

Meeting Date
02/28/2024
Agenda Item
#5a.



**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**



PERIOD ENDING: December 31, 2023

Investment Performance Review for

Contra Costa County Employees' Retirement Association

Table of Contents



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Investment Landscape

TAB I

Investment Performance
Review

TAB II

A decorative geometric pattern of overlapping triangles in shades of blue and green is overlaid on the left side of the image. A white triangle is positioned to the left of the main text.

**PERSPECTIVES
THAT DRIVE
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SUCCESS**

1ST QUARTER 2024
Investment Landscape

Verus business update

Since our last Investment Landscape webinar:

- Verus hired Adam Babson, *Director of Portfolio Management* (Seattle)
- JC Faubion, CFA, *Senior Consulting Associate*, obtained the CAIA charter
- James Wadner, *Performance Analyst*, recently passed his CFA level I exam
- We celebrated our 38th anniversary. Wurts Johnson & Company (founding name) was established in January 1986.
- Recent research, found at verusinvestments.com/research:
 - *Is now the time to de-risk?*
 - *Liquidity needs during market drawdowns*
 - *2024 Annual Capital Market Assumptions*

Table of contents



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Economic environment 9

Fixed income rates & credit 21

Equity 26

Other assets 35

Appendix 38

Recent Verus research

Visit: verusinvestments.com/research

Topics of interest

LIQUIDITY NEEDS DURING MARKET DRAWDOWNS

What is the fundamental reason why investors should care about liquidity? In short, investors want to avoid being forced to sell high-returning assets that have fallen in value in order to pay for benefits, philanthropic spending, expenses, and cover capital calls for their private asset programs. We first touch on the different definitions of liquidity and illustrate how these relate to institutional portfolios. Second, we examine those liquidity characteristics in times of market stress, the way in which illiquid assets often behave, and how that impacts investors. Lastly, we outline a tool that we have created and discuss how this can be used to assist clients with gauging the appropriate level of liquidity in their own portfolios. Overall, we believe investors should put much thought and care into portfolio liquidity decisions.

IS NOW THE TIME TO DE-RISK?

Is now a good time to engage in de-risking strategies? The combination of rising interest rates and relatively strong risk asset performance since 2020 seem to suggest so. We aim to give plan sponsors a better appreciation of the potential benefits of de-risking strategies and examine when it would be most prudent to adopt these strategies. ERISA plan sponsors that have frozen benefits or report actuarial obligations with a market-based interest rate will find this paper most applicable to them.

Annual research

2024 CAPITAL MARKET ASSUMPTIONS

Capital Market Assumptions guide our advice and recommendations. They reflect the best judgments of our research and investment teams regarding the expected long-term behavior of capital markets.

Investment Landscape

1st Quarter 2024

4th quarter summary

THE ECONOMIC CLIMATE

- Real GDP increased at a 2.9% pace from a year ago in Q3 (4.9% quarter-over-quarter annualized rate). The economy has remained relatively strong while inflation now appears likely to fall closer to the Fed's 2% target in 2024. These expectations contributed to a dovish pivot from the Fed, a sharp drop in interest rates, and a notable market rally as the possibility of a soft landing has risen.
- Unemployment fell slightly from 3.8% to 3.7%, though the labor participation rate dropped sharply towards the end of the year. The labor market remains surprisingly resilient after roughly a full year of higher interest rates.

PORTFOLIO IMPACTS

- Consumer sentiment has been incredibly poor, and one of the greatest concerns for Americans is inflation. Although inflation has fallen considerably, prices of goods and services remain high, placing strain on budgets. Because inflation measures the rate of change of prices, rather than the level of prices, lower inflation has failed to ease the financial pressure that many households face.
- The Cboe VIX implied volatility index moved even lower during Q4, from 17.5 to 12.5. At the same time, bond market volatility was very high, as indicated by the "MOVE" Index. Uncertainty around inflation, the Federal Reserve's possible interest rate path and the extent of rate cuts, potential recession, and fears around the U.S. fiscal situation are likely contributing to market shakiness.

THE INVESTMENT CLIMATE

- An abrupt change in Federal Reserve communication regarding interest rate cuts during the quarter coincided with sharply lower bond yields, higher equity valuations, and further tightening of credit spreads.
- U.S. headline inflation fell during the quarter, from 3.7% to 3.3% year-over-year. Core CPI (ex-food & energy) declined from 4.1% to 3.9%. Low inflation numbers in October and November (0.0% and 0.1% month-over-month) were counterbalanced by a surprisingly high inflation number in December (0.3% month-over-month).

ASSET ALLOCATION ISSUES

- U.S. equities (S&P 500 +11.7%) led international developed equities (MSCI EAFE +10.4%) and emerging market equities (MSCI EM +7.9%) during the quarter. Domestic equities also led non-U.S. equities over the full year while emerging markets lagged. Wide sector performance differences contributed to U.S. leadership given a much heavier tech focus of the domestic market.
- Style factor performance was mixed during Q4. Small cap outperformed large cap by +2.0%. Value underperformed Growth by -3.2%. Over the full year, small caps underperformed large caps by -9.6% while value stocks underperformed growth by a whopping -31.2%. Besides an extreme period of value underperformance during 2020, calendar year 2023 was the worst 1-year rolling period in more than two decades.

Risk assets rallied in Q4 following a dovish pivot from the Federal Reserve and recent economic data suggesting a greater chance of a soft landing

What drove the market in Q4?

“A Soft Landing is in View as Inflation Drops”

HEADLINE CPI MONTH-OVER-MONTH CHANGES

July	Aug	Sept	Oct	Nov	Dec
0.2%	0.6%	0.4%	0.0%	0.1%	0.3%

Article Source: WSJ, November 14th, 2023

“U.S. Labor Market Resilience Keeps Economy Afloat as Year Ends”

U-3 UNEMPLOYMENT RATE

July	Aug	Sept	Oct	Nov	Dec
3.5%	3.8%	3.8%	3.8%	3.7%	3.7%

Article Source: Reuters, December 21st, 2023

“U.S. Consumer Spending, Inflation Slow in Sign of Cooling Economy”

U.S. NOMINAL RETAIL SALES (YEAR-OVER-YEAR)

July	Aug	Sept	Oct	Nov	Dec
2.8%	2.8%	4.0%	2.2%	4.0%	5.6%

Article Source: Bloomberg, November 30th, 2023

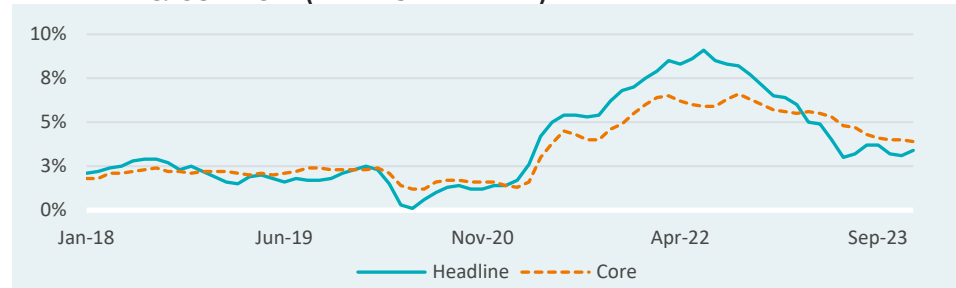
“Fed Holds Rates Steady, Indicating Three Cuts Coming in 2024”

FOMC PROJECTED END OF 2023 FED FUNDS RATE

Sep 22 SEP	Dec 22 SEP	Mar 23 SEP	June 23 SEP	Sept 23 SEP	Dec 23 SEP
4.60%	5.10%	5.10%	5.60%	5.60%	5.40%

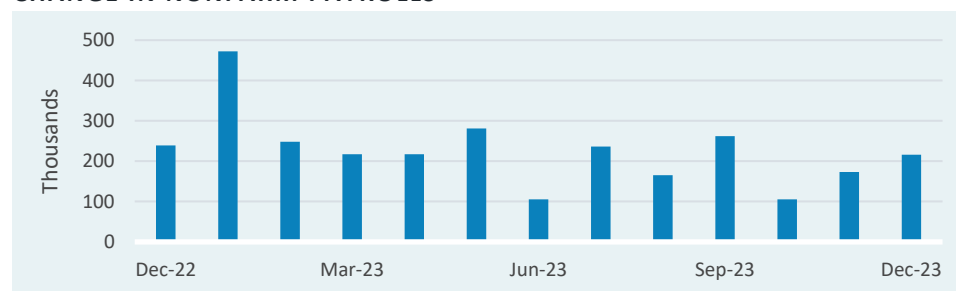
Article Source: CNBC, December 13th, 2023

HEADLINE & CORE CPI (YEAR-OVER-YEAR)



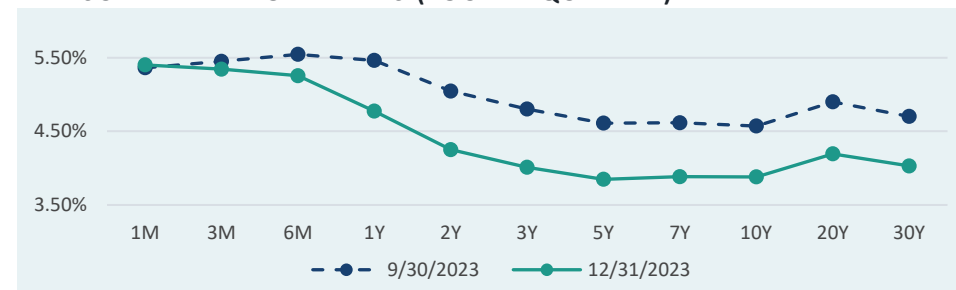
Source: BLS, as of 12/31/23

CHANGE IN NONFARM PAYROLLS



Source: BLS, as of 12/31/23

TREASURY YIELD MOVEMENTS (FOURTH QUARTER)



Source: Bloomberg, as of 12/31/23

Economic environment

U.S. economics summary

- Real GDP increased at a 2.9% pace year-over-year in Q3 (4.9% quarter-over-quarter annualized rate). The economy has remained relatively strong while inflation appears more likely to fall closer to the Fed’s target in 2024. These expectations contributed to a dovish pivot from the Federal Reserve in December, a sharp drop in interest rates, and a notable market rally as the possibility of a soft landing has risen.
- U.S. headline inflation fell during the quarter, from 3.7% to 3.3% year-over-year. Core CPI (ex-food & energy) declined further from 4.1% to 3.9%. Low inflation numbers in October and November (0.0% and 0.1% month-over-month) were counterbalanced by a surprisingly high inflation number in December (0.3% month-over-month).
- Consumer spending has been stable, with real personal consumption expenditures up +2.7% year-over-year in November, the strongest growth figure since early 2022. However, strong spending appears to be at the expense

of a low household savings rate (4.1% in November) and may be partly driven by necessity (higher prices of goods & services) rather than by a positive financial or economic outlook.

- The job market has shown mixed signals, increasing in total size during 2023 but arguably with some weakness around the edges. Unemployment rose during the year but fell slightly in Q4 from 3.8% to 3.7%. This historic mismatch between jobs available and workers available has been slowly closing.
- Consumer sentiment improved slightly but remains incredibly poor. Inflation is a central concern for Americans. Although inflation has fallen considerably, prices of goods and services remain high, placing strain on budgets. Because inflation measures the rate of change of prices, rather than the level of prices, lower inflation has failed to ease the financial pressure that many households face.

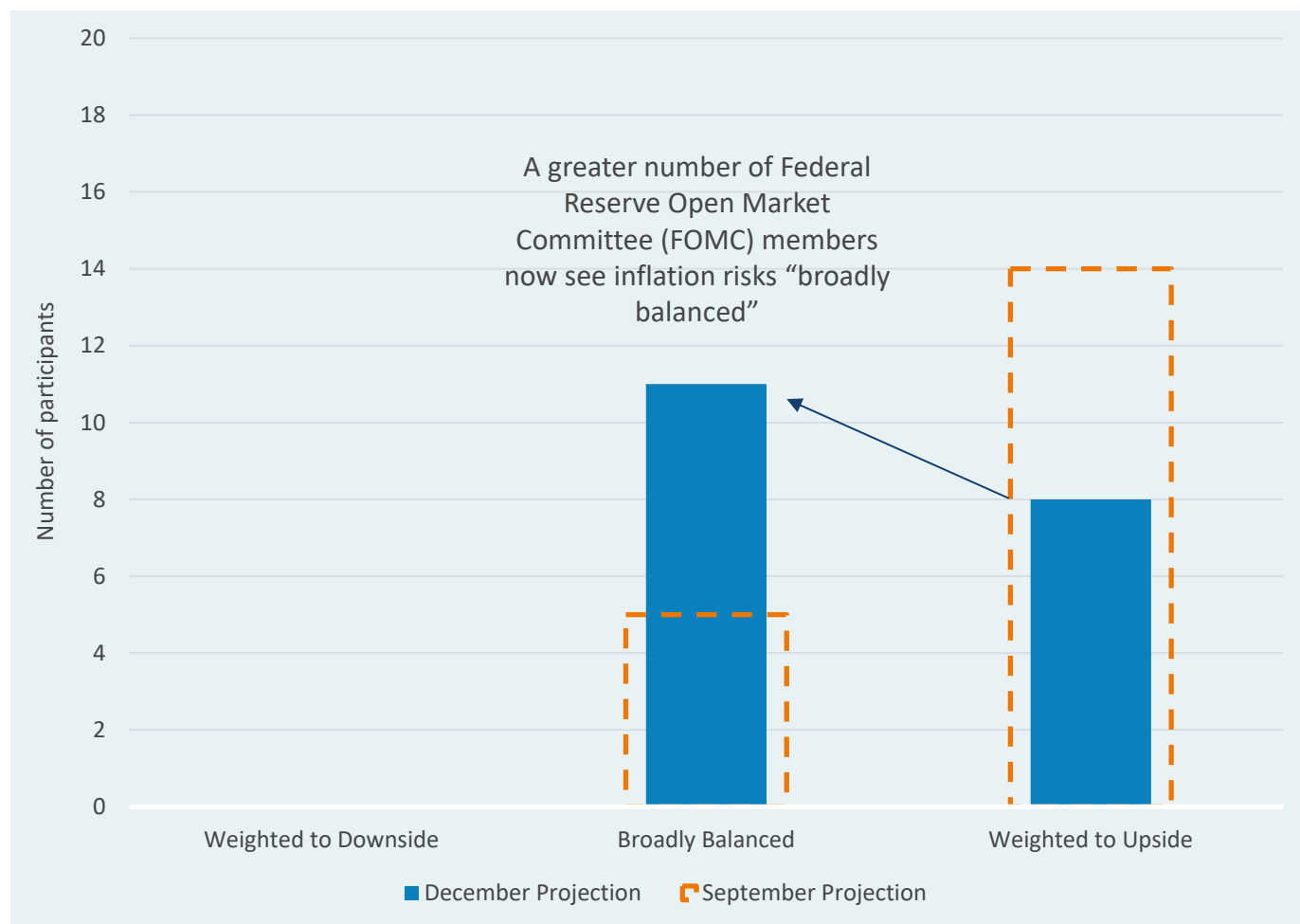
	Most Recent	12 Months Prior
Real GDP (YoY)	2.9% 9/30/23	1.7% 9/30/22
Inflation (CPI YoY, Core)	3.9% 12/31/23	6.4% 12/31/22
Expected Inflation (5yr-5yr forward)	2.2% 12/31/23	2.3% 12/31/22
Fed Funds Target Range	5.25–5.50% 12/31/23	4.25–4.50% 12/31/22
10-Year Rate	3.88% 12/31/23	3.88% 12/31/22
U-3 Unemployment	3.7% 12/31/23	3.5% 12/31/22
U-6 Unemployment	7.1% 12/31/23	6.5% 12/31/22

Shifting signaling from the Federal Reserve

December 2023 risks to core inflation: FOMC participants

On December 13th, the Fed's tone shifted. Powell spoke to a much rosier inflation picture and described a greater focus on both sides of its dual mandate—price stability and full employment.

Although optimistic, Powell's comments emphasized a cautious view of the restrictive policy's impact, *"Our actions have moved our policy rate well into restrictive territory, meaning that tight policy is putting downward pressure on economic activity and inflation, and the full effects of our tightening likely have not yet been felt... Given how far we have come, along with the uncertainties and risks that we face, the Committee is proceeding carefully."*



Source: Federal Reserve December 2023 Summary of Economic Projections

Inflation

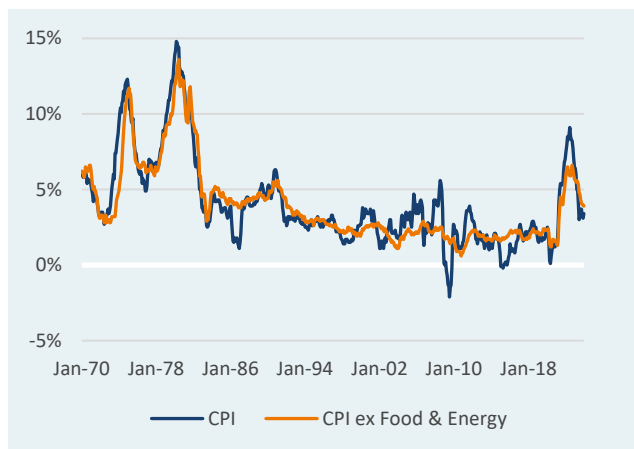
U.S. headline inflation fell during the quarter, from 3.7% to 3.3% year-over-year in December. Core CPI (ex-food & energy) declined further from 4.1% to 3.9%. It is not yet clear how long it will take for inflation to return to the Federal Reserve's 2% target, or how bumpy that ride might be. Low inflation numbers in October and November (0.0% and 0.1% month-over-month) were counterbalanced by a surprisingly high inflation release in December (0.3% month-over-month).

Most of the largest initial drivers of U.S. inflation, such as food, energy, and used autos, are now moderating in price and helping to bring inflation down towards the Fed's 2% target.

Additionally, the largest component of the inflation "basket" of goods and services is shelter prices (the cost of rents or renter's equivalent). The calculation of shelter for official government data purposes tends to reflect market rent movements with a lag. Market-based rent indexes reflect much lower rent inflation. For example, the series published by Zillow indicates 3.3% year-over-year inflation as of December. This suggests that as government shelter data catches up with true market rent prices, the greatest support to current inflation levels (shelter costs) will drop materially, potentially bringing inflation officially back to around a 2% level.

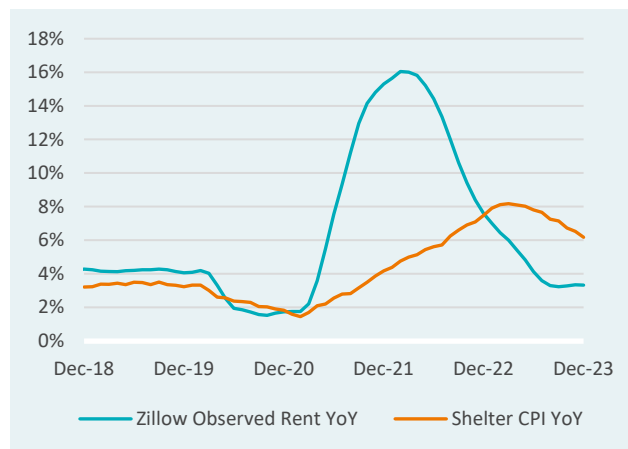
Inflation & other economic data released in Q4 suggests a path for inflation to fall towards 2% in 2024

U.S. CPI (YOY)



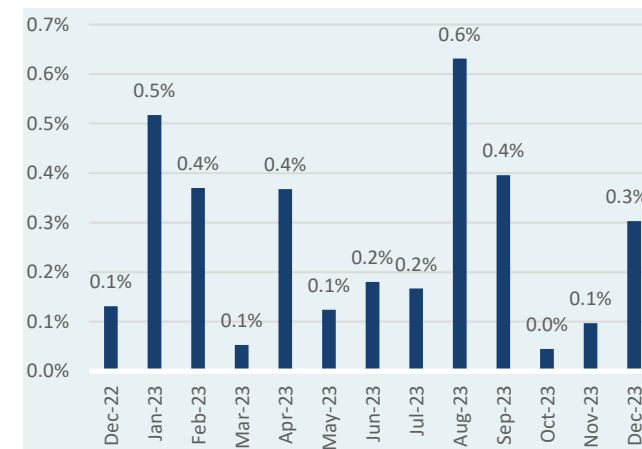
Source: BLS, as of 12/31/23

ZILLOW OBSERVED RENT VS. SHELTER CPI (YOY)



Source: Zillow Observed Rent Index, as of 12/31/23

MONTHLY PRICE MOVEMENT (CPI)



Source: BLS, as of 12/31/23

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.

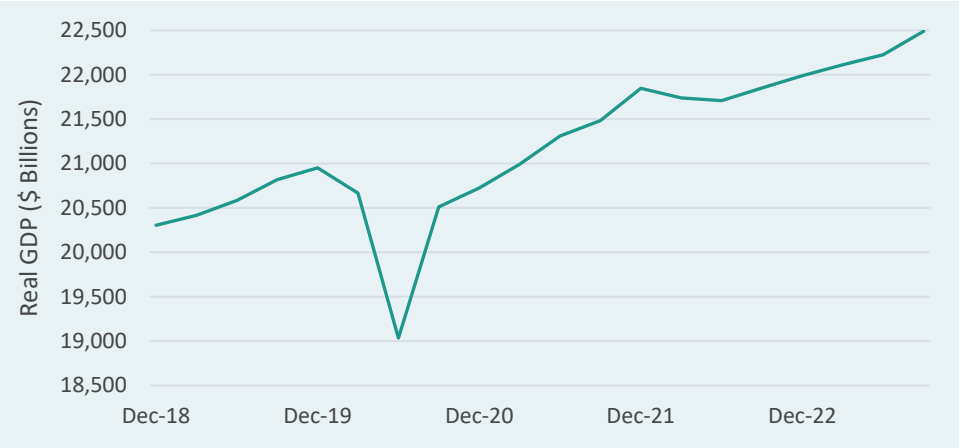
The economy has remained relatively strong while inflation

now appears likely to fall closer to the Fed target in 2024. These expectations contributed to a sharp drop in interest rates towards the end of 2023, and a notable market rally, as the possibility of a soft landing has risen.

A string of positive economic news occurred throughout the fourth quarter. The economic outlook has improved along with this new information, though we continue to believe economic bumpiness is on the horizon—perhaps in mid-2024. However, U.S. markets appear to be fully pricing in the soft-landing narrative, which likely limits the upside if that were to come to fruition.

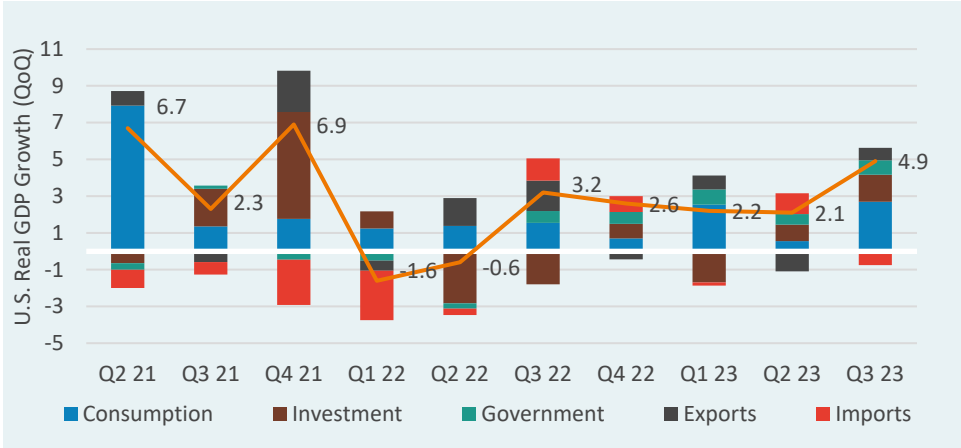
The U.S. economy continues to show resilience despite aggressive monetary tightening & low consumer confidence

U.S. REAL GROSS DOMESTIC PRODUCT



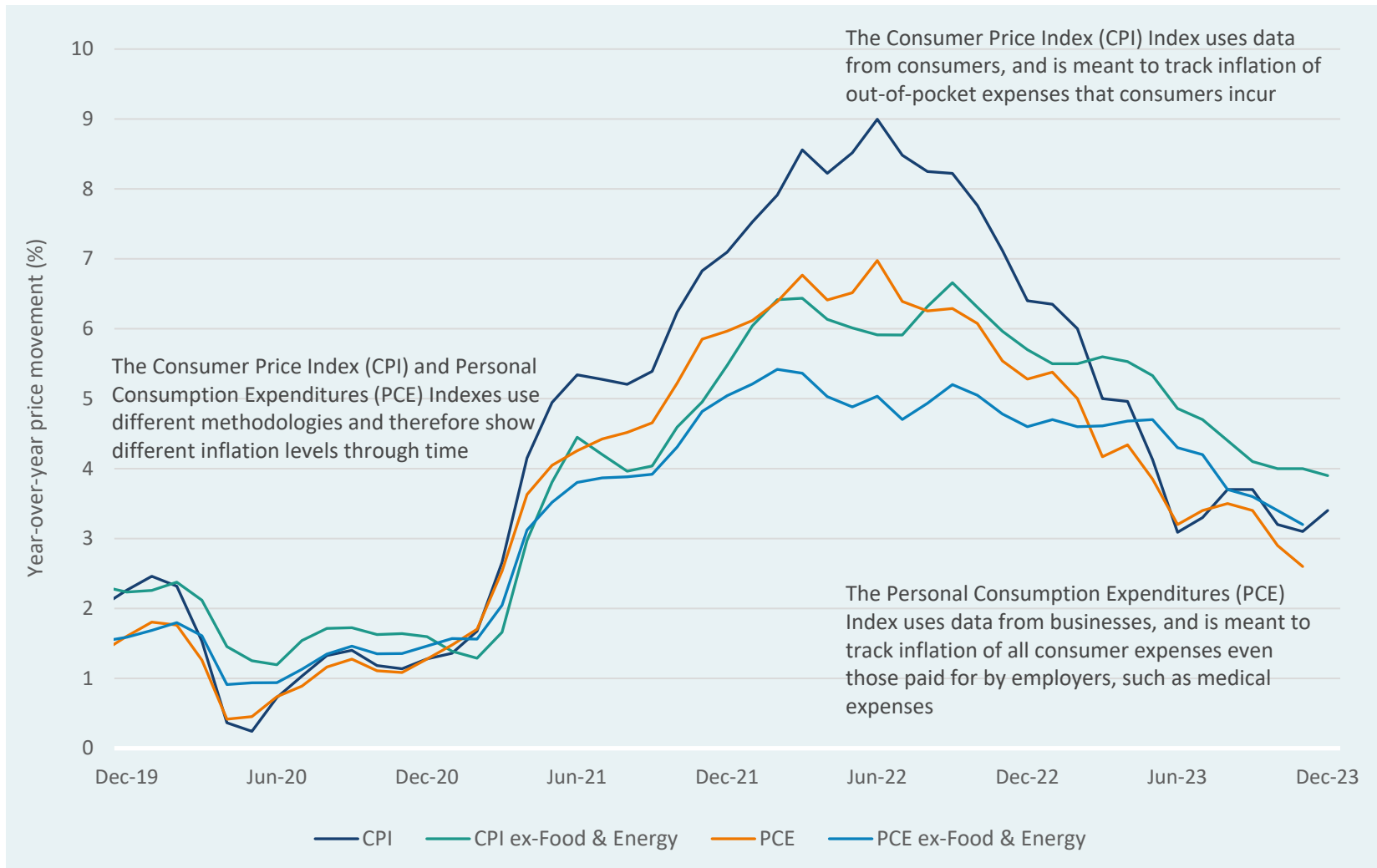
Source: FRED, as of 9/30/23

U.S. REAL GDP COMPONENTS (QOQ)



Source: FRED, as of 9/30/23

How are inflation conditions evolving?



Recent price trends suggest inflation may move closer to the Fed's 2% target in 2024

A moderation of shelter prices, which tend to be lagged in official statistics, could be the most notable driver of lower inflation in future quarters

Source: FRED, Verus, PCE data as of 11/30/23, CPI data as of 12/31/23

Labor market

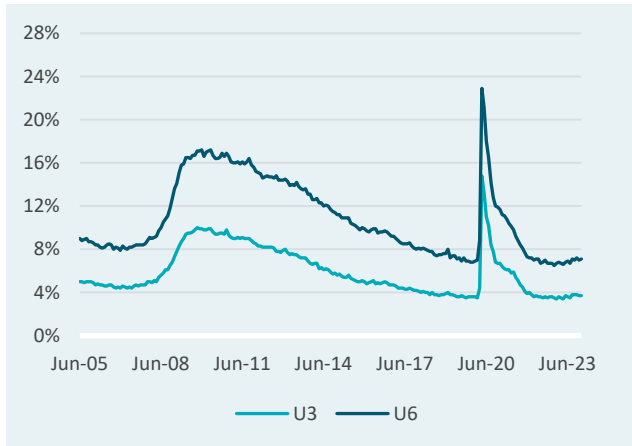
Unemployment fell slightly in Q4 from 3.8% to 3.7%, though the labor participation rate dropped sharply towards the end of the year from 62.8% to 62.5%. According to most available metrics, the labor market remains surprisingly resilient. While throughout history higher interest rates, and yield curve inversion in particular, have typically been followed by recession, the economy has been strong in the face of higher interest rates for roughly a full year. These dynamics have fueled hope that the economy may achieve a soft landing.

Some mixed signals have appeared in recent months. The labor participation rate has fallen for both younger and older

workers, potentially a sign of stalling of strong post-pandemic job growth. Rebalancing within the labor market continued, as the mismatch between the number of *workers available* and the number of *available jobs* closes. This gap was 5.5 million at the beginning of the year and fell to 2.5 million in November. This rebalancing appears to be due to positive factors (a growing workforce) rather than negative factors (fewer jobs available), as more Americans are seeking employment and finding jobs that had previously gone unfilled.

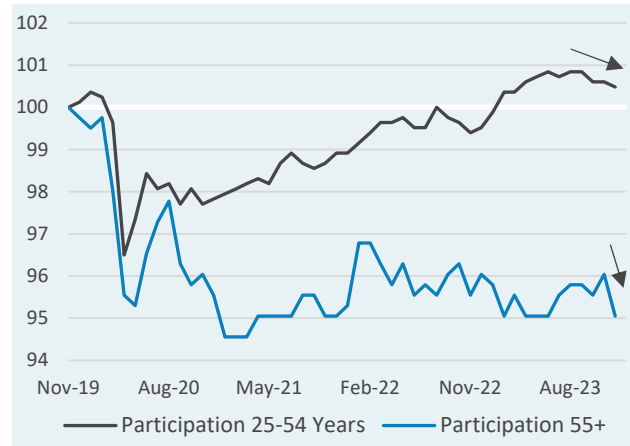
The gap between *available jobs* and *available workers* was cut in half during 2023, as the labor market moves into balance

U.S. UNEMPLOYMENT



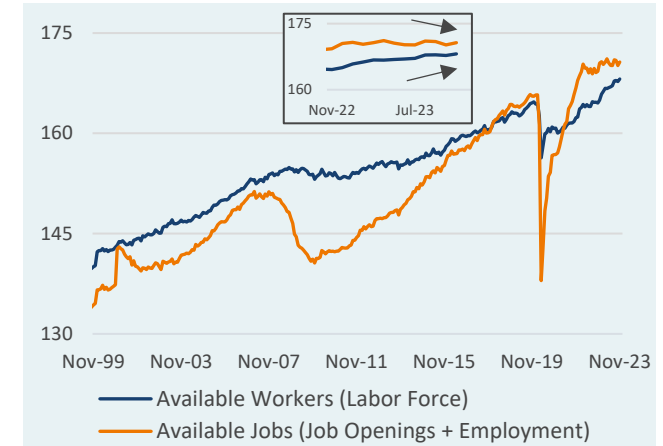
Source: FRED, as of 12/31/23

LABOR FORCE PARTICIPATION RATE BY AGE



Source: FRED, as of 12/31/23

WORKERS AVAILABLE VS. AVAILABLE JOBS



Source: BLS, Verus, as of 11/30/23

The consumer

We believe there are two important sides to the U.S. consumer picture. First, spending has been stable, as real (inflation-adjusted) personal consumption expenditures continued at a moderate pace, at 2.7% year-over-year in November—the strongest growth figure since early 2022. But second, strong spending appears to be coming at the expense of household savings (very low at 4.1% in November) and may be partly driven by necessity (higher prices of goods and services) rather than driven by a positive financial or economic outlook. This latter point is supported by incredibly poor consumer sentiment.

As discussed in last quarter’s report, wealth for the majority of

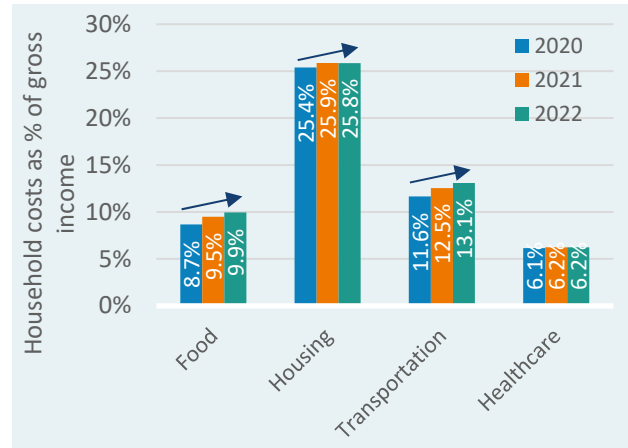
Americans has greatly expanded over the past decade, fueled by higher home prices, a bull market for stocks, and broad economic strength. However, this stands in stark contrast to reports of widespread financial difficulties of Americans. For example, a Lending Club survey conducted in November 2023 indicated that 62% of consumers are living paycheck to paycheck. In this unique environment, it is difficult to gauge the extent to which greater wealth, though often illiquid, might help extend strong spending into future quarters, or whether spending is set to slow as households reset their spending to lower levels to try and return to more conservative budgets with an appropriate savings rate.

REAL PERSONAL SPENDING



Source: FRED, as of 11/30/23

HIGHER COSTS EATING INTO BUDGETS



Source: BLS, Verus, as of 9/8/23 – household costs as % of gross income

PERSONAL SAVINGS RATE



Source: FRED, as of 11/30/23

Sentiment

Sentiment readings were up slightly during Q4 but remain pessimistic. The University of Michigan Consumer Sentiment survey improved from 67.9 to 69.7 on reports that households believe inflation is on a better trajectory.

A confusing aspect of the consumer picture is the large disconnect between economic data (good in many respects) and sentiment readings (very poor overall). For example, inflation has mostly normalized but many Americans continue to express deep concerns about high inflation and difficulties in making ends meet. A major driver of this disconnect is what we might call the “lower inflation conundrum”. As displayed below, prices surged substantially in recent years, meaning inflation was high, but then prices plateaued, which led inflation to come down. *Why hasn't*

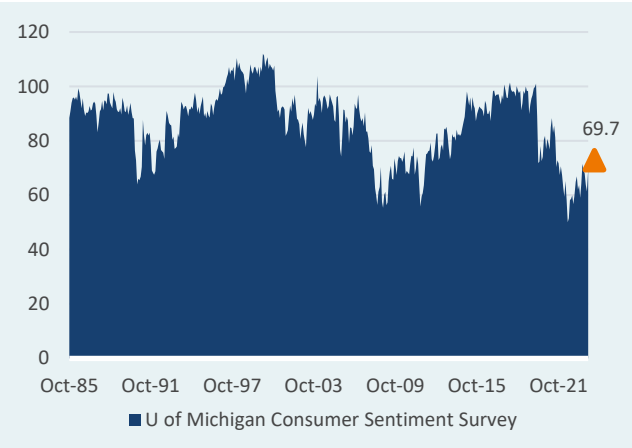
lower inflation led Americans to feel better about the economy? This is because inflation measures the *rate of change* in the price of goods and services, not the overall level. Prices are currently very high while the rate of inflation is fairly low.

The NFIB Small Business Optimism index improved slightly during Q4, with the gains occurring in December. The index has now been below the 50-year average level for two years. According to the report, 23% of business owners reported inflation as the most important issue for business operations—now a greater concern than the labor shortage. Small businesses remain very pessimistic about conditions and do not expect these conditions to improve in 2024.

Sentiment improved slightly during the quarter

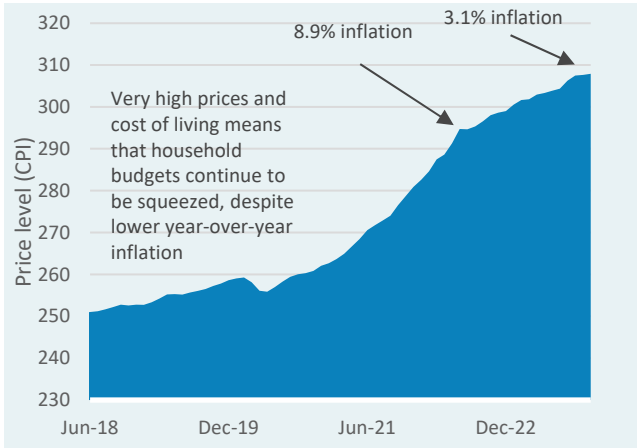
Inflation remains very poor

CONSUMER SENTIMENT



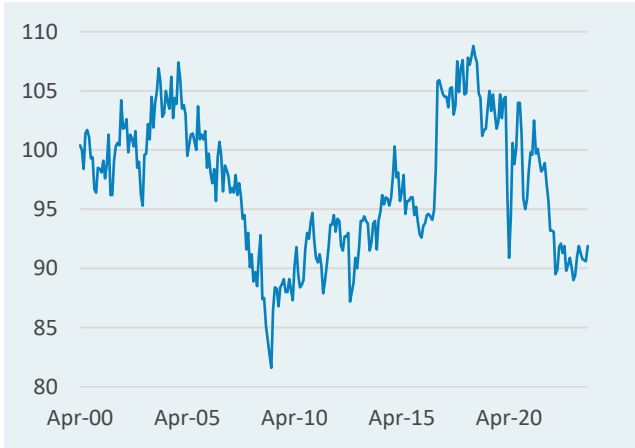
Source: University of Michigan, as of 12/31/23

THE “LOWER INFLATION” CONUNDRUM



Source: FRED, as of 11/30/23

NFIB SMALL BUSINESS SENTIMENT



Source: NFIB, as of 12/31/23

Housing

Home prices increased 3.0% in the third quarter, with ongoing support from very low housing inventory levels. It is possible that low inventories, high costs of new construction, a lack of forced sales (home sales due to financial stress), and an unwillingness of current homeowners to sell and sacrifice their existing low mortgage rate, could act as an ongoing support to high home prices despite extreme unaffordability.

On a brighter note, housing affordability on the margin may be moving in a better direction. Despite mild gains in home prices, the 30-year average fixed mortgage rate has fallen from a 23-year high of 7.3% to 6.6% at the

end of December. A moderation in mortgage rates, with expectations for a handful of Federal Reserve rate cuts in 2023, could help affordability and provide a support to home demand in the near-term.

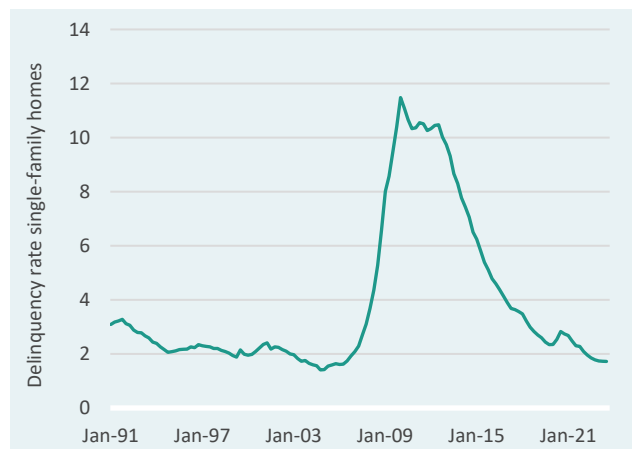
Mortgage delinquency levels of single-family homeowners continue to be muted, at 1.7% as of Q3. Surprisingly, mortgage delinquency rates have consistently declined since the pandemic. This may be a reflection of significant home equity built up for the average homeowner, the ability of homeowners to draw on that equity to help make financial ends meet, and a hesitance to default on a loan if the loan is not underwater.

30-YEAR MORTGAGE RATE (%)



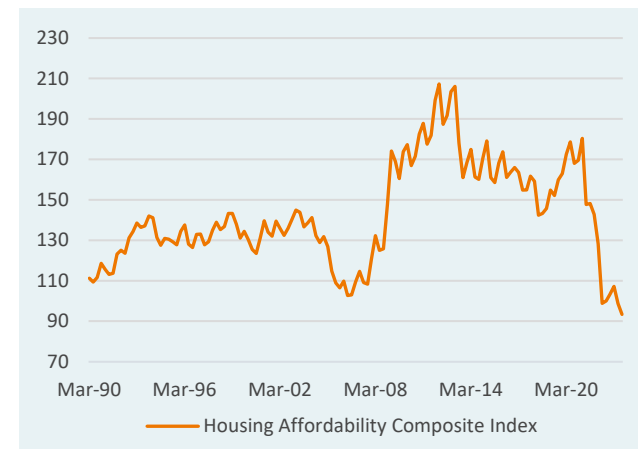
Source: FRED, as of 12/31/23

SINGLE-FAMILY HOME DELINQUENCY RATE (%)



Source: FRED, as of 9/30/23

HOUSING AFFORDABILITY



Source: FRED, as of 9/30/23 – 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

- The ongoing threat of inflation, and central banks' tightrope act of working to battle that inflation without tipping economies into recession, was expected to be a key risk of 2024. However, in the fourth quarter inflation has fallen more quickly than expected, while economic growth has generally been more resilient. The global growth picture seems to have improved, all else equal, although growth is still expected to slow materially in the coming quarters.
- Conflicts within the Middle East have led to heightened geopolitical tensions, and broader escalation is a notable risk. While military action has been relatively confined, further conflict could have a material impact on global supply chains and energy markets. The war in Ukraine, which played a large part in initially driving inflation across developed economies, is still fresh in many investors' minds.
- Inflation fell significantly in the Eurozone and U.K., helping to take

some pressure off the ECB and BOE (headline inflation receded to 3.4% and 4.0% across the Eurozone and U.K., respectively). Despite the easing of price pressures, interest rates sit at multi-decade highs at both central banks which does little to change expectations for stagnant and potentially even negative economic growth.

- China reported GDP growth of 5.2% in 2023, exceeding the 5% growth target set by the CCP. While the reported figure is slightly above the CCP's target, growth has disappointed investors and economists alike, especially following a nearly three-year COVID-19 lockdown. The country continues to face a variety of challenges including incredibly dire demographic trends, geopolitical tension with the U.S., slowing growth, financial distress amongst the property sector and local government financing vehicles, a heavy national debt burden, and deflation.

Area	GDP (Real, YoY)	Inflation (CPI, YoY)	Unemployment
United States	2.9% 9/30/23	3.4% 12/31/23	3.7% 12/31/23
Eurozone	0.0% 9/30/23	2.9% 12/31/23	6.4% 11/30/23
Japan	1.5% 9/30/23	2.4% 12/31/23	2.4% 11/30/23
BRICS Nations	5.0% 9/30/23	1.5% 12/31/23	4.8% 12/31/22
Brazil	2.0% 9/30/23	4.6% 12/31/23	7.5% 11/30/23
Russia	5.5% 9/30/23	7.4% 12/31/23	2.9% 11/30/23
India	7.6% 9/30/23	5.7% 12/31/23	8.7% 12/31/23
China	5.2% 12/31/23	-0.3% 12/31/23	5.1% 12/31/23

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

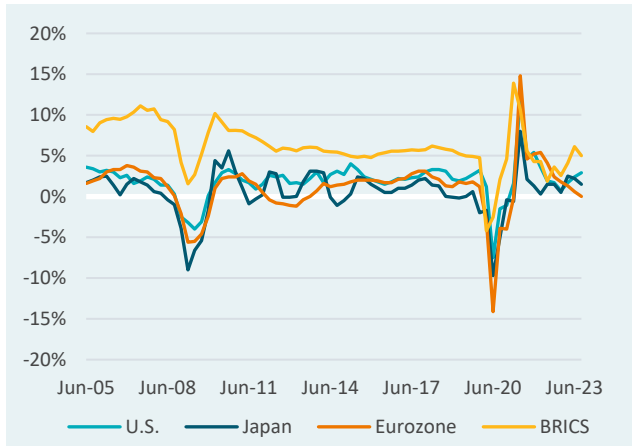
The ongoing threat of inflation, and central banks' tightrope act of working to battle that inflation without tipping economies into recession, was expected to be a key risk of 2024. However, in the fourth quarter inflation has fallen more quickly than expected, while economic growth has generally been more resilient. The global growth picture seems to have improved, all else equal, although growth is still expected to slow materially in the coming quarters.

Although broad macroeconomic conditions improved, additional risks surfaced throughout the quarter, as conflicts within the Middle East escalated. Tensions remain high and concerns around global supply chains

and energy markets have been at the forefront—though impacts across commodity markets have been muted so far.

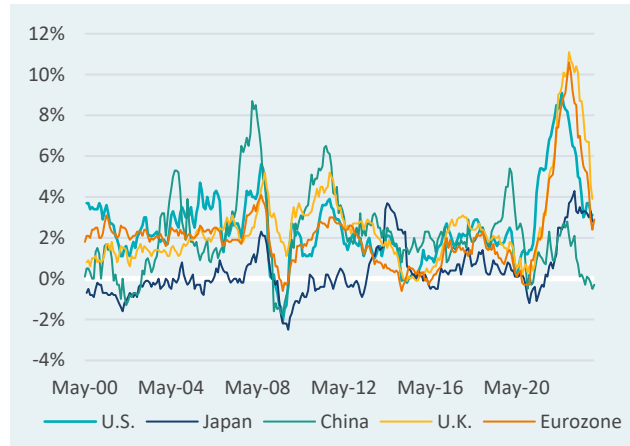
The outlook remains uncertain. Geopolitical tension is still high, especially as the U.S. and China compete for dominance in the technology sector. Developed economies in the Eurozone and Japan are projected by the World Bank to grow less than 1% in 2024, far below historical long-term averages. On the flip side, emerging and developing economies still boast strong growth targets. India is a highlight, as growth expectations for both 2024 and 2025 sit above six-percent.

REAL GDP GROWTH (YEAR-OVER-YEAR)



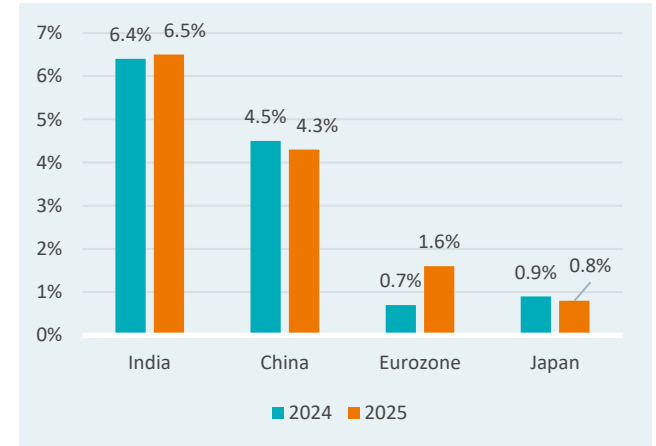
Source: Bloomberg, as of 9/30/23

INFLATION (CPI YEAR-OVER-YEAR)



Source: Bloomberg, as of 12/31/23 – or most recent release

WORLD BANK REAL GDP FORECASTS



Source: World Bank Global Economic Prospects, as of 1/9/24

Fixed income rates & credit

Fixed income environment

- The 10-year U.S. Treasury yield reversed its gains from the prior quarter, falling from 4.58% to 3.88% in Q4, as the market reassessed inflation conditions and the Federal Reserve’s likely path. Further signs that inflation is moderating toward target, along with surprisingly upbeat economic news, likely contributed to the Federal Reserve’s “dovish pivot” as it has been referred to. The 10-year yield ended 2023 unchanged.
- During Q4, credit markets delivered strong results, led by lower-quality bonds such as high yield and bank loans. High yield gained +7.2% (Bbg U.S. Corporate High Yield), while bank loans rose +2.8% (S&P/LSTA Leveraged Loan). Longer duration investment grade corporate bonds (Bloomberg U.S. Long Corporate Credit) rose 14.0% during the quarter as both falling interest rates and narrower credit spreads acted as a tailwind.
- The U.S. yield curve has remained inverted for 1.5 years, which is

among the most extended periods in modern history. This is indicated by the 10-year minus 2-year Treasury yield—ending the year at -35bps, up from -44bps in Q3. Unique attributes of the current economic environment suggest that this curve inversion may not coincide with a near-term recession.

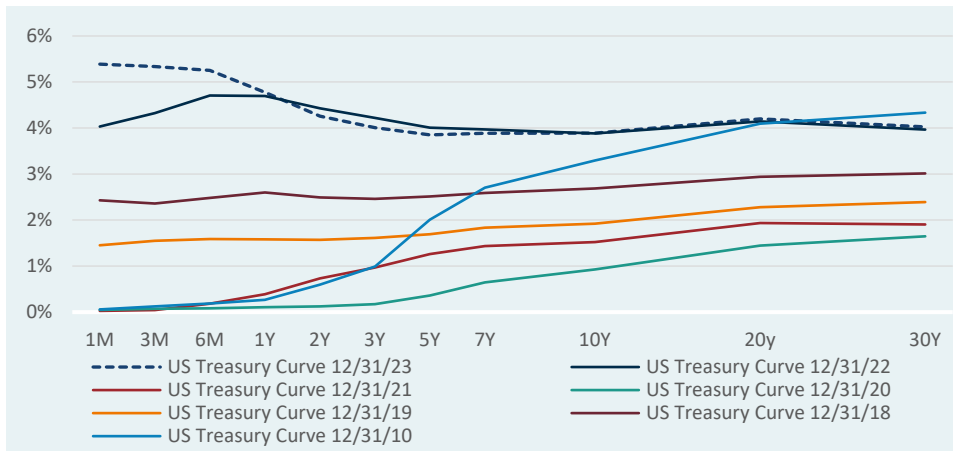
- US interest rates remained steady during the quarter as inflation continued to moderate towards the Federal Reserve Bank's 2.0% target. Importantly, expectations for future rate cuts increased following the statement made by Chairman Powell that future rate hikes may not be required.
- With inflation and economic growth continuing to moderate during the quarter, market expectations for future rate cuts by the Federal Reserve increased. As a result, interest rates across the US Treasury curve declined meaningfully, with shorter-term rates declining more than longer-term rates.

	QTD Total Return	1 Year Total Return
Core Fixed Income (Bloomberg U.S. Aggregate)	6.8%	5.5%
Core Plus Fixed Income (Bloomberg U.S. Universal)	6.8%	6.2%
U.S. Treasuries (Bloomberg U.S. Treasury)	5.7%	4.1%
U.S. Treasuries: Long (Bloomberg U.S. Treasury 20+)	13.4%	2.7%
U.S. High Yield (Bloomberg U.S. Corporate HY)	7.2%	13.4%
Bank Loans (S&P/LSTA Leveraged Loan)	2.8%	13.3%
Emerging Market Debt Local (JPM GBI-EM Global Diversified)	8.1%	12.7%
Emerging Market Debt Hard (JPM EMBI Global Diversified)	9.2%	11.1%
Mortgage-Backed Securities (Bloomberg MBS)	7.5%	5.0%

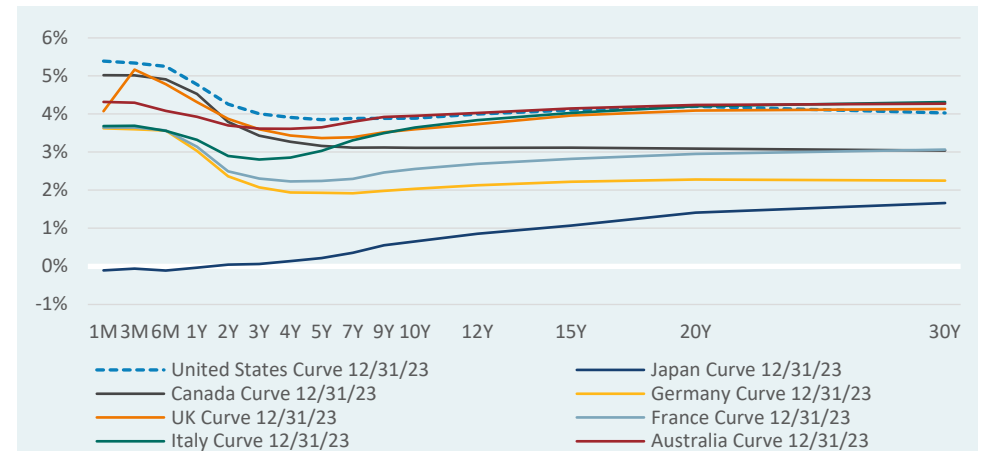
Source: Bloomberg, as of 12/31/23

Yield environment

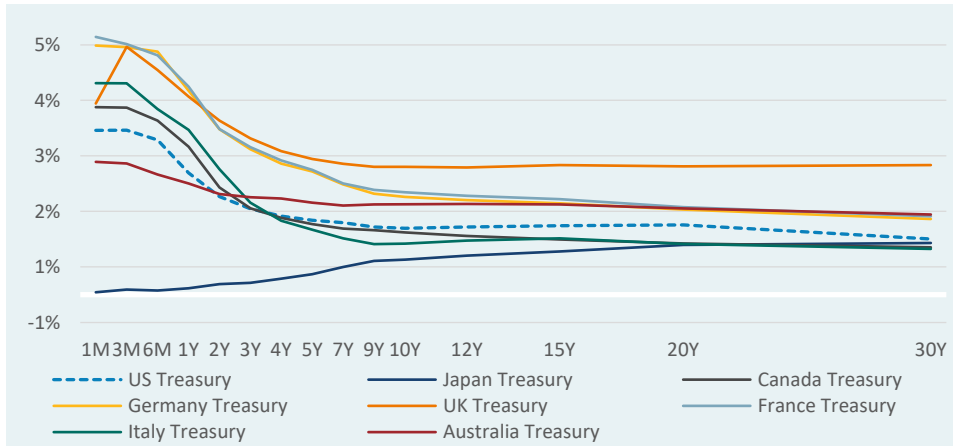
U.S. YIELD CURVE



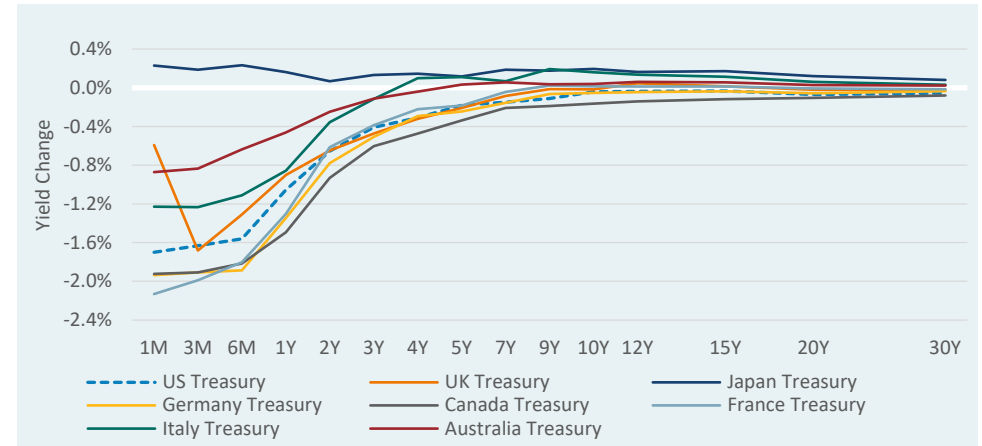
GLOBAL GOVERNMENT YIELD CURVES



YIELD CURVE CHANGES OVER LAST FIVE YEARS



IMPLIED CHANGES OVER NEXT YEAR



Source: Bloomberg, as of 12/31/23

Credit environment

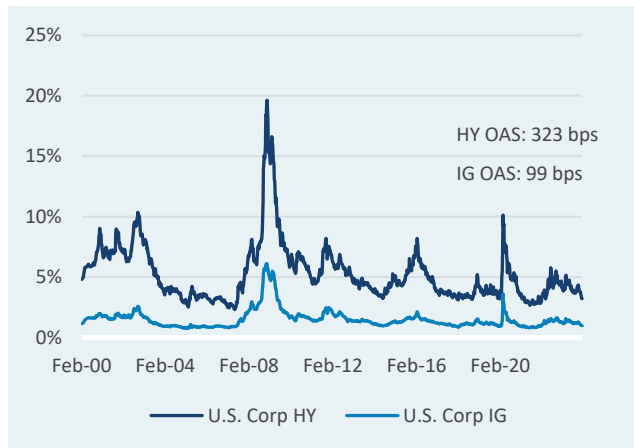
During the fourth quarter, credit markets delivered strong positive results, led by lower-quality credits such as high yield bonds and bank loans. High yield bonds delivered strong results gaining 7.2% (Bbg U.S. Corporate High Yield), while bank loans rose 2.8% (CS Leveraged Loans). Longer duration investment grade corporate bonds (Bloomberg U.S. Long Corporate Credit) rose 14.0% during the quarter as both falling interest rates and narrower credit spreads acted as a tailwind.

Higher-quality BB-rated bonds outperformed lower quality credits during the period returning 7.3% compared to 6.8% and 6.6% for B-rated and CCC-rated bonds, respectively. While absolute returns were positive, bank loans delivered a less-than-impressive 2.8%, primarily due to the

combination of falling interest rates and expectations that the Federal Reserve Bank would begin cutting rates in the future.

