

Verus⁷⁷⁷

Meeting Date
08/23/2023
Agenda Item
#5a.



**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**



PERIOD ENDING: JUNE 30, 2023

Investment Performance Review for

Contra Costa County Employees' Retirement Association

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Investment Landscape

TAB I

Investment Performance
Review

TAB II

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

**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**

**3RD QUARTER 2023
Investment Landscape**

Verus business update

Since our last Investment Landscape webinar:

- Verus hired four employees:
 - **Dan Hougard, FSA**, Associate Director | Actuarial Services (Chicago)
 - **Chibueze Odoh**, Public Markets Analyst (Seattle)
 - **Madison Martin**, Performance Analyst (Seattle)
 - **Palmer Pederson**, Performance Analyst (Seattle)
- In addition, we've partnered with Rainier Scholars for a summer internship position. Rainier Scholars is a program that offers a pathway to college graduation for underrepresented communities.
 - **Moses Dagmawi**, Summer Intern (Seattle)

Recent Verus research

Visit: verusinvestments.com/research

Annual research

2023 REAL ASSETS OUTLOOK

In our Outlook last year, we said, “We believe inflation will likely begin falling later in 2022.” And though that turned out to be true, we came to that conclusion because we believed the Fed would choke off the pressures of inflation. Coming into 2023, it appeared as though inflation would continue to retreat lower, but unexpected price increases have complicated the picture. There are now banking instability issues, geopolitics, a softening economy, and a dozen other headline issues weighing on investors’ minds.

We believe the Fed will keep policy tight until inflation returns to their target level. We expect rates to stay higher for longer, which could present challenges and opportunities across private markets which have broadly failed to adjust equity values for the new higher-rate environment.

The Verus 2023 Real Assets Outlook includes insights around the following trends:

- Dislocations in Commercial Real Estate
- Elevated valuations in Infrastructure
- Declining interest in Natural Resources

Topics of interest

PRIVATE REAL ESTATE IN TAFT-HARTLEY PORTFOLIOS

Taft-Hartley pension funds in the United States often make allocations to private real estate with the dual objectives of generating robust returns and supporting union workers by investing in “labor-friendly” real estate strategies. There is occasionally a misconception that investing in labor-friendly real estate strategies involves sacrificing performance.

In this Topic of Interest whitepaper, we examine core real estate manager performance over time using the North American Building Trades Report Card to identify whether a performance difference does in fact exist. We conclude, based on the data, that labor-friendly private real estate performance has been competitive with the broader private real estate universe and that significant return was not sacrificed when investing in labor-friendly strategies during the period examined.

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2nd quarter summary

THE ECONOMIC CLIMATE

- Real GDP increased at a 2.0% rate in Q1 (1.8% growth year-over-year). The slowdown from the prior quarter reflected weaker inventory buildups and slower business investment. An upturn in consumer spending was the greatest support to economic growth, as consumption has ticked along at a steady rate.
- The unemployment rate remained very tight at 3.6% in June. The workforce appears to be experiencing a healthy, and possibly low pain, rebalancing of resources. Many workers are returning to the workforce while fewer job openings are being posted. Both of these effects reduce the mismatch between *workers available* and *available jobs*.

PORTFOLIO IMPACTS

- The U.S. consumer has shown resiliency. Household budgets have been strained by high inflation and a jump in interest rates; however, the boom in wealth over the past decade, fueled by a substantial bull market in stocks and in residential real estate, may provide a cushion in the next downturn. It remains unclear whether the U.S. will face recession in the near-term.
- The Cboe VIX implied volatility index fell to a surprisingly low level, despite broad expectations of recession, regional bank risks, and other not-yet-known consequences of liquidity withdrawal from the financial system. The index fell from 18.7% to 13.6% during the second quarter.

THE INVESTMENT CLIMATE

- The Fed implemented an additional rate hike to a new range of 5.00–5.25%, but longer-term U.S. interest rates remain anchored. This has resulted in the most deeply inverted U.S. yield curve since the early 1980s at -1.06% (defined as 10-year UST yield minus 2-year UST yield).
- Inflation fell further in the U.S., with June CPI coming in at a surprisingly low 3% year-over-year and Core CPI at 4.8%. Weakening energy prices have had a big impact on overall inflation levels, though prices appear to also be softening across many other types of goods and services, suggesting milder inflation is not solely an energy story.

ASSET ALLOCATION ISSUES

- Global equities persisted in their upward trajectory during Q2 (MSCI ACWI +6.2%). International developed markets underperformed domestic equities (S&P 500 +8.7%, MSCI EAFE +3.0%), as did emerging markets (MSCI EM +0.9%). U.S. equities rallied for a third consecutive quarter. A surge in AI-focused hype helped drive an expansion in the valuations of large tech firms.
- Growth stocks (+12.8%) outpaced value (+4.1%) once again, bringing the year-to-date performance differential to +23.9%. Sector-specific drivers, including product launches and upward adjustments to company guidance among Information Technology (+18.6%) mega-caps, drove growth stocks higher. Over recent years, certain style factors have exhibited some of the wildest swings in history.

Equity & credit markets performed strongly during Q2

A variety of risks hang overhead, though markets appear to be expecting a “soft landing”

What drove the market in Q2?

“U.S. inflation cooled in June for the 12th straight month”

HEADLINE CONSUMER PRICE INFLATION (YEAR-OVER-YEAR)

Jan	Feb	Mar	Apr	May	Jun
6.4%	6.0%	5.0%	4.9%	4.1%	3.0%

Article Source: CNN, July 12th, 2023

“Top U.S. banks raise dividends after sailing through Fed stress tests”

KBW REGIONAL BANKING INDEX (MONTHLY RETURN)

Jan	Feb	Mar	Apr	May	June
2.9%	0.5%	-20.6%	-3.6%	-8.7%	7.1%

Article Source: Reuters, June 30th, 2023

“This classic recession indicator just hit its lowest level since 1981”

10-YEAR U.S. TREASURY YIELD MINUS 2-YEAR U.S. TREASURY YIELD

Jan	Feb	Mar	Apr	May	Jun
-0.68%	-0.79%	-0.64%	-0.56%	-0.56%	-0.89%

Article Source: CNBC, July 7th, 2023

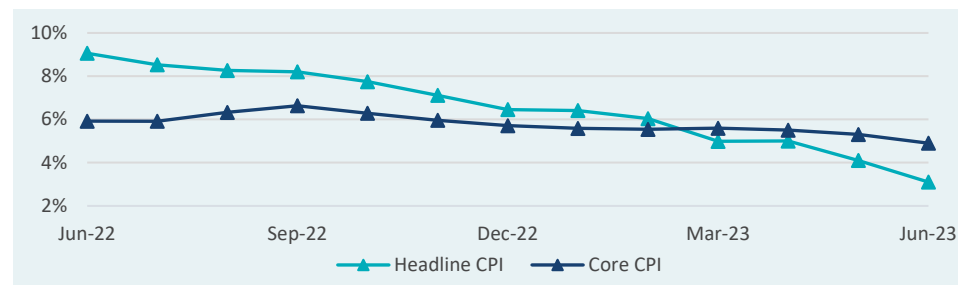
“Fed pauses interest rate hikes, signals two more increases likely...”

FED FUNDS TARGET RATE – UPPER BOUND

Q1 22	Q2 22	Q3 22	Q4 22	Q1 23	Q2 23
0.50%	1.75%	3.25%	4.50%	5.00%	5.25%

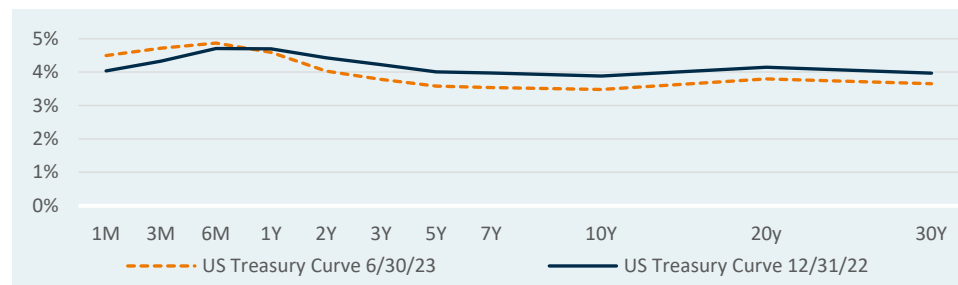
Article Source: USA Today, June 14th, 2023

U.S. HEADLINE VS. CORE INFLATION (YEAR-OVER-YEAR)



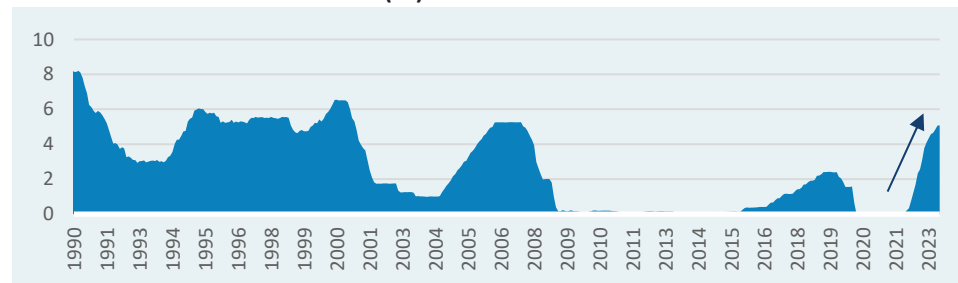
Source: FRED, as of 6/30/23

DEEP U.S. YIELD CURVE INVERSION



Source: Bloomberg, as of 6/30/23

EFFECTIVE FED FUNDS RATE (%)



Source: FRED, as of 6/30/23

Economic environment

U.S. economics summary

- Real GDP increased at a 2.0% rate in the first quarter of 2023 (1.8% growth year-over-year). The slowdown reflected weaker inventory buildups and slower business investment. Despite loftier inflation and higher interest rates, many economic signals are positive and/or improving.
- Inflation fell further in the U.S., with June CPI coming in at a surprisingly low 3% year-over-year and Core CPI at 4.8%. Weaker energy prices have had a large impact on overall inflation levels, though prices appear to also be softening across many other types of goods and services, suggesting milder inflation is not solely an energy story.
- The U.S. consumer has shown resiliency, with spending moving along at a moderate pace—at 2.1% year-over-year in May. These consumption patterns will be worth watching, as spending is the largest driver of economic growth.
- The Fed released its annual banking stress test results, which was applicable to the “too big to fail” class of banks. Results helped ease banking concerns as all 23 banks passed.
- The unemployment rate remained very tight at 3.6% in June. The workforce appears to be experiencing a healthy, and possibly low pain, rebalancing of resources. Many workers are returning to the workforce at the same time that fewer job openings are posted. Both of these effects reduce the mismatch between the total number of workers available relative to available jobs.
- Consumer sentiment improved slightly during the second quarter by most measures but remains pessimistic. The University of Michigan Consumer Sentiment survey showed that the outlook has improved due to factors such as the debt ceiling resolution and falling inflation.

	Most Recent	12 Months Prior
Real GDP (YoY)	1.8% 3/31/23	3.7% 3/31/22
Inflation (CPI YoY, Core)	4.8% 6/30/23	8.9% 6/30/22
Expected Inflation (5yr-5yr forward)	2.3% 6/30/23	2.1% 6/30/22
Fed Funds Target Range	5.00–5.25% 6/30/23	1.50–1.75% 6/30/22
10-Year Rate	3.81% 6/30/23	2.98% 6/30/22
U-3 Unemployment	3.6% 6/30/23	3.6% 6/30/22
U-6 Unemployment	6.9% 6/30/23	6.7% 6/30/22

GDP growth

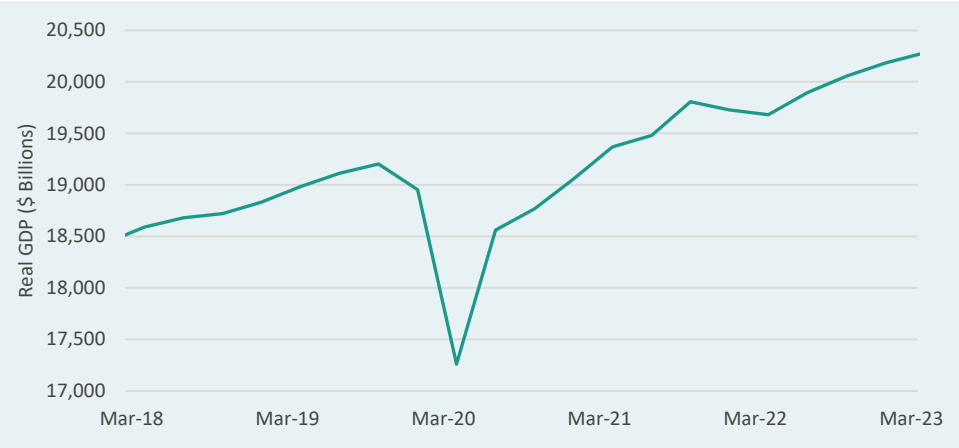
Real GDP increased at a 2.0% rate in the first quarter of 2023 (1.8% growth year-over-year). The slowdown from the prior quarter reflected weaker inventory buildups and slower business investment. An upturn in consumer spending was the greatest support to economic growth, as consumption has ticked along at a steady rate despite higher costs of borrowing. Second quarter GDP growth is expected to be 2.3%, according to the Atlanta Fed GDPNow forecast, as of July 10th.

Growth varied across industries, with service-producing industries producing 2.6% growth, government-related growing 2.7%, and goods-producing industry growth falling by -0.7%.

The economy has increasingly shown signs of resilience, casting doubt on whether a recession is imminent. Markets seem to be interpreting this resilience as a negative development, due to implications for even tighter monetary policy and a more aggressive Federal Reserve in the fight against inflation. This *bad news is good news* dynamic was illustrated on July 6th when ADP’s National Employment Report indicated that 497,000 private sector jobs were added in June—double the expected number. This strong report sent bond yields higher and equity markets lower.

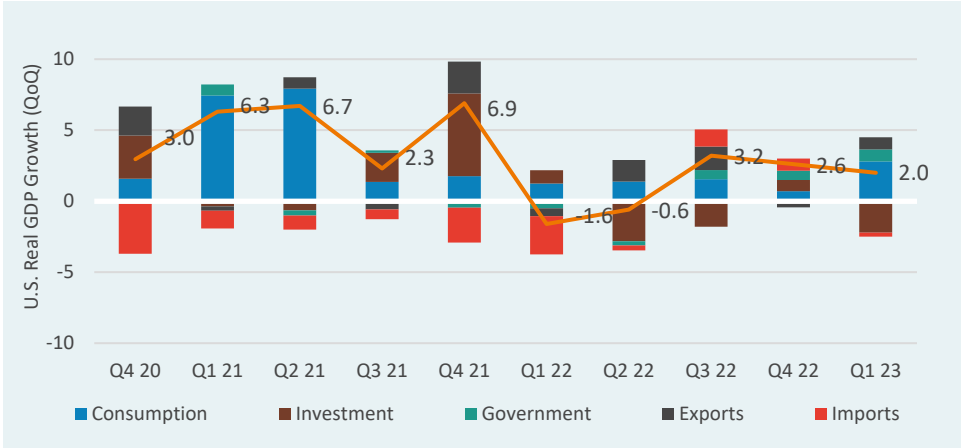
The U.S. economy continues to show resilience despite aggressive monetary tightening & low consumer confidence

U.S. REAL GROSS DOMESTIC PRODUCT



Source: FRED, as of 3/31/23

U.S. REAL GDP COMPONENTS (QOQ)



Source: FRED, as of 3/31/23

Inflation

Inflation has continued to move lower in the U.S., with June CPI coming in at a surprisingly low 3% year-over-year and Core CPI (ex-food & energy) at 4.8%. Weaker energy prices have had a significant impact on overall inflation levels, as well as *base effects* as larger price moves of 2022 begin to fall out of the official twelve-month inflation calculation. In recent months, prices appear to also be softening across many other types of goods and services, suggesting milder inflation is not solely an energy story. Inflation concerns are now centered on core inflation (ex-food & energy) which remains stubbornly high and has shown fewer signs of abating.

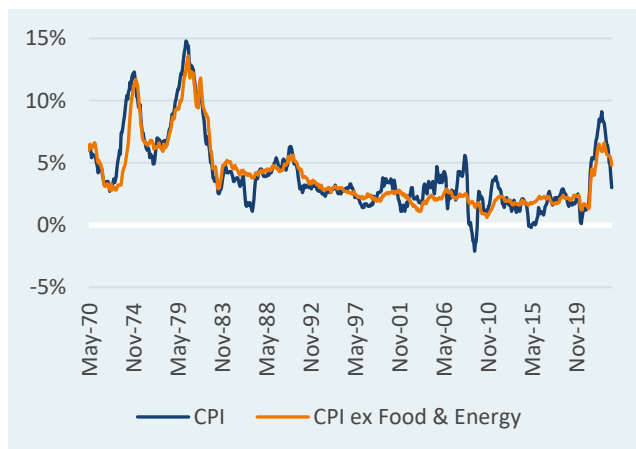
rising faster than wages which contributed to an environment where real household incomes were falling (wages not keeping up with goods and services prices). Recently this trend has reversed. This may lead to an environment in which households are benefiting from inflation as wages rise faster than inflation in the prices of goods and services.

In past editions of this document, we predicted that inflation (CPI) was very likely to fall to around 4% in Q2 for technical reasons related to the twelve-month window with which inflation is calculated. These effects have played out as expected.

U.S. inflation continues to fall, though persistent monthly core inflation (ex-food & energy) is a concern

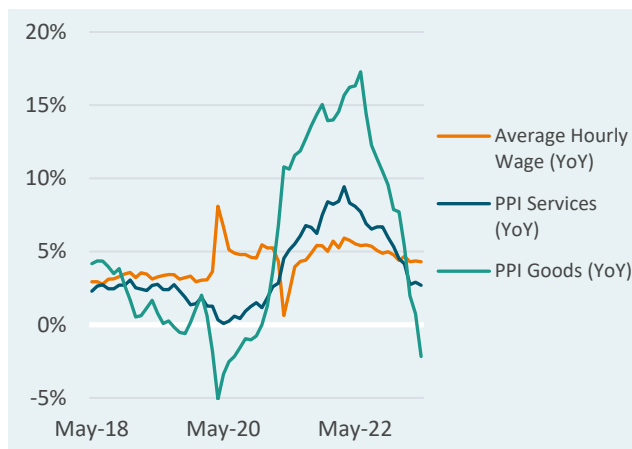
Earlier in the U.S. inflationary cycle business input costs were

U.S. CPI (YOY)



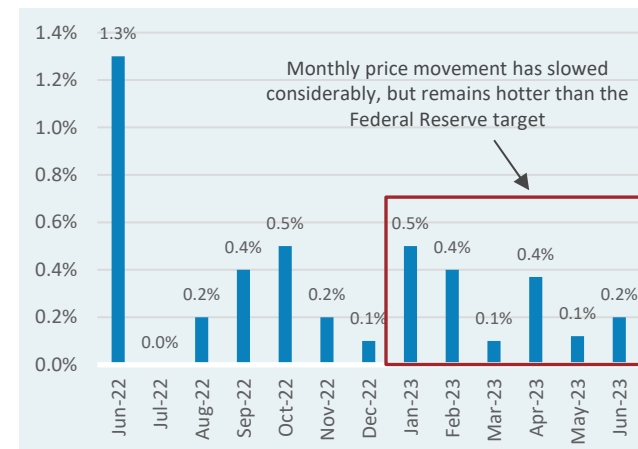
Source: BLS, as of 6/30/23

HIGHER PRICES MAY NOW BENEFIT CONSUMERS



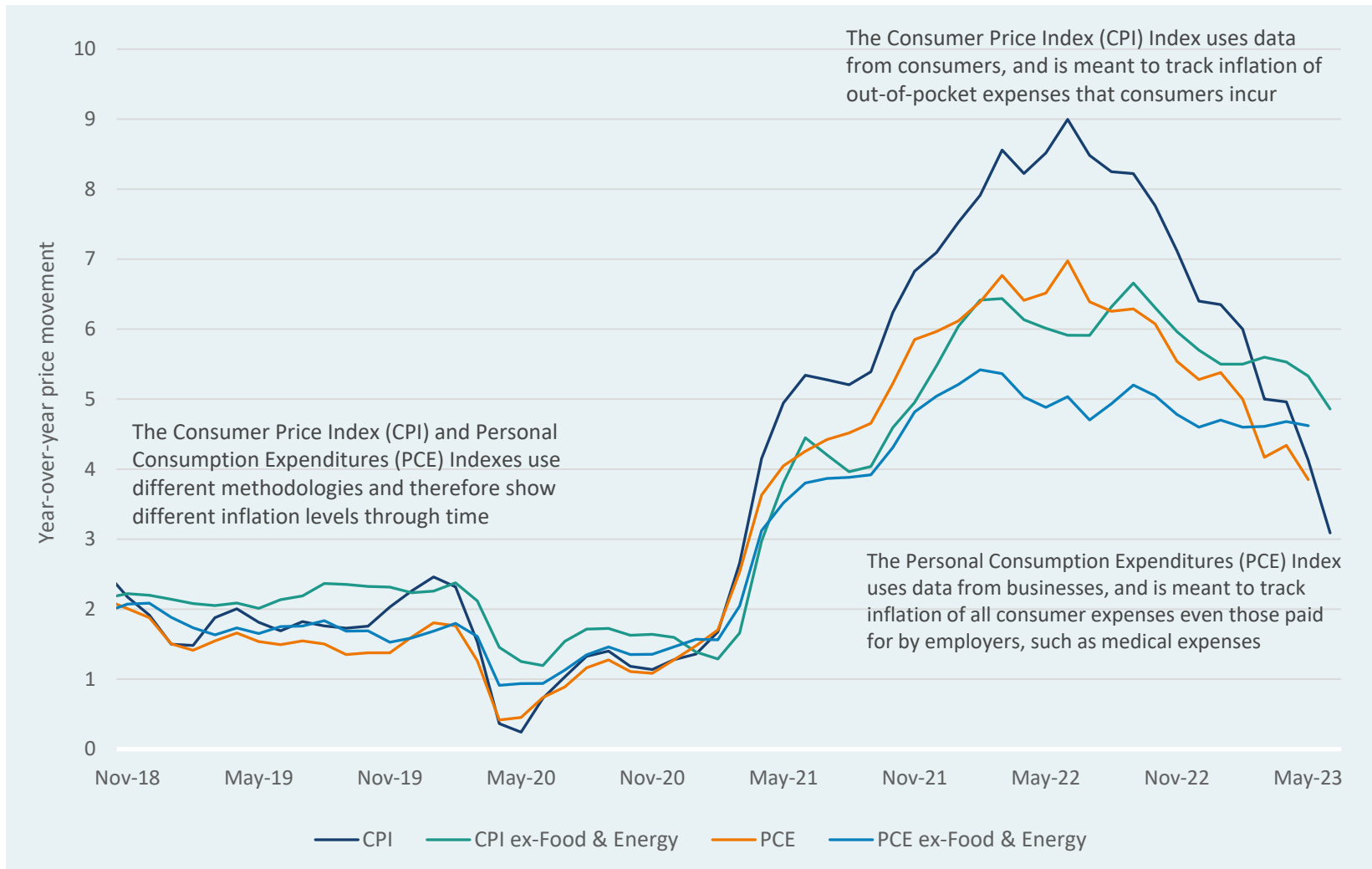
Source: FRED, BLS, as of 5/31/23

MONTHLY PRICE MOVEMENT



Source: BLS, as of 6/30/23

How are inflation conditions evolving?



U.S. inflation continues to fall, though persistent monthly core inflation (ex-food & energy) is a concern

Source: FRED, Verus, PCE data as of 5/31/23, CPI data as of 6/30/23

Labor market

The unemployment rate remained very tight at 3.6% in June, despite far higher interest rates, liquidity withdrawal from the Federal Reserve, and concerns of a possible recession.

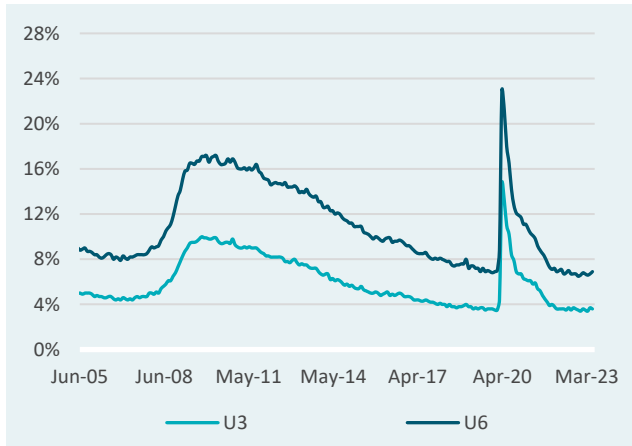
Labor participation rates further recovered over the quarter as many workers who had left the labor force during the pandemic are once again seeking employment. This recovery has been highly concentrated in the core age cohort (25-54 years). In fact, the labor participation rate of this age group has surpassed the pre-pandemic level. Workers aged 55 and older have overall not been returning to the workforce. Participation of these workers has actually declined slightly

over the past year.

Overall, the workforce appears to be experiencing a healthy, and possibly relatively low pain, rebalancing of resources. Many workers are returning to the workforce at the same time that fewer job openings are posted. Both of those effects reduce the mismatch between the number of *workers available* and the *available jobs*. These unique dynamics could allow for a reduction in labor market tightness without a major cycle of layoffs, while potentially also helping ease inflation pressure if a looser labor market helps dampen wage growth.

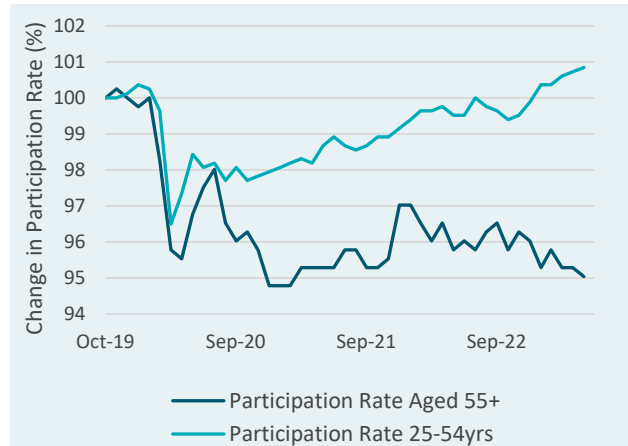
Many workers who left the labor force during the pandemic are returning to the job market, helping to rebalance labor conditions

U.S. UNEMPLOYMENT



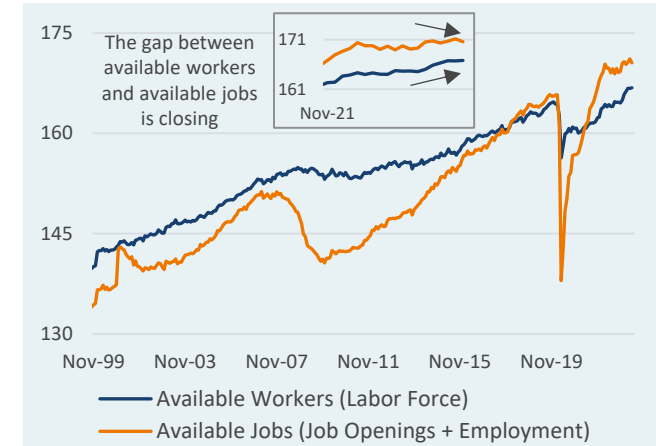
Source: FRED, as of 6/30/23

LABOR FORCE PARTICIPATION RATE



Source: FRED, as of 6/30/23

WORKERS AVAILABLE VS. AVAILABLE JOBS



Source: BLS, as of 5/31/23

The consumer

The U.S. consumer has shown resiliency, with real (inflation-adjusted) personal consumption expenditures moving along at a moderate pace—at 2.1% year-over-year in May. These consumption patterns will be worth watching, as spending is the largest driver of economic growth and is likely the greatest determinant of whether recession occurs in the near-term.

Personal savings rates remain depressed, but this does not seem to be resulting in stronger spending behavior. We suspect lower savings rates are at least partly a product of

high inflation and falling real (inflation-adjusted) incomes.

Household budgets have come under strain due to high inflation in recent years and a sharp increase in interest rates which impacted borrowing costs. However, it is important to contrast this with the fact that Americans have experienced a boom in wealth and prosperity over the past decade, fueled by substantial bull markets in stocks and in residential real estate, among other assets. This wealth may serve as somewhat of a unique buffer against economic weakness.

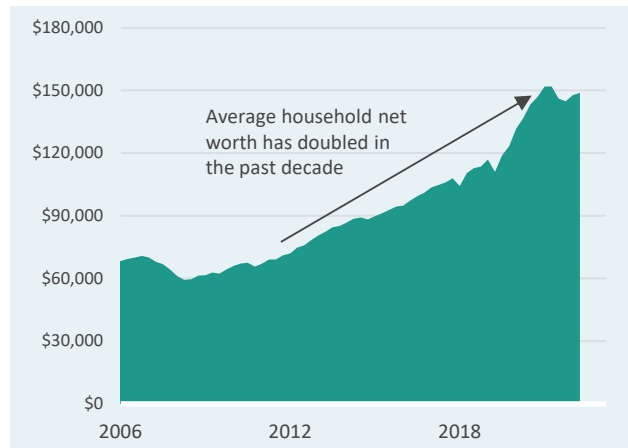
The vast wealth created over the past decade may serve as a unique buffer against economic weakness

REAL PERSONAL SPENDING



Source: FRED, as of 5/31/23

AVERAGE HOUSEHOLD NET WORTH



Source: FRED, as of 1/31/23

PERSONAL SAVINGS RATE



Source: FRED, as of 5/31/23

Sentiment

Consumer sentiment improved slightly during the second quarter by most measures but remains pessimistic. The University of Michigan Consumer Sentiment survey showed that the outlook has brightened due to factors such as the debt ceiling resolution and falling inflation.

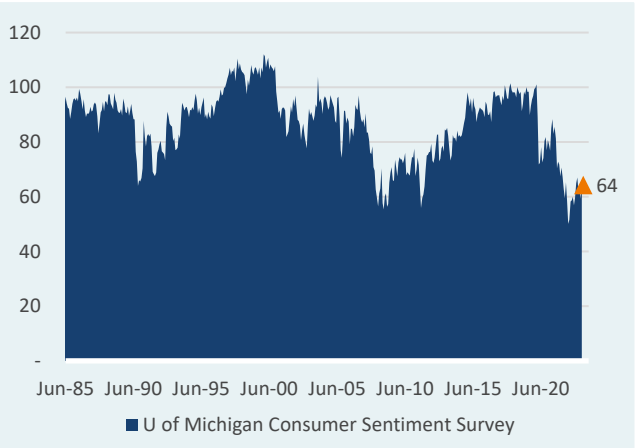
Consumer confidence as indicated by the Conference Board improved materially, although confidence readings reflect levels typically associated with recession within the next year. According to the Conference Board survey, responses suggested a more positive outlook for family finances, better

labor market conditions, and further declines in inflation. Across age cohorts, Americans younger than age 35 expressed the largest gains in optimism.

The NFIB Small Business Optimism index improved slightly but remains at very depressed levels. Difficulties in hiring qualified employees and high inflation were the greatest small business concerns in June. Fewer business owners reported plans to increase prices, perhaps an indication of easing inflation pressure.

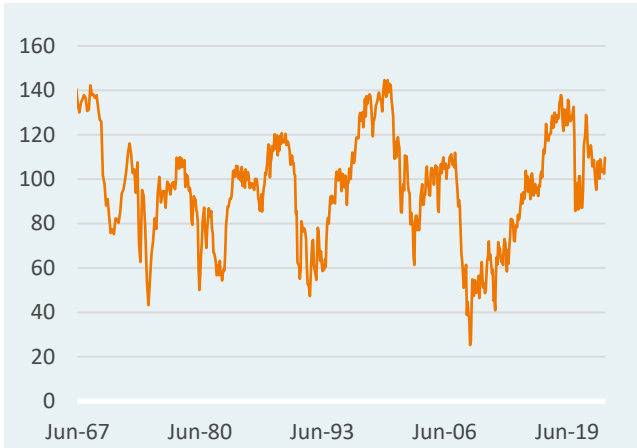
Sentiment improved during Q2 but remains poor by most measures

CONSUMER SENTIMENT



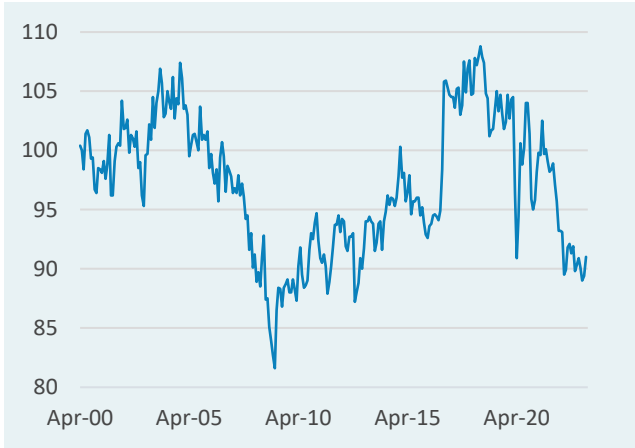
Source: University of Michigan, as of 6/30/23

CONFERENCE BOARD CONSUMER CONFIDENCE



Source: Conference Board, as of 6/30/23

NFIB SMALL BUSINESS SENTIMENT



Source: NFIB, as of 6/30/23

Housing

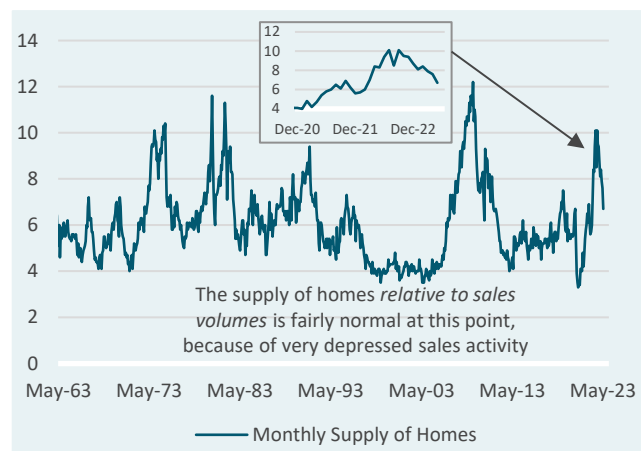
The U.S. housing market continues to face difficult conditions. High mortgage rates and extremely poor affordability have led to the slowest existing home sales activity since the depths of the bear market following the 2008-2009 Housing Crisis. However, conditions are currently very different from that time, as there are few signs of distressed sales. Many sellers are simply refusing to list their homes rather than selling at lower prices—effectively reducing available inventory. Additionally, many potential sellers with very low mortgage interest rates are choosing not to list their homes due to the high financial costs of giving up their low mortgage rate. These dynamics

have contributed to very low housing supply, effectively providing an ongoing support to higher home values.

Together, very low home inventories and weak sales activity have resulted in a fairly normal supply of homes *relative to demand*. It remains to be seen whether the market will experience a cooling and leveling off in the near-term, or whether price depreciation will need to occur to rebalance the market and incentivize potential buyers to make a purchase.

