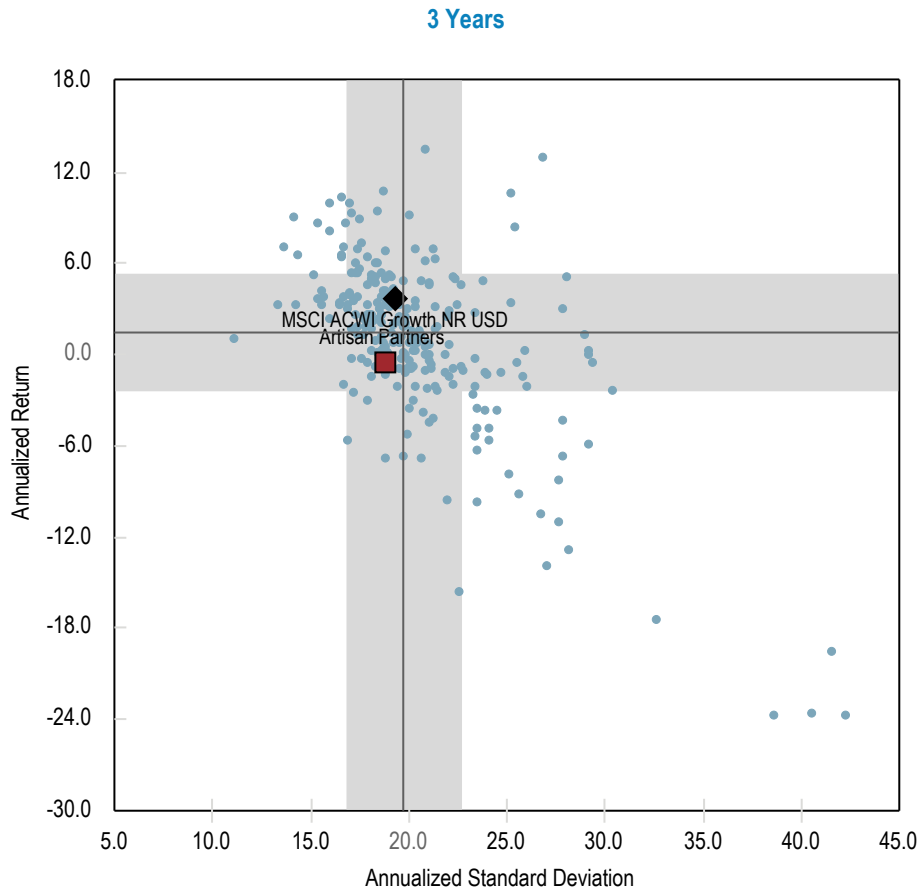
Global equity portfolio of companies that is benchmark agnostic with accelerating profit cycles and a focus on capital allocation. Primary personnel include James Hamel, Craigh Cepukenas, and Matthew Kamm.

Artisan Partners vs. eV Global Growth Equity Gross Universe



	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● Artisan Partners	-5.10 (38)	16.29 (58)	-0.46 (70)	7.94 (29)	10.40 (18)	-29.59 (60)	14.99 (55)	41.66 (34)	37.00 (12)	-7.94 (60)
▲ MSCI ACWI Growth NR USD	-4.89 (34)	24.41 (15)	3.76 (27)	8.37 (23)	9.53 (29)	-28.61 (56)	17.10 (41)	33.60 (50)	32.72 (36)	-8.13 (60)
5th Percentile	-1.71	29.63	8.75	10.57	12.10	-14.04	26.06	99.93	39.90	2.08
1st Quartile	-4.21	21.87	3.88	8.16	9.72	-22.20	19.68	45.38	34.65	-2.91
Median	-5.76	17.55	1.49	6.67	8.62	-27.19	15.46	33.28	31.25	-6.59
3rd Quartile	-7.46	13.04	-0.92	4.88	7.47	-31.87	9.69	23.19	28.32	-11.47
95th Percentile	-11.40	0.66	-9.14	0.70	4.43	-44.33	-0.63	11.71	20.96	-17.41
Population	269	267	242	193	116	277	266	252	234	216





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Artisan Partners	-0.5	18.8	0.0
MSCI ACWI Growth NR USD	3.8	19.3	0.2
eV Global Growth Equity Median	1.5	19.8	0.1
Population	242	242	242

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Artisan Partners	7.9	19.2	0.4
MSCI ACWI Growth NR USD	8.4	19.7	0.4
eV Global Growth Equity Median	6.7	20.1	0.4
Population	193	193	193

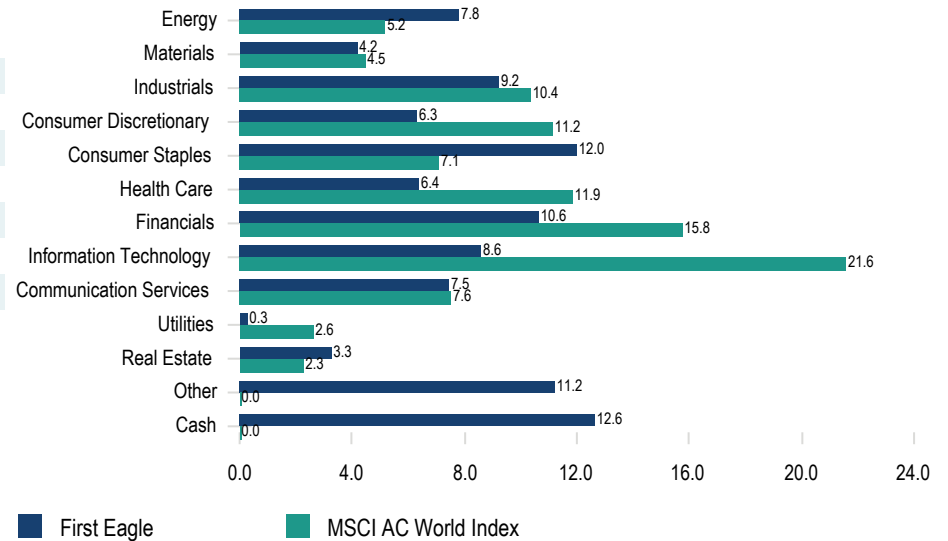
First Eagle Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: September 30, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	127	2,947
Wtd. Avg. Mkt. Cap \$M	140,557.14	401,761.58
Median Mkt. Cap \$M	25,614.56	11,768.97
Price/Earnings ratio	17.37	17.44
Price/Book ratio	2.36	3.38
Return on Equity (%)	-5.51	8.96
Current Yield (%)	2.25	2.27
Beta (5 Years, Monthly)	0.76	1.00

Sector Allocation (%) vs. MSCI AC World Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
SPDR Gold Trust	11.20	-3.83
Oracle Corp	3.09	-10.75
Meta Platforms Inc	2.60	4.61
Schlumberger Ltd	2.46	19.18
Exxon Mobil Corp	2.44	10.55
Comcast Corp	2.12	7.46
HCA Healthcare Inc	1.60	-18.76
Alphabet Inc	1.50	8.99
Imperial Oil Ltd	1.48	21.59
Philip Morris International Inc	1.34	-3.81

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Schlumberger Ltd	2.02	19.18	0.39
Imperial Oil Ltd	1.19	21.59	0.26
NOV Inc	0.81	30.61	0.25
Exxon Mobil Corp	2.17	10.55	0.23
Comcast Corp	1.88	7.46	0.14
Alphabet Inc	1.34	8.99	0.12
Meta Platforms Inc	2.43	4.61	0.11
MS&AD Insurance Group	0.84	6.65	0.06
Flowserve Corp.	0.60	7.60	0.05
Alphabet Inc	0.47	9.32	0.04

Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Cie Financiere Richemont	1.67	-25.58	-0.43
Oracle Corp	3.39	-10.75	-0.36
HCA Healthcare Inc	1.92	-18.76	-0.36
SPDR Gold Trust	9.31	-3.83	-0.36
Fanuc Corp	0.96	-25.07	-0.24
Universal Health Services	1.09	-20.19	-0.22
IPG Photonics Corp	0.86	-25.24	-0.22
Ambev SA	1.01	-18.87	-0.19
Willis Towers Watson plc	1.24	-10.92	-0.14
Taiwan Semiconductor Man.	0.99	-13.45	-0.13