Credit spreads narrowed during the quarter despite concerns related to an economic slowdown, weakening corporate fundamentals, and rising geopolitical tensions. Lower-quality, high yield bond spreads fell by 0.6% to roughly 3.2%, while investment grade spreads decreased by roughly 0.2% to 1.0%. Broadly, spreads remain below their long-term historical averages, which suggests that investors remain confident about the ability of those companies to service their debt. That said, slower U.S. economic growth could lead to wider credit spreads as investors seek safety in higher quality assets.

SPREADS



Source: Barclays, Bloomberg, as of 12/31/23

HIGH YIELD BONDS MONTHLY INCOME RETURN



Source: Bloomberg, as of 12/31/23

CREDIT SPREAD (OAS)

Market	12/31/23	12/31/22
Long U.S. Corp	1.2%	1.6%
U.S. Inv Grade Corp	1.0%	1.3%
U.S. High Yield	3.2%	4.7%
U.S. Bank Loans*	5.0%	5.9%

Source: Barclays, Credit Suisse, Bloomberg, as of 12/31/23

*Discount margin (4-year life)

Default & issuance

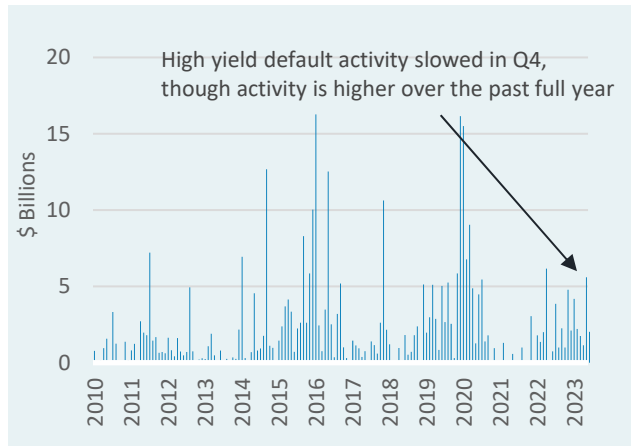
Default activity increased during Q4 as increased borrowing costs acted as a headwind. Eighteen companies defaulted, which were concentrated in the retail, telecommunications, and financial sectors. A total of \$15.8 billion of bank loan and high yield bonds were affected by default or distressed exchanges, up from \$11.5 billion in the prior quarter. Notable company defaults included Rite Aid (Retail), Ligado Networks (Telecommunications), and WeWork (Financial).

For 2023, both the number of defaults and volume increased meaningfully year-over-year. During the period, 88 companies defaulted on \$83.7 billion in high-yield bonds and bank loans compared to 35 companies and \$47.8 billion in 2022. High yield bond default rates have

increased to roughly 2.8%, up from 1.7% a year earlier, but are still below the long-term annual average of roughly 3.2%. High-yield default recovery rates ended the year at 32.8%, down sharply from 55.3% a year ago at the same time.

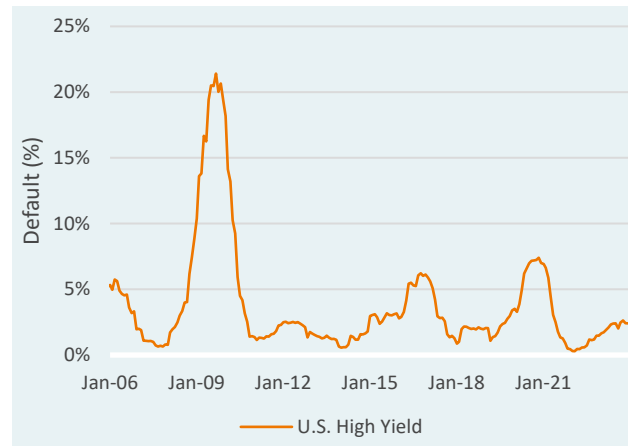
The issuance of investment grade credit slowed from the prior quarter, down to \$204 billion from \$275 billion. With borrowing costs falling as interest rates declined, high-yield bond issuance climbed slightly to \$42 billion, up from \$40 billion in Q3. On a year-over-year basis, the volume of both investment-grade and high yield issuance increased, up \$69.1 billion and \$5.3 billion, respectively.

U.S. HY MONTHLY DEFAULTS (PAR WEIGHTED)



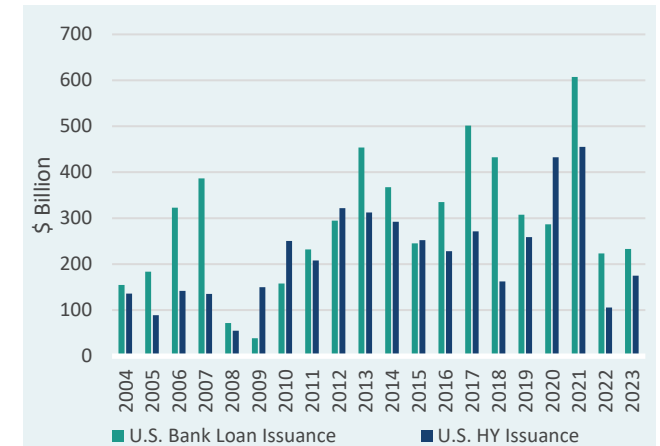
Source: BofA Merrill Lynch, as of 12/31/23

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



Source: BofA Merrill Lynch, as of 12/31/23 – par weighted

DEVELOPED MARKET ISSUANCE (\$ BILLIONS)



Source: BofA Merrill Lynch, all developed markets, as of 12/31/23

Equity

Equity environment

- Domestic equities delivered a strong rally to finish Q4, driven by a combination of better-than-expected Q3 earnings and signals of easing from the Federal Reserve. The S&P 500 Index gained +26.3% during 2023.
- U.S. equities (S&P 500 +11.7%) led international developed equities (MSCI EAFE +10.4%) and emerging market equities (MSCI EM +7.9%) during the quarter. Domestic equities also led non-U.S. equities over the full year, while emerging markets were laggards. Wide sector performance differences contributed to U.S. leadership, given the much heavier tech focus of the domestic market.
- The U.S. dollar fell sharply, as investors reassessed Federal Reserve policy and interest rates retraced lower. This move created a tailwind for investors with unhedged exposure to foreign currencies. On a trade-weighted basis, the value of the U.S. dollar fell -4.3%. However, over the full calendar year investors with unhedged currency exposure saw moderate losses, due to wide fluctuations of the dollar.
- Style factor investing delivered mixed performance for investors in Q4. Over the full year, style investing suffered substantially. Small cap underperformed by -9.6% while value stocks underperformed growth by a whopping -31.2%. Besides an extreme period during 2020, calendar year 2023 was the worst 1-year rolling period in more than two decades.
- The Cboe VIX implied volatility index moved even lower during the fourth quarter, from 17.5 to 12.5 in December. Priced volatility is incredibly low—at a level that has historically tended to coincide with very strong economic and market conditions.

	QTD TOTAL RETURN		1 YEAR TOTAL RETURN	
	(unhedged)	(hedged)	(unhedged)	(hedged)
U.S. Large Cap (S&P 500)	11.7%		26.3%	
U.S. Small Cap (Russell 2000)	14.0%		16.9%	
U.S. Equity (Russell 3000)	12.1%		26.0%	
U.S. Large Value (Russell 1000 Value)	9.5%		11.5%	
US Large Growth (Russell 1000 Growth)	14.2%		42.7%	
Global Equity (MSCI ACWI)	11.0%	9.7%	22.2%	22.7%
International Large (MSCI EAFE)	10.4%	6.0%	18.2%	19.9%
Eurozone (EURO STOXX 50)	13.3%	9.3%	26.5%	25.6%
U.K. (FTSE 100)	6.9%	2.5%	14.3%	8.8%
Japan (TOPIX)	8.2%	3.6%	19.3%	35.7%
Emerging Markets (MSCI Emerging Markets)	7.9%	5.7%	9.8%	10.1%

Source: Russell Investments, MSCI, STOXX, FTSE, JPX, as of 12/31/23

Domestic equity

Domestic equities finished the fourth quarter with a strong rally, driven by a combination of better-than-expected Q3 earnings and signals of easing from the Federal Reserve. The S&P 500 Index delivered a gain of +26.3% over 2023, boosted by a +11.7% rise over the final quarter of the year. Shares in the U.S. outperformed international developed and emerging markets over the calendar year.

Third-quarter earnings surprised to the upside, driven by large earnings beats in the communication services and consumer discretionary sectors. Per FactSet, in Q3 earnings grew by 4.9% year-over-year, in contrast to initial expectations of a -0.3% decline at the beginning of the quarter.

From a sector perspective gains were broad, outside of energy. Real estate and information technology outperformed—driven by easing rates on the long-end of the curve and strong demand within the accelerated computing and artificial intelligence space.

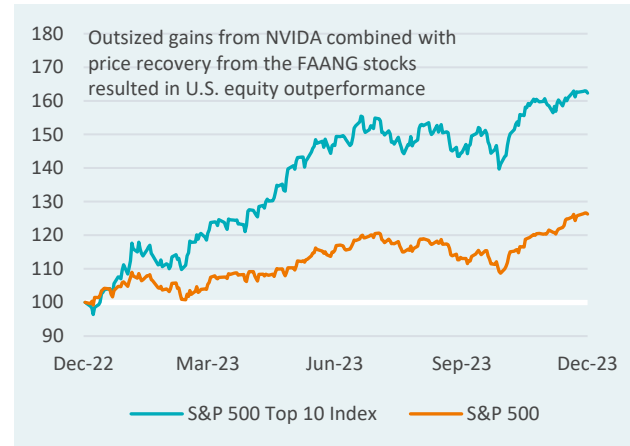
Going forward, domestic equities likely face a challenging environment to build off of the large gains seen in 2023. Valuations remain elevated as the S&P 500 Index approaches a new all-time high. At the same time, earnings growth has been modest, with Q4 earnings expected to come in at +1.3% per FactSet. Although the outlook remains challenged, growth catalysts such as stable inflation, monetary easing, and greater chance of a soft-landing present investors with upside opportunity.

S&P 500 PRICE INDEX



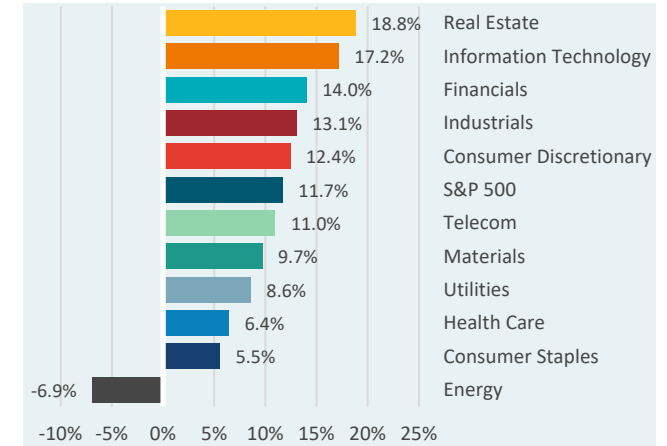
Source: Bloomberg, as of 12/31/23

2023 PERFORMANCE (INDEX 100)



Source: Bloomberg, S&P, as of 12/31/23

Q4 2023 SECTOR PERFORMANCE



Source: Morningstar, as of 12/31/23

Domestic equity size & style

Style factor investing delivered mixed performance for investors in the fourth quarter. Small cap outperformed large cap by +2.0% during Q4 (Russell 2000 vs. Russell 1000). Value underperformed Growth by -3.2% (Russell 1000 Value vs. Russell 1000 Growth). Over the full year, style investing suffered substantially. Small cap underperformed by -9.6% while value stocks underperformed growth by a whopping -31.2%. Besides an extreme period during 2020, calendar year 2023 was the worst 1-year rolling period in more than two decades.

The wide variability of style investing continues to be fueled by extreme sector volatility. For example, the information technology sector, which tends to be more concentrated in growth stocks, performed +57.8% in

2023. Meanwhile, utilities and energy sectors, which tend to be more concentrated in value stocks, performed -7.1% and -1.3%, respectively. Mega cap growth stocks have propelled the U.S. market higher in 2023—a reversal from significant losses in 2022. Many market-leading stocks are concentrated in technology and telecom sectors, which have outperformed the overall index (+57.8% and +55.8%, respectively).

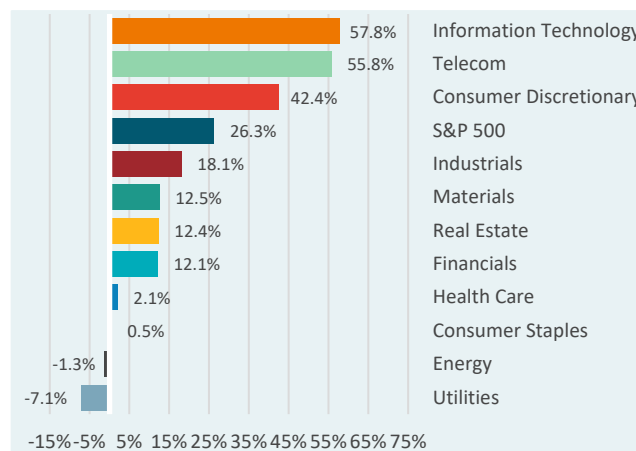
We believe sector variability and the way this has contributed to style factor volatility is further evidence that style investing should be a long-term decision. Short-term factor timing decisions should typically be pursued only in the rare occasion of obvious market mispricing and a foreseen catalyst for price correction.

VALUE VS. GROWTH 1-YR ROLLING



Source: FTSE, as of 12/31/23

VALUE VS GROWTH (YOY)



Source: Morningstar, as of 12/31/23

1-YEAR SIZE & STYLE PERFORMANCE

	Value	Core	Growth
Large Cap	11.5%	26.5%	42.7%
Mid Cap	12.7%	17.2%	25.9%
Small Cap	14.6%	16.9%	18.7%

Source: FTSE, as of 12/31/23

International developed equity

International developed equities also benefited from shifting expectations around Federal Reserve policy in the fourth quarter, with the MSCI EAFE Index delivering a +10.4% gain in unhedged currency terms. Fading dollar strength provided a large boost, as expectations for potential easing from the Federal Reserve contrasted against shifting policy from the ECB and BOE.

In terms of relative performance, international developed shares trailed the U.S., but outperformed emerging market equities. Sector weightings played the largest role, as gains from mega-cap technology names drove domestic

performance, contrasting against the heavier financials and industrial sector composition of the MSCI EAFE index.

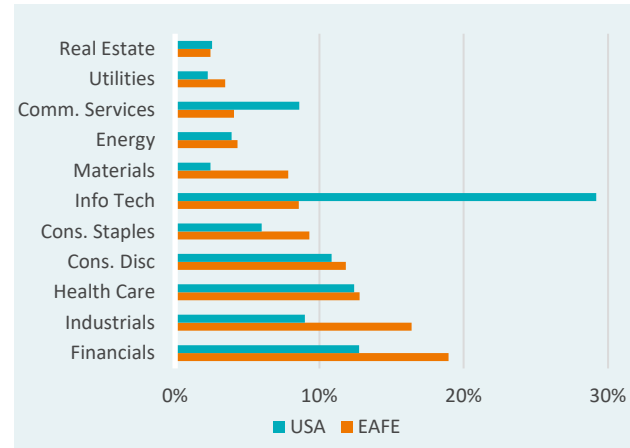
Despite macroeconomic challenges, international developed equities saw strong performance in 2023, up +18.2% in unhedged dollar terms. Japanese shares continued to benefit from zero-interest rate policy and shifting investment away from China and into Japan. European shares were lifted by better-than-expected global growth and the ability for companies to pass off higher prices – resulting in strong earnings.

INTERNATIONAL DEVELOPED EQUITY



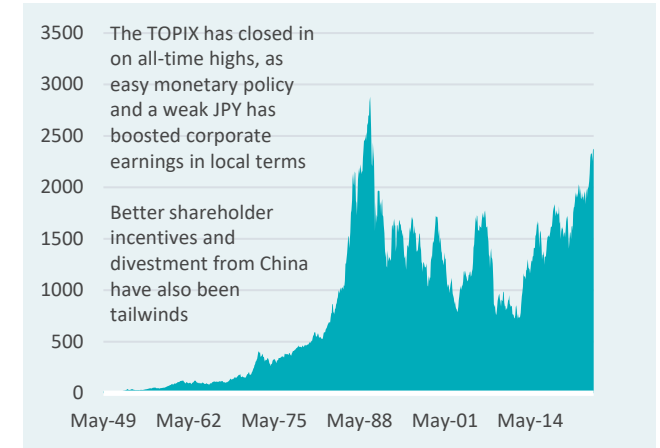
Source: MSCI, as of 12/31/23

MSCI EAFE VS. USA SECTOR WEIGHTING



Source: MSCI, as of 12/31/23

JAPAN TOPIX PRICE INDEX



Source: Tokyo Stock Exchange, as of 12/31/23

Emerging market equity

Emerging markets saw a positive end to 2023, rising +7.9% in the fourth quarter – helping to notch a +9.8% gain for the index over the 2023 calendar year. While rebounding from losses seen last year (-20.1% decline in 2022), emerging market equities underperformed both domestic and international developed equities for the second straight year.

Most countries within the index saw positive returns in the last quarter of the year, fueled by the broader rally in risk assets as U.S. monetary policy expectations eased. China was the outlier, declining -4.2%.

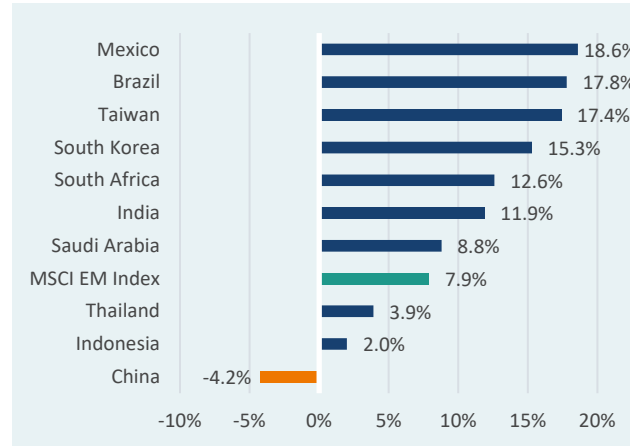
Chinese shares remain the elephant in the room within emerging markets. The MSCI EM ex China Index outperformed the flagship index by more than 10% in 2023, which highlights the large drag that China has caused, given its nearly 30% country weight in the index. The country continues to face a variety of challenges including incredibly dire demographic trends, geopolitical tension with the U.S., slowing growth, financial distress amongst the property sector and local government financing vehicles, a heavy national debt burden, and deflation. Combined with further consolidation of power within the CCP, the cheap pricing of Chinese equities may be justified.

EMERGING MARKET EQUITY



Source: MSCI, as of 12/31/23

Q4 2023 MSCI EM COUNTRY RETURNS (USD)



Source: Bloomberg, MSCI, as of 12/31/23

MSCI EM VS. EM EX CHINA (GROWTH \$100K)



Source: Bloomberg, MSCI, as of 12/31/23

Equity valuations

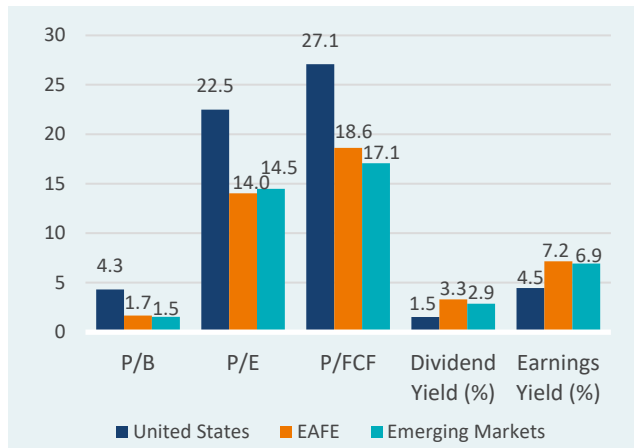
U.S. equity valuation drifted further above those of non-U.S. equities during the quarter. The domestic market is priced at a historic 71% premium over emerging market equities, up from a 59% premium in the third quarter. A portion of the U.S. pricing premium is due to a larger U.S. technology sector, which tends to demand higher valuations, though the valuation gap remains wide even after adjusting for sector composition.

The lower valuations of international developed equities may be at least partly justified due to weaker growth potential and unique challenges in those markets, though rising valuations create a high bar for future profit growth. In order for U.S. equities to justify high valuations over the

longer-term, business will need to generate supernormal earnings growth, and/or stock multiples will need to move upward even further.

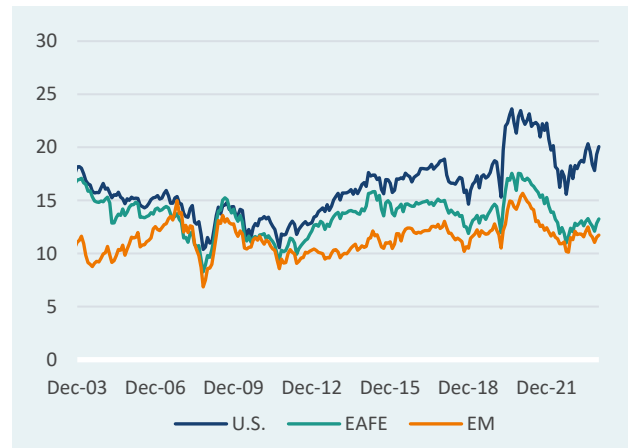
U.S. equity market valuations seem to have defied rising interest rates. Theoretically (and historically) speaking, equities should be fairly sensitive to sharply higher interest rates—the present value of stocks is less when rates are high due to the discounting effect, higher interest rates damage profits as financing is more expensive, and the overall economy tends to slow as borrowing costs rise which bodes poorly for profits. At least for now, the U.S. market remains richly valued and median bank forecasts are for a healthy 2024 S&P 500 return.

MSCI VALUATION METRICS (3-MONTH AVG)



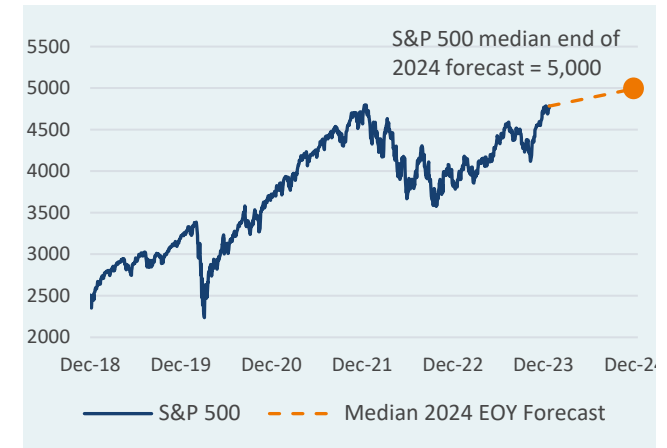
Source: Bloomberg, as of 12/31/23

FORWARD PRICE/EARNINGS RATIO



Source: MSCI, Bloomberg, as of 12/31/23

2024 S&P 500 MEDIAN FORECAST



Source: Bloomberg, as of 1/10/24. Banks included in forecast include J.P. Morgan, Goldman Sachs, Bank of America, Citibank, Morgan Stanley, Deutsche Bank, and UBS.

Market volatility

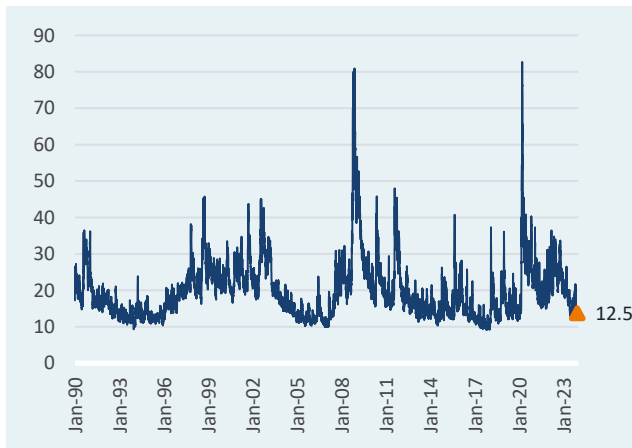
The Cboe VIX implied volatility index moved even lower during the fourth quarter, from 17.5 to 12.5 in December. Priced volatility is incredibly low—at a level that has historically tended to coincide with very strong economic and market conditions.

Realized volatility of global equity markets over the past year has also moderated. The relative volatility of markets has moved back in line with historical behavior—U.S. equities showing the lowest volatility, followed closely by international developed equities, and with emerging market

equities delivering greater risk. This behavior is a reversal of recent years when emerging market volatility was lower than that of developed markets—an uncommon occurrence historically speaking.

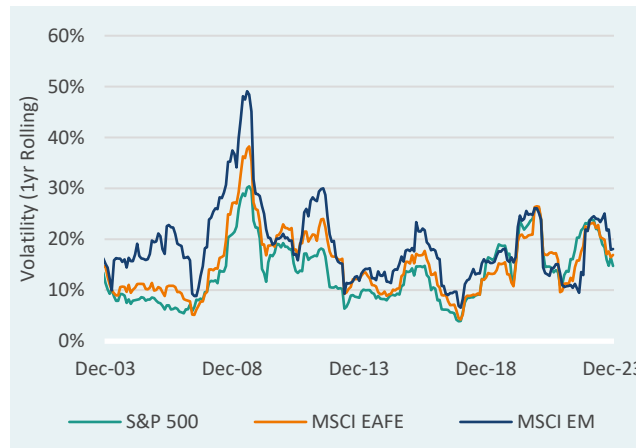
Bond markets remain shaky, as indicated by the “MOVE” Index—which calculates the implied volatility of U.S. Treasury securities. Uncertainty around inflation, the Federal Reserve’s interest rate path and the extent of rate cuts, potential recession, and fears around the U.S. fiscal situation, are likely to act as an ongoing support to volatility.

U.S. IMPLIED VOLATILITY (VIX)



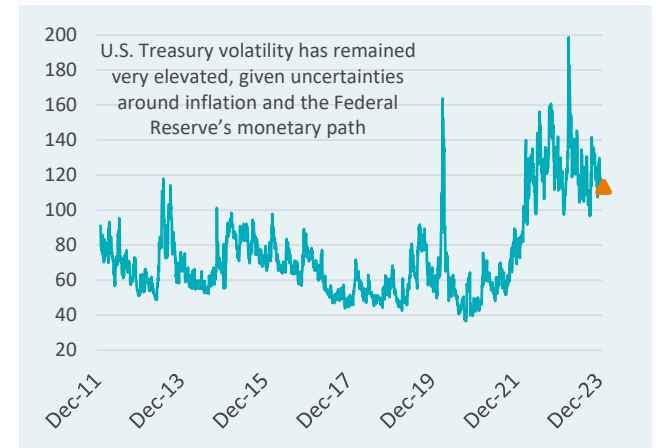
Source: Cboe, as of 12/31/23

REALIZED VOLATILITY



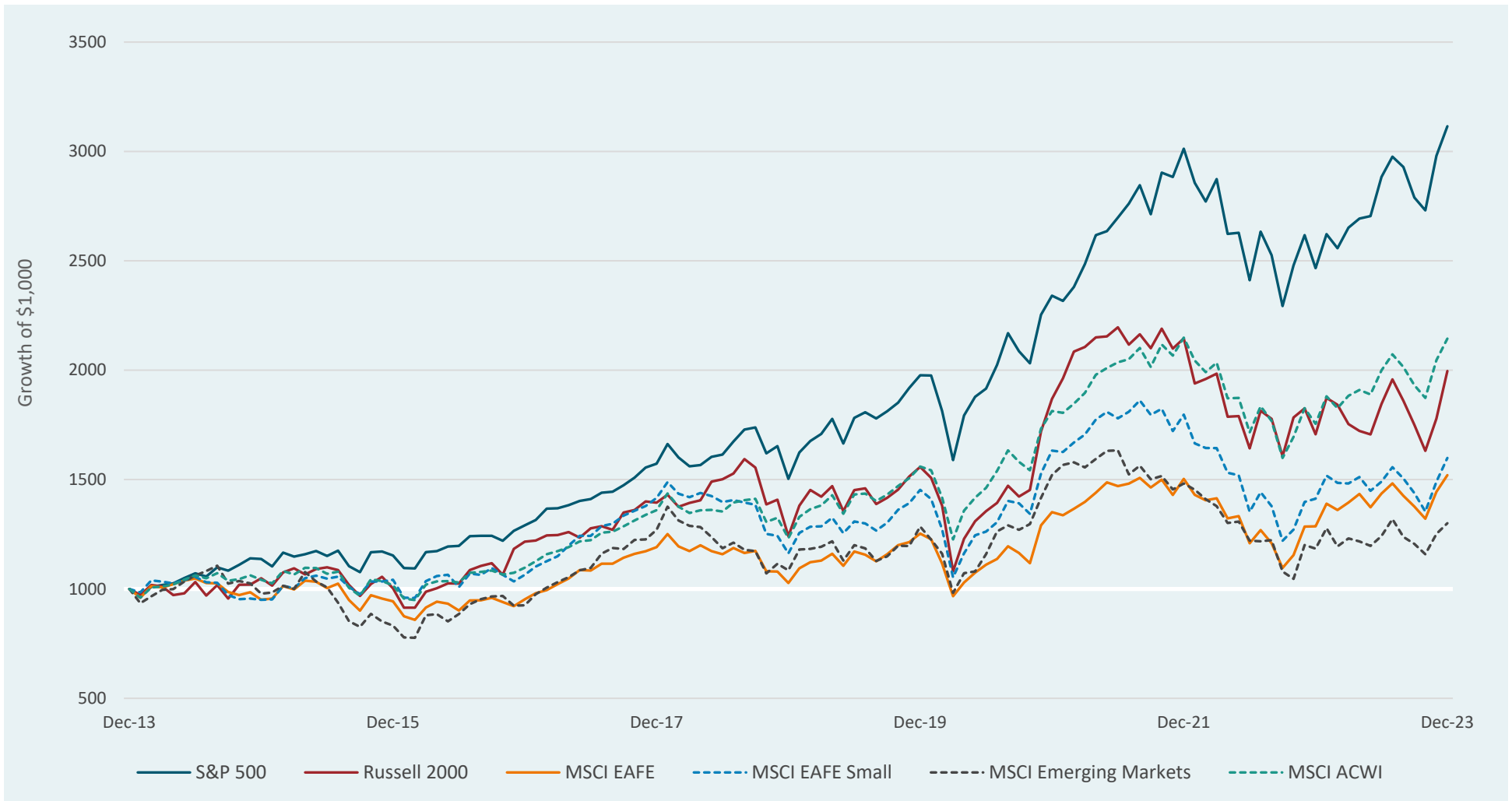
Source: S&P, MSCI, as of 12/31/23

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



Source: Bloomberg, as of 12/31/23

Long-term equity performance



Source: MPI, as of 12/31/23

Other assets

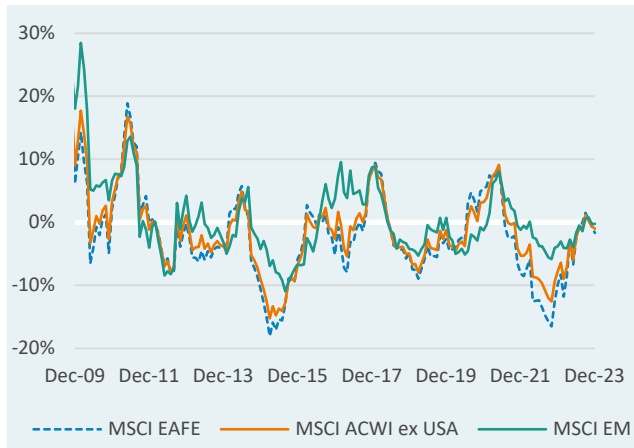
Currency

The U.S. dollar fell sharply in the fourth quarter, as investors reassessed Federal Reserve policy and interest rates retraced lower. This move created a tailwind for investors with unhedged exposure to foreign currencies. On a trade-weighted basis, the value of the U.S. dollar fell -4.3%. However, following wide fluctuations of the dollar during 2023, and the performance volatility that resulted, investors with unhedged foreign currency exposure saw moderate losses. For investors with unhedged international developed equity exposure, this delivered a loss of -1.7%. Unhedged exposure to emerging market currencies resulted in a loss of -0.2%.

As investors evaluate market movements and performance of 2023, it may be worth reflecting on the benefits which a more thoughtful

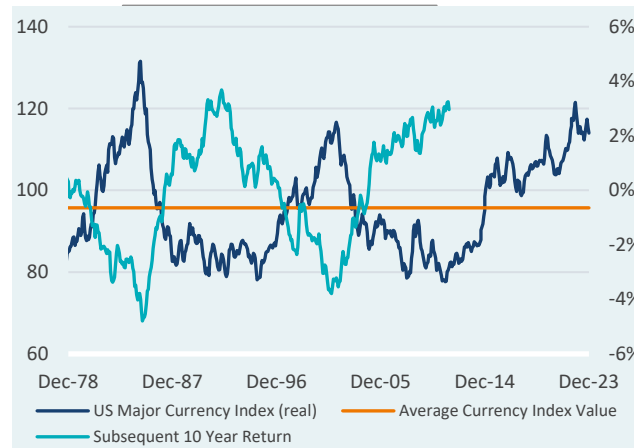
currency approach might deliver. A better approach may reduce the uncompensated risk of unhedged foreign currency exposure. Additionally, the MSCI Currency Factor Mix Index—a representation of a passive investment in the currency market, by investing in currencies with higher interest rates, currencies 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 what was delivered in 2023. During the year, an unhedged exposure to currency markets (assuming MSCI EAFE equity implementation) resulted in a loss of -1.7% and volatility of 7.5%. Meanwhile, an implementation to Currency Factor Mix delivered a gain of +1.4% and volatility of 2.5%.

EFFECT OF CURRENCY (1-YEAR ROLLING)



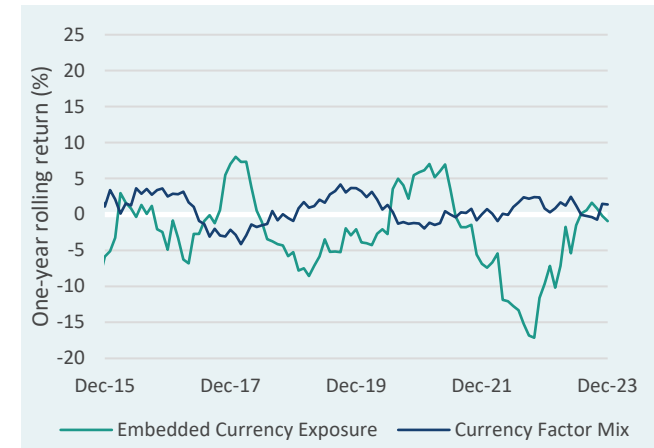
Source: MSCI, as of 12/31/23

U.S. DOLLAR MAJOR CURRENCY INDEX



Source: Bloomberg, as of 12/31/23

EMBEDDED CURRENCY VS CURRENCY FACTORS



Source: Bloomberg, MSCI, as of 12/31/23

Event strategies lead in equity, credit

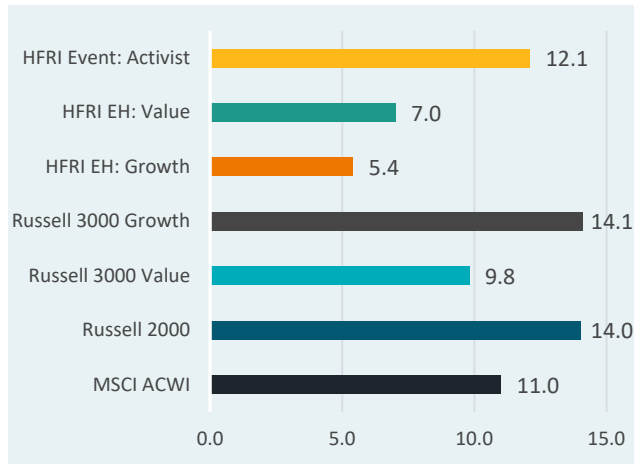
Stock and credit markets rallied in the fourth quarter, and directionally biased strategies within those markets outperformed non-directional peers. Within the equity focused strategy group:

- Activist strategies, which benefited from their smaller cap exposure, continued their run of strong performance with favorable up capture relative to L/S peers.
- Interestingly, value managers outperformed growth counterparts despite growth indexes outperforming value, likely due to a smaller cap bias.

Within the fixed income / credit focused strategy group:

- Event Driven credit strategies such as Distressed and Credit Arbitrage outperformed Relative Value credit strategies such as Structured Credit and Long/Short Credit, as market directionality paid off and economic optimism benefited special situation, catalyst-oriented positioning.
- Event Driven strategies have outperformed both stocks and high yield over the last few years after struggling to keep up in the decade following the Global Financial Crisis.

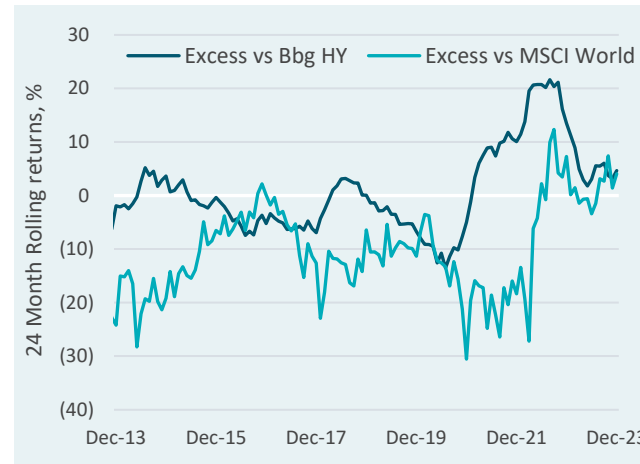
4Q RETURNS (%) FOR EQUITY STRATEGIES



Source: HFR, MPI. Data as of 12/31/23

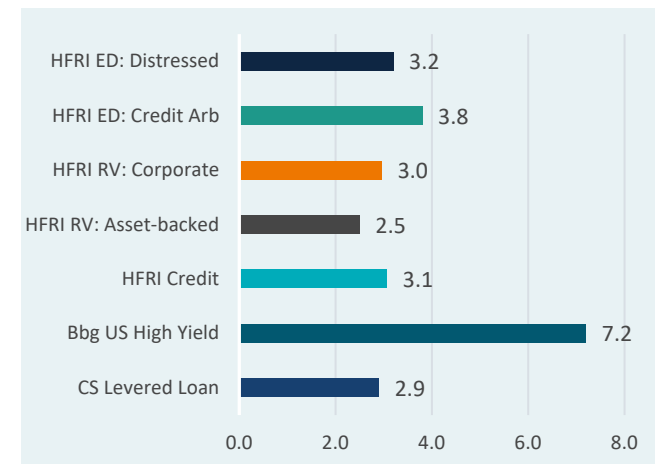
EH = Equity Hedge ED = Event Driven

HFRI EVENT DRIVEN RETURNS VS STOCKS/HY



Source: HFR, MPI. Data as of 12/31/23 HFRI Event Driven (Total) vs Bloomberg US Corp HY & MSCI World Index

4Q RETURNS (%) FOR CREDIT STRATEGIES



Source: HFR, MPI. Data as of 12/31/23

ED = Event Driven RV = Relative Value

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	42.7	19.5	14.9
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	26.5	15.5	11.8
Small Cap Growth	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	18.7	10.9	8.4
International Equity	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	18.2	10.0	7.4
Small Cap Equity	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	16.9	10.0	7.2
60/40 Global Portfolio	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	15.4	9.2	7.2
Small Cap Value	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	14.6	8.2	6.8
Large Cap Value	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	11.5	7.2	5.1
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	9.8	7.0	4.3
Hedge Funds of Funds	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	6.3	5.3	3.3
US Bonds	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	5.5	5.1	2.7
Cash	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	5.0	3.7	1.8
Real Estate	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	-5.1	1.8	1.2
Commodities	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	-7.9	1.1	-1.1

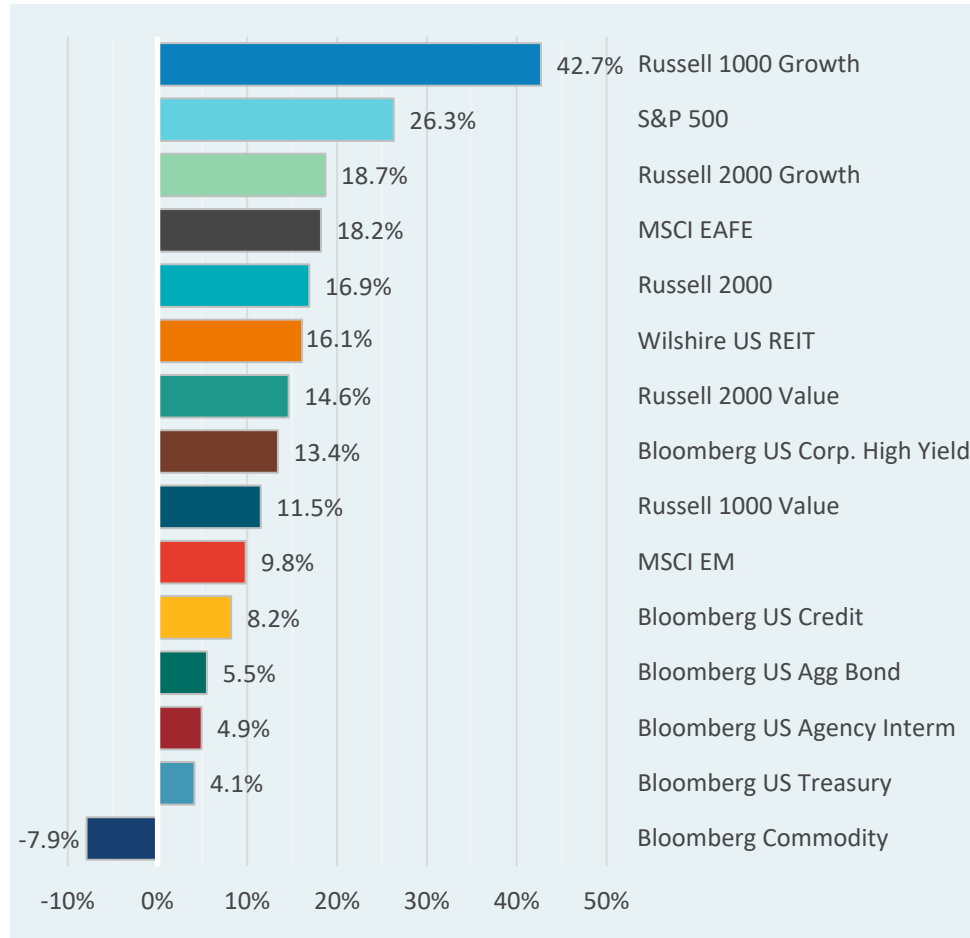
BEST
↑
↓
WORST

 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	

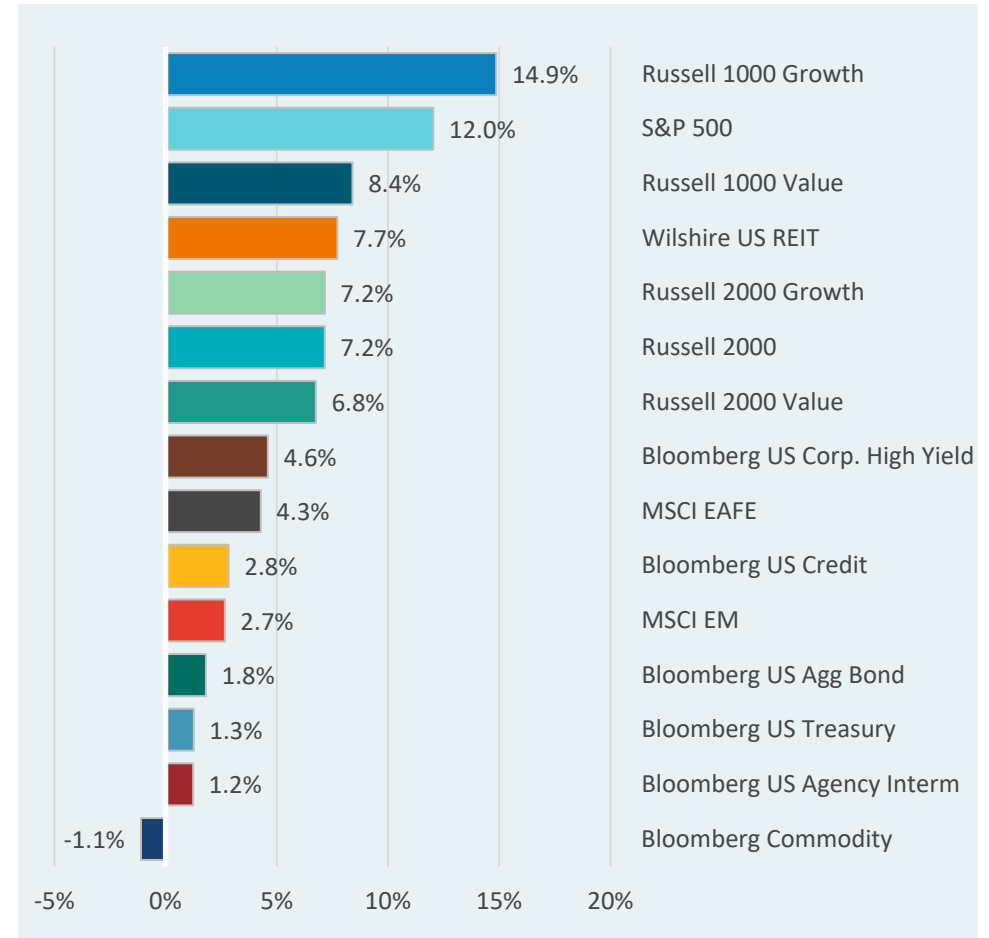
Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Growth, Russell 2000, Russell 2000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, Bloomberg US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, Bloomberg Global Bond. NCREIF Property Index performance data as of 9/30/23.

Major asset class returns

ONE YEAR ENDING DECEMBER



TEN YEARS ENDING DECEMBER



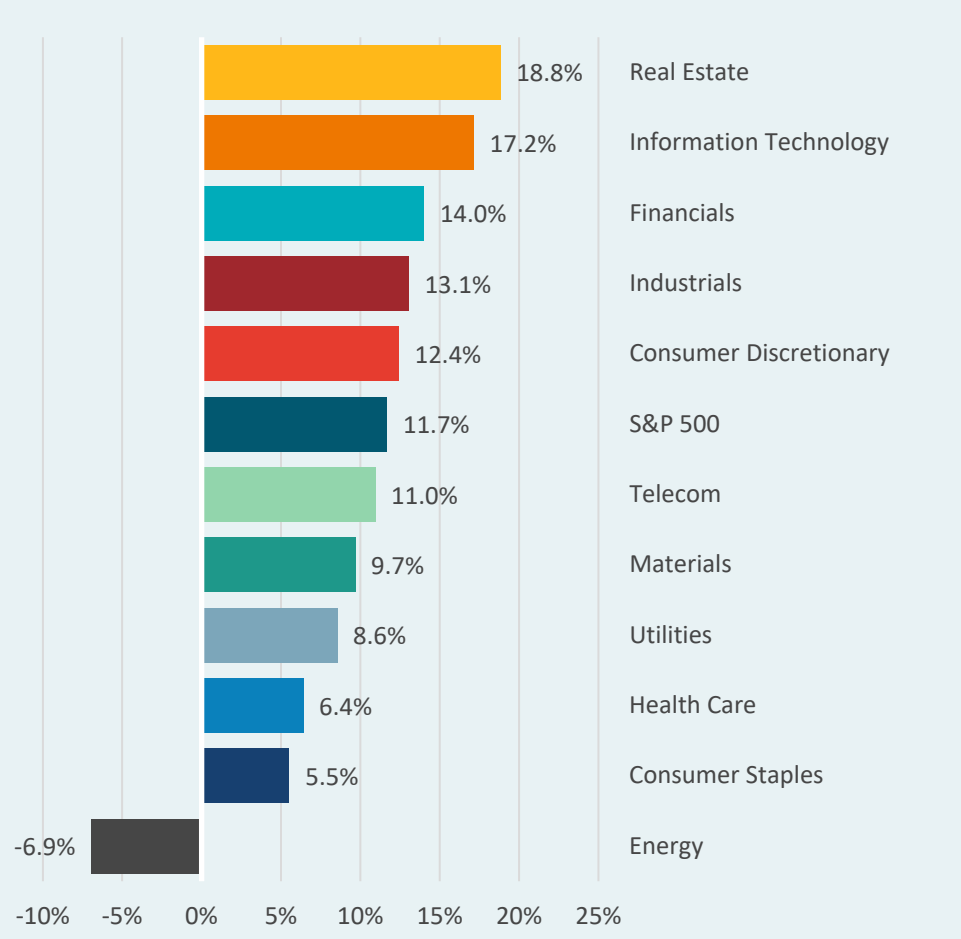
*Only publicly traded asset performance is shown here. Performance of private assets is typically released with a 3- to 6-month delay.

Source: Morningstar, as of 12/31/23

Source: Morningstar, as of 12/31/23

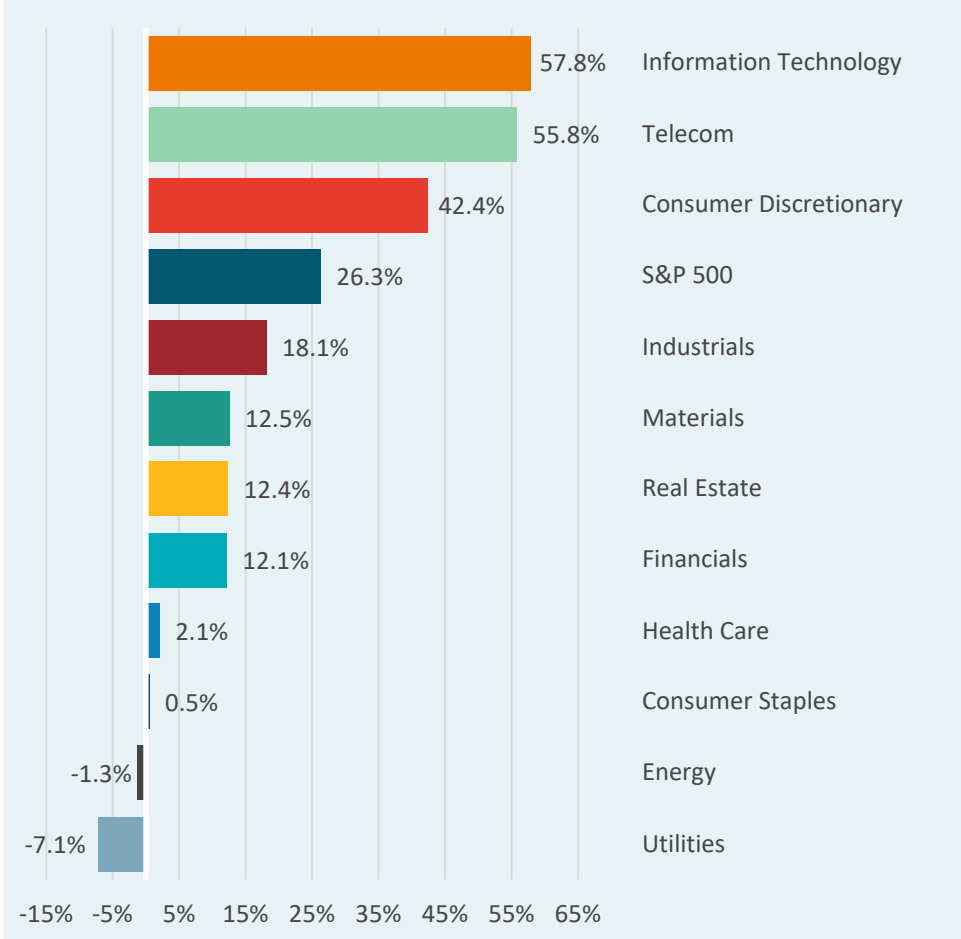
S&P 500 sector returns

QTD



Source: Morningstar, as of 12/31/23

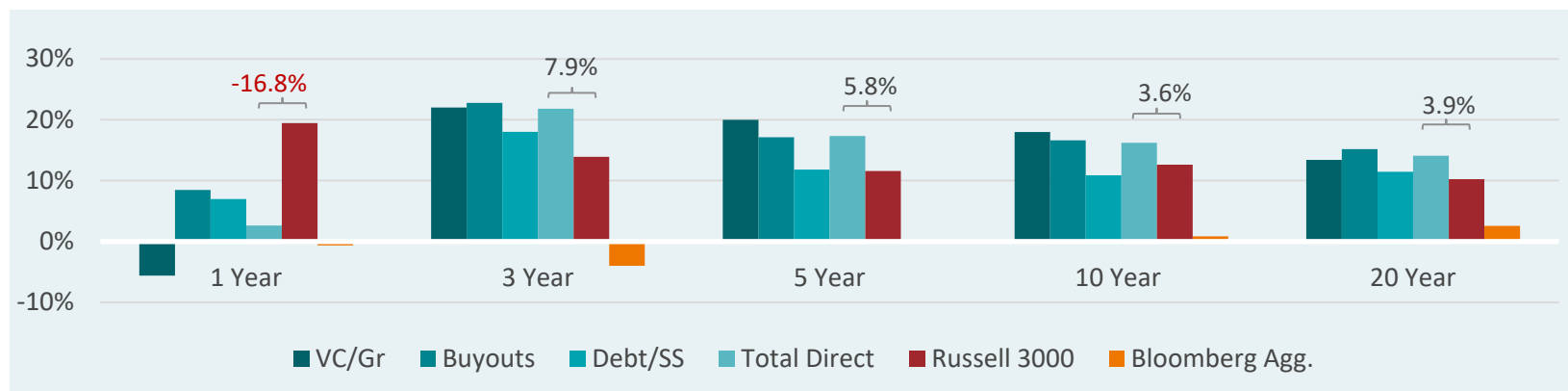
ONE YEAR ENDING DECEMBER



Source: Morningstar, as of 12/31/23

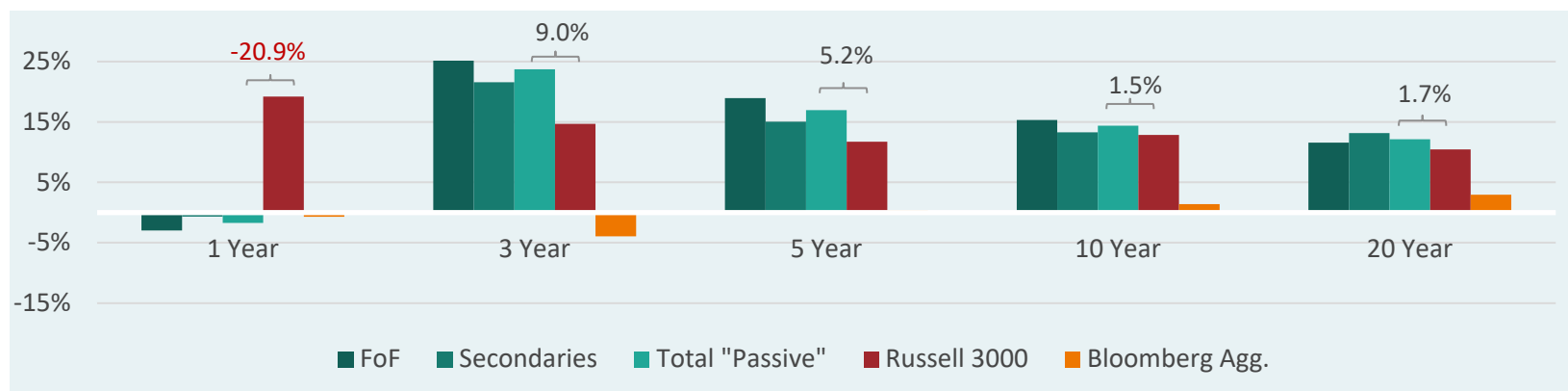
Private equity vs. traditional assets performance

DIRECT PRIVATE EQUITY FUND INVESTMENTS



Direct P.E Fund Investments outperformed comparable public equities across all time periods, aside from the 1-year.

"PASSIVE" STRATEGIES

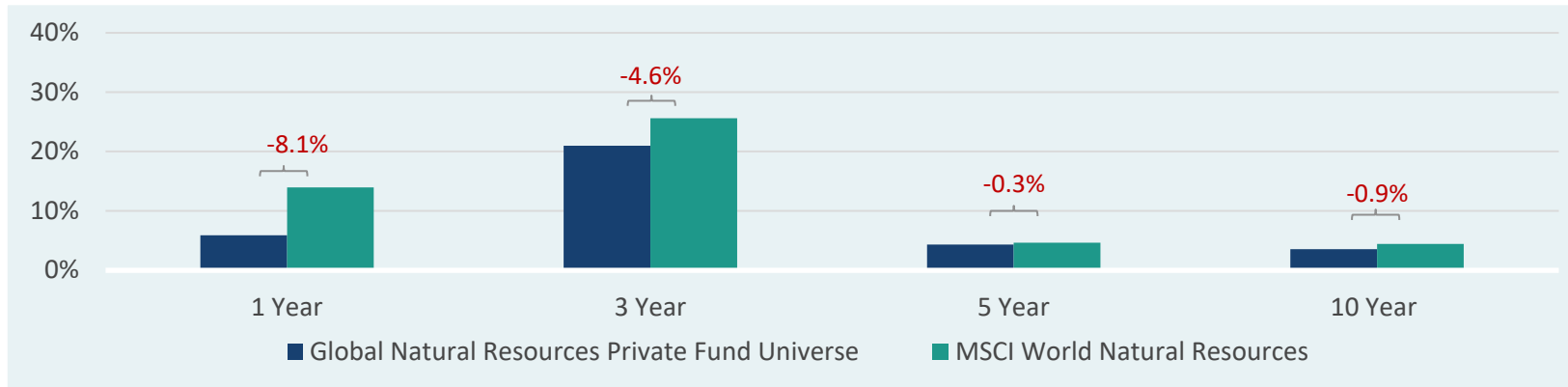


"Passive" strategies outperformed comparable public equities across all time periods, aside from the 1-year.