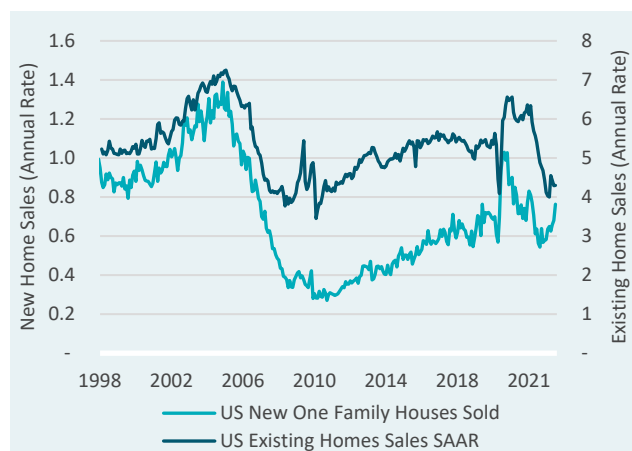
Home sales have slowed to a crawl as affordability is poor, and potential sellers don't want to lose their low interest rates

HOUSING SUPPLY



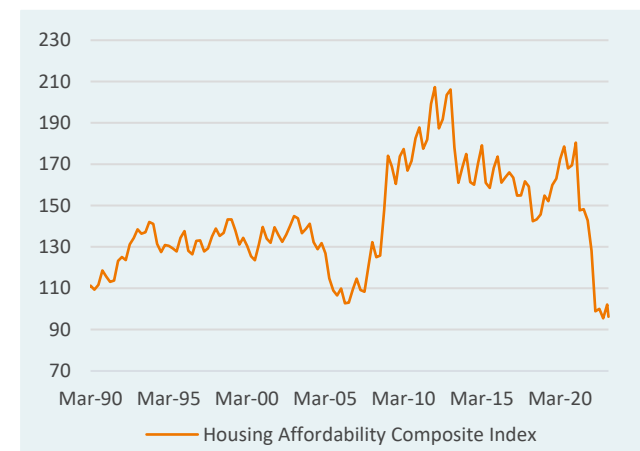
Source: FRED, as of 5/31/23

HOME SALES: NEW & EXISTING (MILLIONS)



Source: FRED, as of 5/31/23

HOUSING AFFORDABILITY



Source: FRED, as of 4/30/23

International economics summary

- Developed-economy growth has slowed materially. Many countries faced heavy risks, including energy crises, inflation uncertainty, contracting government spending, and higher interest rates. However, many areas have fared better than initially feared, helping to boost the performance of international equities. The IMF forecasts a pronounced slowing of growth in developed economies from 2.7% in 2022 to 1.3% in 2023, and a relatively unchanged emerging market growth rate from 4.0% to 3.9%.
- Unlike the Federal Reserve’s recent pause, many central banks have opted for more rate hikes amid backdrops of relative economic strength and persistent inflation. In June, the Bank of England voted 7-2 for a +50bps increase while the European Central Bank and Bank of Canada hiked +25bps. The ECB also raised core inflation projections to 5.4% through year-end and

lowered GDP growth to 0.9% for the year.

- On June 16th, the Bank of Japan announced that they would keep their low-rate policy unchanged. The dovish stance, including expectations for cooling inflation, was negative for the yen. Following the announcement, the yen weakened through month-end to finish -2.5% lower against the dollar.
- Inflation fell further across developed countries and has dropped surprisingly quickly in the emerging markets. China now faces a 0% inflation rate and risks of deflation, while inflation in Brazil has fallen from over 11% in late 2022 to below 4% in May. Further declines in prices could create new market risks as deflation has serious economic implications, especially in heavily debt-burdened nations.

Area	GDP (Real, YoY)	Inflation (CPI, YoY)	Unemployment
United States	1.8% 3/31/23	3.0% 6/30/23	3.6% 6/30/23
Eurozone	1.0% 3/31/23	5.5% 6/30/23	6.5% 5/31/23
Japan	1.3% 3/31/23	3.2% 5/31/23	2.6% 5/31/23
BRICS Nations	4.9% 3/31/23	4.2% 3/31/23	4.8% 12/31/22
Brazil	4.0% 3/31/23	3.9% 5/31/23	8.3% 5/31/23
Russia	(1.8%) 3/31/23	2.5% 5/31/23	3.2% 5/31/23
India	6.1% 3/31/23	4.8% 6/30/23	7.7% 5/31/23
China	4.5% 3/31/23	0.0% 6/30/23	5.2% 5/31/23

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.

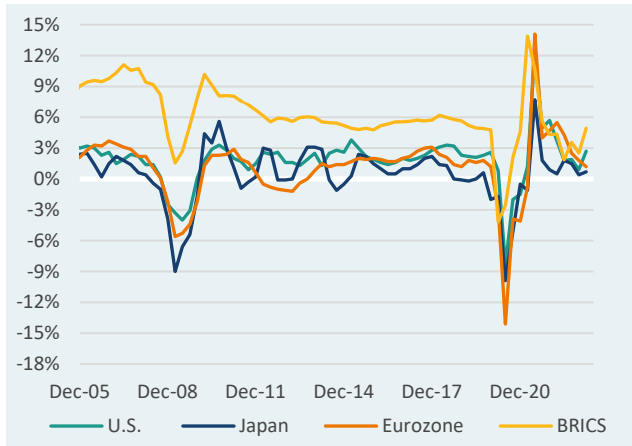
International economics

Developed economies have suffered a material slowdown in growth, though not as dramatic as economists had feared at the beginning of the year. All twenty countries of the Eurozone have now entered a technical recession, on the back of a significant contraction in government spending as well as central bank rate hikes. Meanwhile, as many developed economies cope with stagnating growth, emerging economies have fared better overall, despite the more moderate growth rate of China. The IMF forecasts a pronounced slowing of growth in developed economies from 2.7% in 2022 to 1.3% in 2023, and a relatively unchanged rate of growth of emerging

markets from 4.0% to 3.9%.

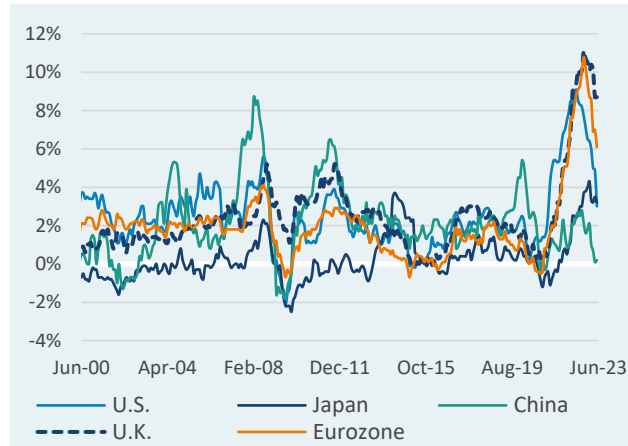
Inflation has subsided in many developed countries and dropped surprisingly quickly across emerging markets. China now faces a 0% inflation rate and risks of deflation, while inflation in Brazil has fallen from over 11% in late 2022 to below 4% in May. Further declines in prices could create new market risks as deflation has serious economic implications, especially in heavily debt-burdened nations. Deflation creates an environment where debt loads are *growing* on an inflation-adjusted basis.

REAL GDP GROWTH (YOY)



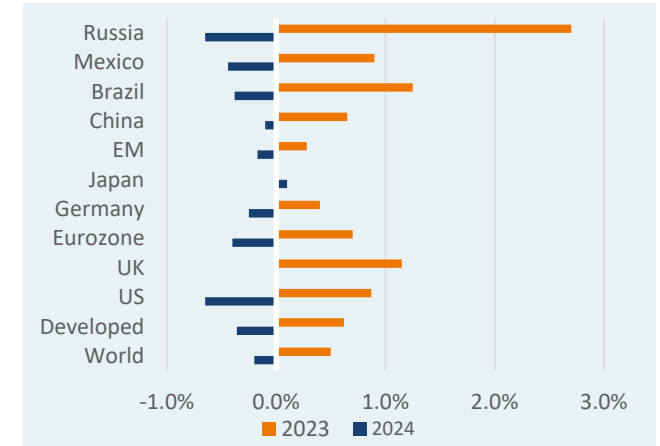
Source: Bloomberg, as of 3/31/23

INFLATION (CPI YOY)



Source: Bloomberg, as of 6/30/23 – or most recent release

GROWTH FORECASTS: CHANGES OVER PAST 6M



Source: Bloomberg median of economist estimates, as of 6/22/23

Fixed income rates & credit

Fixed income environment

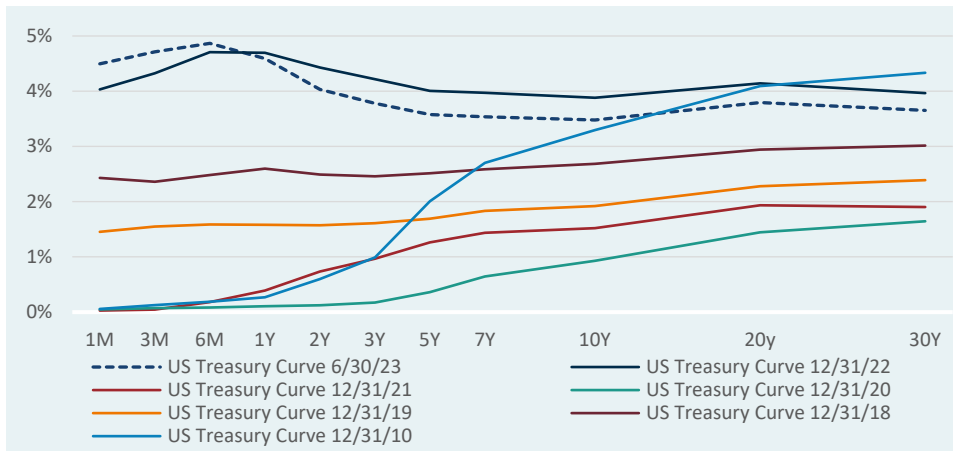
- The 10-year U.S. Treasury yield increased during the quarter from 3.48% to 3.81%, reversing the decline experienced during Q1. Despite an additional rise in short-term interest rates, longer-term interest rates remain anchored. This has resulted in the most deeply inverted yield curve since the early 1980s at -1.06% (10-year Treasury yield minus 2-year Treasury yield).
- The Federal Reserve opted to keep interest rates stable in June, but signaled two more rate hikes were ahead in 2023. Some referred to this messaging as a “hawkish pause”. Despite cooling inflation, the Fed appears concerned about strong ongoing labor market conditions and persistent monthly price rises. Markets are pricing in a high likelihood of a +25bps July hike.
- Historically, equities and bonds have experienced negative correlation (moved in opposite directions through time). In 2022, both equities and bonds suffered losses as the Fed continued tightening monetary policy. Following the failure of SVB, the asset classes seems to have resumed negative correlation behavior.
- During the second quarter, higher quality credit and U.S. Treasuries saw mild losses. Riskier credit performed very well as credit spreads have stayed surprisingly tight. Longer duration investment grade corporate bonds disappointed, returning -0.3%.
- Despite concerns related to the future path of Federal Reserve rate hikes, interest rate volatility declined during the quarter as indicated by the ICE BofA “MOVE” Index, which measures the volatility priced into U.S. Treasury bonds. While inflation has moderated in recent quarters, the market may need to price in additional rate hikes should it remain above the Federal Reserve's target of roughly 2%, which could contribute to further volatility.

	QTD Total Return	1 Year Total Return
Core Fixed Income (Bloomberg U.S. Aggregate)	(0.8%)	(0.9%)
Core Plus Fixed Income (Bloomberg U.S. Universal)	(0.6%)	0.0%
U.S. Treasuries (Bloomberg U.S. Treasury)	(1.4%)	(2.1%)
U.S. High Yield (Bloomberg U.S. Corporate HY)	1.7%	9.1%
Bank Loans (S&P/LSTA Leveraged Loan)	3.1%	10.7%
Emerging Market Debt Local (JPM GBI-EM Global Diversified)	2.5%	11.4%
Emerging Market Debt Hard (JPM EMBI Global Diversified)	2.2%	7.4%
Mortgage-Backed Securities (Bloomberg MBS)	(0.6%)	(1.5%)

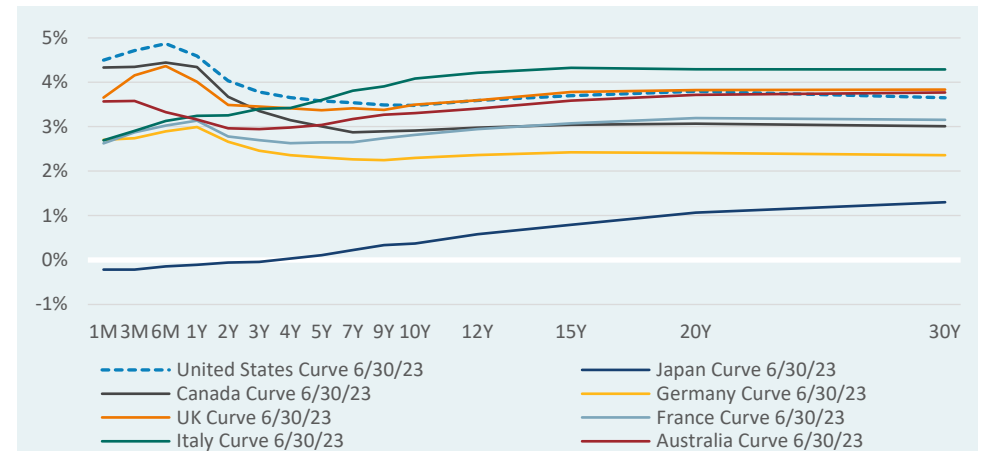
Source: Bloomberg, as of 6/30/23

Yield environment

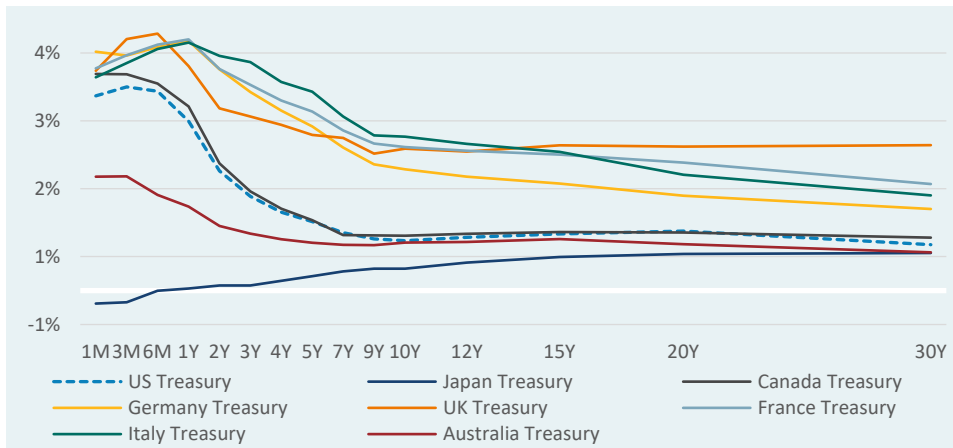
U.S. YIELD CURVE



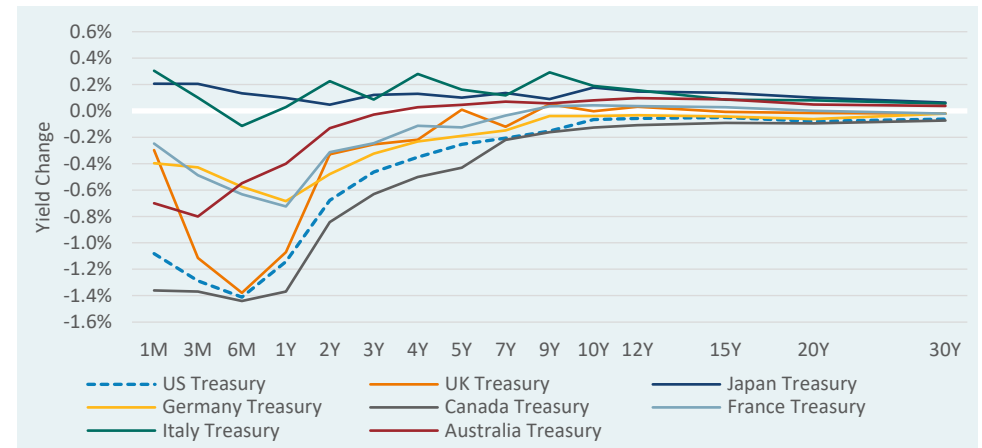
GLOBAL GOVERNMENT YIELD CURVES



YIELD CURVE CHANGES OVER LAST FIVE YEARS



IMPLIED CHANGES OVER NEXT YEAR



Source: Bloomberg, as of 6/30/23

Credit environment

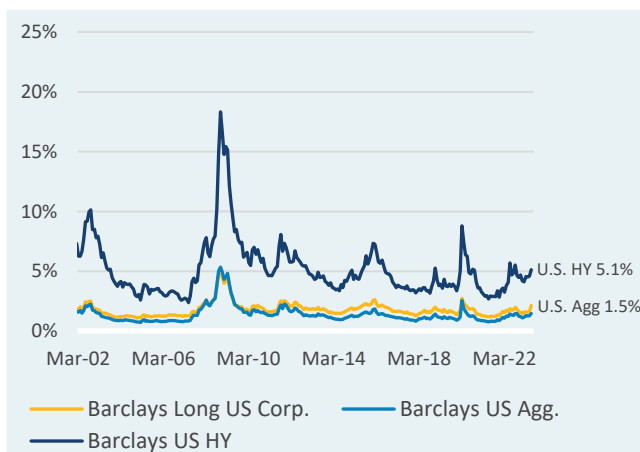
During the second quarter, fixed income markets delivered mixed results with lower-quality credits such as bank loans and high yield bonds outperforming higher-quality credits. Bank loans posted strong returns for the period, delivering 3.1%, followed by high-yield bonds which returned 1.7%. Longer duration investment grade corporate bonds disappointed, returning -0.3%.

Within high-yield bonds, lower quality CCC-rated bonds continued their strong run, outperforming BB- and B-rated bonds. CCC-rated bonds returned 4.7% during the period compared to 1.8% and 0.8% for B-rated and BB-rated bonds, respectively. Bank loans delivered strong returns during the period as investors favored shorter-duration assets given the expectation of interest rate rises. Lower-quality bank loans also

outperformed higher-quality loans, with CCC-rated loans rising 3.3% compared to 2.5% for BB-rated loans.

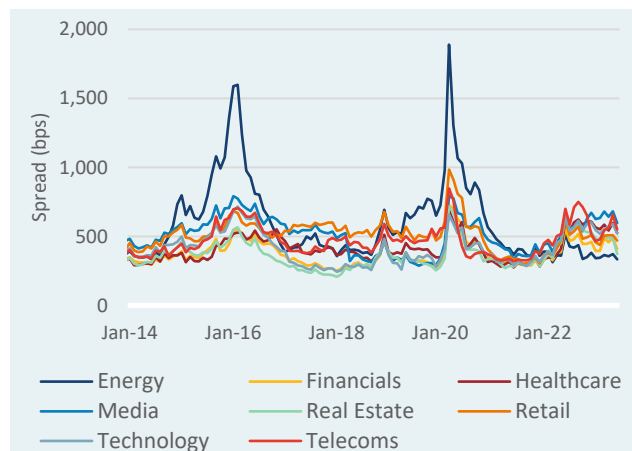
Credit spreads widened during the quarter on fears of an economic slowdown, the effects of higher interest rates, and as heightened credit stress weighed on prices. Lower-quality high-yield bond spreads rose by more than 0.6% during the period to 5.1%, while investment grade spreads increased by roughly 0.2% to 1.5%. Broadly, spreads remain close to their long-term historical averages, which suggests that investors maintain a fairly positive credit outlook. However, if the U.S. economy were to show real signs of weakening, credit spreads would likely move wider.

SPREADS



Source: Barclays, Bloomberg, as of 6/30/23

HIGH YIELD SECTOR SPREADS



Source: Bank of America, as of 6/30/23

CREDIT SPREAD (OAS)

Market	6/30/23	6/30/22
Long U.S. Corp	2.1%	1.9%
U.S. Inv Grade Corp	1.3%	1.6%
U.S. High Yield	5.1%	5.7%
U.S. Bank Loans*	5.4%	5.9%

Source: Barclays, Credit Suisse, Bloomberg, as of 6/30/23

*Discount margin (4-year life)

Default & issuance

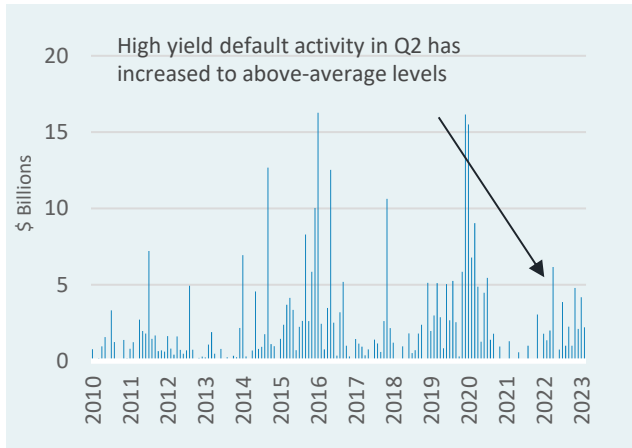
Default activity, while remaining below the long-term trend, increased during the second quarter. Twelve companies defaulted, which were concentrated in the Technology, Industrial, Retail, and Financial-related sectors. A total of \$32.2 billion was affected by default or distressed exchanges during Q2, up from \$20.8 billion in the prior quarter. Notable company defaults included Diebold (Technology), WeWork (Financials), Westco (Industrial) and Bed, Bath & Beyond (Retail).

Past twelve-month default rates for both high-yield bonds and bank loans increased as the cost of borrowing jumped. At the end of the quarter, the trailing one-year default rate of high-yield bonds rose to 2.4%, up from 1.9% in the prior quarter. While defaults have increased, they remain

below the long-term annual average of roughly 3.2% for high-yield bonds. High-yield default recovery rates fell, ending the period at 33.0%, down -11.5% from the previous quarter.

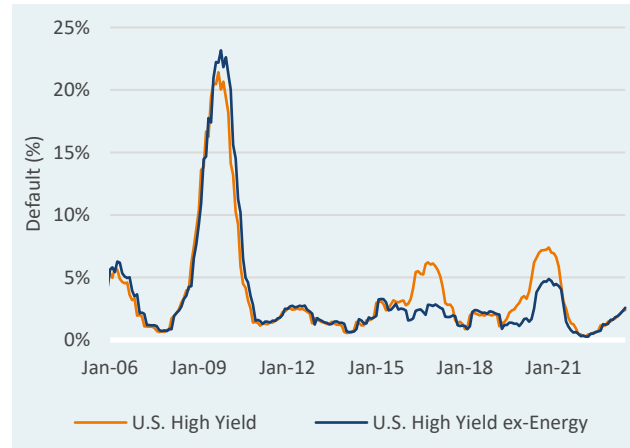
The pace of investment-grade credit issuance slowed, with \$333 billion of issuance compared to \$412 billion in the first quarter. Conditions were different in levered credit, which saw high-yield bond issuance accelerate to \$56 billion—up from \$40.2 billion in Q1. In contrast to prior years, the 2023 level of investment-grade issuance is on track to match 2022, while high-yield issuance is significantly ahead of the pace set during that same period.

U.S. HY MONTHLY DEFAULTS (PAR WEIGHTED)



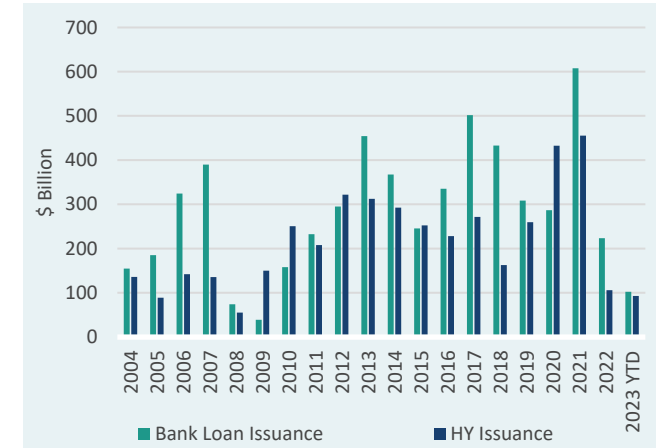
Source: BofA Merrill Lynch, as of 6/30/23

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



Source: BofA Merrill Lynch, as of 6/30/23 – par weighted

DEVELOPED MARKET ISSUANCE (\$ BILLIONS)



Source: BofA Merrill Lynch, all developed markets, as of 6/30/23

Equity

Equity environment

- Global equities persisted in their upward trajectory during Q2 (MSCI ACWI +6.2%). Domestic equities (S&P 500 +8.7%) outperformed both international developed (MSCI EAFE +3.0%) and emerging markets (MSCI EM +0.9%).
- U.S. equities rallied for a third consecutive quarter as mega-cap technology stocks remained top performers. A surge in AI-focused hype helped drive an expansion in the valuations of large tech firms including Nvidia and Apple – which became the first company to exceed \$3 trillion in market cap.
- The effects of currency movements on portfolio performance was mixed during Q2. Varying central bank approaches to inflation have contributed to much uncertainty around the path of the U.S. dollar and therefore heightened volatility for investors with unhedged currency exposure. During the past year, currency movement led to a -2.5% loss for investors with unhedged exposure to international developed equity (MSCI EAFE unhedged +18.8%, MSCI EAFE hedged +21.3%).
- Growth stocks (+12.8%) again outpaced value (+4.1%), bringing the year-to-date performance differential to +23.9%. Over recent years, style factors (ex: small vs large, value vs growth) have exhibited some of the wildest swings in history.
- The Cboe VIX implied volatility index moved to surprisingly low levels, despite broad expectations of recession, ongoing risks of regional bank contagion, and other not-yet-known consequences of central bank liquidity withdrawal from the financial system. The index fell from 18.7% to 13.6% during the second quarter.

	QTD TOTAL RETURN		1 YEAR TOTAL RETURN	
	(unhedged)	(hedged)	(unhedged)	(hedged)
U.S. Large Cap (S&P 500)	8.7%		19.6%	
U.S. Small Cap (Russell 2000)	5.2%		12.3%	
U.S. Equity (Russell 3000)	8.4%		19.0%	
U.S. Large Value (Russell 1000 Value)	4.1%		11.5%	
US Large Growth (Russell 1000 Growth)	12.8%		27.1%	
Global Equity (MSCI ACWI)	6.2%	6.2%	16.5%	17.5%
International Large (MSCI EAFE)	3.0%	5.0%	18.8%	21.3%
Eurozone (EURO STOXX 50)	4.1%	4.5%	36.3%	34.7%
U.K. (FTSE 100)	2.4%	0.0%	14.0%	10.9%
Japan (TOPIX)	4.2%	16.0%	19.4%	31.2%
Emerging Markets (MSCI Emerging Markets)	0.9%	1.6%	1.8%	3.4%

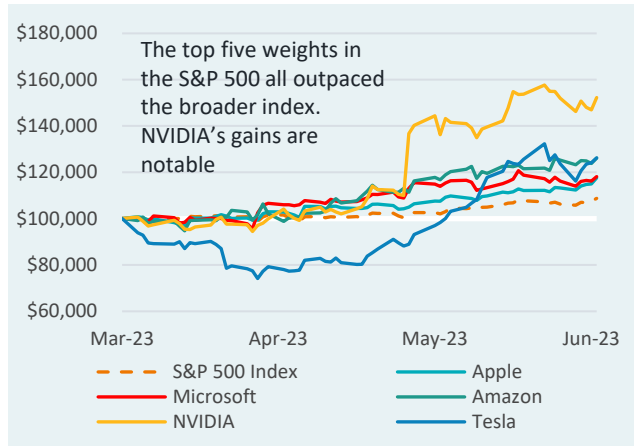
Source: Russell Investments, MSCI, STOXX, FTSE, JPX, as of 6/30/23

Domestic equity

U.S. equities rallied (S&P 500 Index +8.7%) for a third consecutive quarter as mega-cap technology stocks remained top performers. A surge in AI-focused hype helped drive an expansion in the valuations of tech firms such as Apple, which became the first company to exceed \$3 trillion in market cap, and Nvidia, which became the fifth trillion-dollar company in the S&P 500 following its recent ascent. This trend was apparent from the strong overall outperformance of the Information Technology sector. Breadth improved near quarter-end as investors digested a pause in Fed rate hikes and expectations for a U.S. recession eased, providing a tailwind for sectors excluded from the tech rally.

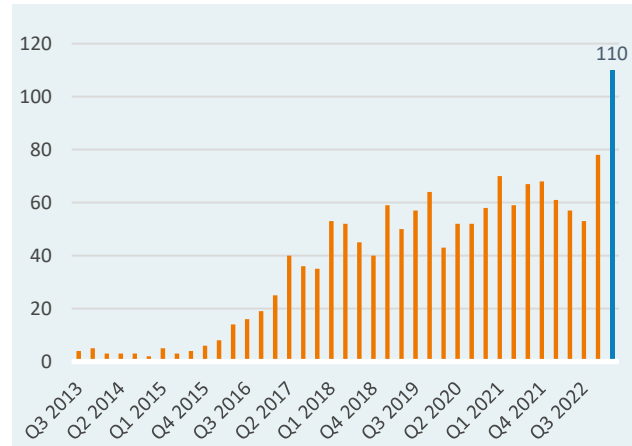
The Financial sector (+5.3%) saw some reprieve in the second quarter and recovered slightly from steep March declines which resulted from the collapse of three mid-sized banks. In its annual stress test, the Federal Reserve found the 23 largest U.S. banks capable of weathering a severe recession while proceeding with their respective lending businesses. Despite the results, the industry faces mounting headwinds including a deeply-inverted yield curve and the prospect of further Fed tightening.

GROWTH OF \$100,000 QUARTER TO DATE



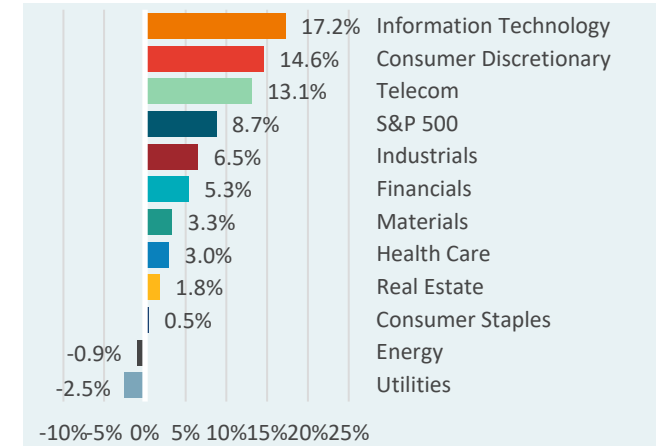
Source: Bloomberg, as of 6/30/23

OF S&P COMPANIES CITING "AI" ON EARNINGS CALLS



Source: FactSet, as of 6/30/23

Q2 2023 SECTOR PERFORMANCE



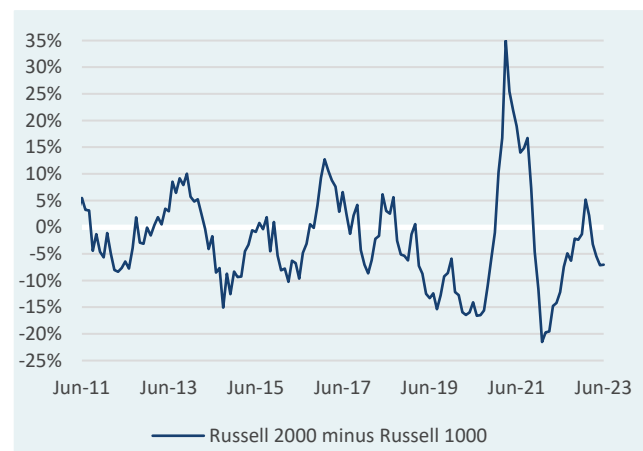
Source: Morningstar, as of 6/30/23

Domestic equity size & style

Growth stocks (+12.8%) continued to outpace value (+4.1%), bringing the year-to-date performance difference to +23.9%. Sector-specific drivers, including product launches and upward adjustments to company guidance among Information Technology (+18.6%) heavyweights, drove growth index performance. Sector behavior has persistently contributed to style factor disparity. This was evident in Q2 alongside large gains in Information Technology (+17.2%) and notable underperformance from Energy and Utilities (-0.9% and -2.5%, respectively).

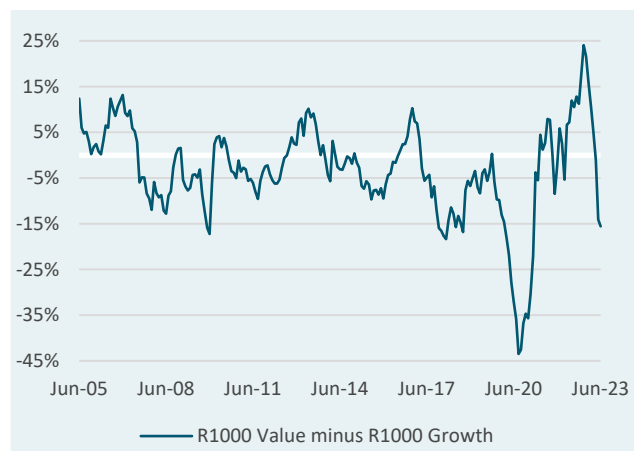
Over recent years, style factors (ex: small vs large, value vs growth) have exhibited some of the wildest swings in history. We maintain our view that factor timing should rarely be pursued for most investors. There are occasions when market mispricing offers a compelling case to tilt into a style factor, though these occasions come along perhaps every few decades rather than every few years. We believe that style investing is most appropriately pursued in a strategic manner based on each individual investor's market beliefs and long-term goals.

SMALL CAP VS LARGE CAP (YOY)



Source: FTSE, as of 6/30/23

VALUE VS GROWTH (YOY)



Source: FTSE, as of 6/30/23

1-YEAR SIZE & STYLE PERFORMANCE

	Value	Core	Growth
Large Cap	11.5%	19.4%	27.1%
Mid Cap	10.5%	14.9%	23.1%
Small Cap	6.0%	12.3%	18.5%

Source: Bloomberg, as of 6/30/23

International developed equity

International developed equities lagged the domestic market but outpaced emerging market equities for a third straight quarter. The MSCI EAFE Index rose +3.0% in unhedged currency terms as both Asian and European equities notched gains. International developed markets have performed very well over the past year despite recession, aggressive central bank interest rate hikes, and a severe energy crisis in Europe, up +18.8% (MSCI EAFE) relative to the global opportunity set at +16.5% (MSCI ACWI). Some of this behavior may relate to Europe's energy crisis turning out less severe than originally feared. We expect that relatively cheap valuations of many

markets may act as somewhat of a floor in the case of near-term equity stress, given that the gap in pricing between U.S. and non-U.S. stocks is at one of the widest levels in history.