% of Portfolio

13.75

1.64

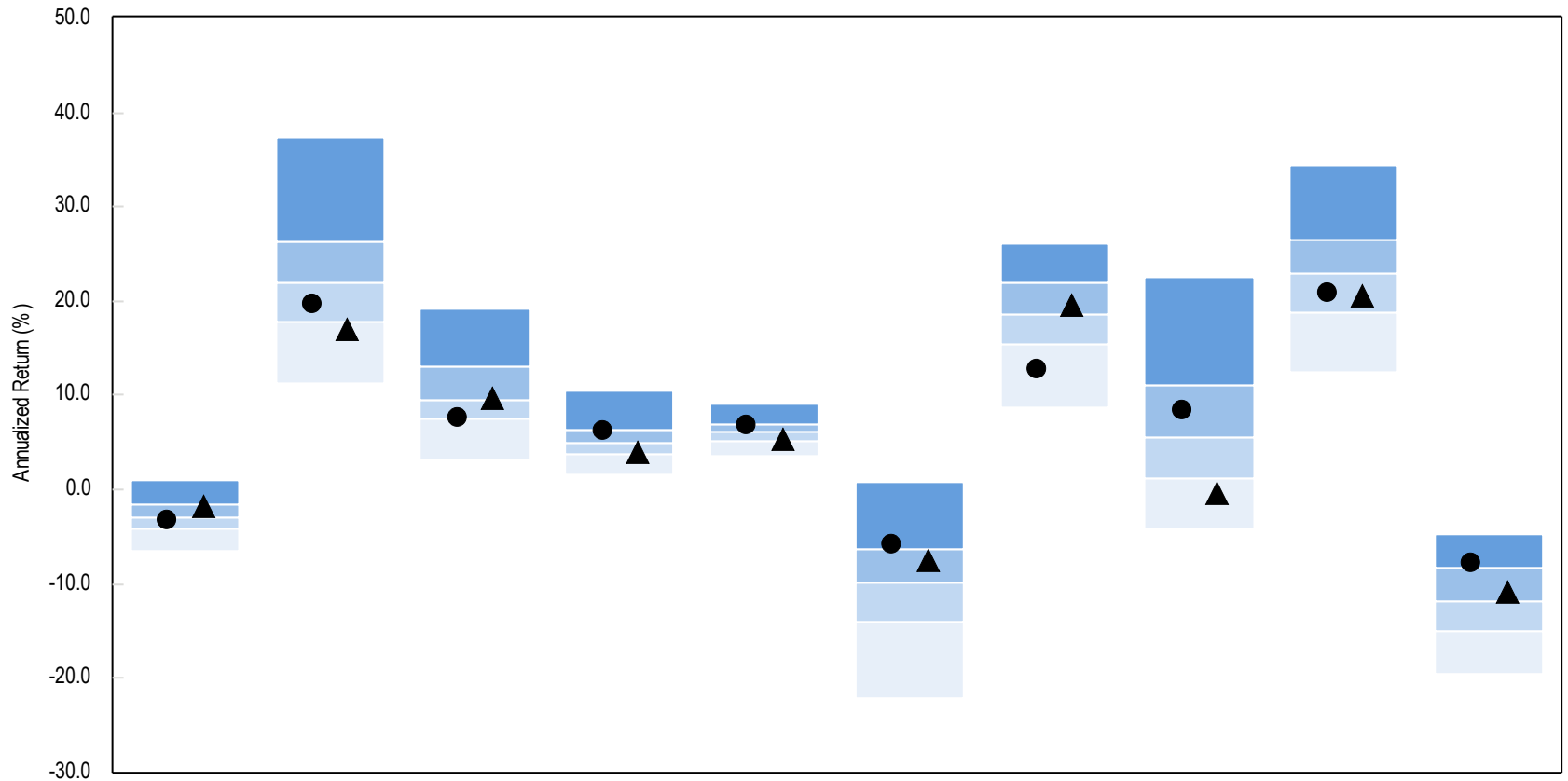
% of Portfolio

22.44

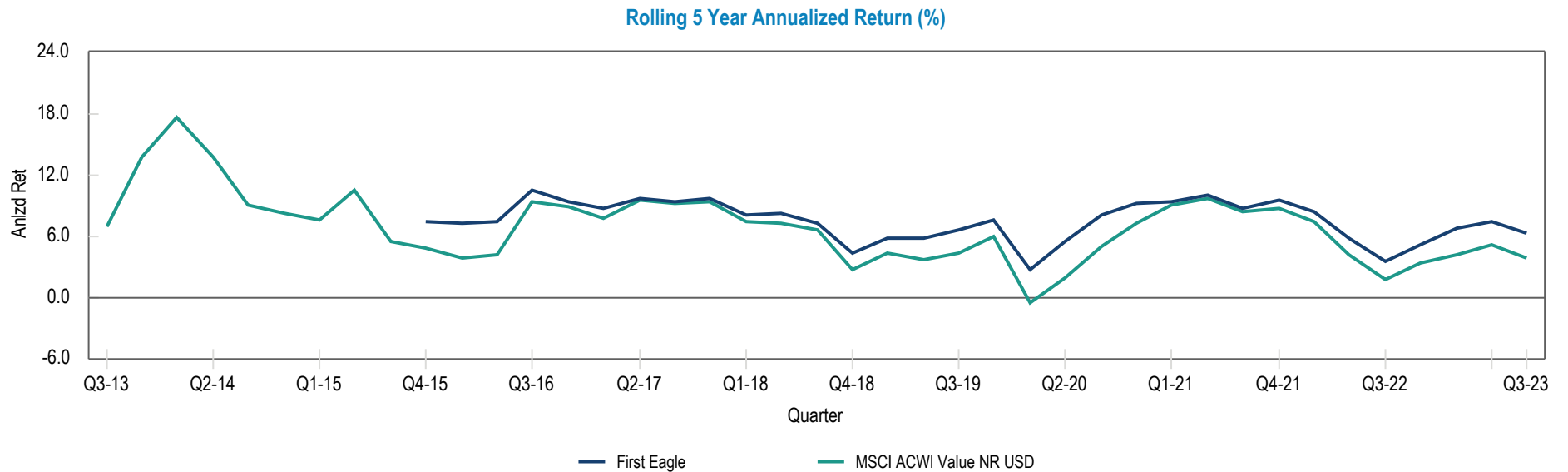
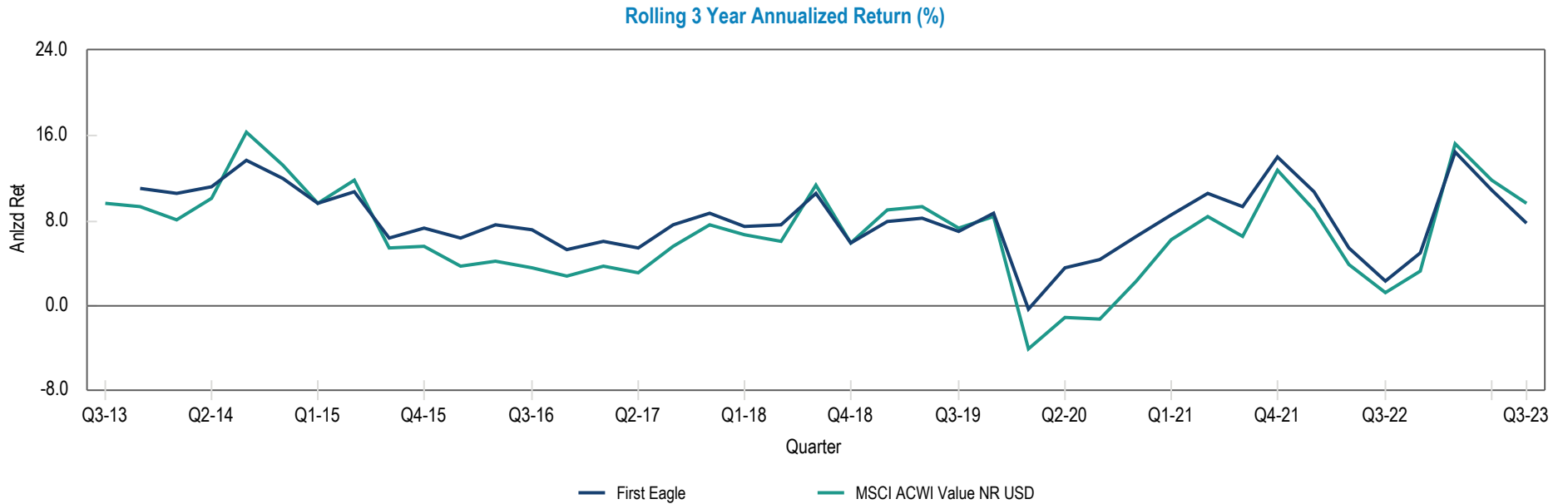
-2.65

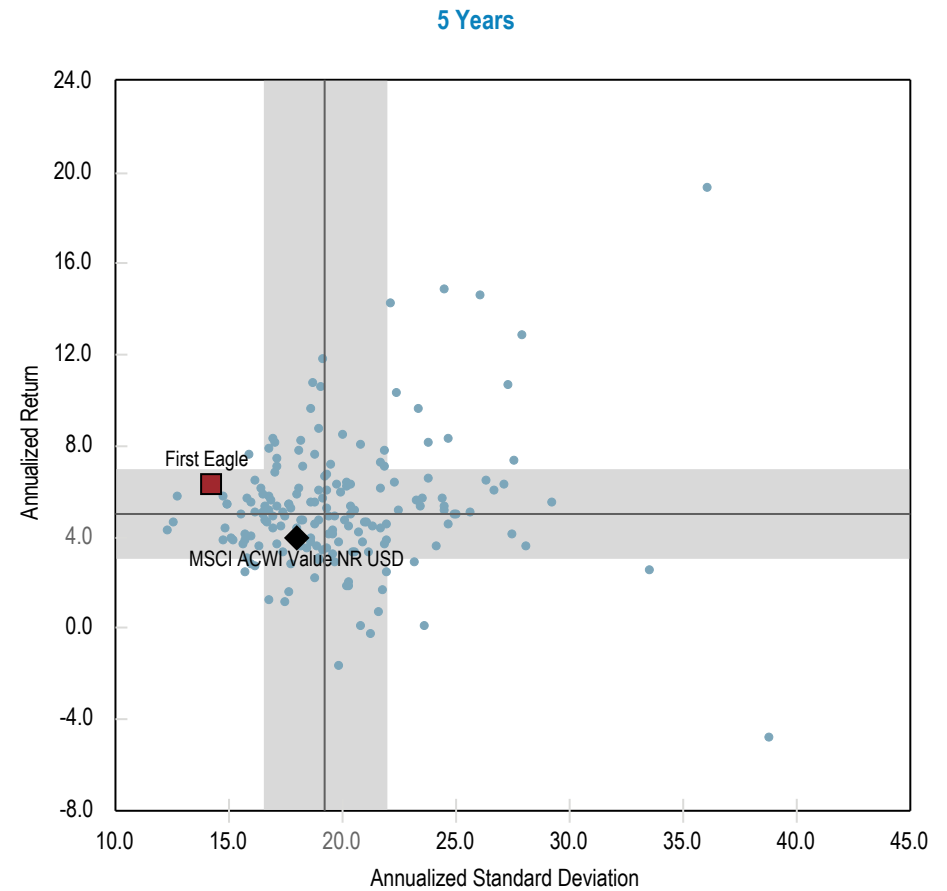
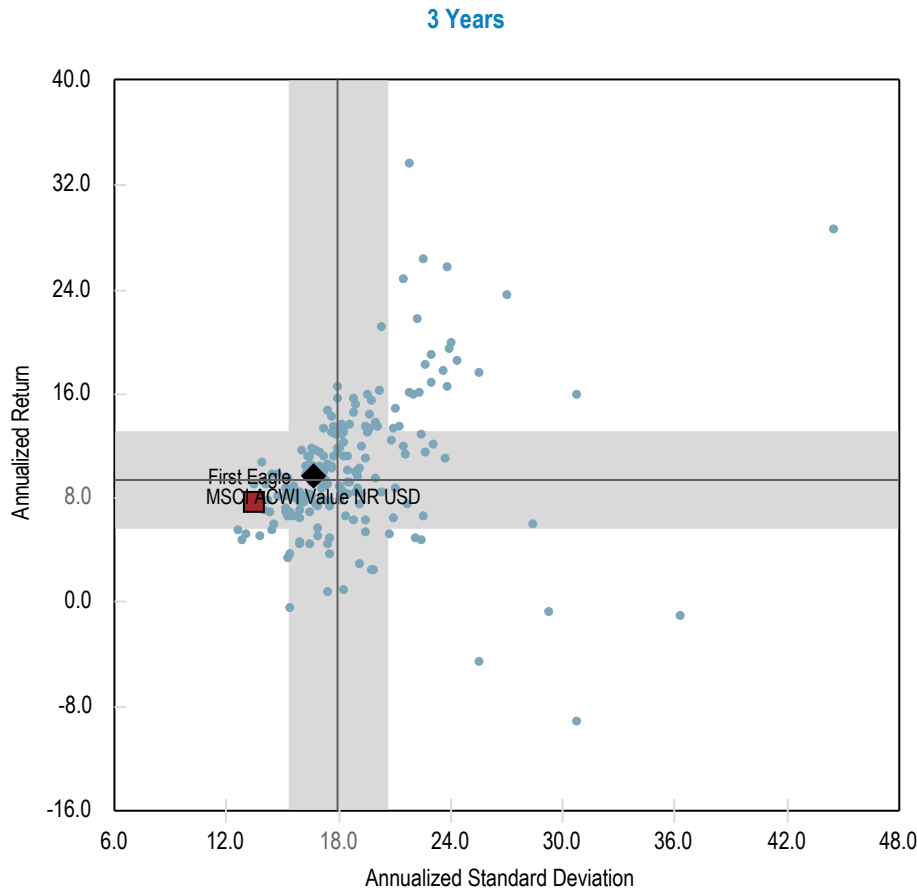
Global equity portfolio that is benchmark agnostic comprised of companies with low valuations. Primary personnel include Matt McLennan and Kimball Brooker.

First Eagle vs. eV Global Value Equity Gross Universe



	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● First Eagle	-3.21 (59)	19.74 (67)	7.78 (72)	6.36 (24)	6.86 (28)	-5.61 (21)	12.95 (86)	8.47 (33)	21.01 (64)	-7.64 (18)
▲ MSCI ACWI Value NR USD	-1.76 (30)	16.98 (79)	9.72 (49)	3.97 (72)	5.27 (73)	-7.55 (35)	19.62 (41)	-0.33 (82)	20.59 (67)	-10.79 (45)
5th Percentile	1.01	37.32	19.24	10.48	9.21	0.80	26.12	22.63	34.34	-4.73
1st Quartile	-1.57	26.27	12.98	6.28	6.92	-6.26	21.91	11.05	26.44	-8.35
Median	-2.86	22.00	9.45	5.04	6.13	-9.81	18.62	5.53	22.87	-11.74
3rd Quartile	-4.09	17.87	7.45	3.81	5.13	-13.95	15.35	1.31	18.85	-14.96
95th Percentile	-6.52	11.29	3.22	1.63	3.54	-22.15	8.66	-4.18	12.44	-19.53
Population	210	208	191	171	125	215	222	231	226	230





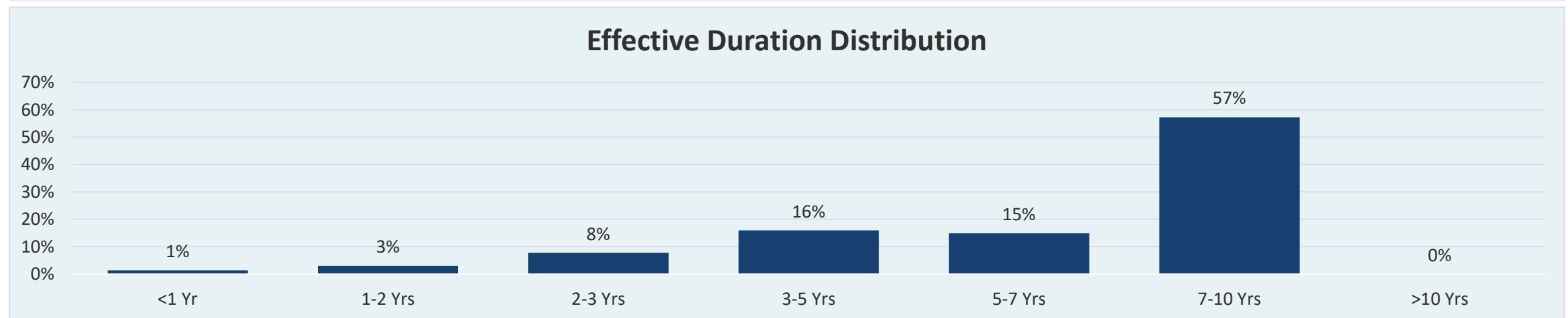
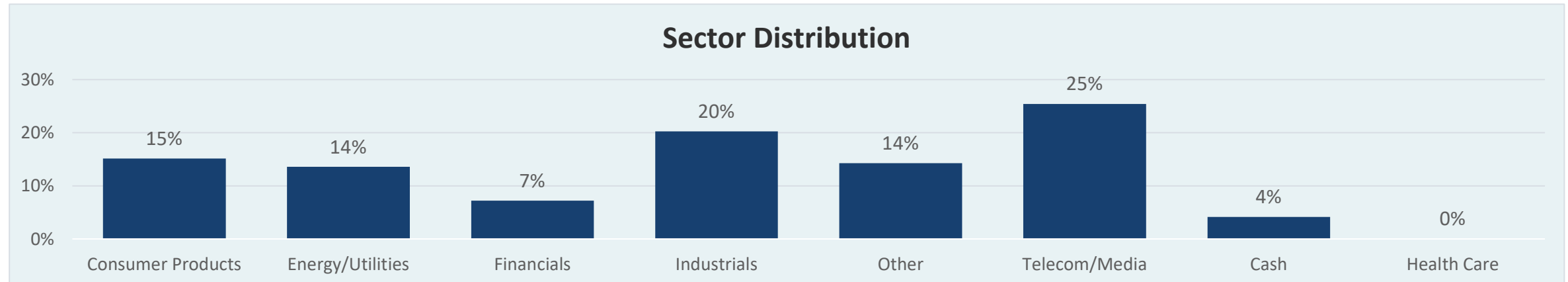
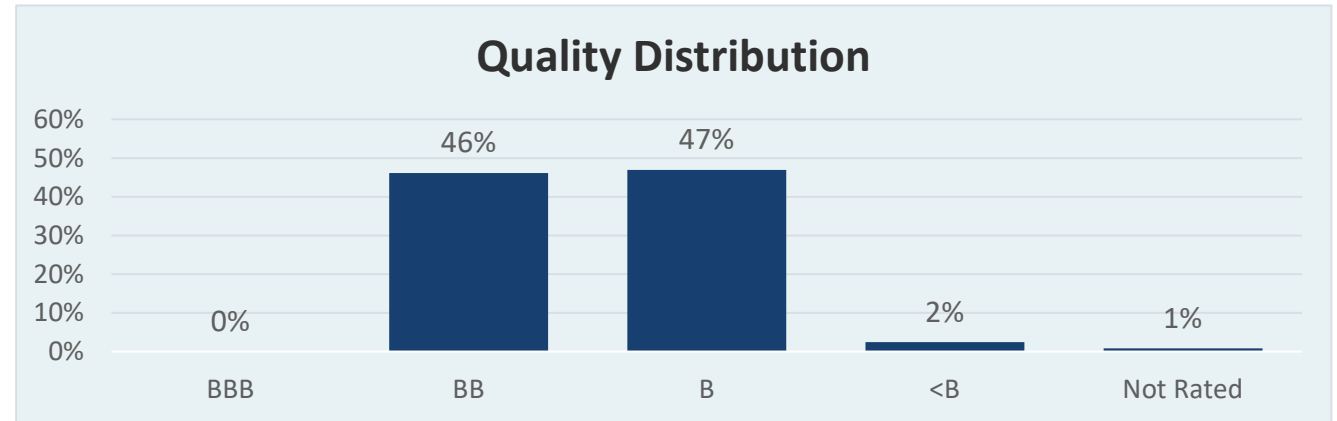
	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
First Eagle	7.8	13.5	0.5
MSCI ACWI Value NR USD	9.7	16.6	0.5
eV Global Value Equity Median	9.4	18.0	0.5
Population	191	191	191

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
First Eagle	6.4	14.2	0.4
MSCI ACWI Value NR USD	4.0	18.0	0.2
eV Global Value Equity Median	5.0	19.2	0.3
Population	171	171	171

High Yield Managers

Domestic high yield fixed income portfolio with a focus on security selection. Primary personnel include Douglas Forsyth, Justin Kass, William Stickney, and Michael Yee.