Sources: Refinitiv PME: U.S. Private Equity Funds sub asset classes as of June 30, 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.

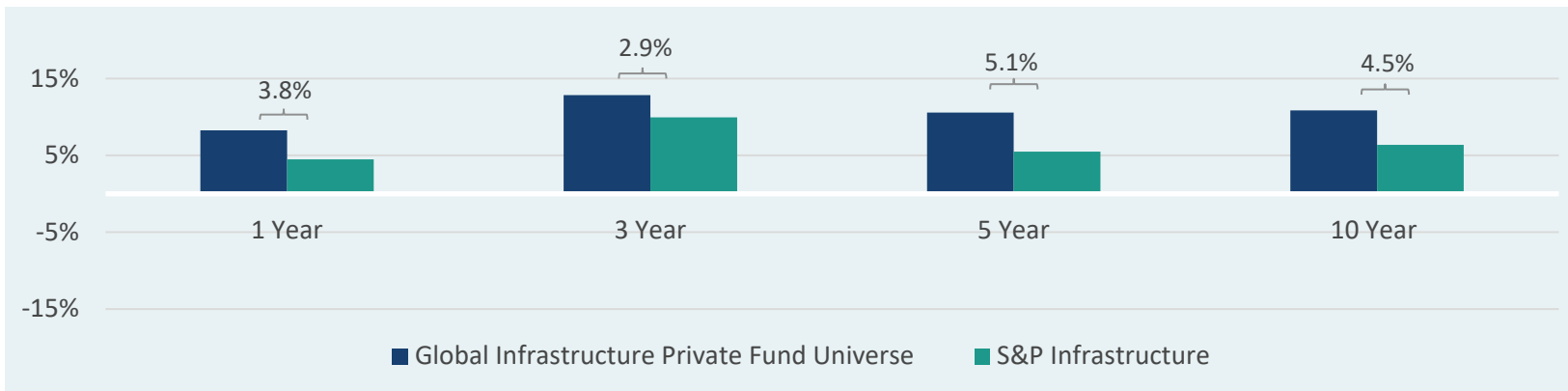
Private vs. liquid real assets performance

GLOBAL NATURAL RESOURCES FUNDS



N.R. funds underperformed the MSCI World Natural Resources benchmark across all periods.

GLOBAL INFRASTRUCTURE FUNDS

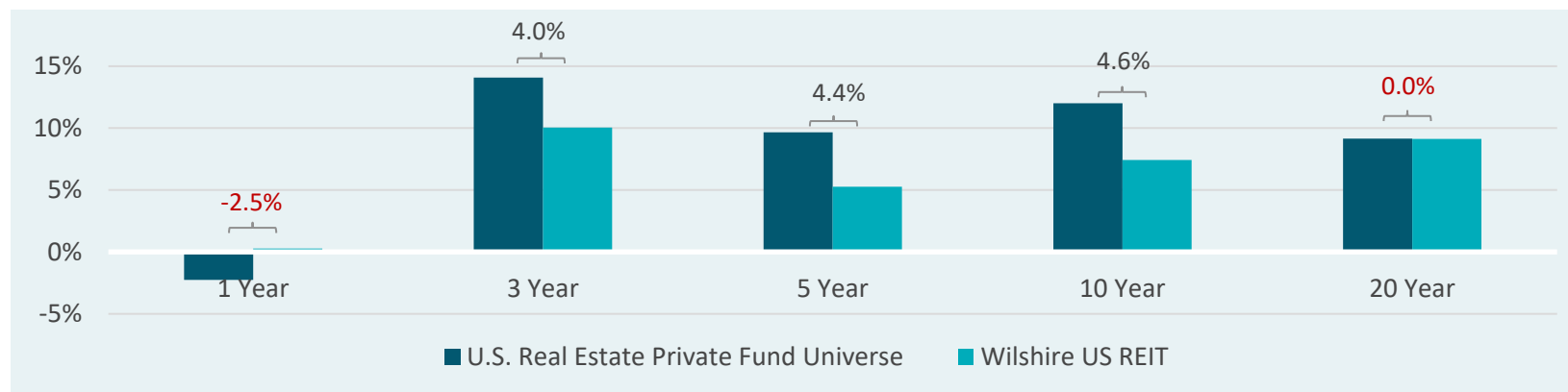


Infra. funds outperformed the S&P Infra. across all periods.

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 June 30, 2023. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real assets universes.

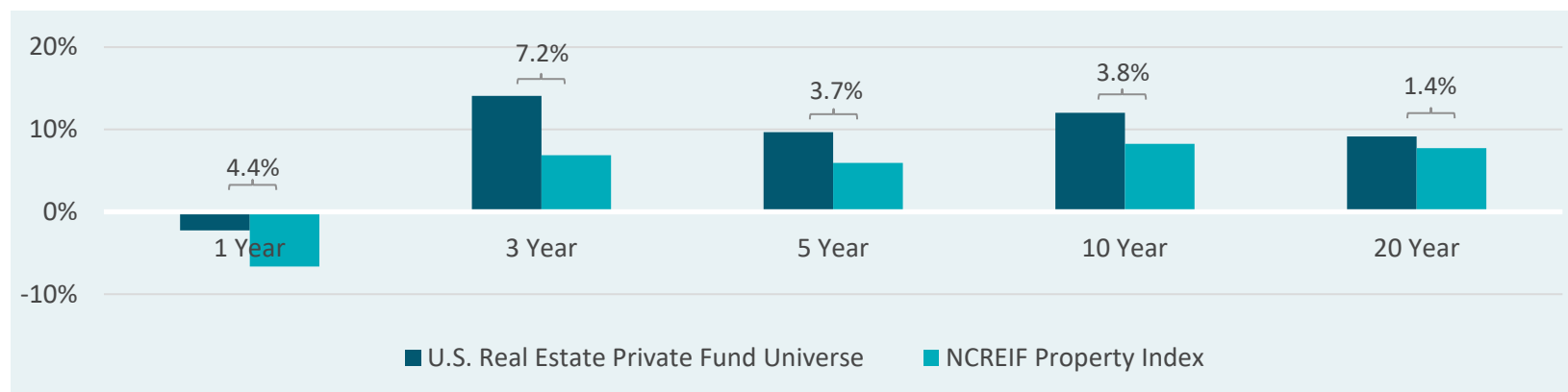
Private vs. liquid and core real estate performance

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



U.S. Private R.E. fund performance relative to the Wilshire U.S. REIT Index has been mixed.

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 June 30, 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	4.5	11.7	26.3	26.3	10.0	15.7	12.0
S&P 500 Equal Weighted	6.9	11.9	13.9	13.9	9.3	13.8	10.4
DJ Industrial Average	4.9	13.1	16.2	16.2	9.4	12.5	11.1
Russell Top 200	4.1	11.7	29.9	29.9	10.0	16.5	12.7
Russell 1000	4.9	12.0	26.5	26.5	9.0	15.5	11.8
Russell 2000	12.2	14.0	16.9	16.9	2.2	10.0	7.2
Russell 3000	5.3	12.1	26.0	26.0	8.5	15.2	11.5
Russell Mid Cap	7.7	12.8	17.2	17.2	5.9	12.7	9.4
Style Index							
Russell 1000 Growth	4.4	14.2	42.7	42.7	8.9	19.5	14.9
Russell 1000 Value	5.5	9.5	11.5	11.5	8.9	10.9	8.4
Russell 2000 Growth	12.0	12.7	18.7	18.7	(3.5)	9.2	7.2
Russell 2000 Value	12.4	15.3	14.6	14.6	7.9	10.0	6.8

INTERNATIONAL EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
MSCI ACWI	4.8	11.0	22.2	22.2	5.7	11.7	7.9
MSCI ACWI ex US	5.0	9.8	15.6	15.6	1.5	7.1	3.8
MSCI EAFE	5.3	10.4	18.2	18.2	4.0	8.2	4.3
MSCI EM	3.9	7.9	9.8	9.8	(5.1)	3.7	2.7
MSCI EAFE Small Cap	7.3	11.1	13.2	13.2	(0.7)	6.6	4.8
Style Index							
MSCI EAFE Growth	5.7	12.7	17.6	17.6	0.3	8.8	5.1
MSCI EAFE Value	4.9	8.2	19.0	19.0	7.6	7.1	3.2
Regional Index							
MSCI UK	4.5	6.9	14.1	14.1	8.8	6.9	2.5
MSCI Japan	4.4	8.2	20.3	20.3	0.7	6.9	5.0
MSCI Euro	4.4	12.9	25.2	25.2	6.0	9.3	4.1
MSCI EM Asia	3.3	6.7	7.8	7.8	(6.9)	4.3	4.1
MSCI EM Latin American	8.3	17.6	32.7	32.7	9.9	6.1	2.1

FIXED INCOME

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
Bloomberg US TIPS	2.7	4.7	3.9	3.9	(1.0)	3.2	2.4
Bloomberg US Treasury Bills	0.5	1.4	5.1	5.1	2.1	1.9	1.3
Bloomberg US Agg Bond	3.8	6.8	5.5	5.5	(3.3)	1.1	1.8
Bloomberg US Universal	3.8	6.8	6.2	6.2	(3.0)	1.4	2.1
Duration							
Bloomberg US Treasury 1-3 Yr	1.2	2.6	4.3	4.3	(0.1)	1.3	1.0
Bloomberg US Treasury Long	8.6	12.7	3.1	3.1	(11.4)	(1.2)	2.3
Bloomberg US Treasury	3.4	5.7	4.1	4.1	(3.8)	0.5	1.3
Issuer							
Bloomberg US MBS	4.3	7.5	5.0	5.0	(2.9)	0.3	1.4
Bloomberg US Corp. High Yield	3.7	7.2	13.4	13.4	2.0	5.4	4.6
Bloomberg US Agency Interm	1.6	3.2	4.9	4.9	(1.1)	1.1	1.2
Bloomberg US Credit	4.2	8.2	8.2	8.2	(3.2)	2.4	2.8

OTHER

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Index							
Bloomberg Commodity	(2.7)	(4.6)	(7.9)	(7.9)	10.8	7.2	(1.1)
Wilshire US REIT	10.2	16.3	16.1	16.1	7.5	7.6	7.7
CS Leveraged Loans	1.6	2.9	13.0	13.0	5.6	5.6	4.4
S&P Global Infrastructure	4.2	10.9	6.8	6.8	6.0	7.4	5.7
Alerian MLP	(3.4)	3.0	23.8	23.8	31.8	10.9	1.6
Regional Index							
JPM EMBI Global Div	4.7	9.2	11.1	11.1	(3.6)	1.7	3.2
JPM GBI-EM Global Div	3.2	8.1	12.7	12.7	(3.2)	1.1	0.1
Hedge Funds							
HFRI Composite	2.6	3.6	7.5	7.5	4.3	7.0	4.5
HFRI FOF Composite	2.3	3.4	6.3	6.3	2.3	5.1	3.3
Currency (Spot)							
Euro	1.2	4.3	3.5	3.5	(3.4)	(0.7)	(2.2)
Pound Sterling	0.7	4.4	6.0	6.0	(2.3)	0.0	(2.6)
Yen	4.9	5.9	(6.4)	(6.4)	(9.9)	(4.9)	(2.9)

Source: Morningstar, HFRI, as of 12/31/23

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: December 31, 2023



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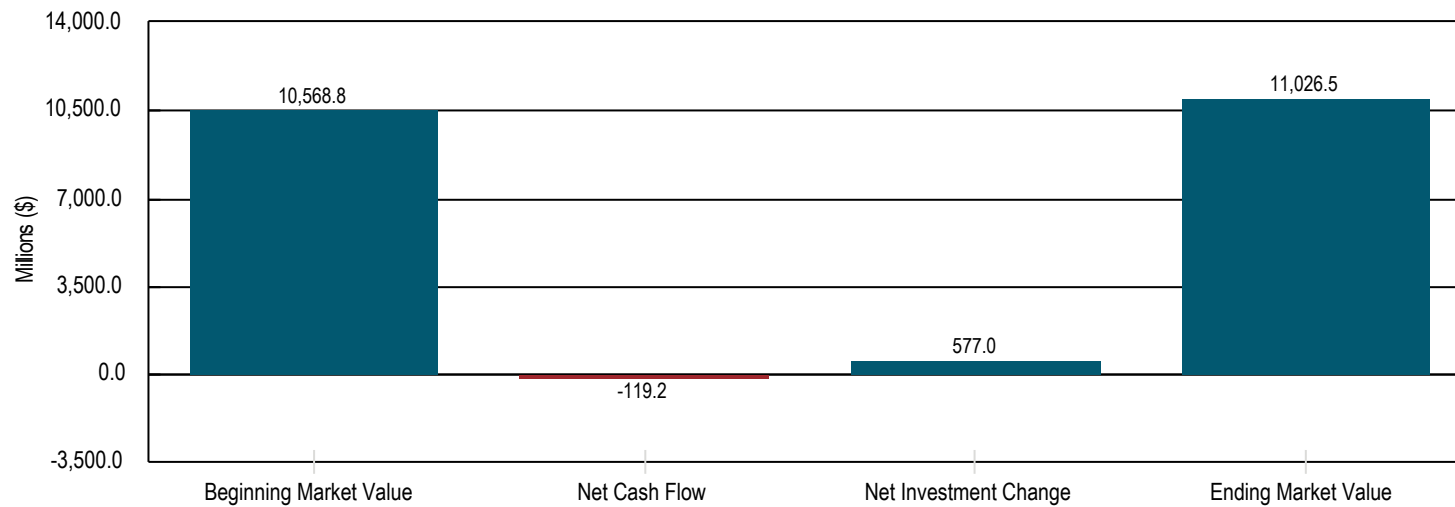
LOS ANGELES 310.297.1777

SAN FRANCISCO 415.362.3484

Portfolio Reconciliation

	Last Three Months	YTD
Beginning Market Value	\$10,568,787,999	\$10,223,348,190
Net Cash Flow	-\$119,234,904	-\$106,941,901
Net Investment Change	\$576,951,762	\$910,098,567
Ending Market Value	\$11,026,504,856	\$11,026,504,856

Change in Market Value
Last Three Months

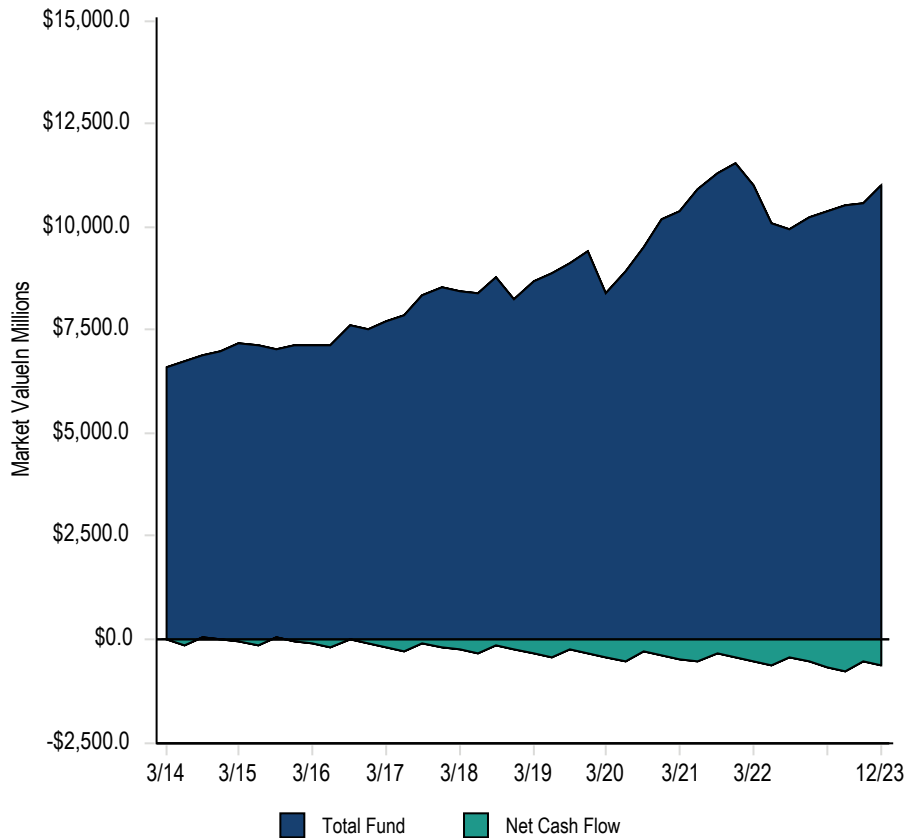


Contributions and withdrawals may include intra-account transfers between managers/funds.

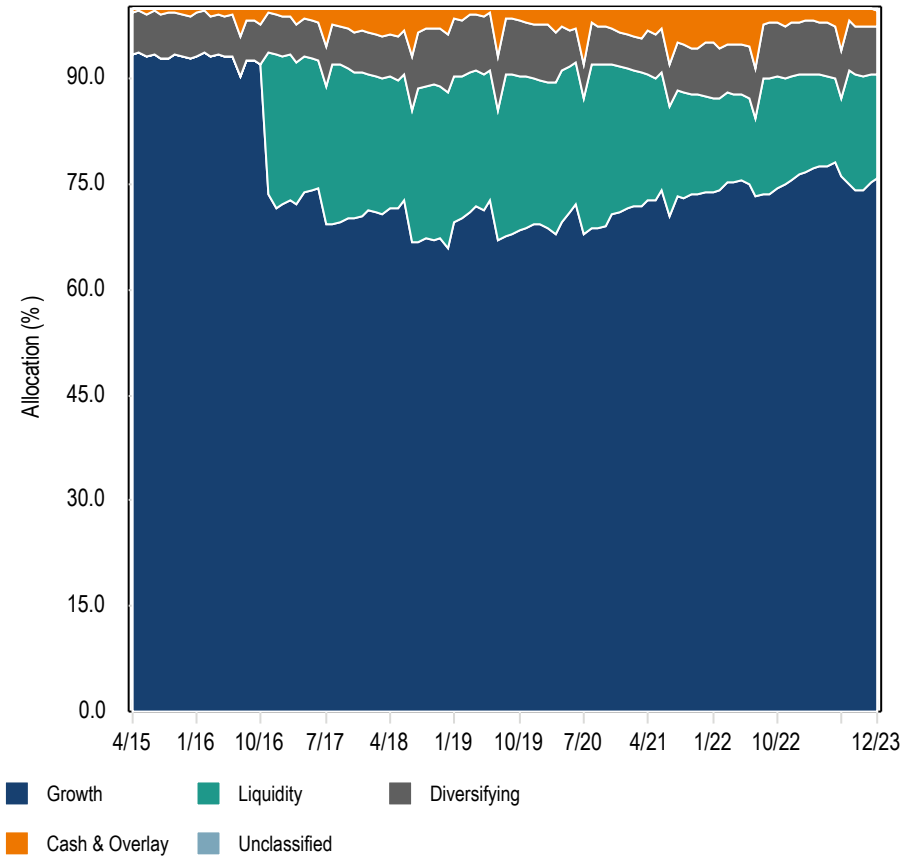
Total Fund
Asset Allocation History

Contra Costa County Employees' Retirement Association
Period Ending: December 31, 2023

Market Value History
Cumulative Cash Flows

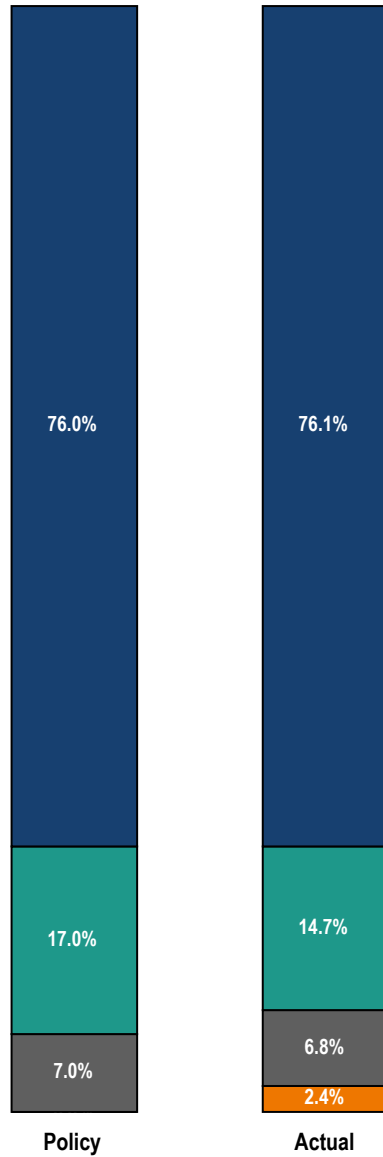


Asset Allocation History



Total Fund
Asset Allocation vs. Policy Target

Contra Costa County Employees' Retirement Association
Period Ending: December 31, 2023



	Current Balance	Current Allocation	Policy Target	Difference
Growth	\$8,385,757,491	76.1	76.0	\$5,613,801
Liquidity	\$1,623,979,726	14.7	17.0	-\$250,526,099
Diversifying	\$750,193,285	6.8	7.0	-\$21,662,055
Cash & Overlay	\$266,574,353	2.4	0.0	\$266,574,353
Total	\$11,026,504,856	100.0	100.0	

Policy Targets approved July 2023.

Total Fund
Executive Summary (Net of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: December 31, 2023

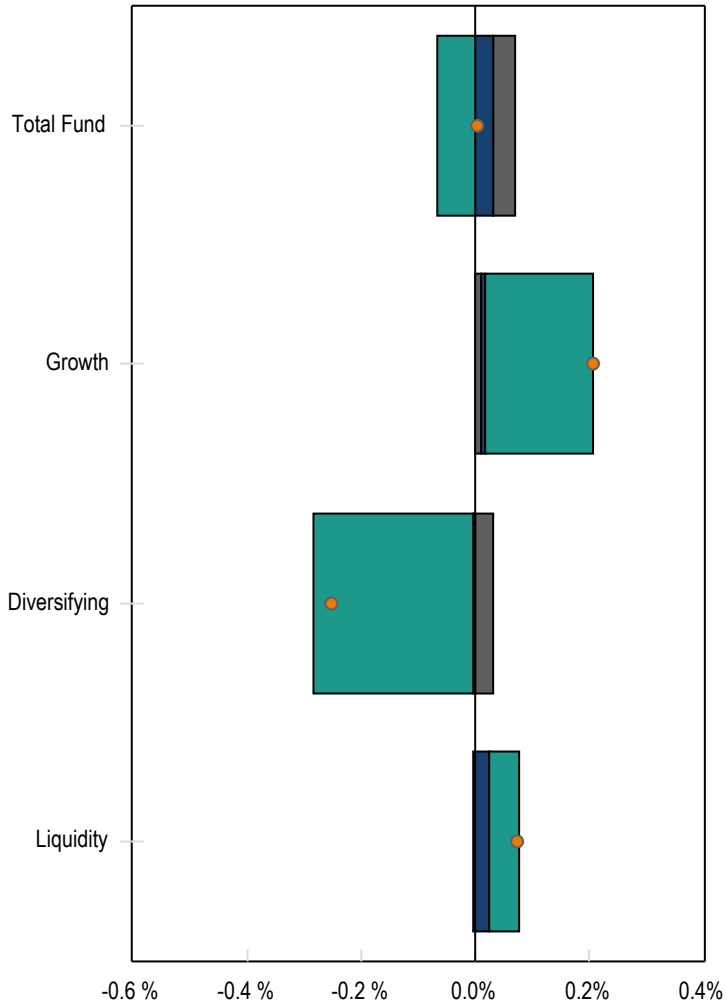
	% of Portfolio	QTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018
Total Fund	100.0	5.5	9.0	3.5	6.8	6.1	-10.6	13.9	9.2	14.6	-2.7
Policy Index		5.5	9.9	5.1	8.1	7.1	-8.4	15.3	10.8	14.6	-0.9
Policy Index (Adjusted)		5.5	9.9	5.1	7.5	6.7	-8.4	15.3	8.5	14.1	-1.5
Growth	76.1	6.4	10.1	5.1	9.0	7.6	-11.7	19.2	12.0	18.3	-3.9
Custom Growth Benchmark		6.1	11.3	6.7	10.5	8.7	-10.3	21.6	13.8	19.3	-2.1
Diversifying	6.8	2.3	2.2	-0.7	0.6	0.4	-5.7	1.7	-1.7	6.8	-2.3
Custom Diversifying Benchmark		5.7	7.4	1.0	2.7	3.2	-5.7	1.6	4.7	6.1	1.4
Liquidity	14.7	3.0	5.4	0.5	1.9	-	-3.5	-0.3	3.4	4.8	1.7
Blmbg. 1-3 Year Gov/Credit Index		2.7	4.6	0.1	1.5	-	-3.7	-0.5	3.3	4.0	1.6

*Correlation between the Growth and Diversifying composites is .81, .57, and .63 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: December 31, 2023

Attribution Effects
 3 Months Ending December 31, 2023



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

Performance Attribution

	3 Mo
Wtd. Actual Return	5.51
Wtd. Index Return	5.51
Excess Return	0.00
Selection Effect	-0.07
Allocation Effect	0.03
Interaction Effect	0.04

Attribution Summary
 Last 3 Months

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Growth	6.4	6.1	0.3	0.2	0.0	0.0	0.2
Diversifying	2.3	5.7	-3.5	-0.3	0.0	0.0	-0.3
Liquidity	3.0	2.7	0.3	0.0	0.0	0.0	0.1
Total Fund	5.5	5.5	0.0	-0.1	0.0	0.0	0.0

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

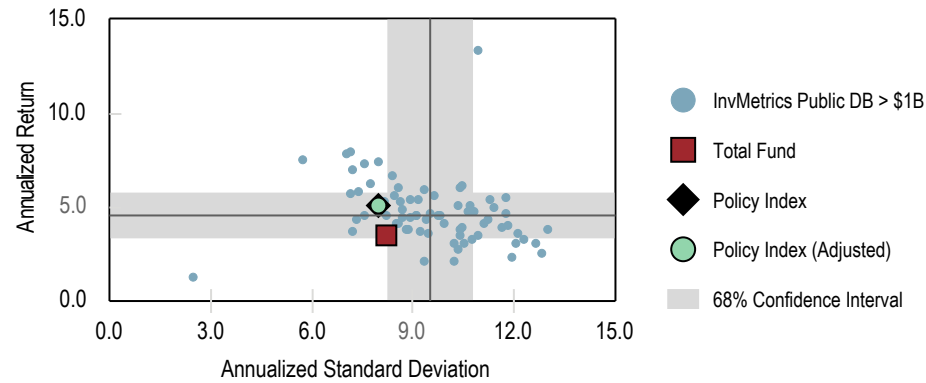
Total Fund
Executive Summary (Net of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: December 31, 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	3.54	-1.55	8.21	-1.60	1.03	0.88	0.99	0.21	-1.68	96.45	110.07

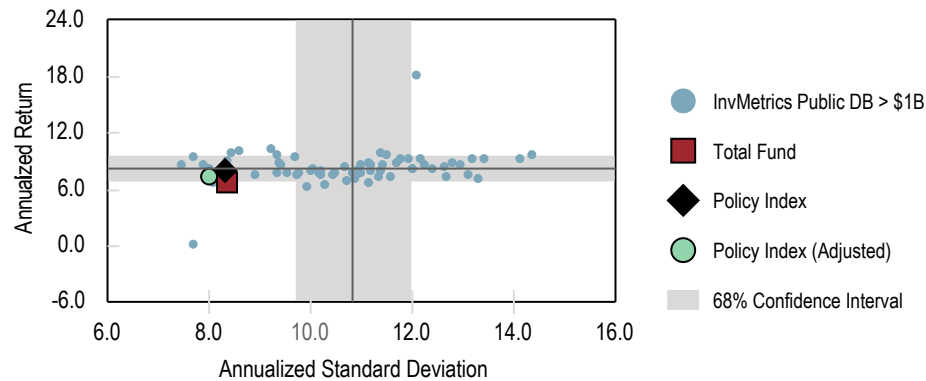
Risk vs. Return



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	6.80	-1.26	8.34	-0.98	0.98	1.86	0.95	0.61	-0.64	96.11	106.58

Risk vs. Return



Total Fund
Performance Summary (Gross of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: December 31, 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	11,026,504,856	100.0	5.6	9.2	3.8	7.1	6.5	-10.4	14.2	9.5	14.9	-2.5		Oct-92
Policy Index			5.5	9.9	5.1	8.1	7.1	-8.4	15.3	10.8	14.6	-0.9		
Policy Index (Adjusted)			5.5	9.9	5.1	7.5	6.7	-8.4	15.3	8.5	14.1	-1.5		
InvMetrics Public DB > \$1B Rank			80	88	73	89	54	48	66	79	89	32		
Total Fund ex Overlay & Cash	10,759,930,503	97.6	5.6	9.2	4.1	7.3	6.6	-9.9	14.6	9.7	14.7	-2.1		Dec-03
Policy Index			5.5	9.9	5.1	8.1	7.1	-8.4	15.3	10.8	14.6	-0.9		
Policy Index (Adjusted)			5.5	9.9	5.1	7.5	6.7	-8.4	15.3	8.5	14.1	-1.5		
InvMetrics Public DB > \$1B Rank			79	88	67	87	48	40	60	74	90	26		
Growth	8,385,757,491	76.1	6.4	10.4	5.3	9.3	8.0	-11.4	19.6	12.4	18.7	-3.6		Jan-03
Custom Growth Benchmark			6.1	11.3	6.7	10.5	8.7	-10.3	21.6	13.8	19.3	-2.1		
Total Domestic Equity	2,070,423,172	18.8	11.5	21.6	6.2	13.2	10.4	-18.3	20.6	22.2	26.7	-7.2		Sep-82
Russell 3000 Index			12.1	26.0	8.5	15.2	11.5	-19.2	25.7	20.9	31.0	-5.2		
InvMetrics Public DB US Equity Rank			77	71	91	90	76	51	99	15	100	77		
BlackRock Russell 1000 Index	1,209,333,414	11.0	12.0	26.6	9.0	15.5	-	-19.1	26.5	21.0	31.4	-4.8	12.7	May-17
Russell 1000 Index			12.0	26.5	9.0	15.5	-	-19.1	26.5	21.0	31.4	-4.8	12.7	
eV US Large Cap Equity Rank			42	34	59	40	-	69	55	35	40	51		
Boston Partners	404,182,450	3.7	9.0	14.7	13.1	13.1	9.7	-3.8	31.3	3.0	24.3	-8.7	10.7	Jun-95
Russell 1000 Value Index			9.5	11.5	8.9	10.9	8.4	-7.5	25.2	2.8	26.5	-8.3	9.2	
eV US Large Cap Value Equity Rank			74	39	15	41	45	36	18	63	79	59		
Emerald Advisers	232,966,434	2.1	14.8	19.2	-1.4	11.7	9.5	-23.8	5.5	39.0	30.3	-10.1	12.4	Apr-03
Russell 2000 Growth Index			12.7	18.7	-3.5	9.2	7.2	-26.4	2.8	34.6	28.5	-9.3	10.2	
eV US Small Cap Growth Equity Rank			10	41	50	62	54	27	77	57	48	86		
Ceredex	223,940,873	2.0	10.5	16.0	10.9	10.5	7.6	-8.5	28.4	2.3	18.4	-11.3	10.4	Nov-11
Russell 2000 Value Index			15.3	14.6	7.9	10.0	6.8	-14.5	28.3	4.6	22.4	-12.9	9.7	
eV US Small Cap Value Equity Rank			82	61	49	83	71	28	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: December 31, 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	1,455,185,342	13.2	10.3	15.4	0.7	7.9	4.7	-18.2	8.3	15.8	23.7	-14.3		Sep-88
MSCI AC World ex USA Index			9.8	16.2	2.0	7.6	4.3	-15.6	8.3	11.1	22.1	-13.8		
MSCI EAFE Index			10.5	18.9	4.5	8.7	4.8	-14.0	11.8	8.3	22.7	-13.4		
InvMetrics Public DB Global ex-US Equity Rank			35	82	71	50	57	68	51	26	42	67		
International Equity	975,149,419	8.8	11.1	15.6	1.1	9.3	5.4	-18.1	9.0	19.0	27.0	-13.6	6.2	Oct-10
MSCI AC World ex USA Index			9.8	16.2	2.0	7.6	4.3	-15.6	8.3	11.1	22.1	-13.8	4.8	
InvMetrics Public DB Global ex-US Equity Rank			15	81	58	23	22	65	35	7	15	42		
Pyrford	502,490,844	4.6	8.6	15.2	4.8	8.0	-	-7.0	7.6	4.7	22.1	-10.1	4.6	May-14
MSCI AC World ex USA Value			8.4	17.3	5.8	6.3	-	-8.6	10.5	-0.8	15.7	-14.0	2.7	
eV ACWI ex-US Value Equity Rank			73	84	76	64	-	20	84	46	37	6		
William Blair	472,658,576	4.3	14.0	16.2	-2.5	10.3	5.7	-27.7	10.5	33.3	32.0	-16.8	6.7	Nov-10
MSCI AC World ex USA Growth			11.1	14.0	-2.7	7.5	4.5	-23.1	5.1	22.2	27.3	-14.4	4.9	
eV ACWI ex-US Growth Equity Rank			32	59	56	41	65	59	43	36	37	73		
Emerging Markets Equity	480,035,922	4.4	8.7	14.4	0.1	5.9	-	-18.4	7.6	11.4	19.4	-15.3	4.4	Feb-17
MSCI Emerging Markets			7.9	9.8	-5.1	3.7	-	-20.1	-2.5	18.3	18.4	-14.6	3.8	
InvMetrics Public DB Emerging Markets Equity Rank			56	58	22	8	-	29	28	68	27	67		
PIMCO RAE Emerging Markets	248,383,507	2.3	8.9	23.1	9.2	8.8	-	-9.7	17.1	2.1	14.6	-12.3	6.7	Mar-17
MSCI Emerging Markets Value			8.1	14.2	0.0	3.4	-	-15.8	4.0	5.5	12.0	-10.7	3.3	
eV Emg Mkts All Cap Value Equity Rank			41	12	7	17	-	32	8	85	77	48		
TT Emerging Markets	231,652,415	2.1	8.6	5.8	-8.1	3.2	-	-26.4	-0.2	20.8	24.8	-18.4	1.1	Aug-17
MSCI Emerging Markets			7.9	9.8	-5.1	3.7	-	-20.1	-2.5	18.3	18.4	-14.6	1.8	
eV Emg Mkts Equity Rank			39	91	88	90	-	90	59	39	24	82		
Total Global Equity	1,161,600,644	10.5	10.3	19.0	3.3	12.2	8.9	-18.8	14.1	25.3	28.9	-7.8		Dec-03
MSCI AC World Index			11.0	22.2	5.7	11.7	7.9	-18.4	18.5	16.3	26.6	-9.4		
InvMetrics Public DB Global Equity Rank			72	68	83	33	1	84	61	1	17	20		
Artisan Partners	600,553,612	5.4	13.2	24.5	0.3	14.4	11.1	-29.6	15.0	41.7	37.0	-7.9	12.2	Oct-12
MSCI ACWI Growth NR USD			12.7	33.2	3.7	14.6	10.1	-28.6	17.1	33.6	32.7	-8.1	11.1	
eV Global Growth Equity Rank			42	37	54	22	16	60	56	33	12	60		
First Eagle	560,922,713	5.1	7.4	13.7	6.6	9.7	7.1	-5.6	13.0	8.5	21.0	-7.6	8.0	Jan-11
MSCI ACWI Value NR USD			9.2	11.8	7.3	8.2	5.5	-7.5	19.6	-0.3	20.6	-10.8	6.4	
eV Global Value Equity Rank			85	67	61	54	29	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: December 31, 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	1,104,706,437	10.0	1.7	9.1	9.9	8.2	9.6	10.5	10.0	4.0	7.7	8.3		Sep-06
Total High Yield	157,281,692	1.4	6.7	12.4	1.9	5.1	4.0	-10.6	5.3	5.2	15.3	-3.2		Dec-03
ICE BofA U.S. High Yield Index			7.1	13.5	2.0	5.2	4.5	-11.2	5.4	6.2	14.4	-2.3		
eV US High Yield Fixed Inc Rank			50	64	81	73	89	74	54	73	36	89		
Voya Global Investors	157,281,692	1.4	6.7	12.4	1.9	5.1	4.0	-10.6	5.3	5.2	15.3	-3.2	6.3	May-00
ICE BofA U.S. High Yield Index			7.1	13.5	2.0	5.2	4.5	-11.2	5.4	6.2	14.4	-2.3	6.5	
eV US High Yield Fixed Inc Rank			50	64	81	73	89	74	54	73	36	89		
Total Real Estate	775,070,499	7.0	-1.3	-10.1	0.5	0.6	5.9	-5.2	19.2	-5.9	8.1	7.4		Sep-92
Real Estate Benchmark			-2.4	-11.0	0.5	1.9	5.6	-4.5	19.3	0.6	7.5	6.8		
NCREIF-ODCE			-4.8	-12.0	4.9	4.2	7.3	7.5	22.2	1.2	5.3	8.3		
NCREIF Property Index			-3.0	-7.9	4.6	4.3	6.8	5.5	17.7	1.6	6.4	6.7		
Total Core Real Estate	214,043,952	1.9	16.3	12.8	7.9	9.0	8.6	-24.8	48.3	-4.6	28.2	-5.0		Jan-01
Adelante	97,412,587	0.9	15.4	17.2	8.4	9.3	8.8	-26.7	48.3	-4.6	28.2	-5.0	9.7	Oct-01
Wilshire U.S. REIT Index			16.3	16.1	7.5	7.6	7.7	-26.8	46.2	-7.9	25.8	-4.8	9.1	
Invesco US Fundamental Beta	116,631,364	1.1	17.0	9.4	-	-	-	-	-	-	-	-	-3.8	Mar-22
Wilshire U.S. REIT Index			16.3	16.1	-	-	-	-	-	-	-	-	-3.0	
Total Private Real Estate	561,026,548	5.1	-6.9	-17.2	-1.1	-0.7	5.3	1.3	15.3	-6.1	6.2	8.8		Sep-92
Private Equity	1,321,616,546	12.0	0.5	-1.0	16.5	13.3	12.8	-0.5	60.4	8.7	8.4	12.0		Dec-03
Risk Parity	339,873,160	3.1	6.6	4.9	-3.3	3.2	-	-21.5	9.7	10.0	18.1	-		Jan-19
60% MSCI ACWI Net/40% Blmbg. Global Aggregate			9.9	15.4	1.2	7.0	-	-17.3	8.8	14.0	18.6	-		
AQR Global Risk Premium-EL	176,809,243	1.6	6.6	7.0	-0.3	4.6	-	-16.3	10.7	6.2	18.7	-	4.6	Jan-19
HFR Risk Parity Vol 10 Index			9.4	10.5	-1.2	3.4	-	-18.3	6.8	3.6	18.4	-	3.4	
PanAgora Risk Parity Multi Asset	163,063,917	1.5	6.7	2.8	-6.2	-	-	-26.1	8.7	14.0	-	-	1.4	Mar-19
HFR Risk Parity Vol 10 Index			9.4	10.5	-1.2	-	-	-18.3	6.8	3.6	-	-	2.3	

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: December 31, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Diversifying	750,193,285	6.8	2.4	2.6	-0.3	0.9	0.7	-5.4	2.0	-1.3	7.1	-2.0		Dec-03
<i>Custom Diversifying Benchmark</i>			5.7	7.4	1.0	2.7	3.2	-5.7	1.6	4.7	6.1	1.4		
Diversifying Fixed Income	223,296,696	2.0	6.9	5.5	-3.1	0.1	1.2	-13.3	-0.7	1.6	8.6	-1.7		Dec-03
<i>Blmbg. U.S. Aggregate Index</i>			6.8	5.5	-3.3	1.1	1.8	-13.0	-1.5	7.5	8.7	0.0		
<i>eV US Core Fixed Inc Rank</i>			47	85	79	100	100	76	32	100	79	100		
AFL-CIO	223,235,851	2.0	6.9	5.5	-3.2	1.0	1.9	-13.3	-0.7	6.6	8.2	0.6	5.2	Jul-91
<i>Blmbg. U.S. Aggregate Index</i>			6.8	5.5	-3.3	1.1	1.8	-13.0	-1.5	7.5	8.7	0.0	4.9	
<i>eV US Core Fixed Inc Rank</i>			46	86	80	98	92	77	32	95	86	14		
Diversifying Multi-Asset	526,896,589	4.8	0.6	1.4	0.7	-	-	-1.9	2.8	-	-	-		Aug-20
<i>Custom Diversifying Multi-Asset Benchmark</i>			4.9	8.7	3.1	-	-	-3.1	4.1	-	-	-		
Acadian Multi-Asset Absolute Return Fund	211,000,534	1.9	-5.2	-5.4	-1.3	-	-	-0.1	1.7	-	-	-	-0.7	Aug-20
<i>FTSE 3-Month T-bill +5%</i>			2.6	10.5	7.4	-	-	6.6	5.0	-	-	-	7.1	
Sit LLCAR	315,896,054	2.9	4.8	6.9	-	-	-	-3.3	-	-	-	-	2.8	Apr-21
<i>Blmbg. U.S. Aggregate Index +1%</i>			7.1	6.6	-	-	-	-12.1	-	-	-	-	-1.4	
Liquidity	1,623,979,726	14.7	3.0	5.5	0.6	2.0	-	-3.4	-0.2	3.5	4.9	1.8		Nov-16
<i>Blmbg. 1-3 Year Gov/Credit Index</i>			2.7	4.6	0.1	1.5	-	-3.7	-0.5	3.3	4.0	1.6		
<i>eV US Short Duration Fixed Inc Rank</i>			48	43	49	50	-	50	46	75	39	25		
DFA Short Credit	365,687,785	3.3	1.8	5.4	-0.2	1.5	-	-5.3	-0.4	2.9	5.2	1.2	1.5	Dec-16
<i>ICE BofA 1-5 Year U.S. Corp/Govt Index</i>			3.3	4.9	-0.6	1.6	-	-5.5	-0.9	4.6	5.1	1.4	1.5	
<i>eV US Short Duration Fixed Inc Rank</i>			98	46	86	89	-	91	67	89	26	89		
Insight Short Duration	601,555,000	5.5	2.4	5.7	1.5	2.5	-	-1.1	0.1	3.2	4.7	1.7	2.2	Dec-16
<i>Blmbg. 1-3 Year Gov/Credit Index</i>			2.7	4.6	0.1	1.5	-	-3.7	-0.5	3.3	4.0	1.6	1.4	
<i>eV US Short Duration Fixed Inc Rank</i>			90	31	12	20	-	6	32	85	48	38		
Sit Short Duration	656,736,941	6.0	4.3	5.4	0.0	1.8	-	-4.8	-0.3	4.6	4.9	2.5	1.8	Dec-16
<i>Blmbg. 1-3 Year Govt Index</i>			2.6	4.3	-0.1	1.3	-	-3.8	-0.6	3.1	3.6	1.6	1.2	
<i>eV US Short Duration Fixed Inc Rank</i>			2	50	80	63	-	80	58	29	40	3		
Total Cash	144,877,481	1.3	1.4	2.5	1.7	1.9	1.0	2.4	0.4	1.3	3.3	1.7		Dec-03
<i>90 Day U.S. Treasury Bill</i>			1.4	5.0	2.2	1.9	1.2	1.5	0.0	0.7	2.3	1.9		
Cash	144,873,116	1.3	1.4	6.1	2.9	2.7	1.8	2.2	0.4	1.3	3.4	1.7	17.5	Apr-98
Northern Trust Transition	4,365	0.0	1.4	-99.2	-81.1	-	-	-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: December 31, 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	11,026,504,856	100.0	5.5	9.0	3.5	6.8	6.1	-10.6	13.9	9.2	14.6	-2.7		Oct-92
Policy Index			5.5	9.9	5.1	8.1	7.1	-8.4	15.3	10.8	14.6	-0.9		
Policy Index (Adjusted)			5.5	9.9	5.1	7.5	6.7	-8.4	15.3	8.5	14.1	-1.5		
Total Fund ex Overlay & Cash	10,759,930,503	97.6	5.5	9.0	3.8	7.0	6.2	-10.1	14.3	9.4	14.3	-2.4		Dec-03
Policy Index			5.5	9.9	5.1	8.1	7.1	-8.4	15.3	10.8	14.6	-0.9		
Policy Index (Adjusted)			5.5	9.9	5.1	7.5	6.7	-8.4	15.3	8.5	14.1	-1.5		
Growth	8,385,757,491	76.1	6.4	10.1	5.1	9.0	7.6	-11.7	19.2	12.0	18.3	-3.9		Jan-03
Custom Growth Benchmark			6.1	11.3	6.7	10.5	8.7	-10.3	21.6	13.8	19.3	-2.1		
Total Domestic Equity	2,070,423,172	18.8	11.5	21.4	6.0	12.8	10.0	-18.5	20.2	21.8	26.1	-7.6		Sep-82
Russell 3000 Index			12.1	26.0	8.5	15.2	11.5	-19.2	25.7	20.9	31.0	-5.2	11.7	
BlackRock Russell 1000 Index	1,209,333,414	11.0	12.0	26.6	9.0	15.5	-	-19.1	26.5	20.9	31.4	-4.8	12.7	May-17
Russell 1000 Index			12.0	26.5	9.0	15.5	-	-19.1	26.5	21.0	31.4	-4.8	12.7	
Boston Partners	404,182,450	3.7	8.9	14.3	12.8	12.8	9.3	-4.1	31.0	2.6	23.8	-8.9	10.6	Jun-95
Russell 1000 Value Index			9.5	11.5	8.9	10.9	8.4	-7.5	25.2	2.8	26.5	-8.3	9.2	
Emerald Advisers	232,966,434	2.1	14.7	18.6	-1.9	11.0	8.8	-24.2	4.9	38.2	29.4	-10.7	12.0	Apr-03
Russell 2000 Growth Index			12.7	18.7	-3.5	9.2	7.2	-26.4	2.8	34.6	28.5	-9.3	10.1	
Ceredex	223,940,873	2.0	10.4	15.5	10.3	10.0	7.1	-9.0	27.7	1.7	17.7	-11.8	9.9	Nov-11
Russell 2000 Value Index			15.3	14.6	7.9	10.0	6.8	-14.5	28.3	4.6	22.4	-12.9	9.7	
Total International Equity	1,455,185,342	13.2	10.2	15.1	0.3	7.5	4.2	-18.6	7.8	15.2	23.2	-14.7		Sep-88
MSCI AC World ex USA Index			9.8	16.2	2.0	7.6	4.3	-15.6	8.3	11.1	22.1	-13.8		
MSCI EAFE Index			10.5	18.9	4.5	8.7	4.8	-14.0	11.8	8.3	22.7	-13.4		
International Equity	975,149,419	8.8	11.0	15.2	0.7	8.9	5.0	-18.4	8.6	18.5	26.5	-13.9		Oct-10
MSCI AC World ex USA Index			9.8	16.2	2.0	7.6	4.3	-15.6	8.3	11.1	22.1	-13.8		
Pyrford	502,490,844	4.6	8.5	14.7	4.4	7.6	-	-7.4	7.1	4.2	21.6	-10.5	4.2	May-14
MSCI AC World ex USA Value			8.4	17.3	5.8	6.3	-	-8.6	10.5	-0.8	15.7	-14.0	2.7	
William Blair	472,658,576	4.3	13.9	15.8	-2.8	9.9	5.3	-28.0	10.1	32.8	31.5	-17.1	6.3	Nov-10
MSCI AC World ex USA Growth			11.1	14.0	-2.7	7.5	4.5	-23.1	5.1	22.2	27.3	-14.4	4.9	
Emerging Markets Equity	480,035,922	4.4	8.7	14.4	-0.3	5.4	-	-18.9	7.0	10.7	18.7	-15.7		Feb-17
MSCI Emerging Markets			7.9	9.8	-5.1	3.7	-	-20.1	-2.5	18.3	18.4	-14.6		
PIMCO RAE Emerging Markets	248,383,507	2.3	8.9	23.0	8.8	8.3	-	-10.1	16.5	1.6	14.0	-12.6	6.3	Mar-17
MSCI Emerging Markets Value			8.1	14.2	0.0	3.4	-	-15.8	4.0	5.5	12.0	-10.7	3.3	
TT Emerging Markets	231,652,415	2.1	8.6	5.8	-8.4	2.7	-	-26.8	-0.9	20.0	24.0	-18.9	0.6	Aug-17
MSCI Emerging Markets			7.9	9.8	-5.1	3.7	-	-20.1	-2.5	18.3	18.4	-14.6	1.8	

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: December 31, 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	1,161,600,644	10.5	10.1	18.2	2.5	11.4	8.1	-19.4	13.2	24.4	27.9	-8.5		Dec-03
MSCI AC World Index			11.0	22.2	5.7	11.7	7.9	-18.4	18.5	16.3	26.6	-9.4		
Artisan Partners	600,553,612	5.4	13.0	23.6	-0.5	13.5	10.3	-30.1	14.1	40.6	36.0	-8.6	11.4	Oct-12
MSCI ACWI Growth NR USD			12.7	33.2	3.7	14.6	10.1	-28.6	17.1	33.6	32.7	-8.1	11.1	
First Eagle	560,922,713	5.1	7.2	12.9	5.9	8.9	6.3	-6.3	12.1	7.7	20.1	-8.3	7.2	Jan-11
MSCI ACWI Value NR USD			9.2	11.8	7.3	8.2	5.5	-7.5	19.6	-0.3	20.6	-10.8	6.4	
Private Credit	1,104,706,437	10.0	1.7	9.1	9.9	8.2	9.1	10.5	10.0	4.0	7.7	8.3		Sep-06
Total High Yield	157,281,692	1.4	6.6	12.0	1.5	4.7	3.6	-10.9	4.9	4.7	14.7	-3.6		Dec-03
ICE BofA US High Yield Master II			7.1	13.5	2.0	5.2	4.5	-11.2	5.3	6.1	14.4	-2.3		
Voya Global Investors	157,281,692	1.4	6.6	11.8	1.5	4.7	3.5	-10.9	4.9	4.7	14.7	-3.6	6.1	May-00
ICE BofA US High Yield Master II			7.1	13.5	2.0	5.2	4.5	-11.2	5.3	6.1	14.4	-2.3	6.6	
Total Real Estate	775,070,499	7.0	-1.4	-10.2	0.4	0.6	5.6	-5.3	19.2	-6.0	8.1	7.4		Sep-92
Real Estate Benchmark			-2.4	-11.0	0.5	1.9	5.6	-4.5	19.3	0.6	7.5	6.8		
NCREIF-ODCE			-4.8	-12.0	4.9	4.2	7.3	7.5	22.2	1.2	5.3	8.3		
NCREIF Property Index			-3.0	-7.9	4.6	4.3	6.8	5.5	17.7	1.6	6.4	6.7		
Total Core Real Estate	214,043,952	1.9	16.1	12.4	7.5	8.5	8.1	-25.1	47.5	-5.2	27.5	-5.5		Jan-01
Adelante	97,412,587	0.9	15.2	16.5	7.8	8.6	8.2	-27.2	47.5	-5.2	27.5	-5.5	9.4	Oct-01
Wilshire U.S. REIT Index			16.3	16.1	7.5	7.6	7.7	-26.8	46.2	-7.9	25.8	-4.8	9.1	
Invesco US Fundamental Beta	116,631,364	1.1	16.9	9.2	-	-	-	-	-	-	-	-	-4.0	Mar-22
Wilshire U.S. REIT Index			16.3	16.1	-	-	-	-	-	-	-	-	-3.0	
Total Private Real Estate	561,026,548	5.1	-6.9	-17.2	-1.1	-0.7	4.9	1.3	15.3	-6.1	6.2	8.8		Sep-92
Private Equity	1,321,616,546	12.0	0.5	-1.0	16.5	13.3	12.4	-0.5	60.4	8.7	8.4	12.0		Dec-03
Risk Parity	339,873,160	3.1	6.6	4.7	-3.6	2.9	-	-21.8	9.3	9.6	17.7	-		Jan-19
60% MSCI ACWI Net/40% Blmbg. Global Aggregate			9.9	15.4	1.2	7.0	-	-17.3	8.8	14.0	18.6	-		
AQR Global Risk Premium-EL	176,809,243	1.6	6.6	6.8	-0.6	4.2	-	-16.6	10.3	5.8	18.3	-	4.2	Jan-19
HFR Risk Parity Vol 10 Index			9.4	10.5	-1.2	3.4	-	-18.3	6.8	3.6	18.4	-	3.4	
PanAgora Risk Parity Multi Asset	163,063,917	1.5	6.6	2.4	-6.5	-	-	-26.3	8.3	13.6	-	-	1.0	Mar-19
HFR Risk Parity Vol 10 Index			9.4	10.5	-1.2	-	-	-18.3	6.8	3.6	-	-	2.3	

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: December 31, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Diversifying	750,193,285	6.8	2.3	2.2	-0.7	0.6	0.4	-5.7	1.7	-1.7	6.8	-2.3		Dec-03
<i>Custom Diversifying Benchmark</i>			5.7	7.4	1.0	2.7	3.2	-5.7	1.6	4.7	6.1	1.4		
Diversifying Fixed Income	223,296,696	2.0	6.8	5.2	-3.5	-0.3	0.9	-13.5	-1.0	1.2	8.3	-2.0		Dec-03
<i>Blmbg. U.S. Aggregate Index</i>			6.8	5.5	-3.3	1.1	1.8	-13.0	-1.5	7.5	8.7	0.0		
AFL-CIO	223,235,851	2.0	6.8	5.2	-3.5	0.6	1.5	-13.6	-1.0	6.2	7.8	0.2	4.9	Jul-91
<i>Blmbg. U.S. Aggregate Index</i>			6.8	5.5	-3.3	1.1	1.8	-13.0	-1.5	7.5	8.7	0.0	4.9	
Diversifying Multi-Asset	526,896,589	4.8	0.5	0.9	0.3	-	-	-2.3	2.4	-	-	-		Aug-20
<i>Custom Diversifying Multi-Asset Benchmark</i>			4.9	8.7	3.1	-	-	-3.1	4.1	-	-	-		
Acadian Multi-Asset Absolute Return Fund	211,000,534	1.9	-5.4	-5.9	-1.8	-	-	-0.6	1.1	-	-	-	-1.2	Aug-20
<i>FTSE 3-Month T-bill +5%</i>			2.6	10.5	7.4	-	-	6.6	5.0	-	-	-	7.1	
Sit LLCAR	315,896,054	2.9	4.7	6.5	-	-	-	-3.7	-	-	-	-	2.5	Apr-21
<i>Blmbg. U.S. Aggregate +1%</i>			7.1	6.6	-	-	-	-12.1	-	-	-	-	-1.4	
Liquidity	1,623,979,726	14.7	3.0	5.4	0.5	1.9	-	-3.5	-0.3	3.4	4.8	1.7		Nov-16
<i>Blmbg. 1-3 Year Gov/Credit Index</i>			2.7	4.6	0.1	1.5	-	-3.7	-0.5	3.3	4.0	1.6		
DFA Short Credit	365,687,785	3.3	1.8	5.3	-0.3	1.4	-	-5.4	-0.5	2.8	5.2	1.1	1.4	Dec-16
<i>ICE BofA 1-5 Year U.S. Corp/Govt</i>			3.3	4.9	-0.6	1.6	-	-5.5	-0.9	4.6	5.1	1.4	1.5	
Insight Short Duration	601,555,000	5.5	2.4	5.7	1.5	2.4	-	-1.2	0.0	3.1	4.6	1.7	2.2	Dec-16
<i>Blmbg. 1-3 Year Gov/Credit Index</i>			2.7	4.6	0.1	1.5	-	-3.7	-0.5	3.3	4.0	1.6	1.4	
Sit Short Duration	656,736,941	6.0	4.3	5.2	-0.2	1.7	-	-5.0	-0.5	4.4	4.7	2.3	1.7	Dec-16
<i>Blmbg. 1-3 Year Govt Index</i>			2.6	4.3	-0.1	1.3	-	-3.8	-0.6	3.1	3.6	1.6	1.2	
Total Cash	144,877,481	1.3	1.4	2.5	1.7	1.9	1.0	2.4	0.4	1.3	3.3	1.7		Dec-03
<i>90 Day U.S. Treasury Bill</i>			1.4	5.0	2.2	1.9	1.2	1.5	0.0	0.7	2.3	1.9		
Cash	144,873,116	1.3	1.4	6.1	2.9	2.7	1.8	2.2	0.4	1.3	3.4	1.7		Apr-98
Northern Trust Transition	4,365	0.0	1.4	-99.2	-81.1	-	-	-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 - Investment Summary

Contra Costa County Employees' Retirement Association
Period Ending: December 31, 2023