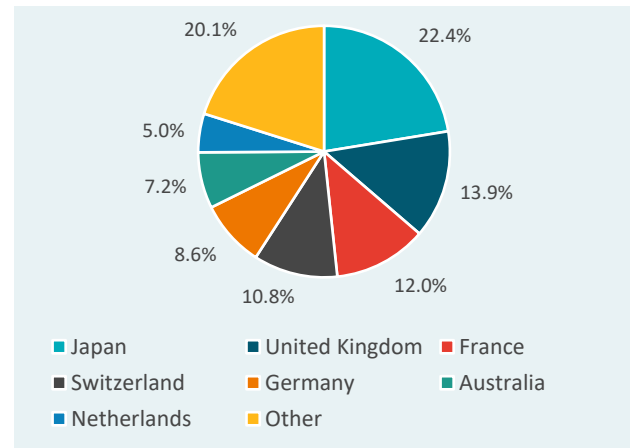
Japanese equities (MSCI Japan +6.4%) saw broad gains after the Bank of Japan held interest rates in negative territory and economic data showed resilience in the face of weakening global demand. Additional factors, including stronger-than-expected earnings from automakers and tech conglomerates, helped boost the Nikkei Index to 33-year highs.

INTERNATIONAL DEVELOPED EQUITY



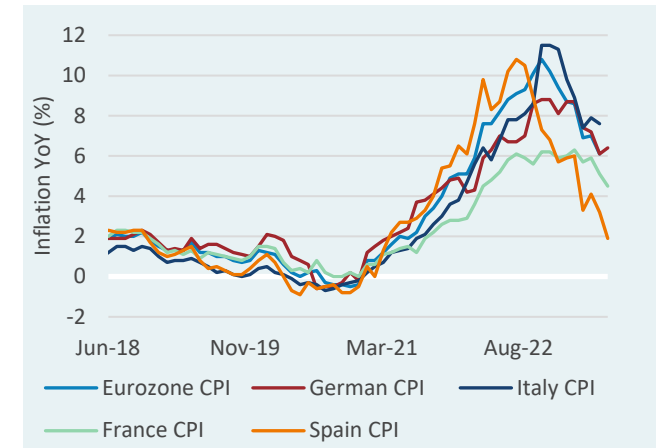
Source: MSCI, as of 6/30/23

MSCI EAFE INDEX COUNTRY DECOMPOSITION



Source: MSCI, as of 6/30/23

EUROZONE INFLATION



Source: Bloomberg, as of 6/30/23 or latest release

Emerging market equity

Emerging market equities lagged other global markets again in the second quarter. The MSCI EM Index finished up +0.9%, while the MSCI EAFE Index rose +3.0% and the S&P 500 gained +8.7%.

There were substantial performance differences across the emerging markets complex in Q2, ranging from Brazil's performance of +20.7% to China's -9.7%. We believe skilled active management is a preferred way to navigate risks and potentially bolster performance in this asset class.

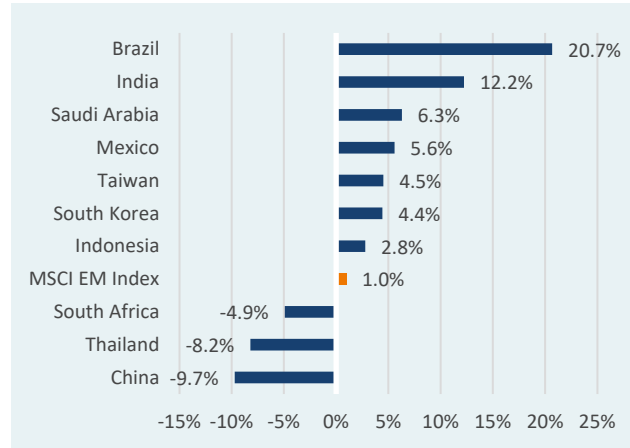
Over the past year, China's reopening provided a significant boost to equities, though not large enough to recover from previous significant losses driven by a mix of the three-year "zero-covid" policy, government crackdowns on large technology names, and knock-on effects from property market stress. Negative China sentiment has been building recently due to developments such as increasing geopolitical tensions with the U.S. (which eased on the margin following Secretary of State Blinken's visit to China), credit issues amongst property and local government financing vehicles, and a very high youth unemployment rate.

EMERGING MARKET EQUITY



Source: MSCI, as of 6/30/23

Q2 2023 MSCI COUNTRY RETURNS (USD)



Source: Bloomberg, MSCI, as of 6/30/23

MSCI CHINA INDEX



Source: MSCI, as of 6/30/23

Equity valuations

Equity valuation disparities continued to be wide. U.S. equities are priced at a 50% valuation premium (Price/Earnings) over international developed, at 21.0 and 14.2, respectively. Although domestic markets arguably face more attractive conditions on a relative basis, high valuations have historically acted as a material headwind to medium- and longer-term performance.

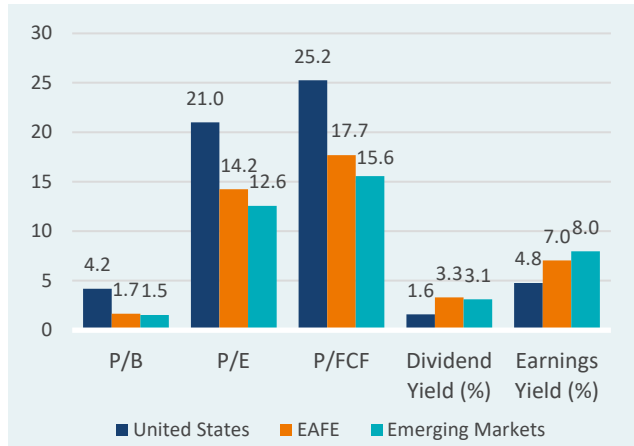
Emerging market equities are now priced near their longer-term average, though valuations differ considerably from country-to-country. For example, Taiwan is cheap by historical standards, with prices likely reflecting a discount for risks

related to China and slowing semiconductor demand. India is richly priced relative to history, perhaps in recognition of the country's high growth and greater potential as Chinese growth has moderated.

Quickly rising interest rates should theoretically result in a sharp fall in equity valuations, in order to maintain the "equity risk premium" of stock returns over bond returns. This effect has not yet occurred, which means the yield of equity is now only slightly more than the yield of high-quality bonds. Many investors may find bonds relatively attractive (and stocks relative less unattractive) in the current environment.

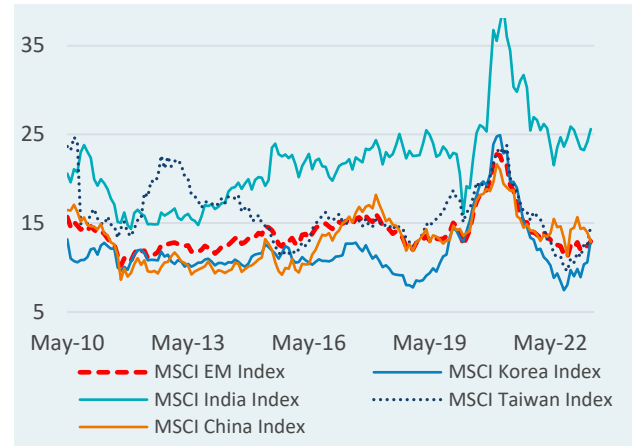
High-quality bonds are yielding nearly as much as equities, increasing the relative attractiveness of bonds

MSCI VALUATION METRICS (3-MONTH AVG)



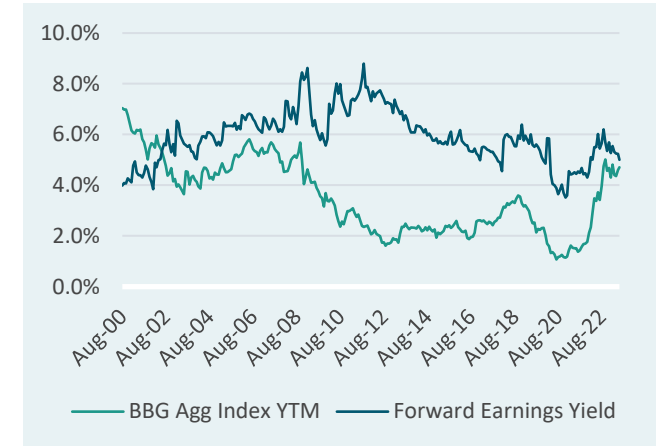
Source: Bloomberg, as of 6/30/23

P/E EMERGING MARKETS



Source: MSCI, Bloomberg, as of 5/31/23

U.S. VALUATIONS: BONDS VS. STOCKS



Source: Bloomberg, Standard & Poor's, as of 6/30/23

Market volatility

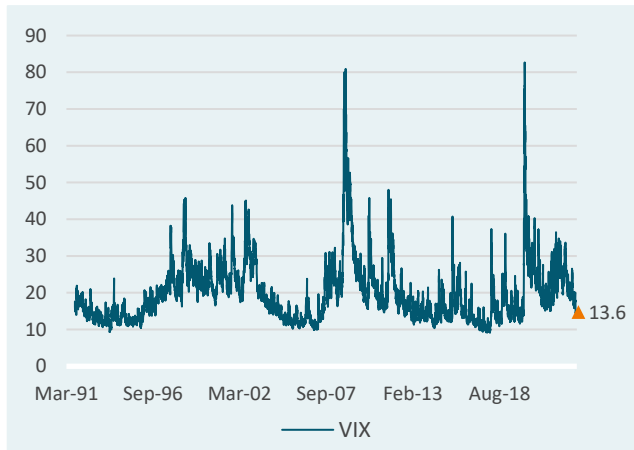
The Cboe VIX implied volatility index has moved to surprisingly low levels, despite broad expectations of recession, ongoing risk of regional bank contagion, and other not-yet-known consequences of central bank liquidity withdrawal from the financial system. The index fell from 18.7% to 13.6% during the second quarter.

The realized volatility of global equity markets has been elevated. Emerging market volatility in recent years has been lower than developed market volatility—an uncommon occurrence historically speaking. This trend has now reversed

as realized risk in emerging markets surpassed most developed economy public markets.

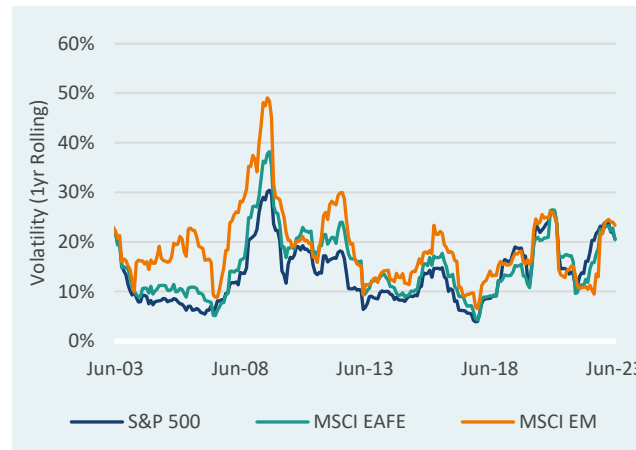
The first half of 2023 has been a truly unique environment for fixed income. Federal Reserve tightening, mass withdrawal of liquidity from the financial system, and a deeply inverted yield curve have led to elevated uncertainty and market volatility. These conditions are captured by the ICE BofA “MOVE” Index, which measures the volatility priced into U.S. Treasury bonds.

U.S. IMPLIED VOLATILITY (VIX)



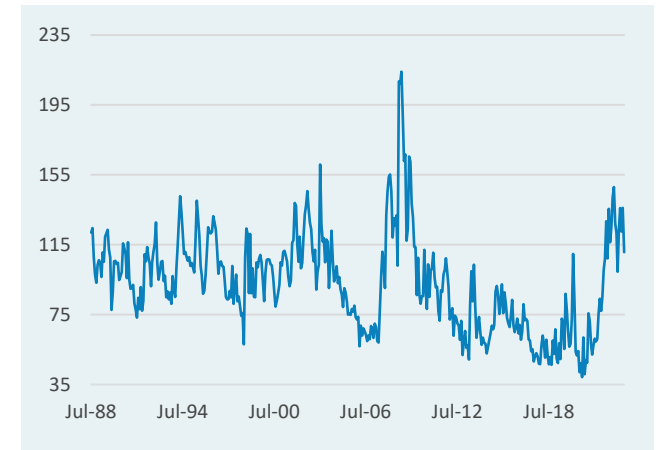
Source: Cboe, as of 6/30/23

REALIZED VOLATILITY



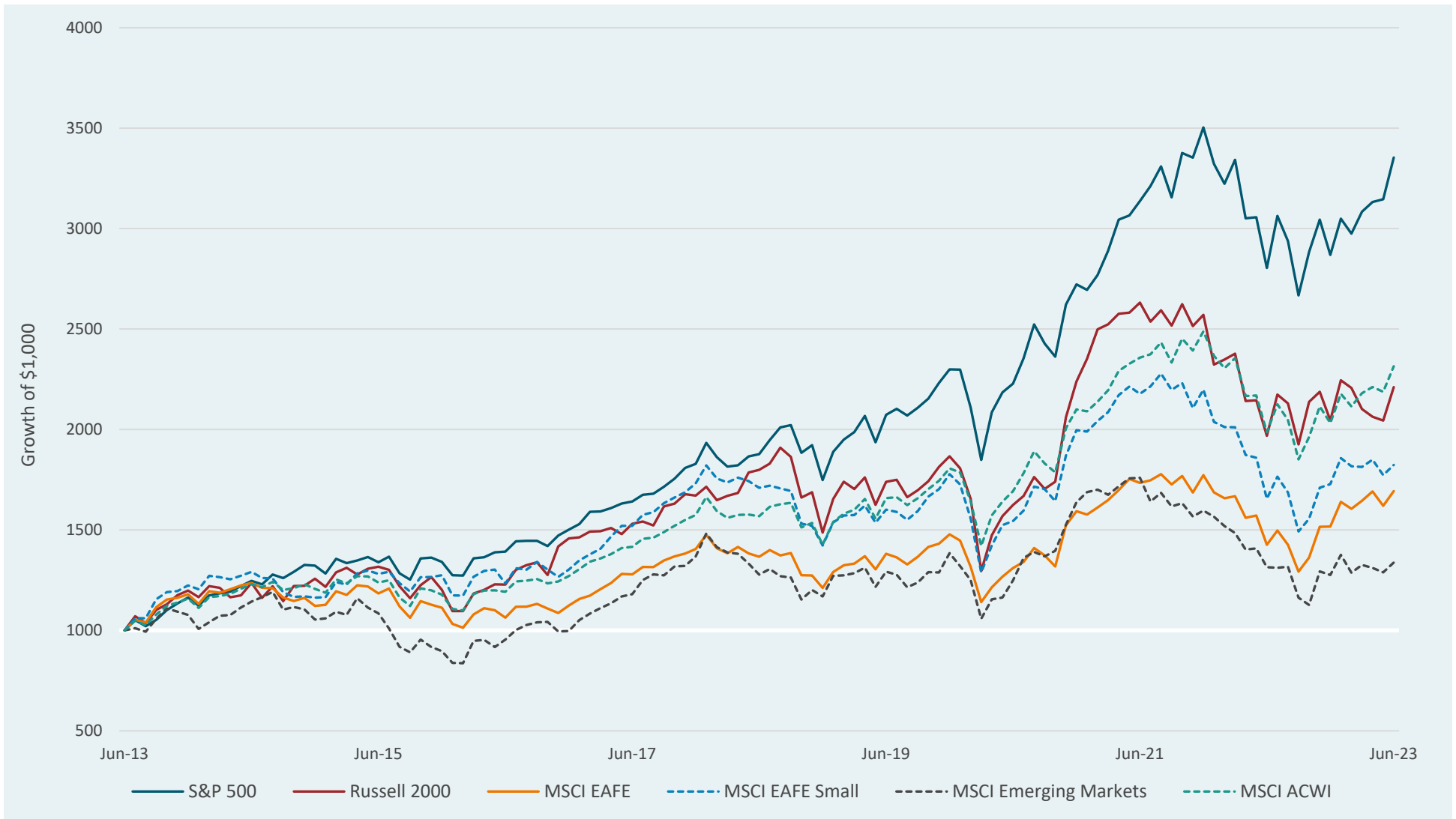
Source: S&P, MSCI, as of 6/30/23

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



Source: Bloomberg, as of 6/30/23

Long-term equity performance



Source: MPI, as of 6/30/23

Other assets

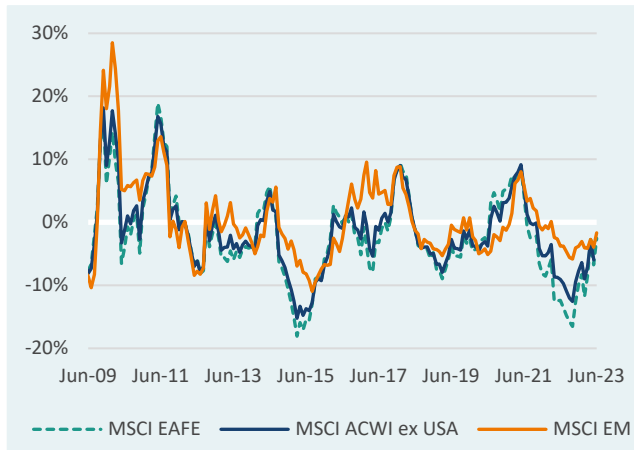
Currency

The effects of currency volatility on portfolio performance was mixed in Q2. Overall, the value of the U.S. dollar was unchanged on a trade-weighted basis. Varying central bank approaches to fighting inflation has contributed to much uncertainty around the path of the U.S. dollar and therefore the volatility generated by currency movement for investors with unhedged currency exposure (what we refer to as “embedded currency”). During the past full year, currency movement led to a -2.5% loss for investors with unhedged exposure to international developed equity (MSCI EAFE unhedged +18.8%, MSCI EAFE hedged +21.3%).

portfolio risk while also increasing long-term expected returns. The MSCI Currency Factor Mix Index—a representation of a passive investment in the currency market—has shown a positive one-year rolling return over most periods with very low volatility. This contrasts to the unhedged currency exposure that most investors own, which has demonstrated high volatility and frequent losses.

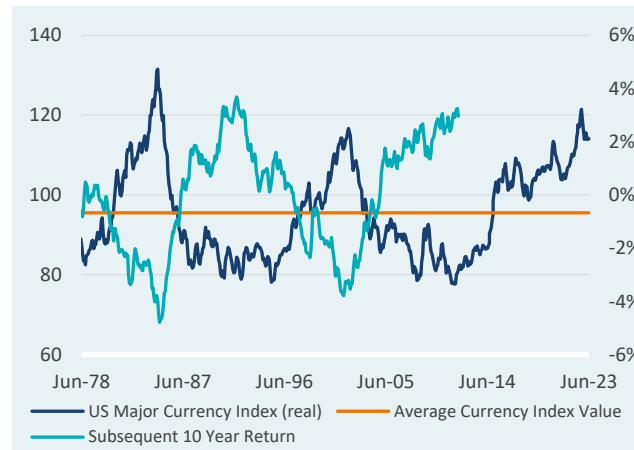
A thoughtful currency program may allow investors to reduce their total

EFFECT OF CURRENCY (1-YEAR ROLLING)



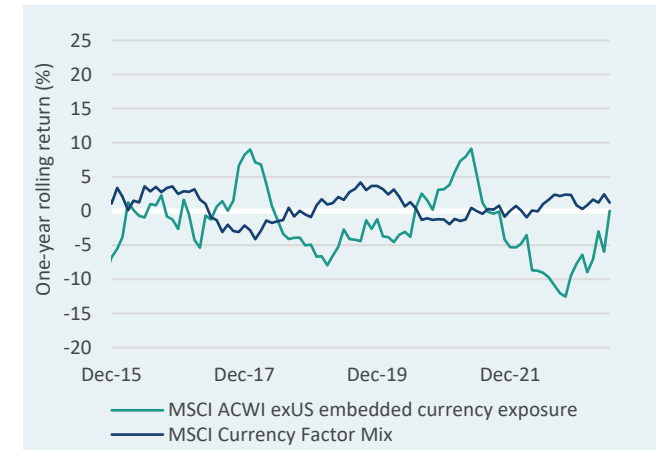
Source: MSCI, as of 6/30/23

BLOOMBERG DOLLAR SPOT INDEX



Source: Federal Reserve, as of 6/30/23

EMBEDDED CURRENCY VS CURRENCY FACTORS



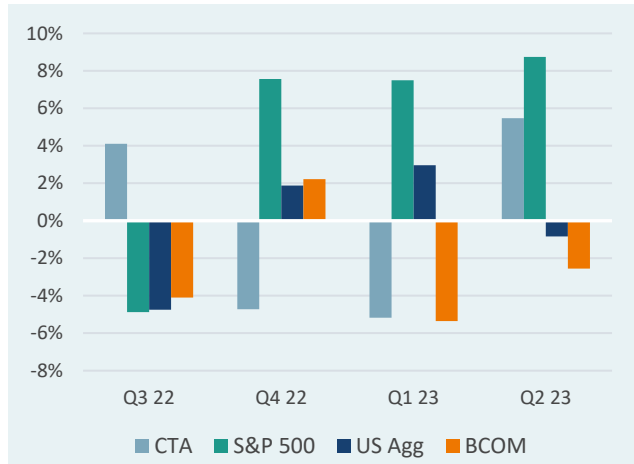
Source: Bloomberg, MSCI, as of 6/30/23

CTAs pivot, merger arbitrage gets hit

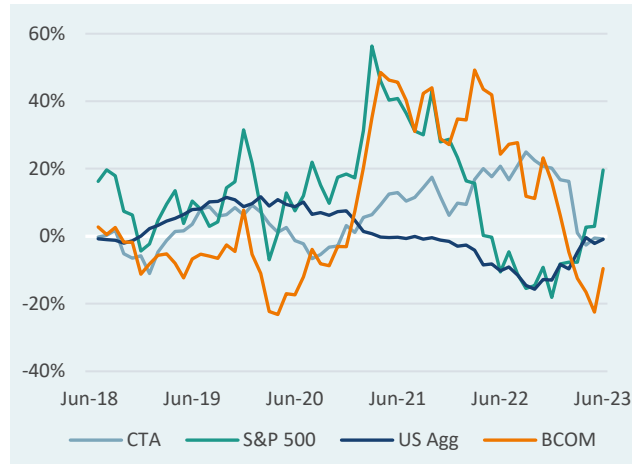
Commodity Trading Advisor (CTA) strategies, as proxied by the SocGen CTA Index, rebounded in Q2 after their worst two consecutive quarters (4Q22 through 1Q23) on record going back to the year 2000. When looking at major asset class returns for each of the last four quarters, it becomes clear that trend following strategies flipped to investing long in the equity markets after two strong quarters in a row for stocks. Trailing twelve-month returns as of the end of the quarter show fixed income at a performance inflection point and commodities bottoming out after a difficult year. Any gains in the near term for CTA strategies will likely depend on whether equity markets continue upward.

An interesting opportunity in merger arbitrage is unfolding, as an aggressive antitrust stance from the Federal Trade Commission and Chairperson Lina Kahn has pushed merger spreads to wide levels while equity markets have enjoyed a period of strong returns over the past year. Average deal spreads have increased to reflect this additional regulatory risk. Prior to this current period, the HFRI Merger Arbitrage index had only posted a negative 12-month return during COVID-19 (2020), the Global Financial Crisis (2008-2009), and the Tech Bubble (2001-2002). Each of those periods involved a recession.

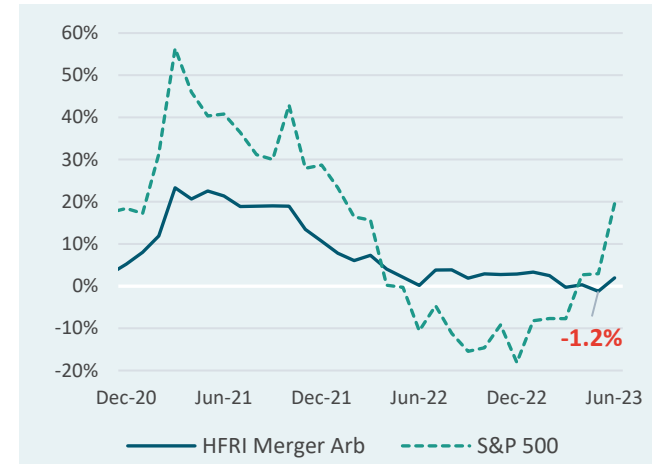
QUARTERLY RETURNS – PAST 4 QUARTERS



CTA 1-YEAR RETURNS, LAST 5 YEARS



MERGER ARB 1-YEAR RETURNS, LAST 3 YEARS



Source: HFR, MPI, Morningstar. SocGen, Data as of 6/30/23

Appendix

Periodic table of returns

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	YTD	5-Year	10-Year
Large Cap Growth	56.3	26.0	34.5	32.6	39.8	5.2	79.0	29.1	14.3	18.6	43.3	13.5	13.3	31.7	37.3	6.7	36.4	38.5	28.3	16.1	29.0	15.1	15.7
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	16.7	11.9	12.6
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	13.6	8.1	9.2
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	11.7	6.7	8.8
60/40 Global Portfolio	39.2	16.5	7.5	18.4	11.6	-25.9	28.4	16.8	0.4	16.4	33.1	6.0	0.0	11.8	21.7	-3.5	25.5	18.3	25.2	-7.5	8.8	4.7	8.3
Small Cap Equity	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	8.1	4.6	8.3
Large 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	5.1	4.4	7.3
Emerging Markets Equity	29.7	12.9	5.3	15.1	7.0	-35.6	20.6	15.5	-2.9	14.6	12.1	4.2	-1.4	8.0	13.7	-8.3	18.6	7.8	11.3	-14.5	4.9	4.2	5.5
Small Cap Value	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	2.5	4.2	5.4
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	2.3	3.5	3.4
Cash	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	2.3	3.3	3.0
US Bonds	9.0	6.3	4.2	4.8	-0.2	-38.5	5.9	6.5	-11.7	4.2	-2.0	-1.8	-7.5	1.0	3.5	-12.9	7.7	0.5	0.0	-20.4	2.1	1.5	1.5
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	-1.8	0.9	0.9
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	-7.8	0.8	-1.0

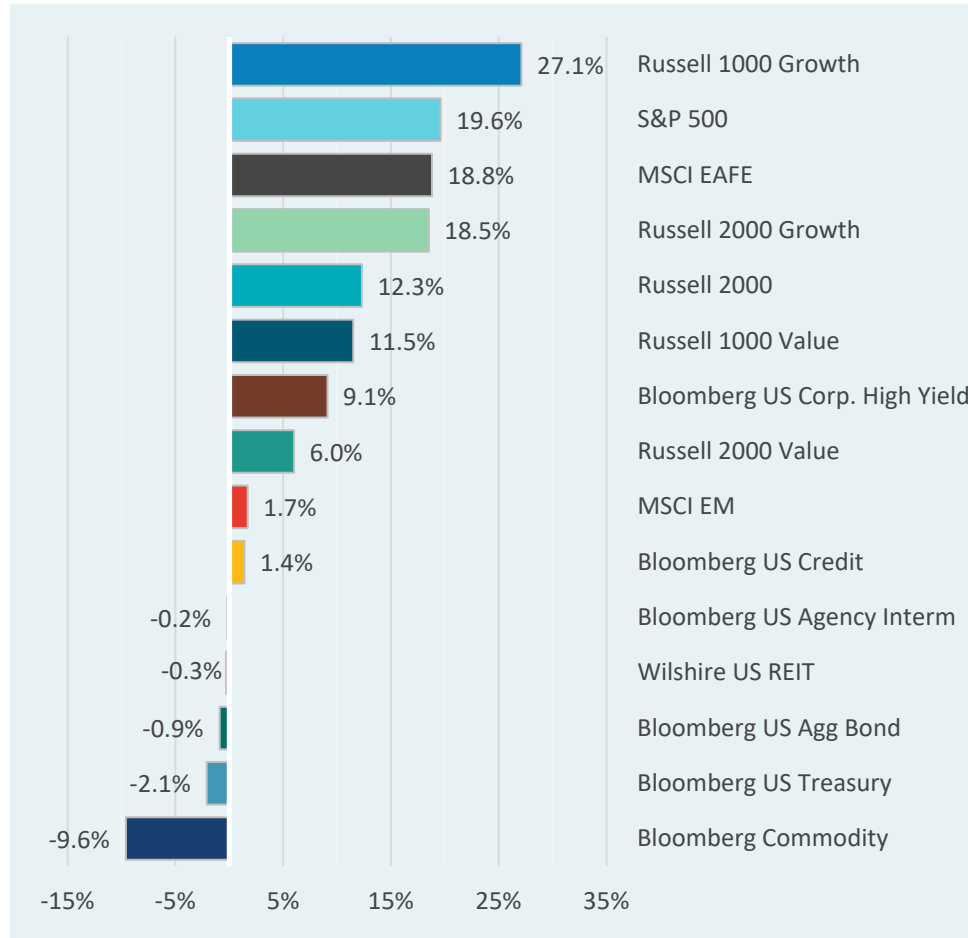
BEST
↑
WORST
↓

 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	

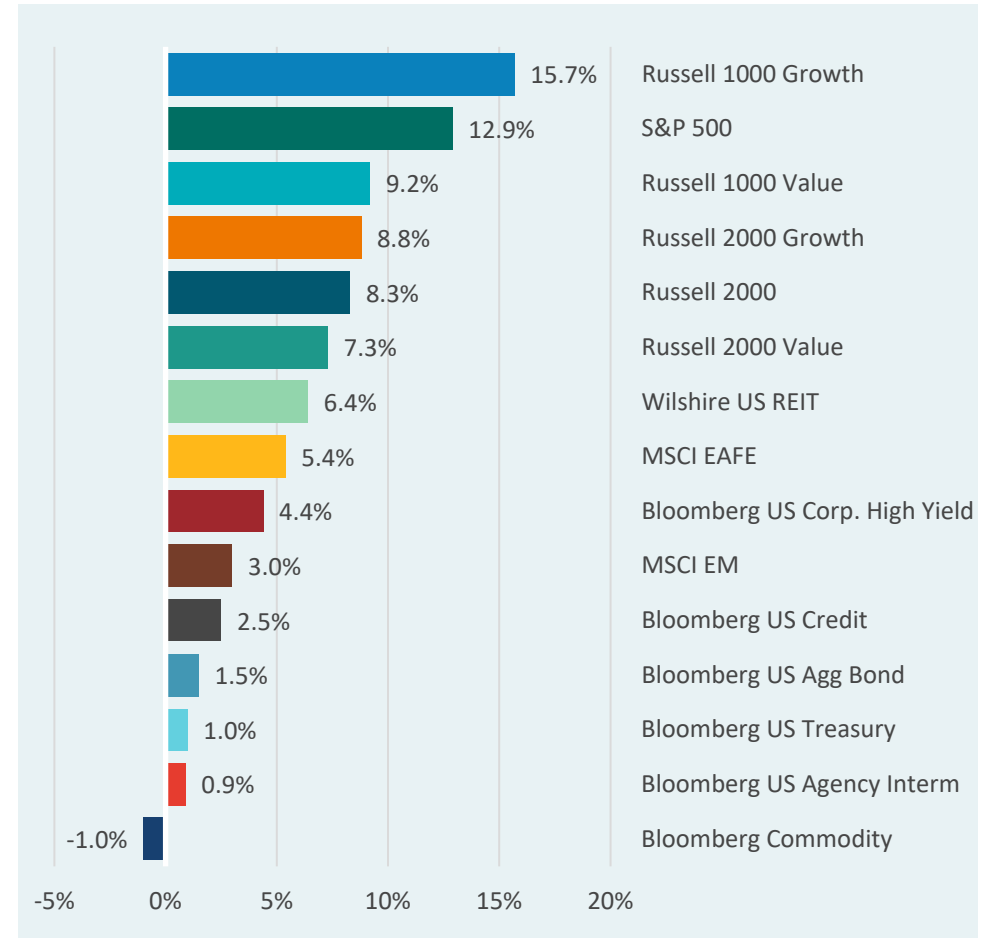
Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Growth, Russell 2000, Russell 2000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, Bloomberg US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, Bloomberg Global Bond. NCREIF Property Index performance data as of 3/31/22.

Major asset class returns

ONE YEAR ENDING JUNE



TEN YEARS ENDING JUNE



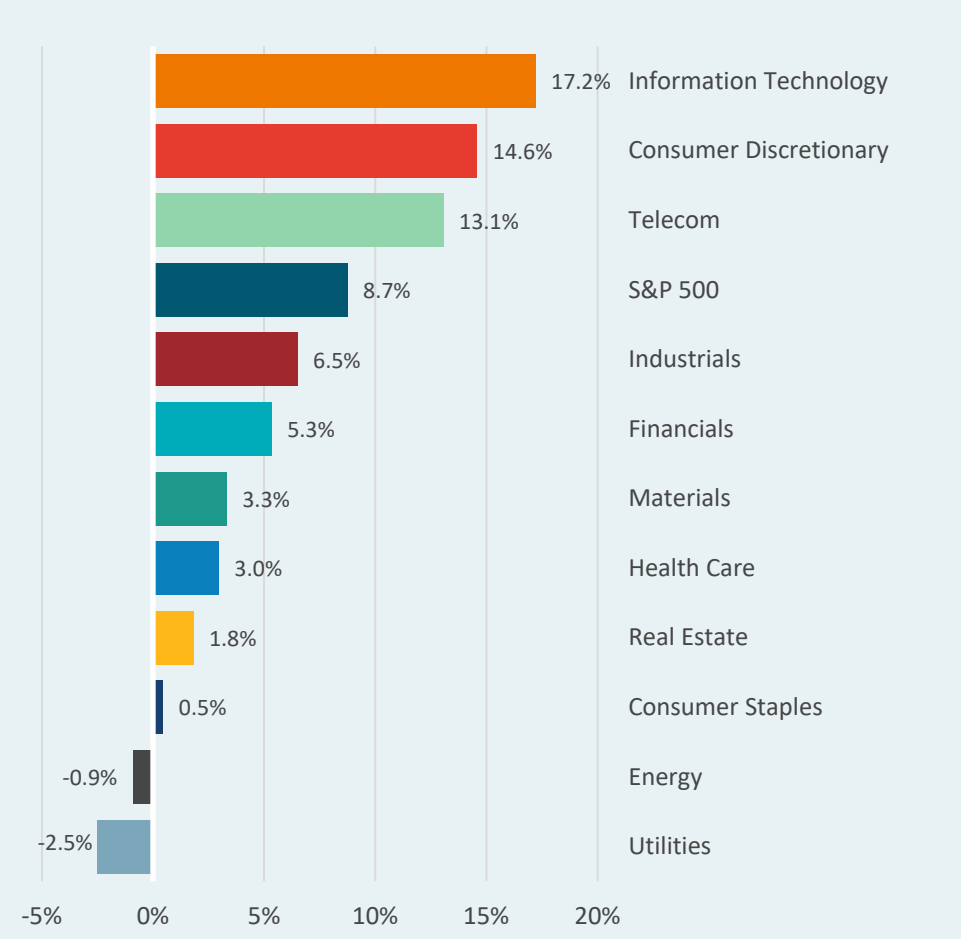
*Only publicly traded asset performance is shown here. Performance of private assets is typically released with a 3- to 6-month delay.