	Voya	ICE BofAML HY Master II
Effective Duration	3.60	3.60
Yield to Maturity	8.0%	9.0%
Average Quality	B1	B1
Average Coupon	6.7%	6.0%

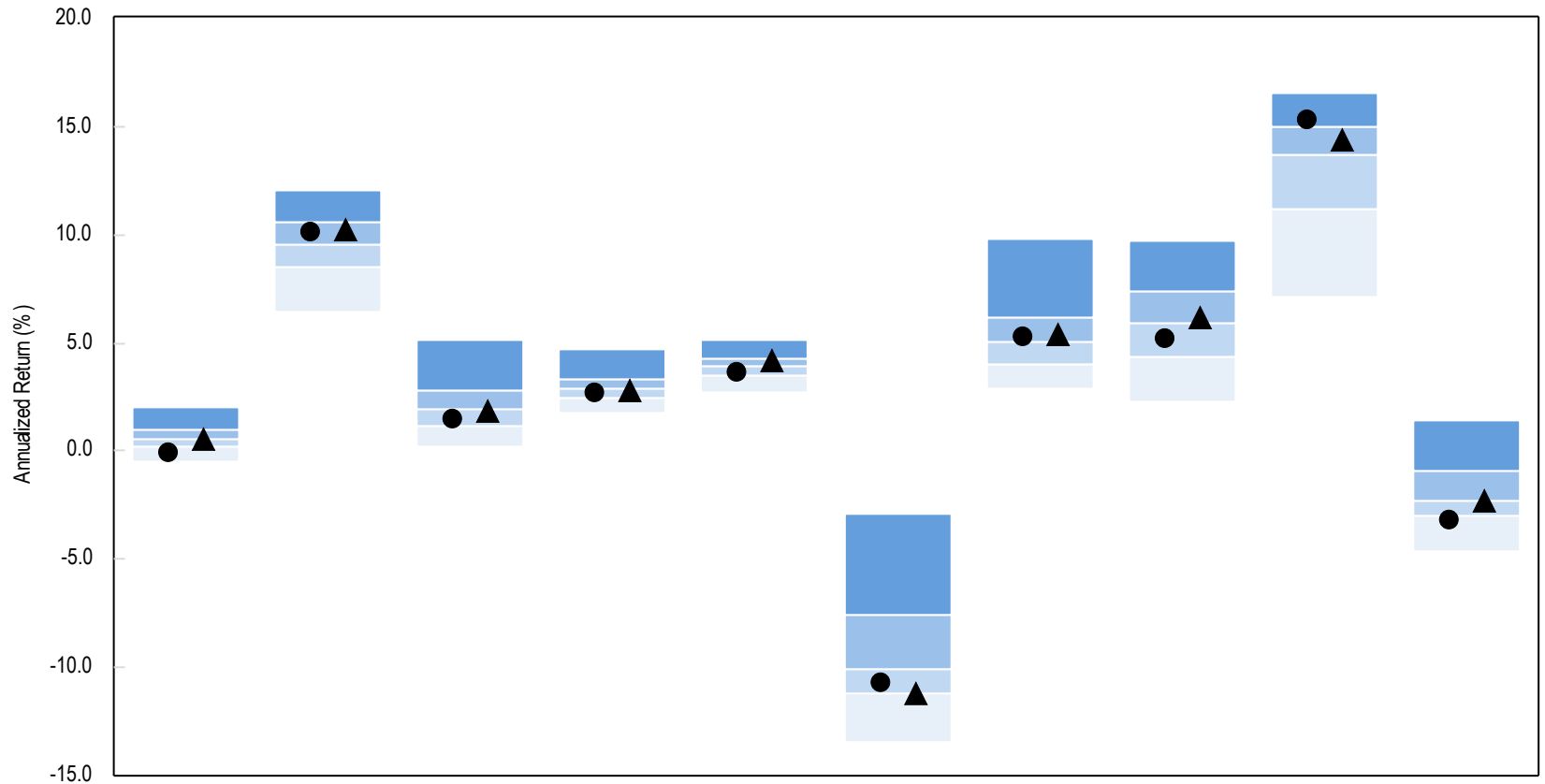


Quality distribution excludes cash.

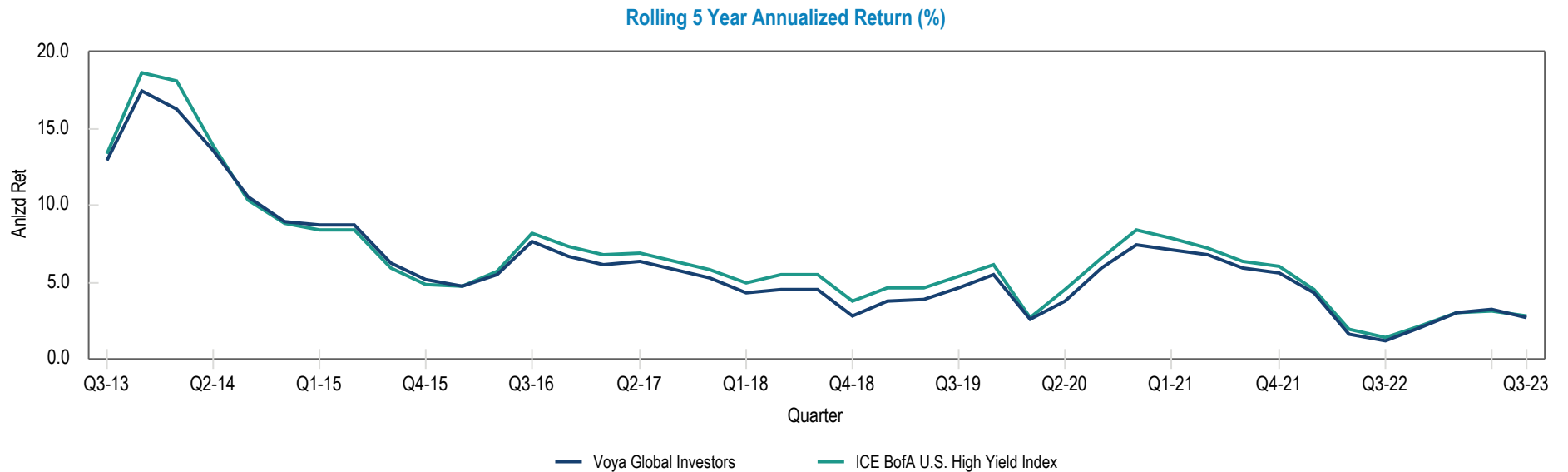
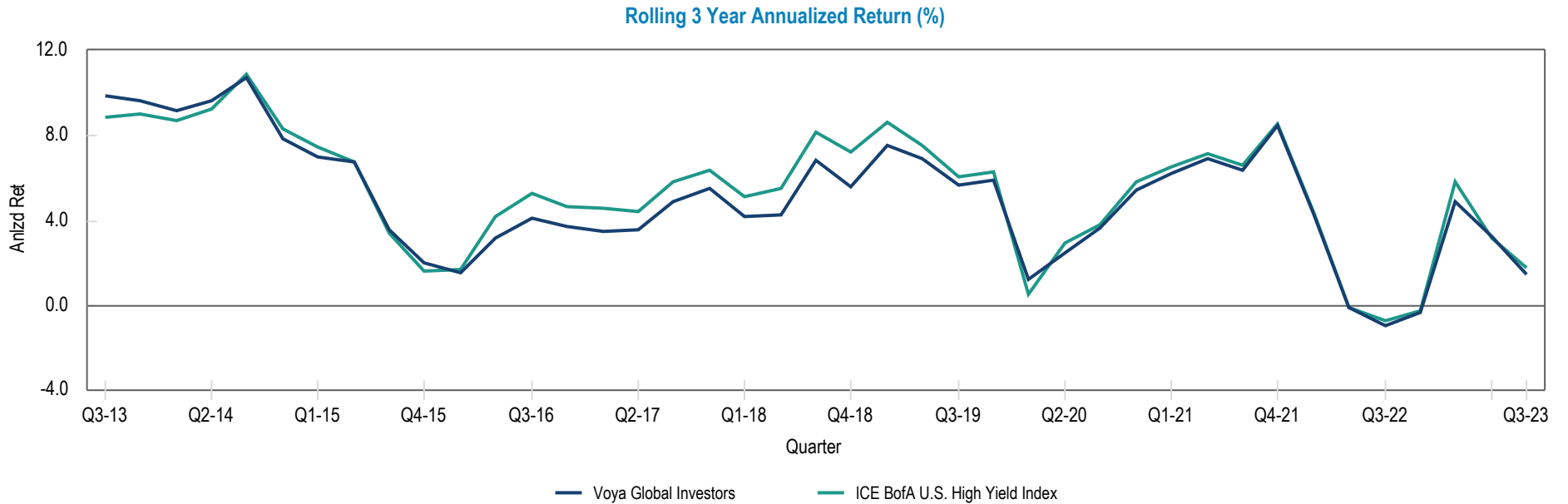
Voya Financial acquired Allianz Global Investors in 2022.

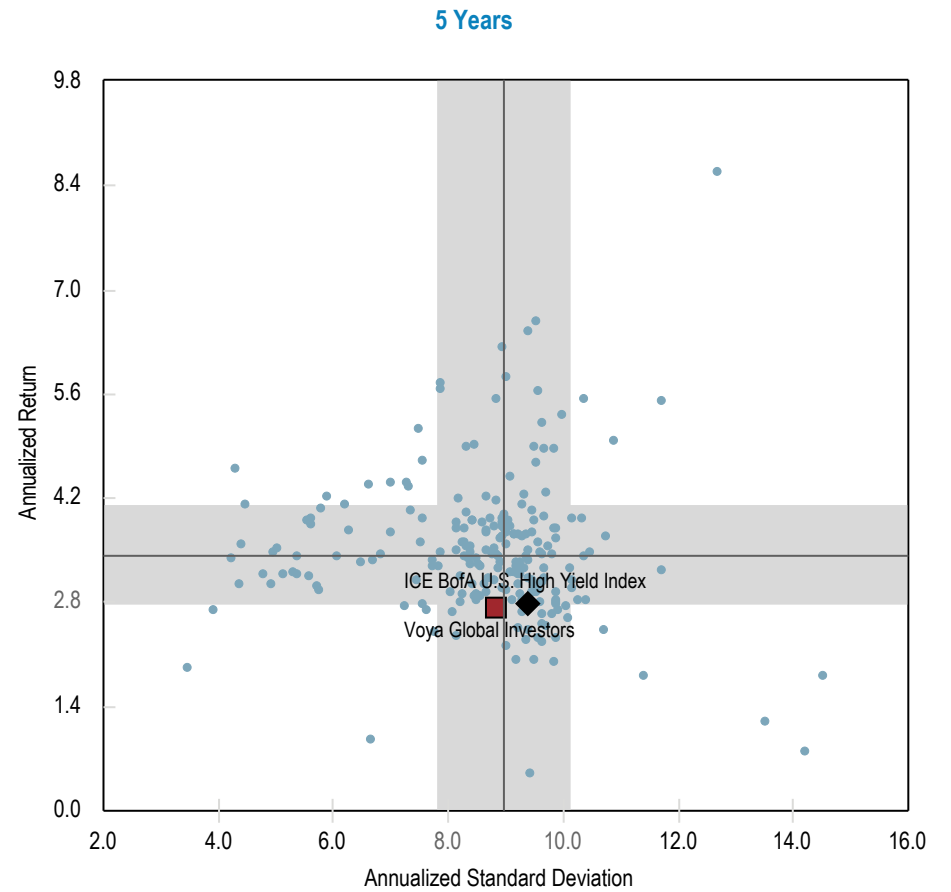
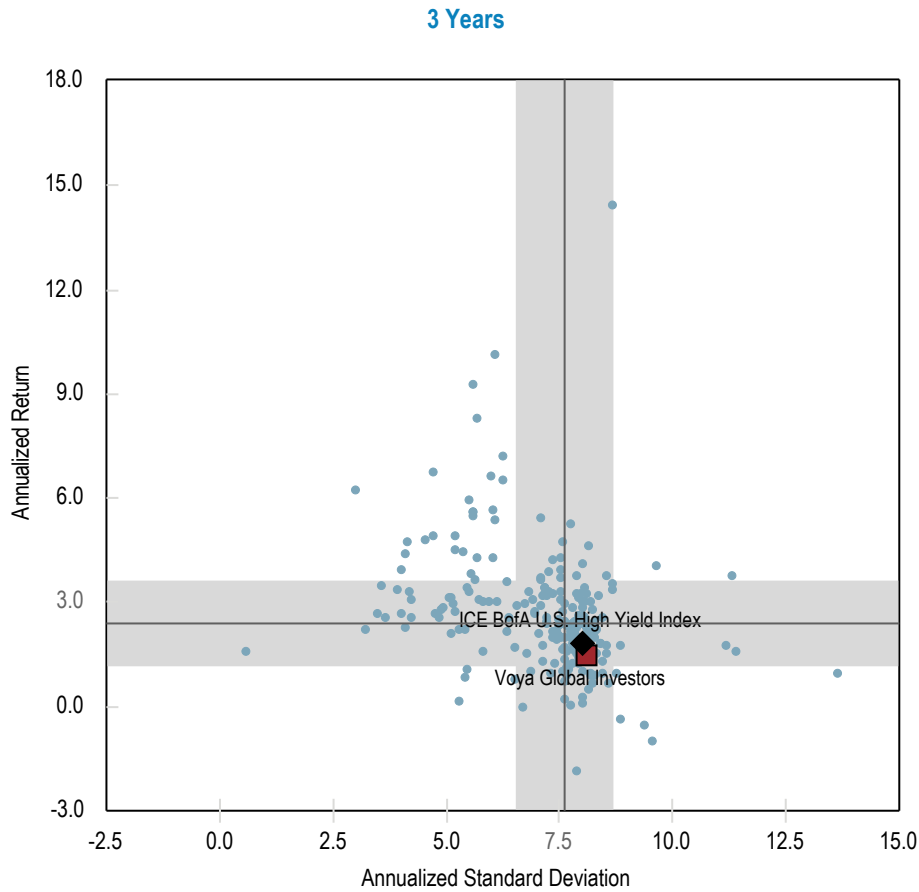