StepStone Group Analysis (*)												
Closing Date	Manager Name/Fund Name	Estimated Market Value as of 12/31/2023 ¹	Total Commitment	Total % 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 Equity & Venture Capital												
2/11/2004	Adams Street Partners	\$114,729,087	\$210,000,000	93%	\$195,823,407	\$116,206	\$3,550,613	\$279,686,092	\$14,176,593	1.43	2.01	9/30/2023
1/15/2009	Adams Street Partners II	\$3,314,895	\$30,000,000	95%	\$28,365,000	\$0	\$276,027	\$45,661,555	\$1,635,000	1.61	1.73	9/30/2023
9/21/2012	Adams Street Partners - Fund 5	\$9,641,758	\$40,000,000	77%	\$30,845,875	\$0	\$1,184,819	\$32,286,795	\$9,154,125	1.05	1.36	9/30/2023
1/18/1996	Adams Street Partners - BPF	\$465,245	\$59,565,614	97%	\$57,517,409	\$0	\$0	\$103,896,144	\$2,024,035	1.81	1.81	9/30/2023
3/31/2016	Adams Street Venture Innovation	\$158,652,832	\$75,000,000	92%	\$69,280,251	\$0	\$0	\$35,897,266	\$5,719,749	0.52	2.81	9/30/2023
5/18/2018	AE Industrial Partners Fund II, LP	\$39,326,541	\$35,000,000	103%	\$36,067,717	\$1,711,569	\$848,599	\$15,671,952	\$8,055,256	0.43	1.52	9/30/2023
11/27/2013	Aether Real Assets III	\$16,560,831	\$25,000,000	106%	\$26,404,849	\$279,819	\$574,823	\$7,785,428	\$944,954	0.29	0.92	9/30/2023
11/30/2013	Aether Real Assets III Surplus	\$39,121,194	\$50,000,000	106%	\$53,006,965	\$29,309	\$930,315	\$15,115,662	\$738,443	0.29	1.02	9/30/2023
1/30/2016	Aether Real Assets IV	\$54,679,275	\$50,000,000	102%	\$50,892,773	\$0	\$0	\$8,306,803	\$3,832,805	0.16	1.24	9/30/2023
4/30/2004	Bay Area Equity Fund I ⁴	\$0	\$10,000,000	100%	\$10,000,000	\$0	\$0	\$37,018,019	\$0	3.70	3.70	9/30/2023
6/29/2009	Bay Area Equity Fund II ⁴	\$11,792,685	\$10,000,000	100%	\$10,000,000	\$0	\$0	\$3,684,910	\$0	0.37	1.55	9/30/2023
6/30/2013	Commonfund	\$34,992,847	\$50,000,000	95%	\$47,649,993	\$0	\$1,232,791	\$33,883,799	\$2,350,007	0.71	1.45	9/30/2023
7/15/2005	EIF US Power Fund II ⁴	\$10,602	\$50,000,000	130%	\$65,029,556	\$0	\$0	\$76,092,655	\$0	1.17	1.17	9/30/2023
5/31/2007	EIF US Power Fund III ⁴	\$2,167,726	\$65,000,000	110%	\$71,409,097	\$0	\$48,021	\$93,077,887	\$0	1.30	1.33	9/30/2023
11/28/2011	EIF US Power Fund IV	\$18,909,056	\$50,000,000	130%	\$64,917,547	\$0	\$263,816	\$50,464,797	\$4	0.78	1.07	9/30/2023
11/28/2016	EIF US Power Fund V	\$31,479,634	\$50,000,000	143%	\$71,633,870	\$0	\$437,137	\$65,340,271	\$3,888,697	0.91	1.35	9/30/2023
3/31/2023	EGT X, L.P.	\$11,041,191	\$100,000,000	17%	\$17,450,752	\$3,826,463	-\$98,900	\$2,669,844	\$85,177,156	0.15	0.79	6/30/2023
2/21/2019	Genstar Capital Partners IX, L.P.	\$67,162,974	\$50,000,000	96%	\$48,083,549	\$147,332	\$936,288	\$27,299,645	\$7,699,107	0.57	1.96	9/30/2023
4/1/2021	Genstar Capital Partners X, L.P.	\$40,502,750	\$42,500,000	93%	\$39,406,048	\$9,362,023	\$56,226	\$181,283	\$3,275,234	0.00	1.03	9/30/2023
6/30/2023	Genstar Capital Partners XI, L.P.	\$0	\$75,000,000	0%	\$298,210	\$298,210	\$0	\$0	\$74,701,790	N/A	N/A	N/A
6/30/2023	Green Equity Investors IX	\$910,039	\$60,000,000	1%	\$576,976	\$0	\$0	\$0	\$59,423,024	N/A	N/A	9/30/2023
10/27/2020	GTCR Fund XIII, L.P.	\$26,167,299	\$50,000,000	53%	\$26,392,753	\$415,000	\$109,350	\$5,556,257	\$23,607,247	0.21	1.20	9/30/2023
6/30/2023	GTCR Fund XIV	\$0	\$100,000,000	0%	\$0	\$0	\$0	\$0	\$100,000,000	N/A	N/A	N/A
5/10/2021	Hellman & Friedman Capital Partners X, L.P.	\$59,661,030	\$75,000,000	72%	\$54,243,885	\$271,661	\$140,005	\$140,005	\$20,768,284	0.00	1.10	9/30/2023
3/31/2023	Jade Equity Investors II, LP	-\$28,479	\$15,000,000	0%	\$0	\$0	\$0	\$0	\$15,000,000	N/A	N/A	6/30/2023
11/18/2009	Oaktree PIF 2009	\$344,120	\$40,000,000	87%	\$34,812,560	\$0	\$0	\$47,032,470	\$6,308,961	1.35	1.36	9/30/2023
5/2/2013	Ocean Avenue Fund II	\$24,203,276	\$30,000,000	90%	\$27,000,000	\$0	\$0	\$44,294,244	\$3,000,000	1.64	2.54	9/30/2023
4/15/2016	Ocean Avenue Fund III	\$53,687,919	\$50,000,000	93%	\$46,500,000	\$0	\$2,750,000	\$57,709,752	\$3,500,000	1.24	2.40	9/30/2023
11/30/2007	Paladin III	\$7,809,812	\$25,000,000	140%	\$34,954,262	\$0	\$0	\$71,324,279	\$387,482	2.04	2.26	9/30/2023
8/22/2011	Pathway 6	\$10,756,050	\$30,000,000	101%	\$30,263,207	\$23,527	\$290,072	\$52,742,837	\$2,656,111	1.74	2.10	9/30/2023
7/10/2013	Pathway 7	\$27,678,698	\$40,000,000	99%	\$39,620,012	\$45,000	\$1,350,374	\$54,605,384	\$3,671,887	1.38	2.08	6/30/2023
11/23/2015	Pathway 8	\$61,350,153	\$70,000,000	100%	\$69,725,061	\$110,250	\$3,464,738	\$89,159,064	\$5,228,078	1.28	2.16	6/30/2023
1/19/1999	Pathway	\$63,323,589	\$50,000,000	99%	\$49,255,120	\$88,749	\$2,752,537	\$43,254,641	\$3,089,504	0.88	2.16	6/30/2023
7/31/2009	Pathway 2008	\$2,079,920	\$125,000,000	101%	\$126,517,050	\$130,709	\$478,607	\$190,444,516	\$10,513,800	1.51	1.52	6/30/2023
6/3/2014	Siguler Guff CCCERA Opportunities	\$121,416,096	\$200,000,000	88%	\$175,083,208	\$0	\$8,408,946	\$223,690,941	\$28,597,500	1.28	1.97	9/30/2023
5/18/2018	Siris Partners IV, L.P.	\$42,289,735	\$35,000,000	94%	\$32,963,940	\$549,293	\$1,464,041	\$5,820,012	\$6,130,376	0.18	1.46	9/30/2023
6/30/2023	Symphony Technology Group VII	\$0	\$50,000,000	0%	\$0	\$0	\$0	\$0	\$50,000,000	N/A	N/A	N/A
5/27/2021	TA XIV-A, L.P.	\$35,587,859	\$50,000,000	76%	\$38,000,000	\$3,500,000	\$0	\$1,500,000	\$13,500,000	0.04	0.98	N/A
6/30/2023	TA XV-A, L.P.	\$0	\$90,000,000	0%	\$0	\$0	\$0	\$0	\$90,000,000	N/A	N/A	N/A
6/28/2019	TPG Healthcare Partners, L.P.	\$8,334,643	\$35,000,000	21%	\$7,501,200	\$4,310,956	\$0	\$0	\$27,490,124	0.00	1.11	9/30/2023
3/31/2023	TPG Healthcare Partners II	\$23,785,276	\$35,000,000	67%	\$23,534,961	\$0	\$41,514	\$6,263,131	\$11,465,039	N/A	N/A	9/30/2023
3/31/2023	TPG Partners IX	\$16,291,241	\$65,000,000	25%	\$16,324,989	\$14,271,942	\$4,332	\$4,332	\$48,675,011	N/A	N/A	9/30/2023
9/17/2021	Trident IX, L.P.	\$24,380,956	\$50,000,000	46%	\$23,201,490	\$0	\$0	\$0	\$26,798,510	N/A	N/A	N/A
5/24/2019	Trident VIII, L.P.	\$48,661,010	\$40,000,000	96%	\$38,314,293	\$253,059	\$657,166	\$3,792,372	\$4,992,136	0.10	1.37	9/30/2023
12/8/2015	Wastewater Opportunity Fund	\$8,375,182	\$25,000,000	126%	\$31,512,759	\$0	\$0	\$27,076,172	\$521,541	0.86	1.12	9/30/2023
Total Private Equity and Venture Capital		\$1,321,616,546	\$2,562,065,614	75%	\$1,920,380,595	\$39,741,078	\$32,152,257	\$1,858,431,215	\$788,697,569	0.97	1.66	
% of Portfolio (Market Value)		12.0%										

* 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 - IRR Summary

Contra Costa County Employees' Retirement Association
Period Ending: December 31, 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	14.7%	14.7%	-	12.6%	9/30/2023
Adams Street Partners II	12/31/2008	13.9%	13.2%	-	10.5%	9/30/2023
Adams Street Partners - Fund 5	12/31/2008	9.3%	8.1%	-	6.4%	9/30/2023
Adams Street Partners Venture	1/18/1996	32.6%	32.7%	-	30.6%	9/30/2023
Adams Street Partners - BPF	3/31/2016	14.2%	14.2%	-	11.6%	9/30/2023
AE Industrial Partners Fund II, LP	5/18/2018	24.3%	-	21.4%	-	9/30/2023
Aether Real Assets III ¹	11/27/2013	0.1%	-	-1.4%	-	9/30/2023
Aether Real Assets III Surplus ¹	11/30/2013	1.5%	-	0.4%	-	9/30/2023
Aether Real Assets IV ¹	1/30/2016	6.5%	-	4.9%	-	9/30/2023
Bay Area Equity Fund I ⁹	11/26/2003	31.3%	31.3%	22.9%	22.9%	9/30/2023
Bay Area Equity Fund II ⁹	11/26/2003	8.4%	8.4%	4.7%	4.7%	9/30/2023
CommonFund ¹	6/30/2013	-	-	-	8.2%	12/31/2022
Energy Investor Fund II ⁹	7/15/2005	5.6%	5.3%	2.9%	2.6%	9/30/2023
Energy Investor Fund V	11/28/2016	18.8%	16.4%	14.7%	12.5%	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%	-	6.5%	-	12/31/2023
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	16.9%	16.9%	14.0%	14.0%	9/30/2023
Benchmark ⁴		14.6%	-	-	-	9/30/2023
Pathway 7	7/10/2013	18.7%	18.7%	16.0%	16.0%	9/30/2023
Benchmark ⁵		15.1%	-	-	-	9/30/2023
Pathway 8	11/23/2015	20.7%	20.7%	18.7%	18.7%	9/30/2023
Benchmark ⁶		16.4%	-	-	-	9/30/2023
Pathway Private Equity Fund	1/19/1999	13.4%	13.4%	8.3%	8.3%	9/30/2023
Benchmark ⁷		10.4%	-	-	-	9/30/2023
Pathway Private Equity Fund 2008	7/31/2009	17.1%	17.1%	14.0%	14.0%	9/30/2023
Benchmark ⁸		13.3%	-	-	-	9/30/2023
Siguler Guff CCCERA Opportunities	6/3/2014	18.2%	19.0%	17.7%	16.5%	9/30/2023
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	24.0%	33.0%	-	19.0%	9/30/2023
Trident VIII, L.P.	5/24/2019	14.1%	-	8.1%	-	9/30/2023
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: December 31, 2023

StepStone Group Analysis (*)

Closing Date	Manager Name/Fund Name	Estimated Market Value as of 12/31/2023 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	\$2,059,323	\$16,500,000	114%	\$18,750,000	\$0	\$0	\$20,410,032	\$2,319,783	1.09	1.20	9/30/2023
12/18/2017	Stepstone CC Opportunities Fund	\$1,092,414,600	\$1,170,000,000	87%	\$1,017,250,587	\$8,682,190	\$16,069,933	\$245,401,919	\$262,325,551	0.24	1.32	9/30/2023
8/1/2012	Torchlight IV	\$2,972,174	\$60,000,000	141%	\$84,866,971	\$0	\$0	\$109,589,365	\$0	1.29	1.33	9/30/2023
3/12/2015	Torchlight V	\$7,260,340	\$75,000,000	80%	\$60,000,000	\$0	\$0	\$71,460,214	\$15,000,000	1.19	1.31	9/30/2023
	Total Private Credit	\$1,104,706,437										
	% of Portfolio (Market Value)	10.0%										

*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: December 31, 2023

Verus Internal Analysis

Inception Date	Manager Name/Fund Name	Estimated Market Value as of 12/31/2023 ¹	Total Commitment	Total % Called	Capital Called	Current Qtr. Capital Called	Current Qtr. Distributions	Total Distributions ⁸	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	\$10,202,531	\$80,000,000	94%	\$75,401,855	\$0	\$0	\$101,711,550	\$12,334,302	1.35	1.48	9/30/2023
12/8/2014	Angelo Gordon Realty Fund IX	\$18,478,010	\$65,000,000	93%	\$60,125,000	\$0	\$0	\$58,012,501	\$7,572,500	0.96	1.27	9/30/2023
3/24/2023	BlackStone Strategic Partners Real Estate VIII	\$4,877,981	\$80,000,000	5%	\$4,135,831	\$4,135,831	\$0	\$0	\$75,864,169	N/A	N/A	N/A
3/24/2023	Blackstone Real Estate Partners X	\$4,534,419	\$100,000,000	5%	\$5,468,649	\$828,423	\$0	\$0	\$94,531,351	0.00	0.83	9/30/2023
12/14/2023	Cross Lake RE IV	\$1,880,326	\$60,000,000	3%	\$1,880,326	\$1,880,326	\$0	\$0	\$58,119,674	N/A	N/A	N/A
6/23/2005	DLJ RECP III	\$10,290,642	\$75,000,000	95%	\$70,968,662	\$0	\$1,128,351	\$77,985,055	\$4,031,338	1.10	1.24	9/30/2023
2/11/2008	DLJ RECP IV	\$43,051,205	\$100,000,000	119%	\$118,794,333	\$0	\$0	\$99,841,735	\$1,876,084	0.84	1.20	9/30/2023
7/1/2014	DLJ RECP V	\$25,133,676	\$75,000,000	146%	\$109,393,496	\$1,300,200	\$0	\$100,933,448	\$1,766,747	0.92	1.15	9/30/2023
3/19/2019	DLJ RECP VI	\$30,487,418	\$50,000,000	77%	\$38,496,759	\$0	\$0	\$11,369,099	\$15,396,028	0.30	1.09	9/30/2023
12/14/2023	EQT Exeter Industrial Value Fund VI	\$5,122,069	\$60,000,000	10%	\$6,000,000	\$6,000,000	\$0	\$0	\$54,000,000	N/A	N/A	N/A
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	\$58,669,764	\$75,000,000	87%	\$65,318,898	\$0	\$0	\$9,319,462	\$9,681,102	0.14	1.04	12/31/2023
9/27/2022	Invesco Real Estate VI	\$49,475,393	\$100,000,000	54%	\$53,778,909	\$8,147,656	\$0	\$2,230,131	\$66,873,408	0.04	0.96	9/30/2023
11/10/2023	KSL Capital Partners VI, L.P.	\$11,766,813	\$50,000,000	24%	\$11,766,813	\$11,766,813	\$0	\$0	\$38,233,187	N/A	N/A	N/A
7/16/2013	LaSalle Income & Growth VI ⁴	\$13,658,492	\$75,000,000	95%	\$71,428,571	\$0	\$0	\$84,541,423	\$0	1.18	1.37	9/30/2023
2/28/2017	LaSalle Income & Growth VII	\$26,910,963	\$75,000,000	96%	\$72,154,315	\$2,845,685	\$0	\$50,904,014	\$2,845,685	0.71	1.08	9/30/2023
7/3/2013	Long Wharf Fund IV ⁴	\$292,888	\$25,000,000	100%	\$25,000,000	\$0	\$0	\$34,948,087	\$0	1.40	1.41	12/31/2023
9/30/2016	Long Wharf Fund V ⁴	\$28,758,306	\$50,000,000	100%	\$50,000,000	\$0	\$0	\$37,244,373	\$0	0.74	1.32	12/31/2023
6/27/2019	Long Wharf Fund VI	\$34,319,023	\$50,000,000	100%	\$49,999,998	\$0	\$0	\$27,056,490	\$2	0.54	1.23	12/31/2023
5/30/2023	Long Wharf Fund VII	\$6,651,081	\$50,000,000	18%	\$9,108,500	\$3,177,405	\$0	\$0	\$40,891,500	0.00	0.73	12/31/2023
12/31/2011	Oaktree REOF V ⁴	\$379,871	\$50,000,000	101%	\$50,315,673	\$0	\$0	\$78,780,733	\$5,000,000	1.57	1.57	12/31/2023
9/30/2013	Oaktree REOF VI ⁴	\$17,840,801	\$80,000,000	100%	\$80,000,000	\$0	\$0	\$84,810,175	\$18,400,000	1.06	1.28	12/31/2023
4/1/2015	Oaktree REOF VII	\$37,548,420	\$65,000,000	139%	\$90,350,000	\$0	\$0	\$26,277,174	\$18,915,000	0.29	0.71	12/31/2023
11/10/2013	Paulson Real Estate Fund II ⁴	\$11,684,659	\$20,000,000	97%	\$19,345,623	\$0	\$1,025,006	\$25,449,660	\$654,377	1.32	1.92	9/30/2023
4/28/2022	PCCP IX	\$56,893,930	\$75,000,000	76%	\$56,801,564	\$2,625,000	\$0	\$0	\$18,198,436	0.00	1.00	9/30/2023
1/25/2012	Siguler Guff DREOF	\$12,297,761	\$75,000,000	93%	\$69,375,000	\$0	\$345,259	\$104,116,370	\$5,625,000	1.50	1.68	9/30/2023
8/31/2013	Siguler Guff DREOF II	\$27,117,102	\$70,000,000	89%	\$61,985,000	\$0	\$13,107	\$55,704,893	\$8,015,000	0.90	1.34	9/30/2023
1/27/2016	Siguler Guff DREOF II Co-Inv	\$12,248,272	\$25,000,000	85%	\$21,277,862	\$0	\$0	\$13,871,261	\$3,722,138	0.65	1.23	9/30/2023
Total Closed End Real Estate		\$561,026,548	\$1,730,000,000	79%	\$1,373,218,040	\$36,707,339	\$2,511,724	\$1,124,884,960	\$513,000,626	0.82	1.23	
% of Portfolio (Market Value)		5.1%										

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: December 31, 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	-	-	-	7.0%	9/30/2023
Stepstone CC Opportunities Fund ¹	2/2/2018	-	9.9%	-	9.2%	12/31/2022
Torchlight IV	8/1/2012	11.2%	11.7%	9.0%	9.7%	9/30/2023
Torchlight V	3/12/2015	14.1%	14.1%	10.1%	10.1%	9/30/2023
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	-	-	-	12.1%	9/30/2023
Angelo Gordon IX	12/8/2014	-	-	-	5.6%	9/30/2023
Blackstone Real Estate Partners X 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	6/23/2005	-1.0%	-1.0%	-3.0%	-3.0%	9/30/2023
DLJ RECP IV	2/11/2008	4.0%	4.0%	1.0%	2.0%	9/30/2023
DLJ RECP V	7/1/2014	11.0%	11.0%	5.0%	5.0%	9/30/2023
DLJ RECP VI	3/19/2019	11.0%	11.0%	2.0%	3.0%	9/30/2023
EQT Exeter Industrial Value Fund VI ¹	12/14/2023	-	-	-	-	N/A
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	13.0%	-	10.3%	-	9/30/2023
Invesco Fund V	2/20/2019	9.8%	-	7.1%	-	9/30/2023
Invesco Fund VI	9/27/2022	-	-	-	-	N/A
KSL Capital Partners VI ¹	11/10/2023	-	-	-	-	N/A
LaSalle Income & Growth VI ⁴	7/16/2013	10.5%	10.5%	8.5%	8.6%	12/31/2023
LaSalle Income & Growth VII	2/28/2017	1.7%	-1.6%	-0.3%	-0.5%	12/31/2023
Long Wharf IV ⁴	7/3/2013	14.7%	14.5%	11.1%	11.0%	12/31/2023
Long Wharf V ⁴	9/30/2016	9.7%	10.1%	7.1%	7.4%	12/31/2023
Long Wharf VI	6/27/2019	26.6%	28.3%	16.4%	17.3%	12/31/2023
Long Wharf VII	5/1/2023	-7.1%	-5.6%	-30.5%	-24.5%	12/31/2023
Oaktree REOF V ⁴	12/31/2011	16.6%	-	12.2%	-	12/31/2023
Oaktree REOF VI ⁴	9/30/2013	10.4%	-	6.6%	-	12/31/2023
Oaktree REOF VII	4/1/2015	16.2%	-	10.1%	-	12/31/2023
Paulson ⁴	11/10/2013	-	-	12.2%	-	12/31/2022
PCCP IX	5/27/2021	5.5%	-	1.1%	-	9/30/2023
Siguler Guff I	1/25/2012	12.3%	15.0%	10.7%	11.9%	9/30/2023
Siguler Guff II	8/31/2013	8.9%	9.0%	7.6%	7.4%	9/30/2023
Siguler Guff DREOF II Co-Inv	1/27/2016	5.6%	5.8%	4.6%	4.4%	9/30/2023

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: December 31, 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	8.98	0.00	17.42	0.00	1.00	0.02	1.00	0.46	0.28	100.01	99.99
Boston Partners	12.81	3.95	16.43	3.88	0.98	3.27	0.96	0.69	1.10	102.77	86.41
Emerald Advisers	-1.94	1.56	21.47	1.50	0.96	4.86	0.95	-0.08	0.32	102.83	97.76
Ceredex	10.32	2.38	19.28	3.40	0.83	7.41	0.89	0.50	0.23	89.81	79.99
Pyrford	4.42	-1.38	13.67	-0.38	0.82	5.54	0.88	0.23	-0.29	84.89	88.00
William Blair	-2.84	-0.17	18.99	0.11	1.02	5.83	0.91	-0.17	0.01	106.57	105.92
PIMCO RAE Emerging Markets	8.79	8.79	17.19	9.05	1.01	6.46	0.86	0.46	1.35	128.85	87.34
TT Emerging Markets	-8.45	-3.37	19.65	-2.75	1.09	6.13	0.91	-0.46	-0.51	116.57	126.75
Artisan Partners	-0.47	-4.13	19.38	-3.83	0.97	4.70	0.94	-0.04	-0.86	86.81	100.33
First Eagle	5.86	-1.47	12.94	-0.22	0.82	4.39	0.93	0.34	-0.39	80.46	80.98
Voya Global Investors	1.47	-0.53	8.39	-0.51	1.00	1.08	0.98	-0.04	-0.48	96.60	101.28
Adelante	7.77	0.25	20.41	0.47	0.96	1.60	1.00	0.36	0.03	96.78	95.47
AQR Global Risk Premium-EL	-0.57	0.63	10.41	0.47	0.90	2.44	0.96	-0.21	0.22	91.89	89.03
PanAgora Risk Parity Multi Asset	-6.52	-5.32	14.83	-4.79	1.27	4.57	0.95	-0.52	-1.11	108.63	138.16
AFL-CIO	-3.46	-0.15	6.83	-0.34	0.95	1.03	0.98	-0.81	-0.17	92.33	95.97
DFA Short Credit	-0.31	0.29	2.71	0.17	0.80	1.33	0.81	-0.97	0.21	88.52	83.47
Insight Short Duration	1.46	1.37	1.76	1.41	0.55	1.61	0.46	-0.43	0.84	72.54	22.22
Sit Short Duration	-0.17	-0.08	3.47	-0.02	1.47	1.82	0.81	-0.67	-0.02	151.76	152.23

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: December 31, 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	15.51	-0.01	18.79	-0.01	1.00	0.02	1.00	0.77	-0.51	99.97	100.00
Boston Partners	12.78	1.87	19.25	1.65	1.01	3.09	0.97	0.63	0.58	101.38	93.58
Emerald Advisers	11.00	1.78	23.75	2.04	0.96	5.26	0.95	0.48	0.29	102.27	97.66
Ceredex	9.96	-0.04	22.77	1.06	0.87	7.11	0.92	0.45	-0.08	88.57	85.40
Pyrford	7.60	1.26	14.93	2.53	0.75	6.81	0.89	0.44	0.07	85.44	77.56
William Blair	9.87	2.38	19.21	2.12	1.04	5.06	0.93	0.49	0.49	111.04	103.76
PIMCO RAE Emerging Markets	8.31	4.93	20.80	4.89	1.07	5.88	0.92	0.40	0.88	115.79	95.83
TT Emerging Markets	2.69	-1.00	22.49	-1.04	1.15	6.00	0.95	0.15	-0.04	116.39	121.24
Artisan Partners	13.52	-1.06	19.01	-0.19	0.95	4.85	0.94	0.67	-0.21	93.36	93.27
First Eagle	8.93	0.69	14.09	2.33	0.76	5.61	0.93	0.55	0.00	82.33	73.96
Voya Global Investors	4.65	-0.56	8.98	-0.18	0.92	1.70	0.97	0.34	-0.35	93.55	96.27
Adelante	8.65	1.09	19.99	1.28	0.95	1.72	1.00	0.42	0.46	98.33	94.33
AFL-CIO	0.59	-0.51	5.80	-0.45	0.94	1.05	0.97	-0.19	-0.50	88.95	94.23
DFA Short Credit	1.39	-0.16	2.50	0.14	0.81	1.43	0.71	-0.19	-0.11	82.62	78.42
Insight Short Duration	2.42	0.91	2.04	1.50	0.61	1.86	0.30	0.27	0.48	84.74	17.44
Sit Short Duration	1.70	0.41	3.02	-0.11	1.43	1.60	0.79	-0.05	0.27	148.13	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: December 31, 2023

Name	Asset Class	Fee Schedule	Market Value	Estimated Fee Value	Expense Fee (%)
BlackRock Russell 1000 Index	Growth	0.03 % of Assets	\$1,209,333,414	\$362,800	0.03
Boston Partners	Growth	0.50 % of First \$25 M 0.30 % Thereafter	\$404,182,450	\$1,262,547	0.31
Emerald Advisers	Growth	0.75 % of First \$10 M 0.60 % Thereafter	\$232,966,434	\$1,412,799	0.61
Ceredex	Growth	0.85 % of First \$10 M 0.68 % of Next \$40 M 0.51 % Thereafter	\$223,940,873	\$1,244,098	0.56
Pyrford	Growth	0.70 % of First \$50 M 0.50 % of Next \$50 M 0.35 % Thereafter	\$502,490,844	\$2,008,718	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	\$472,658,576	\$1,832,976	0.39
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	\$248,383,507	\$1,430,226	0.58
TT Emerging Markets	Growth	0.70 % of First \$100 M 0.65 % of Next \$100 M 0.60 % Thereafter	\$231,652,415	\$1,539,914	0.66
Artisan Partners	Growth	0.75 % of Assets	\$600,553,612	\$4,504,152	0.75
First Eagle	Growth	0.75 % of Assets	\$560,922,713	\$4,206,920	0.75
Voya Global Investors	Growth	0.50 % of First \$50 M 0.40 % of Next \$50 M 0.35 % Thereafter	\$157,281,692	\$650,486	0.41
Invesco US Fundamental Beta	Growth	0.15 % of Assets	\$116,631,364	\$174,947	0.15
AQR Global Risk Premium-EL	Growth	0.38 % of Assets	\$176,809,243	\$671,875	0.38

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

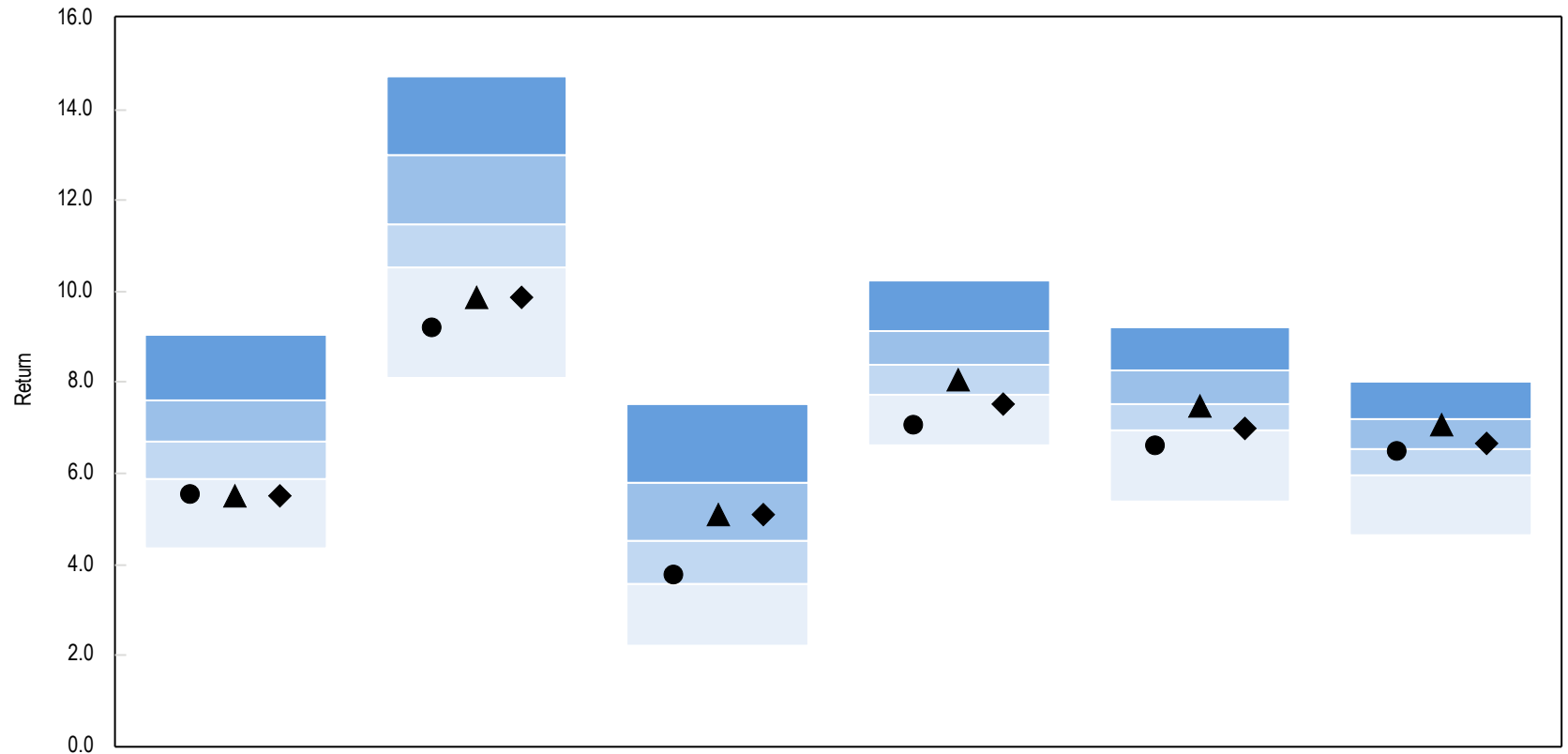
Total Fund
Investment Fund Fee Analysis

Contra Costa County Employees' Retirement Association
Period Ending: December 31, 2023

Name	Asset Class	Fee Schedule	Market Value	Estimated Fee Value	Expense Fee (%)
PanAgora Risk Parity Multi Asset	Growth	0.35 % of Assets	\$163,063,917	\$570,724	0.35
AFL-CIO	Diversifying	0.32 % of Assets	\$223,235,851	\$714,355	0.32
Acadian Multi-Asset Absolute Return Fund	Diversifying	0.50 % of Assets	\$211,000,534	\$1,055,003	0.50
Sit LLCAR	Diversifying	0.39 % of First \$200 M 0.35 % Thereafter	\$315,896,054	\$1,200,405	0.38
DFA Short Credit	Liquidity	0.20 % of First \$25 M 0.10 % Thereafter	\$365,687,785	\$390,688	0.11
Insight Short Duration	Liquidity	0.06 % of First \$500 M 0.05 % of Next \$500 M 0.04 % Thereafter	\$601,555,000	\$350,778	0.06
Sit Short Duration	Liquidity	0.15 % of Assets	\$656,736,941	\$985,105	0.15

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

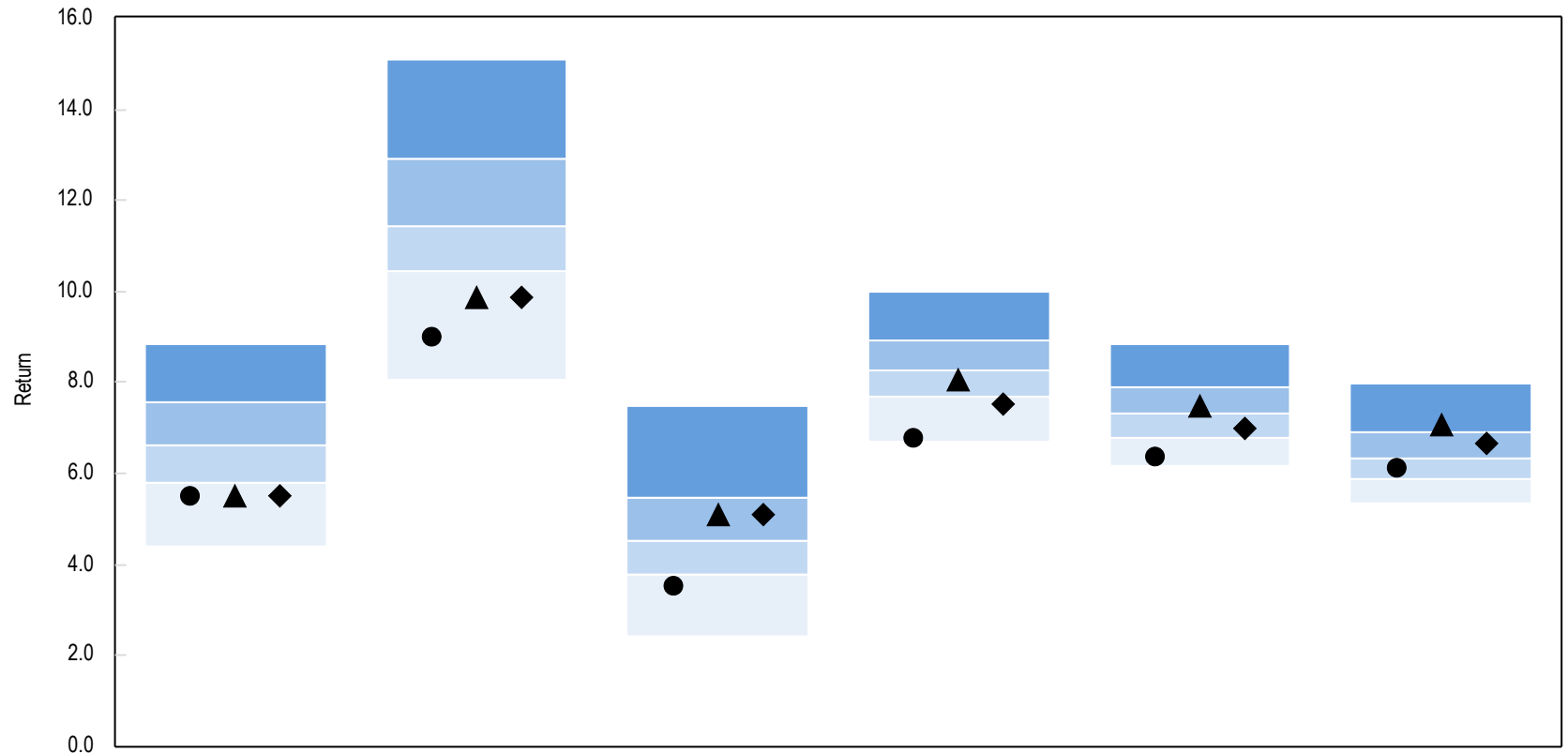
Total Fund Cumulative Performance vs. InvMetrics Public DB >\$1B Gross



	3 Mo	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs
● Total Fund	5.56 (80)	9.23 (88)	3.78 (73)	7.07 (89)	6.63 (81)	6.48 (54)
▲ Policy Index	5.51 (81)	9.89 (85)	5.09 (36)	8.06 (63)	7.51 (51)	7.08 (29)
◆ Policy Index (Adjusted)	5.51 (81)	9.89 (85)	5.09 (36)	7.51 (84)	7.00 (73)	6.66 (46)
5th Percentile	9.05	14.71	7.53	10.22	9.20	8.00
1st Quartile	7.60	12.99	5.81	9.15	8.26	7.20
Median	6.72	11.48	4.53	8.39	7.54	6.55
3rd Quartile	5.89	10.55	3.57	7.72	6.93	5.97
95th Percentile	4.36	8.11	2.21	6.61	5.37	4.63
Population	105	96	83	80	80	75

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

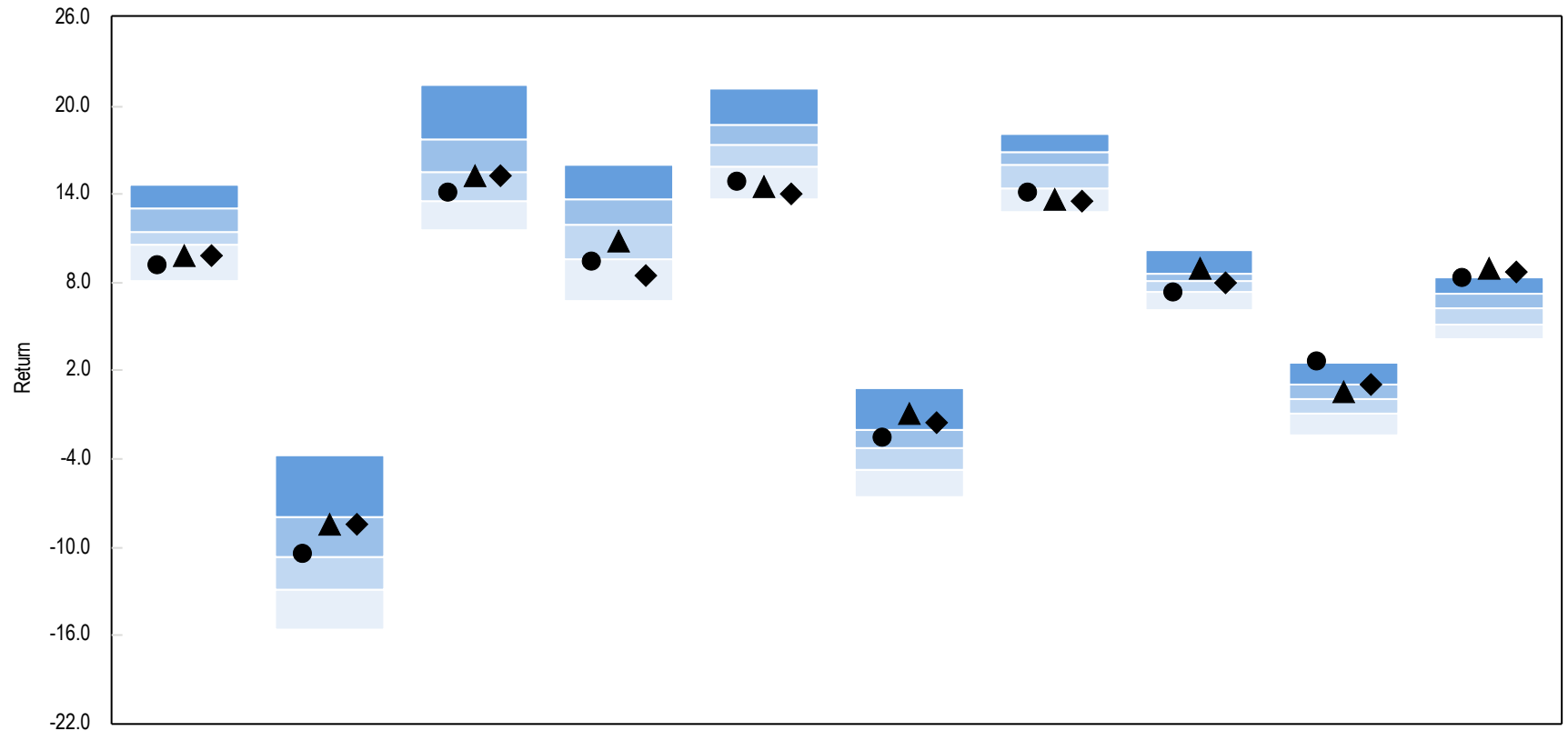


	3 Mo	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs
● Total Fund	5.51 (80)	9.02 (89)	3.54 (80)	6.80 (94)	6.36 (92)	6.11 (58)
▲ Policy Index	5.51 (80)	9.89 (83)	5.09 (33)	8.06 (59)	7.51 (42)	7.08 (23)
◆ Policy Index (Adjusted)	5.51 (80)	9.89 (83)	5.09 (33)	7.51 (83)	7.00 (65)	6.66 (37)
5th Percentile	8.85	15.09	7.49	10.00	8.85	7.98
1st Quartile	7.56	12.92	5.45	8.94	7.91	6.89
Median	6.61	11.42	4.53	8.28	7.33	6.34
3rd Quartile	5.81	10.46	3.77	7.70	6.77	5.86
95th Percentile	4.41	8.07	2.42	6.69	6.15	5.36
Population	94	85	72	69	68	63

Total Fund
Peer Universe Comparison: Consecutive Periods (Gross of Fees)

Contra Costa County Employees' Retirement Association
Period Ending: December 31, 2023

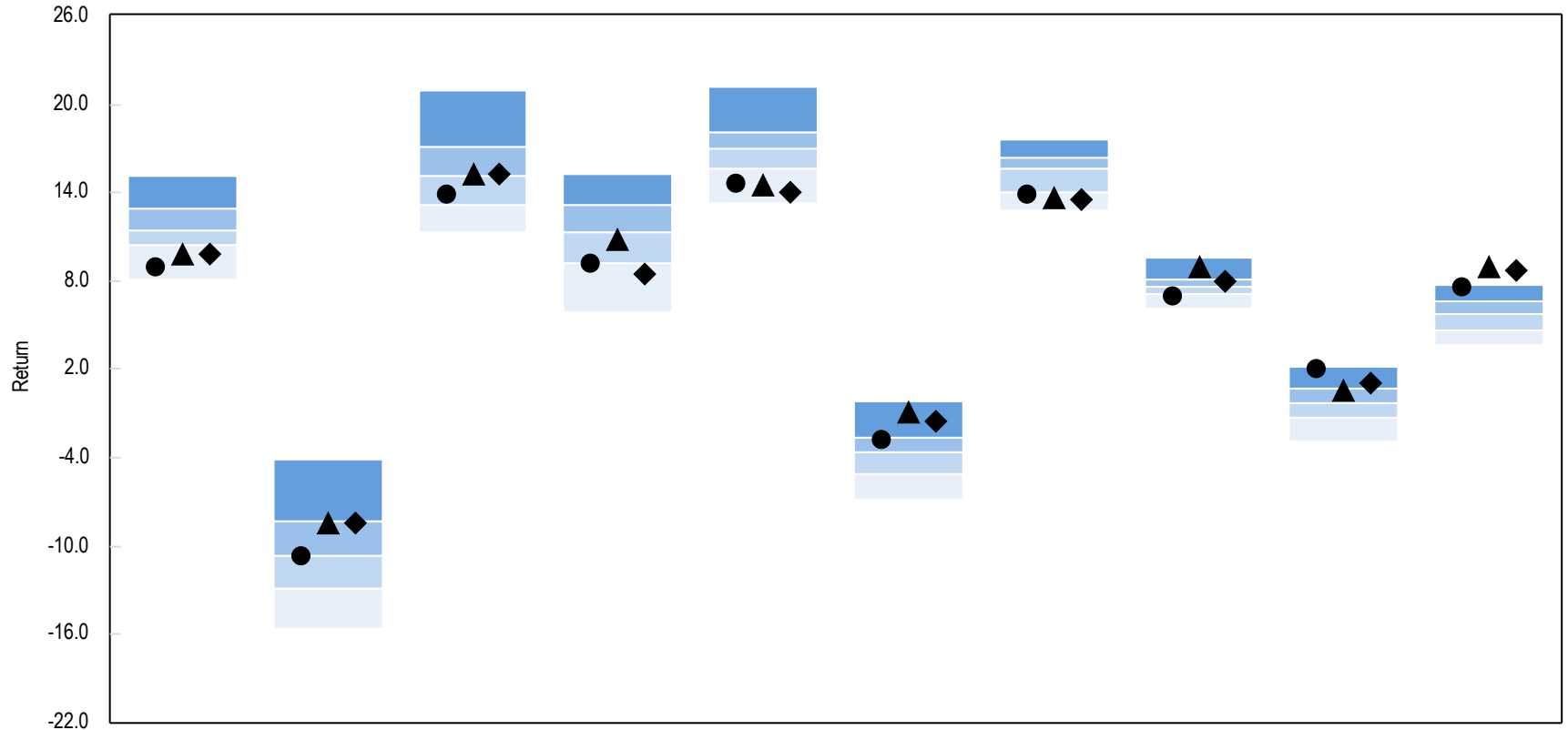
Total Fund Consecutive Periods vs. InvMetrics Public DB >\$1B Gross



	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
● Total Fund	9.23 (88)	-10.39 (48)	14.21 (66)	9.52 (79)	14.92 (89)	-2.46 (32)	14.18 (79)	7.43 (74)	2.70 (3)	8.40 (6)
▲ Policy Index	9.89 (85)	-8.38 (27)	15.29 (53)	10.81 (63)	14.58 (90)	-0.94 (12)	13.69 (90)	8.93 (18)	0.58 (35)	9.03 (2)
◆ Policy Index (Adjusted)	9.89 (85)	-8.38 (27)	15.29 (53)	8.49 (91)	14.06 (93)	-1.52 (17)	13.51 (92)	8.03 (54)	1.06 (25)	8.67 (3)
5th Percentile	14.71	-3.72	21.43	16.04	21.22	0.77	18.11	10.15	2.60	8.40
1st Quartile	12.99	-7.91	17.69	13.70	18.69	-2.07	16.81	8.61	1.05	7.26
Median	11.48	-10.68	15.54	11.93	17.30	-3.27	16.02	8.08	0.11	6.23
3rd Quartile	10.55	-12.82	13.49	9.65	15.90	-4.71	14.36	7.38	-0.86	5.18
95th Percentile	8.11	-15.60	11.54	6.74	13.63	-6.57	12.78	6.10	-2.39	4.21
Population	96	122	158	170	133	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.

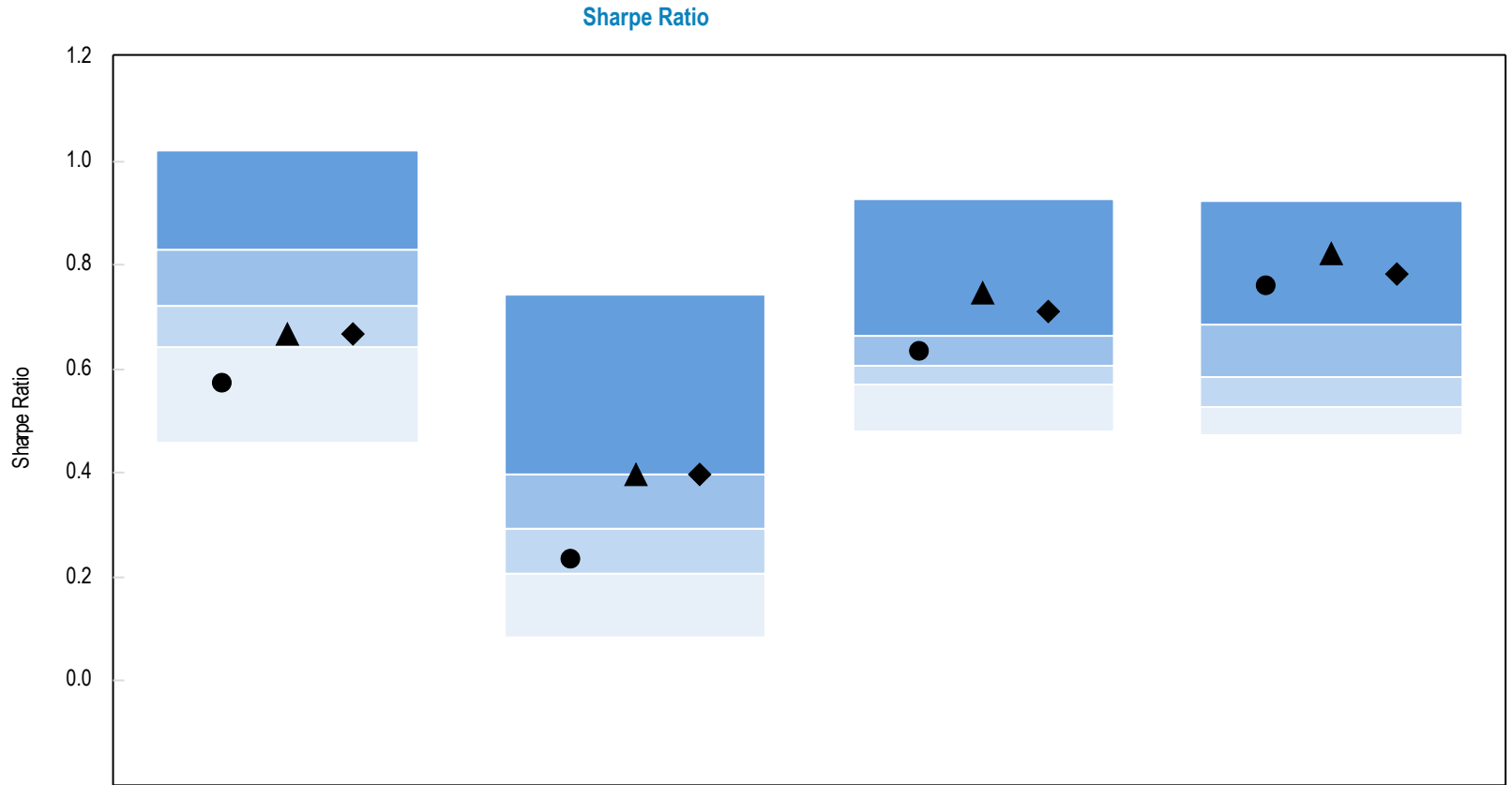
Total Fund Consecutive Periods vs. InvMetrics Public DB >\$1B Net



	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
● Total Fund	9.02 (89)	-10.61 (51)	13.90 (65)	9.23 (76)	14.61 (92)	-2.72 (29)	13.86 (80)	6.94 (79)	2.09 (9)	7.67 (7)
▲ Policy Index	9.89 (83)	-8.38 (27)	15.29 (50)	10.81 (60)	14.58 (92)	-0.94 (7)	13.69 (85)	8.93 (14)	0.58 (26)	9.03 (2)
◆ Policy Index (Adjusted)	9.89 (83)	-8.38 (27)	15.29 (50)	8.49 (89)	14.06 (93)	-1.52 (10)	13.51 (87)	8.03 (33)	1.06 (22)	8.67 (2)
5th Percentile	15.09	-4.07	20.99	15.24	21.22	-0.12	17.64	9.59	2.21	7.79
1st Quartile	12.92	-8.33	17.17	13.13	18.15	-2.65	16.42	8.12	0.75	6.59
Median	11.42	-10.61	15.19	11.37	17.00	-3.66	15.65	7.61	-0.32	5.74
3rd Quartile	10.46	-12.83	13.20	9.25	15.64	-5.12	14.02	7.12	-1.28	4.67
95th Percentile	8.07	-15.60	11.31	5.83	13.27	-6.79	12.79	6.17	-2.82	3.69
Population	85	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: December 31, 2023

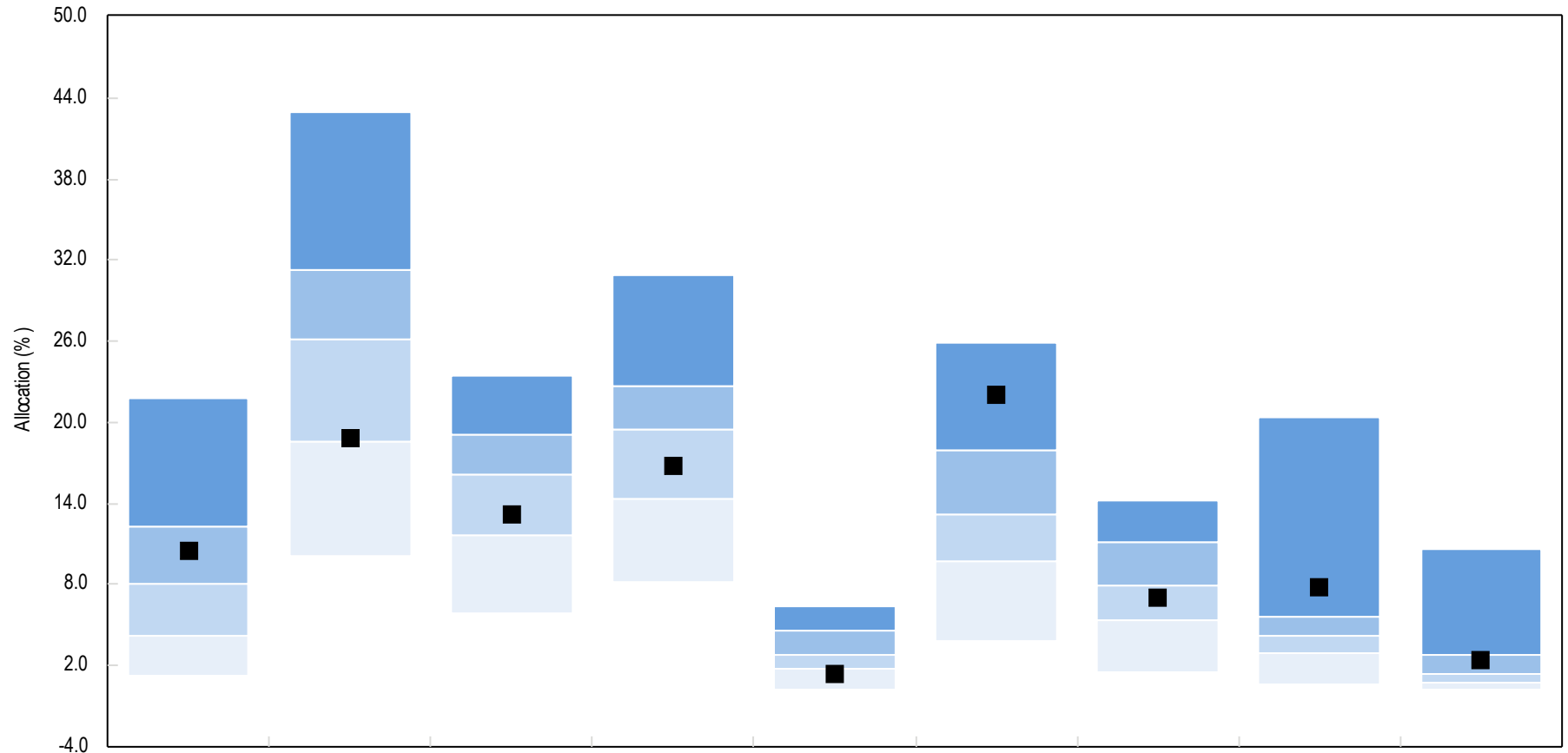


	1 Yr	3 Yrs	5 Yrs	10 Yrs
● Total Fund	0.57 (86)	0.23 (65)	0.63 (39)	0.76 (17)
▲ Policy Index	0.67 (66)	0.40 (26)	0.75 (19)	0.82 (9)
◆ Policy Index (Adjusted)	0.67 (66)	0.40 (26)	0.71 (22)	0.78 (15)
5th Percentile	1.02	0.74	0.93	0.92
1st Quartile	0.83	0.40	0.66	0.68
Median	0.72	0.29	0.61	0.59
3rd Quartile	0.64	0.21	0.57	0.53
95th Percentile	0.46	0.08	0.48	0.47
Population	85	72	69	63

Total Fund
Peer Universe Comparison: Asset Allocation

Contra Costa County Employees' Retirement Association
Period Ending: December 31, 2023

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



	Global Equity 10.5 (34)	US Equity 18.8 (74)	Global ex-US Equity 13.2 (71)	US Fixed 16.8 (66)	Global ex-US Fixed 1.4 (80)	Private Equity 22.0 (10)	Total Real Estate 7.0 (62)	Multi-Asset 7.9 (15)	Cash & Equivalents 2.4 (29)
■ Total Fund									
5th Percentile	21.8	42.9	23.5	30.9	6.3	25.9	14.2	20.4	10.6
1st Quartile	12.3	31.2	19.1	22.7	4.5	17.9	11.2	5.6	2.8
Median	8.1	26.2	16.2	19.5	2.8	13.2	7.9	4.2	1.4
3rd Quartile	4.2	18.5	11.7	14.4	1.7	9.8	5.4	2.9	0.7
95th Percentile	1.3	10.1	5.9	8.2	0.3	3.9	1.5	0.6	0.2
Population	32	92	91	89	33	71	75	28	79