Source: Morningstar, as of 6/30/23

Source: Morningstar, as of 6/30/23

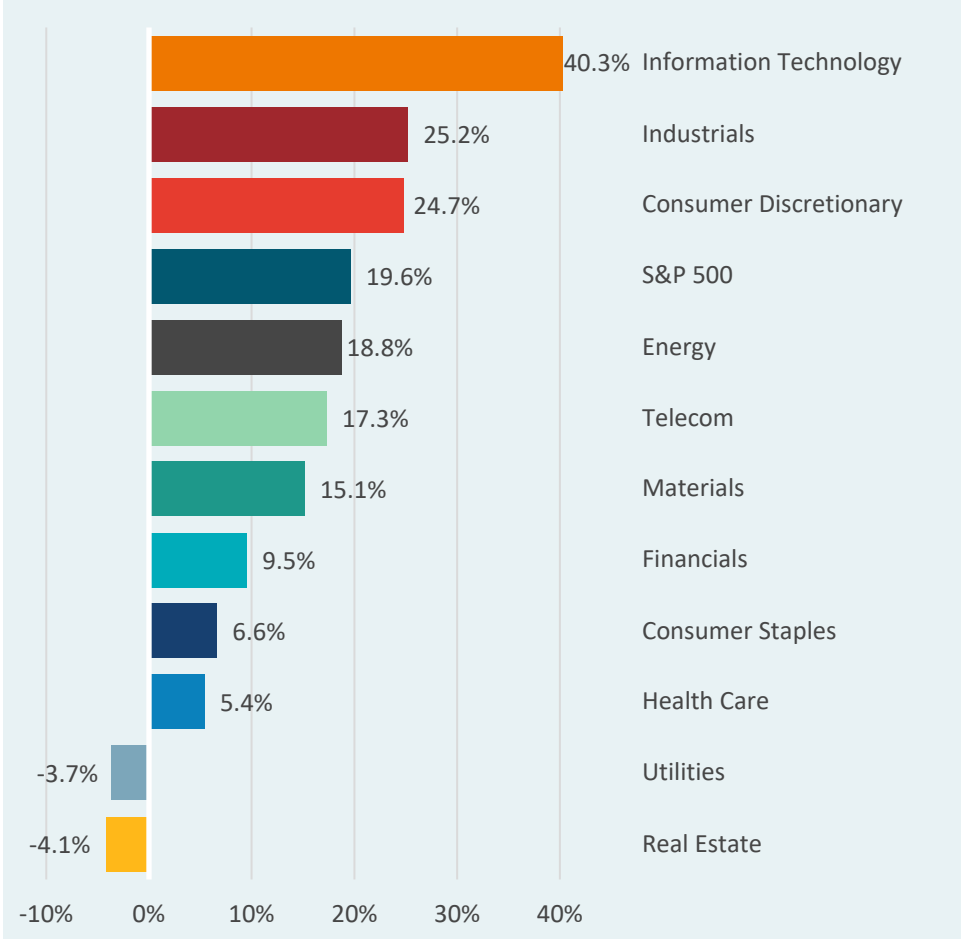
S&P 500 sector returns

QTD



Source: Morningstar, as of 6/30/23

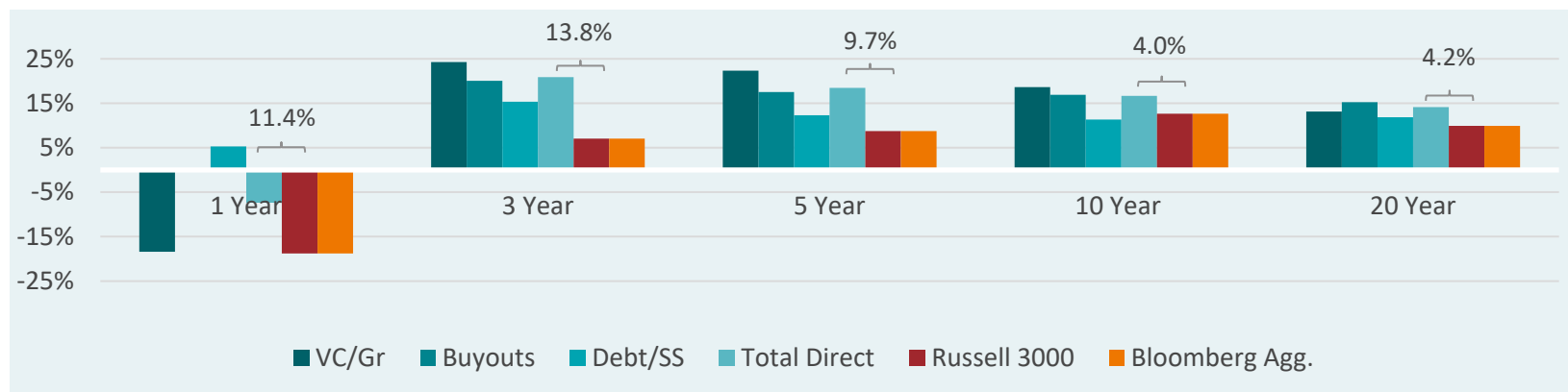
ONE YEAR ENDING JUNE



Source: Morningstar, as of 6/30/23

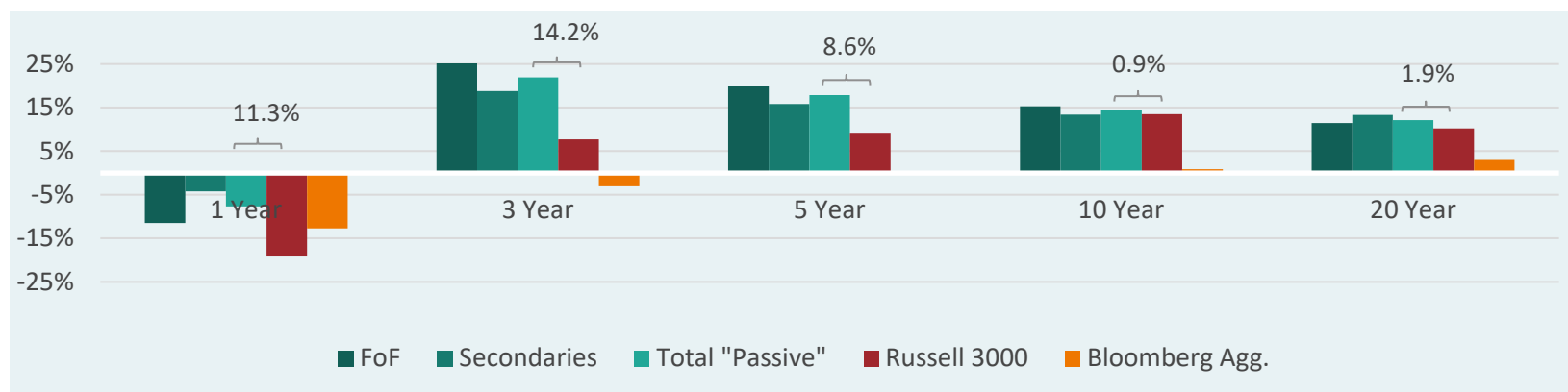
Private equity vs. traditional assets performance

DIRECT PRIVATE EQUITY FUND INVESTMENTS



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

“PASSIVE” STRATEGIES

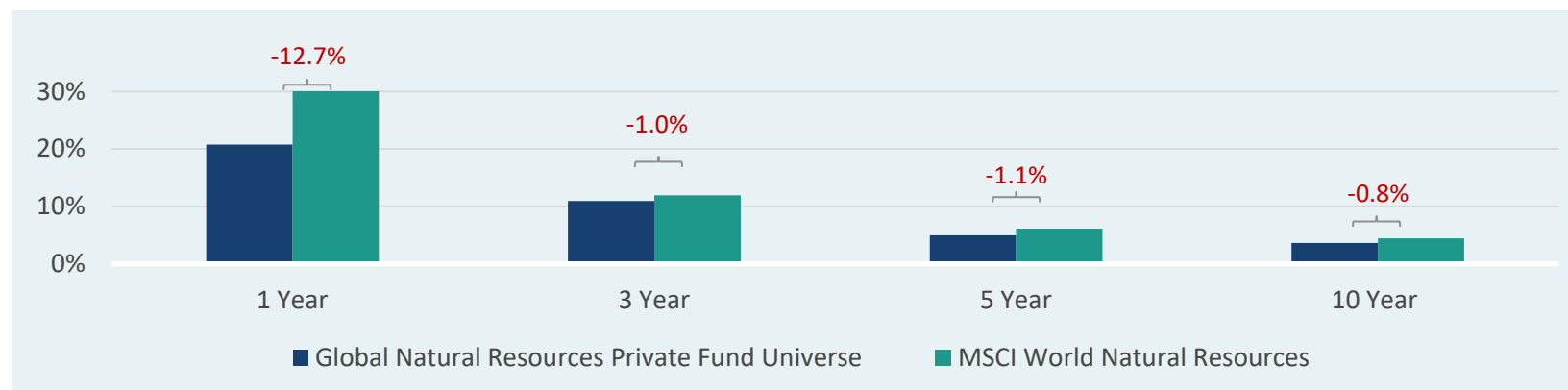


“Passive” strategies outperformed comparable public equities across all time periods.

Sources: Refinitiv PME: U.S. Private Equity Funds sub asset classes as of December 31, 2022. Public Market Equivalent returns resulted from “Total Passive” and Total Direct’s identical cash flows invested into and distributed from respective traditional asset comparable.

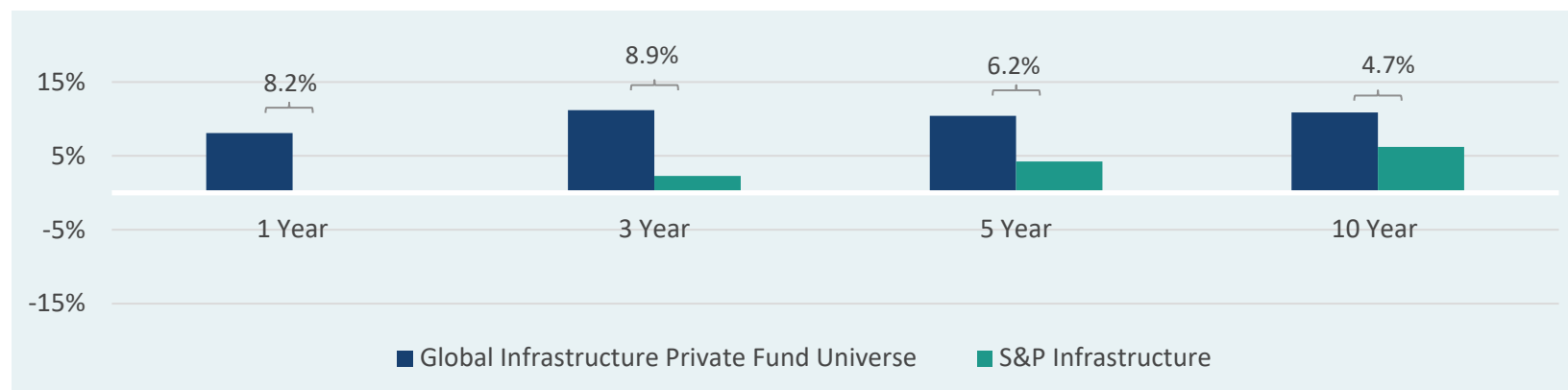
Private vs. liquid real assets performance

GLOBAL NATURAL RESOURCES FUNDS



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

GLOBAL INFRASTRUCTURE FUNDS

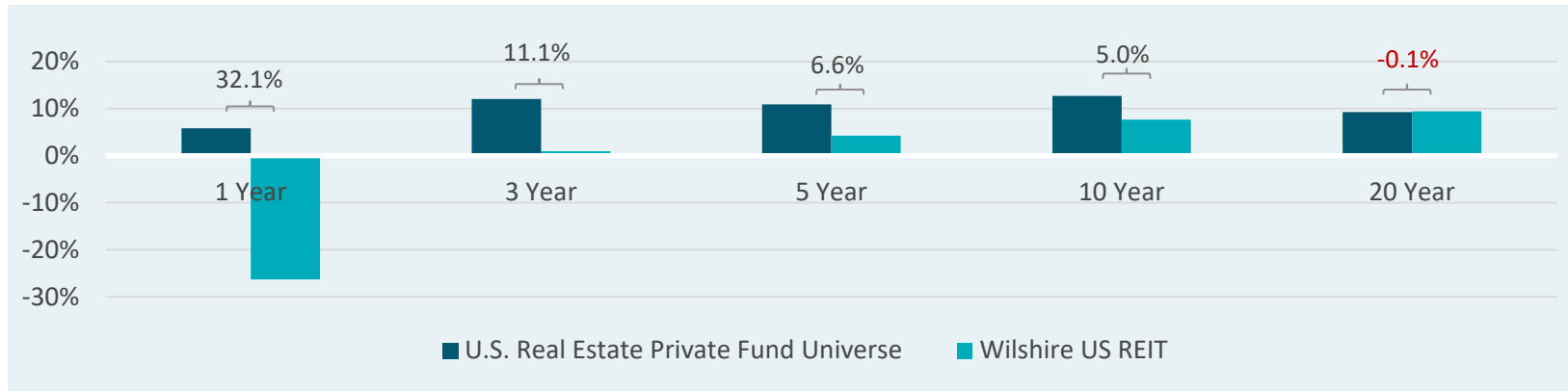


Infra. funds outperformed the S&P Infra. across all periods.

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 December 31, 2022. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real assets universes.

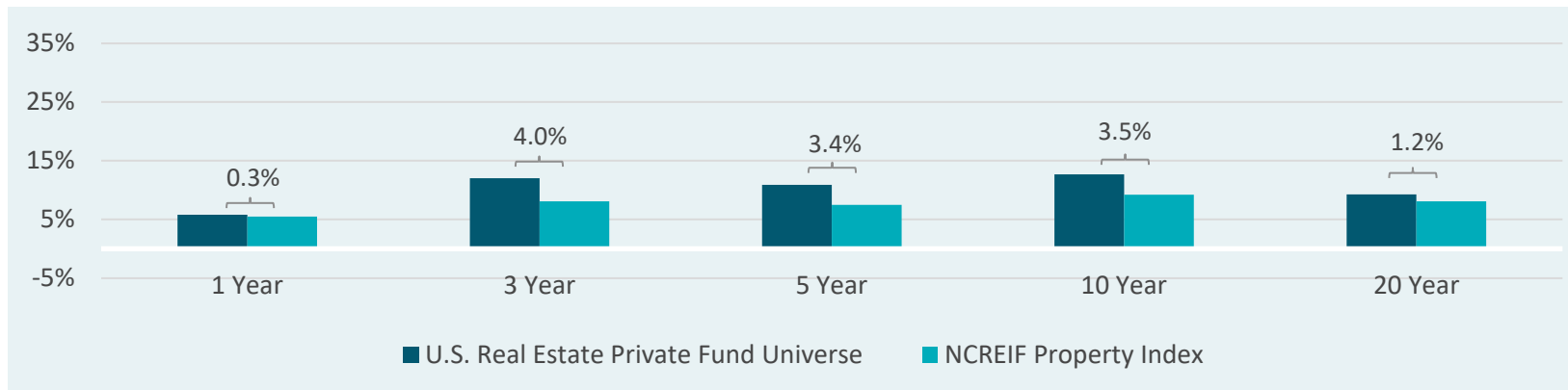
Private vs. liquid and core real estate performance

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



U.S. Private R.E. funds outperformed the Wilshire U.S. REIT Index across all time periods, aside the 20-year

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 December 31, 2022. 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	6.6	8.7	16.9	19.6	14.6	12.3	12.9
S&P 500 Equal Weighted	7.7	4.0	7.0	13.8	15.8	10.2	11.5
DJ Industrial Average	4.7	4.0	4.9	14.2	12.3	9.6	11.3
Russell Top 200	6.2	9.9	19.4	20.9	14.6	13.2	13.5
Russell 1000	6.8	8.6	16.7	19.4	14.1	11.9	12.6
Russell 2000	8.1	5.2	8.1	12.3	10.8	4.2	8.3
Russell 3000	6.8	8.4	16.2	19.0	13.9	11.4	12.3
Russell Mid Cap	8.3	4.8	9.0	14.9	12.5	8.5	10.3
Style Index							
Russell 1000 Growth	6.8	12.8	29.0	27.1	13.7	15.1	15.7
Russell 1000 Value	6.6	4.1	5.1	11.5	14.3	8.1	9.2
Russell 2000 Growth	8.3	7.1	13.6	18.5	6.1	4.2	8.8
Russell 2000 Value	7.9	3.2	2.5	6.0	15.4	3.5	7.3

INTERNATIONAL EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
MSCI ACWI	5.8	6.2	13.9	16.5	11.0	8.1	8.8
MSCI ACWI ex US	4.5	2.4	9.5	12.7	7.2	3.5	4.7
MSCI EAFE	4.6	3.0	11.7	18.8	8.9	4.4	5.4
MSCI EM	3.8	0.9	4.9	1.7	2.3	0.9	3.0
MSCI EAFE Small Cap	2.9	0.6	5.5	10.2	5.7	1.3	6.2
Style Index							
MSCI EAFE Growth	3.5	2.8	14.2	20.2	6.3	5.4	6.4
MSCI EAFE Value	5.6	3.2	9.3	17.4	11.3	2.9	4.1
Regional Index							
MSCI UK	3.9	2.2	8.4	13.2	12.6	2.8	3.9
MSCI Japan	4.1	6.4	13.0	18.1	5.7	3.1	5.2
MSCI Euro	6.4	3.8	19.9	32.7	11.7	5.2	6.2
MSCI EM Asia	2.7	(0.8)	4.0	(0.9)	1.2	1.2	4.7
MSCI EM Latin American	12.0	14.0	18.5	29.8	16.4	4.8	1.1

FIXED INCOME

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
Bloomberg US TIPS	(0.3)	(1.4)	1.9	(1.4)	(0.1)	2.5	2.1
Bloomberg US Treasury Bills	0.4	1.2	2.3	3.6	1.2	1.5	1.0
Bloomberg US Agg Bond	(0.4)	(0.8)	2.1	(0.9)	(4.0)	0.8	1.5
Bloomberg US Universal	(0.2)	(0.6)	2.3	(0.0)	(3.4)	1.0	1.8
Duration							
Bloomberg US Treasury 1-3 Yr	(0.5)	(0.6)	1.0	0.1	(1.1)	0.9	0.8
Bloomberg US Treasury Long	(0.0)	(2.3)	3.7	(6.8)	(12.1)	(0.9)	1.8
Bloomberg US Treasury	(0.8)	(1.4)	1.6	(2.1)	(4.8)	0.4	1.0
Issuer							
Bloomberg US MBS	(0.4)	(0.6)	1.9	(1.5)	(3.7)	0.0	1.1
Bloomberg US Corp. High Yield	1.7	1.7	5.4	9.1	3.1	3.4	4.4
Bloomberg US Agency Interm	(0.5)	(0.4)	1.5	(0.2)	(2.0)	0.7	0.9
Bloomberg US Credit	0.3	(0.3)	3.1	1.4	(3.4)	1.7	2.5

OTHER

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Index							
Bloomberg Commodity	4.0	(2.6)	(7.8)	(9.6)	17.8	4.7	(1.0)
Wilshire US REIT	5.4	3.3	6.7	(0.3)	8.6	4.4	6.4
CS Leveraged Loans	2.2	3.1	6.3	10.1	6.2	4.0	4.1
S&P Global Infrastructure	3.0	(0.1)	3.8	4.2	10.6	5.3	6.7
Alerian MLP	4.5	6.2	9.8	31.5	31.2	5.9	0.8
Regional Index							
JPM EMBI Global Div	2.2	2.2	4.1	7.4	(3.1)	0.6	2.8
JPM GBI-EM Global Div	3.3	2.5	7.8	11.4	(1.4)	0.3	(0.6)
Hedge Funds							
HFRI Composite	2.2	2.2	3.5	5.1	8.2	5.0	4.7
HFRI FOF Composite	1.2	1.5	2.3	3.7	5.0	3.3	3.4
Currency (Spot)							
Euro	2.3	0.4	2.2	4.4	(1.0)	(1.4)	(1.7)
Pound Sterling	2.6	2.8	5.7	4.7	1.0	(0.8)	(1.8)
Yen	(3.3)	(7.9)	(8.7)	(6.0)	(9.3)	(5.2)	(3.7)

Source: Morningstar, HFRI, as of 6/30/23.

Definitions

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

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

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

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

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Contra Costa County Employees Retirement Association

Investment Performance Review

Period Ending: June 30, 2023



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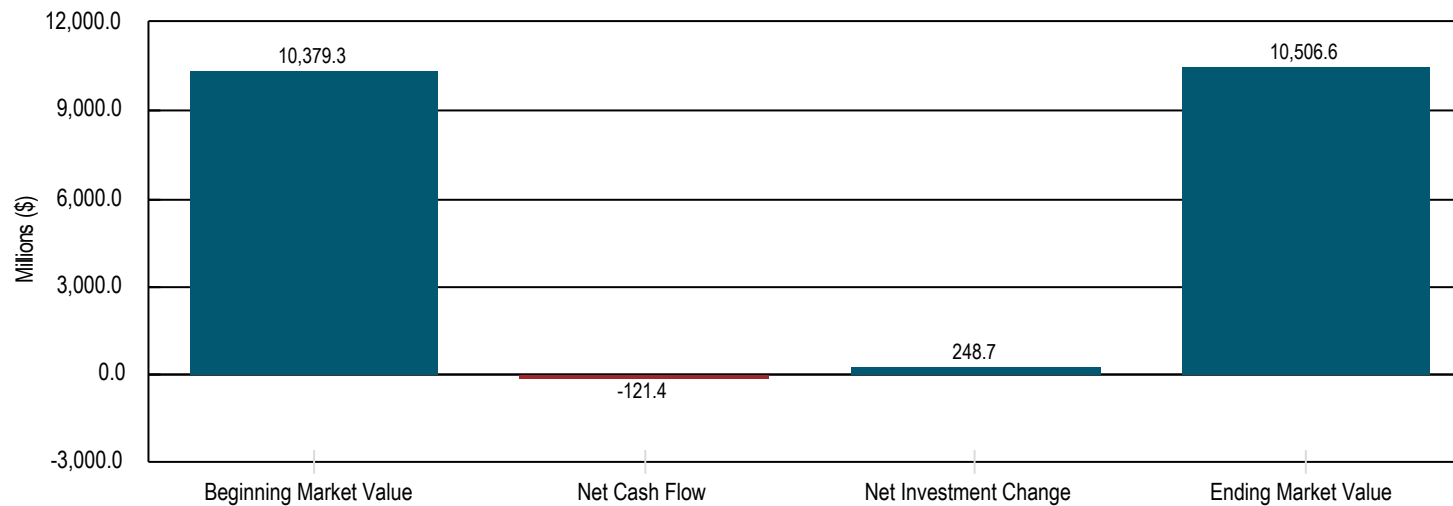
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Portfolio Reconciliation

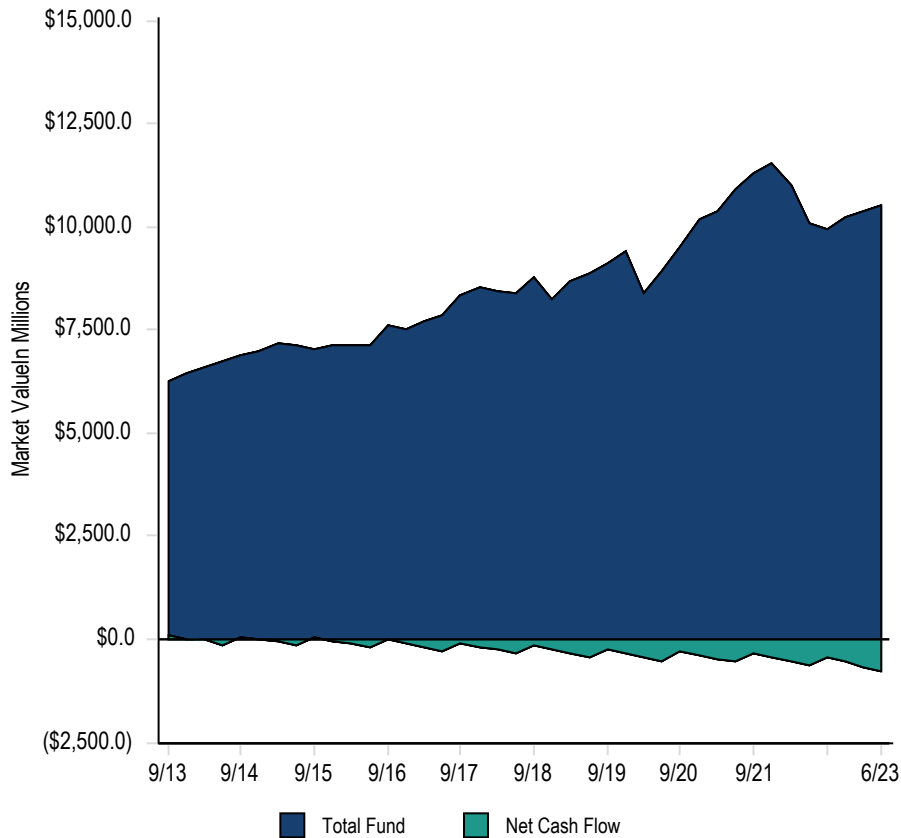
	Last Three Months	YTD
Beginning Market Value	\$10,379,329,352	\$10,223,348,190
Net Cash Flow	-\$121,402,579	-\$238,062,169
Net Investment Change	\$248,664,246	\$521,304,998
Ending Market Value	\$10,506,591,019	\$10,506,591,019

Change in Market Value
Last Three Months

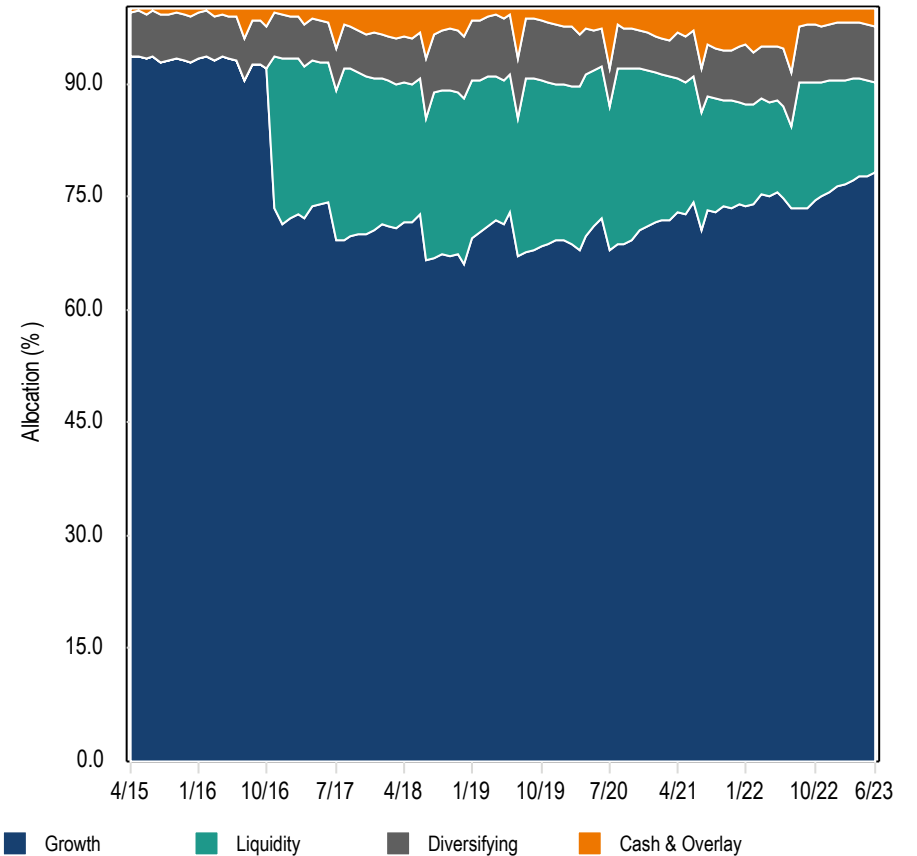


Contributions and withdrawals may include intra-account transfers between managers/funds.

Market Value History
Cumulative Cash Flows



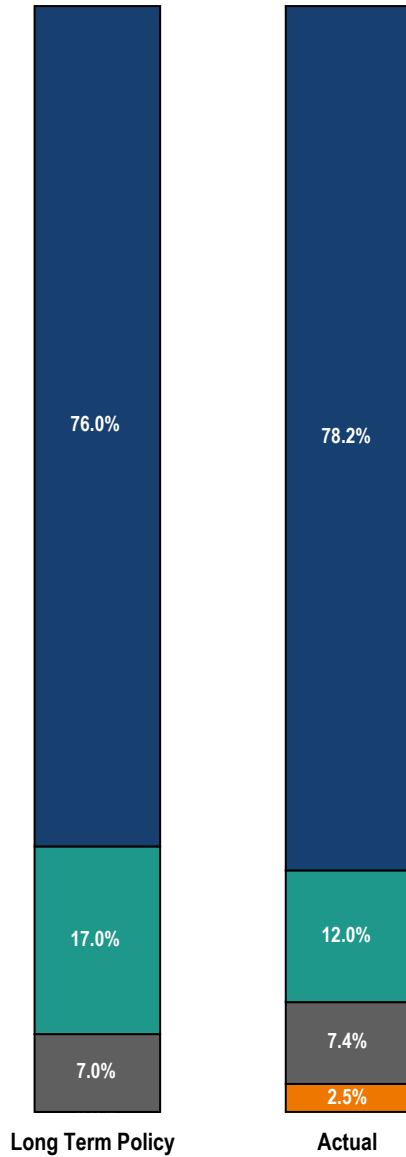
Asset Allocation History



Policy reflects Long-Term Asset Allocation approved July 2022.

Total Fund
Asset Allocation vs. Long Term Target Policy

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



Allocation vs. Long Term Target

	Current Balance	Current Allocation	Long Term Target	Difference
Growth	\$8,212,549,385	78.2	76.0	\$227,540,211
Liquidity	\$1,255,962,758	12.0	17.0	-\$530,157,715
Diversifying	\$775,169,656	7.4	7.0	\$39,708,285
Cash & Overlay	\$262,909,219	2.5	0.0	\$262,909,219
Total	\$10,506,591,019	100.0	100.0	

Allocation vs. Current Targets

	Current Balance (\$)	Current Allocation (%)	Current Target (%)	Difference
Growth	\$8,212,549,385	78.2	75.5	\$280,073,166
Liquidity	\$1,255,962,758	12.0	17.0	-\$530,157,715
Diversifying	\$775,169,656	7.4	7.5	-\$12,824,670
Cash & Overlay	\$262,909,219	2.5	0.0	\$262,909,219
Total	\$10,506,591,019	100.0	100.0	

Current and Long-Term Policy Targets approved July 2022.