Voya Global Investors vs. eV US High Yield Fixed Inc Gross Universe



	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● Voya Global Investors	-0.01 (85)	10.19 (36)	1.50 (65)	2.73 (59)	3.63 (66)	-10.64 (64)	5.34 (42)	5.18 (65)	15.32 (19)	-3.20 (78)
▲ ICE BofA U.S. High Yield Index	0.53 (54)	10.20 (36)	1.82 (53)	2.80 (56)	4.16 (31)	-11.22 (76)	5.36 (42)	6.17 (43)	14.41 (36)	-2.27 (50)
5th Percentile	2.01	12.01	5.14	4.71	5.16	-2.94	9.81	9.73	16.54	1.43
1st Quartile	1.00	10.54	2.81	3.36	4.25	-7.55	6.15	7.40	14.94	-0.92
Median	0.57	9.54	1.90	2.90	3.90	-10.03	5.05	5.88	13.70	-2.30
3rd Quartile	0.23	8.48	1.14	2.44	3.51	-11.20	4.05	4.35	11.17	-3.01
95th Percentile	-0.46	6.47	0.19	1.81	2.72	-13.45	2.91	2.31	7.09	-4.60
Population	223	222	217	207	171	240	241	249	255	256





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Voya Global Investors	1.5	8.1	0.0
ICE BofA U.S. High Yield Index	1.8	8.0	0.1
eV US High Yield Fixed Inc Median	2.4	7.6	0.1
Population	229	229	229

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Voya Global Investors	2.7	8.8	0.2
ICE BofA U.S. High Yield Index	2.8	9.4	0.2
eV US High Yield Fixed Inc Median	3.4	9.0	0.2
Population	219	219	219

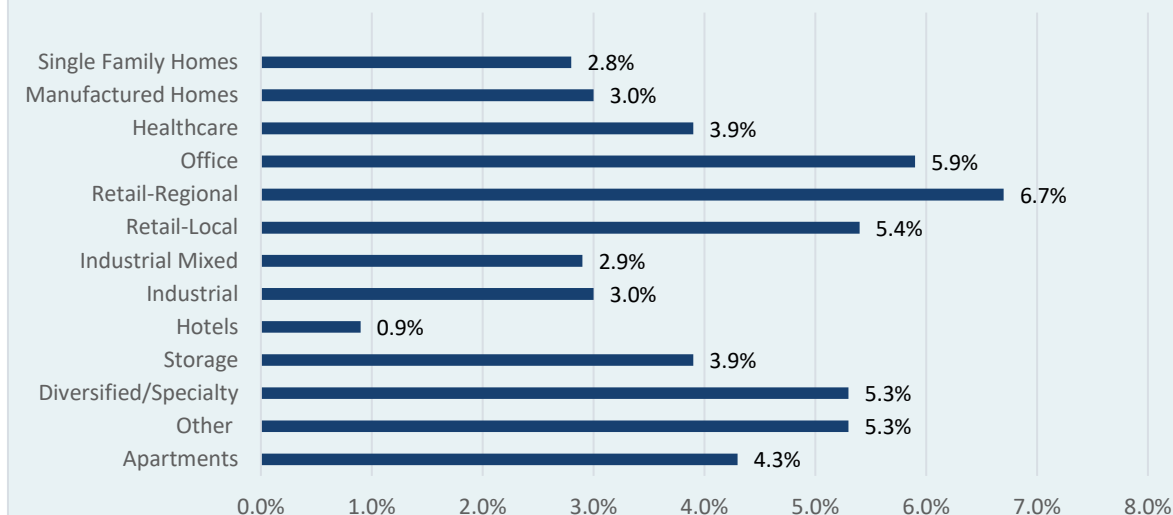
Real Estate Managers

Diversified portfolio of U.S. REITs with a focus on the underlying real estate assets

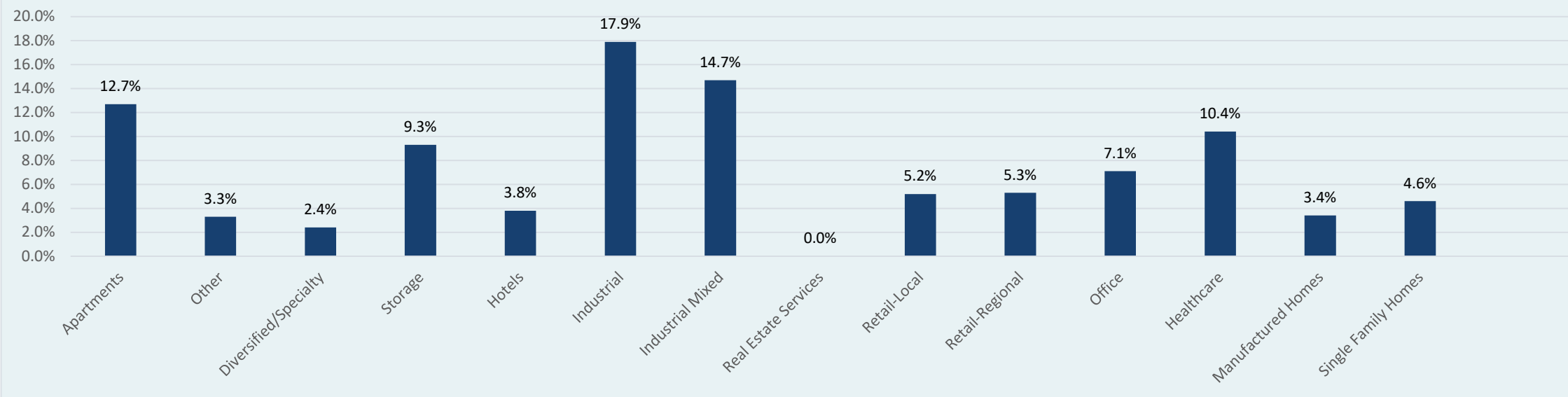
Top Five Holdings

Company	Property Type	Allocation
ProLogis Inc.	Industrial	14.3%
Equinix Inc.	Industrial Mixed	9.3%
Welltower Inc.	Healthcare	7.1%
Equity Residential	Apartments	5.4%
Public Storage	Storage	4.9%

Dividend Yield by Property Type



Property Type Allocation



0.0224% is allocated to Cash and Cash Equivalents.

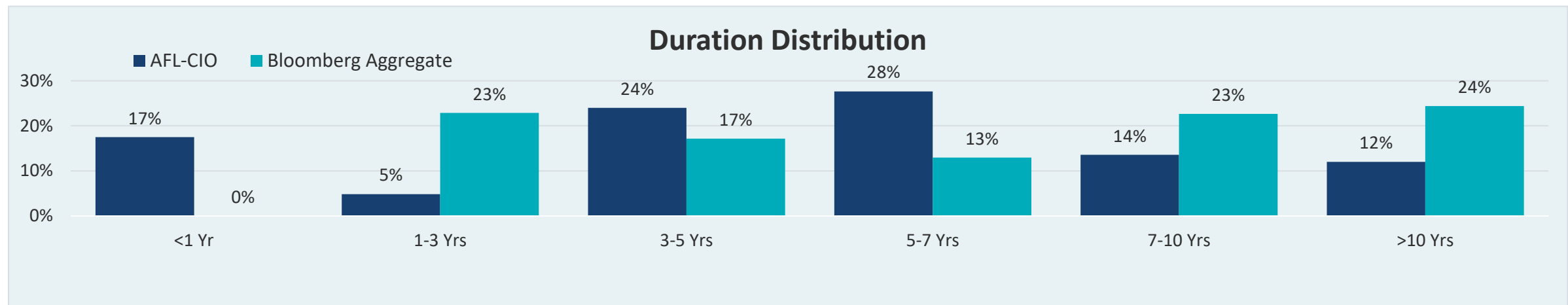
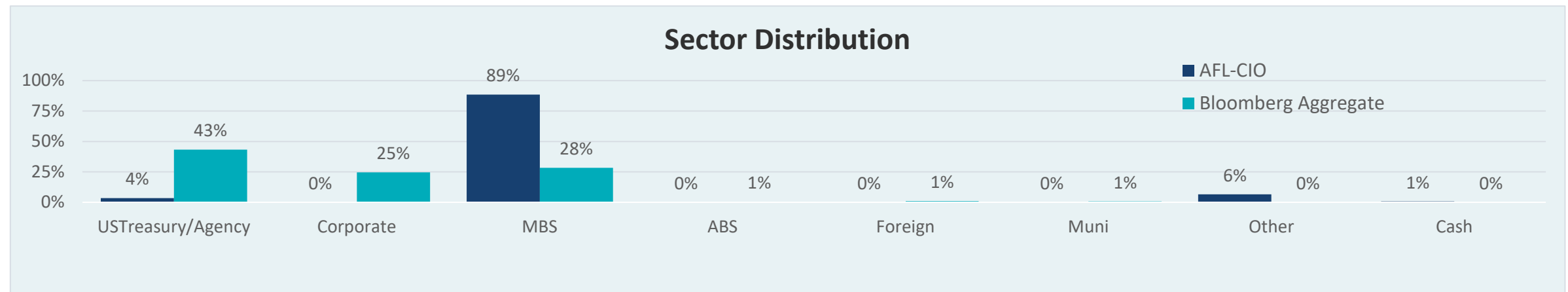
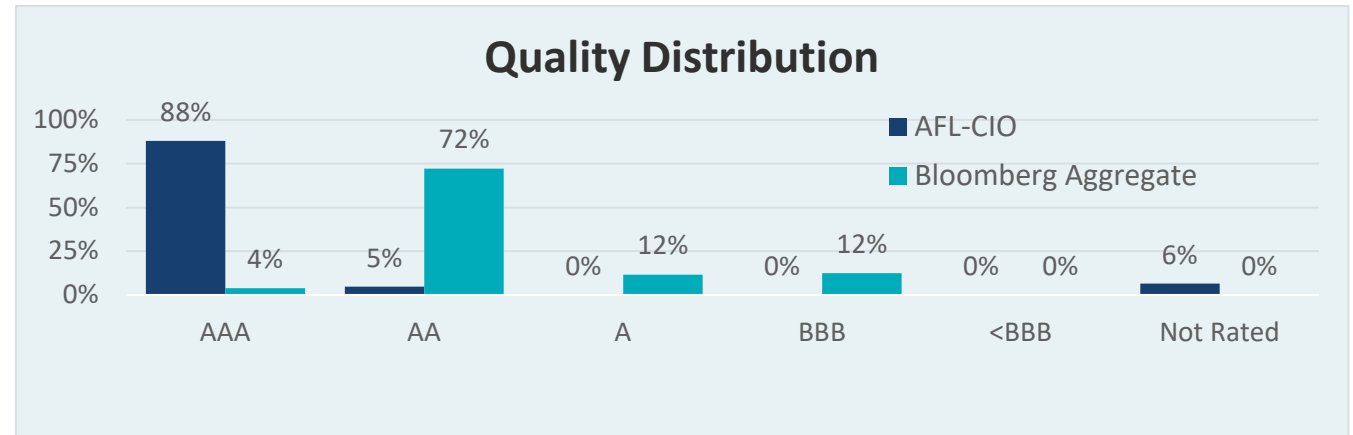
Diversifying Fixed Income Managers

AFL-CIO Manager Portfolio Overview

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

Domestic core fixed income portfolio with an exclusive focus on mortgage-related securities. Primary personnel include Stephen Coyle and Chang Su.