Domestic Equity Managers

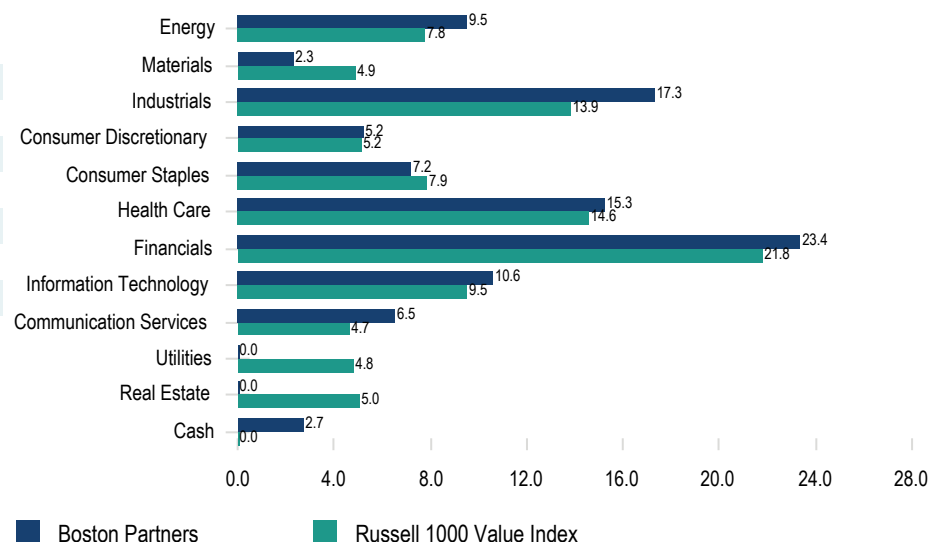
Boston Partners Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: December 31, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	90	849
Wtd. Avg. Mkt. Cap \$M	181,831.45	139,507.59
Median Mkt. Cap \$M	46,592.56	12,547.49
Price/Earnings ratio	16.18	16.75
Price/Book ratio	2.66	2.45
Return on Equity (%)	-3.97	-23.27
Current Yield (%)	1.74	2.33
Beta (5 Years, Monthly)	1.01	1.00

Sector Allocation (%) vs. Russell 1000 Value Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
JPMorgan Chase & Co	4.24	18.16
Berkshire Hathaway Inc	3.45	1.82
Alphabet Inc	3.09	6.75
Morgan Stanley	2.35	15.55
Bristol-Myers Squibb Co	1.89	-10.70
Philip Morris International Inc	1.82	3.06
Sanofi	1.82	-7.29
Discover Financial Services	1.79	30.80
Wells Fargo & Co	1.75	21.50
UnitedHealth Group Incorporated	1.71	4.78

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
JPMorgan Chase & Co	3.68	18.16	0.67
Advanced Micro Devices Inc	1.10	43.37	0.48
United Rentals Inc.	1.36	29.42	0.40
Wells Fargo & Co	1.77	21.50	0.38
Discover Financial Services	1.20	30.80	0.37
CRH PLC	1.06	28.98	0.31
Micron Technology Inc.	1.15	25.82	0.30
General Dynamics Corp	1.49	18.23	0.27
Morgan Stanley	1.74	15.55	0.27
QUALCOMM Inc.	0.82	31.04	0.25

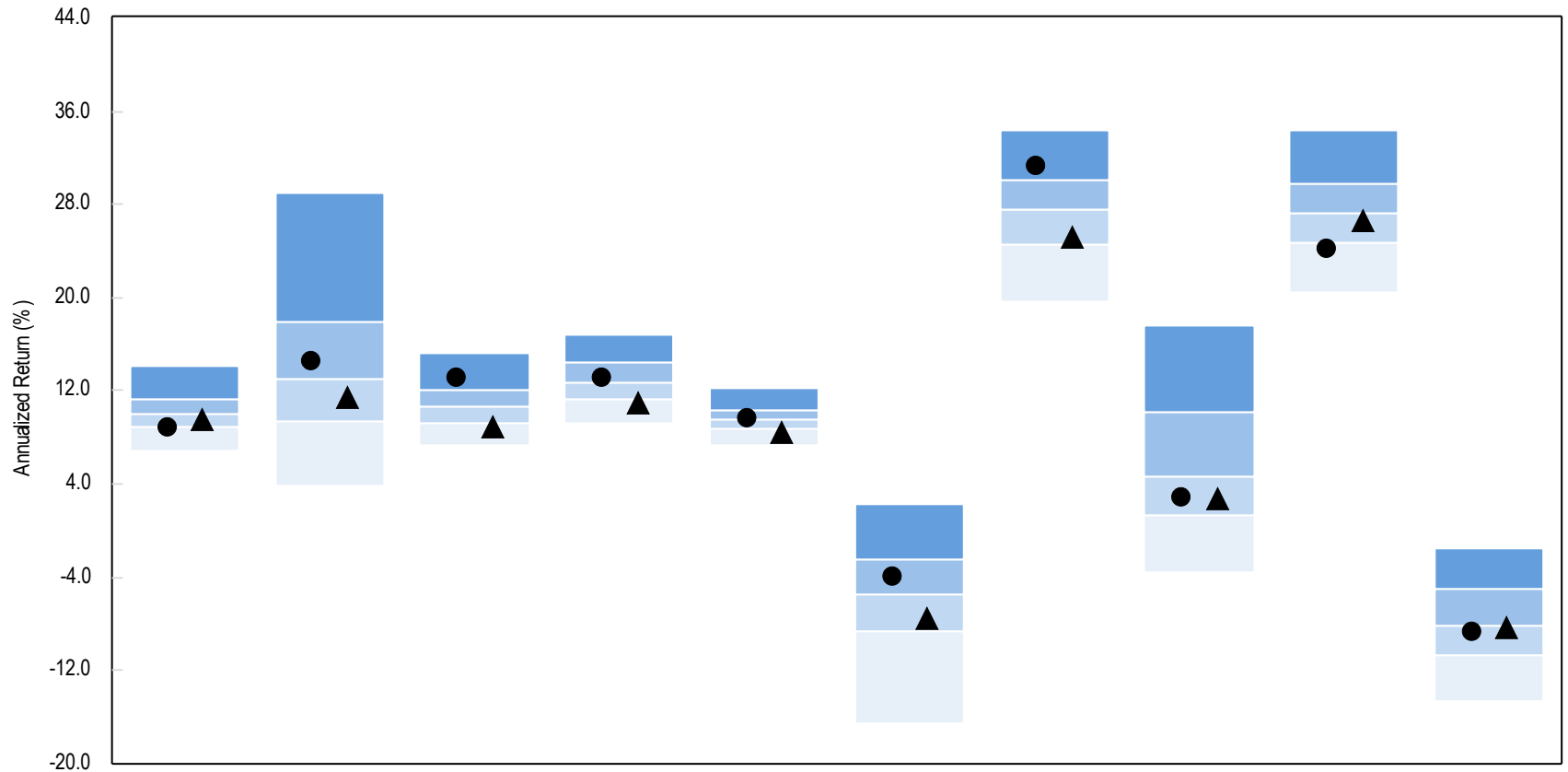
Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Cenovus Energy Inc	1.61	-19.53	-0.31
Bristol-Myers Squibb Co	2.55	-10.70	-0.27
Schlumberger Ltd	1.52	-10.30	-0.16
Sanofi	1.87	-7.29	-0.14
Cisco Systems Inc	2.37	-5.34	-0.13
Halliburton Co	1.02	-10.33	-0.10
BP plc	1.10	-7.42	-0.08
BorgWarner Inc	0.61	-10.91	-0.07
Aon plc	0.56	-10.06	-0.06
Conocophillips	1.44	-2.63	-0.04

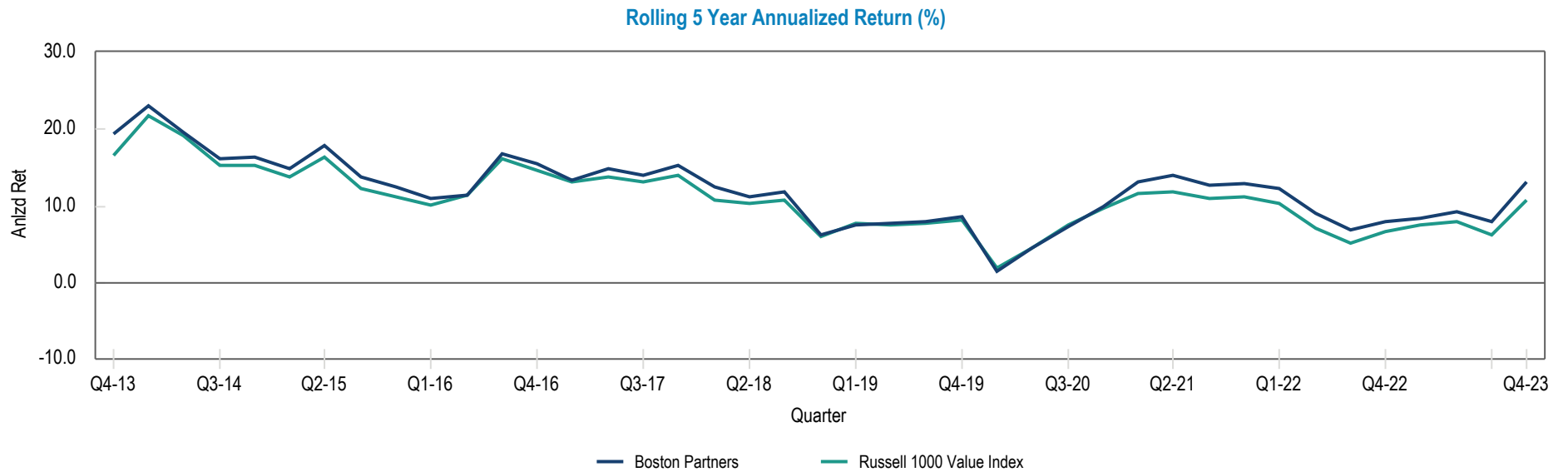
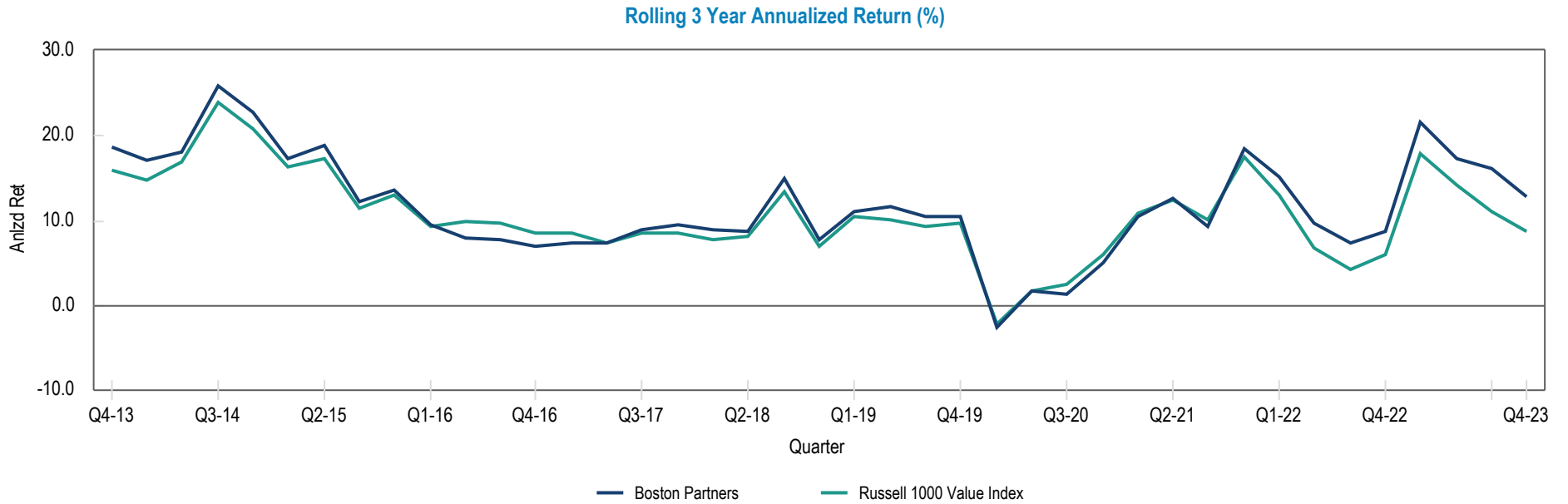
% of Portfolio 15.37 3.70 % of Portfolio 14.65 -1.35

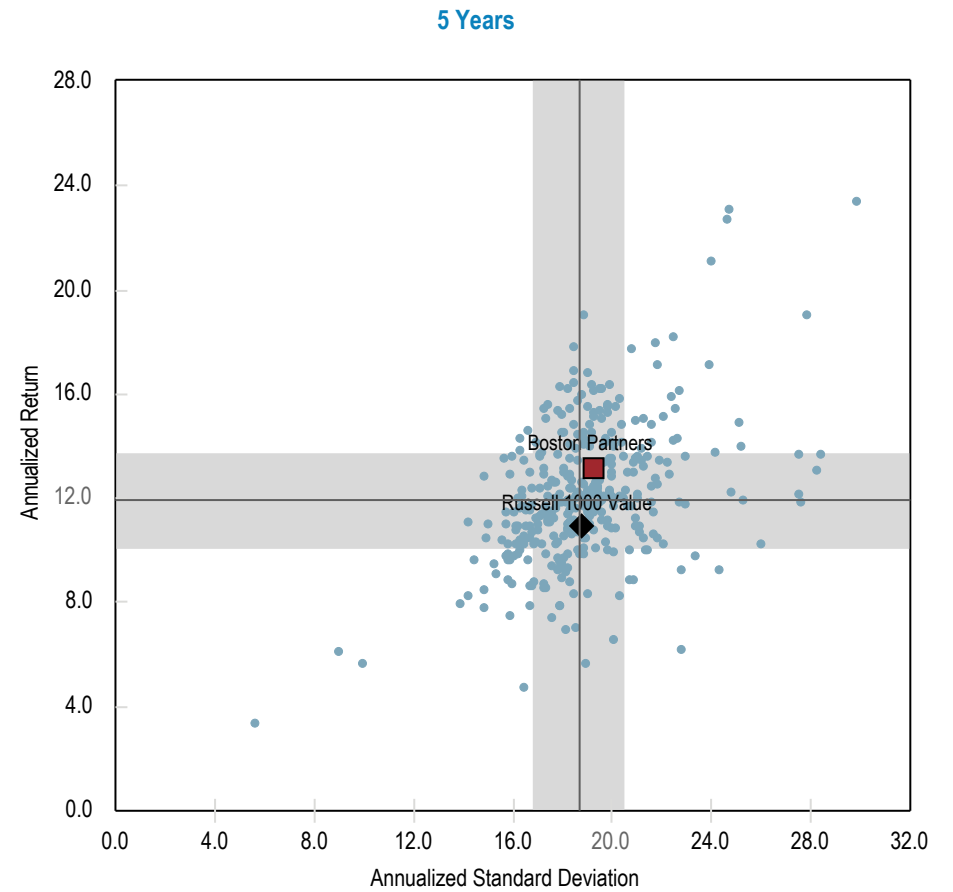
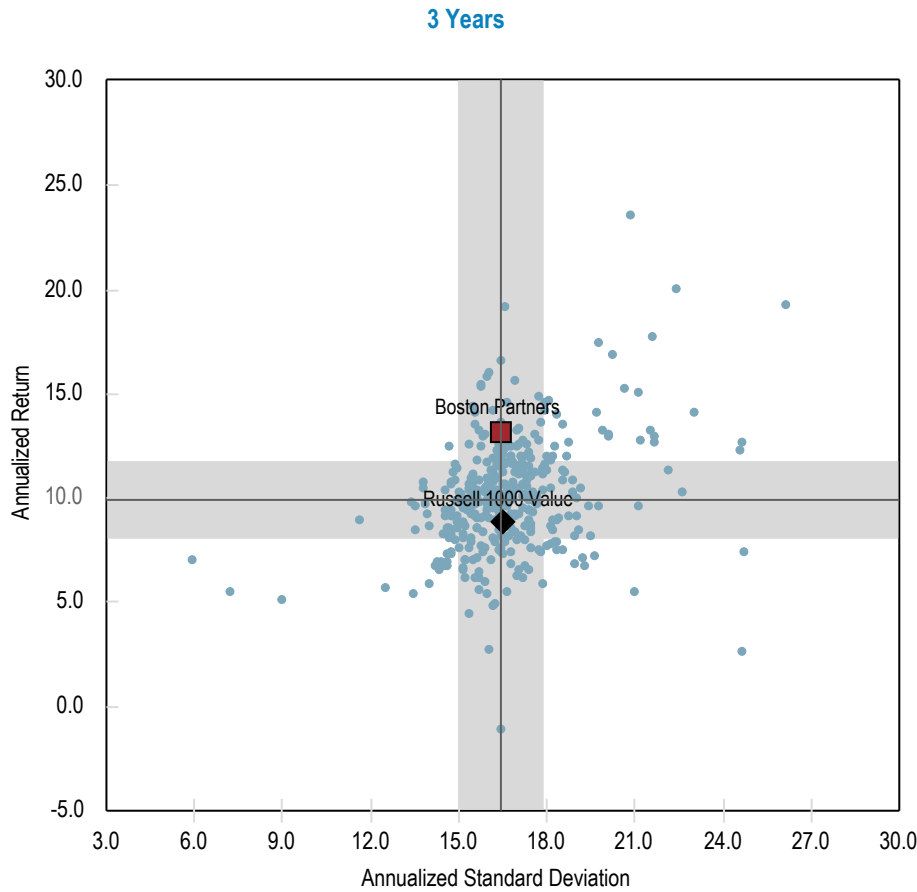
Domestic equity large cap value portfolio exhibiting low turnover in companies with low valuations relative to intrinsic value. Primary personnel include Mark Donovan and David Pyle.

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	8.97 (74)	14.67 (39)	13.15 (15)	13.13 (41)	9.67 (45)	-3.82 (36)	31.34 (18)	2.96 (63)	24.26 (79)	-8.65 (59)
▲ Russell 1000 Value Index	9.50 (61)	11.46 (62)	8.86 (80)	10.91 (81)	8.40 (85)	-7.54 (68)	25.16 (72)	2.80 (64)	26.54 (57)	-8.27 (54)
5th Percentile	14.06	28.93	15.27	16.84	12.16	2.29	34.34	17.56	34.33	-1.47
1st Quartile	11.36	17.90	12.16	14.42	10.41	-2.48	30.16	10.11	29.85	-5.02
Median	10.05	13.05	10.69	12.66	9.49	-5.43	27.59	4.65	27.19	-8.10
3rd Quartile	8.89	9.38	9.26	11.24	8.72	-8.66	24.57	1.30	24.74	-10.66
95th Percentile	6.85	3.82	7.30	9.26	7.41	-16.45	19.69	-3.52	20.39	-14.67
Population	389	389	383	367	331	414	424	430	458	480





3 Years

	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Boston Partners	13.1	16.4	0.7
Russell 1000 Value Index	8.9	16.5	0.5
eV US Large Cap Value Equity Median	10.7	16.4	0.6
Population	383	383	383

5 Years

	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Boston Partners	13.1	19.2	0.6
Russell 1000 Value Index	10.9	18.8	0.5
eV US Large Cap Value Equity Median	12.7	18.6	0.6
Population	367	367	367

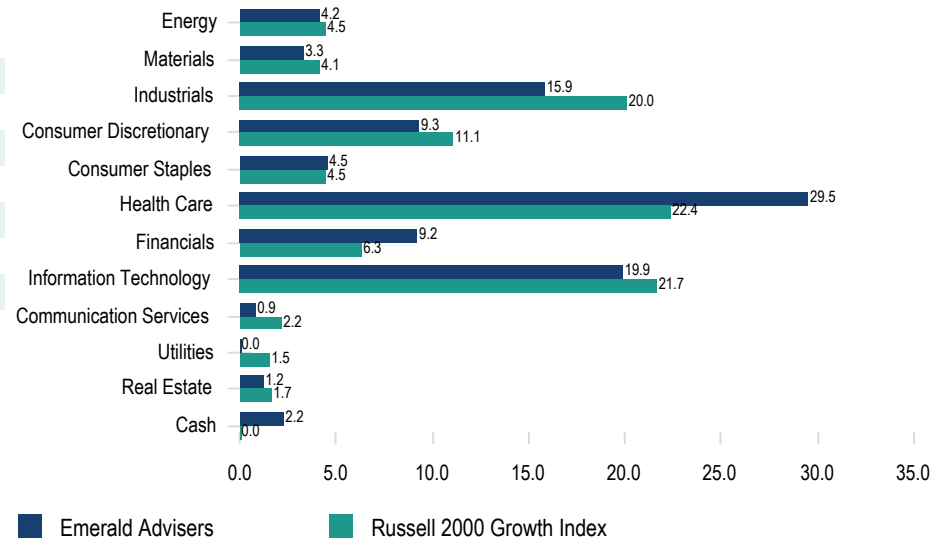
Emerald Advisers
 Manager Portfolio Overview

Contra Costa County Employees' Retirement Association
 Period Ending: December 31, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	114	1,074
Wtd. Avg. Mkt. Cap \$M	3,917.13	3,741.63
Median Mkt. Cap \$M	2,788.67	1,220.03
Price/Earnings ratio	24.28	22.53
Price/Book ratio	4.16	4.00
Return on Equity (%)	5.58	-15.50
Current Yield (%)	0.49	0.63
Beta (5 Years, Monthly)	0.96	1.00

Sector Allocation (%) vs. Russell 2000 Growth Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
ImmunoGen Inc	2.39	86.83
Acadia Pharmaceuticals Inc	2.18	50.24
Freshpet Inc	2.11	31.69
Carpenter Technology Corp	2.11	5.69
Super Micro Computer Inc	1.96	3.66
Blueprint Medicines Corp	1.94	83.67
Varonis Systems Inc	1.92	48.27
Churchill Downs Inc	1.86	16.66
Transmedics Group Inc	1.81	44.16
FTAI Aviation Ltd	1.79	31.48

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Blueprint Medicines Corp	1.44	83.67	1.20
ImmunoGen Inc	1.36	86.83	1.18
Acadia Pharmaceuticals Inc	1.54	50.24	0.78
Varonis Systems Inc	1.38	48.27	0.66
Freshpet Inc	1.54	31.69	0.49
Transmedics Group Inc	1.10	44.16	0.48
BridgeBio Pharma Inc	0.87	53.09	0.46
FTAI Aviation Ltd	1.46	31.48	0.46
Kratos Defense & Security Solutions	1.25	35.09	0.44
Shift4 Payments Inc	1.25	34.26	0.43

Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Replimune Group Inc	0.85	-50.73	-0.43
Chart Industries Inc	1.94	-19.39	-0.38
TETRA Technologies Inc	0.91	-29.15	-0.26
Babcock & Wilcox Enterprises Inc	0.40	-65.32	-0.26
AtriCure Inc	1.02	-18.52	-0.19
Championx Corp	0.84	-17.78	-0.15
Amylyx Pharmaceuticals Inc	0.70	-19.61	-0.14
Lantheus Holdings Inc	1.07	-10.77	-0.12
Ameresco Inc	0.64	-17.87	-0.11
Cactus Inc	1.19	-9.32	-0.11

% of Portfolio

13.19

6.58

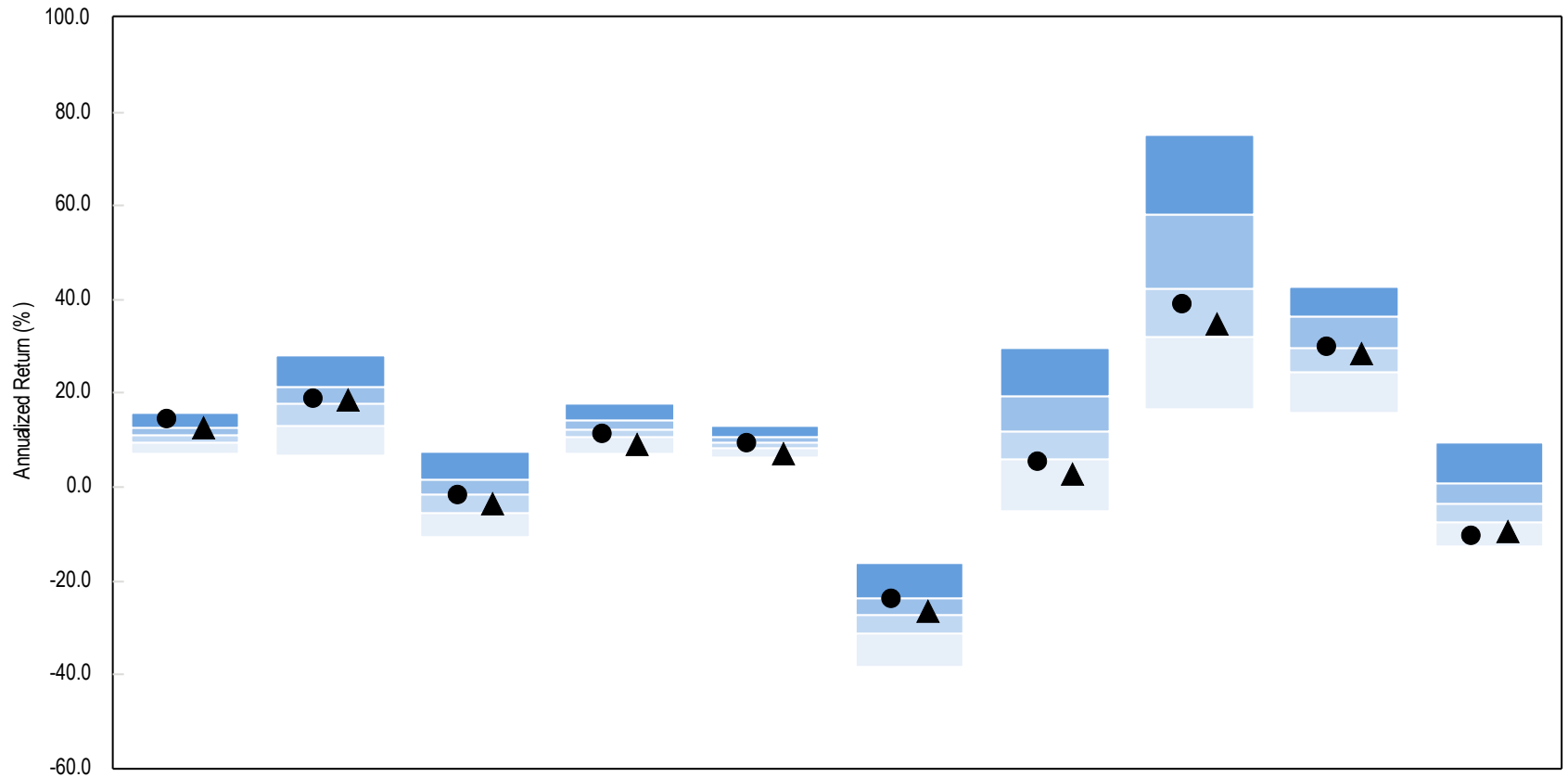
% of Portfolio

9.56

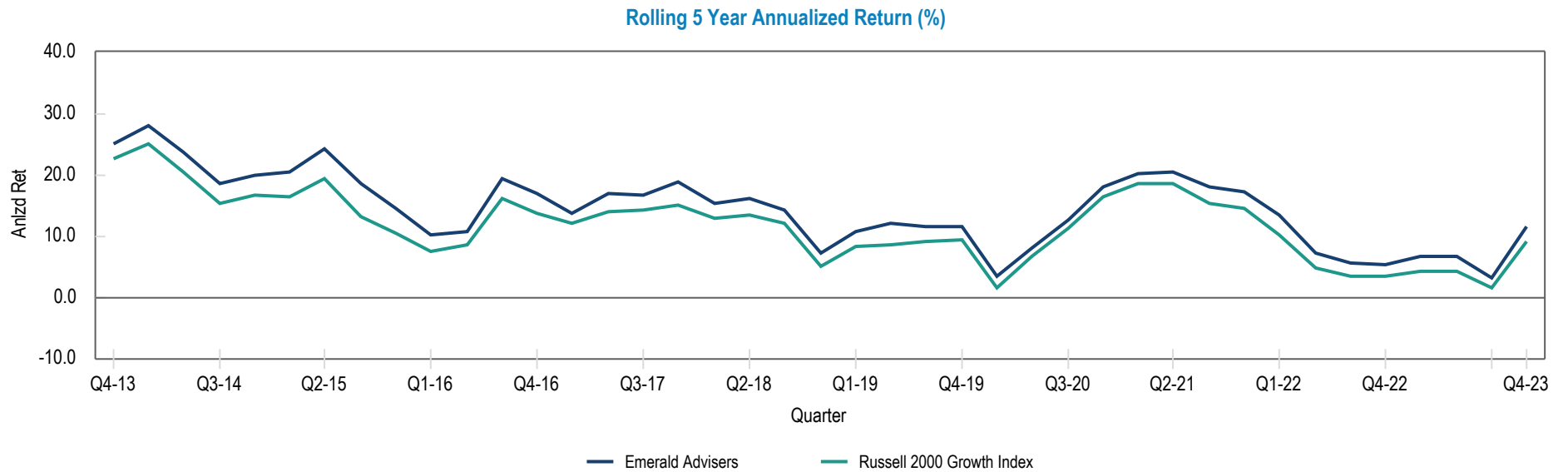
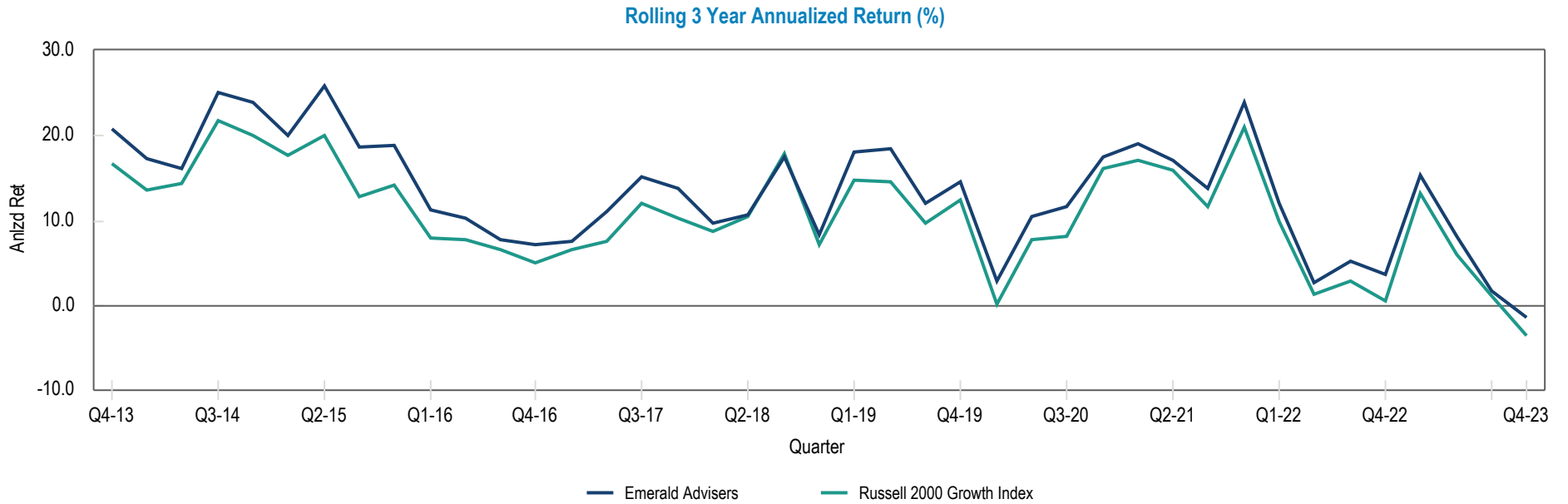
-2.15

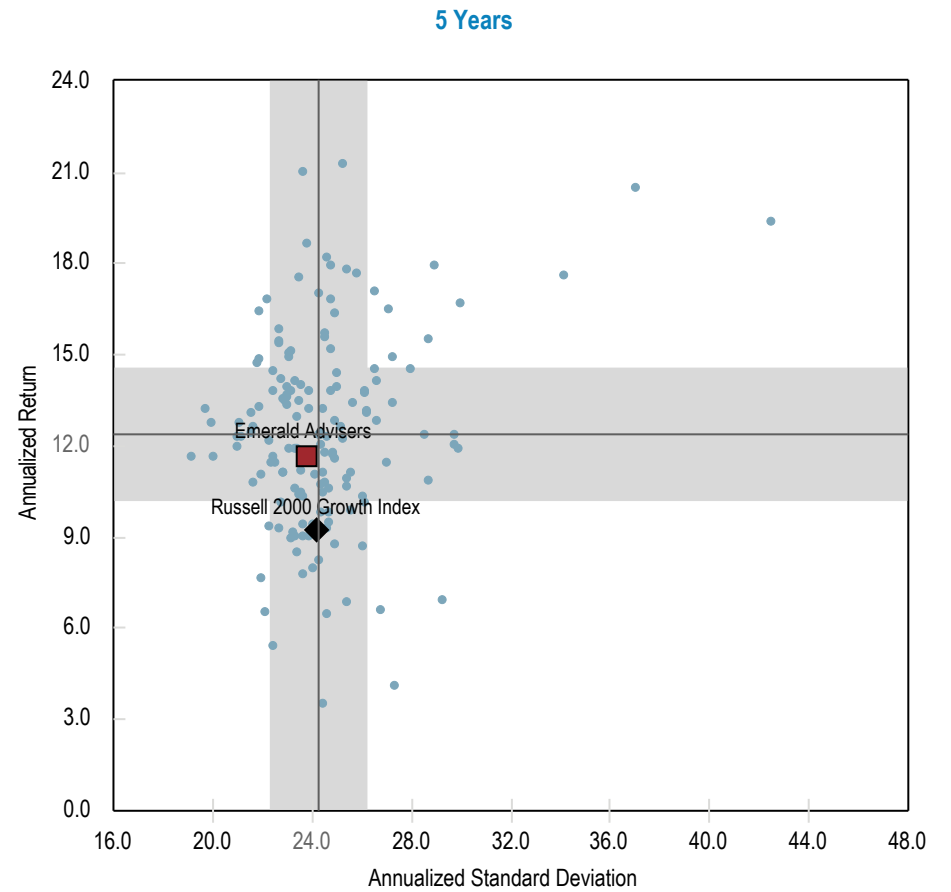
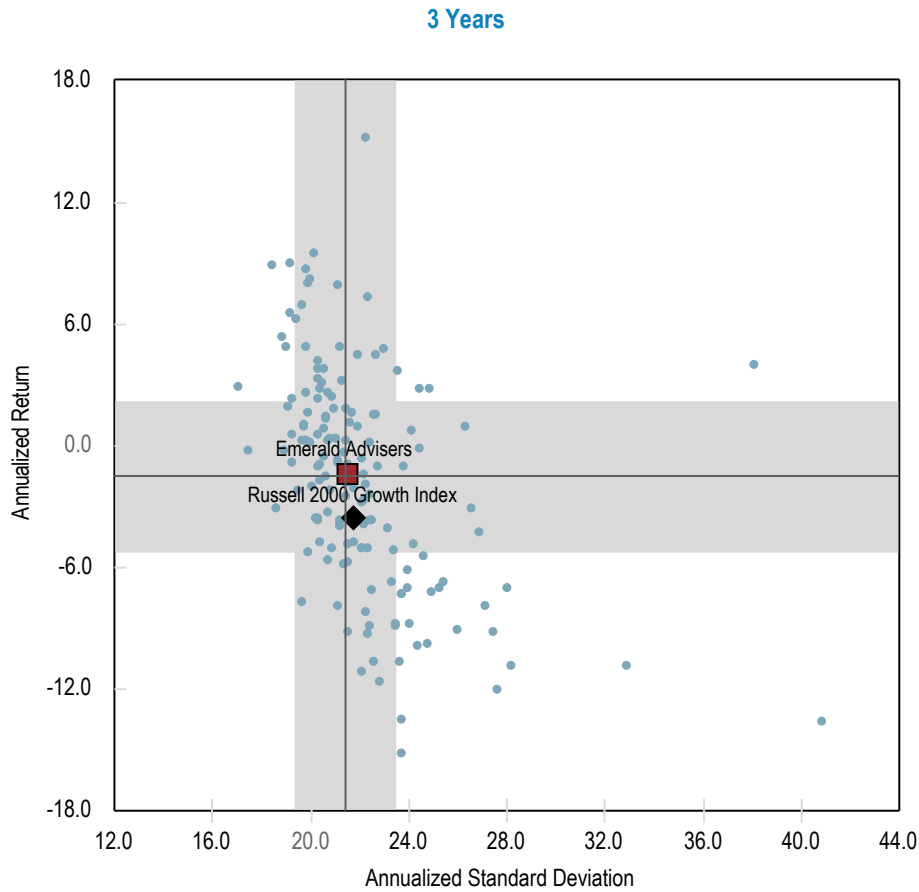
Domestic equity small cap growth portfolio of companies with significantly high growth rates. Primary personnel include Kenneth Mertz, Joseph Garner, and Stacey Sears.

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	14.84 (10)	19.15 (41)	-1.39 (50)	11.66 (62)	9.46 (54)	-23.75 (27)	5.53 (77)	38.96 (57)	30.26 (48)	-10.14 (86)
▲ Russell 2000 Growth Index	12.75 (30)	18.66 (45)	-3.50 (62)	9.22 (88)	7.16 (95)	-26.36 (44)	2.83 (85)	34.63 (67)	28.48 (53)	-9.31 (82)
5th Percentile	16.04	27.94	7.55	17.89	12.96	-16.20	29.85	74.95	42.60	9.65
1st Quartile	12.88	21.33	1.76	14.20	10.60	-23.57	19.36	58.30	36.52	0.66
Median	11.18	17.72	-1.50	12.40	9.54	-27.20	11.86	42.23	29.57	-3.70
3rd Quartile	9.61	13.27	-5.32	10.64	8.31	-31.12	5.92	31.96	24.74	-7.47
95th Percentile	7.27	6.68	-10.71	7.31	6.41	-38.40	-4.98	16.49	15.94	-12.52
Population	156	156	155	151	135	171	182	183	190	194





3 Years

	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Emerald Advisers	-1.4	21.5	-0.1
Russell 2000 Growth Index	-3.5	21.8	-0.2
eV US Small Cap Growth Equity Median	-1.5	21.4	-0.1
Population	155	155	155

5 Years

	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Emerald Advisers	11.7	23.8	0.5
Russell 2000 Growth Index	9.2	24.2	0.4
eV US Small Cap Growth Equity Median	12.4	24.2	0.5
Population	151	151	151

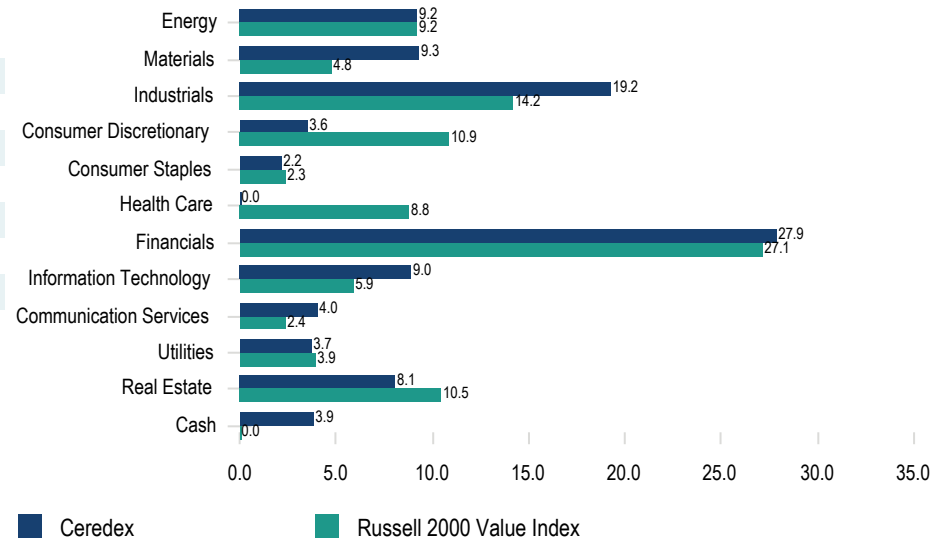
Ceredex
Manager Portfolio Overview

Contra Costa County Employees' Retirement Association
Period Ending: December 31, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	70	1,431
Wtd. Avg. Mkt. Cap \$M	5,299.70	2,724.68
Median Mkt. Cap \$M	5,654.66	823.90
Price/Earnings ratio	16.96	11.45
Price/Book ratio	2.10	1.63
Return on Equity (%)	2.06	1.65
Current Yield (%)	2.35	2.25
Beta (5 Years, Monthly)	0.87	1.00

Sector Allocation (%) vs. Russell 2000 Value Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
Ashland Inc	2.22	3.72
Bank of Hawaii Corp	2.05	47.59
Agree Realty Corp	2.04	15.40
KBR Inc	2.01	-5.75
Schneider National Inc	1.96	-7.74
RB Global Inc	1.91	7.48
IDACORP Inc.	1.86	5.91
Pinnacle Financial Partners Inc	1.86	30.53
OGE Energy Corp	1.85	6.14
Atlantic Union Bankshares Corp	1.83	28.33

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Bank of Hawaii Corp	1.60	47.59	0.76
Signet Jewelers Ltd	1.51	49.87	0.75
Columbia Banking System Inc	1.69	33.59	0.57
Steven Madden Ltd	1.68	32.86	0.55
Pinnacle Financial Partners Inc	1.80	30.53	0.55
Armstrong World Industries Inc	1.45	37.05	0.54
Seacoast Banking Corp of Florida	1.52	30.40	0.46
SouthState Corporation	1.69	26.32	0.44
F.N.B. Corp	1.42	28.83	0.41
Colliers International Group Inc	1.16	32.99	0.38

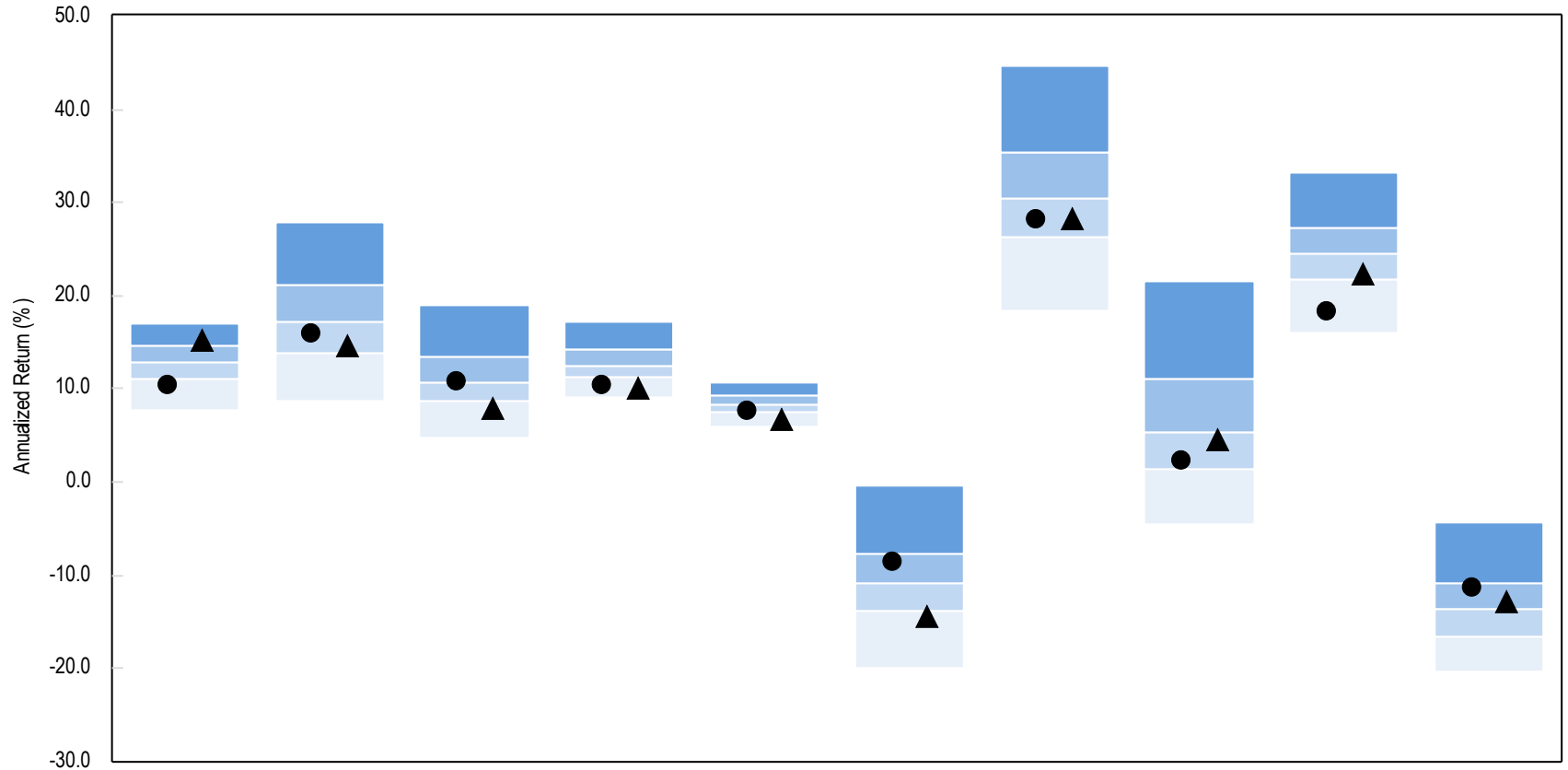
Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Belden Inc	1.74	-19.94	-0.35
Championx Corp	1.81	-17.78	-0.32
Helios Technologies Inc	1.41	-18.12	-0.26
Cactus Inc	1.82	-9.32	-0.17
Schneider National Inc	1.53	-7.74	-0.12
Forward Air Corp	1.42	-8.20	-0.12
KBR Inc	1.88	-5.75	-0.11
Range Resources Corp.	1.72	-5.83	-0.10
Iridium Communications Inc	0.98	-9.23	-0.09
Matador Resources Co	1.82	-4.06	-0.07

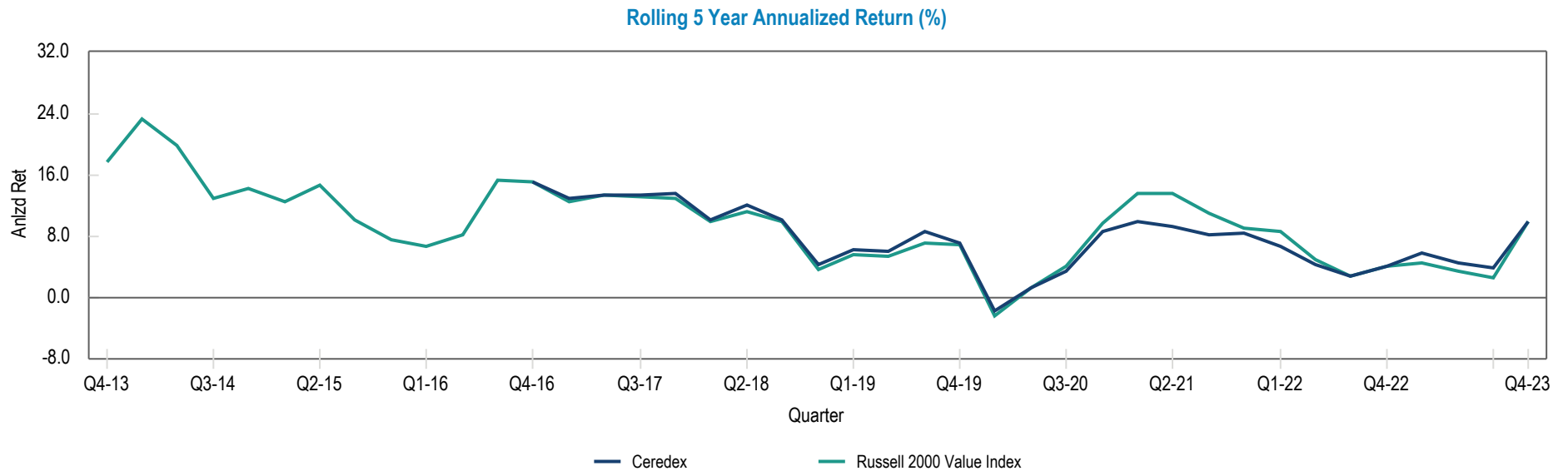
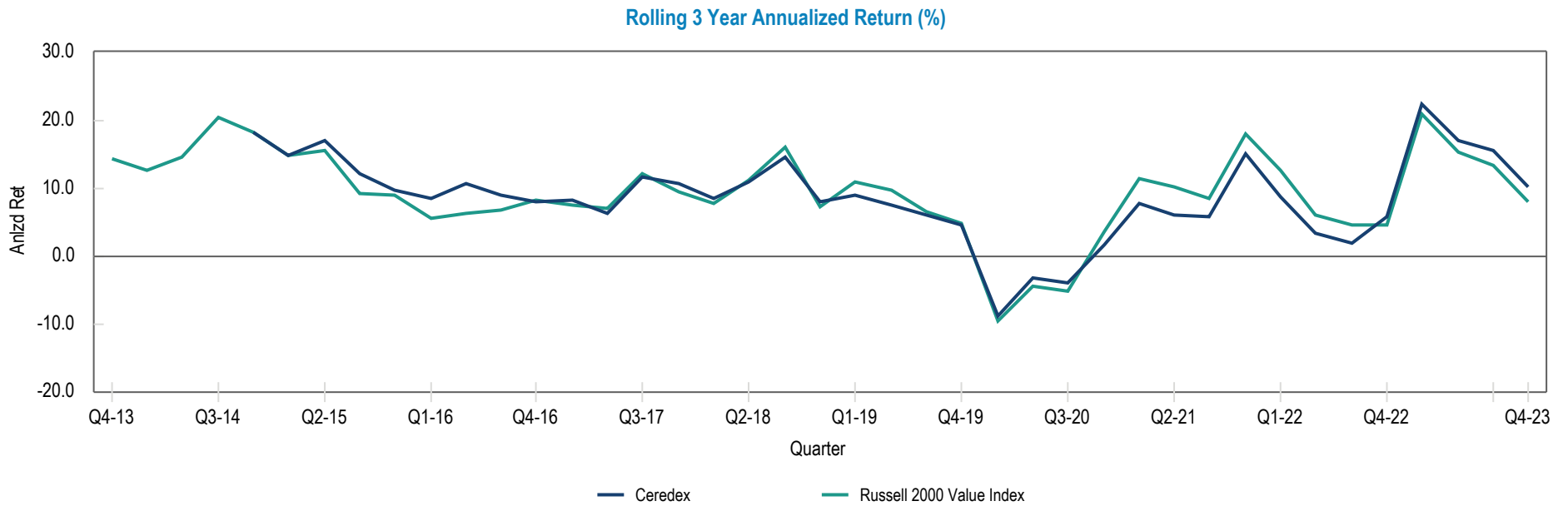
% of Portfolio 15.52 5.42 % of Portfolio 16.13 -1.70

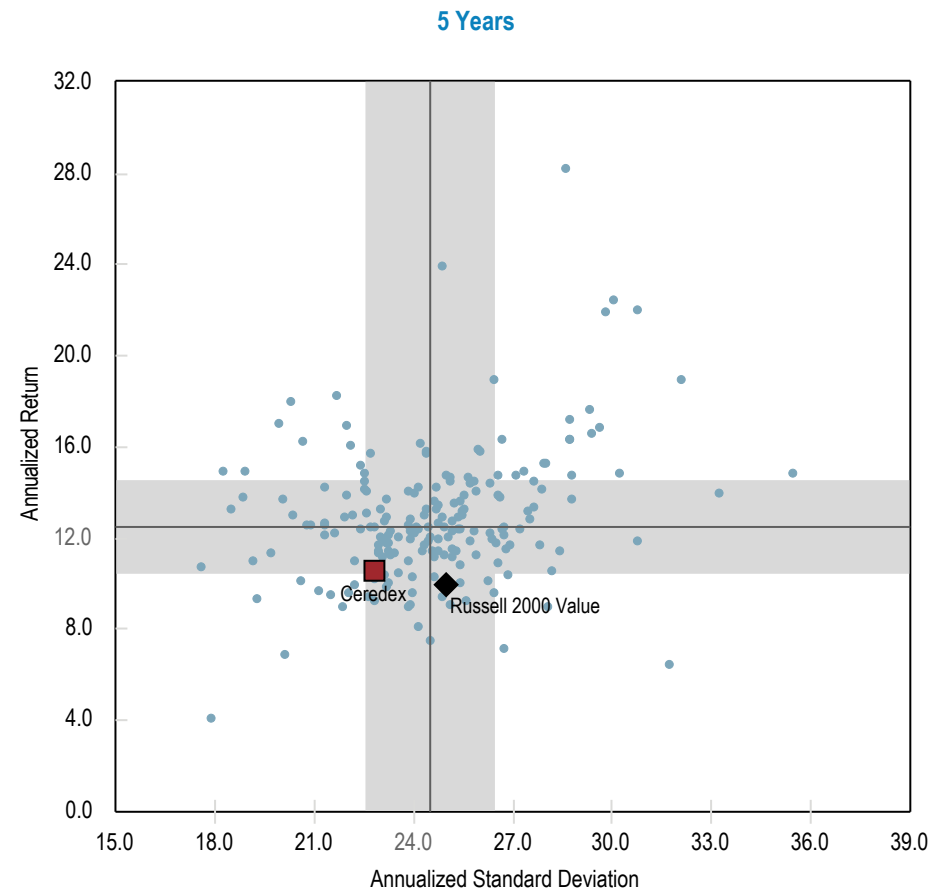
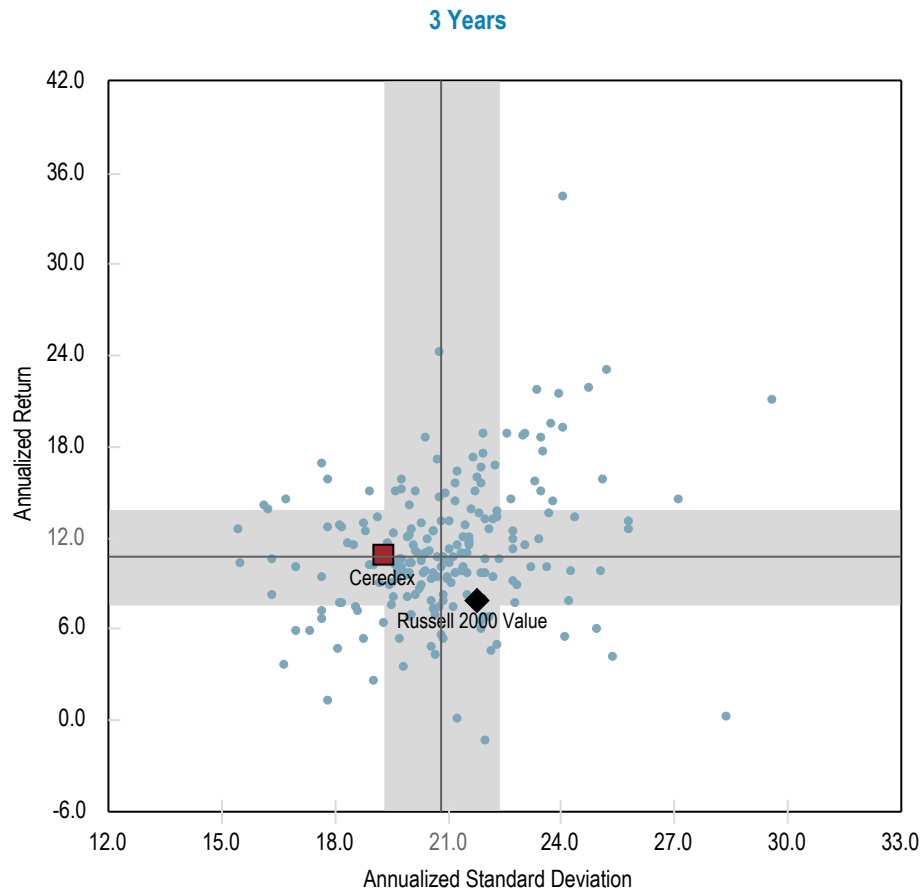
Domestic equity small cap value portfolio of companies with dividend yields and low valuations. Primary personnel include Brett Barner and David Maynard.