Total Fund
Executive Summary (Net of Fees)

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

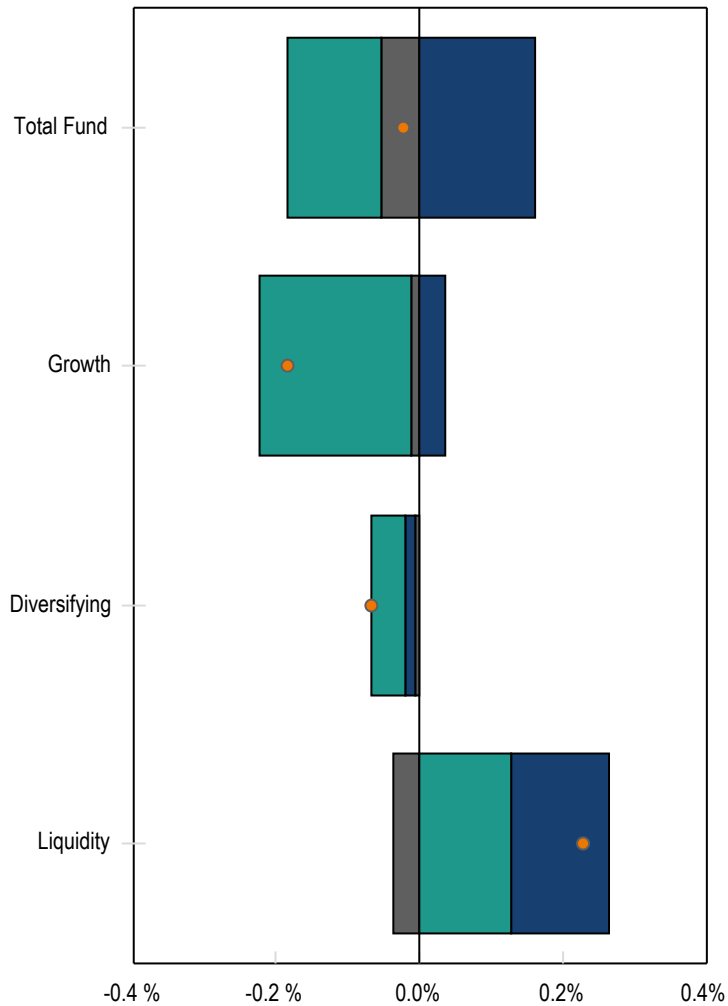
	% of Portfolio	QTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018
Total Fund	100.0	2.4	5.5	6.4	5.3	6.7	-10.6	13.9	9.2	14.6	-2.7
Policy Index		2.5	6.4	8.6	6.8	7.7	-8.3	15.3	10.8	14.6	-0.9
Policy Index (Adjusted)		2.5	6.4	7.5	6.2	7.2	-8.3	15.3	8.5	14.1	-1.5
Growth	78.2	3.0	6.8	9.4	7.1	8.3	-11.6	19.2	12.0	18.3	-3.9
Custom Growth Benchmark		3.3	8.1	12.3	8.9	9.3	-10.2	21.6	13.8	19.3	-2.1
Diversifying	7.4	-0.3	-1.4	-0.4	0.1	0.3	-5.7	1.7	-1.7	6.8	-2.3
Custom Diversifying Benchmark		0.4	2.7	0.5	2.1	2.9	-5.4	1.6	4.7	6.1	1.4
Liquidity	12.0	0.3	1.5	-0.4	1.5	-	-3.5	-0.3	3.4	4.8	1.7
Blmbg. 1-3 Year Gov/Credit index		-0.4	0.5	-0.9	1.1	-	-3.7	-0.5	3.3	4.0	1.6

*Correlation between the Growth and Diversifying composites is .57, .50 and .59 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: June 30, 2023

Attribution Effects
 3 Months Ending June 30, 2023



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

Performance Attribution

	3 Mo
Wtd. Actual Return	2.43
Wtd. Index Return	2.45
Excess Return	-0.02
Selection Effect	-0.13
Allocation Effect	0.16
Interaction Effect	-0.05

Attribution Summary
 Last 3 Months

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Growth	3.0	3.3	-0.3	-0.2	0.0	0.0	-0.2
Diversifying	-0.3	0.4	-0.7	0.0	0.0	0.0	-0.1
Liquidity	0.3	-0.4	0.7	0.1	0.1	0.0	0.2
Total Fund	2.4	2.4	0.0	-0.1	0.2	-0.1	0.0

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

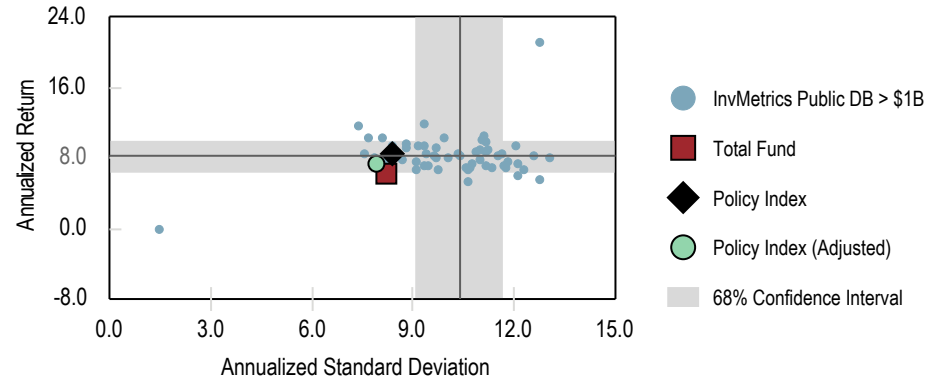
Total Fund
Executive Summary (Net of Fees)

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

3 Years

	Anlzd Return	Ann Excess Performance	Anlzd Standard Deviation	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Information Ratio	Up Capture	Down Capture
Total Fund	6.38	-2.18	8.21	-1.74	0.97	1.49	0.97	0.64	-1.38	91.42	107.30

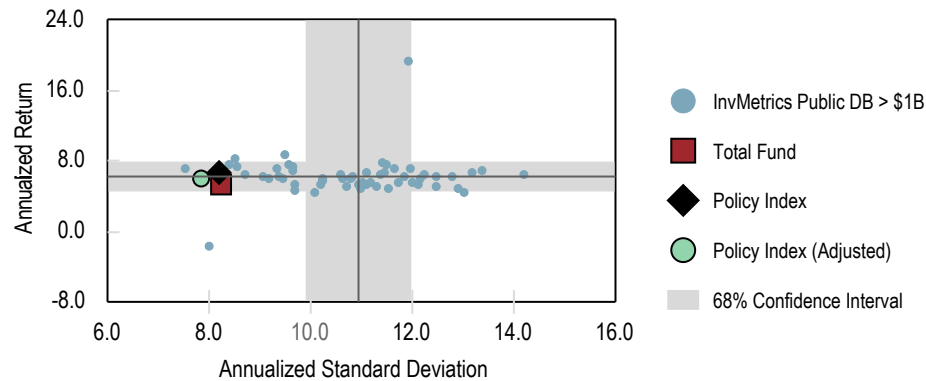
Risk vs. Return



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	5.35	-1.46	8.23	-1.22	0.98	1.88	0.95	0.48	-0.73	94.87	107.08

Risk vs. Return



Total Fund
Performance Summary (Gross of Fees)

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

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Total Fund	10,506,591,019	100.0	2.5	5.7	6.7	5.6	7.1	-10.4	14.2	9.5	14.9	-2.5		
Policy Index			2.5	6.4	8.6	6.8	7.7	-8.3	15.3	10.8	14.6	-0.9		
Policy Index (Adjusted)			2.5	6.4	7.5	6.2	7.2	-8.3	15.3	8.5	14.1	-1.5		
InvMetrics Public DB > \$1B Rank			73	88	94	84	54	43	66	79	90	31		
Total Fund ex Overlay & Cash	10,243,681,800	97.5	2.5	5.7	7.0	5.9	7.3	-9.8	14.6	9.7	14.7	-2.1		
Policy Index			2.5	6.4	8.6	6.8	7.7	-8.3	15.3	10.8	14.6	-0.9		
Policy Index (Adjusted)			2.5	6.4	7.5	6.2	7.2	-8.3	15.3	8.5	14.1	-1.5		
InvMetrics Public DB > \$1B Rank			72	88	93	73	52	38	60	75	91	24		
Growth	8,212,549,385	78.2	3.1	7.0	9.7	7.4	8.8	-11.4	19.6	12.4	18.7	-3.6		
Custom Growth Benchmark			3.3	8.1	12.3	8.9	9.3	-10.2	21.6	13.8	19.3	-2.1		
Total Domestic Equity	1,860,303,986	17.7	7.0	17.6	12.4	8.9	11.4	-18.3	20.6	22.2	26.7	-7.2		
Russell 3000 Index			8.4	19.0	13.9	11.4	12.3	-19.2	25.7	20.9	31.0	-5.2		
InvMetrics Public DB US Equity Rank			67	63	82	99	87	47	99	15	100	77		
BlackRock Russell 1000 Index	1,016,442,905	9.7	8.6	19.4	14.1	11.9	-	-19.1	26.5	21.0	31.4	-4.8	12.4	May-17
Russell 1000 Index			8.6	19.4	14.1	11.9	-	-19.1	26.5	21.0	31.4	-4.8	12.3	
eV US Large Cap Equity Rank			34	36	49	40	-	69	55	35	40	50		
Boston Partners	416,630,766	4.0	4.7	12.0	17.7	9.4	10.3	-3.8	31.3	3.0	24.3	-8.7	10.6	Jun-95
Russell 1000 Value Index			4.1	11.5	14.3	8.1	9.2	-7.5	25.2	2.8	26.5	-8.3	9.1	
eV US Large Cap Value Equity Rank			40	54	22	49	47	36	18	63	79	58		
Emerald Advisers	221,725,345	2.1	8.9	20.9	8.1	6.6	11.4	-23.8	5.5	39.0	30.3	-10.1	12.5	Apr-03
Russell 2000 Growth Index			7.1	18.5	6.1	4.2	8.8	-26.4	2.8	34.6	28.5	-9.3	10.3	
eV US Small Cap Growth Equity Rank			11	22	56	74	50	27	77	57	49	86		
Ceredex	205,504,972	2.0	2.4	18.1	17.7	5.1	8.8	-8.5	28.4	2.3	18.4	-11.3	10.1	Nov-11
Russell 2000 Value Index			3.2	6.0	15.4	3.5	7.3	-14.5	28.3	4.6	22.4	-12.9	9.1	
eV US Small Cap Value Equity Rank			76	22	58	75	63	27	59	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: June 30, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Total International Equity	1,650,873,116	15.7	3.3	12.2	7.5	4.6	5.9	-18.2	8.3	15.8	23.7	-14.3		
MSCI AC World ex USA Index			2.7	13.3	7.7	4.0	5.2	-15.6	8.3	11.1	22.1	-13.8		
MSCI EAFE Index			3.2	19.4	9.5	4.9	5.9	-14.0	11.8	8.3	22.7	-13.4		
InvMetrics Public DB Global ex-US Equity Rank			34	80	40	45	45	68	50	27	43	66		
International Equity	935,339,523	8.9	2.8	14.7	7.1	5.8	6.7	-18.1	9.0	19.0	27.0	-13.6		
MSCI AC World ex USA Index			2.7	13.3	7.7	4.0	5.2	-15.6	8.3	11.1	22.1	-13.8		
InvMetrics Public DB Global ex-US Equity Rank			69	65	59	18	13	64	36	8	16	40		
Pyrford	480,757,874	4.6	2.7	13.7	8.2	5.7	-	-7.0	7.6	4.7	22.1	-10.1	4.4	May-14
MSCI AC World ex USA Value			3.0	12.2	10.4	2.7	-	-8.6	10.5	-0.8	15.7	-14.0	2.0	
eV ACWI ex-US Value Equity Rank			61	71	94	23	-	19	83	45	36	5		
William Blair	454,581,649	4.3	2.9	16.1	5.6	5.7	6.9	-27.7	10.5	33.3	32.0	-16.8	6.6	Nov-10
MSCI AC World ex USA Growth			1.9	13.3	4.0	4.1	5.6	-23.1	5.1	22.2	27.3	-14.4	4.9	
eV ACWI ex-US Growth Equity Rank			47	57	49	46	63	59	42	36	36	72		
Emerging Markets Equity	715,533,593	6.8	4.1	9.0	8.4	3.1	-	-18.4	7.6	11.4	19.4	-15.3		
MSCI Emerging Markets			0.9	1.7	2.3	0.9	-	-20.1	-2.5	18.3	18.4	-14.6		
InvMetrics Public DB Emerging Markets Equity Rank			31	28	7	8	-	29	28	68	27	67		
PIMCO RAE Emerging Markets	385,958,815	3.7	6.4	19.5	15.3	5.3	-	-9.7	17.1	2.1	14.6	-12.3	5.5	Mar-17
MSCI Emerging Markets Value			2.5	4.1	6.3	1.2	-	-15.8	4.0	5.5	12.0	-10.7	2.4	
eV Emg Mkts All Cap Value Equity Rank			8	6	10	27	-	32	8	85	78	44		
TT Emerging Markets	329,574,778	3.1	1.5	-1.2	2.1	1.0	-	-26.4	-0.2	20.8	24.8	-18.4	1.1	Aug-17
MSCI Emerging Markets			0.9	1.7	2.3	0.9	-	-20.1	-2.5	18.3	18.4	-14.6	1.1	
eV Emg Mkts Equity Rank			61	95	75	80	-	90	58	38	24	82		
Total Global Equity	1,075,994,466	10.2	4.7	16.2	8.4	8.8	9.9	-18.8	14.1	25.3	28.9	-7.8		
MSCI AC World Index			6.2	16.5	11.0	8.1	8.8	-18.4	18.5	16.3	26.6	-9.4		
InvMetrics Public DB Global Equity Rank			45	84	99	1	1	84	61	1	17	20		
Artisan Partners	536,371,052	5.1	6.1	18.2	6.0	9.9	12.1	-29.6	15.0	41.7	37.0	-7.9	12.0	Oct-12
MSCI ACWI Growth NR USD			9.2	23.1	9.6	10.4	11.0	-28.6	17.1	33.6	32.7	-8.1	11.0	
eV Global Growth Equity Rank			46	44	67	31	19	60	56	34	12	60		
First Eagle	539,500,613	5.1	3.4	14.5	11.0	7.4	7.8	-5.6	13.0	8.5	21.0	-7.6	8.0	Jan-11
MSCI ACWI Value NR USD			3.0	10.0	11.8	5.2	6.2	-7.5	19.6	-0.3	20.6	-10.8	6.0	
eV Global Value Equity Rank			56	56	70	25	28	20	85	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: June 30, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Private Credit	1,060,154,131	10.1	4.6	7.6	10.9	8.5	9.9	10.5	10.0	4.0	7.7	8.3		
Total High Yield	147,379,539	1.4	1.3	9.3	3.3	3.2	3.9	-10.6	5.3	5.2	15.3	-3.2		
ICE BofA U.S. High Yield Index			1.6	8.9	3.2	3.2	4.3	-11.2	5.4	6.2	14.4	-2.3		
eV US High Yield Fixed Inc Rank			72	37	67	82	88	75	54	72	35	90		
Voya Global Investors	147,379,539	1.4	1.3	9.3	3.3	3.2	3.9	-10.6	5.3	5.2	15.3	-3.2	6.1	May-00
ICE BofA U.S. High Yield Index			1.6	8.9	3.2	3.2	4.3	-11.2	5.4	6.2	14.4	-2.3	6.3	
eV US High Yield Fixed Inc Rank			72	37	67	82	88	75	54	72	35	90		
Total Real Estate	779,162,278	7.4	-2.6	-9.0	2.0	2.4	7.0	-4.8	19.2	-5.9	8.1	7.4		
Real Estate Benchmark			-2.6	-8.4	4.0	4.0	6.6	-4.1	19.3	0.7	7.6	6.7		
NCREIF-ODCE			-2.7	-10.0	8.0	6.5	8.7	7.5	22.2	1.2	5.3	8.3		
NCREIF Property Index			-2.0	-6.6	6.8	5.9	7.8	5.5	17.7	1.6	6.4	6.7		
Total Core Real Estate	198,545,294	1.9	2.2	-2.7	9.4	6.1	7.6	-24.8	48.3	-4.6	28.2	-5.0		
Adelante	90,003,387	0.9	4.2	0.2	9.7	6.3	7.7	-26.7	48.3	-4.6	28.2	-5.0	9.5	Oct-01
Wilshire U.S. REIT Index			3.3	-0.3	8.6	4.4	6.4	-26.8	46.2	-7.9	25.8	-4.8	8.9	
Invesco US Fundamental Beta	108,541,907	1.0	0.6	-4.9	-	-	-	-	-	-	-	-	-10.2	Mar-22
Wilshire U.S. REIT Index			3.3	-0.3	-	-	-	-	-	-	-	-	-10.0	
Total Private Real Estate	580,616,984	5.5	-4.1	-10.9	1.6	2.2	7.1	1.9	15.3	-6.1	6.2	8.8		
Private Equity	1,306,037,349	12.4	-0.1	-4.9	20.1	14.6	13.8	-0.5	60.4	8.7	8.4	12.0		
Risk Parity	332,644,519	3.2	-1.8	-3.1	0.1	-	-	-21.5	9.7	10.0	18.1	-		
60% MSCI ACWI Net/40% Blmbg. Global Aggregate			3.1	9.2	4.5	-	-	-17.3	8.8	14.0	18.6	-		
AQR Global Risk Premium-EL	170,170,821	1.6	-1.0	-1.1	2.2	-	-	-16.3	10.7	6.2	18.7	-	4.2	Jan-19
HFR Risk Parity Vol 10 Index			0.1	1.0	0.3	-	-	-18.3	6.8	3.6	18.4	-	2.5	
PanAgora Risk Parity Multi Asset	162,473,698	1.5	-2.5	-5.3	-1.8	-	-	-26.1	8.7	14.0	-	-	1.4	Mar-19
HFR Risk Parity Vol 10 Index			0.1	1.0	0.3	-	-	-18.3	6.8	3.6	-	-	1.2	

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: June 30, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Diversifying	775,169,656	7.4	-0.2	-1.0	0.0	0.5	0.7	-5.4	2.0	-1.3	7.1	-2.0		
<i>Custom Diversifying Benchmark</i>			0.4	2.7	0.5	2.1	2.9	-5.4	1.6	4.7	6.1	1.4		
Diversifying Fixed Income	221,087,687	2.1	-0.8	-1.9	-3.9	-0.7	0.9	-13.3	-0.7	1.6	8.6	-1.7		
<i>Blmbg. U.S. Aggregate Index</i>			-0.8	-0.9	-4.0	0.8	1.5	-13.0	-1.5	7.5	8.7	0.0		
<i>eV US Core Fixed Inc Rank</i>			84	99	90	100	100	76	32	100	81	100		
AFL-CIO	221,026,841	2.1	-0.8	-1.9	-3.9	0.7	1.6	-13.3	-0.7	6.6	8.2	0.6	5.2	Jul-91
<i>Blmbg. U.S. Aggregate Index</i>			-0.8	-0.9	-4.0	0.8	1.5	-13.0	-1.5	7.5	8.7	0.0	4.9	
<i>eV US Core Fixed Inc Rank</i>			84	100	90	98	93	76	32	96	88	14		
Diversifying Multi-Asset	554,081,970	5.3	0.0	-0.6	-	-	-	-1.9	2.8	-	-	-		
<i>Custom Diversifying Multi-Asset Benchmark</i>			1.0	4.6	-	-	-	-3.1	4.1	-	-	-		
Acadian Multi-Asset Absolute Return Fund	248,722,202	2.4	-1.2	-2.6	-	-	-	-0.1	1.7	-	-	-	0.4	Aug-20
<i>FTSE 3-Month T-bill +5%</i>			2.5	8.9	-	-	-	6.6	5.0	-	-	-	6.4	
Sit LLCAR	305,359,768	2.9	1.0	1.2	-	-	-	-3.3	-	-	-	-	1.9	Apr-21
<i>Blmbg. U.S. Aggregate Index +1%</i>			-0.6	0.1	-	-	-	-12.1	-	-	-	-	-3.4	
Liquidity	1,255,962,758	12.0	0.3	1.6	-0.3	1.6	-	-3.4	-0.2	3.5	4.9	1.8		
<i>Blmbg. 1-3 Year Gov/Credit Index</i>			-0.4	0.5	-0.9	1.1	-	-3.7	-0.5	3.3	4.0	1.6		
<i>eV US Short Duration Fixed Inc Rank</i>			24	47	55	45	-	49	45	75	39	25		
DFA Short Credit	285,679,415	2.7	0.8	2.3	-0.9	1.2	-	-5.3	-0.4	2.9	5.2	1.2	1.1	Dec-16
<i>ICE BofA 1-5 Year U.S. Corp/Govt Index</i>			-0.6	0.2	-1.5	1.2	-	-5.5	-0.9	4.6	5.1	1.4	1.0	
<i>eV US Short Duration Fixed Inc Rank</i>			12	23	82	86	-	90	67	89	26	90		
Insight Short Duration	459,458,946	4.4	0.9	2.5	0.7	2.0	-	-1.1	0.1	3.2	4.7	1.7	1.8	Dec-16
<i>Blmbg. 1-3 Year Gov/Credit index</i>			-0.4	0.5	-0.9	1.1	-	-3.7	-0.5	3.3	4.0	1.6	1.0	
<i>eV US Short Duration Fixed Inc Rank</i>			9	21	18	16	-	6	31	85	48	38		
Sit Short Duration	510,824,397	4.9	-0.4	0.4	-1.1	1.6	-	-4.8	-0.3	4.6	4.9	2.5	1.4	Dec-16
<i>Blmbg. 1-3 Year Govt Index</i>			-0.6	0.2	-1.1	0.9	-	-3.8	-0.6	3.1	3.6	1.6	0.8	
<i>eV US Short Duration Fixed Inc Rank</i>			84	89	87	47	-	79	58	28	39	3		
Total Cash	147,659,708	1.4	1.4	1.5	0.9	1.6	1.0	2.4	0.4	1.3	3.3	1.7	10.6	Dec-03
<i>90 Day U.S. Treasury Bill</i>			1.2	3.6	1.3	1.6	1.0	1.5	0.0	0.7	2.3	1.9	1.3	
Cash	147,655,463	1.4	1.4	5.1	2.0	2.3	1.8	2.2	0.4	1.3	3.4	1.7	17.7	Apr-98
Northern Trust Transition	4,246	0.0	1.3	-99.2	-76.5	-	-	-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: June 30, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Total Fund	10,506,591,019	100.0	2.4	5.5	6.4	5.3	6.7	-10.6	13.9	9.2	14.6	-2.7		
Policy Index			2.5	6.4	8.6	6.8	7.7	-8.3	15.3	10.8	14.6	-0.9		
Policy Index (Adjusted)			2.5	6.4	7.5	6.2	7.2	-8.3	15.3	8.5	14.1	-1.5		
Total Fund ex Overlay & Cash	10,243,681,800	97.5	2.4	5.5	6.7	5.6	6.9	-10.1	14.3	9.4	14.3	-2.4		
Policy Index			2.5	6.4	8.6	6.8	7.7	-8.3	15.3	10.8	14.6	-0.9		
Policy Index (Adjusted)			2.5	6.4	7.5	6.2	7.2	-8.3	15.3	8.5	14.1	-1.5		
Growth	8,212,549,385	78.2	3.0	6.8	9.4	7.1	8.3	-11.6	19.2	12.0	18.3	-3.9		
Custom Growth Benchmark			3.3	8.1	12.3	8.9	9.3	-10.2	21.6	13.8	19.3	-2.1		
Total Domestic Equity	1,860,303,986	17.7	6.9	17.4	12.0	8.5	11.0	-18.5	20.2	21.8	26.1	-7.6		
Russell 3000 Index			8.4	19.0	13.9	11.4	12.3	-19.2	25.7	20.9	31.0	-5.2		
BlackRock Russell 1000 Index	1,016,442,905	9.7	8.6	19.4	14.1	11.9	-	-19.1	26.5	20.9	31.4	-4.8	12.3	May-17
Russell 1000 Index			8.6	19.4	14.1	11.9	-	-19.1	26.5	21.0	31.4	-4.8	12.3	
Boston Partners	416,630,766	4.0	4.6	11.6	17.4	9.0	10.0	-4.1	31.0	2.6	23.8	-8.9	10.4	Jun-95
Russell 1000 Value Index			4.1	11.5	14.3	8.1	9.2	-7.5	25.2	2.8	26.5	-8.3	9.1	
Emerald Advisers	221,725,345	2.1	8.7	20.2	7.5	6.0	10.7	-24.2	4.9	38.2	29.4	-10.7	12.1	Apr-03
Russell 2000 Growth Index			7.1	18.5	6.1	4.2	8.8	-26.4	2.8	34.6	28.5	-9.3	10.1	
Ceredex	205,504,972	2.0	2.2	17.5	17.0	4.5	8.2	-9.0	27.7	1.7	17.7	-11.8	9.5	Nov-11
Russell 2000 Value Index			3.2	6.0	15.4	3.5	7.3	-14.5	28.3	4.6	22.4	-12.9	9.1	
Total International Equity	1,650,873,116	15.7	3.3	11.8	7.1	4.2	5.4	-18.6	7.8	15.2	23.2	-14.7		
MSCI AC World ex USA Index			2.7	13.3	7.7	4.0	5.2	-15.6	8.3	11.1	22.1	-13.8		
MSCI EAFE Index			3.2	19.4	9.5	4.9	5.9	-14.0	11.8	8.3	22.7	-13.4		
International Equity	935,339,523	8.9	2.7	14.3	6.7	5.4	6.3	-18.4	8.6	18.5	26.5	-13.9		
MSCI AC World ex USA Index			2.7	13.3	7.7	4.0	5.2	-15.6	8.3	11.1	22.1	-13.8		
Pyrford	480,757,874	4.6	2.6	13.2	7.8	5.3	-	-7.4	7.1	4.2	21.6	-10.5	3.9	May-14
MSCI AC World ex USA Value			3.0	12.2	10.4	2.7	-	-8.6	10.5	-0.8	15.7	-14.0	2.0	
William Blair	454,581,649	4.3	2.8	15.6	5.2	5.3	6.5	-28.0	10.1	32.8	31.5	-17.1	6.2	Nov-10
MSCI AC World ex USA Growth			1.9	13.3	4.0	4.1	5.6	-23.1	5.1	22.2	27.3	-14.4	4.9	
Emerging Markets Equity	715,533,593	6.8	4.1	8.6	7.9	2.5	-	-18.9	7.0	10.7	18.7	-15.7		
MSCI Emerging Markets			0.9	1.7	2.3	0.9	-	-20.1	-2.5	18.3	18.4	-14.6		
PIMCO RAE Emerging Markets	385,958,815	3.7	6.4	19.1	14.7	4.8	-	-10.1	16.5	1.6	14.0	-12.6	5.0	Mar-17
MSCI Emerging Markets Value			2.5	4.1	6.3	1.2	-	-15.8	4.0	5.5	12.0	-10.7	2.4	
TT Emerging Markets	329,574,778	3.1	1.5	-1.5	1.5	0.4	-	-26.8	-0.9	20.0	24.0	-18.9	0.5	Aug-17
MSCI Emerging Markets			0.9	1.7	2.3	0.9	-	-20.1	-2.5	18.3	18.4	-14.6	1.1	

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: June 30, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Total Global Equity	1,075,994,466	10.2	4.5	15.4	7.6	8.0	9.1	-19.4	13.2	24.4	27.9	-8.5		
MSCI AC World Index			6.2	16.5	11.0	8.1	8.8	-18.4	18.5	16.3	26.6	-9.4		
Artisan Partners	536,371,052	5.1	5.9	17.3	5.2	9.1	11.3	-30.1	14.1	40.6	36.0	-8.6	11.2	Oct-12
MSCI ACWI Growth NR USD			9.2	23.1	9.6	10.4	11.0	-28.6	17.1	33.6	32.7	-8.1	11.0	
First Eagle	539,500,613	5.1	3.2	13.7	10.2	6.6	7.0	-6.3	12.1	7.7	20.1	-8.3	7.2	Jan-11
MSCI ACWI Value NR USD			3.0	10.0	11.8	5.2	6.2	-7.5	19.6	-0.3	20.6	-10.8	6.0	
Private Credit	1,060,154,131	10.1	4.6	7.6	10.9	8.5	9.3	10.5	10.0	4.0	7.7	8.3		
Total High Yield	147,379,539	1.4	1.3	8.9	2.9	2.8	3.5	-10.9	4.9	4.7	14.7	-3.6		
ICE BofA US High Yield Master II			1.6	8.9	3.2	3.2	4.3	-11.2	5.3	6.1	14.4	-2.3		
Voya Global Investors	147,379,539	1.4	1.3	8.9	2.9	2.8	3.5	-10.9	4.9	4.7	14.7	-3.6	5.9	May-00
ICE BofA US High Yield Master II			1.6	8.9	3.2	3.2	4.3	-11.2	5.3	6.1	14.4	-2.3	6.4	
Total Real Estate	779,162,278	7.4	-2.6	-9.1	2.0	2.3	6.5	-4.9	19.2	-6.0	8.1	7.4		
Real Estate Benchmark			-2.6	-8.4	4.0	4.0	6.6	-4.1	19.3	0.7	7.6	6.7		
NCREIF-ODCE			-2.7	-10.0	8.0	6.5	8.7	7.5	22.2	1.2	5.3	8.3		
NCREIF Property Index			-2.0	-6.6	6.8	5.9	7.8	5.5	17.7	1.6	6.4	6.7		
Total Core Real Estate	198,545,294	1.9	2.1	-3.0	8.9	5.6	7.1	-25.1	47.5	-5.2	27.5	-5.5		
Adelante	90,003,387	0.9	4.0	-0.4	9.1	5.7	7.2	-27.2	47.5	-5.2	27.5	-5.5	9.2	Oct-01
Wilshire U.S. REIT Index			3.3	-0.3	8.6	4.4	6.4	-26.8	46.2	-7.9	25.8	-4.8	8.9	
Invesco US Fundamental Beta	108,541,907	1.0	0.6	-5.0	-	-	-	-	-	-	-	-	-10.3	Mar-22
Wilshire U.S. REIT Index			3.3	-0.3	-	-	-	-	-	-	-	-	-10.0	
Total Private Real Estate	580,616,984	5.5	-4.1	-10.9	1.6	2.2	6.7	1.9	15.3	-6.1	6.2	8.8		
Private Equity	1,306,037,349	12.4	-0.1	-4.9	20.1	14.6	13.2	-0.5	60.4	8.7	8.4	12.0		
Risk Parity	332,644,519	3.2	-1.8	-3.5	-0.3	-	-	-21.8	9.3	9.6	17.7	-		
60% MSCI ACWI Net/40% Blmbg. Global Aggregate			3.1	9.2	4.5	-	-	-17.3	8.8	14.0	18.6	-		
AQR Global Risk Premium-EL	170,170,821	1.6	-1.0	-1.4	1.9	-	-	-16.6	10.3	5.8	18.3	-	3.8	Jan-19
HFR Risk Parity Vol 10 Index			0.1	1.0	0.3	-	-	-18.3	6.8	3.6	18.4	-	2.5	
PanAgora Risk Parity Multi Asset	162,473,698	1.5	-2.6	-5.6	-2.2	-	-	-26.3	8.3	13.6	-	-	1.1	Mar-19
HFR Risk Parity Vol 10 Index			0.1	1.0	0.3	-	-	-18.3	6.8	3.6	-	-	1.2	

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: June 30, 2023

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Diversifying	775,169,656	7.4	-0.3	-1.4	-0.4	0.1	0.3	-5.7	1.7	-1.7	6.8	-2.3		
Custom Diversifying Benchmark			0.4	2.7	0.5	2.1	2.9	-5.4	1.6	4.7	6.1	1.4		
Diversifying Fixed Income	221,087,687	2.1	-0.9	-2.2	-4.2	-1.0	0.6	-13.5	-1.0	1.2	8.3	-2.0		
Blmbg. U.S. Aggregate Index			-0.8	-0.9	-4.0	0.8	1.5	-13.0	-1.5	7.5	8.7	0.0		
AFL-CIO	221,026,841	2.1	-0.9	-2.2	-4.2	0.3	1.2	-13.6	-1.0	6.2	7.8	0.2	4.9	Jul-91
Blmbg. U.S. Aggregate Index			-0.8	-0.9	-4.0	0.8	1.5	-13.0	-1.5	7.5	8.7	0.0	4.9	
Diversifying Multi-Asset	554,081,970	5.3	-0.1	-1.0	-	-	-	-2.3	2.4	-	-	-		
Custom Diversifying Multi-Asset Benchmark			1.0	4.6	-	-	-	-3.1	4.1	-	-	-		
Acadian Multi-Asset Absolute Return Fund	248,722,202	2.4	-1.3	-3.1	-	-	-	-0.6	1.1	-	-	-	-0.1	Aug-20
FTSE 3-Month T-bill +5%			2.5	8.9	-	-	-	6.6	5.0	-	-	-	6.4	
Sit LLCAR	305,359,768	2.9	0.9	0.9	-	-	-	-3.7	-	-	-	-	1.6	Apr-21
Blmbg. U.S. Aggregate +1%			-0.6	0.1	-	-	-	-12.1	-	-	-	-	-3.4	
Liquidity	1,255,962,758	12.0	0.3	1.5	-0.4	1.5	-	-3.5	-0.3	3.4	4.8	1.7		
Blmbg. 1-3 Year Gov/Credit Index			-0.4	0.5	-0.9	1.1	-	-3.7	-0.5	3.3	4.0	1.6		
DFA Short Credit	285,679,415	2.7	0.8	2.2	-1.0	1.1	-	-5.4	-0.5	2.8	5.2	1.1	1.0	Dec-16
ICE BofA 1-5 Year U.S. Corp/Govt			-0.6	0.2	-1.5	1.2	-	-5.5	-0.9	4.6	5.1	1.4	1.0	
Insight Short Duration	459,458,946	4.4	0.9	2.5	0.6	2.0	-	-1.2	0.0	3.1	4.6	1.7	1.8	Dec-16
Blmbg. 1-3 Year Gov/Credit index			-0.4	0.5	-0.9	1.1	-	-3.7	-0.5	3.3	4.0	1.6	1.0	
Sit Short Duration	510,824,397	4.9	-0.4	0.2	-1.2	1.5	-	-5.0	-0.5	4.4	4.7	2.3	1.3	Dec-16
Blmbg. 1-3 Year Govt Index			-0.6	0.2	-1.1	0.9	-	-3.8	-0.6	3.1	3.6	1.6	0.8	
Total Cash	147,659,708	1.4	1.4	1.5	0.9	1.6	1.0	2.4	0.4	1.3	3.3	1.7		
90 Day U.S. Treasury Bill			1.2	3.6	1.3	1.6	1.0	1.5	0.0	0.7	2.3	1.9		
Cash	147,655,463	1.4	1.4	5.1	2.0	2.3	1.8	2.2	0.4	1.3	3.4	1.7		
Northern Trust Transition	4,246	0.0	1.3	-99.2	-76.5	-	-	-4.8	-6.1	104.1	-	-		

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: June 30, 2023

StepStone Group Analysis (*)												
Closing Date	Manager Name/Fund Name	Estimated Market Value as of 6/30/2023 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	\$124,200,627	\$210,000,000	93%	\$194,765,257	\$0	\$4,121,330	\$272,629,805	\$15,234,743	1.40	2.04	12/31/2022
1/15/2009	Adams Street Partners II	\$3,576,474	\$30,000,000	95%	\$28,365,000	\$0	\$0	\$45,385,528	\$1,635,000	1.60	1.73	3/31/2023
9/21/2012	Adams Street Partners - Fund 5	\$10,842,424	\$40,000,000	77%	\$30,845,875	\$0	\$915,072	\$31,101,976	\$9,154,125	1.01	1.36	3/31/2023
1/18/1996	Adams Street Partners - BPF	\$471,906	\$59,565,614	97%	\$57,517,409	\$0	\$0	\$103,896,144	\$2,048,205	1.81	1.81	12/31/2022
3/31/2016	Adams Street Venture Innovation	\$169,476,537	\$75,000,000	90%	\$67,496,738	\$1,459,238	\$1,880,797	\$32,667,487	\$7,503,262	0.48	2.99	3/31/2023
5/18/2018	AE Industrial Partners Fund II, LP	\$39,275,612	\$35,000,000	98%	\$34,356,148	\$1,261,723	\$0	\$14,823,352	\$9,752,530	0.43	1.57	3/31/2023
11/27/2013	Aether Real Assets III	\$17,650,900	\$25,000,000	104%	\$26,027,077	\$0	\$0	\$6,937,064	\$1,295,313	0.27	0.94	3/31/2023
11/30/2013	Aether Real Assets III Surplus	\$42,420,257	\$50,000,000	106%	\$52,761,318	\$0	\$0	\$13,496,164	\$855,648	0.26	1.06	3/31/2023
1/30/2016	Aether Real Assets IV	\$58,179,233	\$50,000,000	101%	\$50,552,308	\$515,820	\$917,407	\$6,309,771	\$4,152,278	0.12	1.28	3/31/2023
4/30/2004	Bay Area Equity Fund I ⁴	-\$2,816	\$10,000,000	100%	\$10,000,000	\$0	\$0	\$37,018,019	\$0	3.70	3.70	3/31/2023
6/29/2009	Bay Area Equity Fund II ⁴	\$19,810,993	\$10,000,000	100%	\$10,000,000	\$0	\$0	\$3,684,910	\$0	0.37	2.35	3/31/2023
6/30/2013	Commonfund	\$36,800,282	\$50,000,000	95%	\$47,649,993	\$125,000	\$1,477,172	\$31,602,780	\$2,350,007	0.66	1.44	12/31/2022
7/15/2005	EIF US Power Fund II ⁴	\$58,920	\$50,000,000	130%	\$65,029,556	\$0	\$0	\$76,092,655	\$0	1.17	1.17	3/31/2023
5/31/2007	EIF US Power Fund III ⁴	\$2,004,391	\$65,000,000	110%	\$71,409,097	\$0	\$0	\$92,933,824	\$0	1.30	1.33	3/31/2023
11/28/2011	EIF US Power Fund IV	\$18,496,965	\$50,000,000	130%	\$64,917,547	\$0	\$3,382,254	\$49,937,166	\$4	0.77	1.05	3/31/2023
11/28/2016	EIF US Power Fund V	\$26,737,625	\$50,000,000	139%	\$69,328,438	\$0	\$4,121,579	\$64,347,345	\$6,194,129	0.93	1.31	12/31/2022
3/31/2023	EQT X, L.P.	-\$881,505	\$100,000,000	2%	\$2,045,376	\$1,192,279	\$760,839	\$1,613,936	\$99,568,560	0.79	0.36	3/31/2023
2/21/2019	Genstar Capital Partners IX, L.P.	\$65,779,809	\$50,000,000	95%	\$47,741,425	\$158,685	\$1,836,517	\$23,307,797	\$7,714,575	0.49	1.87	3/31/2023
4/1/2021	Genstar Capital Partners X, L.P.	\$28,386,521	\$42,500,000	64%	\$27,088,778	\$2,964,998	\$82,201	\$82,201	\$15,493,423	0.00	1.05	3/31/2023
6/30/2023	Genstar Capital Partners XI, L.P.	\$0	\$75,000,000	0%	\$0	\$0	\$0	\$0	\$75,000,000	N/A	N/A	N/A
6/30/2023	Green Equity Investors IX	\$340,032	\$60,000,000	0%	\$0	\$0	\$0	\$0	\$60,000,000	N/A	N/A	6/30/2023
10/27/2020	GTCR Fund XIII, L.P.	\$24,254,624	\$50,000,000	51%	\$25,572,753	\$0	\$0	\$5,446,907	\$24,427,247	0.21	1.16	3/31/2023
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.	\$55,050,745	\$75,000,000	72%	\$53,972,224	\$0	\$0	\$0	\$21,027,776	0.00	1.02	3/31/2023
3/31/2023	Jade Equity Investors II, LP	-\$21,114	\$15,000,000	0%	\$0	\$0	\$0	\$0	\$15,000,000	N/A	N/A	3/31/2023
11/18/2009	Oaktree PIF 2009	\$360,651	\$40,000,000	87%	\$34,812,560	\$0	\$0	\$47,032,470	\$6,308,961	1.35	1.36	3/31/2023
5/2/2013	Ocean Avenue Fund II	\$26,288,371	\$30,000,000	90%	\$27,000,000	\$0	\$0	\$44,016,744	\$3,000,000	1.63	2.60	3/31/2023
4/15/2016	Ocean Avenue Fund III	\$51,500,814	\$50,000,000	93%	\$46,500,000	\$0	\$0	\$54,209,752	\$3,500,000	1.17	2.27	3/31/2023
11/30/2007	Paladin III	\$9,618,297	\$25,000,000	139%	\$34,836,639	\$0	\$0	\$71,182,958	\$387,482	2.04	2.32	3/31/2023
8/22/2011	Pathway 6	\$30,333,121	\$40,000,000	99%	\$39,530,012	\$74,311	\$1,706,372	\$51,632,373	\$3,707,242	1.31	2.07	3/31/2023
7/10/2013	Pathway 7	\$66,052,037	\$70,000,000	99%	\$69,504,561	\$110,250	\$2,844,527	\$83,636,501	\$5,330,702	1.20	2.15	3/31/2023
11/23/2015	Pathway 8	\$69,138,595	\$50,000,000	96%	\$48,137,997	\$88,749	\$2,769,049	\$35,612,588	\$4,113,180	0.74	2.18	3/31/2023
1/19/1999	Pathway	\$2,484,159	\$125,000,000	101%	\$126,343,291	\$144,579	\$808,752	\$189,965,909	\$10,492,756	1.50	1.52	12/31/2022
7/31/2009	Pathway 2008	\$12,052,510	\$30,000,000	101%	\$30,192,222	\$46,336	\$1,079,684	\$51,674,959	\$2,691,369	1.71	2.11	3/31/2023
6/3/2014	Siguler Guff CCCERA Opportunities	\$131,657,570	\$200,000,000	88%	\$175,083,208	\$0	\$870,349	\$210,053,442	\$28,597,500	1.20	1.95	3/31/2023
5/18/2018	Siris Partners IV, L.P.	\$40,772,516	\$35,000,000	85%	\$29,789,444	\$357,934	\$181,344	\$4,346,561	\$7,949,620	0.15	1.51	3/31/2023
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.	\$30,483,765	\$50,000,000	66%	\$33,000,000	\$4,000,000	\$0	\$0	\$17,000,000	0.00	0.92	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.	\$22,913,619	\$24,000,000	93%	\$22,423,552	\$2,361,368	\$0	\$6,221,617	\$4,328,185	0.28	1.30	3/31/2023
3/31/2023	TPG Healthcare Partners II	\$306,482	\$35,000,000	0%	\$0	\$0	\$0	\$0	\$35,000,000	N/A	N/A	3/31/2023
3/31/2023	TPG Partners IX	-\$215,671	\$65,000,000	0%	\$0	\$0	\$0	\$0	\$65,000,000	N/A	N/A	3/31/2023
9/17/2021	Trident IX, L.P.	\$15,191,723	\$50,000,000	33%	\$16,314,603	\$0	\$0	\$0	\$33,685,397	N/A	N/A	N/A
5/24/2019	Trident VIII, L.P.	\$45,657,728	\$40,000,000	95%	\$38,061,234	\$476,240	\$192,267	\$3,135,206	\$4,777,416	0.08	1.28	3/31/2023
12/8/2015	Wastewater Opportunity Fund	\$8,531,620	\$25,000,000	126%	\$31,512,759	\$0	\$429,508	\$27,076,172	\$521,541	0.86	1.13	3/31/2023
Total Private Equity and Venture Capital		\$1,306,037,349	\$2,551,065,614	72%	\$1,840,484,399	\$15,337,509	\$30,377,020	\$1,793,112,083	\$854,798,176	0.97	1.68	
% of Portfolio (Market Value)		12.4%										