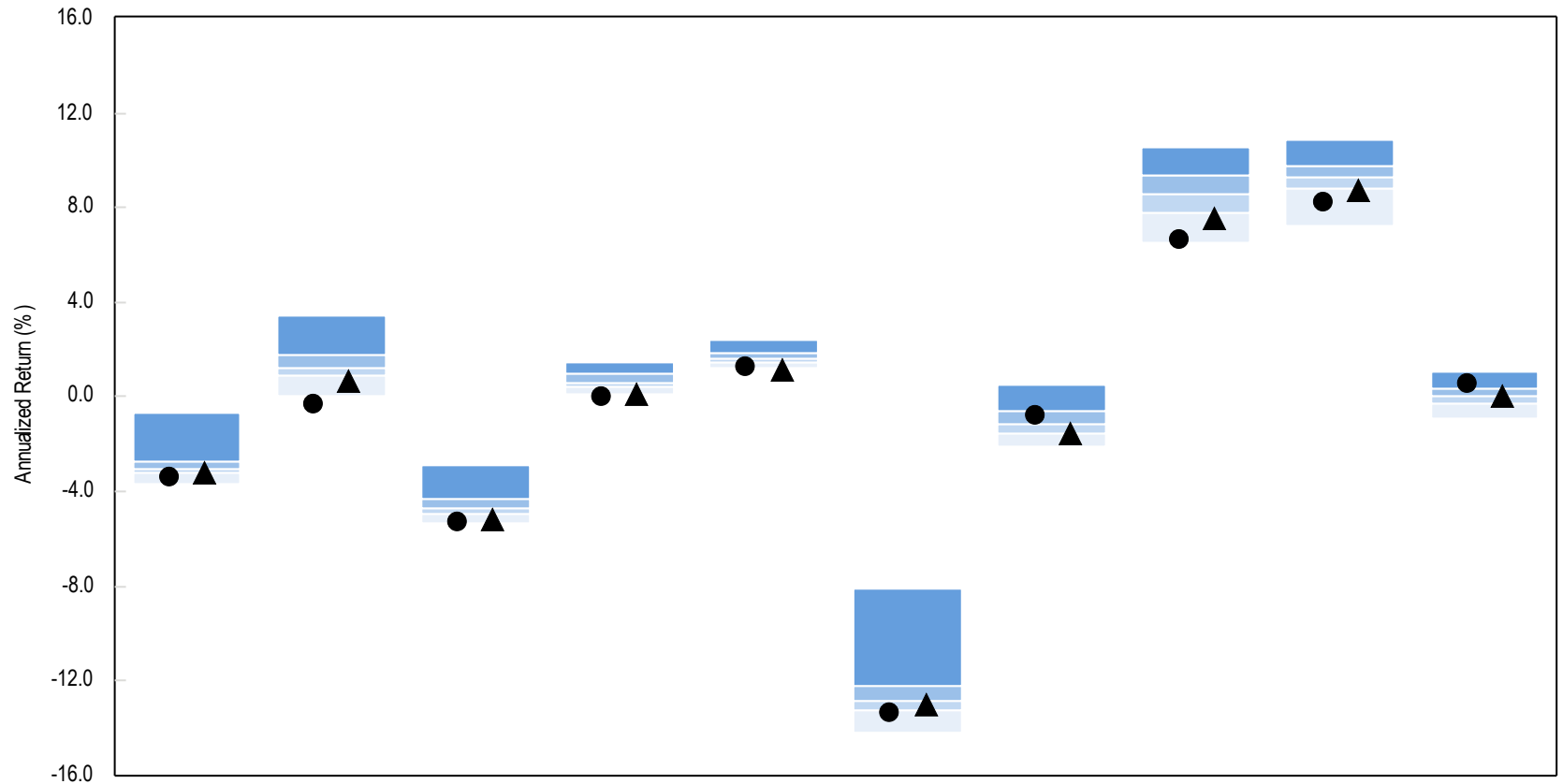
	AFL-CIO	Bloomberg Aggregate
Effective Duration	5.91	6.30
Yield to Maturity	4.1%	8.8%
Average Quality	AAA	AA
Average Coupon	3.5%	3.0%



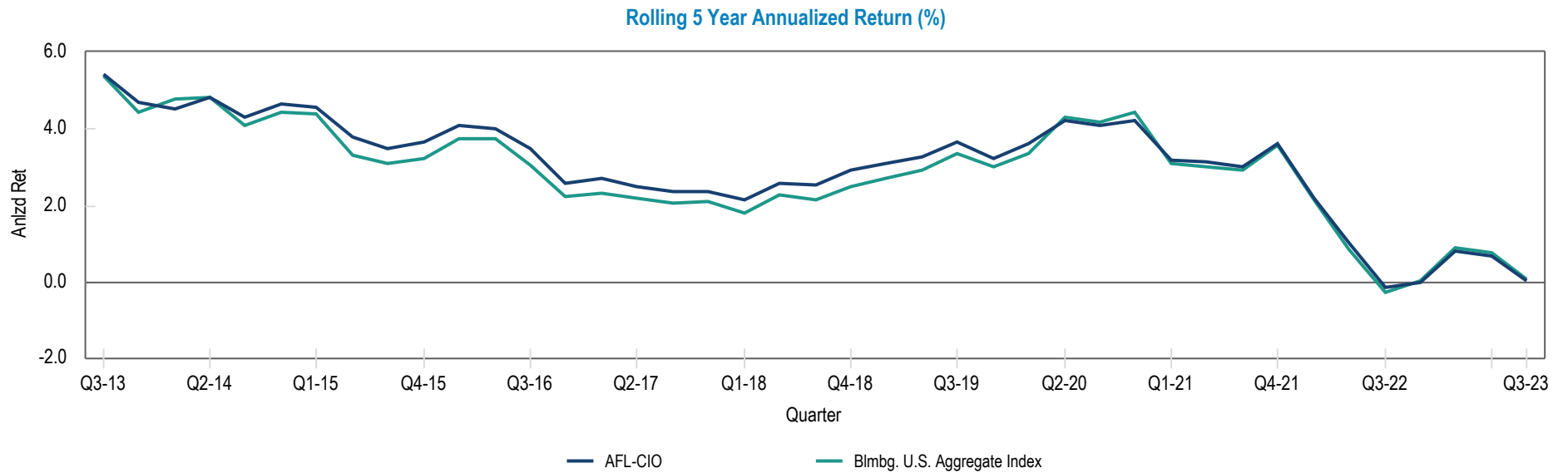
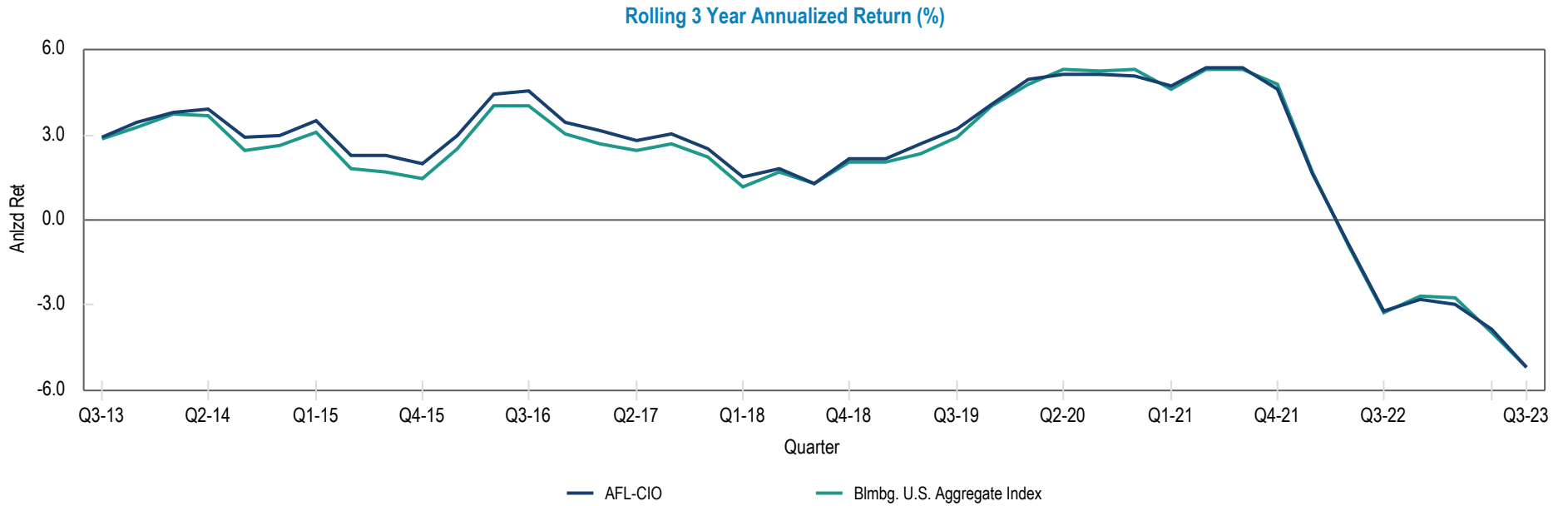
Duration and Quality distributions exclude cash.

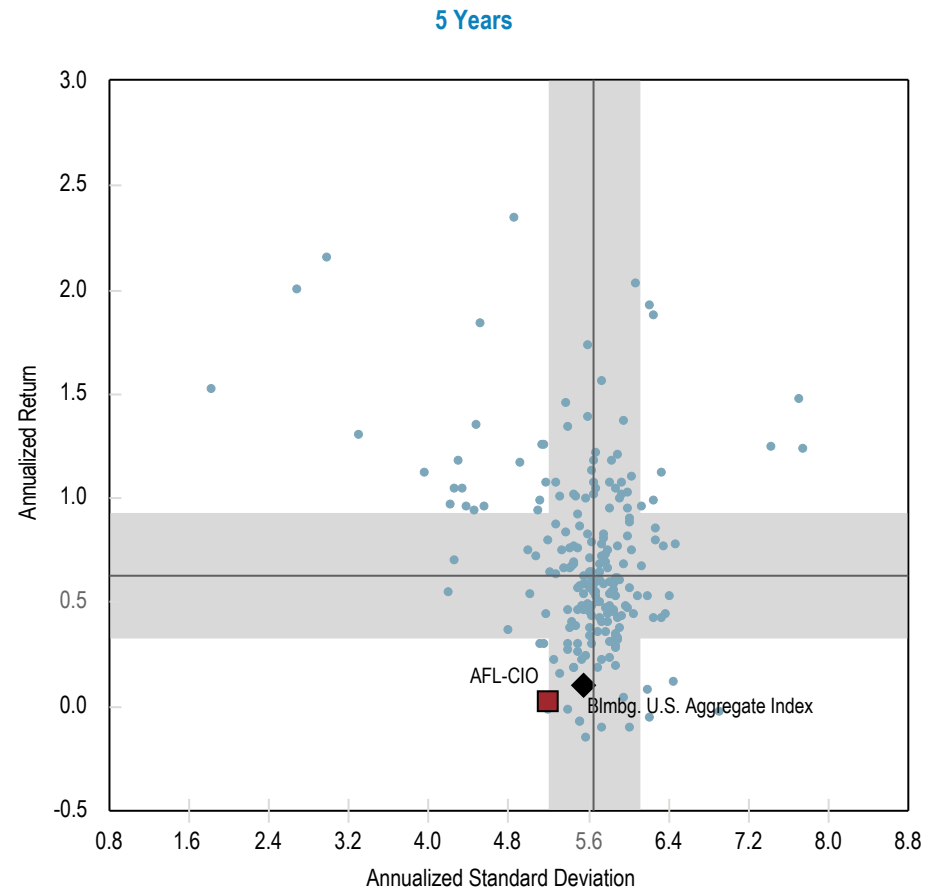
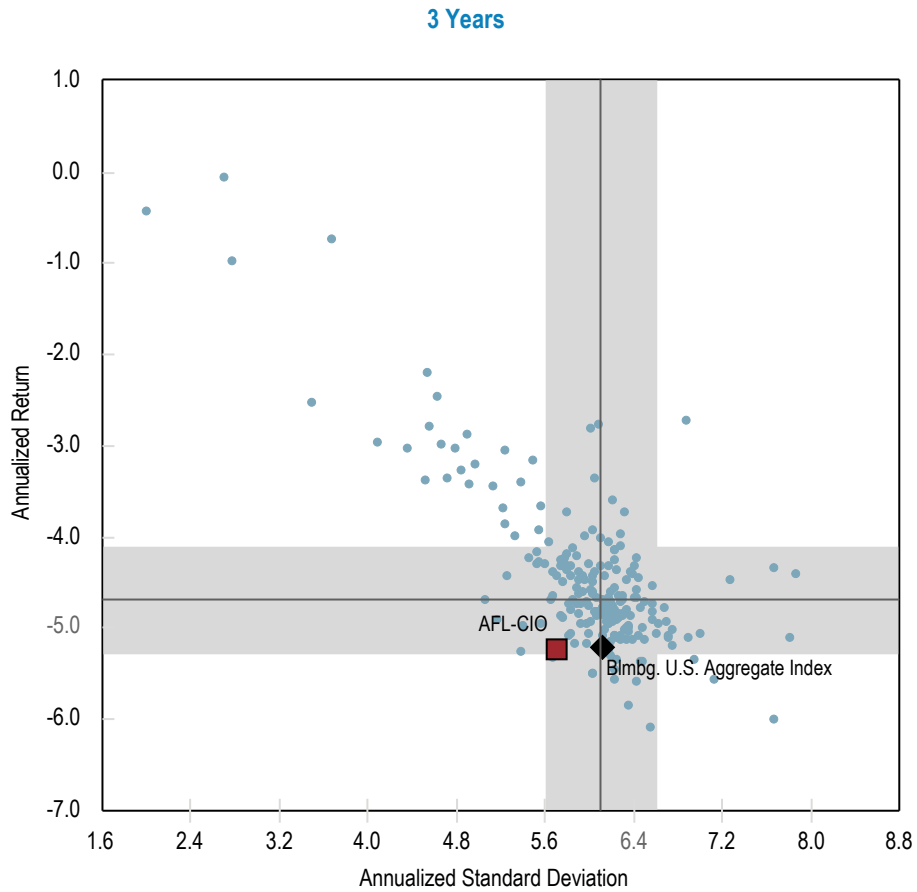


AFL-CIO vs. eV US Core Fixed Inc Gross Universe



	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● AFL-CIO	-3.34 (86)	-0.31 (99)	-5.23 (93)	0.02 (96)	1.28 (93)	-13.27 (76)	-0.73 (33)	6.65 (95)	8.25 (87)	0.59 (14)
▲ Blmbg. U.S. Aggregate Index	-3.23 (76)	0.64 (83)	-5.21 (92)	0.10 (95)	1.13 (98)	-13.01 (63)	-1.55 (77)	7.51 (84)	8.72 (77)	0.01 (53)
5th Percentile	-0.68	3.41	-2.85	1.48	2.37	-8.09	0.50	10.57	10.85	1.08
1st Quartile	-2.75	1.74	-4.28	0.96	1.85	-12.19	-0.62	9.36	9.76	0.34
Median	-3.03	1.23	-4.69	0.63	1.64	-12.83	-1.11	8.57	9.30	0.03
3rd Quartile	-3.22	0.88	-4.94	0.44	1.45	-13.26	-1.52	7.77	8.79	-0.28
95th Percentile	-3.65	0.06	-5.35	0.09	1.24	-14.20	-2.11	6.55	7.22	-0.87
Population	225	225	215	207	194	250	258	261	267	273