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	10.53 (82)	16.02 (61)	10.89 (49)	10.55 (83)	7.64 (71)	-8.46 (28)	28.37 (60)	2.32 (70)	18.36 (88)	-11.32 (29)
▲ Russell 2000 Value Index	15.26 (16)	14.65 (71)	7.94 (80)	10.00 (88)	6.76 (89)	-14.48 (79)	28.27 (60)	4.63 (54)	22.39 (71)	-12.86 (42)
5th Percentile	16.92	27.83	18.89	17.29	10.67	-0.38	44.60	21.48	33.29	-4.34
1st Quartile	14.66	21.12	13.43	14.26	9.36	-7.70	35.31	11.06	27.36	-10.80
Median	12.94	17.24	10.78	12.51	8.30	-10.91	30.49	5.33	24.47	-13.63
3rd Quartile	11.10	13.93	8.70	11.32	7.48	-13.87	26.25	1.35	21.69	-16.58
95th Percentile	7.72	8.80	4.77	9.10	6.01	-19.91	18.35	-4.58	15.95	-20.38
Population	207	207	205	197	175	219	231	245	253	264





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Ceredex	10.9	19.3	0.5
Russell 2000 Value Index	7.9	21.8	0.4
eV US Small Cap Value Equity Median	10.8	20.8	0.5
Population	205	205	205

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Ceredex	10.5	22.8	0.5
Russell 2000 Value Index	10.0	25.0	0.4
eV US Small Cap Value Equity Median	12.5	24.5	0.5
Population	197	197	197

International Equity Managers

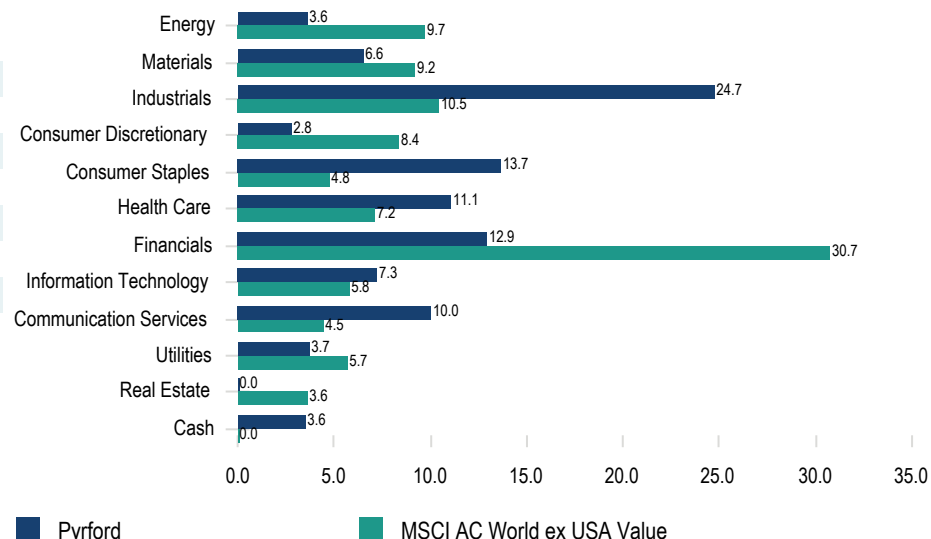
Pyrford Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: December 31, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	79	1,370
Wtd. Avg. Mkt. Cap \$M	56,877.02	66,881.53
Median Mkt. Cap \$M	21,947.46	9,218.19
Price/Earnings ratio	15.35	9.87
Price/Book ratio	2.33	1.74
Return on Equity (%)	5.08	3.43
Current Yield (%)	4.14	4.51
Beta (5 Years, Monthly)	0.75	1.00

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



Largest Holdings

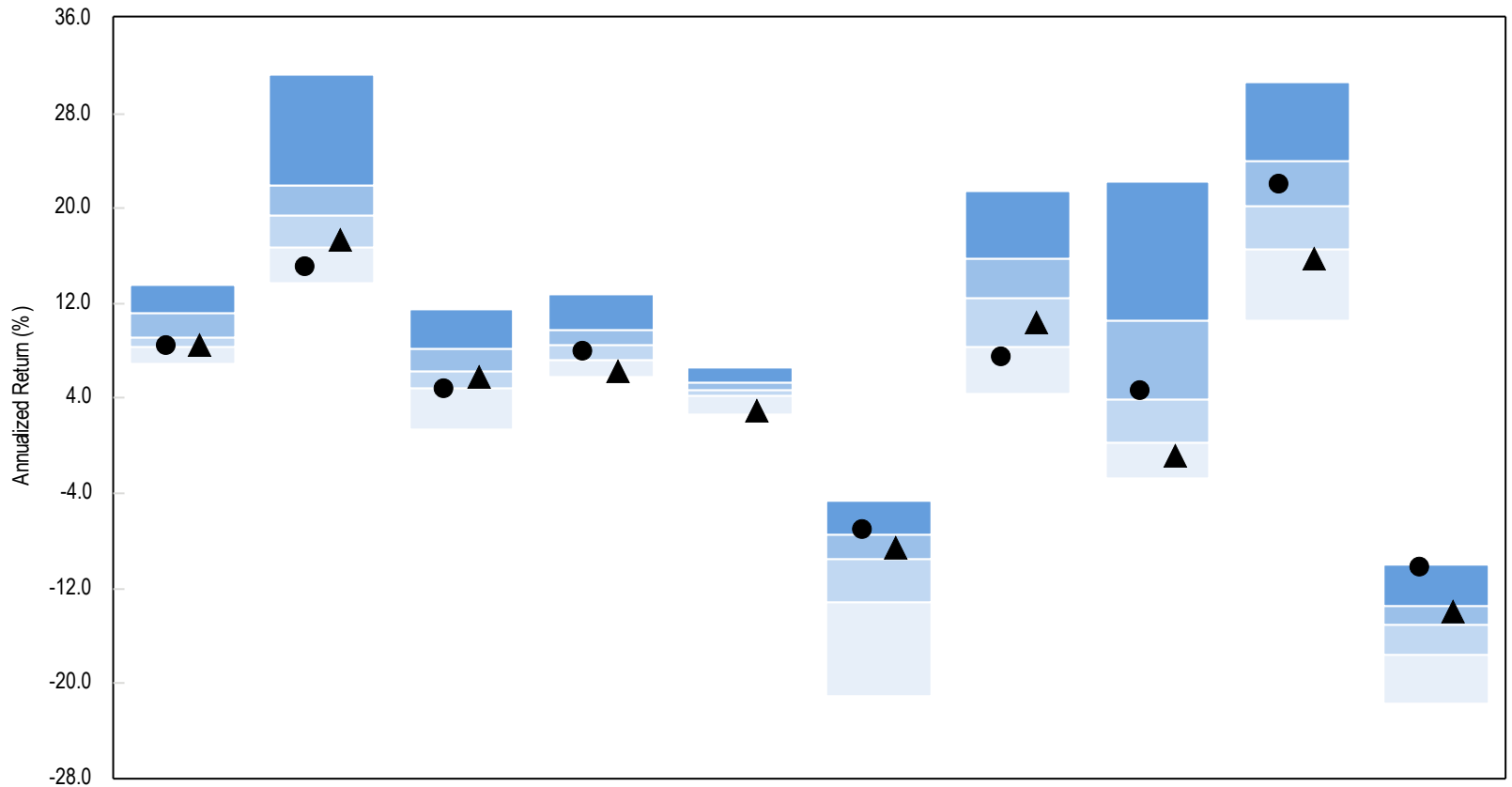
Top Contributors

Top Detractors

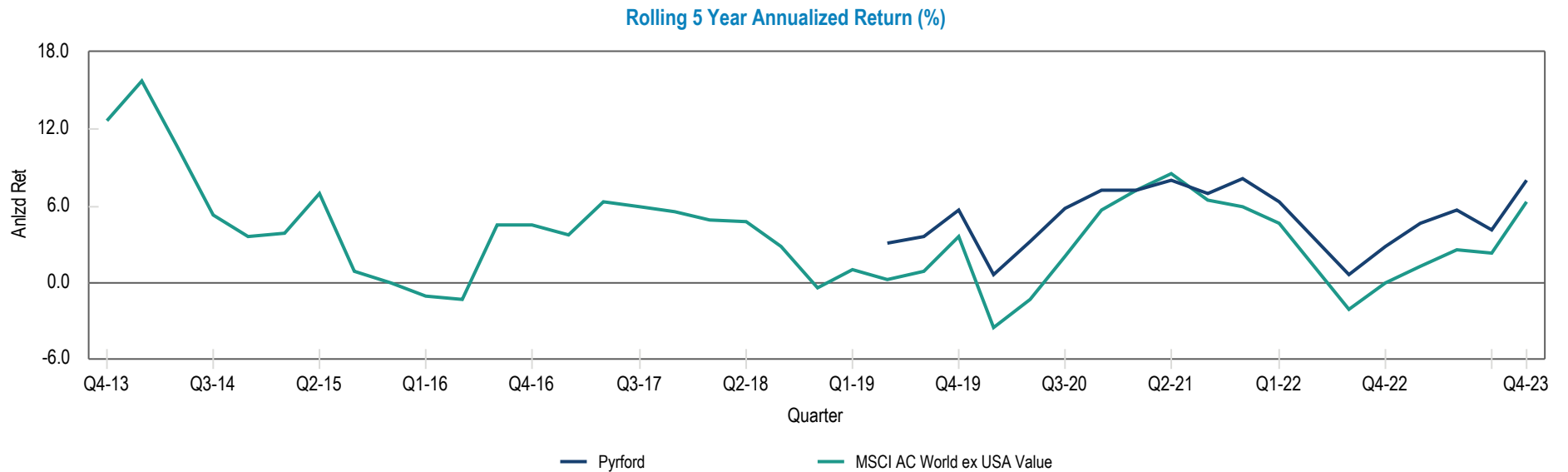
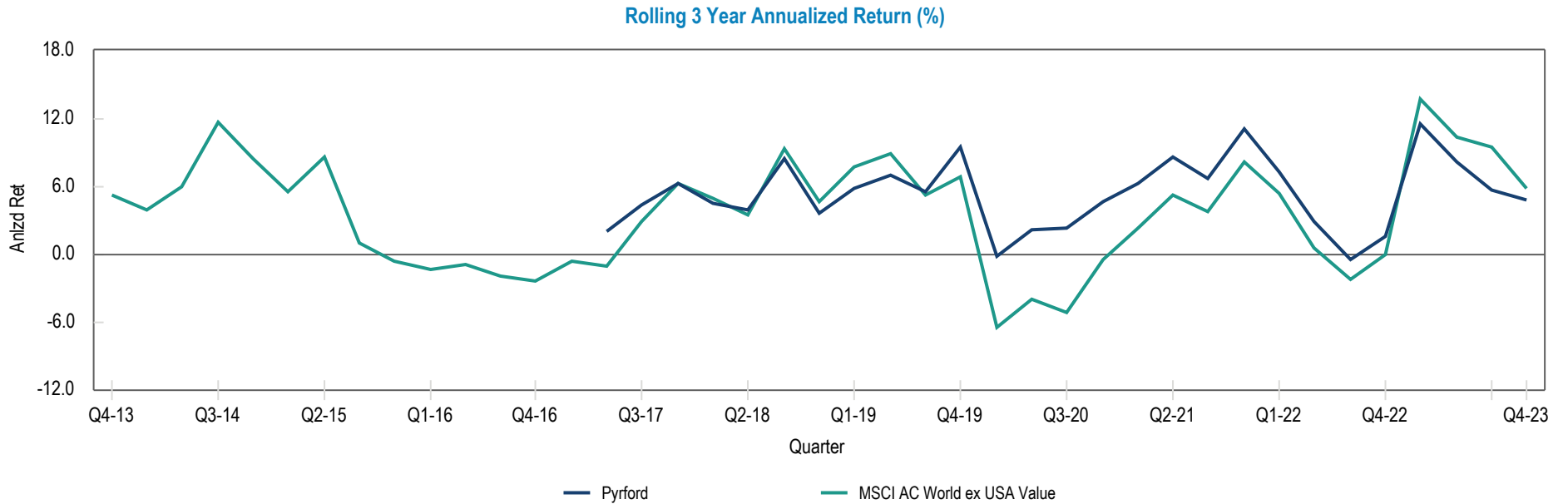
	End Weight (%)	Quarterly Return (%)		Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)		Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Japan Tobacco Inc	2.52	15.07	Nihon Kohden Corp	1.63	27.95	0.46	Woodside Energy Group Ltd	1.45	-10.01	-0.14
United Overseas Bank Ltd	2.39	3.29	Japan Tobacco Inc	2.74	15.07	0.41	Sanofi	1.87	-7.71	-0.14
Nestle SA, Cham Und Vevey	2.37	2.16	Deutsche Post AG	1.63	21.45	0.35	British American Tobacco	1.63	-4.61	-0.08
Roche Holding AG	2.35	6.11	Mitsubishi Electric Corp	2.24	14.44	0.32	BP plc	0.94	-7.24	-0.07
Kddi Corp	2.21	3.75	Nemetschek SE	0.74	41.47	0.31	Merck KGaA	0.92	-4.93	-0.05
Mitsubishi Electric Corp	2.16	14.44	Brenntag SE	1.69	18.16	0.31	Nissan Chemical Corp	0.54	-8.35	-0.05
L'Air Liquide SA	2.08	14.96	SAP SE	1.65	18.49	0.31	Abc-Mart Inc	1.35	-2.93	-0.04
Novartis AG	2.07	3.66	L'Air Liquide SA	1.96	14.96	0.29	Reckitt Benckiser Group PLC	1.30	-2.30	-0.03
Telenor ASA	2.05	4.39	Legal & General Group PLC	1.60	17.87	0.29	Unilever PLC	1.87	-1.46	-0.03
Brambles Ltd	1.98	0.41	Rio Tinto Group	1.03	26.31	0.27	Vodafone Group Public	1.40	-1.63	-0.02
			% of Portfolio	16.91		3.31	% of Portfolio	13.27		-0.64

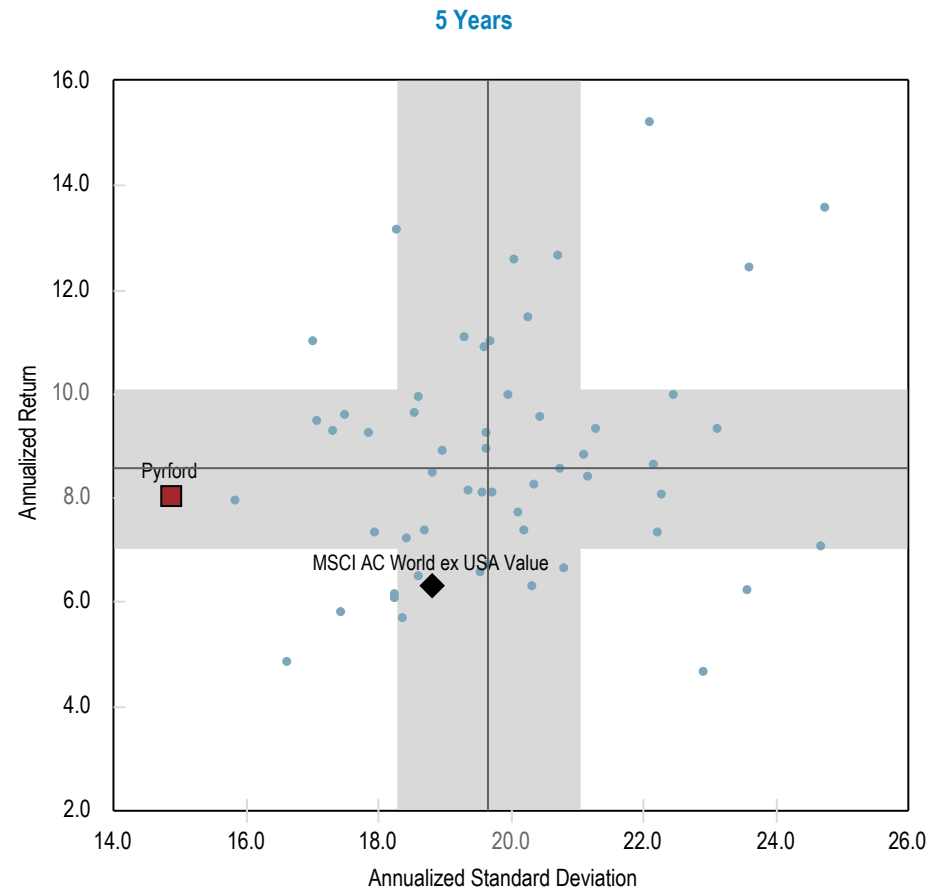
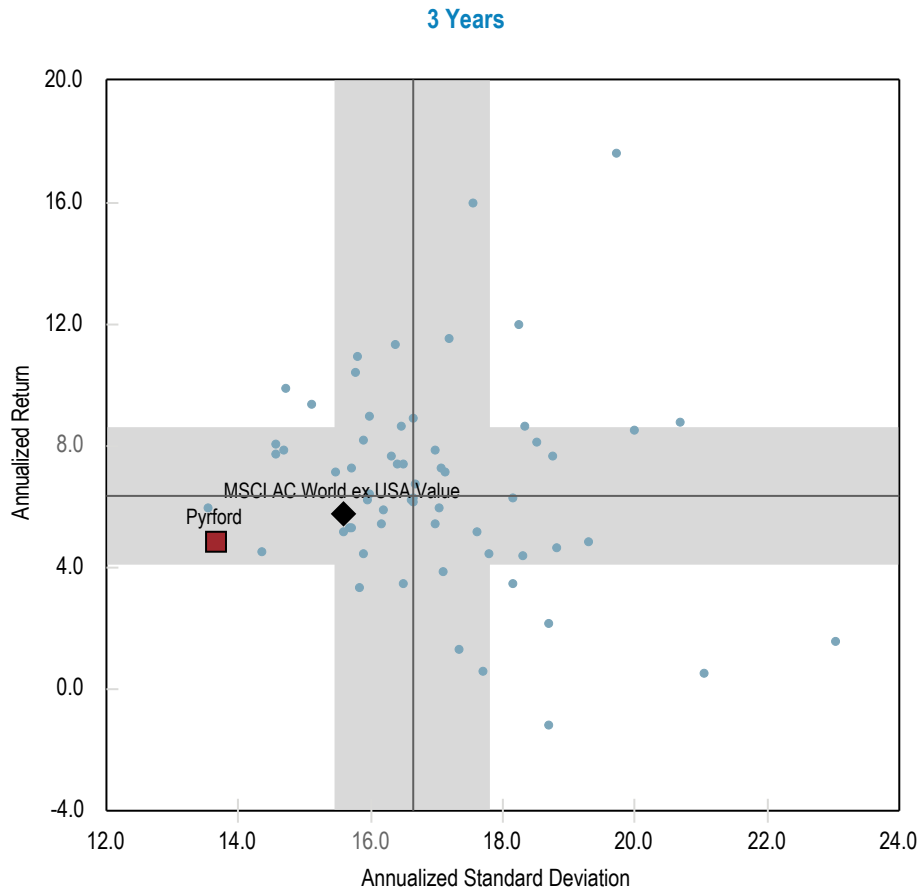
International equity value portfolio of non-US companies with low valuations at the country and stock level. Primary personnel include Tony Cousins, Daniel McDonagh, and Paul Simons.

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	8.58 (73)	15.17 (84)	4.85 (76)	8.05 (64)	-	-6.97 (20)	7.57 (84)	4.66 (46)	22.07 (37)	-10.15 (6)
▲ MSCI AC World ex USA Value (Net)	8.43 (74)	17.30 (69)	5.80 (64)	6.34 (87)	2.92 (88)	-8.59 (40)	10.46 (66)	-0.77 (80)	15.72 (78)	-13.97 (31)
5th Percentile	13.63	31.25	11.51	12.84	6.62	-4.61	21.44	22.27	30.57	-10.04
1st Quartile	11.16	21.98	8.16	9.80	5.34	-7.53	15.82	10.53	24.00	-13.41
Median	9.16	19.46	6.37	8.57	4.70	-9.50	12.53	3.91	20.24	-15.08
3rd Quartile	8.36	16.78	4.94	7.30	4.17	-13.18	8.35	0.30	16.62	-17.58
95th Percentile	6.91	13.68	1.31	5.80	2.63	-21.01	4.34	-2.66	10.49	-21.69
Population	63	63	62	55	36	66	69	70	68	67





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Pyrford	4.8	13.6	0.3
MSCI AC World ex USA Value (Net)	5.8	15.6	0.3
eV ACWI ex-US Value Equity Median	6.4	16.6	0.3
Population	62	62	62

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Pyrford	8.0	14.9	0.5
MSCI AC World ex USA Value (Net)	6.3	18.8	0.3
eV ACWI ex-US Value Equity Median	8.6	19.7	0.4
Population	55	55	55

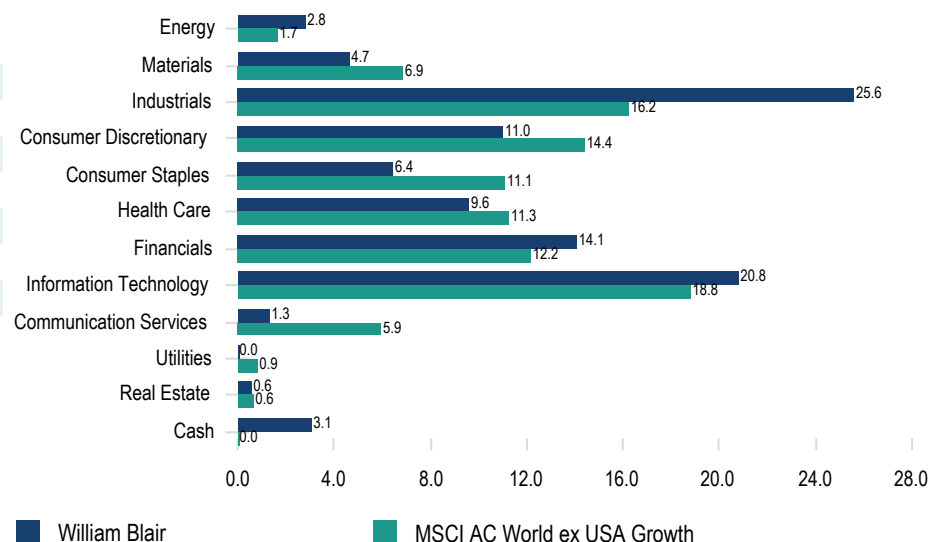
William Blair
Manager Portfolio Overview

Contra Costa County Employees' Retirement Association
Period Ending: December 31, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	175	1,293
Wtd. Avg. Mkt. Cap \$M	84,463.17	112,513.78
Median Mkt. Cap \$M	15,609.28	10,149.04
Price/Earnings ratio	24.97	20.88
Price/Book ratio	3.91	3.48
Return on Equity (%)	6.51	7.84
Current Yield (%)	1.68	1.75
Beta (5 Years, Monthly)	1.04	1.00

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



Largest Holdings

	End Weight (%)	Quarterly Return (%)
Taiwan Semiconductor Man.	2.27	20.23
Novo Nordisk A/S	1.99	13.16
ASML Holding NV	1.95	27.54
Samsung Electronics Co Ltd	1.58	20.25
London Stock Exchange Group	1.49	17.64
Keyence Corp	1.42	18.47
Airbus SE	1.41	14.85
Astrazeneca PLC	1.40	-0.28
Dassault Systemes SA	1.40	30.76
Reliance Industries Ltd	1.30	10.00

Top Contributors

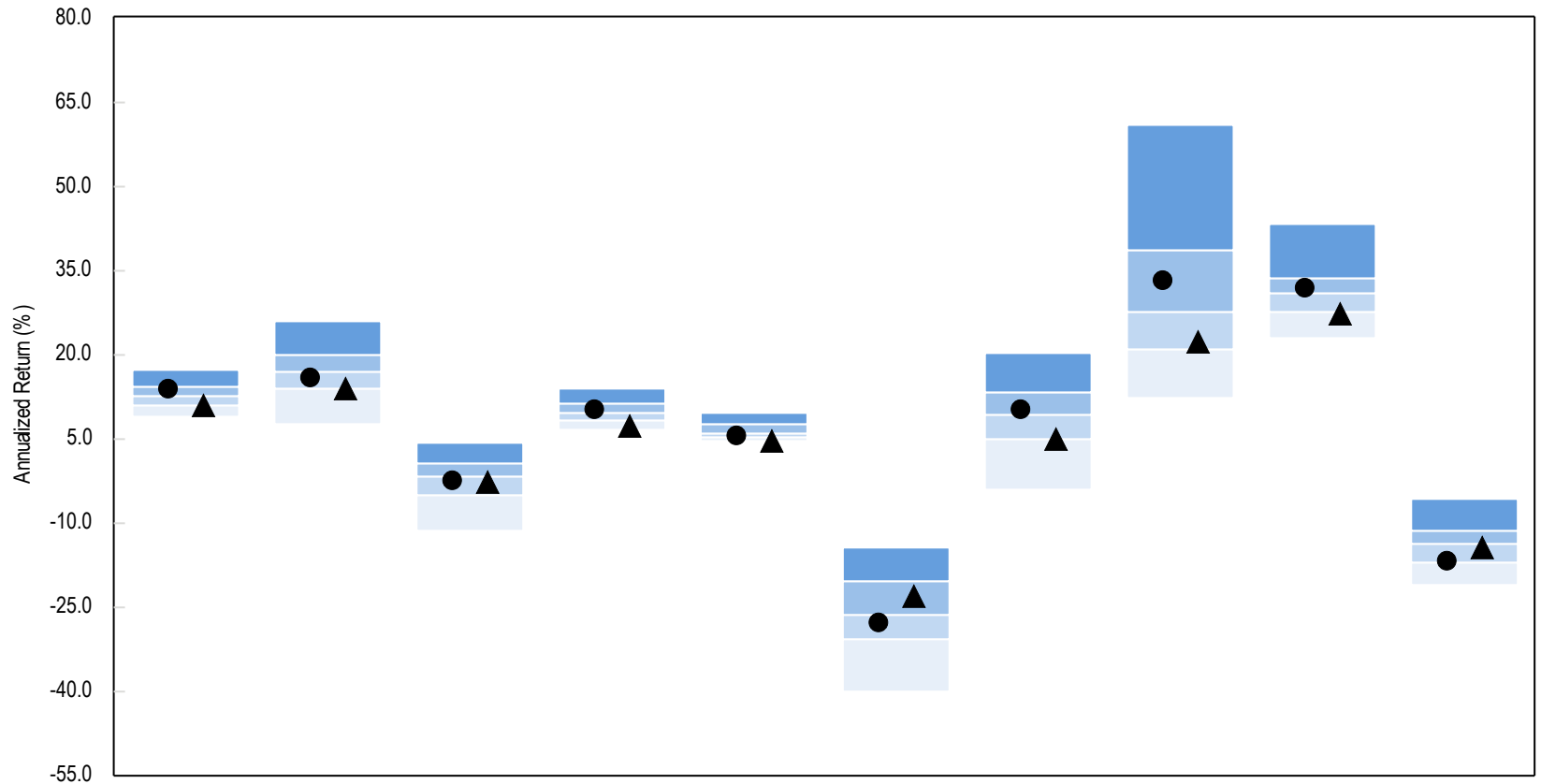
	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Shin-Etsu Chemical Co Ltd	1.10	44.21	0.49
ASML Holding NV	1.75	27.54	0.48
Dassault Systemes SA	1.22	30.76	0.38
Taiwan Semiconductor Man.	1.80	20.23	0.36
Novo Nordisk A/S	2.14	13.16	0.28
Sika AG, Baar	1.00	27.62	0.27
Lululemon Athletica Inc	0.84	32.59	0.27
Mediatek Incorporation	0.60	45.25	0.27
Ryanair Holdings PLC	0.72	37.19	0.27
London Stock Exchange Group	1.44	17.64	0.25
% of Portfolio	12.61		3.33

Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Rentokil Initial PLC	1.16	-24.55	-0.29
DSV A/S	1.53	-6.20	-0.09
Genmab A/S	0.76	-10.32	-0.08
INMODE LTD	0.22	-26.99	-0.06
LONZA GROUP AG	0.60	-9.67	-0.06
Contemporary Amperex Technology Co Ltd	0.23	-17.19	-0.04
SIG Group AG	0.49	-7.10	-0.03
Tencent Holdings LTD	0.91	-3.83	-0.03
Diageo PLC	0.98	-1.68	-0.02
Stevanato Group S p A	0.15	-8.18	-0.01
% of Portfolio	7.03		-0.71

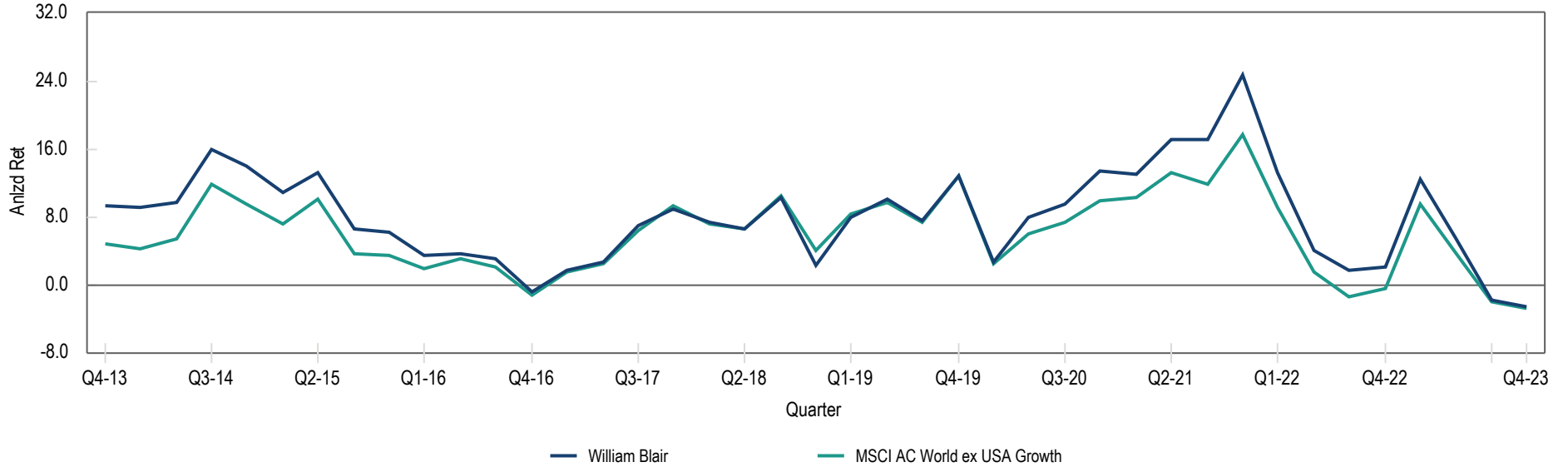
International equity growth portfolio of non-US companies with high growth rates constructed from the security level. Primary personnel include Simon Fennell and Kenneth McAtamney.

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

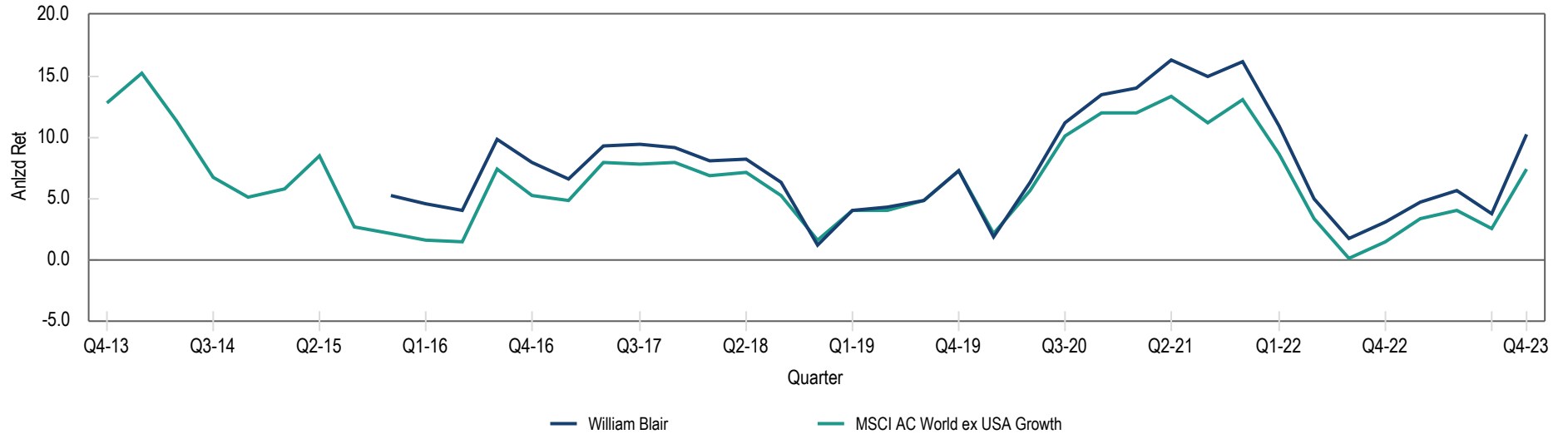


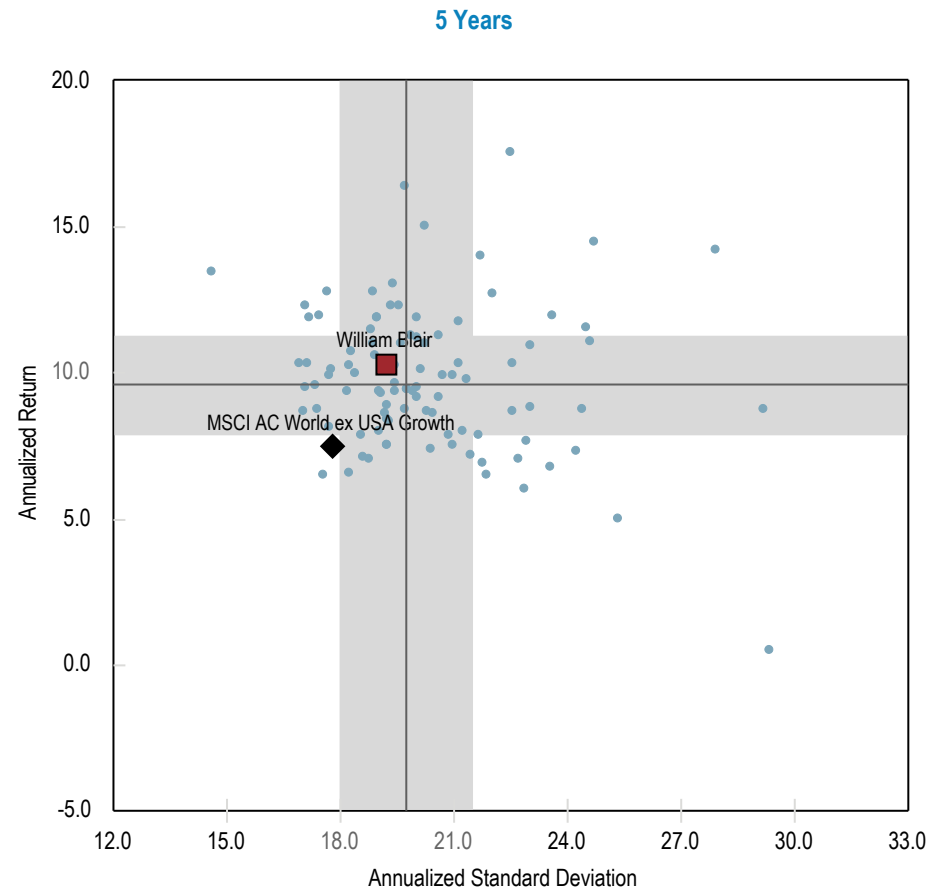
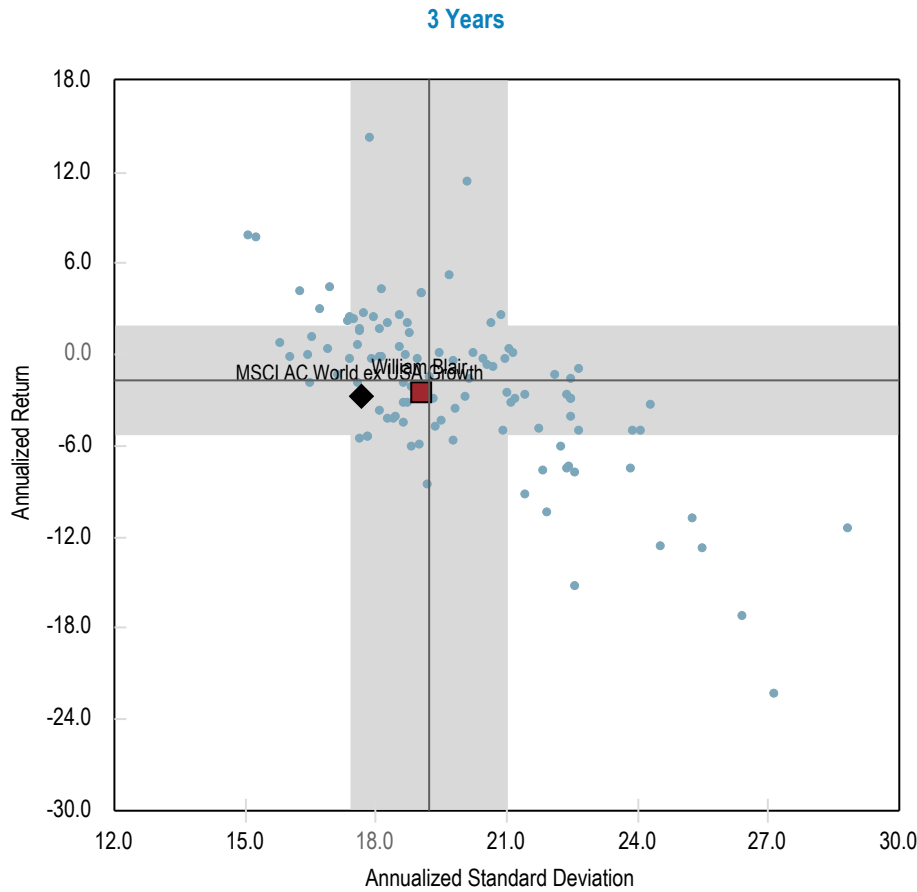
	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● William Blair	13.98 (32)	16.15 (59)	-2.49 (56)	10.28 (41)	5.68 (65)	-27.75 (59)	10.48 (43)	33.25 (36)	32.01 (37)	-16.78 (73)
▲ MSCI AC World ex USA Growth	11.12 (74)	14.03 (76)	-2.67 (58)	7.49 (86)	4.55 (98)	-23.05 (34)	5.09 (75)	22.20 (72)	27.34 (78)	-14.43 (55)
5th Percentile	17.30	26.07	4.43	14.12	9.51	-14.20	20.37	60.94	43.36	-5.65
1st Quartile	14.46	20.11	0.76	11.34	7.73	-20.37	13.39	38.51	33.62	-11.37
Median	12.53	17.03	-1.67	9.59	6.16	-26.35	9.35	27.77	30.93	-13.53
3rd Quartile	11.11	14.08	-4.84	8.32	5.42	-30.74	4.97	21.11	27.77	-16.85
95th Percentile	8.90	7.76	-11.23	6.59	4.67	-39.95	-4.05	12.25	22.92	-20.99
Population	108	108	106	96	70	112	114	110	108	102

Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
William Blair	-2.5	19.0	-0.1
MSCI AC World ex USA Growth (Net)	-2.7	17.6	-0.2
eV ACWI ex-US Growth Equity Median	-1.7	19.2	-0.1
Population	106	106	106

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
William Blair	10.3	19.2	0.5
MSCI AC World ex USA Growth (Net)	7.5	17.8	0.4
eV ACWI ex-US Growth Equity Median	9.6	19.7	0.5
Population	96	96	96

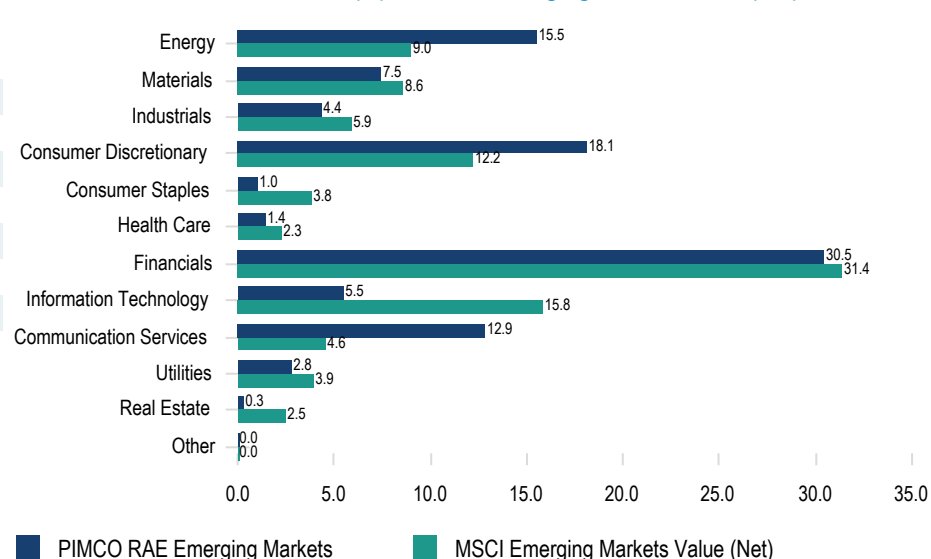
PIMCO RAE Emerging Markets Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: December 31, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	346	843
Wtd. Avg. Mkt. Cap \$M	26,398.17	65,473.50
Median Mkt. Cap \$M	4,323.42	6,355.67
Price/Earnings ratio	7.06	9.65
Price/Book ratio	2.03	1.87
Return on Equity (%)	3.94	3.42
Current Yield (%)	4.81	4.13
Beta (5 Years, Monthly)	1.07	1.00

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



Largest Holdings

	End Weight (%)	Quarterly Return (%)
Vipshop Holdings Limited	15.96	10.93
Petroleo Brasileiro S.A.- Petrobras	6.43	15.01
Netease Inc	5.83	-6.58
Cemex SAB de CV	5.30	19.23
China Construction Bank Corp	4.57	5.52
Tencent Music Entertainment Group	3.97	41.22
Bank of China Ltd	3.08	9.08
China Petroleum & Chemical	2.98	-4.15
Petrochina Co Ltd	2.77	-12.28
Industrial & Comm. Bank of China	2.57	1.63

Top Contributors

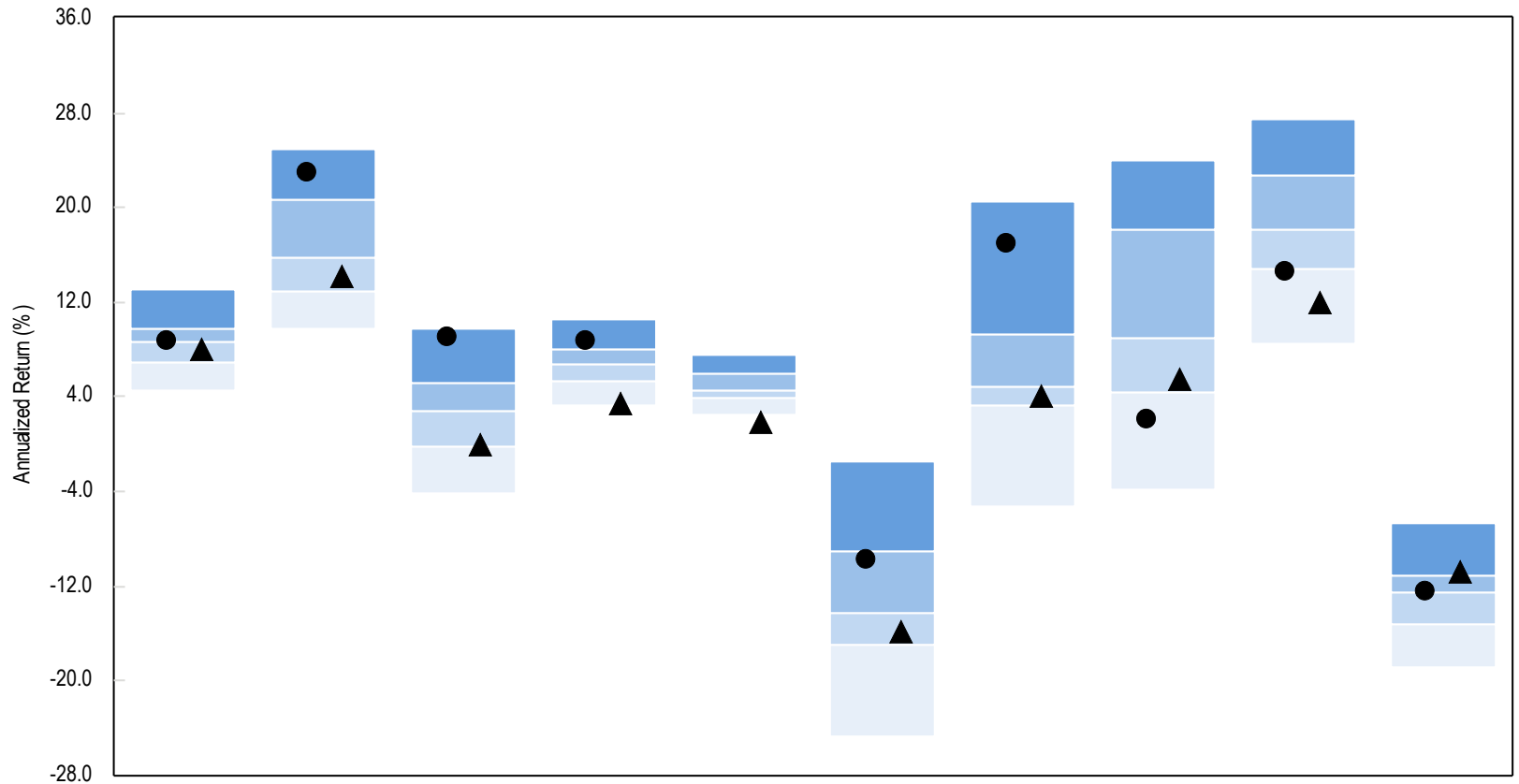
	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Lenovo Group Ltd	1.17	36.83	0.43
Power Finance Corp Ltd	0.80	53.74	0.43
Indian Oil Corp Ltd	0.79	49.74	0.39
Cielo SA	0.94	40.26	0.38
REC Ltd	0.69	44.86	0.31
Compal Electronics Inc	0.83	36.53	0.30
Bharat Heavy Electricals Ltd	0.62	47.44	0.29
Cemex SAB de CV	1.53	18.44	0.28
Vedanta Ltd	1.20	20.99	0.25
National Aluminium Co Ltd	0.66	36.95	0.24
% of Portfolio	9.23		3.32

Top Detractors

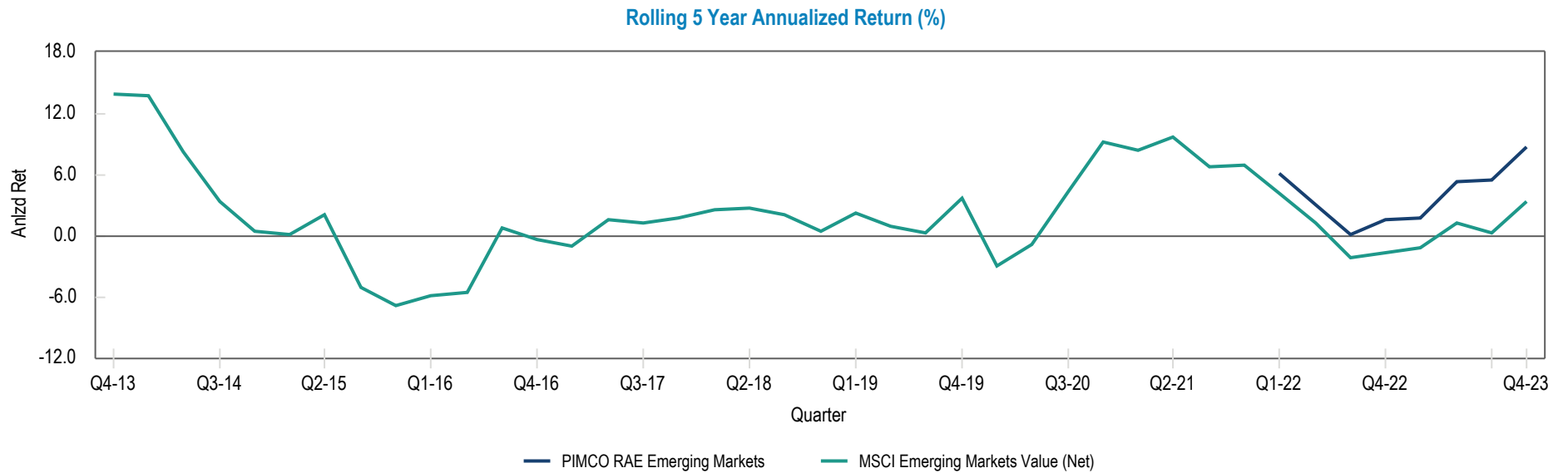
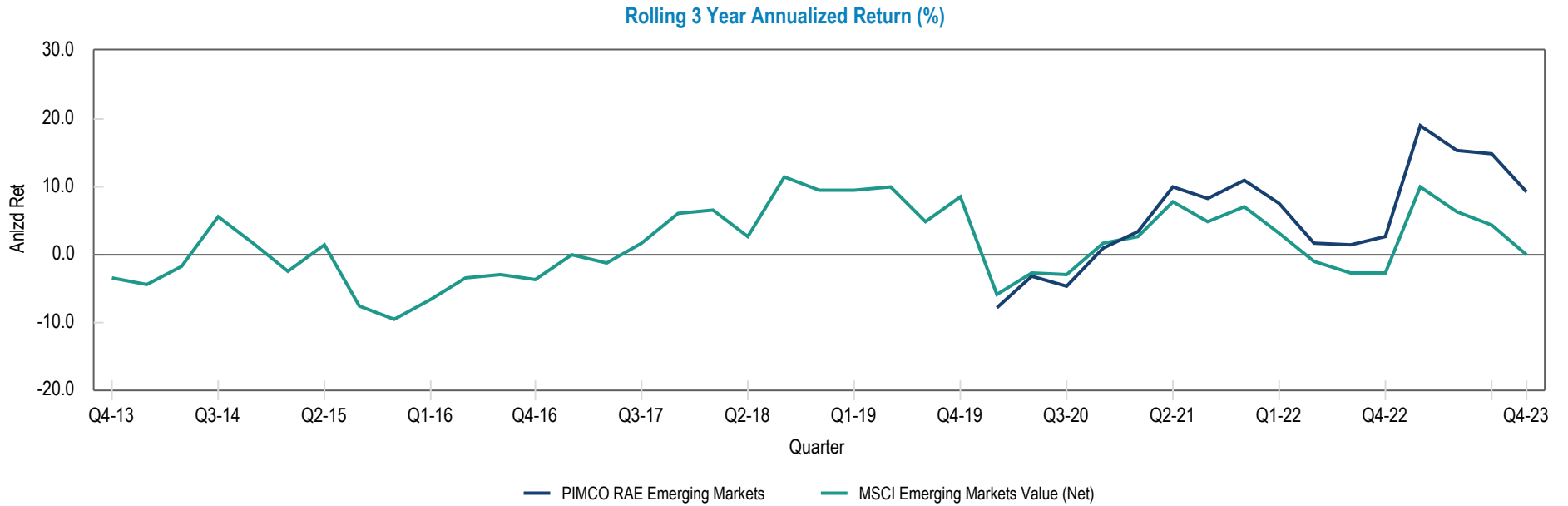
	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Ping An Insurance Group	1.71	-20.95	-0.36
Petrochina Co Ltd	2.42	-12.28	-0.30
IS Yatirim Menkul Degerler A.S.	0.69	-26.91	-0.18
Turkiye Is Bankasi AS	1.02	-15.76	-0.16
China Petroleum & Chemical	2.92	-4.15	-0.12
POSCO Holdings Inc	3.05	-2.18	-0.07
Sinopharm Group Co	0.63	-9.64	-0.06
PT Adaro Energy Indonesia Tbk	0.35	-16.18	-0.06
Posco International Corp	0.67	-8.43	-0.06
Haci Omer Sabanci	0.92	-6.01	-0.06
% of Portfolio	14.38		-1.42

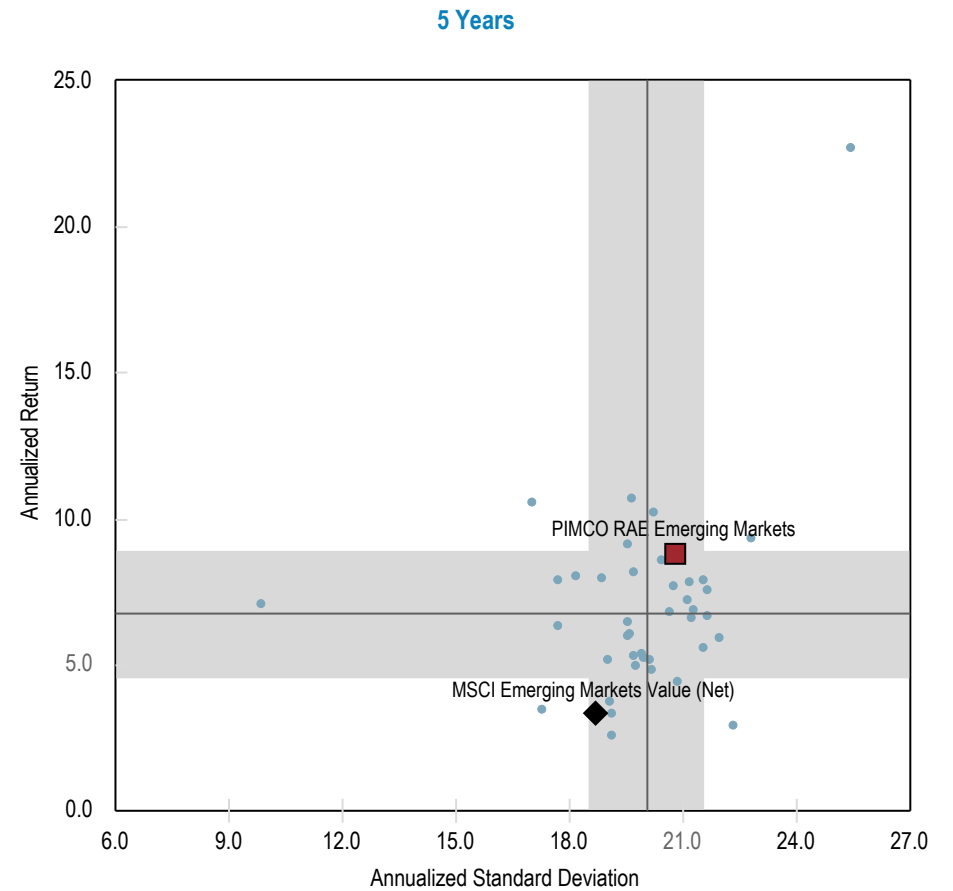
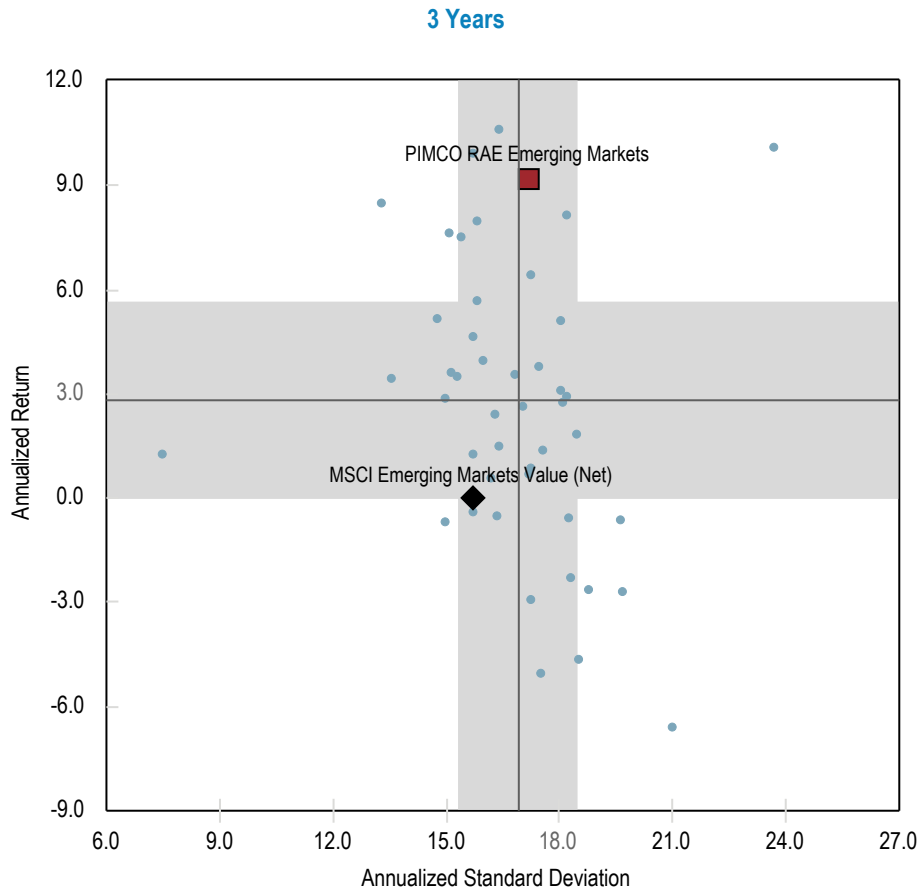
The PIMCO RAE Emerging Markets seeks to invest 80% of its assets in investments that are economically tied to emerging market countries. The portfolio is sub-advised by Research Affiliates, LLC.