* All Data provided by StepStone Group

¹ Latest valuation + capital calls - distributions

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

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

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

Total Fund
Closed End Funds - IRR Summary

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

Private Equity & Venture Capital	Closing Date	Fund Level (G) ²	CCCERA (G)	Fund Level (N) ^{2,3}	CCCERA (N) ³	IRR Date
Adams Street Partners	2/11/2004	12.1%	13.7%	-	11.8%	3/31/2023
Adams Street Partners II	12/31/2008	16.4%	16.4%	-	13.9%	3/31/2023
Adams Street Partners - Fund 5	12/31/2008	9.1%	9.0%	-	6.5%	3/31/2023
Adams Street Partners Venture	1/18/1996	38.0%	37.9%	-	35.8%	3/31/2023
Adams Street Partners - BPF	3/31/2016	14.2%	14.2%	-	11.6%	3/31/2023
AE Industrial Partners Fund II, LP	5/18/2018	28.8%	-	26.3%	-	3/31/2023
Aether Real Assets III ¹	11/27/2013	0.5%	-	-1.1%	-	3/31/2023
Aether Real Assets III Surplus ¹	11/30/2013	2.0%	-	1.0%	-	3/31/2023
Aether Real Assets IV ¹	1/30/2016	8.0%	-	6.2%	-	3/31/2023
Bay Area Equity Fund I ⁹	11/26/2003	31.3%	31.3%	22.9%	22.9%	3/31/2023
Bay Area Equity Fund II ⁹	11/26/2003	13.7%	13.7%	9.3%	9.3%	3/31/2023
CommonFund ¹	6/30/2013	-	-	-	8.2%	12/31/2022
Energy Investor Fund II ⁹	7/15/2005	5.7%	5.3%	2.9%	2.6%	12/31/2022
Energy Investor Fund III ⁹	5/31/2007	7.0%	-	4.4%	-	3/31/2023
Energy Investor Fund IV	8/31/2010	4.8%	-	1.3%	-	3/31/2023
Energy Investor Fund V	11/28/2016	18.0%	-	12.6%	-	3/31/2023
Genstar Capital Partners IX, L.P.	2/21/2019	49.2%	-	34.1%	-	3/31/2023
Oaktree PIF 2009	2/28/2010	6.8%	-	6.6%	-	3/31/2023
Ocean Avenue II	8/15/2013	-	-	19.8%	-	3/31/2023
Ocean Avenue III	4/15/2016	-	-	25.7%	-	3/31/2023
Paladin III	11/30/2007	20.3%	-	-	-	3/31/2023
Pathway 6	8/22/2011	16.5%	16.5%	14.5%	14.5%	3/31/2023
Benchmark ⁴		14.8%	-	-	-	3/31/2023
Pathway 7	7/10/2013	18.6%	18.6%	16.6%	16.6%	3/31/2023
Benchmark ⁵		15.7%	-	-	-	3/31/2023
Pathway 8	11/23/2015	21.2%	21.3%	19.9%	20.1%	3/31/2023
Benchmark ⁶		17.9%	-	-	-	3/31/2023
Pathway Private Equity Fund	1/19/1999	10.2%	10.2%	8.4%	8.4%	3/31/2023
Benchmark ⁷		10.4%	-	-	-	3/31/2023
Pathway Private Equity Fund 2008	7/31/2009	16.4%	16.4%	14.2%	14.2%	3/31/2023
Benchmark ⁸		13.5%	-	-	-	3/31/2023
Siguler Guff CCCERA Opportunities ¹	6/3/2014	18.6%	19.4%	18.1%	16.9%	3/31/2023
Siguler Guff Secondary Opportunities ⁹	8/31/2013	55.3%	118.4%	49.5%	69.0%	9/30/2020
Siris Partners IV, L.P.	5/18/2018	22.4%	-	17.9%	-	3/31/2023
TPG Healthcare Partners, L.P.	6/28/2019	28.0%	41.0%	-	24.0%	3/31/2023
Trident VIII, L.P.	5/24/2019	21.4%	-	16.8%	-	6/30/2023
Wastewater Opportunity Fund	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: June 30, 2023

StepStone Group Analysis (*)												
Closing Date	Manager Name/Fund Name	Estimated Market Value as of 6/30/2023 ¹	Total Commitment	% Called	Contributed Capital	Current Qtr. Change in Contributed Capital	Current Qtr. Change in Distributed Capital	Total Distributions	Remaining Commitment	Distrib./Paid-In (DPI) ²	Tot. Value/Paid-In (TVPI) ³	Latest Valuation
Private Credit												
8/31/2015	Angelo Gordon Energy Credit Opp. ⁴	\$1,926,290	\$16,500,000	114%	\$18,750,000	\$0	\$0	\$20,410,032	\$2,319,783	1.09	1.19	3/31/2023
12/18/2017	Stepstone CC Opportunities Fund	\$1,045,379,865	\$1,170,000,000	84%	\$985,956,363	-\$27,960,032	\$18,694,687	\$211,093,478	\$283,528,337	0.21	1.27	3/31/2023
8/1/2012	Torchlight IV	\$5,668,375	\$60,000,000	141%	\$84,866,971	\$0	\$0	\$108,261,644	\$0	1.28	1.34	6/30/2023
3/12/2015	Torchlight V	\$7,179,601	\$75,000,000	80%	\$60,000,000	\$0	\$0	\$71,460,214	\$15,000,000	1.19	1.31	3/31/2023
Total Private Credit		\$1,060,154,131										
% of Portfolio (Market Value)		10.1%										

*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: June 30, 2023

Verus Internal Analysis												
Inception Date	Manager Name/Fund Name	Estimated Market Value as of 6/30/2023 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	\$11,663,899	\$80,000,000	94%	\$75,401,855	\$0	\$0	\$101,711,550	\$12,334,302	1.35	1.50	3/31/2023
12/8/2014	Angelo Gordon Realty Fund IX	\$23,109,568	\$65,000,000	93%	\$60,125,000	\$0	\$1,300,000	\$56,550,001	\$7,572,500	0.94	1.32	3/31/2023
3/24/2023	Blackstone Real Estate Partners X	\$3,903,497	\$80,000,000	5%	\$4,265,226	\$3,890,731	\$0	\$0	\$75,734,774	0.00	0.92	3/31/2023
6/23/2005	DLJ RECP III	\$12,537,898	\$75,000,000	134%	\$100,709,313 ⁴	\$0	\$0	\$69,364,915	\$4,031,338	0.69	0.81	3/31/2023
2/11/2008	DLJ RECP IV	\$43,742,174	\$100,000,000	130%	\$130,117,329 ⁵	\$0	\$0	\$99,841,735	\$1,876,084	0.77	1.10	3/31/2023
7/1/2014	DLJ RECP V	\$29,822,329	\$75,000,000	143%	\$107,442,215 ⁶	\$53,954	\$0	\$100,933,448	\$15,567,682	0.94	1.22	3/31/2023
3/19/2019	DLJ RECP VI	\$27,859,722	\$50,000,000	67%	\$33,639,828	\$0	\$0	\$13,276,083	\$22,649,572	0.39	1.22	3/31/2023
6/30/2014	Invesco Real Estate IV ⁴	\$651,414	\$35,000,000	87%	\$30,546,401	\$0	\$0	\$39,777,325	\$4,453,599	1.30	1.32	6/30/2023
2/20/2019	Invesco Real Estate V	\$76,095,553	\$75,000,000	87%	\$65,318,898	\$3,556,212	\$0	\$9,319,462	\$9,681,102	0.14	1.31	6/30/2023
9/27/2022	Invesco Real Estate VI	\$43,038,149	\$100,000,000	46%	\$45,631,253	\$5,663,546	\$0	\$2,230,131	\$66,873,408	0.05	0.99	3/31/2023
7/16/2013	LaSalle Income & Growth VI ⁴	\$13,870,420	\$75,000,000	95%	\$71,428,571	\$0	\$0	\$84,541,423	\$0	1.18	1.38	3/31/2023
2/28/2017	LaSalle Income & Growth VII	\$42,435,903	\$75,000,000	96%	\$72,154,315	\$2,845,685	\$0	\$50,904,014	\$2,845,685	0.71	1.29	3/31/2023
7/3/2013	Long Wharf Fund IV ⁴	\$871,690	\$25,000,000	100%	\$25,000,000	\$0	\$0	\$34,948,087	\$0	1.40	1.43	6/30/2023
9/30/2016	Long Wharf Fund V ⁴	\$29,586,670	\$50,000,000	100%	\$50,000,000	\$0	\$0	\$37,244,373	\$0	0.74	1.34	6/30/2023
6/27/2019	Long Wharf Fund VI	\$34,525,266	\$50,000,000	99%	\$49,405,350	\$1,209,118	\$792,864	\$25,668,977	\$594,650	0.52	1.22	6/30/2023
5/30/2023	Long Wharf Fund VII	\$4,056,571	\$50,000,000	10%	\$4,943,391	\$4,943,391	\$0	\$0	\$45,056,609	0.00	0.82	6/30/2023
12/31/2011	Oaktree REOF V ⁴	\$345,437	\$50,000,000	101%	\$50,315,673	\$0	\$37,056	\$78,780,733	\$5,000,000 ⁶	1.57	1.57	6/30/2023
9/30/2013	Oaktree REOF VI ⁴	\$19,549,102	\$80,000,000	100%	\$80,000,000	\$0	\$1,680,000	\$84,810,175	\$18,400,000 ⁶	1.06	1.30	6/30/2023
4/1/2015	Oaktree REOF VII	\$44,971,119	\$65,000,000	100%	\$65,000,000	\$0	\$0	\$42,829,688	\$18,915,000 ⁶	0.66	1.35	6/30/2023
11/10/2013	Paulson Real Estate Fund II ⁴	\$12,732,755	\$20,000,000	97%	\$19,345,623	\$0	\$0	\$25,449,660	\$654,377	1.32	1.97	3/31/2023
4/28/2022	PCCP IX	\$51,797,731	\$75,000,000	67%	\$50,426,564	\$4,500,000	\$0	\$0	\$24,573,436	0.00	1.03	3/31/2023
1/25/2012	Siguler Guff DREOF	\$13,498,965	\$75,000,000	93%	\$69,375,000	\$0	\$2,144,259	\$105,915,370	\$5,625,000	1.53	1.72	3/31/2023
8/31/2013	Siguler Guff DREOF II	\$27,544,228	\$70,000,000	89%	\$61,985,000	\$0	\$921,155	\$56,612,941	\$8,015,000	0.91	1.36	3/31/2023
1/27/2016	Siguler Guff DREOF II Co-Inv	\$12,406,924	\$25,000,000	84%	\$20,915,362	\$377,500	\$0	\$13,871,261	\$4,084,638	0.66	1.26	3/31/2023
Total Closed End Real Estate		\$580,616,984	\$1,520,000,000	88%	\$1,343,492,168	\$27,040,137	\$6,875,334	\$1,134,581,353	\$354,538,755	0.84	1.28	
% of Portfolio (Market Value)		5.5%										

¹Latest valuation + capital calls - distributions

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

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

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

⁵Total distributions may include recallable distributions

⁶Remianing commitment includes recallable distributions

Total Fund
Closed End Funds - IRR Summary

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

Private Credit	Inception	Fund Level (G) ²	CCCERA (G)	Fund Level (N) ^{2,3}	CCCERA (N) ³	IRR Date
Angelo Gordon Energy Cred Opp. ⁴	9/24/2015	-	-	-	7.0%	3/31/2023
Stepstone CC Opportunities Fund ¹	2/2/2018	-	9.9%	-	9.2%	12/31/2022
Torchlight IV	8/1/2012	11.4%	12.0%	9.3%	10.0%	3/31/2023
Torchlight V	3/12/2015	14.3%	14.4%	10.2%	10.2%	3/31/2023
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	-	-	-	12.4%	3/31/2023
Angelo Gordon IX	12/8/2014	-	-	-	6.6%	3/31/2023
Blackstone Real Estate Partners VIII ¹	3/24/2023	-	-	-	-	N/A
DLJ RECP III ¹	6/23/2005	-1.0%	-1.0%	-3.0%	-3.0%	12/31/2022
DLJ RECP IV ¹	2/11/2008	4.0%	4.0%	1.0%	2.0%	12/31/2022
DLJ RECP V ¹	7/1/2014	15.0%	15.0%	9.0%	9.0%	12/31/2022
DLJ RECP VI ¹	3/19/2019	13.0%	13.0%	4.0%	4.0%	12/31/2022
Invesco Fund IV ⁴	6/30/2014	13.3%	-	10.5%	-	3/31/2023
Invesco Fund V	2/20/2019	13.8%	-	10.5%	-	3/31/2023
Invesco Fund VI	9/27/2022	-	-	-	-	N/A
LaSalle Income & Growth VI ⁴	7/16/2013	10.7%	10.7%	8.6%	8.7%	6/30/2023
LaSalle Income & Growth VII	2/28/2017	4.8%	4.7%	3.0%	2.9%	6/30/2023
Long Wharf IV ⁴	7/3/2013	15.2%	15.0%	11.4%	11.4%	6/30/2023
Long Wharf V ⁴	9/30/2016	10.4%	10.8%	7.8%	8.1%	6/30/2023
Long Wharf VI	6/27/2019	31.6%	34.2%	19.5%	20.8%	6/30/2023
Oaktree REOF V ⁴	12/31/2011	16.6%	-	12.2%	-	6/30/2023
Oaktree REOF VI ⁴	9/30/2013	10.6%	-	6.8%	-	6/30/2023
Oaktree REOF VII	4/1/2015	18.8%	-	12.2%	-	6/30/2023
Paulson ⁴	11/10/2013	-	-	12.2%	-	12/31/2022
PCCP IX	5/27/2021	10.5%	-	6.2%	-	3/31/2023
Siguler Guff I ¹	1/25/2012	12.5%	15.2%	10.9%	12.1%	3/31/2023
Siguler Guff II ¹	8/31/2013	9.4%	9.5%	8.1%	7.7%	3/31/2023
Siguler Guff DREOF II Co-Inv ¹	1/27/2016	6.2%	6.4%	5.3%	5.0%	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.

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: June 30, 2023

3 Years

	Anlzd Return	Anlzd Excess Performance	Anlzd Standard Deviation	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Information Ratio	Up Capture	Down Capture
BlackRock Russell 1000 Index	14.08	-0.01	18.17	-0.01	1.00	0.01	1.00	0.75	-0.94	99.98	100.02
Boston Partners	17.35	3.05	17.61	2.66	1.01	3.21	0.97	0.93	0.85	102.92	90.27
Emerald Advisers	7.47	1.37	20.83	1.80	0.91	5.55	0.94	0.39	0.18	100.50	96.59
Ceredex	17.01	1.59	19.45	3.93	0.82	7.74	0.88	0.84	0.10	89.51	78.72
Pyrford	7.80	-2.62	14.73	-0.40	0.79	6.28	0.88	0.50	-0.46	83.71	89.42
William Blair	5.20	1.25	19.07	1.30	1.04	5.79	0.91	0.30	0.26	111.27	107.00
PIMCO RAE Emerging Markets	14.75	8.48	18.16	8.21	1.01	6.57	0.87	0.78	1.22	121.43	84.53
TT Emerging Markets	1.55	-0.77	20.67	-0.66	1.12	6.16	0.92	0.12	-0.03	121.74	126.59
Artisan Partners	5.17	-4.41	19.36	-3.57	0.95	4.85	0.94	0.29	-0.87	84.81	95.68
First Eagle	10.16	-1.66	13.52	0.77	0.78	5.20	0.92	0.69	-0.37	82.29	80.70
Voya Global Investors	2.87	-0.34	8.57	-0.36	1.01	1.07	0.98	0.23	-0.30	98.94	102.09
Adelante	9.14	0.59	19.48	0.77	0.97	1.50	1.00	0.48	0.28	98.65	96.40
AQR Global Risk Premium-EL	1.87	1.58	10.22	1.58	0.93	2.12	0.96	0.11	0.71	98.12	88.08
PanAgora Risk Parity Multi Asset	-2.18	-2.48	15.05	-2.25	1.38	4.81	0.97	-0.15	-0.40	124.00	138.17
AFL-CIO	-4.19	-0.22	5.65	-0.59	0.91	1.15	0.97	-0.96	-0.22	83.43	92.24
DFA Short Credit	-1.03	0.48	2.60	0.34	0.90	0.96	0.87	-0.91	0.51	99.11	87.77
Insight Short Duration	0.61	1.49	1.58	1.05	0.49	1.60	0.34	-0.44	0.93	68.10	23.77
Sit Short Duration	-1.20	-0.10	2.80	0.34	1.38	1.30	0.85	-0.88	-0.06	164.87	141.95

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: June 30, 2023

5 Years

	Anlzd Return	Anlzd Excess Performance	Standard Deviation	Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Information Ratio	Up Capture	Down Capture
BlackRock Russell 1000 Index	11.91	-0.02	19.02	-0.01	1.00	0.01	1.00	0.61	-1.03	99.95	99.99
Boston Partners	9.05	0.94	19.73	0.74	1.03	3.00	0.98	0.46	0.34	102.19	98.42
Emerald Advisers	5.97	1.74	23.83	1.87	0.96	5.32	0.95	0.30	0.30	101.99	96.99
Ceredex	4.53	0.99	22.85	1.27	0.89	6.83	0.92	0.24	0.08	91.15	87.44
Pyrford	5.29	2.64	14.70	3.03	0.75	6.76	0.89	0.32	0.28	85.76	74.50
William Blair	5.26	1.20	18.97	1.17	1.05	5.08	0.93	0.29	0.29	110.16	105.86
PIMCO RAE Emerging Markets	4.76	3.55	20.37	3.76	1.07	5.84	0.92	0.26	0.67	113.74	97.77
TT Emerging Markets	0.37	-0.56	21.86	-0.25	1.13	5.82	0.94	0.06	0.02	117.25	118.78
Artisan Partners	9.06	-1.39	19.03	-0.77	0.95	4.61	0.94	0.47	-0.29	92.34	94.31
First Eagle	6.60	1.44	14.02	2.36	0.76	5.61	0.93	0.42	0.13	82.10	72.99
Voya Global Investors	2.76	-0.42	8.82	-0.21	0.93	1.66	0.97	0.18	-0.28	94.63	97.60
Adelante	5.73	1.34	19.37	1.39	0.96	1.65	0.99	0.31	0.66	99.16	94.35
AFL-CIO	0.32	-0.45	5.07	-0.39	0.92	1.05	0.96	-0.22	-0.44	86.46	91.64
DFA Short Credit	1.08	-0.09	2.49	0.05	0.88	1.25	0.76	-0.18	-0.07	86.29	83.33
Insight Short Duration	1.98	0.85	1.98	1.33	0.58	1.86	0.25	0.22	0.45	81.25	18.38
Sit Short Duration	1.45	0.52	2.70	0.19	1.36	1.30	0.83	-0.02	0.41	154.06	152.52

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: June 30, 2023

Name	Asset Class	Fee Schedule	Market Value	Estimated Fee Value	Expense Fee (%)
BlackRock Russell 1000 Index	Growth	0.03 % of Assets	\$1,016,442,905	\$304,933	0.03
Boston Partners	Growth	0.50 % of First \$25 M 0.30 % Thereafter	\$416,630,766	\$1,299,892	0.31
Emerald Advisers	Growth	0.75 % of First \$10 M 0.60 % Thereafter	\$221,725,345	\$1,345,352	0.61
Ceredex	Growth	0.85 % of First \$10 M 0.68 % of Next \$40 M 0.51 % Thereafter	\$205,504,972	\$1,150,075	0.56
Pyrford	Growth	0.70 % of First \$50 M 0.50 % of Next \$50 M 0.35 % Thereafter	\$480,757,874	\$1,932,653	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	\$454,581,649	\$1,778,745	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	\$385,958,815	\$2,049,315	0.53
TT Emerging Markets	Growth	0.70 % of First \$100 M 0.65 % of Next \$100 M 0.60 % Thereafter	\$329,574,778	\$2,127,449	0.65
Artisan Partners	Growth	0.75 % of Assets	\$536,371,052	\$4,022,783	0.75
First Eagle	Growth	0.75 % of Assets	\$539,500,613	\$4,046,255	0.75
Voya Global Investors	Growth	0.50 % of First \$50 M 0.40 % of Next \$50 M 0.35 % Thereafter	\$147,379,539	\$615,828	0.42
Invesco US Fundamental Beta	Growth	0.15 % of Assets	\$108,541,907	\$162,813	0.15
AQR Global Risk Premium-EL	Growth	0.38 % of Assets	\$170,170,821	\$646,649	0.38

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

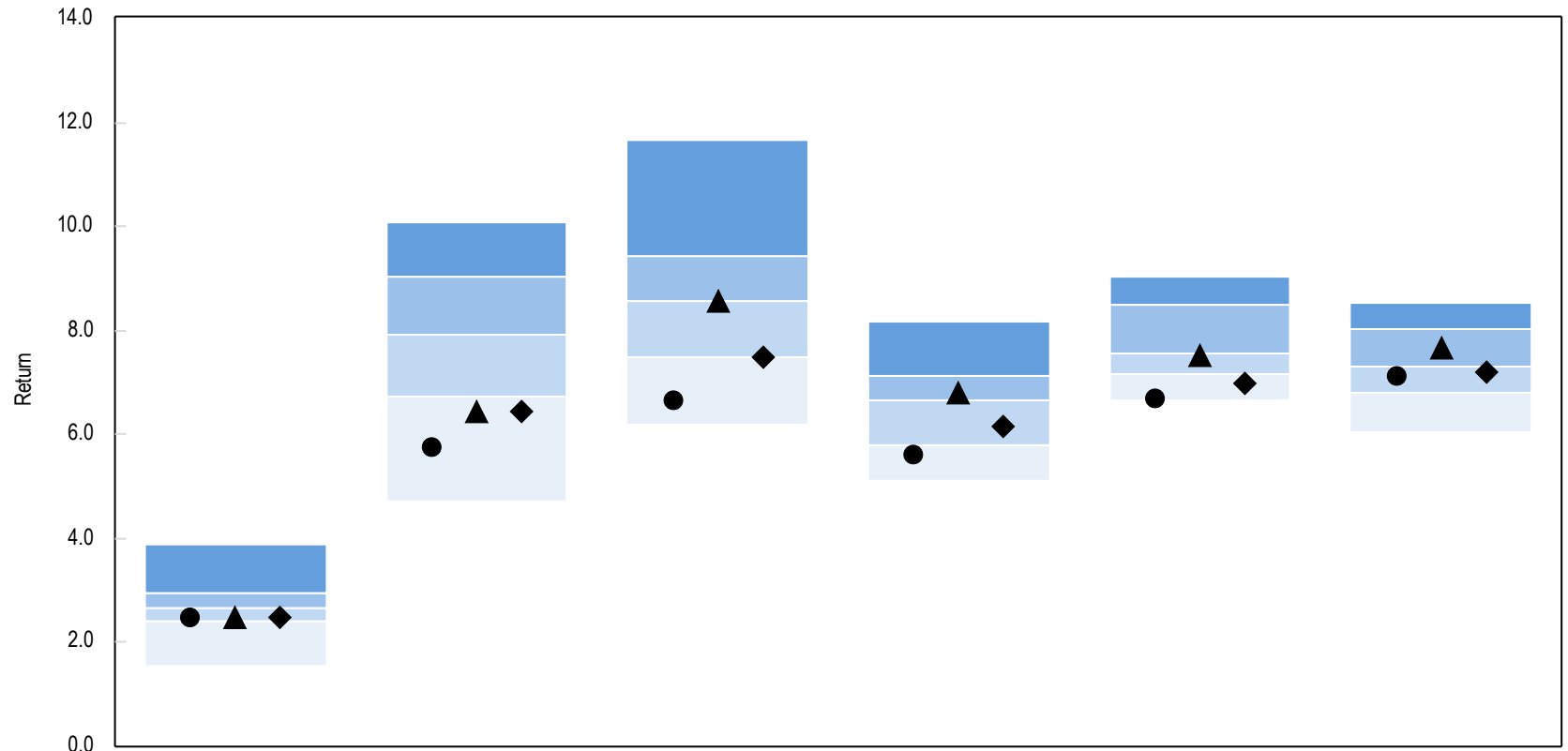
Total Fund
Investment Fund Fee Analysis

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

Name	Asset Class	Fee Schedule	Market Value	Estimated Fee Value	Expense Fee (%)
PanAgora Risk Parity Multi Asset	Growth	0.35 % of Assets	\$162,473,698	\$568,658	0.35
AFL-CIO	Diversifying	0.32 % of Assets	\$221,026,841	\$707,286	0.32
Acadian Multi-Asset Absolute Return Fund	Diversifying	0.50 % of Assets	\$248,722,202	\$1,243,611	0.50
Sit LLCAR	Diversifying	0.39 % of First \$200 M 0.35 % Thereafter	\$305,359,768	\$1,160,367	0.38
DFA Short Credit	Liquidity	0.20 % of First \$25 M 0.10 % Thereafter	\$285,679,415	\$310,679	0.11
Insight Short Duration	Liquidity	0.06 % of First \$500 M 0.05 % of Next \$500 M 0.04 % Thereafter	\$459,458,946	\$275,675	0.06
Sit Short Duration	Liquidity	0.15 % of Assets	\$510,824,397	\$766,237	0.15

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

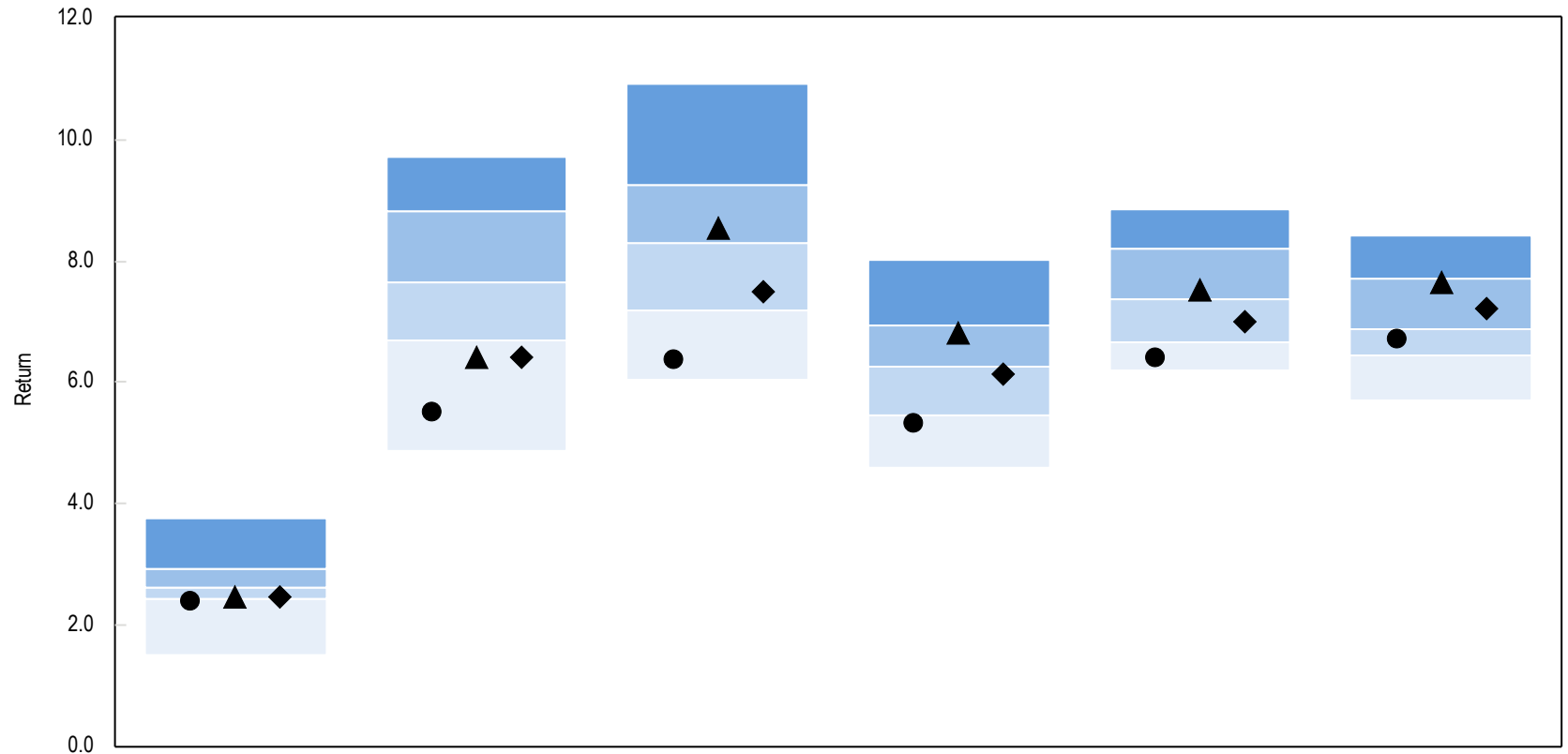
Total Fund Cumulative Performance vs. InvMetrics Public DB >\$1B Gross



	3 Mo	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs
● Total Fund	2.47 (73)	5.75 (88)	6.65 (94)	5.62 (84)	6.71 (95)	7.14 (54)
▲ Policy Index	2.47 (73)	6.43 (77)	8.55 (50)	6.81 (39)	7.52 (60)	7.66 (35)
◆ Policy Index (Adjusted)	2.47 (73)	6.43 (77)	7.49 (75)	6.15 (67)	7.00 (82)	7.21 (53)
5th Percentile	3.89	10.06	11.67	8.17	9.03	8.54
1st Quartile	2.97	9.03	9.43	7.13	8.49	8.01
Median	2.68	7.90	8.55	6.64	7.57	7.32
3rd Quartile	2.42	6.71	7.48	5.78	7.17	6.80
95th Percentile	1.56	4.72	6.21	5.09	6.65	6.06
Population	60	58	52	51	51	48

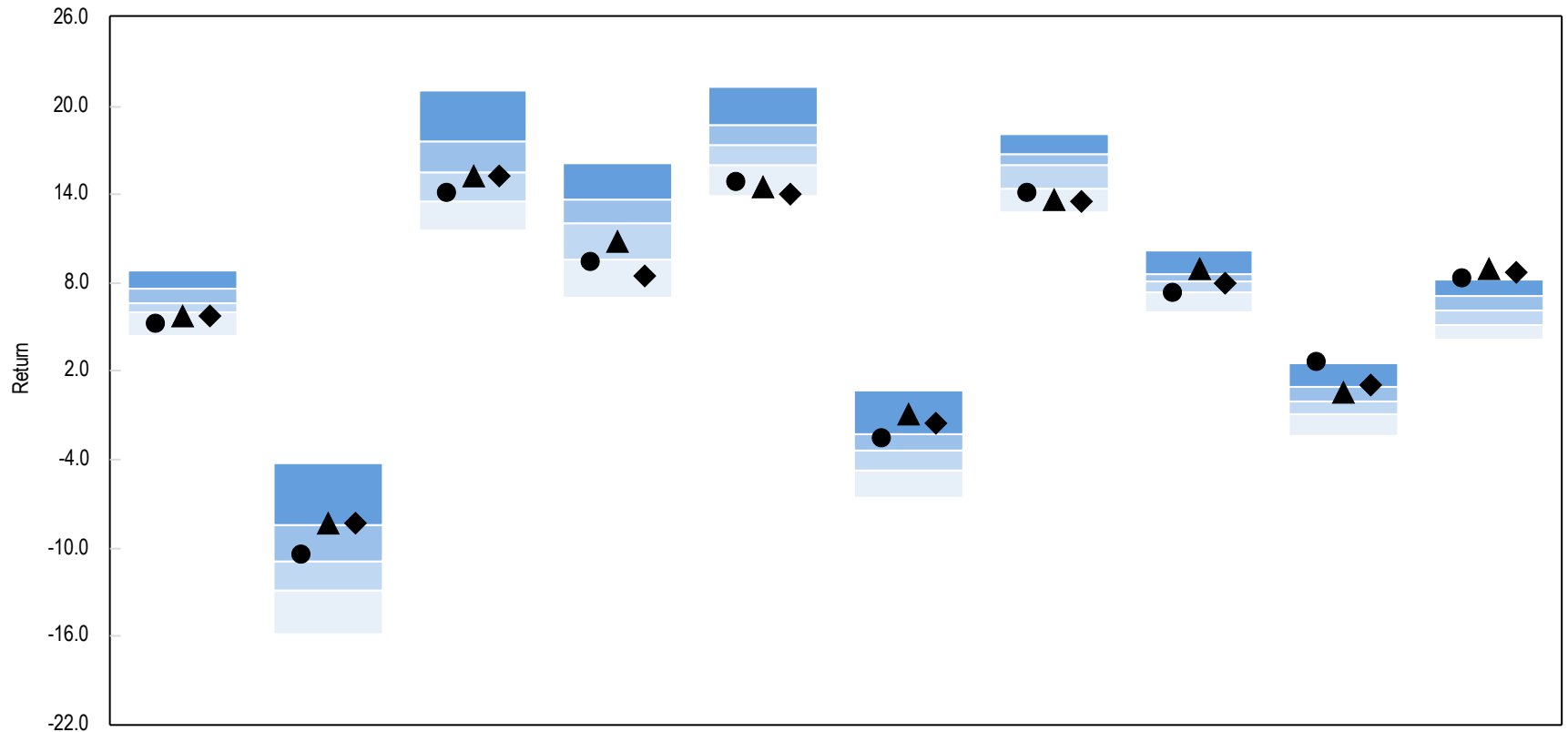
Effective 1/01/2017, only traditional asset class (public equity, public fixed income, REITs) investment management fees will be included in the gross of fee return calculation.