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
AFL-CIO	-5.2	5.7	-1.2
Blmbg. U.S. Aggregate Index	-5.2	6.1	-1.1
eV US Core Fixed Inc Median	-4.7	6.1	-1.0
Population	215	215	215

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
AFL-CIO	0.0	5.2	-0.3
Blmbg. U.S. Aggregate Index	0.1	5.5	-0.3
eV US Core Fixed Inc Median	0.6	5.7	-0.2
Population	207	207	207

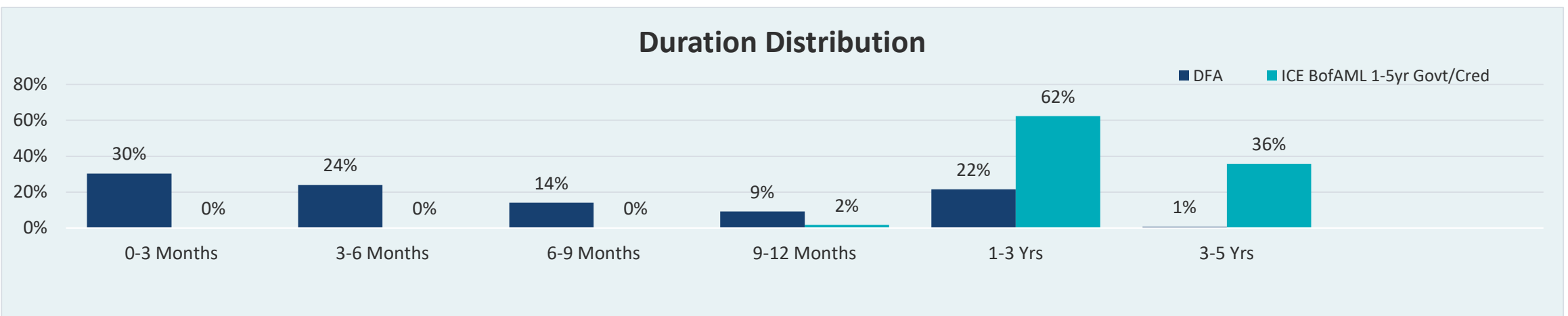
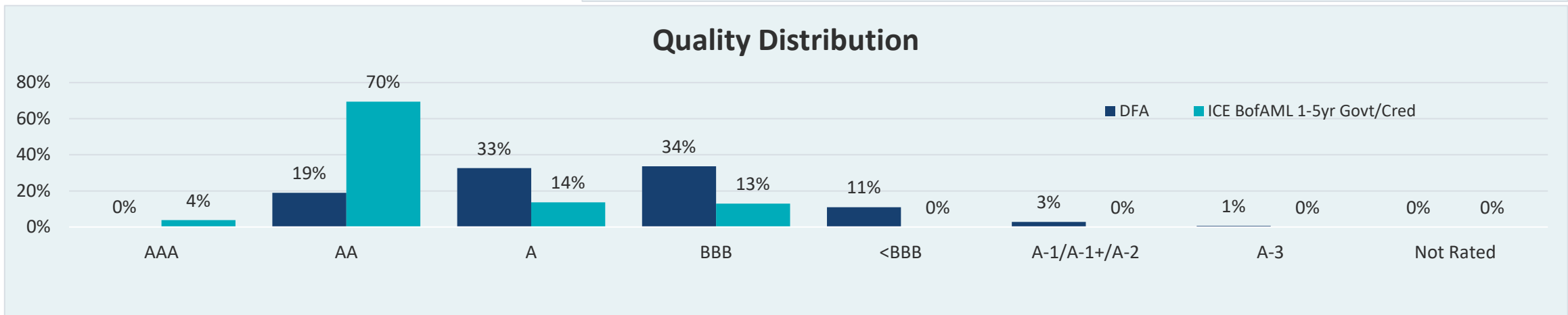
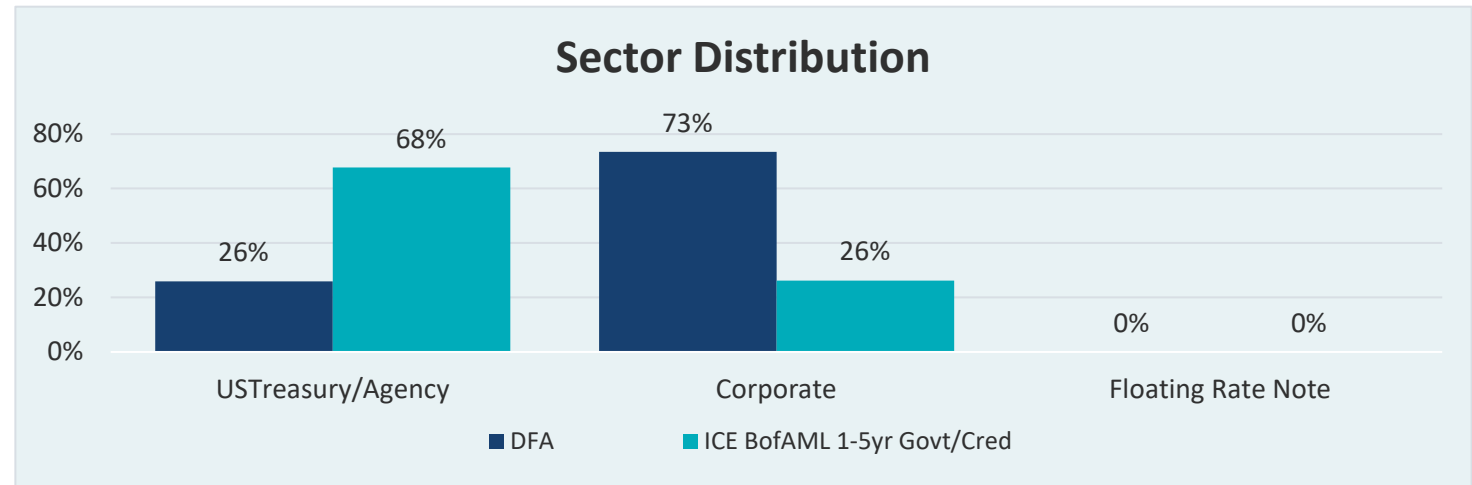
Liquidity Managers

DFA Short Credit Manager Portfolio Overview

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

Domestic short term US credit fixed income portfolio that maximizes total return through income and capital appreciation. Primary personnel include Dave Plecha and Joseph Kolerich.

	DFA	ICE BofAML 1-5yr Govt/Cred
Effective Duration	0.67	2.57
Yield to Maturity	6.23	5.28
Average Quality	A	Aa2
Average Coupon	2.77%	2.68%

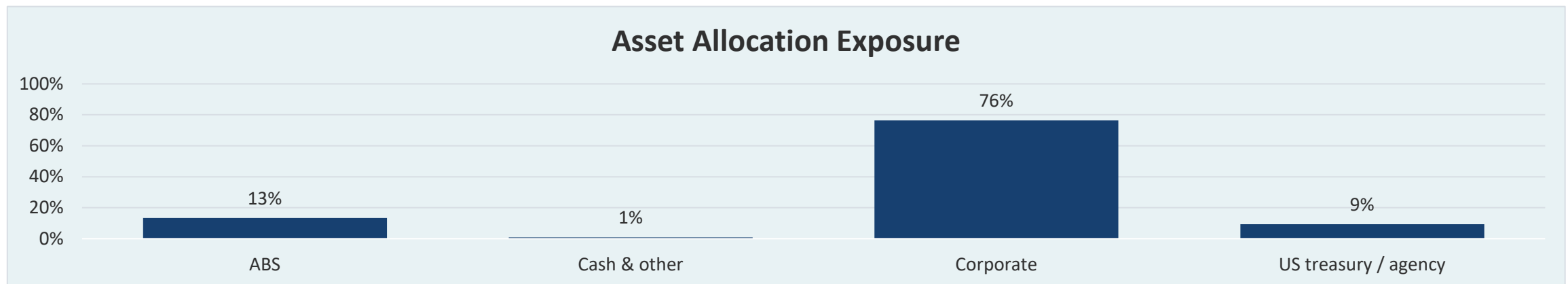
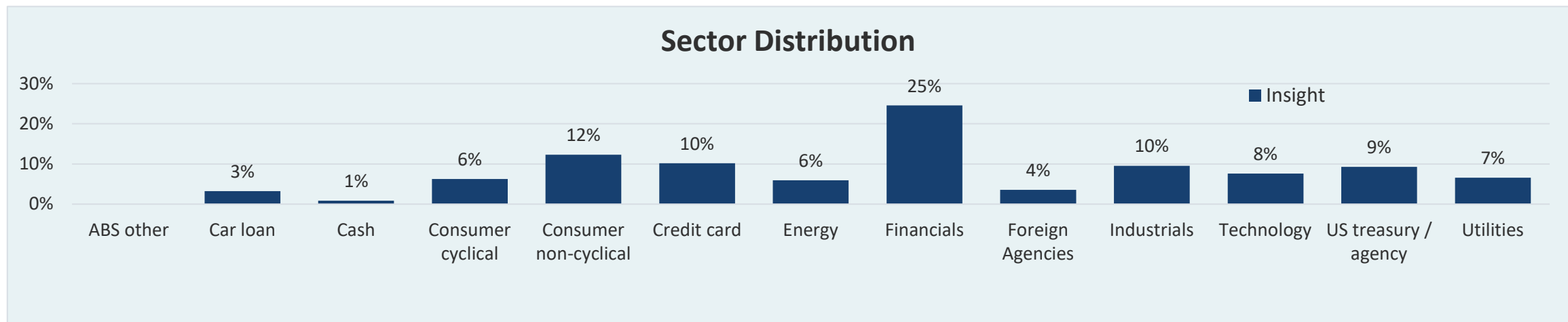
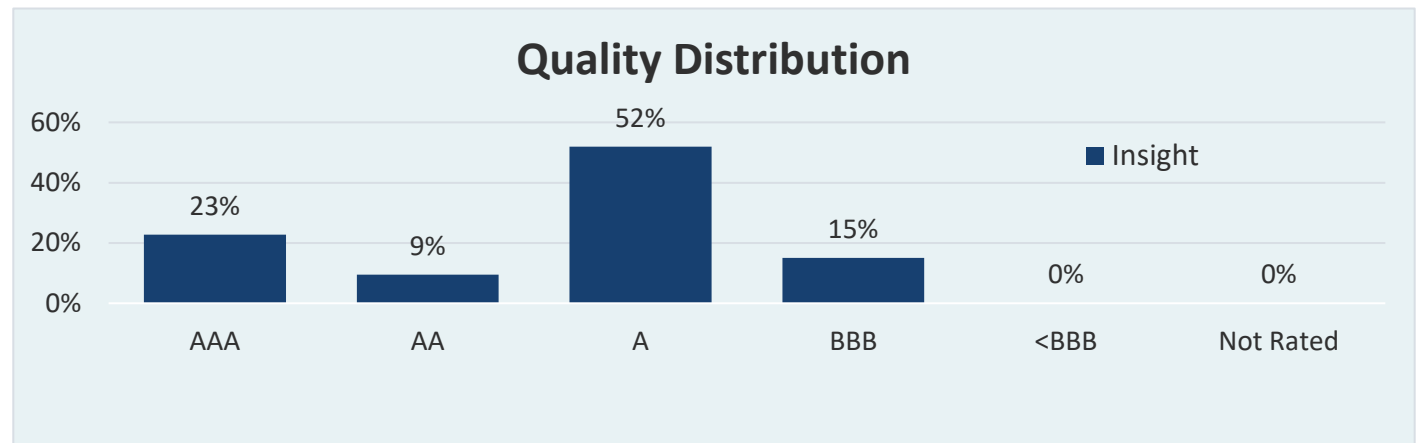


Insight Short Duration Manager Portfolio Overview

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

High quality, short duration multi-sector fixed income portfolio comprised of Treasuries, Agencies, investment grade corporates, and ABS designed specifically to meet CCCERA's liabilities. Key personnel include Gerard Berrigan and Jesse Fogarty.