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	8.87 (41)	23.09 (12)	9.19 (7)	8.79 (17)	-	-9.66 (32)	17.08 (8)	2.13 (85)	14.63 (77)	-12.30 (48)
▲ MSCI Emerging Markets Value NR	8.05 (60)	14.21 (67)	-0.01 (75)	3.38 (95)	1.94 (100)	-15.83 (61)	4.00 (66)	5.48 (71)	11.96 (93)	-10.74 (23)
5th Percentile	13.04	24.89	9.76	10.59	7.54	-1.41	20.57	23.96	27.43	-6.62
1st Quartile	9.82	20.67	5.16	8.03	5.91	-9.00	9.32	18.22	22.73	-11.12
Median	8.59	15.83	2.81	6.74	4.59	-14.31	4.83	8.93	18.21	-12.58
3rd Quartile	6.94	12.96	-0.13	5.29	4.00	-17.01	3.23	4.43	14.85	-15.24
95th Percentile	4.52	9.78	-4.19	3.34	2.57	-24.65	-5.31	-3.79	8.53	-18.81
Population	49	49	46	42	29	55	54	57	58	56





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
PIMCO RAE Emerging Markets	9.2	17.2	0.5
MSCI Emerging Markets Value (Net)	0.0	15.7	-0.1
eV Emg Mkts All Cap Value Equity Median	2.8	16.9	0.1
Population	46	46	46

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
PIMCO RAE Emerging Markets	8.8	20.8	0.4
MSCI Emerging Markets Value (Net)	3.4	18.7	0.2
eV Emg Mkts All Cap Value Equity Median	6.7	20.0	0.3
Population	42	42	42

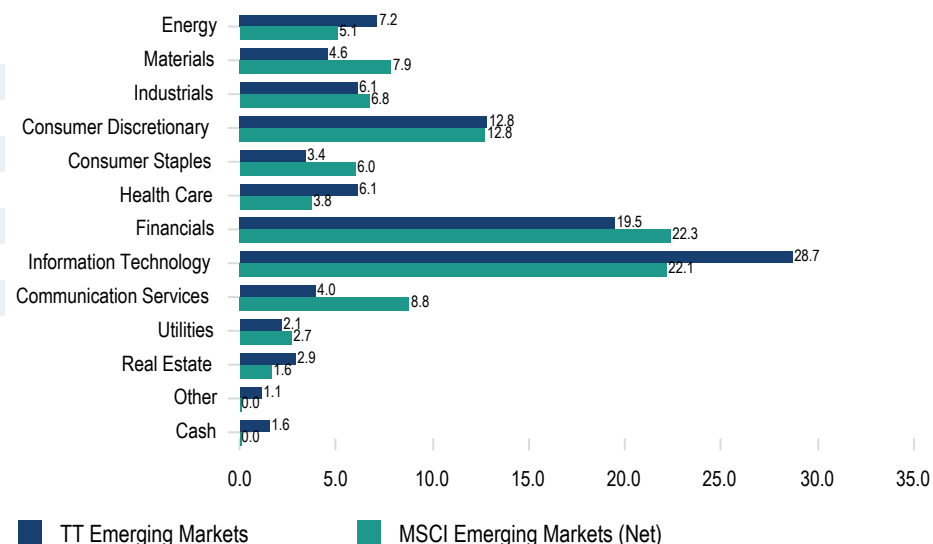
TT Emerging Markets Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: December 31, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	61	1,441
Wtd. Avg. Mkt. Cap \$M	115,523.42	103,753.63
Median Mkt. Cap \$M	16,138.05	6,968.21
Price/Earnings ratio	13.61	12.92
Price/Book ratio	2.51	2.50
Return on Equity (%)	4.36	4.16
Current Yield (%)	1.94	2.79
Beta (5 Years, Monthly)	1.15	1.00

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



Largest Holdings

	End Weight (%)	Quarterly Return (%)
Taiwan Semiconductor Man.	9.44	19.87
Axis Bank Ltd	4.28	6.11
Samsung Electronics Co Ltd	4.05	19.77
Samsung Electronics Co Ltd	3.75	20.25
Grupo Financiero Banorte	3.63	27.54
Icici Bank Ltd	2.92	4.48
Emaar Properties	2.87	-1.48
MercadoLibre Inc	2.79	23.95
Nova Ljubljanska Banka d.d	2.70	23.79
Tencent Holdings LTD	2.57	-3.83

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Taiwan Semiconductor Man.	8.41	19.87	1.67
Grupo Financiero Banorte	4.50	27.54	1.24
Nova Ljubljanska Banka d.d	3.67	23.79	0.87
Samsung Electronics Co Ltd	3.16	19.77	0.63
Atacadao SA	1.33	44.14	0.59
MercadoLibre Inc	2.10	23.95	0.50
Kia Corporation	1.73	28.72	0.50
Banco Bradesco Sa Brad	1.60	28.54	0.46
Samsung Electronics Co Ltd	2.00	20.25	0.41
Varun Beverages Ltd	1.27	30.52	0.39

Top Detractors

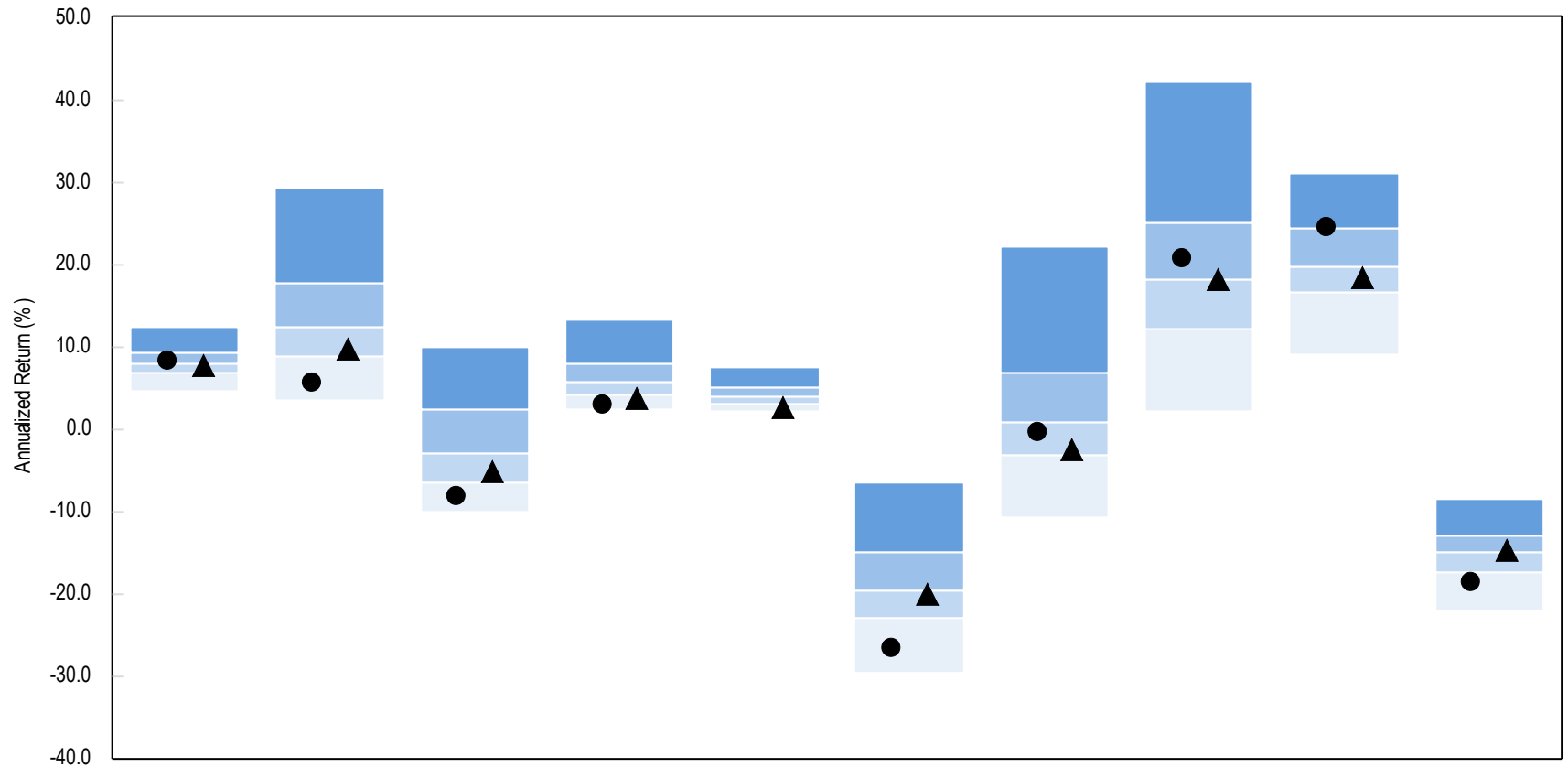
	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Ypf Sociedad Anonima	3.24	-27.91	-0.90
Alibaba Group Holding Ltd	3.24	-10.23	-0.33
ANJOY FOODS GROUP CO LTD	1.61	-12.57	-0.20
Byd Company Ltd	1.32	-11.14	-0.15
Allkem Limited	1.16	-11.63	-0.13
Baidu Inc	1.00	-12.71	-0.13
Contemporary Ampere Technology Co Ltd	0.66	-17.19	-0.11
Ping An Insurance Group	0.48	-20.95	-0.10
Delhivery Limited	1.65	-5.88	-0.10
Koc Holding AS	0.72	-10.27	-0.07

% of Portfolio 29.77 7.24

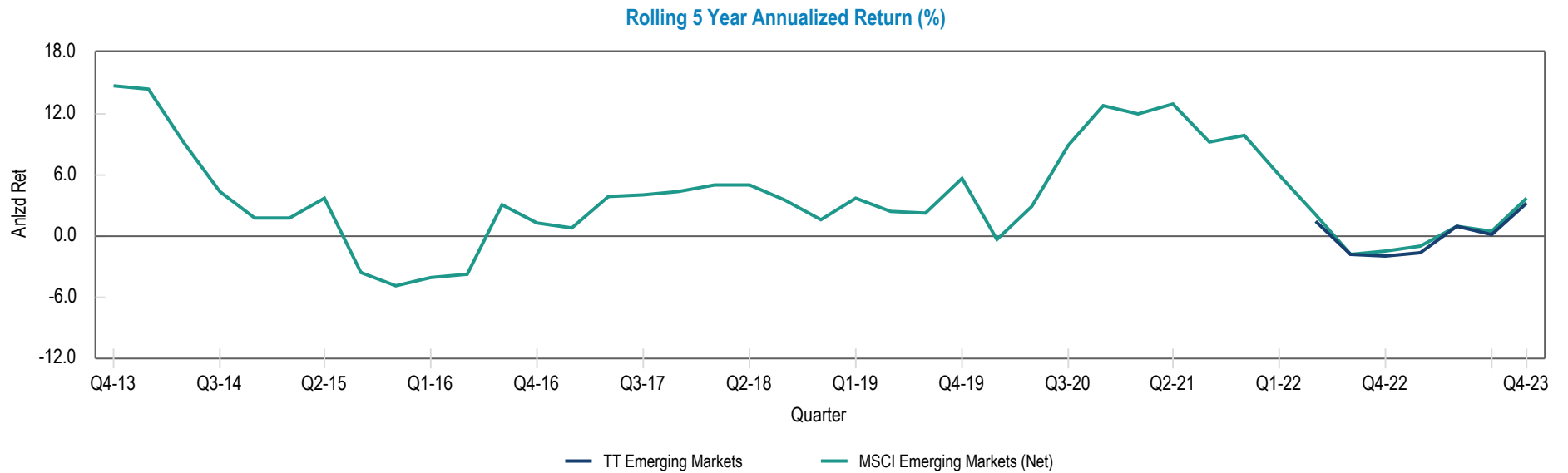
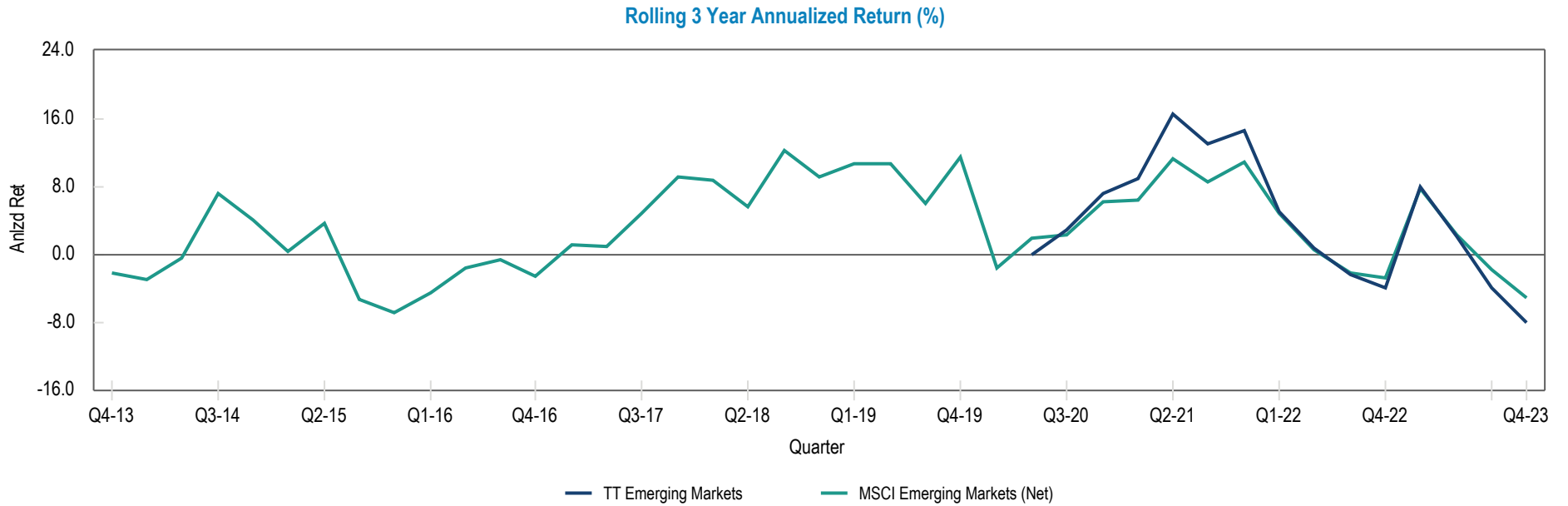
% of Portfolio 15.08 -2.23

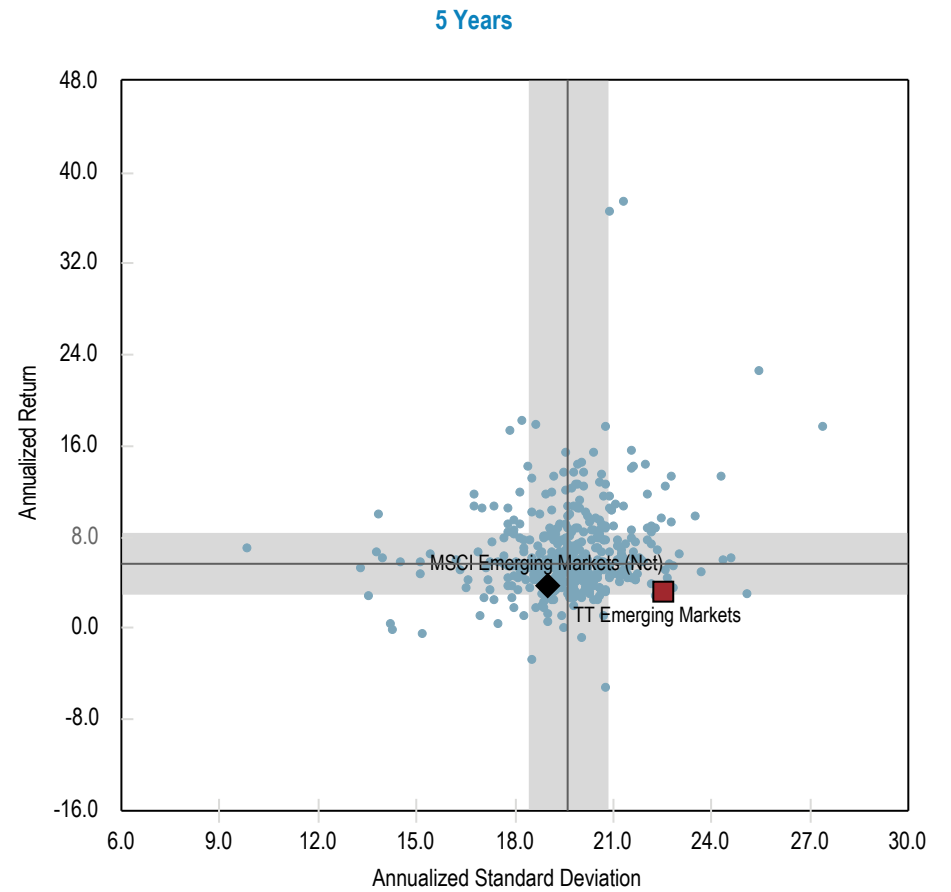
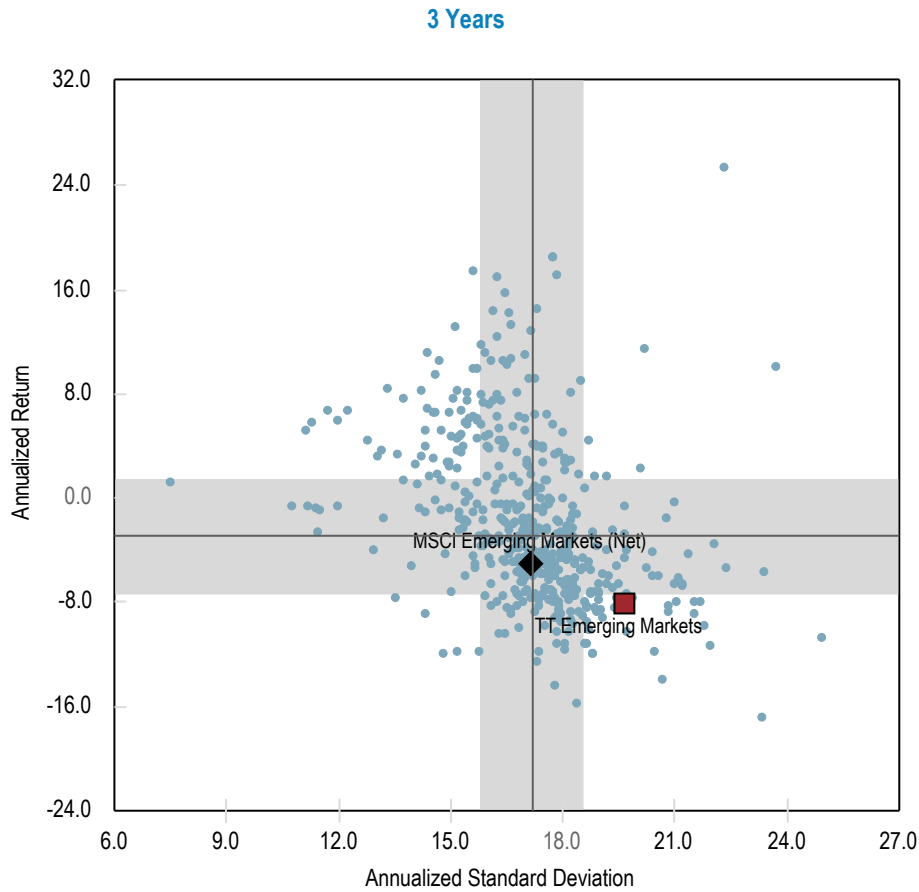
The Emerging Markets Unconstrained strategy aims to outperform its benchmark, MSCI Emerging Markets Index by 5% per annum over a three-year rolling period. It targets high returns and long term capital growth by investing in a focused portfolio of primarily equity and equity-related securities traded 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	8.55 (39)	5.80 (91)	-8.05 (88)	3.22 (90)	-	-26.36 (90)	-0.23 (59)	20.79 (39)	24.77 (24)	-18.39 (82)
▲ MSCI Emerging Markets	7.86 (53)	9.83 (66)	-5.08 (65)	3.68 (83)	2.66 (88)	-20.09 (56)	-2.54 (72)	18.31 (51)	18.42 (63)	-14.57 (45)
5th Percentile	12.50	29.28	10.11	13.33	7.61	-6.36	22.26	42.28	31.16	-8.51
1st Quartile	9.30	17.72	2.39	7.93	5.12	-14.91	6.80	25.14	24.36	-12.79
Median	7.93	12.48	-2.94	5.67	4.09	-19.51	1.00	18.33	19.73	-14.89
3rd Quartile	6.96	8.85	-6.35	4.29	3.20	-22.96	-3.03	12.30	16.61	-17.34
95th Percentile	4.73	3.64	-10.09	2.55	2.13	-29.65	-10.71	2.12	9.14	-22.00
Population	517	517	482	437	311	567	580	579	601	589





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
TT Emerging Markets	-8.1	19.6	-0.4
MSCI Emerging Markets (Net)	-5.1	17.1	-0.3
eV Emg Mkts Equity Median	-2.9	17.2	-0.2
Population	482	482	482

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
TT Emerging Markets	3.2	22.5	0.2
MSCI Emerging Markets (Net)	3.7	19.0	0.2
eV Emg Mkts Equity Median	5.7	19.6	0.3
Population	437	437	437

Global Equity Managers

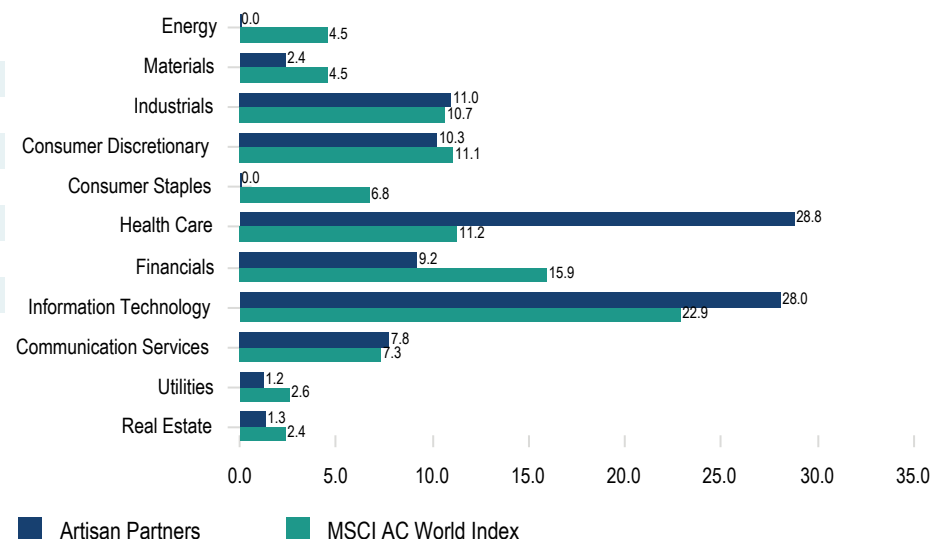
Artisan Partners Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: December 31, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	43	2,921
Wtd. Avg. Mkt. Cap \$M	273,514.40	462,723.22
Median Mkt. Cap \$M	73,932.31	12,992.44
Price/Earnings ratio	32.09	18.93
Price/Book ratio	5.36	3.55
Return on Equity (%)	5.73	0.63
Current Yield (%)	0.58	2.08
Beta (5 Years, Monthly)	0.99	1.00

Sector Allocation (%) vs. MSCI AC World Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
Advanced Micro Devices Inc	6.52	43.37
Novo Nordisk A/S	5.30	13.16
Boston Scientific Corp	4.79	9.49
Atlassian Corp	4.34	18.04
Techtronic Industries Co Ltd	3.95	22.80
Intuit Inc.	3.94	22.54
Veeva Systems Inc	3.79	-5.37
Netflix Inc	3.48	28.94
London Stock Exchange Group	3.26	17.64
Chipotle Mexican Grill Inc	3.13	24.85

Top Contributors

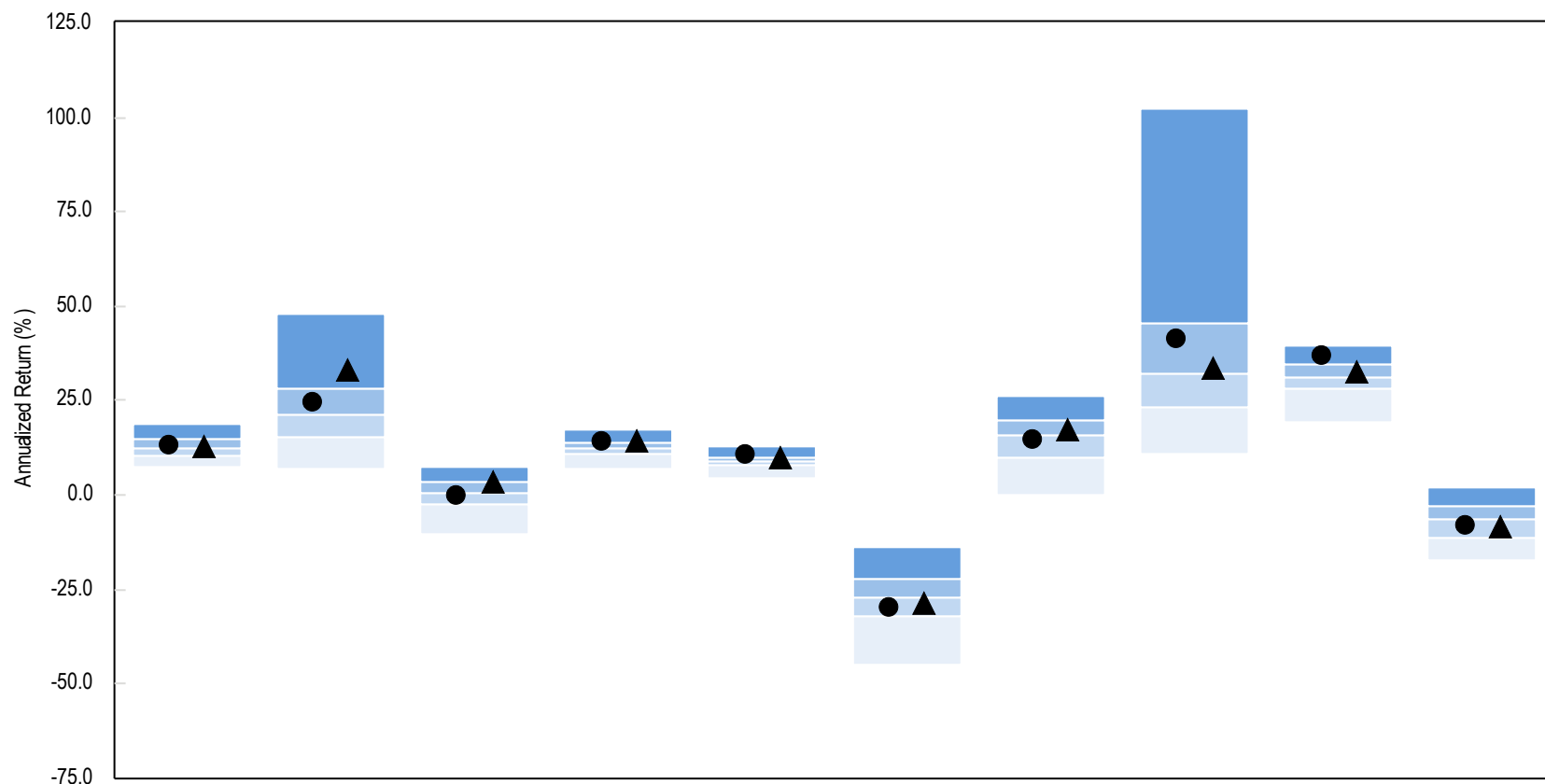
	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Advanced Micro Devices Inc	4.80	43.37	2.08
Netflix Inc	2.86	28.94	0.83
Techtronic Industries Co Ltd	3.52	22.80	0.80
Intuit Inc.	3.53	22.54	0.80
Atlassian Corp	4.02	18.04	0.73
Novo Nordisk A/S	5.13	13.16	0.67
Vestas Wind Systems A/S	1.40	47.57	0.67
Chipotle Mexican Grill Inc	2.65	24.85	0.66
Hexagon AB	1.61	39.63	0.64
Lululemon Athletica Inc	1.82	32.59	0.59
% of Portfolio	31.34		8.46

Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
arGEN-X SE	2.51	-22.62	-0.57
ON Semiconductor Corp	3.67	-10.13	-0.37
Veeva Systems Inc	6.84	-5.37	-0.37
LONZA GROUP AG	3.32	-9.67	-0.32
West Pharmaceutical Services Inc.	0.98	-6.10	-0.06
Tencent Holdings LTD	1.33	-3.83	-0.05
Airbnb Inc	1.82	-0.78	-0.01
Astrazeneca PLC	3.30	-0.28	-0.01
CNH Industrial N.V.	1.19	0.18	0.00
Eaton Corporation plc	0.37	13.36	0.05
% of Portfolio	25.33		-1.71

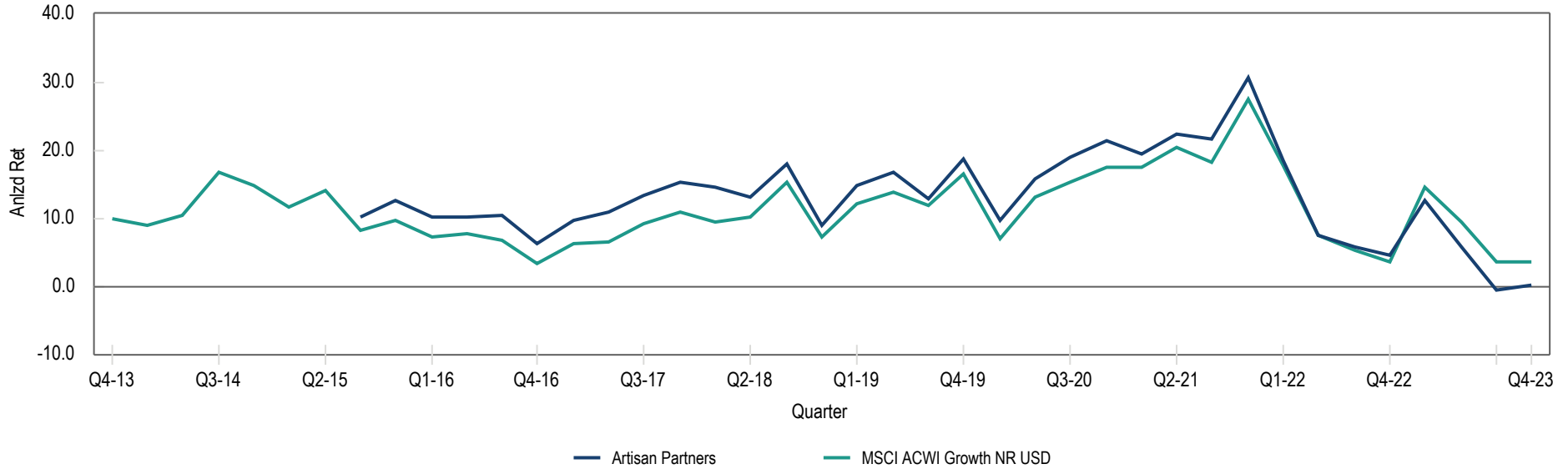
Global equity portfolio of companies that is benchmark agnostic with accelerating profit cycles and a focus on capital allocation. Primary personnel include James Hamel, Craigh Cepukenas, and Matthew Kamm.

Artisan Partners vs. eV Global Growth Equity Gross Universe

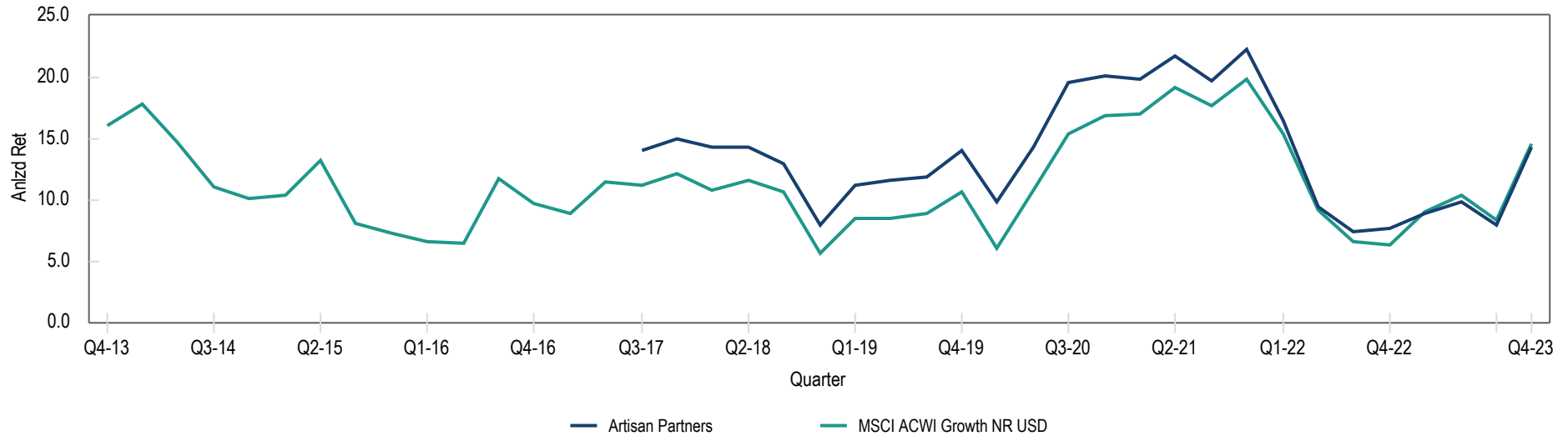


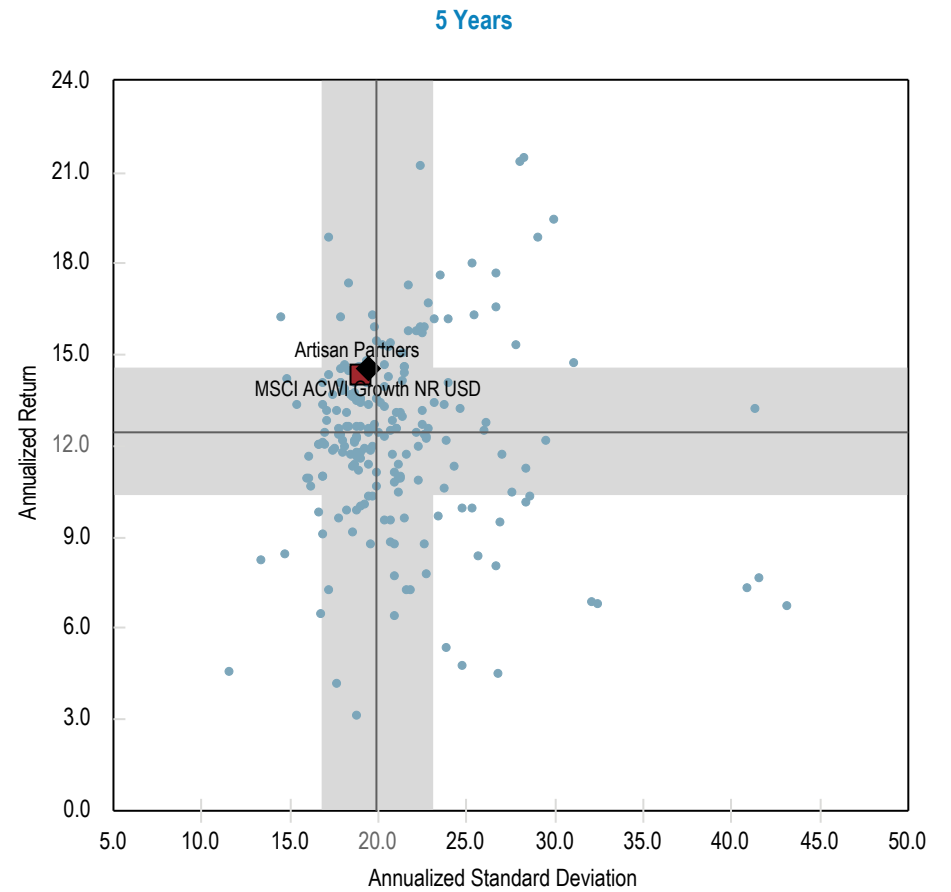
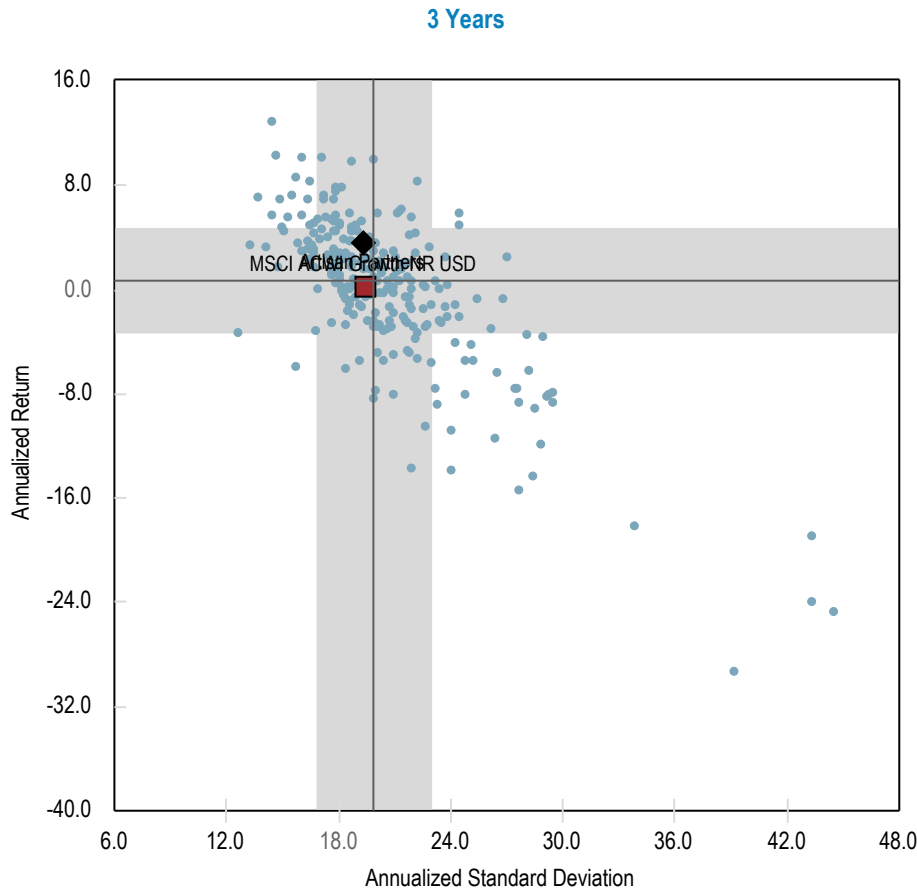
	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● Artisan Partners	13.23 (42)	24.54 (37)	0.27 (54)	14.37 (22)	11.12 (16)	-29.59 (60)	14.99 (56)	41.66 (33)	37.00 (12)	-7.94 (60)
▲ MSCI ACWI Growth NR USD	12.74 (49)	33.22 (17)	3.66 (25)	14.58 (20)	10.06 (28)	-28.61 (56)	17.10 (43)	33.60 (49)	32.72 (36)	-8.13 (61)
5th Percentile	18.71	48.06	7.23	17.12	12.96	-13.59	26.02	102.09	39.64	2.06
1st Quartile	14.67	28.39	3.55	14.11	10.14	-22.02	19.73	45.25	34.66	-2.90
Median	12.61	21.45	0.68	12.46	9.18	-27.16	15.63	32.09	31.25	-6.54
3rd Quartile	10.67	15.31	-2.56	10.92	8.04	-31.83	9.94	23.14	28.35	-11.18
95th Percentile	7.23	6.84	-10.27	7.00	4.64	-44.96	-0.04	11.16	19.49	-17.07
Population	268	265	244	208	121	283	271	258	240	219

Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Artisan Partners	0.3	19.4	0.0
MSCI ACWI Growth NR USD	3.7	19.3	0.2
eV Global Growth Equity Median	0.7	19.9	0.0
Population	244	244	244

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Artisan Partners	14.4	19.0	0.7
MSCI ACWI Growth NR USD	14.6	19.4	0.7
eV Global Growth Equity Median	12.5	19.9	0.6
Population	208	208	208

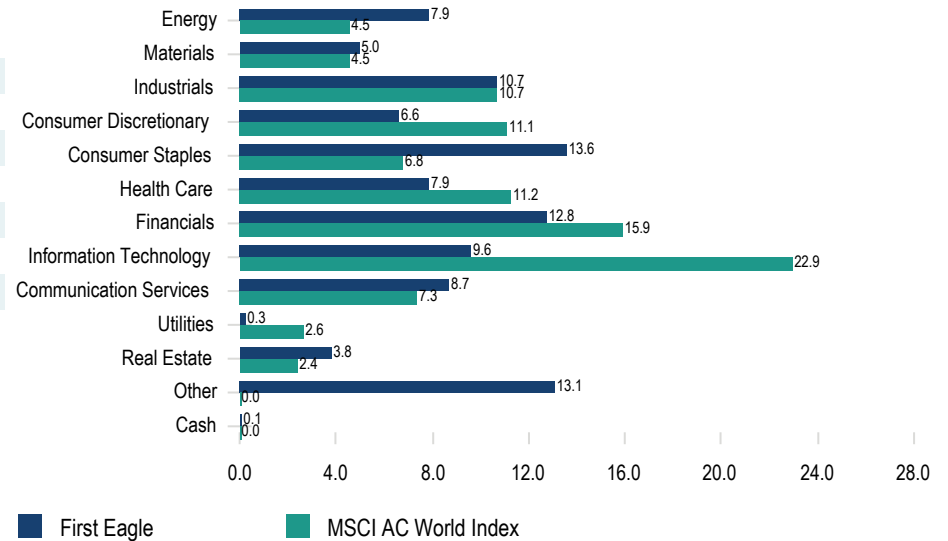
First Eagle
Manager Portfolio Overview

Contra Costa County Employees' Retirement Association
Period Ending: December 31, 2023

Characteristics

	Portfolio	Benchmark
Number of Stocks	126	2,921
Wtd. Avg. Mkt. Cap \$M	160,215.58	462,723.22
Median Mkt. Cap \$M	27,651.62	12,992.44
Price/Earnings ratio	17.86	18.93
Price/Book ratio	2.34	3.55
Return on Equity (%)	-129.37	0.63
Current Yield (%)	2.08	2.08
Beta (5 Years, Monthly)	0.76	1.00

Sector Allocation (%) vs. MSCI AC World Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
SPDR Gold Trust	13.07	11.50
Oracle Corp	3.22	-0.10
Meta Platforms Inc	3.21	17.90
Schlumberger Ltd	2.41	-10.30
Exxon Mobil Corp	2.22	-14.19
Comcast Corp	2.19	-0.44
HCA Healthcare Inc	1.84	10.29
Alphabet Inc	1.82	6.89
Willis Towers Watson plc	1.58	15.83
Danone SA	1.52	17.15

Top Contributors

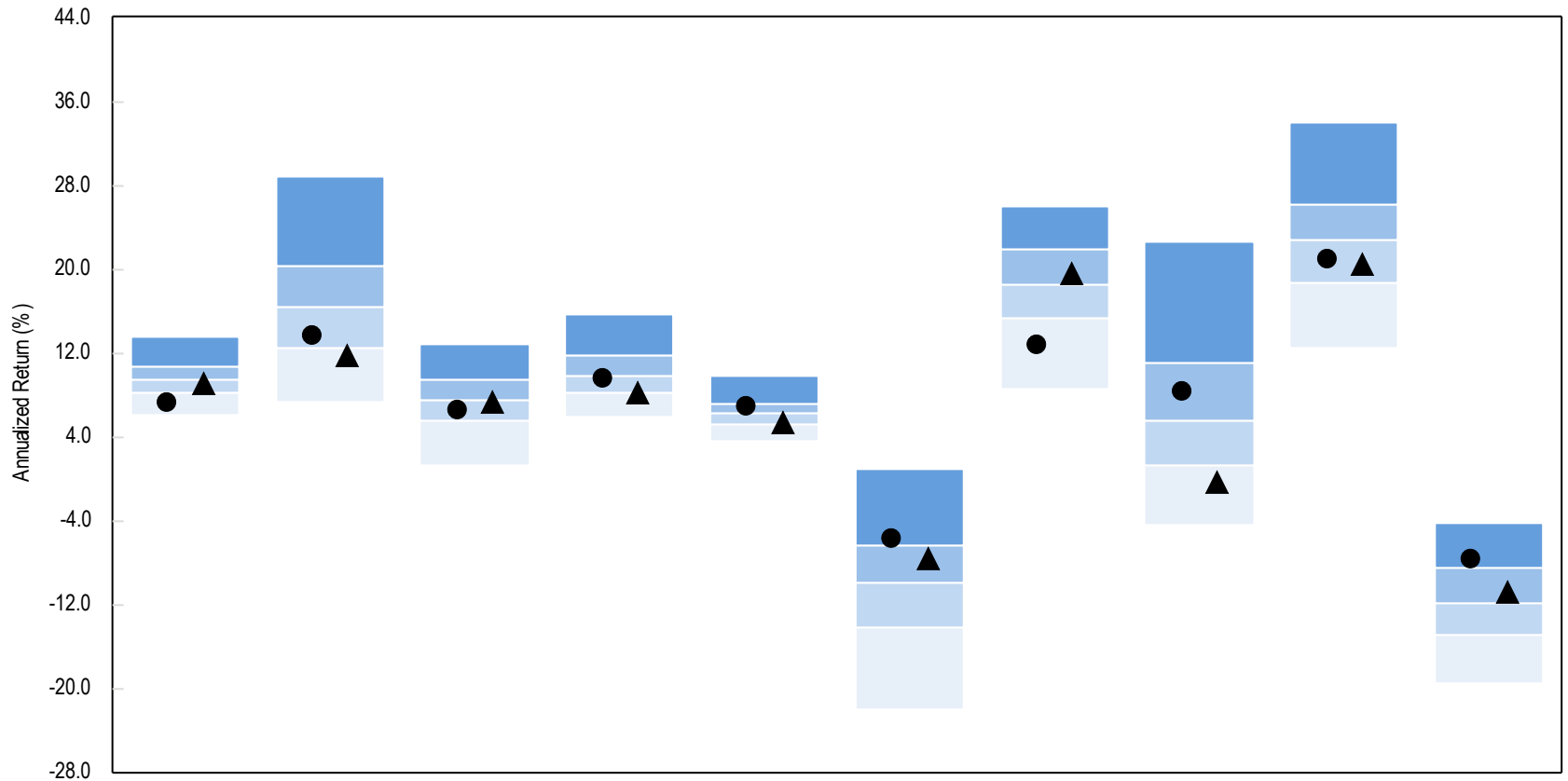
	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
SPDR Gold Trust	11.20	11.50	1.29
Meta Platforms Inc	2.60	17.90	0.47
Fomento Economico Mexican	1.24	20.45	0.25
Bank of New York Mellon Corp (The)	1.02	23.26	0.24
Danone SA	1.24	17.15	0.21
Willis Towers Watson plc	1.28	15.83	0.20
Universal Health Services	0.89	21.42	0.19
Schindler Holding AG, Hergiswil	0.76	24.91	0.19
Taiwan Semiconductor Man.	0.88	20.23	0.18
SALESFORCE INC	0.59	29.77	0.18
% of Portfolio	21.70		3.39

Top Detractors

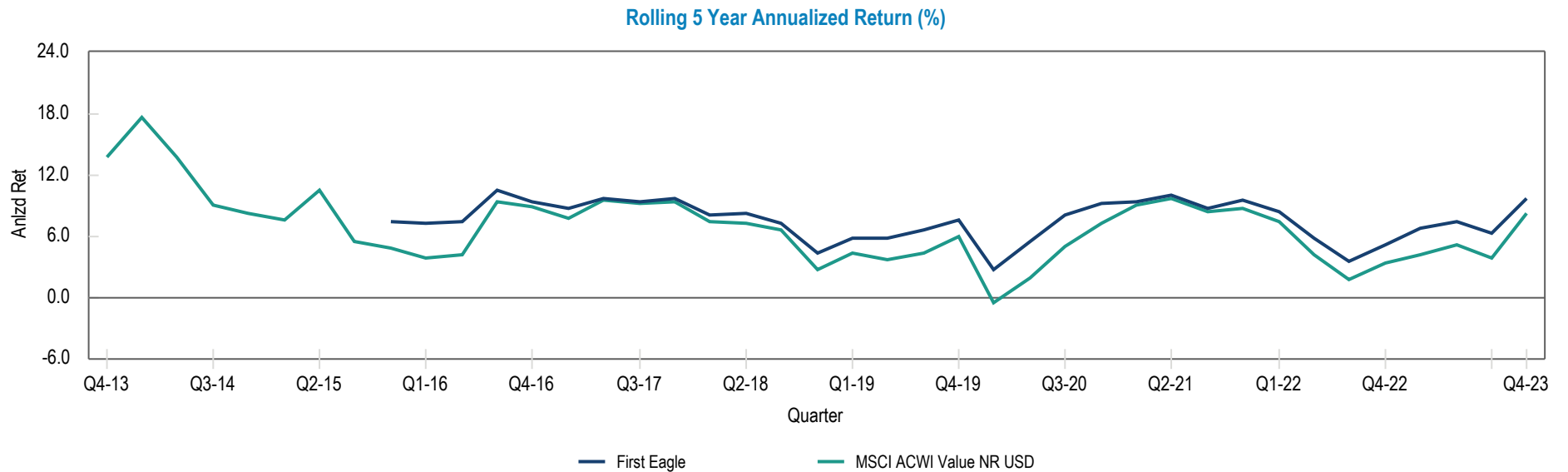
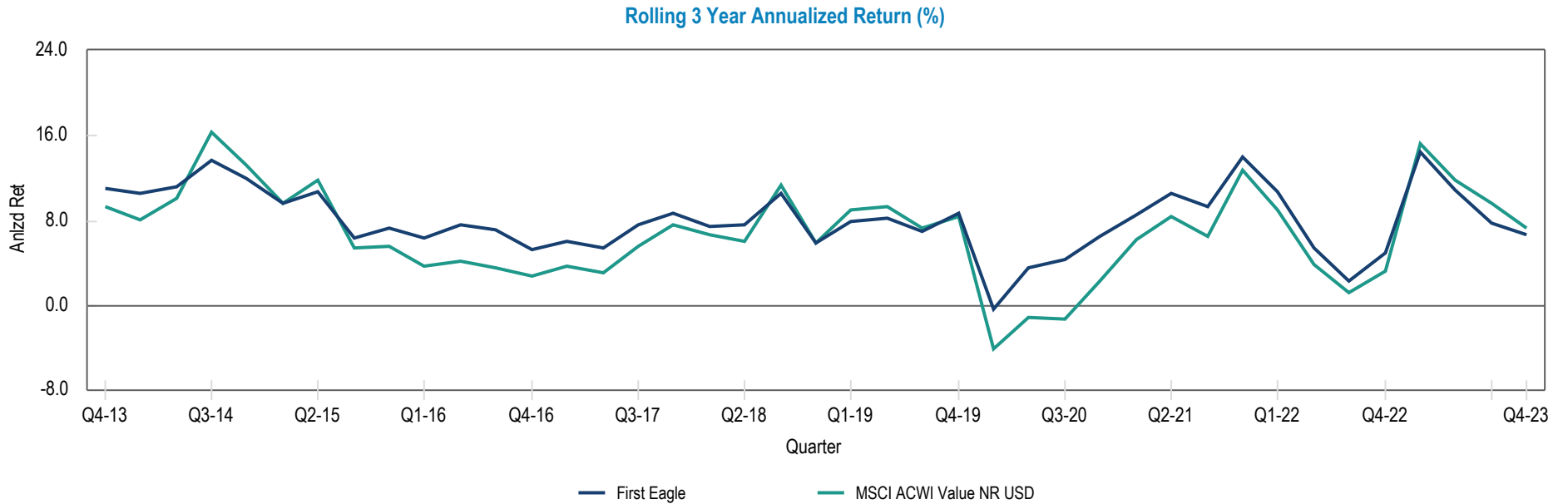
	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Exxon Mobil Corp	2.44	-14.19	-0.35
Schlumberger Ltd	2.46	-10.30	-0.25
Imperial Oil Ltd	1.48	-6.89	-0.10
Alibaba Group Holding Ltd	0.79	-10.23	-0.08
Jardine Matheson Holdings Ltd	0.67	-11.22	-0.08
Sanofi	0.96	-7.71	-0.07
Nutrien Ltd	0.57	-7.94	-0.05
Franco-Nevada Corp	0.20	-16.74	-0.03
NOV Inc	1.25	-2.70	-0.03
Becton Dickinson and Co	0.60	-5.30	-0.03
% of Portfolio	11.42		-1.08

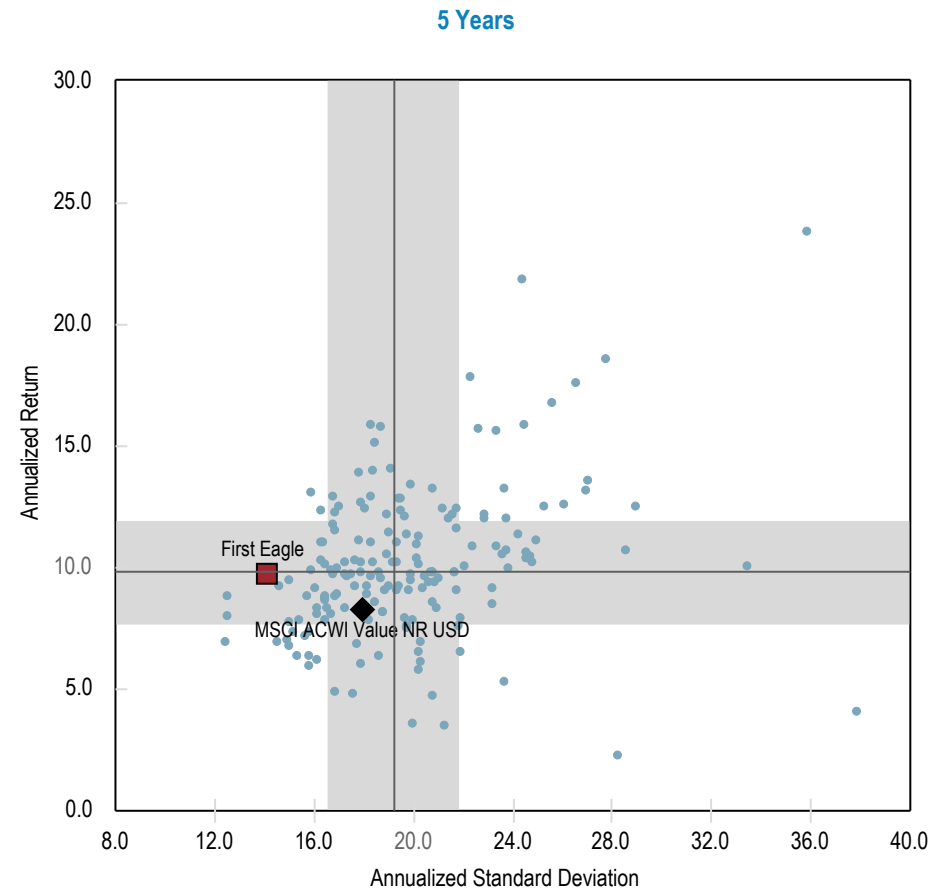
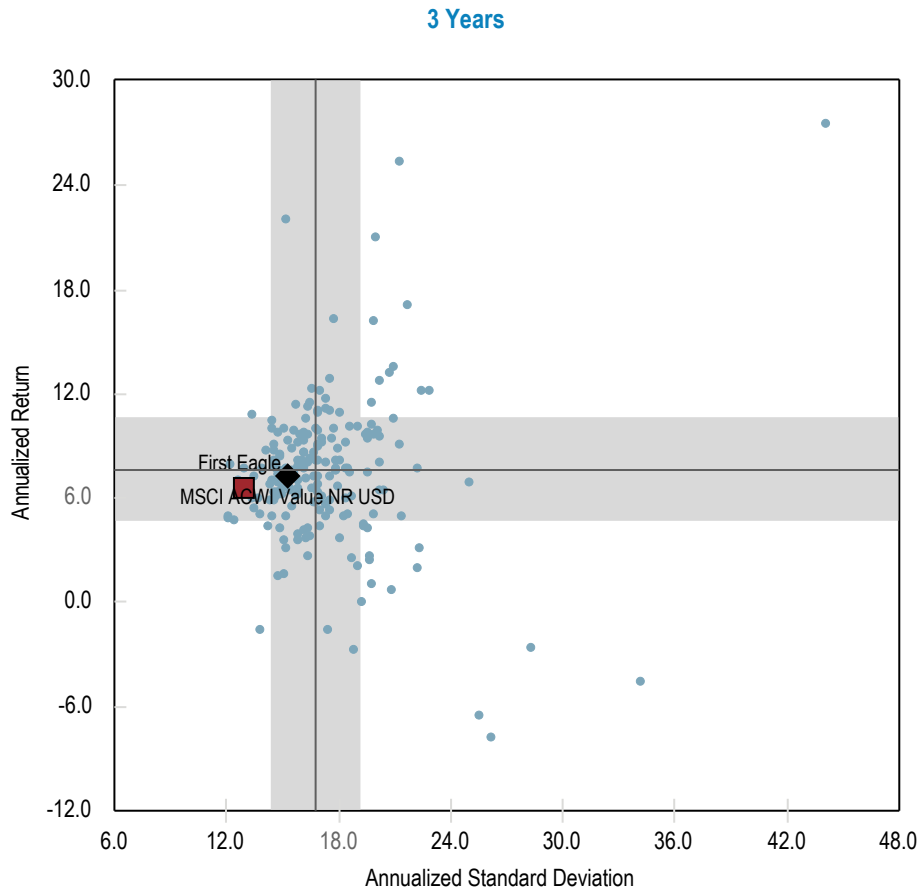
Global equity portfolio that is benchmark agnostic comprised of companies with low valuations. Primary personnel include Matt McLennan and Kimball Brooker.