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



	3 Mo	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs
● Total Fund	2.42 (76)	5.51 (91)	6.38 (94)	5.35 (80)	6.41 (92)	6.74 (58)
▲ Policy Index	2.47 (73)	6.43 (78)	8.55 (41)	6.81 (30)	7.52 (46)	7.66 (27)
◆ Policy Index (Adjusted)	2.47 (73)	6.43 (78)	7.49 (70)	6.15 (57)	7.00 (62)	7.21 (40)
5th Percentile	3.76	9.73	10.91	8.03	8.84	8.43
1st Quartile	2.92	8.82	9.24	6.93	8.21	7.71
Median	2.62	7.66	8.29	6.26	7.36	6.87
3rd Quartile	2.43	6.71	7.20	5.46	6.65	6.44
95th Percentile	1.51	4.88	6.05	4.60	6.21	5.72
Population	66	63	57	56	56	53

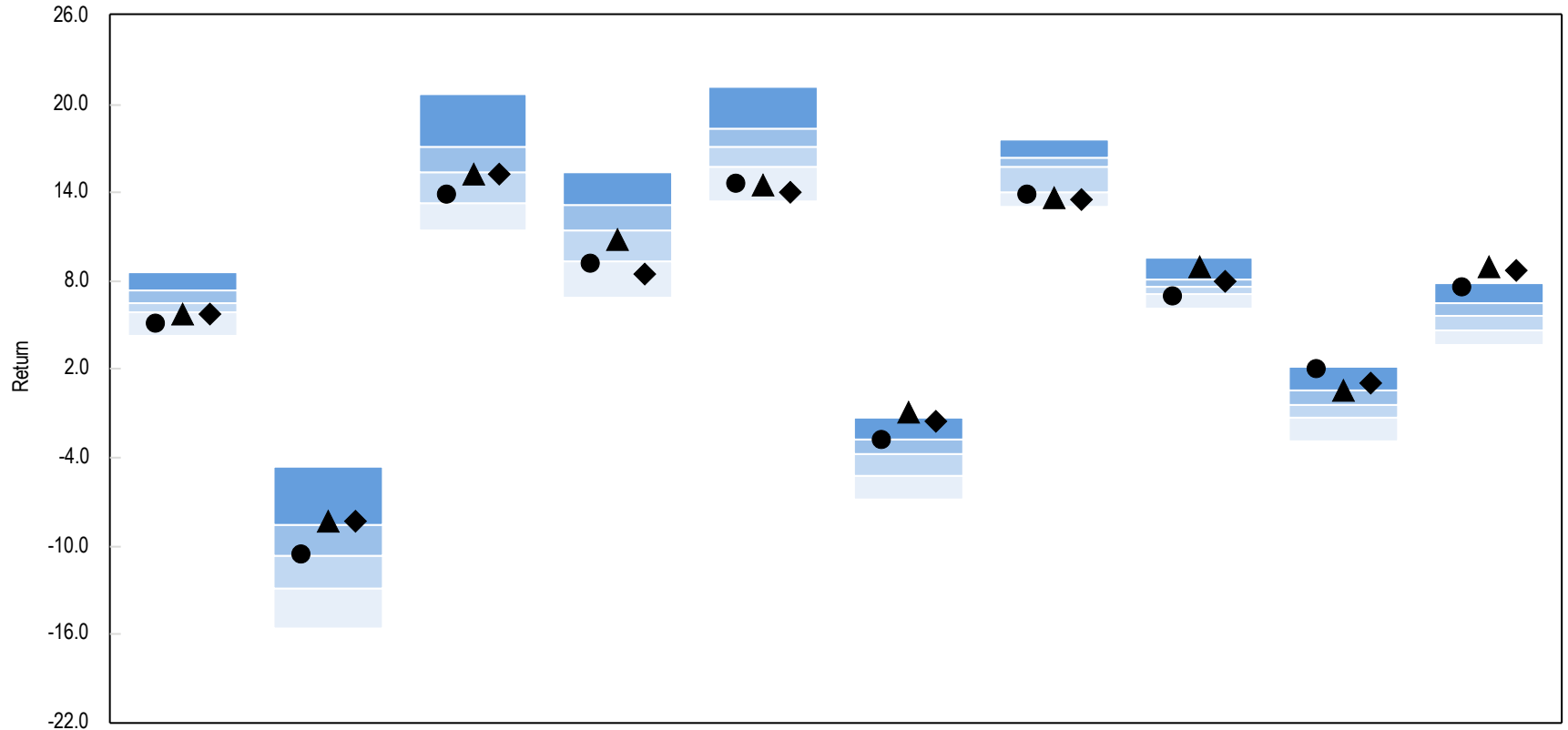
Total Fund Consecutive Periods vs. InvMetrics Public DB >\$1B Gross



	YTD	2022	2021	2020	2019	2018	2017	2016	2015	2014
● Total Fund	5.27 (88)	-10.36 (43)	14.21 (66)	9.52 (79)	14.92 (90)	-2.46 (31)	14.18 (79)	7.43 (73)	2.70 (3)	8.40 (5)
▲ Policy Index	5.79 (81)	-8.34 (25)	15.29 (53)	10.81 (64)	14.58 (92)	-0.94 (10)	13.69 (91)	8.93 (19)	0.58 (33)	9.03 (2)
◆ Policy Index (Adjusted)	5.79 (81)	-8.34 (25)	15.29 (53)	8.49 (91)	14.06 (95)	-1.52 (15)	13.51 (92)	8.03 (54)	1.06 (23)	8.67 (3)
5th Percentile	8.87	-4.24	21.09	16.10	21.27	0.69	18.14	10.18	2.50	8.28
1st Quartile	7.57	-8.47	17.65	13.70	18.69	-2.24	16.81	8.63	1.00	7.10
Median	6.66	-10.84	15.53	12.06	17.32	-3.40	16.04	8.08	0.00	6.12
3rd Quartile	5.98	-12.84	13.51	9.65	16.00	-4.77	14.36	7.38	-0.89	5.13
95th Percentile	4.40	-15.81	11.55	7.04	13.93	-6.61	12.79	6.04	-2.43	4.19
Population	59	120	153	166	129	110	120	124	120	118

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

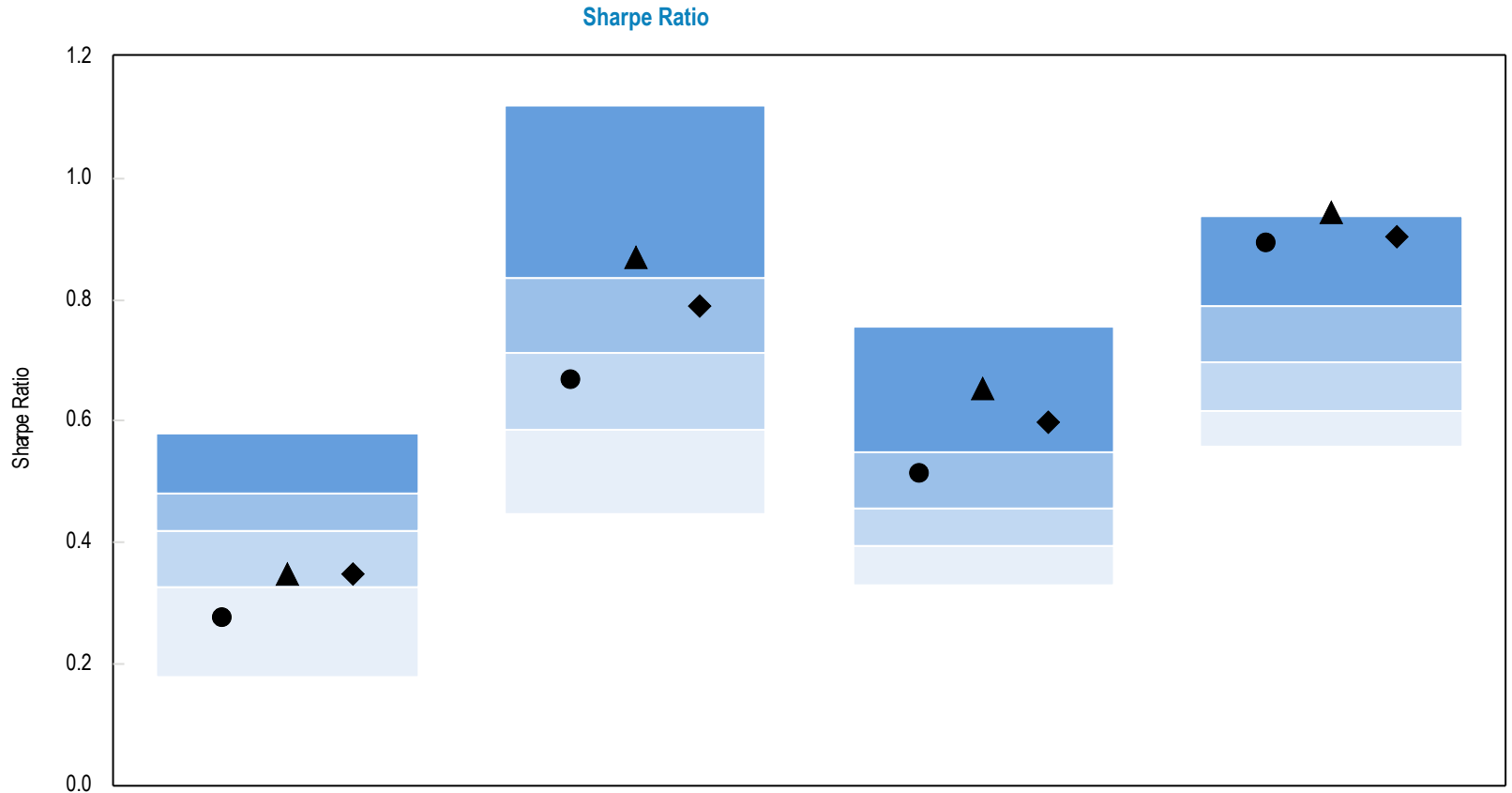
Total Fund Consecutive Periods vs. InvMetrics Public DB >\$1B Net



	YTD	2022	2021	2020	2019	2018	2017	2016	2015	2014
● Total Fund	5.15 (89)	-10.58 (46)	13.90 (66)	9.23 (77)	14.61 (93)	-2.72 (27)	13.86 (81)	6.94 (79)	2.09 (8)	7.67 (8)
▲ Policy Index	5.79 (77)	-8.34 (24)	15.29 (51)	10.81 (61)	14.58 (93)	-0.94 (5)	13.69 (86)	8.93 (14)	0.58 (24)	9.03 (2)
◆ Policy Index (Adjusted)	5.79 (77)	-8.34 (24)	15.29 (51)	8.49 (90)	14.06 (95)	-1.52 (8)	13.51 (88)	8.03 (34)	1.06 (20)	8.67 (3)
5th Percentile	8.65	-4.66	20.70	15.40	21.22	-1.21	17.67	9.60	2.23	7.82
1st Quartile	7.42	-8.58	17.17	13.13	18.35	-2.70	16.41	8.14	0.56	6.55
Median	6.54	-10.67	15.34	11.45	17.08	-3.75	15.71	7.63	-0.37	5.67
3rd Quartile	5.91	-12.83	13.33	9.34	15.74	-5.19	14.03	7.11	-1.28	4.66
95th Percentile	4.30	-15.60	11.38	6.87	13.47	-6.80	13.03	6.15	-2.83	3.69
Population	65	100	131	146	122	102	113	111	108	105

Total Fund
Sharpe Ratio Ranking (Gross of Fees)

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

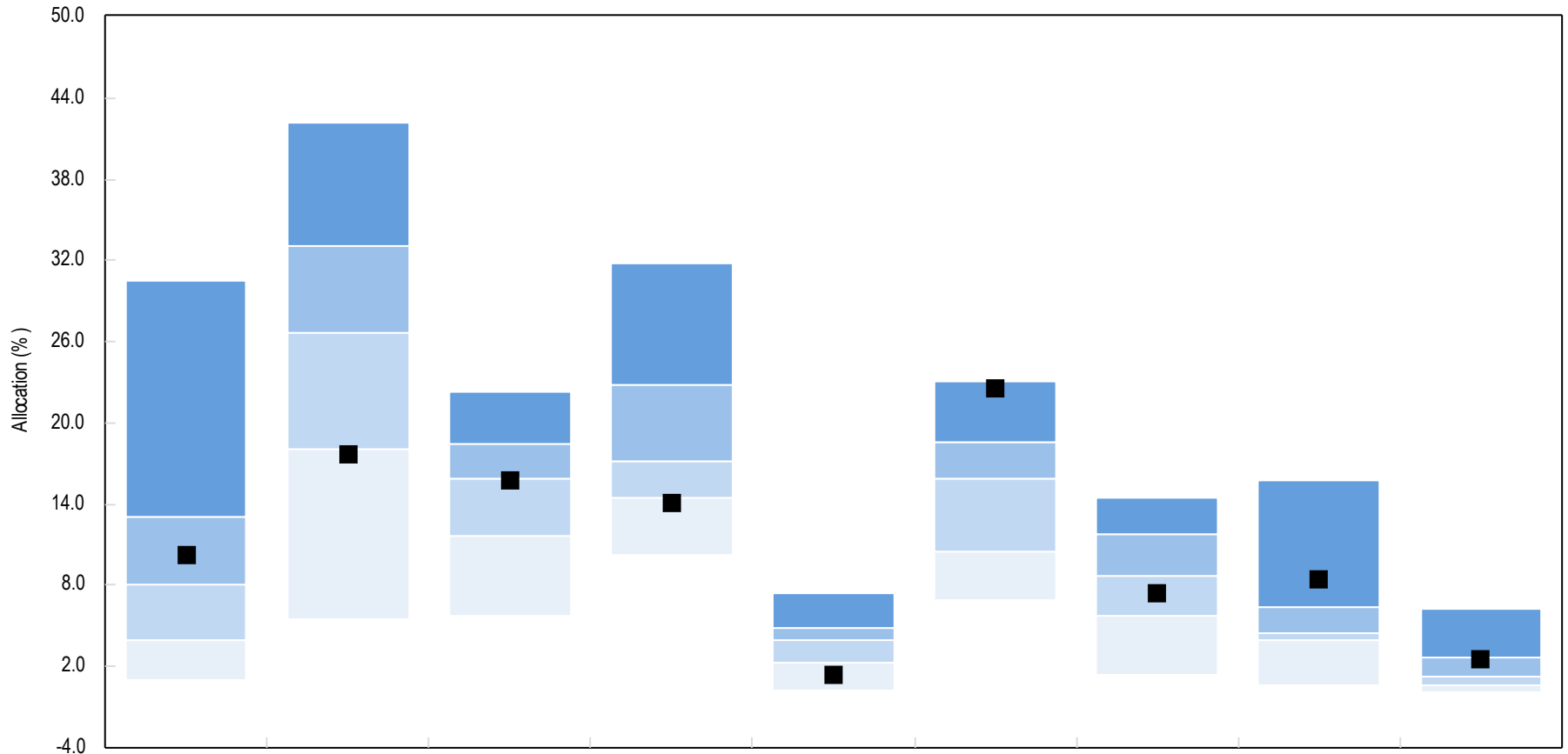


	1 Yr	3 Yrs	5 Yrs	10 Yrs
● Total Fund	0.28 (87)	0.67 (59)	0.52 (33)	0.89 (13)
▲ Policy Index	0.35 (69)	0.87 (21)	0.65 (14)	0.94 (5)
◆ Policy Index (Adjusted)	0.35 (69)	0.79 (35)	0.60 (18)	0.90 (8)
5th Percentile	0.58	1.12	0.76	0.94
1st Quartile	0.48	0.84	0.55	0.79
Median	0.42	0.71	0.46	0.70
3rd Quartile	0.33	0.59	0.39	0.62
95th Percentile	0.18	0.45	0.33	0.56
Population	63	57	56	52

Total Fund
Peer Universe Comparison: Asset Allocation

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

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



	Global Equity	US Equity	Global ex-US Equity	US Fixed	Global ex-US Fixed	Private Equity	Total Real Estate	Multi-Asset	Cash & Equivalents
■ Total Fund	10.2 (33)	17.7 (76)	15.7 (52)	14.1 (81)	1.4 (88)	22.5 (9)	7.4 (61)	8.4 (16)	2.5 (26)
5th Percentile	30.5	42.2	22.3	31.8	7.5	23.1	14.5	15.8	6.3
1st Quartile	13.1	33.0	18.4	22.8	4.8	18.5	11.8	6.4	2.6
Median	8.1	26.7	15.9	17.2	4.0	15.9	8.7	4.4	1.2
3rd Quartile	4.0	18.0	11.7	14.5	2.3	10.5	5.8	4.0	0.7
95th Percentile	1.0	5.5	5.7	10.2	0.2	6.8	1.4	0.6	0.1
Population	19	56	57	55	22	43	47	18	47

Domestic Equity Managers

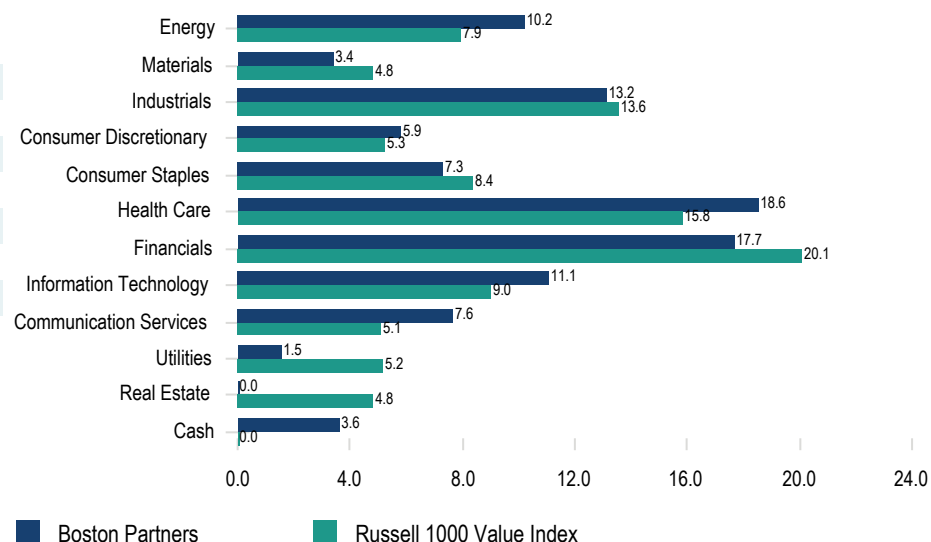
Boston Partners
Manager Portfolio Overview

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

Characteristics

	Portfolio	Benchmark
Number of Stocks	89	844
Wtd. Avg. Mkt. Cap \$M	169,134.93	138,040.56
Median Mkt. Cap \$M	46,155.72	11,638.70
Price/Earnings ratio	16.39	16.18
Price/Book ratio	2.62	2.53
Return on Equity (%)	-3.90	-20.92
Current Yield (%)	1.85	2.38
Beta (5 Years, Monthly)	1.03	1.00

Sector Allocation (%) vs. Russell 1000 Value Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
JPMorgan Chase & Co	3.69	12.49
Berkshire Hathaway Inc	3.56	10.44
Alphabet Inc	3.04	15.40
Bristol-Myers Squibb Co	2.83	-6.99
Johnson & Johnson	2.68	7.60
Cisco Systems Inc	2.45	-0.28
Wells Fargo & Co	2.16	15.11
Activision Blizzard Inc	2.00	-1.51
Sanofi	1.89	2.78
AutoZone Inc	1.83	1.43

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Alphabet Inc	3.20	15.40	0.49
JPMorgan Chase & Co	3.46	12.49	0.43
Berkshire Hathaway Inc	3.56	10.44	0.37
Wells Fargo & Co	1.98	15.11	0.30
AMERISOURCEBERGEN	1.21	20.53	0.25
Applied Materials Inc	1.27	17.98	0.23
Johnson & Johnson	2.96	7.60	0.22
United Rentals Inc.	1.60	13.02	0.21
US Foods Holding Corp	1.03	19.11	0.20
Howmet Aerospace Inc	1.14	17.08	0.19

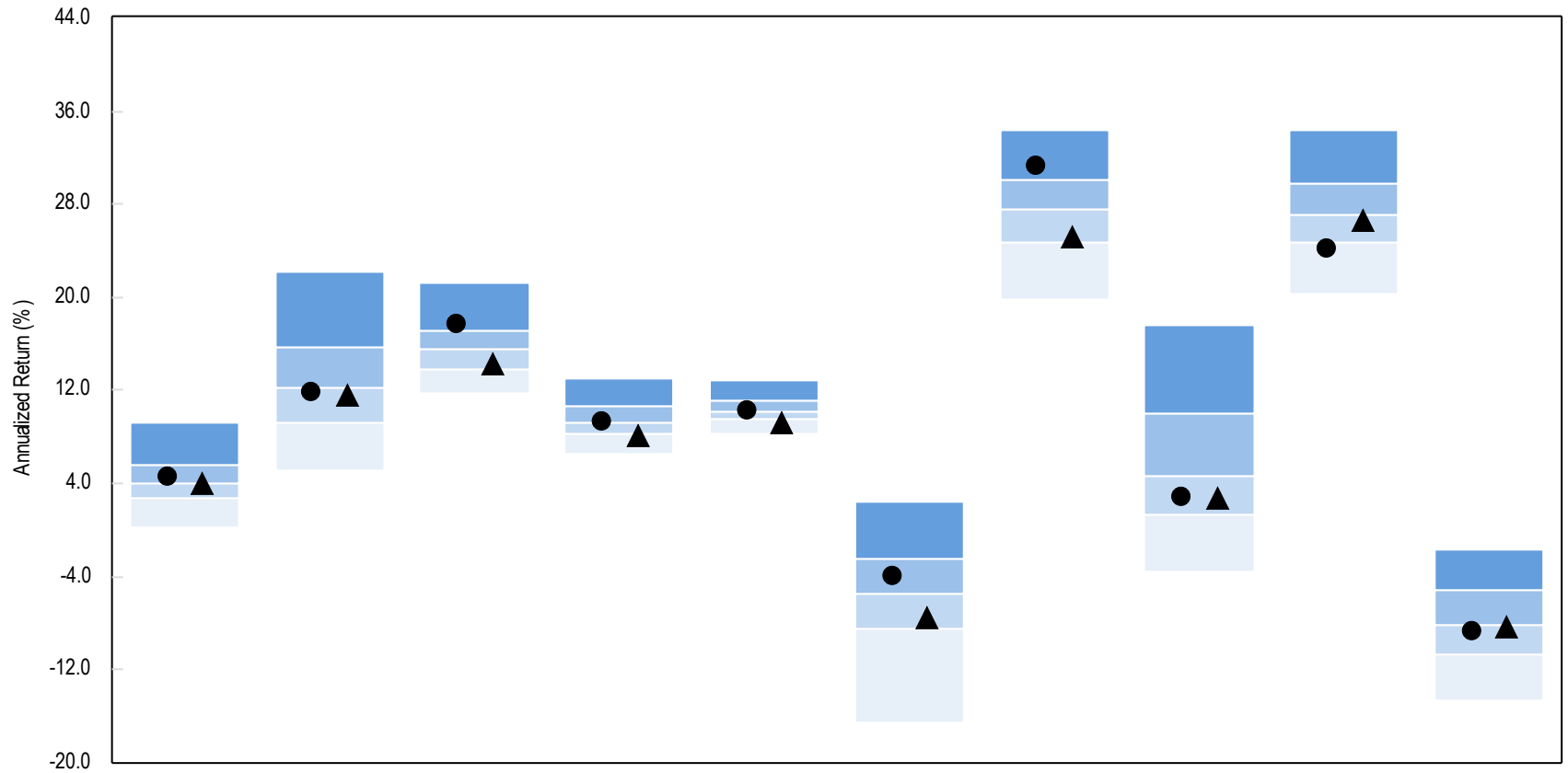
Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Marathon Petroleum Corp	2.09	-12.91	-0.27
Bristol-Myers Squibb Co	3.11	-6.99	-0.22
Keurig Dr Pepper Inc	1.99	-10.79	-0.21
AbbVie Inc	0.70	-14.69	-0.10
CVS Health Corp	1.47	-6.20	-0.09
QUALCOMM Inc.	1.51	-6.04	-0.09
Peabody Energy Corp	0.50	-15.12	-0.08
General Dynamics Corp	1.24	-5.18	-0.06
BP PLC	0.98	-5.96	-0.06
Amgen Inc	0.79	-7.29	-0.06

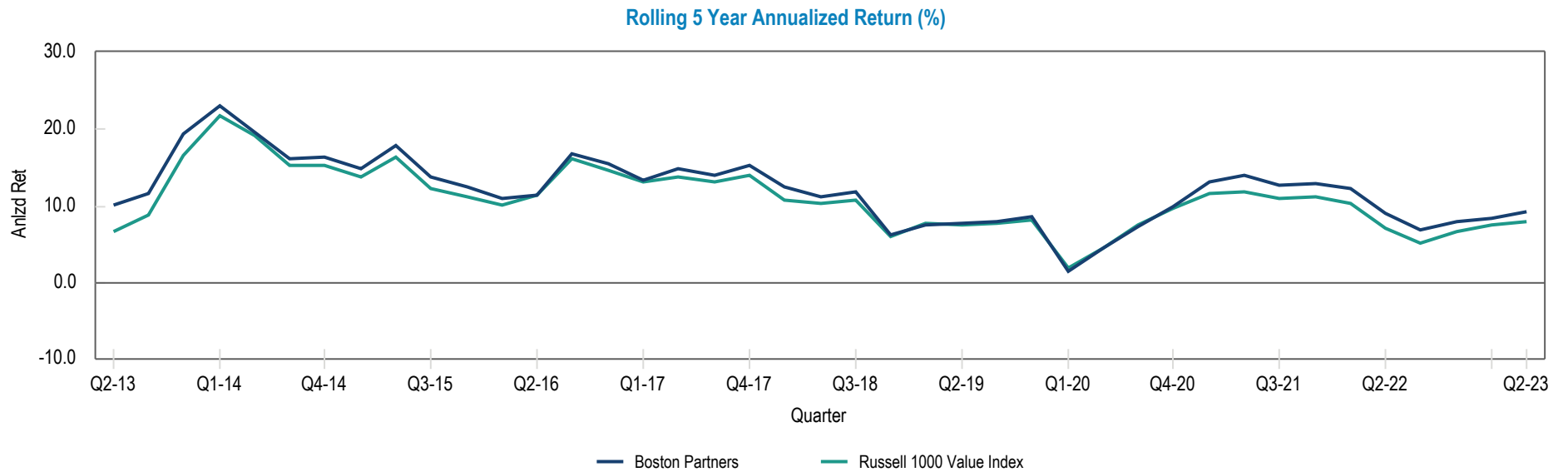
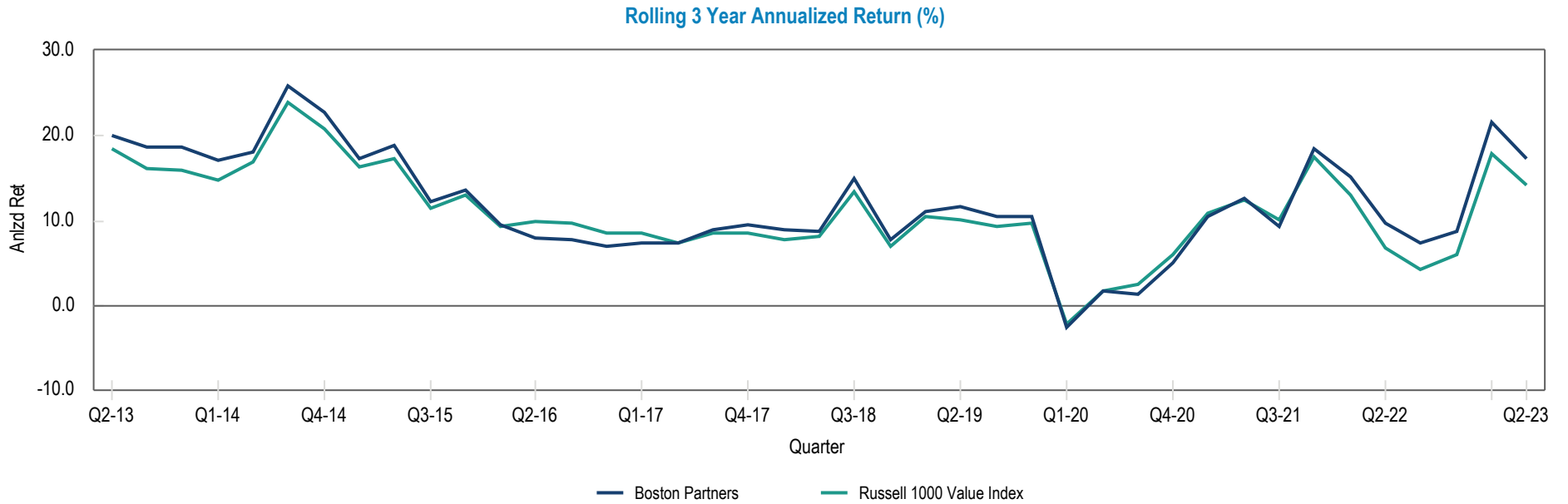
% of Portfolio 21.41 2.90 % of Portfolio 14.38 -1.24

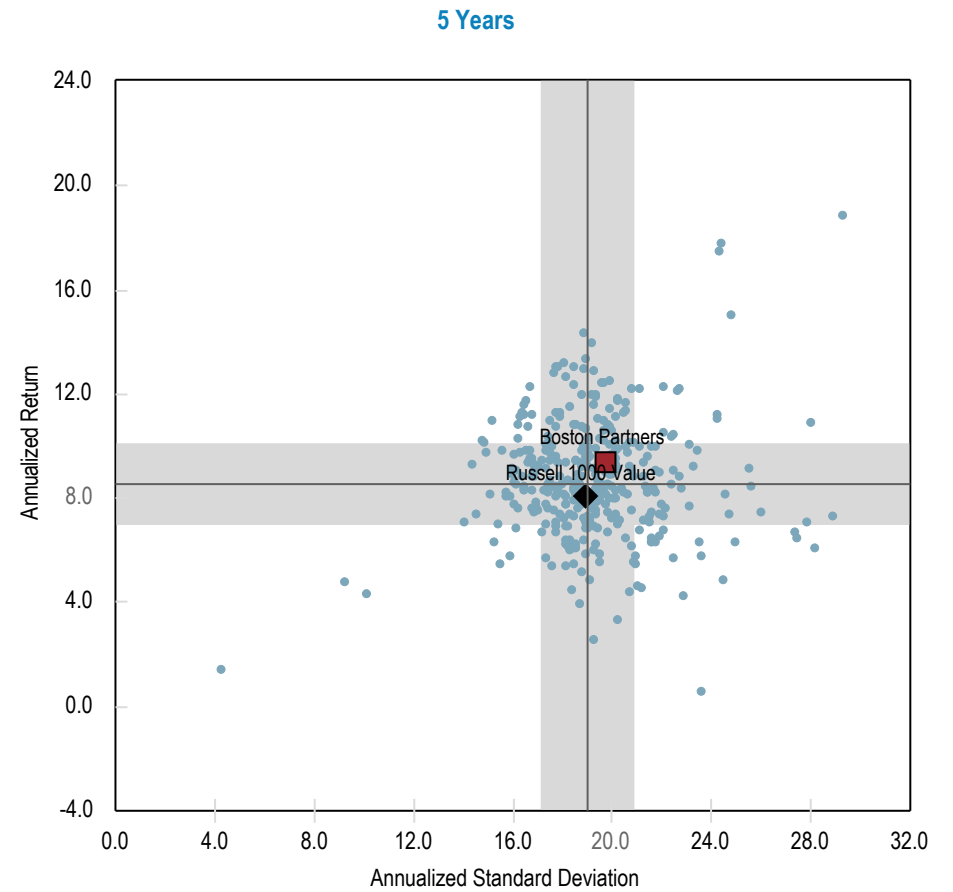
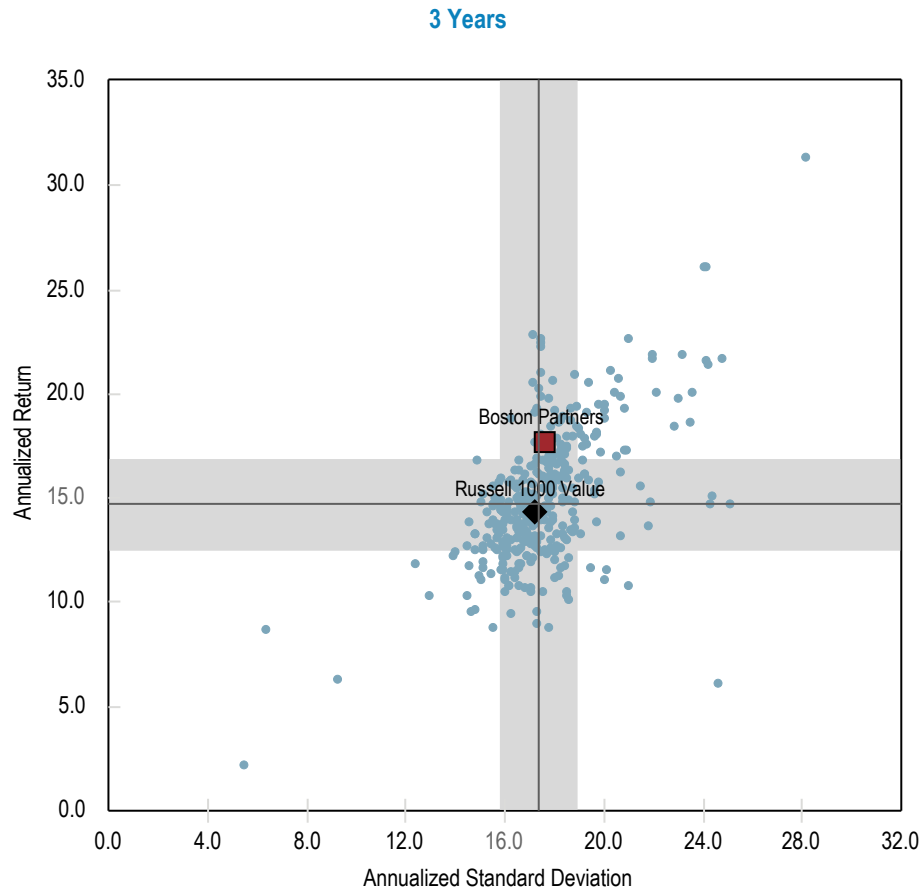
Domestic equity large cap value portfolio exhibiting low turnover in companies with low valuations relative to intrinsic value. Primary personnel include Mark Donovan and David Pyle.