	Insight	Bloomberg 1-3yr Govt
Effective Duration	1.31	1.90
Yield to Maturity	5.84	N/A
Average Quality	A+	AAA
Average Coupon	3.35%	2.00%

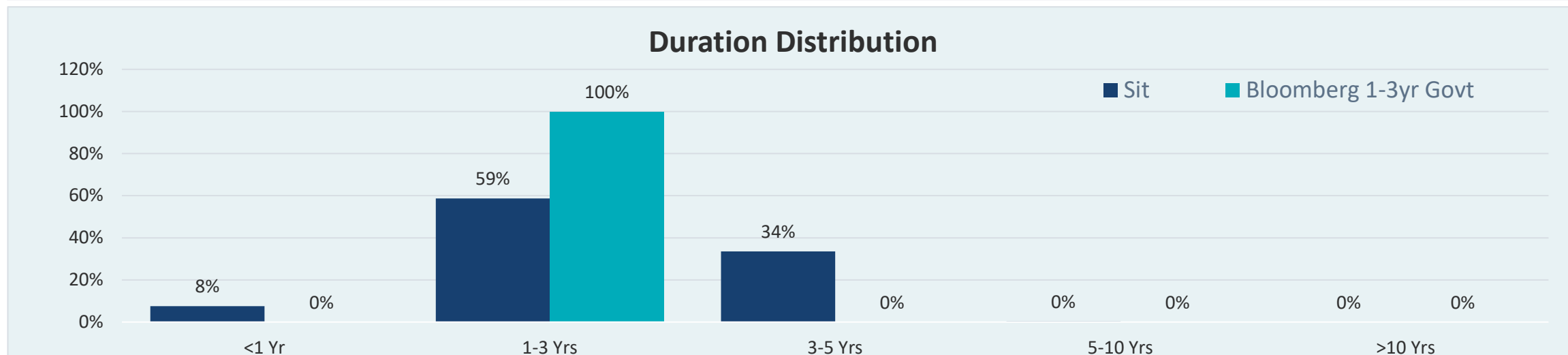
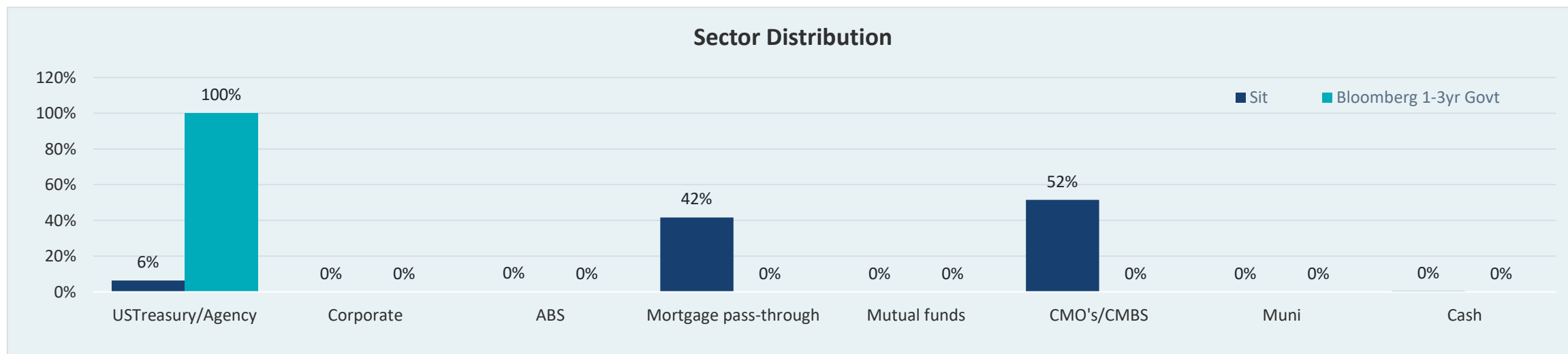
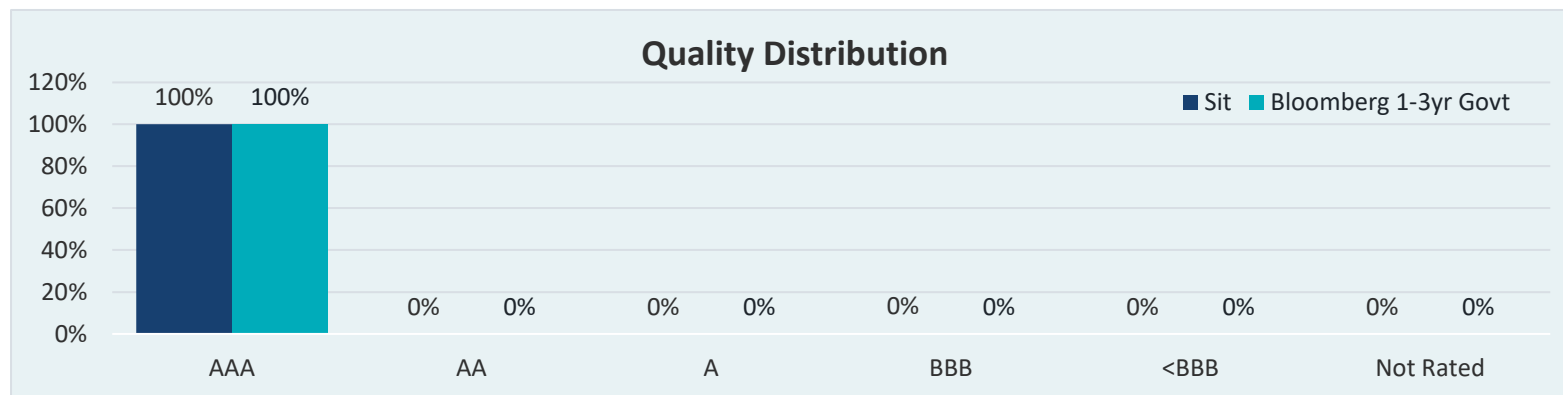


Sit Short Duration Manager Portfolio Overview

Contra Costa County Employees' Retirement Association
Period Ending: September 30, 2023

Short duration fixed income portfolio with a focus on earning high levels of interest income. Primary personnel include Bryce Doty, Paul Jungquist and Michael Brilley.

	Sit	Bloomberg 1-3yr Govt
Modified Duration	2.80	1.90
Yield to Maturity	5.50	N/A
Average Quality	AAA	AAA
Average Coupon	5.90%	2.00%



Data Sources and Methodology

Performance Return Calculations

Performance is calculated using Modified Dietz and for time periods with large cash flow (generally greater than 10% of portfolio value), Time Weighted Rates of Return (TWRR) methodologies. Monthly returns are geometrically linked and annualized for periods longer than one year.

Data Source

Verus is an independent third party consulting firm and calculates returns from best source book of record data. Returns calculated by Verus may deviate from those shown by the manager in part, but not limited to, differences in prices and market values reported by the custodian and manager, as well as significant cash flows into or out of an account. It is the responsibility of the manager and custodian to provide insight into the pricing methodologies and any difference in valuation.

Illiquid Alternatives

Due to the inability to receive final valuation prior to report production, closed end funds (including but are not limited to Real Estate, Hedge Funds, Private Equity, and Private Credit) performance is typically reported at a one-quarter lag. Valuation is reported at a one-quarter lag, adjusted for current quarter flow (cash flows are captured real time). Closed end fund performance is calculated using a time-weighted return methodology consistent with all portfolio and total fund performance calculations. For Private Markets, performance reports also include Verus-calculated multiples based on flows and valuations (e.g. DPI and TVPI) and manager-provided IRRs.

Policy & Custom Index Composition

Policy Index (8/1/2023 - present)	16% Russell 3000, 12% MSCI ACWI ex-US (Gross), 10% MSCI ACWI (Net), 2% Wilshire REIT, 8% Private Real Estate composite returns, 2% FTSE 3-month T-bill +5%, 13% Private Equity composite returns, 10% Private Credit composite returns, 2% ICE BofAML High Yield Master II, 17% Bloomberg 1-3 Yr Gov/Credit, 2.5% Bloomberg US Aggregate, 3% 60% MSCI ACWI Net/40% Bloomberg Global Aggregate, 2.5% Bloomberg US Aggregate TR +1%.
Policy Index (7/1/2022 - present)	16% Russell 3000, 15% MSCI ACWI ex-US (Gross), 9% MSCI ACWI (Net), 2% Wilshire REIT, 8% Private Real Estate composite returns, 2.5% FTSE 3-month T-bill +5%, 13% Private Equity composite returns, 8% Private Credit composite returns, 1.5% ICE BofAML High Yield Master II, 17% Bloomberg 1-3 Yr Gov/Credit, 2.5% Bloomberg US Aggregate, 3% 60% MSCI ACWI Net/40% Bloomberg Global Aggregate, 2.5% Bloomberg US Aggregate TR +1%.
Policy Index (7/1/2021 - 6/30/2022)	16% Russell 3000, 16% MSCI ACWI ex-US (Gross), 9% MSCI ACWI (Net), 2% Wilshire REIT, 8% Private Real Estate composite returns, 3% CPI + 4%, 11% Private Equity composite returns, 8% Private Credit composite returns, 2% ICE BofAML High Yield Master II, 18% Bloomberg 1-3 Yr Gov/Credit, 2.5% Bloomberg US Aggregate, 3% 60% MSCI ACWI Net/40% Bloomberg Global Aggregate, 1.5% HFRI EH Equity Market Neutral.
Policy Index (1/1/2021 - 6/30/2021)	9% Russell 3000, 18% MSCI ACWI ex-US (Gross), 11% MSCI ACWI (Net), 1% Wilshire REIT, 8% Private Real Estate composite returns, 1.5% CPI + 4%, 11% Private Equity composite returns, 7% Private Credit composite returns, 1.5% ICE BofAML High Yield Master II, 25% Bloomberg 1-3 Yr Gov/Credit, 3% Bloomberg US Aggregate, 2% Bloomberg Global Aggregate, 2% HFRI EH Equity Market Neutral.
Policy Index (7/1/2020 - 12/31/2020)	9% Russell 3000, 18% MSCI ACWI ex-US (Gross), 11% MSCI ACWI (Net), 1% Wilshire REIT, 1.6% NCREIF Property Index, 6.4% NCREIF ODCE Index, 1.5% CPI + 4%, 11% S&P 500 +4% (Lagged), 7% ICE BofAML High Yield Master II +2%, 1.5% ICE BofAML High Yield Master II, 25% Bloomberg 1-3 Yr Gov/Credit, 3% Bloomberg US Aggregate, 2% Bloomberg Global Aggregate, 2% HFRI EH Equity Market Neutral.
Policy Index (7/1/2019 - 6/30/2020)	10% Russell 3000, 18% MSCI ACWI ex-US (Gross), 11% MSCI ACWI (Net), 1% Wilshire REIT, 1.6% NCREIF Property Index, 6.4% NCREIF ODCE Index, 2% CPI + 4%, 11% S&P 500 +4% (Lagged), 5% ICE BofAML High Yield Master II +2%, 2% ICE BofAML High Yield Master II, 24% Bloomberg 1-3 Yr Gov/Credit, 3.5% Bloomberg US Aggregate, 2% Bloomberg Global Aggregate, 2.5% HFRI EH Equity Market Neutral.
Policy Index (7/1/2018 - 6/30/2019)	11% Russell 3000, 19% MSCI ACWI ex-US (Gross), 11% MSCI ACWI (Net), 1% Wilshire REIT, 1.8% NCREIF Property Index, 7.2% NCREIF ODCE Index, 2% CPI + 4%, 10% S&P 500 +4% (Lagged), 4% ICE BofAML High Yield Master II +2%, 2% ICE BofAML High Yield Master II, 23% Bloomberg 1-3 Yr Gov/Credit, 3.5% Bloomberg US Aggregate, 2% Bloomberg Global Aggregate, 2.5% HFRI EH Equity Market Neutral.
Policy Index (10/1/2017 - 6/30/2018)	16.3% Russell 3000, 18.8% MSCI ACWI ex-US (Gross), 8.6% MSCI ACWI (Net), 1% Wilshire REIT, 1.6% NCREIF Property Index, 6.4% NCREIF ODCE Index, 2.5% CPI + 4%, 10.1% S&P 500 +4% (Lagged), 1.9% ICE BofAML High Yield Master II +2%, 4.3% ICE BofAML High Yield Master II, 25% Bloomberg 1-3 Yr Gov/Credit, 3.5% Bloomberg US Aggregate.
Policy Index (1/1/2017 - 9/30/2017)	22.9% Russell 3000, 11% MSCI ACWI ex-US (Gross), 10.9% MSCI ACWI (Net), 1% Wilshire REIT, 1.7% NCREIF Property Index, 6.8% NCREIF ODCE Index, 3.6% CPI + 4%, 8.1% S&P 500 +4% (Lagged), 1.7% ICE BofAML High Yield Master II +2%, 5.1% ICE BofAML High Yield Master II, 22.4% Bloomberg 1-3 Yr Gov/Credit, 3.2% Bloomberg US Aggregate, 1.6% 91-Day T-Bills.
Policy Index (4/1/2012-12/31/2016)	27.7% Russell 3000, 10.6% MSCI ACWI ex-US (Gross), 12.3% MSCI ACWI (Net), 19.6% Bloomberg U.S. Aggregate, 5% ICE BofAML High Yield Master II, 4% Bloomberg Global Aggregate, 13.5% Real Estate Benchmark, 6.8% S&P 500 +4% (Lagged), 0.5% 91-Day T-Bills.

Contra Costa County Employees' Retirement Association

Data Sources and Methodology

Period Ending: September 30, 2023

Policy & Custom Index Composition (continued)