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	7.42 (85)	13.75 (67)	6.64 (61)	9.74 (54)	7.06 (29)	-5.61 (21)	12.95 (86)	8.47 (33)	21.01 (64)	-7.64 (18)
▲ MSCI ACWI Value NR USD	9.17 (60)	11.81 (81)	7.33 (54)	8.24 (77)	5.46 (73)	-7.55 (35)	19.62 (41)	-0.33 (81)	20.59 (66)	-10.79 (45)
5th Percentile	13.63	28.82	12.84	15.78	9.94	1.03	26.10	22.62	34.09	-4.24
1st Quartile	10.83	20.42	9.44	11.77	7.28	-6.26	21.92	11.06	26.20	-8.37
Median	9.51	16.37	7.64	9.83	6.26	-9.89	18.60	5.66	22.80	-11.75
3rd Quartile	8.28	12.57	5.67	8.35	5.30	-14.15	15.33	1.28	18.82	-14.92
95th Percentile	6.09	7.42	1.41	5.92	3.65	-21.93	8.64	-4.44	12.47	-19.51
Population	217	216	196	174	130	220	225	233	229	233





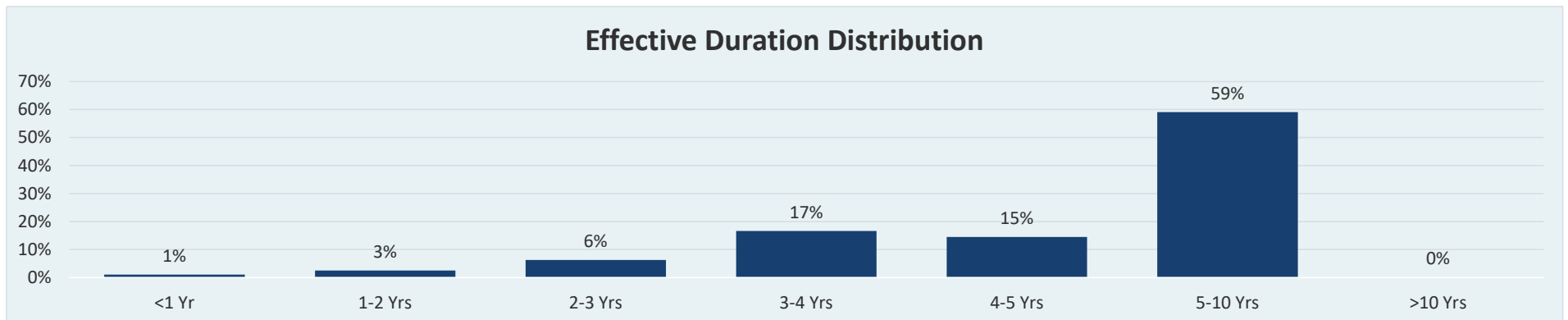
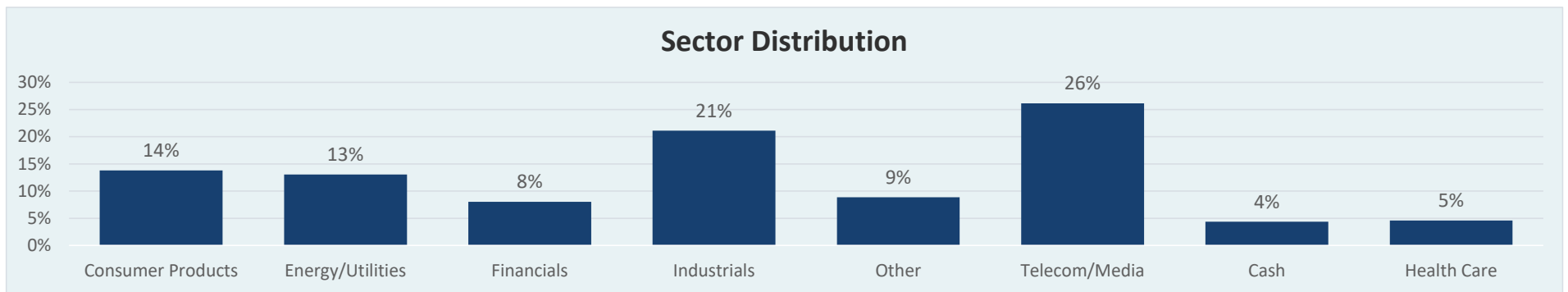
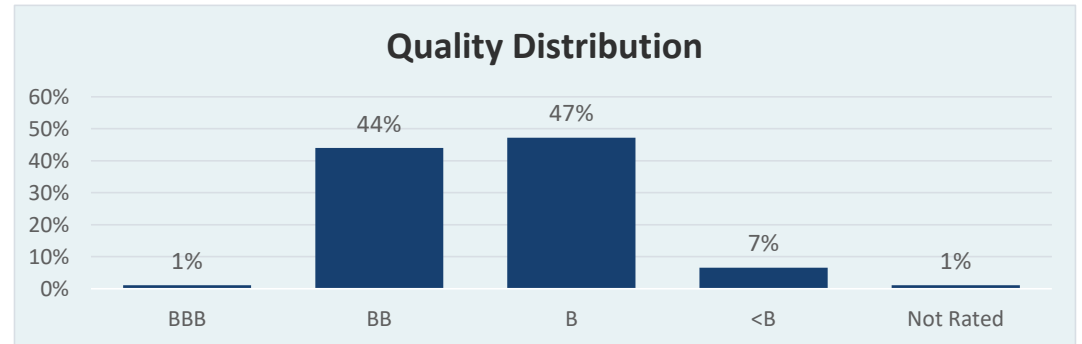
	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
First Eagle	6.6	12.9	0.4
MSCI ACWI Value NR USD	7.3	15.2	0.4
eV Global Value Equity Median	7.6	16.8	0.4
Population	196	196	196

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
First Eagle	9.7	14.1	0.6
MSCI ACWI Value NR USD	8.2	17.9	0.4
eV Global Value Equity Median	9.8	19.2	0.5
Population	174	174	174

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.

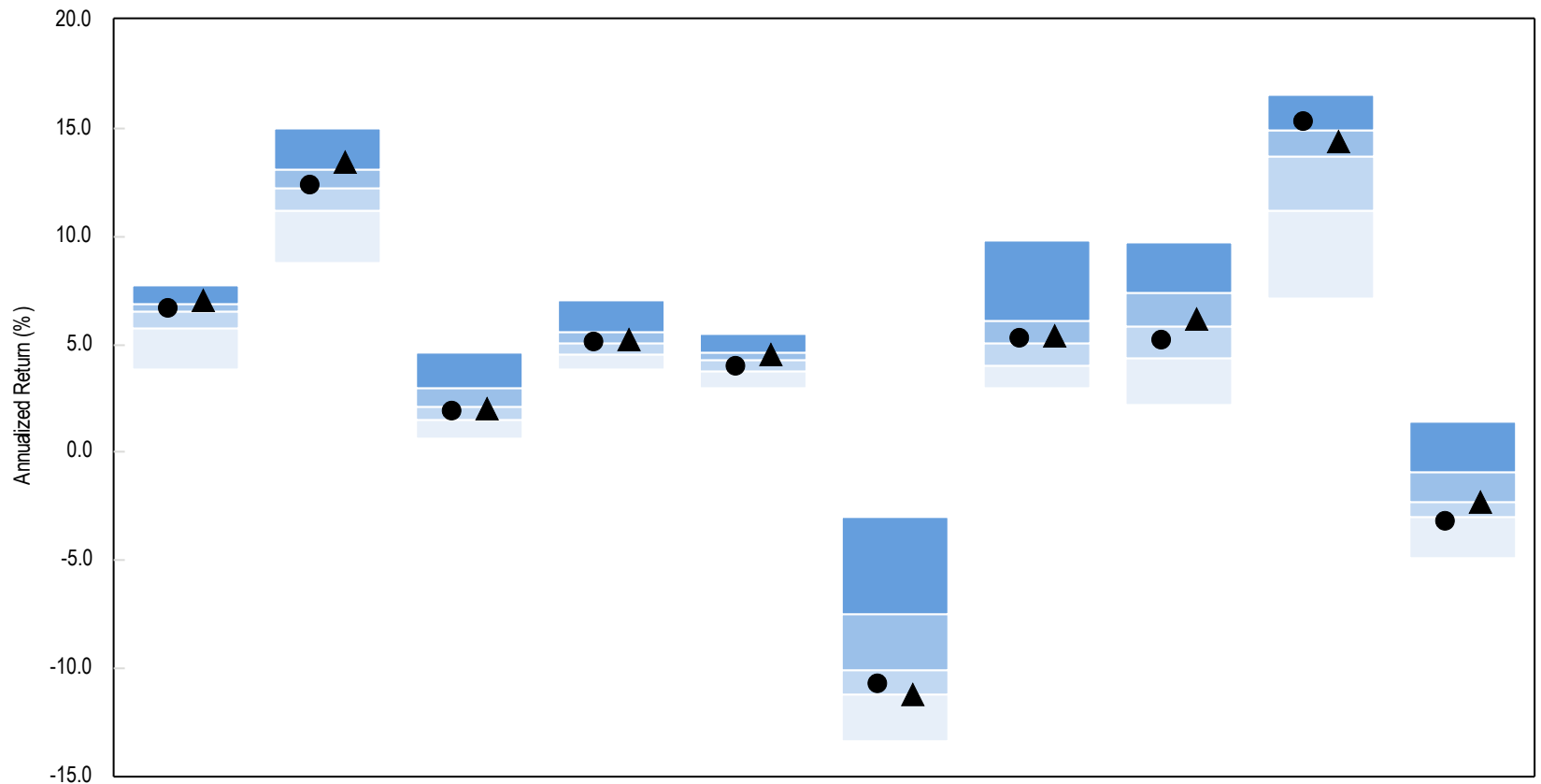
	Allianz	ICE BofAML HY Master II
Effective Duration	3.10	3.30
Yield to Maturity	6.90	7.80
Average Quality	B1	B1
Average Coupon	6.8%	6.1%



Quality distributions exclude cash.

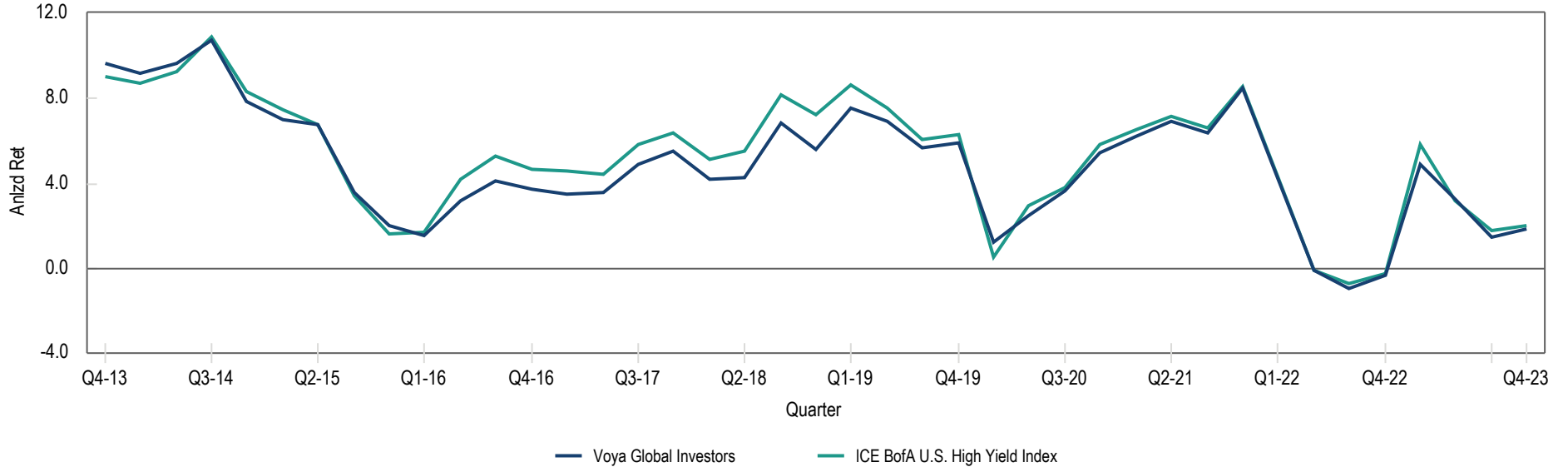
Voya Financial acquired Allianz Global Investors in 2022.

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

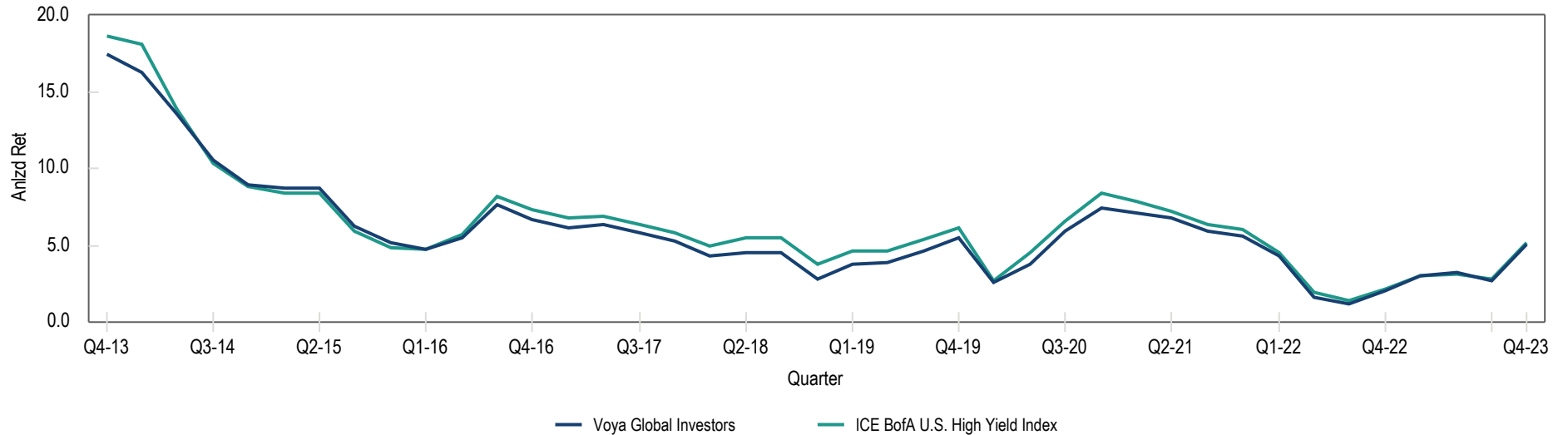


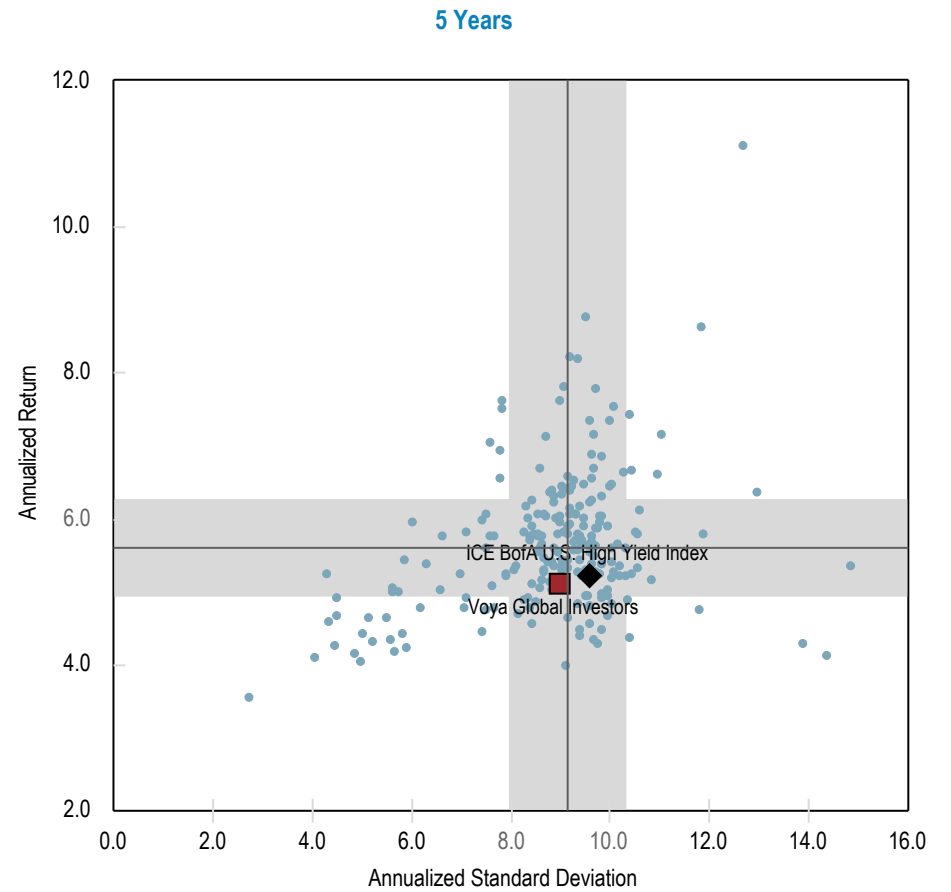
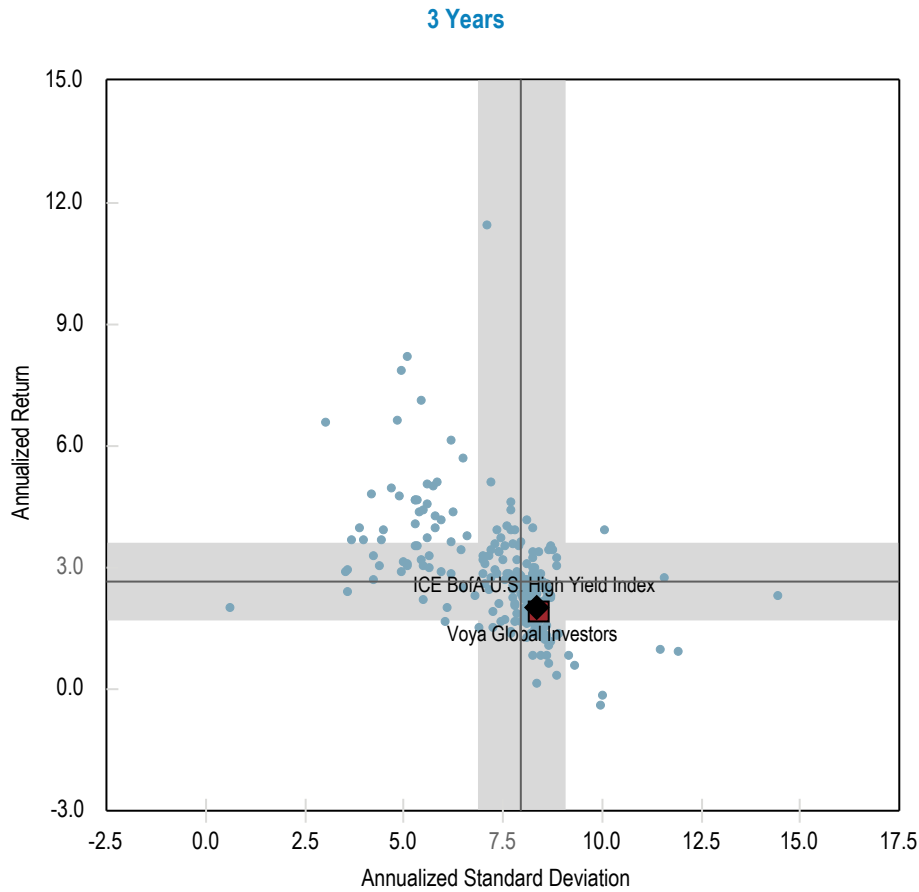
	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● Voya Global Investors	6.73 (38)	12.39 (47)	1.90 (60)	5.11 (49)	3.97 (65)	-10.64 (64)	5.34 (42)	5.18 (66)	15.32 (19)	-3.20 (78)
▲ ICE BofA U.S. High Yield Index	7.06 (19)	13.46 (18)	2.00 (54)	5.21 (44)	4.51 (32)	-11.22 (76)	5.36 (41)	6.17 (42)	14.41 (36)	-2.27 (50)
5th Percentile	7.74	14.97	4.65	7.01	5.48	-2.97	9.81	9.70	16.52	1.43
1st Quartile	6.89	13.10	3.01	5.55	4.62	-7.50	6.10	7.39	14.94	-0.92
Median	6.49	12.25	2.09	5.06	4.24	-10.05	5.02	5.85	13.72	-2.28
3rd Quartile	5.75	11.15	1.51	4.52	3.75	-11.21	4.05	4.38	11.19	-3.01
95th Percentile	3.85	8.75	0.65	3.83	2.95	-13.32	2.93	2.24	7.13	-4.92
Population	226	225	217	209	171	250	248	254	260	260

Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Voya Global Investors	1.9	8.4	0.0
ICE BofA U.S. High Yield Index	2.0	8.3	0.0
eV US High Yield Fixed Inc Median	2.6	8.0	0.1
Population	228	228	228

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Voya Global Investors	5.1	9.0	0.4
ICE BofA U.S. High Yield Index	5.2	9.6	0.4
eV US High Yield Fixed Inc Median	5.6	9.2	0.5
Population	220	220	220

Real Estate Managers

Adelante Manager Portfolio Overview

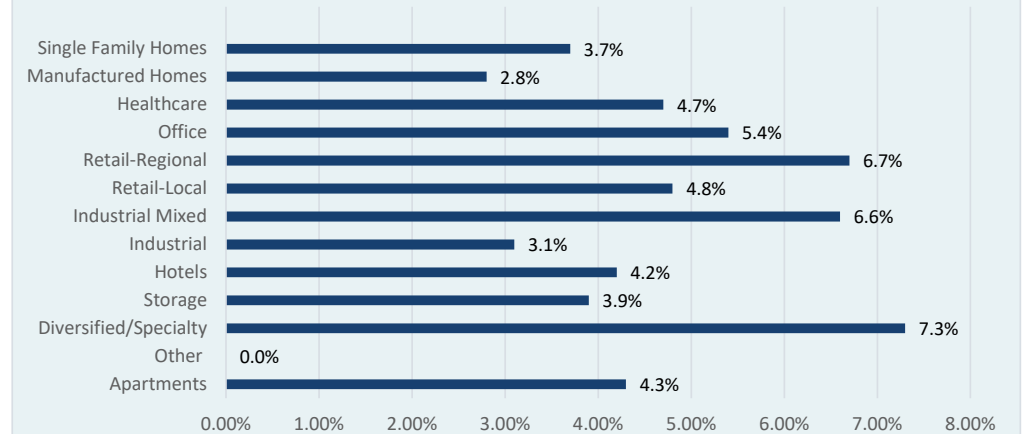
Contra Costa County Employees' Retirement Association Period Ending: December 31, 2023

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

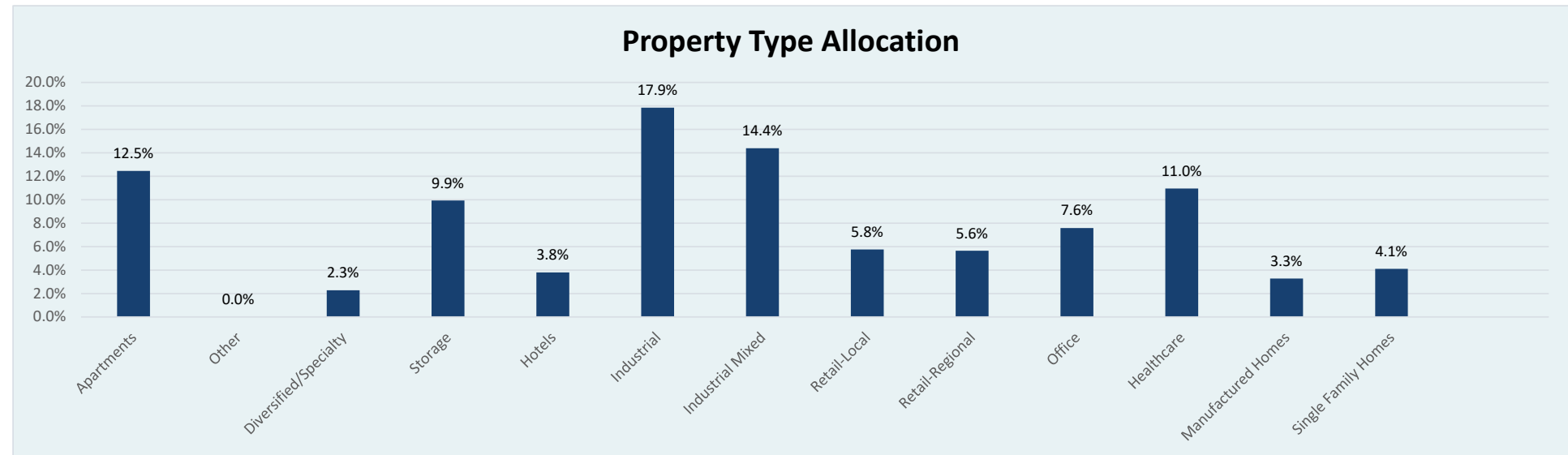
Top Five Holdings

Company	Property Type	Allocation
ProLogis Inc.	Industrial	13.4%
Equinix Inc	Industrial Mixed	8.7%
Welltower, Inc.	Healthcare	7.7%
Public Storage	Storage	6.6%
Simon Property Group, Inc.	Retail-Regional	5.6%

Dividend Yield by Property Type



Property Type Allocation



0.0224% is allocated to Cash and Cash Equivalents.

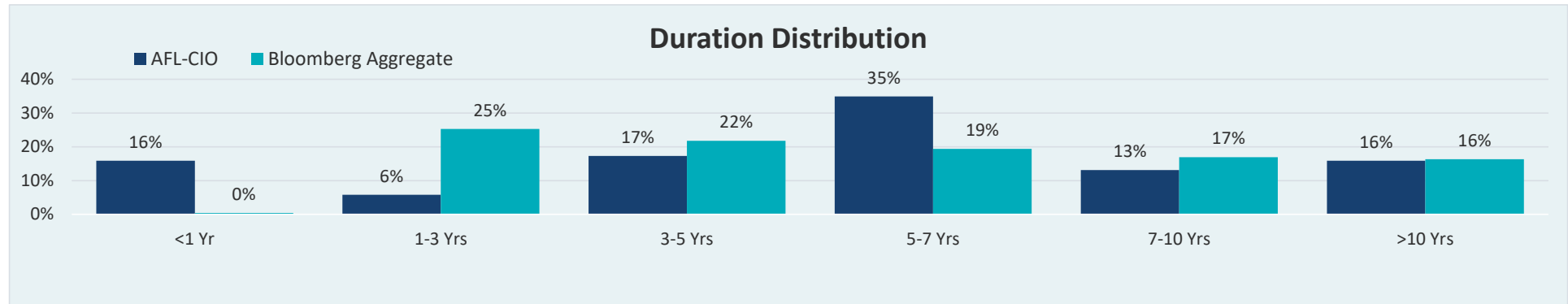
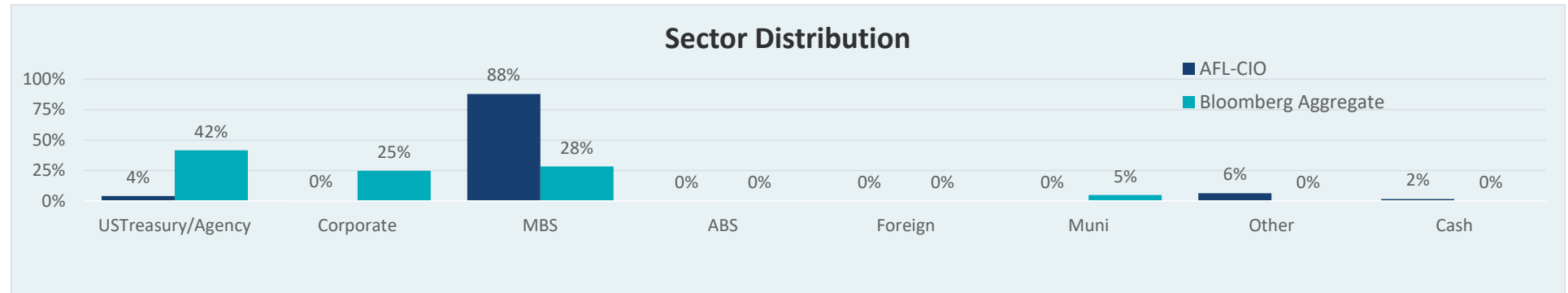
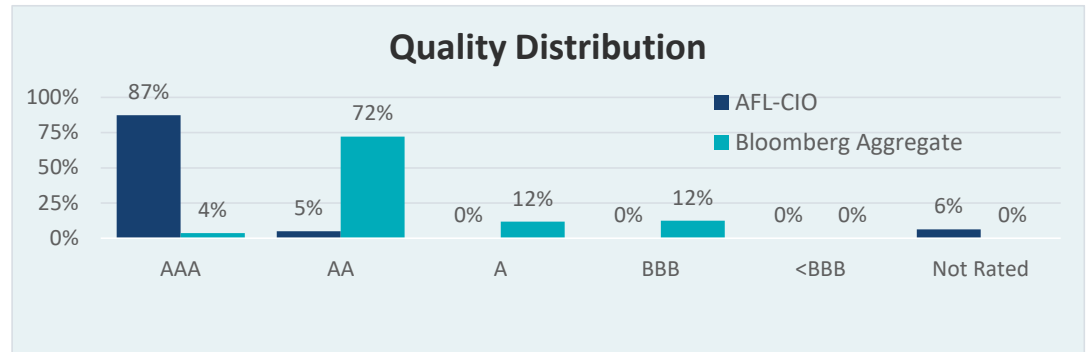
Diversifying Fixed Income Managers

AFL-CIO Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: December 31, 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	6.01	6.12
Yield to Maturity	3.93	3.38
Average Quality	AAA	AA/A
Average Coupon	3.6%	3.1%

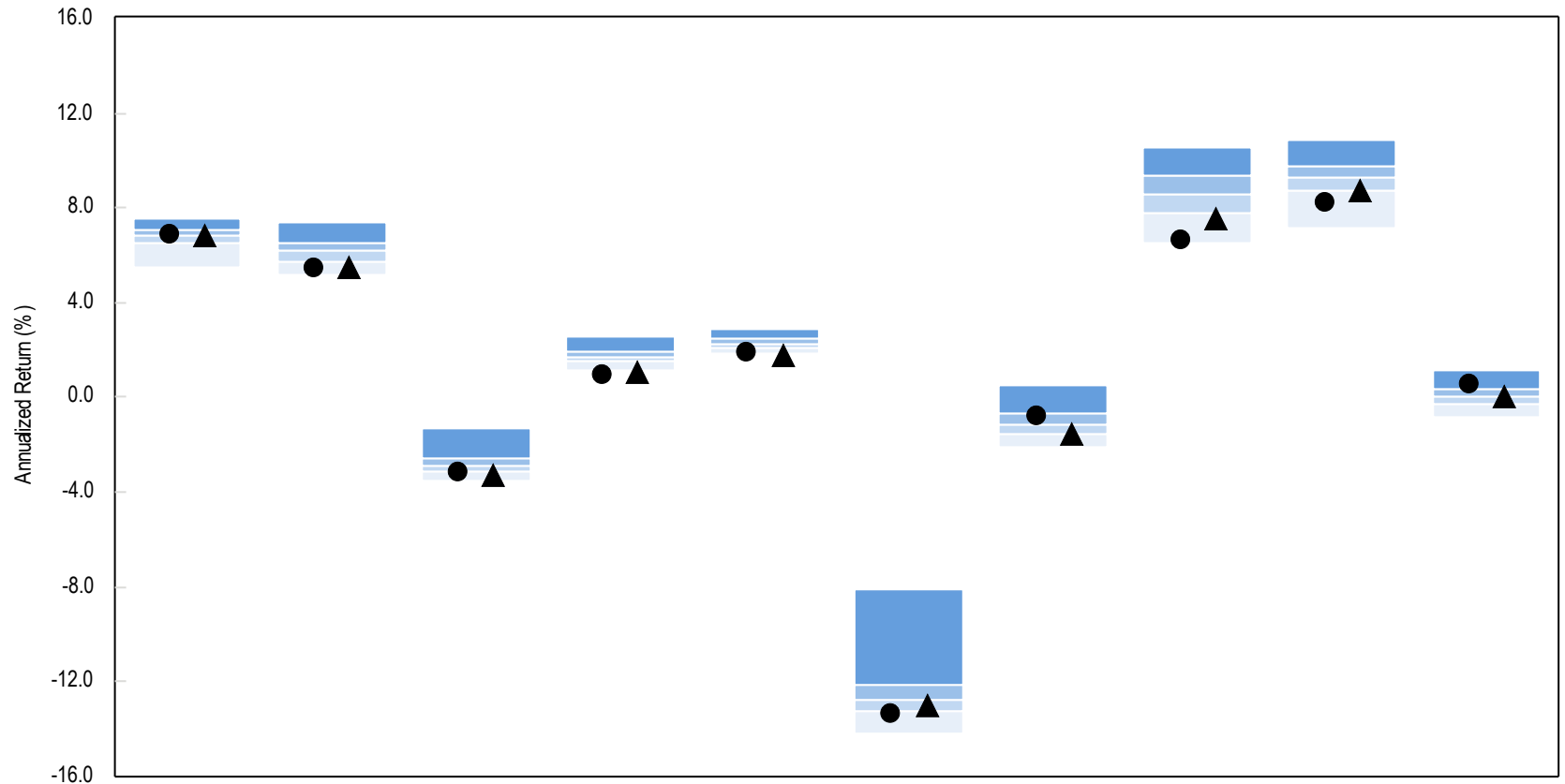


Duration and Quality distributions exclude cash.

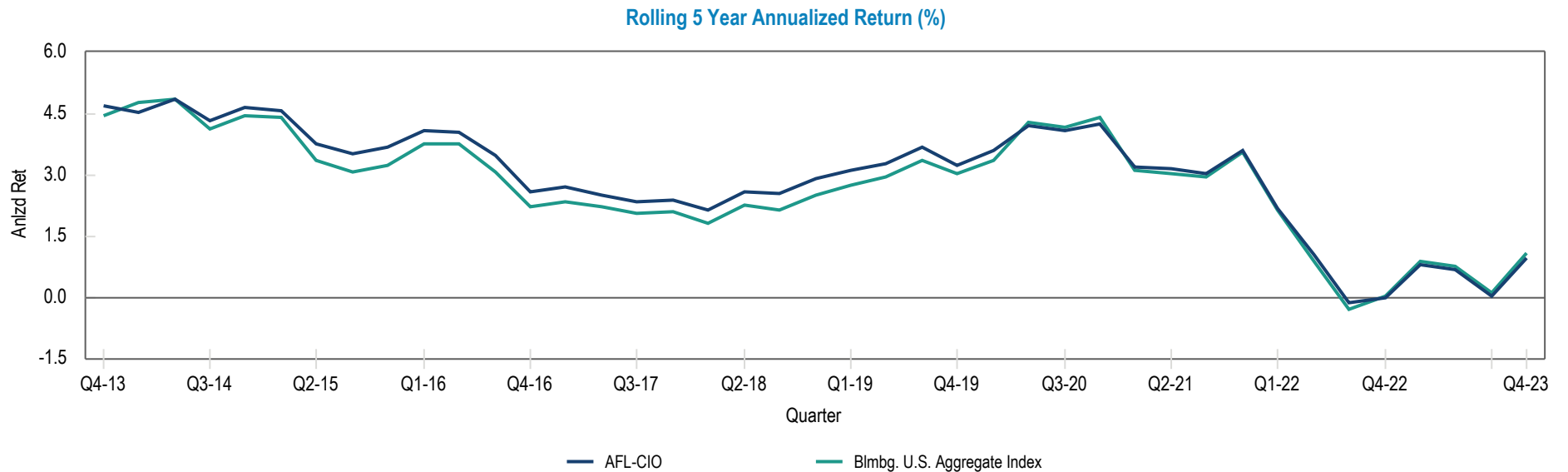
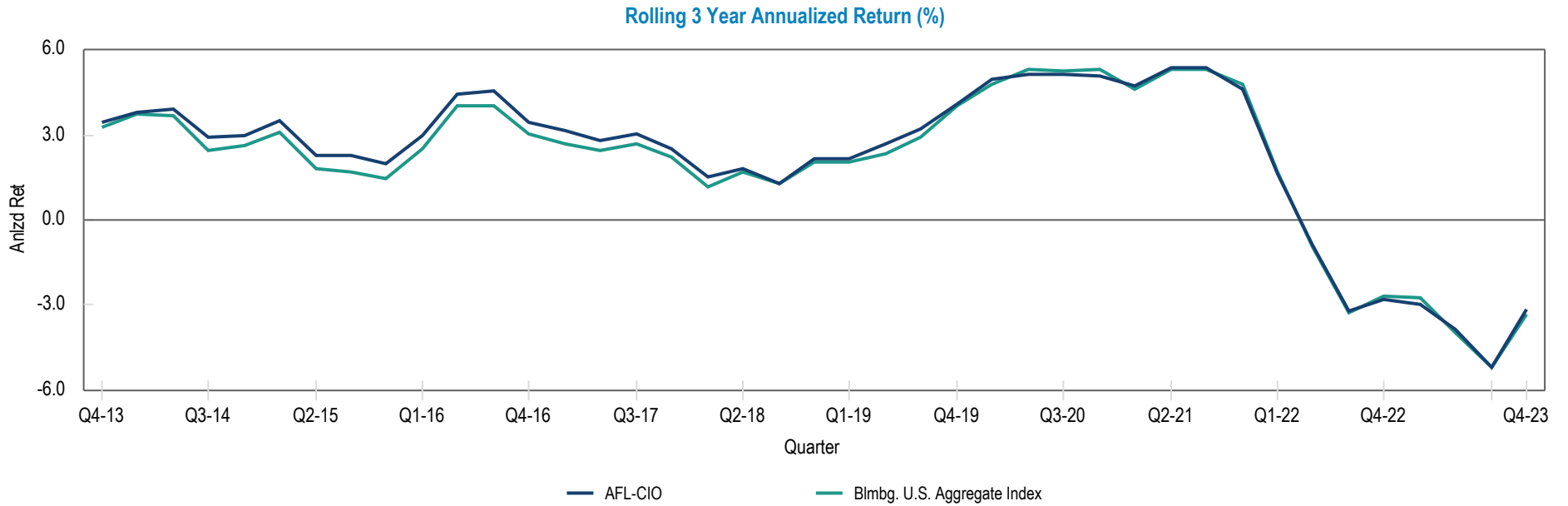
AFL-CIO
 Manager Performance Comparisons (Gross of Fees)

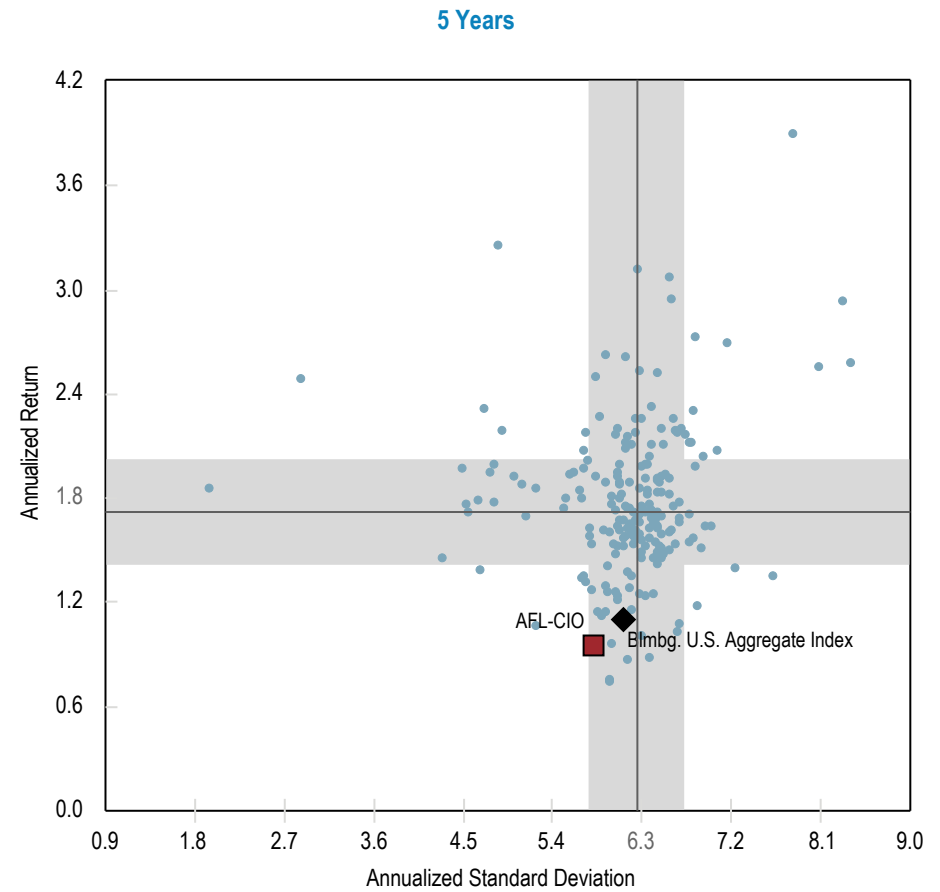
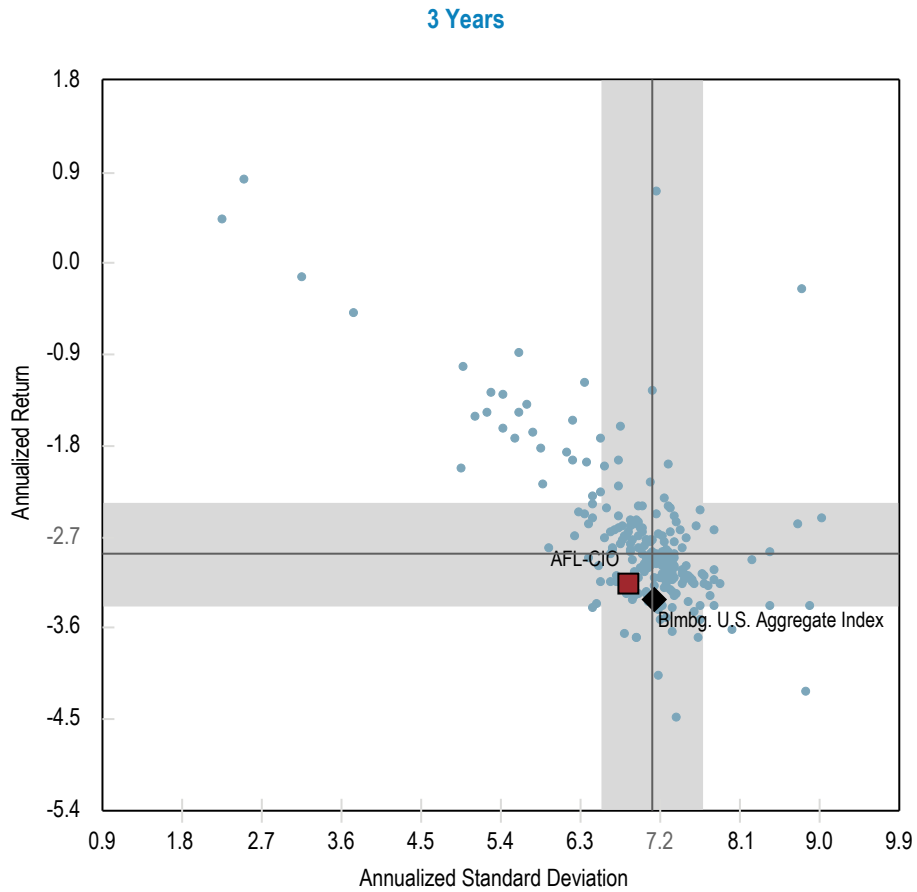
Contra Costa County Employees' Retirement Association
 Period Ending: December 31, 2023

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	6.90 (46)	5.51 (86)	-3.15 (80)	0.95 (98)	1.93 (92)	-13.27 (77)	-0.73 (32)	6.65 (95)	8.25 (86)	0.59 (14)
▲ Blmbg. U.S. Aggregate Index	6.82 (56)	5.53 (85)	-3.31 (89)	1.10 (96)	1.81 (97)	-13.01 (65)	-1.55 (77)	7.51 (84)	8.72 (77)	0.01 (54)
5th Percentile	7.51	7.42	-1.30	2.57	2.88	-8.12	0.49	10.57	10.85	1.14
1st Quartile	7.10	6.55	-2.56	1.97	2.49	-12.16	-0.64	9.35	9.75	0.35
Median	6.86	6.17	-2.87	1.72	2.29	-12.80	-1.12	8.56	9.29	0.03
3rd Quartile	6.50	5.76	-3.12	1.54	2.12	-13.26	-1.52	7.77	8.75	-0.27
95th Percentile	5.50	5.20	-3.50	1.14	1.84	-14.18	-2.11	6.53	7.14	-0.87
Population	226	226	220	211	194	255	263	266	272	278





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
AFL-CIO	-3.2	6.8	-0.8
Blmbg. U.S. Aggregate Index	-3.3	7.1	-0.7
eV US Core Fixed Inc Median	-2.9	7.1	-0.7
Population	220	220	220

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
AFL-CIO	1.0	5.8	-0.1
Blmbg. U.S. Aggregate Index	1.1	6.1	-0.1
eV US Core Fixed Inc Median	1.7	6.2	0.0
Population	211	211	211

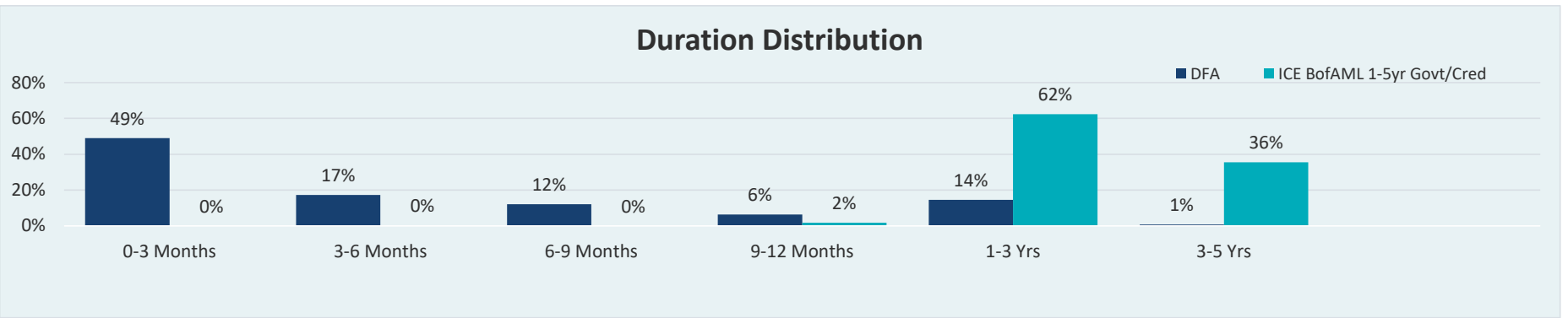
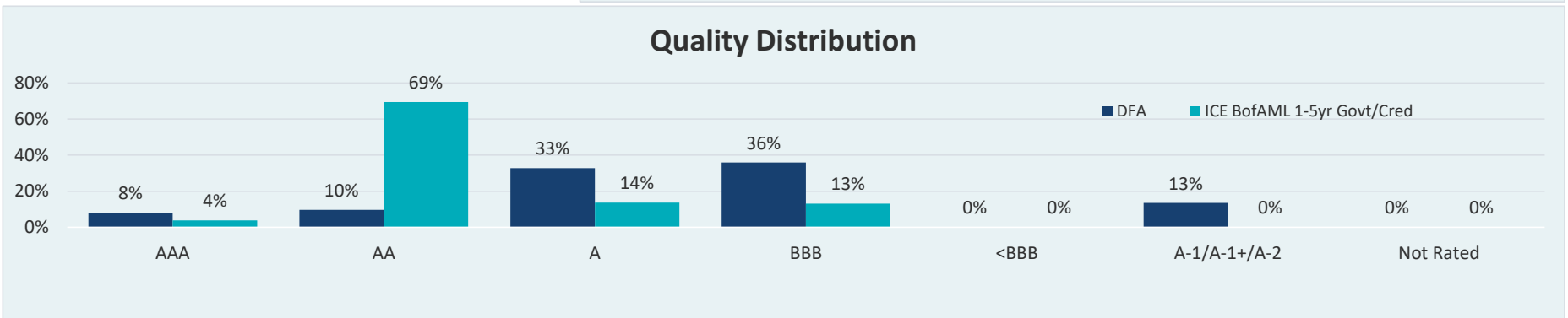
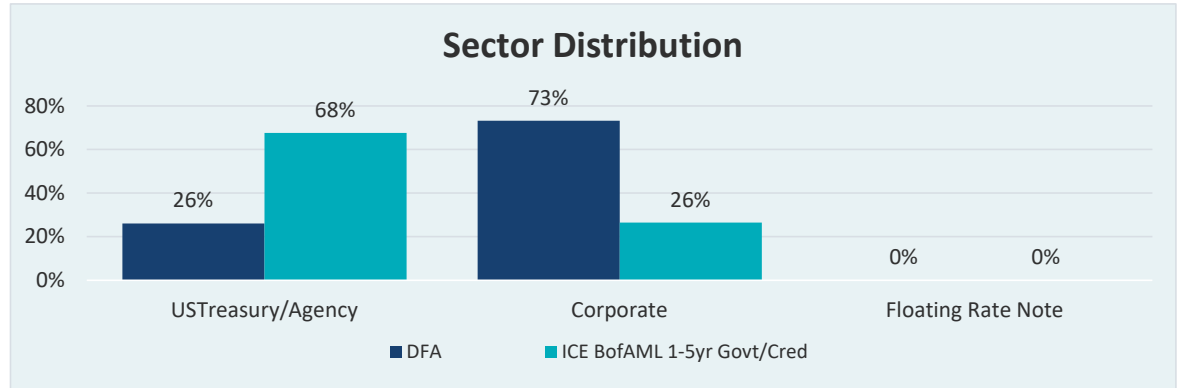
Liquidity Managers

DFA Short Credit
 Manager Portfolio Overview

Contra Costa County Employees' Retirement Association
 Period Ending: December 31, 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	0.47	2.56
Yield to Maturity	5.62	4.47
Average Quality	A	Aa2
Average Coupon	3.21%	3.08%

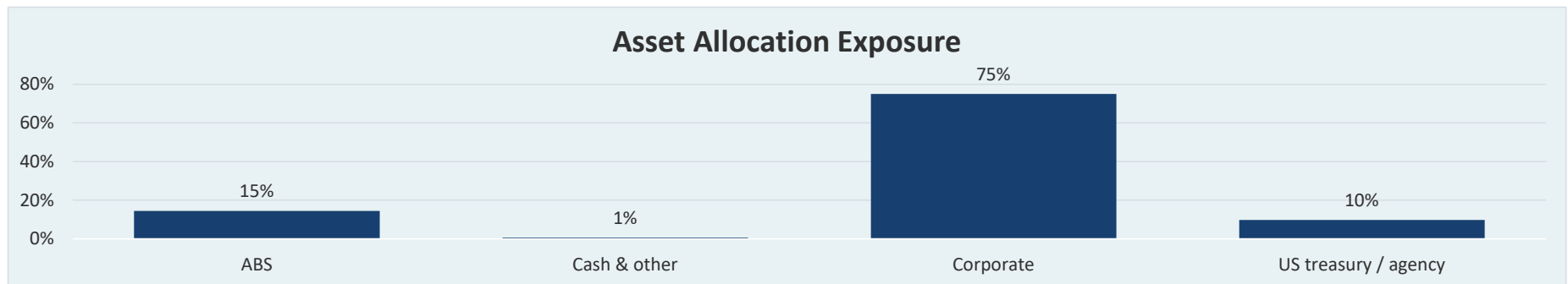
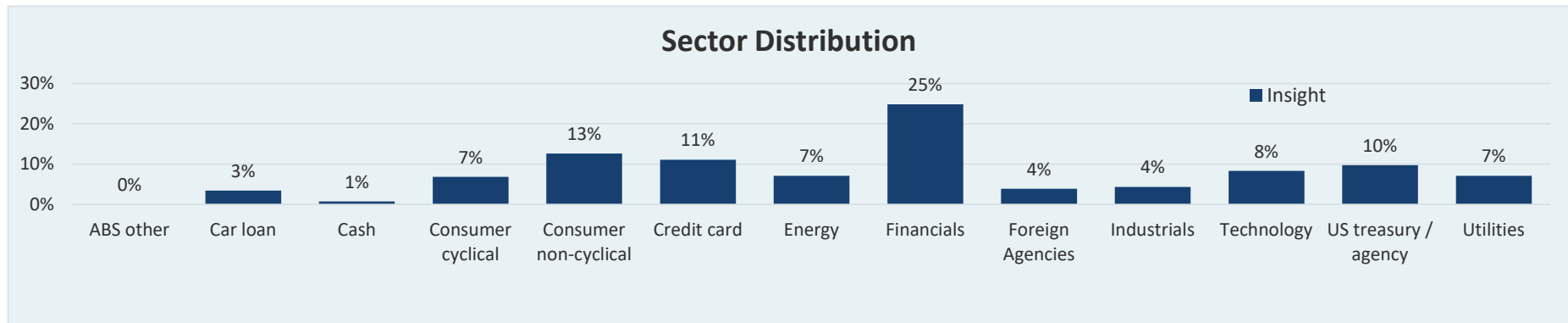
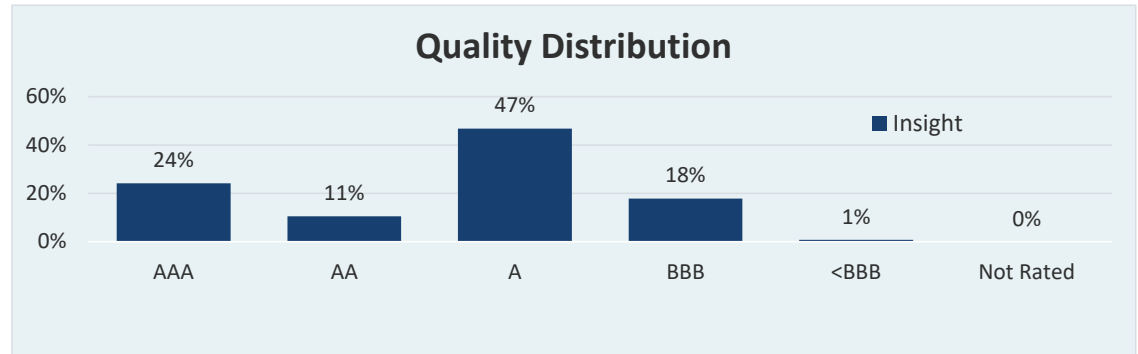


Insight Short Duration Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: December 31, 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	BBgBarc 1-3yr Govt
Effective Duration	1.20	1.90
Yield to Maturity	0.05	N/A
Average Quality	A+	AAA
Average Coupon	3.43%	1.20%

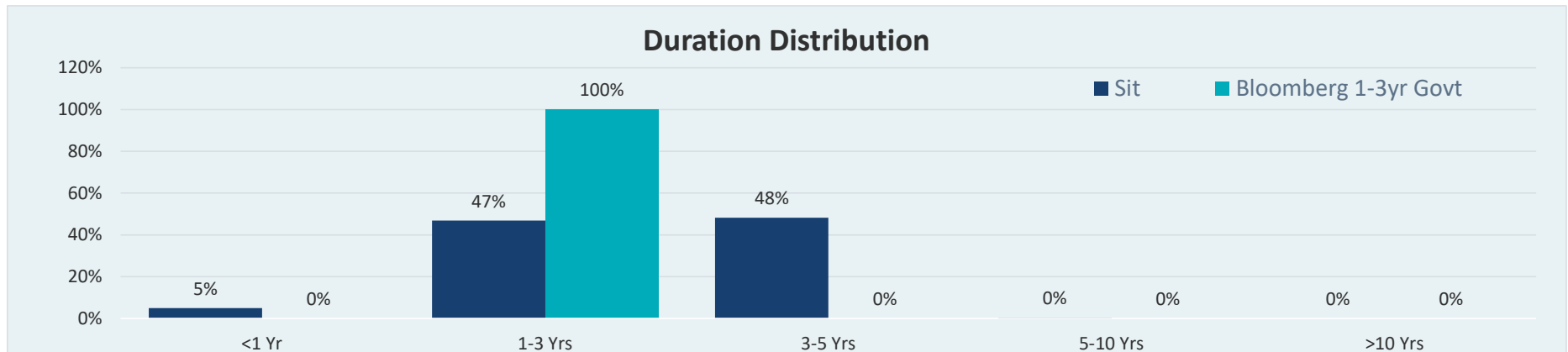
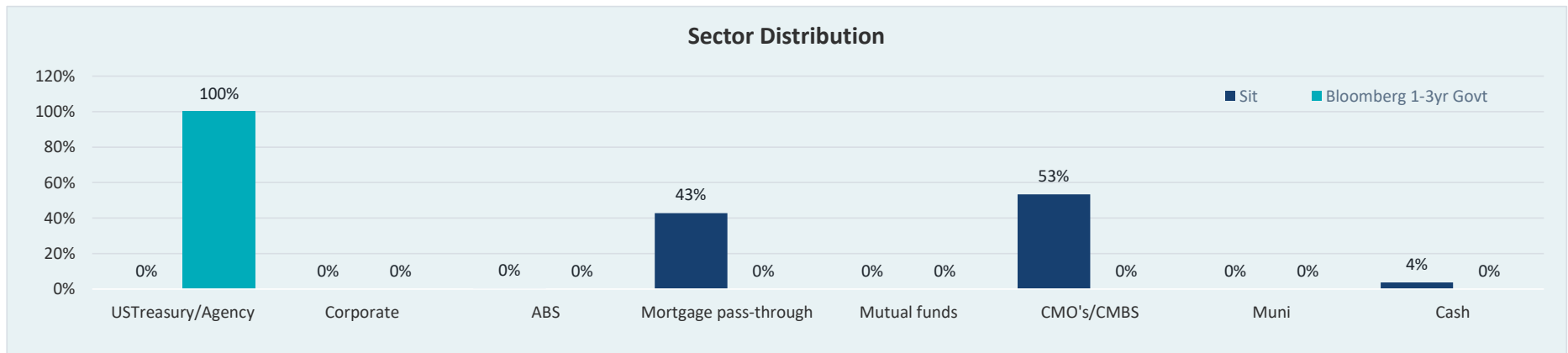
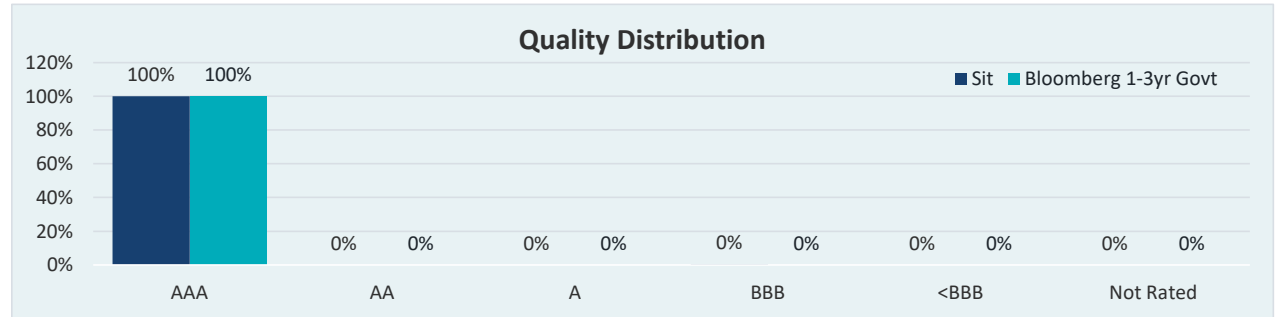


Sit Short Duration Manager Portfolio Overview

Contra Costa County Employees' Retirement Association Period Ending: December 31, 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	BBgBarc 1-3yr Govt
Modified Duration	2.90	1.90
Yield to Maturity	5.70	N/A
Average Quality	AAA	AAA
Average Coupon	5.60%	1.20%



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

Period Ending: December 31, 2023

Data Sources and Methodology

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.

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