Policy Index (4/1/2011-3/31/2012)	31% Russell 3000, 10.4% MSCI EAFE (Gross), 9.6% MSCI ACWI (Net), 25% Bloomberg U.S. Aggregate, 3% ICE BofAML High Yield Master II, 4% Bloomberg Global Aggregate, 8.4% DJ Wilshire REIT, 3.1% NCREIF, 5% S&P 500 +4% (Lagged), 0.5% 91-Day T-Bills.
Policy Index (4/1/2010-3/31/2011)	35.6% Russell 3000, 10.4% MSCI EAFE (Gross), 5% MSCI ACWI (Net), 25% Bloomberg U.S. Aggregate, 3% ICE BofAML High Yield Master II, 4% Bloomberg Global Aggregate, 8.4% DJ Wilshire REIT, 3.1% NCREIF, 5% S&P 500 +4% (Lagged), 0.5% 91-Day T-Bills.
Policy Index (7/1/2009-3/31/2010)	40.6% Russell 3000, 10.4% MSCI EAFE (Gross), 25% Bloomberg U.S. Aggregate, 3% ICE BofAML High Yield Master II, 4% Bloomberg Global Aggregate, 8.4% DJ Wilshire REIT, 3.1% NCREIF, 5% S&P 500 +4% (Lagged), 0.5% 91-Day T-Bills.
Custom Growth Benchmark (7/1/2022 - present)	21.2% Russell 3000, 19.9% MSCI ACWI ex-US (Gross), 11.9% MSCI ACWI (Net), 2.6% Wilshire REIT, 10.6% Private Real Estate composite returns, 17.2% Private Equity composite returns, 10.6% Private Credit composite returns, 2.0% ICE BofAML High Yield Master II, 4% 60% MSCI ACWI Net/40% Bloomberg Global Aggregate
Custom Growth Benchmark (7/1/2021 - 6/30/2022)	21.33% Russell 3000, 21.33% MSCI ACWI ex-US (Gross), 12% MSCI ACWI (Net), 2.67% Wilshire REIT, 10.67% Private Real Estate composite returns, 14.67% Private Equity composite returns, 10.67% Private Credit composite returns, 2.67% ICE BofAML High Yield Master II, 4% 60% MSCI ACWI Net/40% Bloomberg Global Aggregate
Custom Growth Benchmark (1/1/2021 - 6/30/2021)	13.14% Russell 3000, 26.28% MSCI ACWI ex-US (Gross), 16.06% MSCI ACWI (Net), 1.46% Wilshire REIT, 11.68 Private Real Estate composite returns%, 16.06% Private Equity composite returns, 10.22% Private Credit composite returns, 2.19% ICE BofAML High Yield Master II, 2.92% Bloomberg Global Bond
Custom Growth Benchmark (7/1/2020 - 12/31/2020)	13.14% Russell 3000, 26.28% MSCI ACWI ex-US (Gross), 16.06% MSCI ACWI (Net), 1.46% Wilshire REIT, 2.34% NCREIF Property Index, 9.33% NCREIF ODCE Index, 16.06% S&P 500 +4% (Lagged), 10.22% ICE BofAML High Yield Master II +2%, 2.19% ICE BofAML High Yield Master II, 2.92% Bloomberg Global Bond
Custom Growth Benchmark (7/1/2019 - 6/30/20)	14.7% Russell 3000, 26.4% MSCI ACWI ex-US (Gross), 16.2% MSCI ACWI (Net), 1.5% Wilshire REIT, 2.4% NCREIF Property Index, 9.4% NCREIF ODCE Index, 16.2% S&P 500 +4% (Lagged), 7.4% ICE BofAML High Yield Master II +2%, 2.9% ICE BofAML High Yield Master II, 2.9% Bloomberg Global Bond
Custom Growth Benchmark (7/1/2018 - 6/30/2019)	16.0% Russell 3000, 27.5% MSCI ACWI ex-US (Gross), 15.9% MSCI ACWI (Net), 1.5% Wilshire REIT, 2.6% NCREIF Property Index, 10.4% NCREIF ODCE Index, 14.5% S&P 500 +4% (Lagged), 5.8% ICE BofAML High Yield Master II +2%, 2.9% ICE BofAML High Yield Master II, 2.9% Bloomberg Global Bond
Custom Growth Benchmark (9/30/2017- 6/30/2018)	23.6% Russell 3000, 27.2% MSCI ACWI ex-US (Gross), 12.5% MSCI ACWI (Net), 1.5% Wilshire REIT, 2.3% NCREIF Property Index, 9.3% NCREIF ODCE Index, 14.6% S&P 500 +4% (Lagged), 2.8% ICE BofAML High Yield Master II +2%, 6.2% ICE BofAML High Yield Master II
Custom Growth Benchmark (1/1/2017-9/30/2017)	32.6% Russell 3000, 15.7% MSCI ACWI ex-US (Gross), 15.5% MSCI ACWI (Net), 1.4% Wilshire REIT, 2.4% NCREIF Property Index, 9.6% NCREIF ODCE Index, 1.6% CPI +4%, 11.5% S&P 500 +4% (Lagged), 2.4% ICE BofAML High Yield Master II +2%, 7.3% ICE BofAML High Yield Master II
Custom Growth Benchmark (Prior to 1/1/2017)	Weighted-average of the benchmarks of the sub-composites that make up the composite.
Custom Diversifying Benchmark (7/1/2021-present)	35.71% Bloomberg US Aggregate, 21.43% FTSE 3-Month T-bill +4%, 21.43 FTSE 3-Month T-bill +5%, 21.43% Bloomberg Barclays US Aggregate +1%
Custom Diversifying Benchmark (8/1/2020 - 6/30/2021)	46.15% Bloomberg US Aggregate, 30.77 FTSE 3-Month T-bill +4%, 23.08 FTSE 3-Month T-bill +5%.
Custom Diversifying Benchmark (7/1/2018 - 7/31/2020)	43.75% Bloomberg US Aggregate, 25% CPI + 4%, 31.25% HFRI EH Equity Market Neutral.
Custom Diversifying Benchmark (10/1/2017 - 6/30/2018)	58.33% Bloomberg US Aggregate, 41.67% CPI + 4%.
Custom Diversifying Benchmark (1/1/2017 - 9/30/2017)	56.1% Bloomberg US Aggregate, 43.9% CPI + 4%.
Custom Diversifying Benchmark (Prior to 1/1/2017)	Weighted-average of the benchmarks of the sub-composites that make up the composite.
Custom Diversifying Multi-Asset Benchmark (current)	50% FTSE 3-Month T-bill +5%, 50% Bloomberg Barclays US Aggregate +1%
Real Estate Benchmark (current)	20% Wilshire REIT, 80% Private Real Estate composite returns.
Real Estate Benchmark (4/1/2012-11/30/2016)	40% Wilshire REIT, 50% NCREIF Property Index, 10% FTSE/EPRA NAREIT Developed ex-US.

Data Sources and Methodology

Manager Line Up						
Manager	Inception Date	Data Source	Manager	Inception Date	Data Source	
BlackRock Russell 1000 Index	4/20/2017	BlackRock	Invesco Real Estate V	2/20/2019	Invesco	
Boston Partners	6/1/1995	Northern Trust	Invesco Real Estate V	9/27/2022	Invesco	
Emerald Advisors	4/7/2003	Northern Trust	Oaktree REOF V	12/31/2011	Oaktree	
Ceredex	11/6/2011	Northern Trust	Oaktree REOF VI	9/30/2013	Oaktree	
Pyrford	4/25/2014	State Street	Oaktree REOF VII	4/1/2015	Oaktree	
William Blair	10/29/2010	William Blair	PCCI IX	4/28/222	PCCP	
PIMCO RAE Emerging Markets	2/28/2017	State Street	Siguler Guff DREOF	1/25/2012	Siguler Guff	
TT Emerging Markets	7/27/2017	TT	Siguler Guff DREOF II	8/31/2013	Siguler Guff	
Artisan Partners	10/1/2012	SEI Trust	Siguler Guff DREOF II Co-Inv	1/27/2016	Siguler Guff	
First Eagle	1/18/2011	Northern Trust	Paulson Real Estate Fund II	11/10/2013	Paulson	
Allianz Global Investors	4/25/2000	Northern Trust	AE Industrial Partners Fund II	4/8/2019	StepStone Group	
Adelante	9/30/2001	Northern Trust	Adams Street Partners	3/18/1996	StepStone Group	
AQR Global Risk Premium - EL	1/18/2019	AQR	Adams Street Partners II	1/16/2009	StepStone Group	
Panagora Risk Parity Multi Asset	3/15/2019	Panagora	Adams Street Partners Venture	4/28/2017	StepStone Group	
AFL-CIO	6/30/1991	AFL-CIO	Adams Street Partners - BFP	1/18/1996	StepStone Group	
Wellington Real Total Return (in Liquidation)	2/26/2013	Wellington	Adams Street Partners - Fund 5	9/21/2012	StepStone Group	
Acadian Multi-Asset Absolute Return Fund	8/4/2020	SS&C	Aether Real Assets IV	3/16/2016	StepStone Group	
Sit LLCAR	4/15/2021	Northern Trust	Aether Real Assets III	11/27/2013	StepStone Group	
Sit Short Duration	11/2/2016	Northern Trust	Aether Real Assets III Surplus	11/30/2013	StepStone Group	
DFA Short Credit	11/21/2016	Northern Trust	Bay Area Equity Fund	6/14/2004	StepStone Group	
Insight Short Duration	11/18/2016	Northern Trust	Bay Area Equity Fund II	12/7/2009	StepStone Group	
Parametric Overlay	3/29/2017	Northern Trust	Commonfund	6/28/2013	StepStone Group	
Cash	-	Northern Trust	EIF US Power Fund II	8/16/2005	StepStone Group	
Angelo Gordon Energy Credit Opp	9/24/2015	StepStone Group	EIF US Power Fund III	5/30/2007	StepStone Group	
StepStone CC Opportunities Fund	2/1/2018	StepStone Group	EIF US Power Fund IV	11/28/2011	StepStone Group	
Torchlight II	9/30/2006	StepStone Group	EIF US Power Fund V	11/28/2016	StepStone Group	
Torchlight IV	7/1/2012	StepStone Group	Genstar Capital Partners IX, L.P.	2/21/2019	StepStone Group	
Torchlight V	7/1/2012	StepStone Group	Oaktree PIF 2009	2/28/2010	StepStone Group	
Angelo Gordon Realty Fund VIII	1/23/2012	Angelo Gordon	Paladin III	11/30/2007	StepStone Group	
Angelo Gordon Realty Fund IX	12/8/2014	Angelo Gordon	Ocean Avenue Fund II	6/11/2014	StepStone Group	
Blackstone Real Estate Partners X	3/24/2023	Blackstone	Ocean Avenue Fund III	4/15/2016	StepStone Group	
DLJ RECP III	6/23/2005	DLJ	Pathway 6	5/24/2011	StepStone Group	
DLJ RECP IV	2/11/2008	DLJ	Pathway 7	2/7/2013	StepStone Group	
DLJ RECP V	7/1/2014	DLJ	Pathway 8	11/23/2015	StepStone Group	
DLJ RECP VI	3/19/2019	DLJ	Pathway	11/9/1998	StepStone Group	
LaSalle Income & Growth VI	7/16/2013	LaSalle	Pathway 2008	12/26/2008	StepStone Group	
LaSalle Income & Growth VII	2/28/2017	LaSalle	Siguler Guff CCCERA Opps	6/3/2014	StepStone Group	
Hearthstone II	6/17/1998	Hearthstone	Siguler Guff Secondary Opps	11/30/2016	StepStone Group	
Long Wharf Fund IV	7/3/2013	Long Wharf	Siris Partners IV	3/15/2019	StepStone Group	
Long Wharf Fund V	9/30/2016	Long Wharf	TPG Healthcare Partners, L.P.	6/28/2019	StepStone Group	
Long Wharf Fund VI	2/5/2020	Long Wharf	Trident VIII, L.P.	5/24/2019	StepStone Group	
Long Wharf Fund VII	5/30/2023	Long Wharf	Wastewater Opp. Fund	12/8/2015	StepStone Group	
Invesco Real Estate IV	6/30/2014	Invesco				

Other Disclosures

All data prior to 12/31/2014 was provided by previous consultant.
 As of 7/1/2018 all Private Equity and Private Credit data is provided by StepStone Group.

Glossary

Allocation Effect: An attribution effect that describes the amount attributable to the managers' asset allocation decisions, relative to the benchmark.

Alpha: The excess return of a portfolio after adjusting for market risk. This excess return is attributable to the selection skill of the portfolio manager. Alpha is calculated as: $\text{Portfolio Return} - [\text{Risk free Rate} + \text{Portfolio Beta} \times (\text{Market Return} - \text{Risk free Rate})]$.

Benchmark R squared: Measures how well the Benchmark return series fits the manager's return series. The higher the Benchmark R squared, the more appropriate the benchmark is for the manager.

Beta: A measure of systematic, or market risk; the part of risk in a portfolio or security that is attributable to general market movements. Beta is calculated by dividing the covariance of a security by the variance of the market.

Book to Market: The ratio of book value per share to market price per share. Growth managers typically have low book to market ratios while value managers typically have high book to market ratios.

Capture Ratio: A statistical measure of an investment manager's overall performance in up or down markets. The capture ratio is used to evaluate how well an investment manager performed relative to an index during periods when that index has risen (up market) or fallen (down market). The capture ratio is calculated by dividing the manager's returns by the returns of the index during the up/down market, and multiplying that factor by 100.

Correlation: A measure of the relative movement of returns of one security or asset class relative to another over time. A correlation of 1 means the returns of two securities move in lock step, a correlation of -1 means the returns of two securities move in the exact opposite direction over time. Correlation is used as a measure to help maximize the benefits of diversification when constructing an investment portfolio.

Excess Return: A measure of the difference in appreciation or depreciation in the price of an investment compared to its benchmark, over a given time period. This is usually expressed as a percentage and may be annualized over a number of years or represent a single period.

Information Ratio: A measure of a manager's ability to earn excess return without incurring additional risk. Information ratio is calculated as: excess return divided by tracking error.

Interaction Effect: An attribution effect that describes the portion of active management that is contributable to the cross interaction between the allocation and selection effect. This can also be explained as an effect that cannot be easily traced to a source.

Portfolio Turnover: The percentage of a portfolio that is sold and replaced (turned over) during a given time period. Low portfolio turnover is indicative of a buy and hold strategy while high portfolio turnover implies a more active form of management.

Price to Earnings Ratio (P/E): Also called the earnings multiplier, it is calculated by dividing the price of a company's stock into earnings per share. Growth managers typically hold stocks with high price to earnings ratios whereas value managers hold stocks with low price to earnings ratios.

R Squared: Also called the coefficient of determination, it measures the amount of variation in one variable explained by variations in another, i.e., the goodness of fit to a benchmark. In the case of investments, the term is used to explain the amount of variation in a security or portfolio explained by movements in the market or the portfolio's benchmark.

Selection Effect: An attribution effect that describes the amount attributable to the managers' stock selection decisions, relative to the benchmark.

Sharpe Ratio: A measure of portfolio efficiency. The Sharpe Ratio indicates excess portfolio return for each unit of risk associated with achieving the excess return. The higher the Sharpe Ratio, the more efficient the portfolio. Sharpe ratio is calculated as: $\text{Portfolio Excess Return} / \text{Portfolio Standard Deviation}$.

Sortino Ratio: Measures the risk adjusted return of an investment, portfolio, or strategy. It is a modification of the Sharpe Ratio, but penalizes only those returns falling below a specified benchmark. The Sortino Ratio uses downside deviation in the denominator rather than standard deviation, like the Sharpe Ratio.

Standard Deviation: A measure of volatility, or risk, inherent in a security or portfolio. The standard deviation of a series is a measure of the extent to which observations in the series differ from the arithmetic mean of the series. For example, if a security has an average annual rate of return of 10% and a standard deviation of 5%, then two thirds of the time, one would expect to receive an annual rate of return between 5% and 15%.

Style Analysis: A return based analysis designed to identify combinations of passive investments to closely replicate the performance of funds

Style Map: A specialized form or scatter plot chart typically used to show where a Manager lies in relation to a set of style indices on a two dimensional plane. This is simply a way of viewing the asset loadings in a different context. The coordinates are calculated by rescaling the asset loadings to range from -1 to 1 on each axis and are dependent on the Style Indices comprising the Map.

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