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	4.67 (40)	11.96 (54)	17.70 (22)	9.39 (49)	10.32 (47)	-3.82 (36)	31.34 (18)	2.96 (63)	24.26 (79)	-8.65 (58)
▲ Russell 1000 Value Index	4.07 (50)	11.54 (58)	14.30 (68)	8.11 (78)	9.22 (83)	-7.54 (69)	25.16 (73)	2.80 (64)	26.54 (56)	-8.27 (53)
5th Percentile	9.23	22.24	21.18	13.05	12.81	2.38	34.34	17.63	34.35	-1.65
1st Quartile	5.62	15.64	17.17	10.69	11.14	-2.39	30.13	10.06	29.83	-5.19
Median	4.06	12.25	15.48	9.29	10.23	-5.42	27.61	4.64	27.17	-8.18
3rd Quartile	2.78	9.18	13.77	8.22	9.54	-8.51	24.70	1.30	24.72	-10.75
95th Percentile	0.30	5.15	11.73	6.53	8.26	-16.58	19.83	-3.59	20.34	-14.67
Population	382	382	368	360	326	398	408	415	445	468





3 Years

	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Boston Partners	17.7	17.6	0.9
Russell 1000 Value Index	14.3	17.2	0.8
eV US Large Cap Value Equity Median	15.5	17.4	0.8
Population	368	368	368

5 Years

	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Boston Partners	9.4	19.7	0.5
Russell 1000 Value Index	8.1	19.0	0.4
eV US Large Cap Value Equity Median	9.3	19.0	0.5
Population	360	360	360

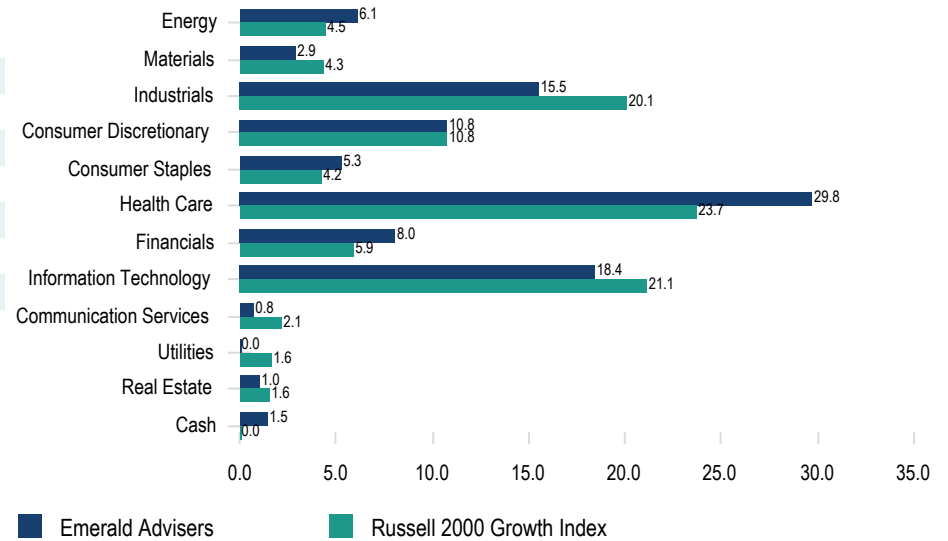
Emerald Advisers
 Manager Portfolio Overview

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

Characteristics

	Portfolio	Benchmark
Number of Stocks	113	1,089
Wtd. Avg. Mkt. Cap \$M	3,499.96	3,257.21
Median Mkt. Cap \$M	2,728.16	1,223.25
Price/Earnings ratio	21.94	20.18
Price/Book ratio	4.04	4.04
Return on Equity (%)	4.48	-17.01
Current Yield (%)	0.51	0.65
Beta (5 Years, Monthly)	0.96	1.00

Sector Allocation (%) vs. Russell 2000 Growth Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
Super Micro Computer Inc	2.30	133.93
Churchill Downs Inc	1.99	8.28
Chart Industries Inc	1.78	27.42
Carpenter Technology Corp	1.73	25.89
Simply Good Foods Co (The)	1.72	-8.00
Acadia Pharmaceuticals Inc	1.69	27.26
Transmedics Group Inc	1.63	10.89
Treace Medical Concepts Inc	1.58	1.55
Freshpet Inc	1.50	-0.57
Shift4 Payments Inc	1.49	-10.41

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Super Micro Computer Inc	2.14	133.93	2.87
Celsius Holdings Inc	1.17	60.52	0.71
Prometheus Biosciences Inc	0.71	86.28	0.61
IVERIC bio Inc	0.93	61.69	0.57
Blueprint Medicines Corp	1.01	40.48	0.41
Carpenter Technology Corp	1.56	25.89	0.40
Acadia Pharmaceuticals Inc	1.40	27.26	0.38
Chart Industries Inc	1.20	27.42	0.33
Replimune Group Inc	0.87	31.48	0.27
ANI Pharmaceuticals Inc	0.77	35.52	0.27

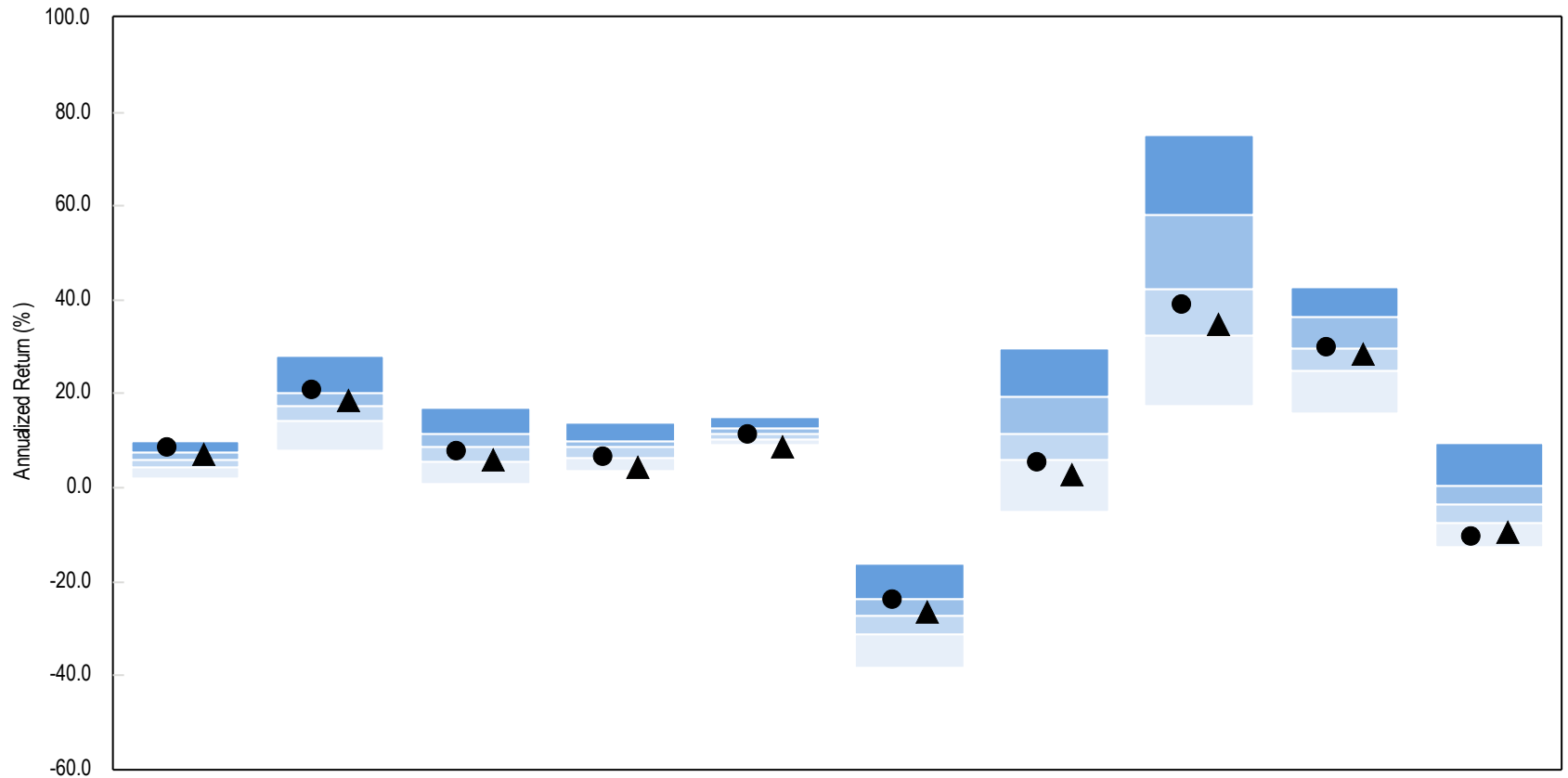
Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Amylyx Pharmaceuticals Inc	1.44	-26.48	-0.38
Mercury Systems Inc	0.85	-32.34	-0.28
Shift4 Payments Inc	2.09	-10.41	-0.22
Everi Holdings Inc	1.39	-15.69	-0.22
Planet Fitness Inc	1.58	-13.17	-0.21
Simply Good Foods Co (The)	2.12	-8.00	-0.17
Certara Inc	0.64	-24.47	-0.16
Cutera Inc	0.40	-35.94	-0.14
Tenable Holdings Inc	1.53	-8.34	-0.13
Pacific Premier Bancorp Inc	1.03	-12.42	-0.13

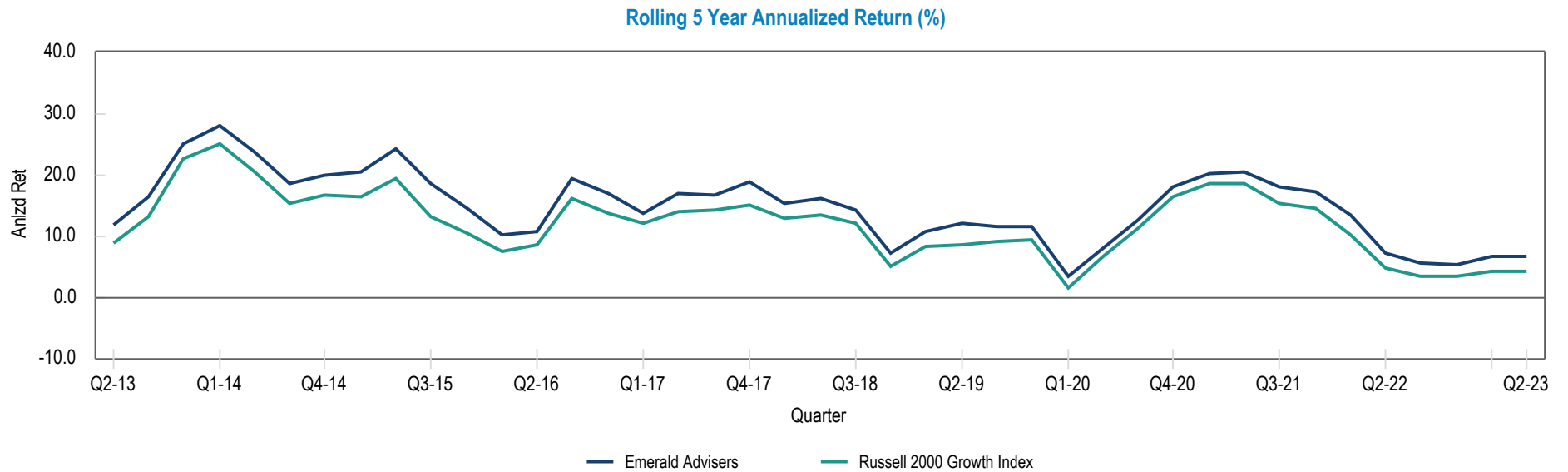
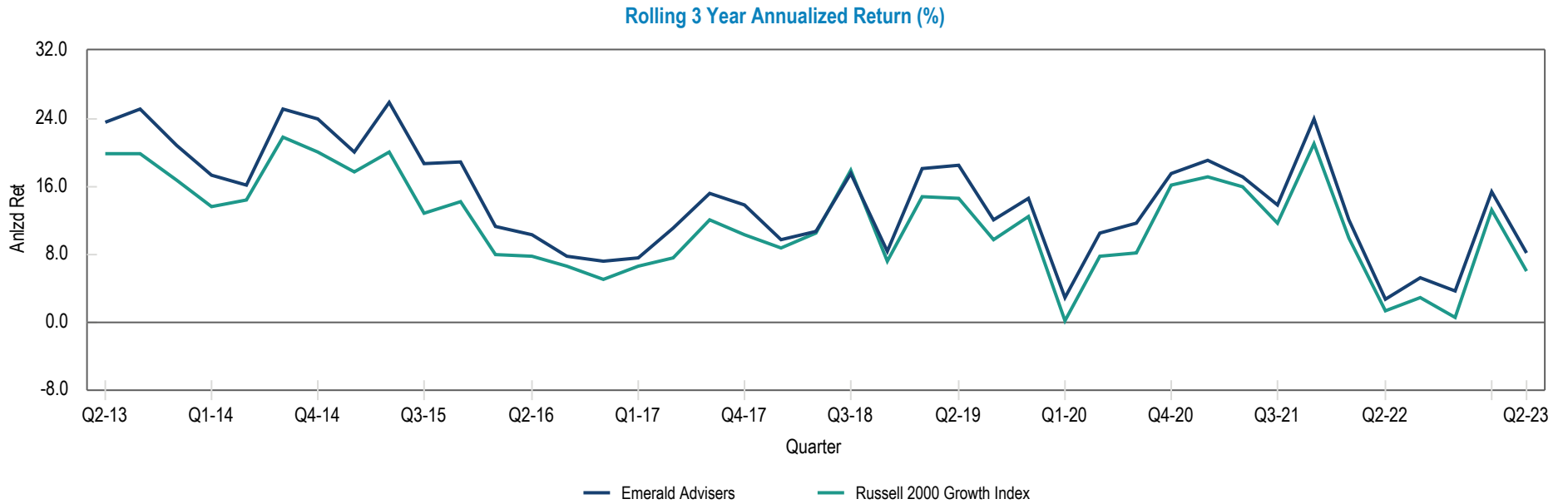
% of Portfolio 11.76 6.83 % of Portfolio 13.07 -2.03

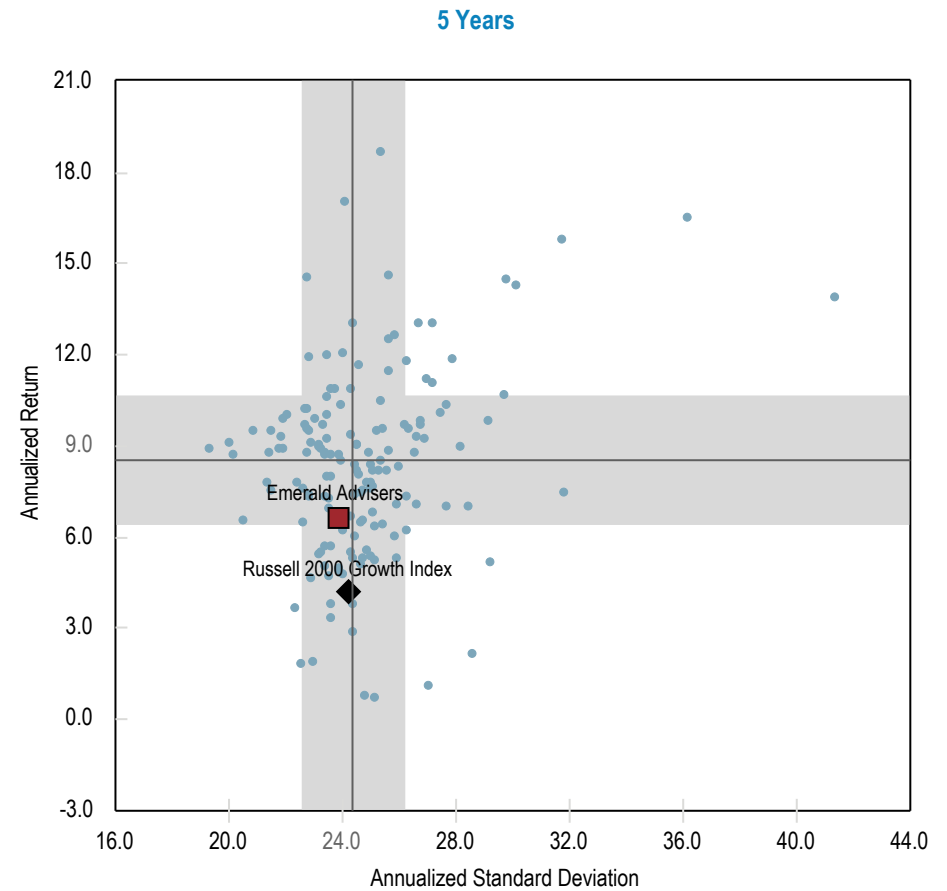
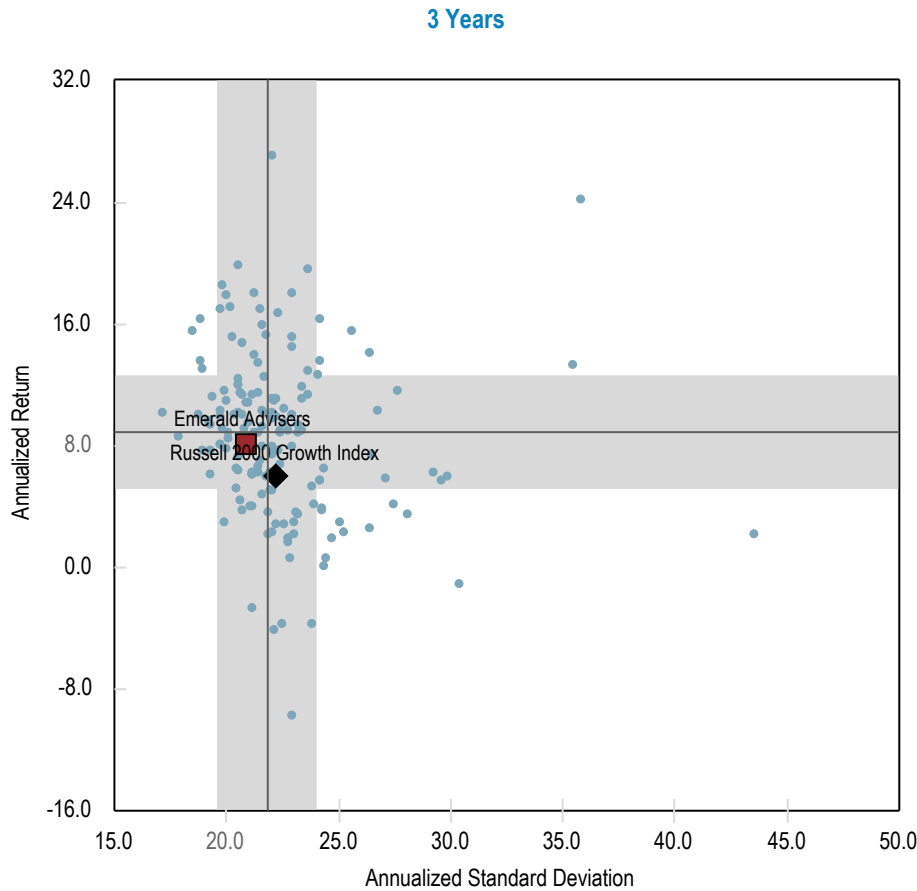
Domestic equity small cap growth portfolio of companies with significantly high growth rates. Primary personnel include Kenneth Mertz, Joseph Garner, and Stacey Sears.

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



	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● Emerald Advisers	8.86 (11)	20.88 (22)	8.11 (56)	6.62 (74)	11.37 (50)	-23.75 (27)	5.53 (77)	38.96 (57)	30.26 (49)	-10.14 (86)
▲ Russell 2000 Growth Index	7.05 (30)	18.53 (38)	6.10 (72)	4.22 (94)	8.83 (96)	-26.36 (44)	2.83 (85)	34.63 (67)	28.48 (54)	-9.31 (82)
5th Percentile	9.75	28.23	17.17	14.05	15.16	-16.17	29.82	74.95	42.84	9.59
1st Quartile	7.54	20.33	11.48	9.84	12.54	-23.58	19.36	58.30	36.58	0.64
Median	5.94	17.28	8.93	8.56	11.37	-27.20	11.57	42.23	29.63	-3.53
3rd Quartile	4.38	14.20	5.69	6.53	10.44	-31.28	5.90	32.57	24.84	-7.28
95th Percentile	1.99	8.11	0.64	3.57	9.12	-38.40	-5.10	17.45	15.96	-12.50
Population	161	161	160	155	135	169	182	183	191	195





	3 Years	3 Years	3 Years
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Emerald Advisers	8.1	20.9	0.4
Russell 2000 Growth Index	6.1	22.2	0.3
eV US Small Cap Growth Equity Median	8.9	21.8	0.4
Population	160	160	160

	5 Years	5 Years	5 Years
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Emerald Advisers	6.6	23.9	0.3
Russell 2000 Growth Index	4.2	24.2	0.2
eV US Small Cap Growth Equity Median	8.6	24.4	0.4
Population	155	155	155

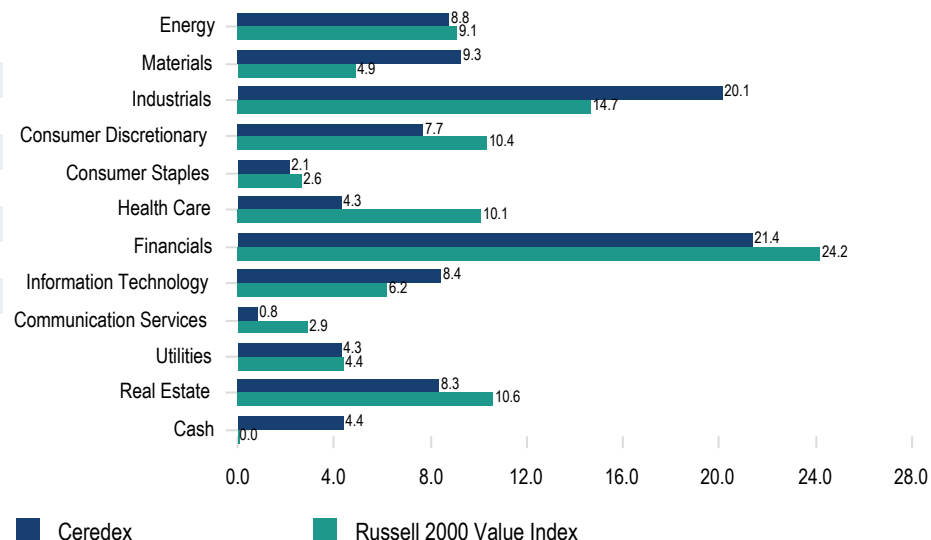
Ceredex
Manager Portfolio Overview

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

Characteristics

	Portfolio	Benchmark
Number of Stocks	73	1,458
Wtd. Avg. Mkt. Cap \$M	4,695.26	2,374.46
Median Mkt. Cap \$M	4,575.04	782.95
Price/Earnings ratio	12.95	8.90
Price/Book ratio	2.26	1.61
Return on Equity (%)	4.68	0.38
Current Yield (%)	2.56	2.48
Beta (5 Years, Monthly)	0.89	1.00

Sector Allocation (%) vs. Russell 2000 Value Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
RB Global Inc	2.48	7.13
Power Integrations Inc	1.96	12.09
Dolby Laboratories Inc	1.90	-1.72
Perrigo Co Plc	1.78	-4.55
Colliers International Group Inc	1.76	-6.83
DENTSPLY SIRONA Inc	1.76	2.25
Curtiss-Wright Corp	1.75	4.20
Herc Holdings Inc	1.64	20.88
Belden Inc	1.63	10.29
Kemper Corp	1.63	-11.09

Top Contributors

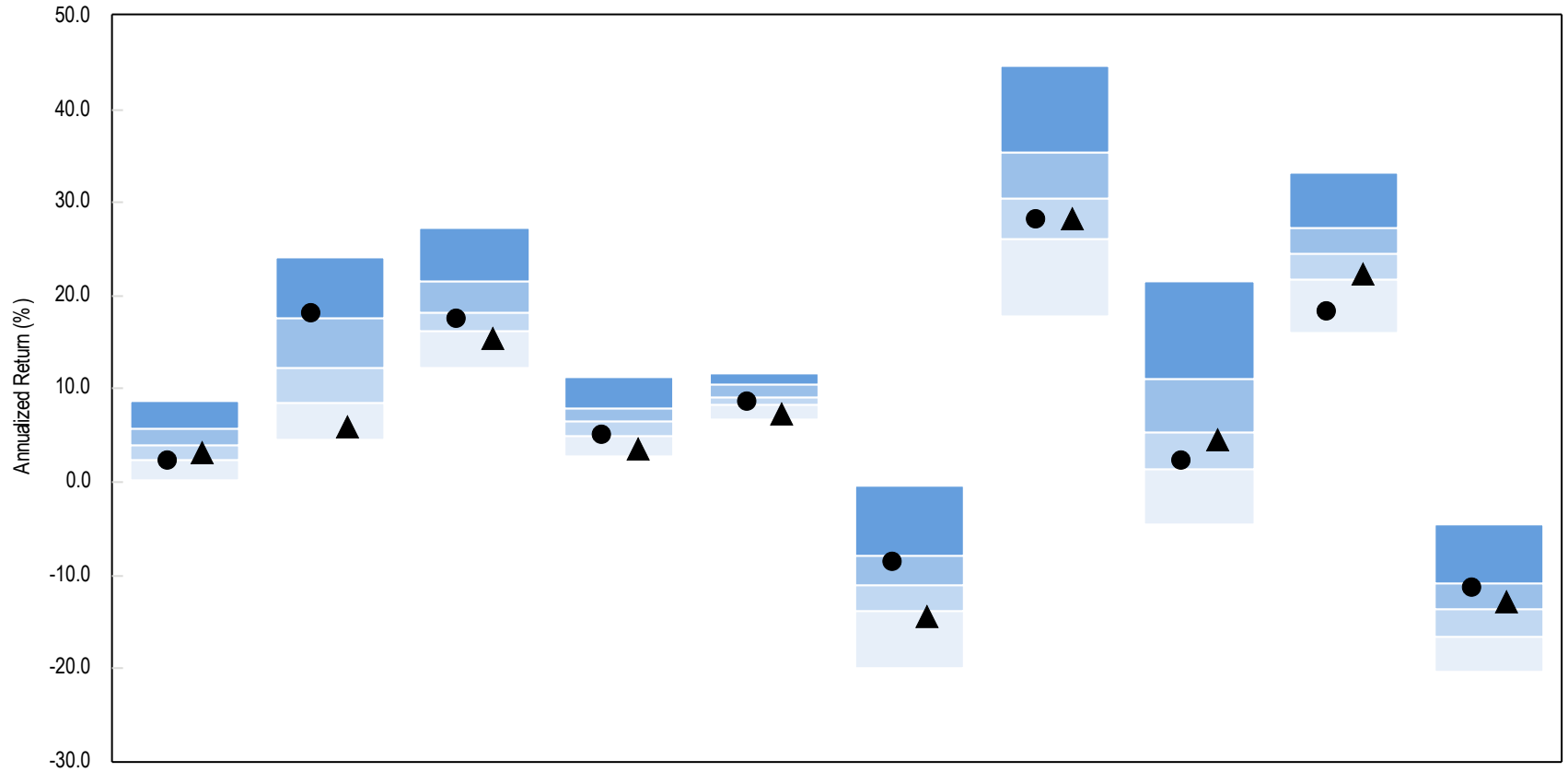
	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Owens Corning	1.69	36.22	0.61
Patterson Cos Inc	1.45	25.44	0.37
SLM Corp	1.11	32.66	0.36
Stantec Inc	2.58	11.92	0.31
Power Integrations Inc	2.38	12.09	0.29
Kinsale Capital Group Inc	1.12	24.73	0.28
EMCOR Group Inc.	1.99	13.78	0.27
KBR Inc	1.38	18.43	0.25
Kinetik Holdings Inc	1.20	15.34	0.18
RB Global Inc	2.58	7.13	0.18
% of Portfolio	17.48		3.11

Top Detractors

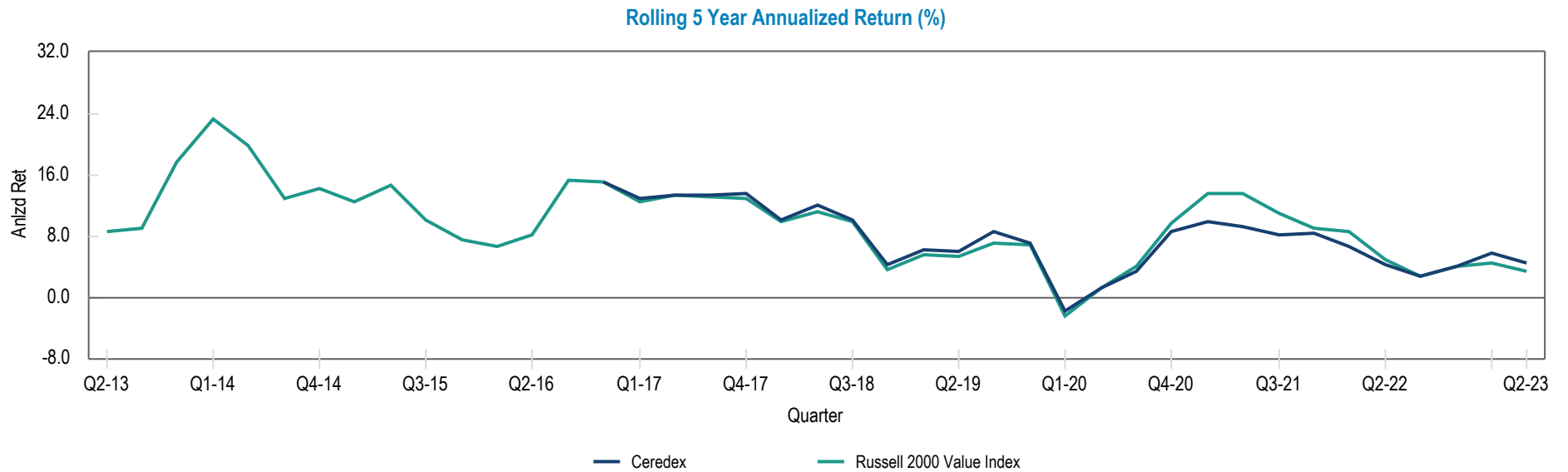
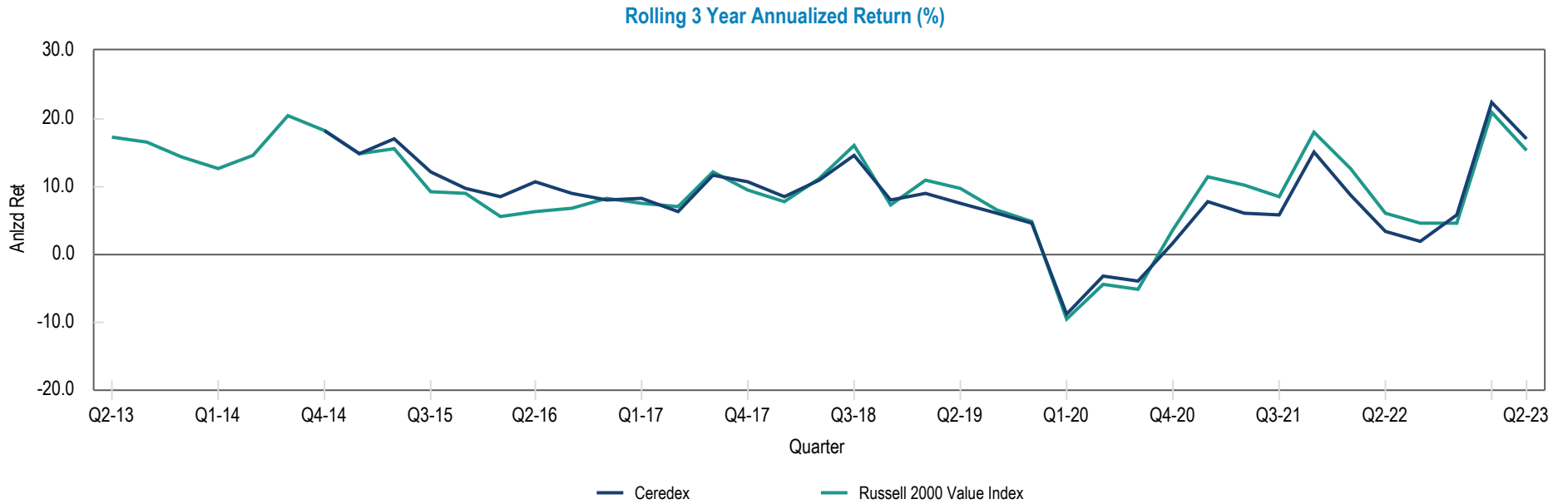
	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Academy Sports and Outdoors Inc	2.96	-17.02	-0.50
First Interstate BancSystem Inc	1.23	-18.59	-0.23
Svenska Kullagerfabriken Skf AB	1.94	-11.72	-0.23
Bank of Hawaii Corp	1.14	-19.45	-0.22
Signet Jewelers Ltd	1.36	-15.84	-0.22
Atlantica Sustainable Inf.	1.09	-19.26	-0.21
Genpact Ltd	1.02	-18.42	-0.19
World Kinect Corp	1.03	-18.11	-0.19
Perrigo Co Plc	3.52	-4.55	-0.16
Ashland Inc	0.96	-15.00	-0.14
% of Portfolio	16.25		-2.29

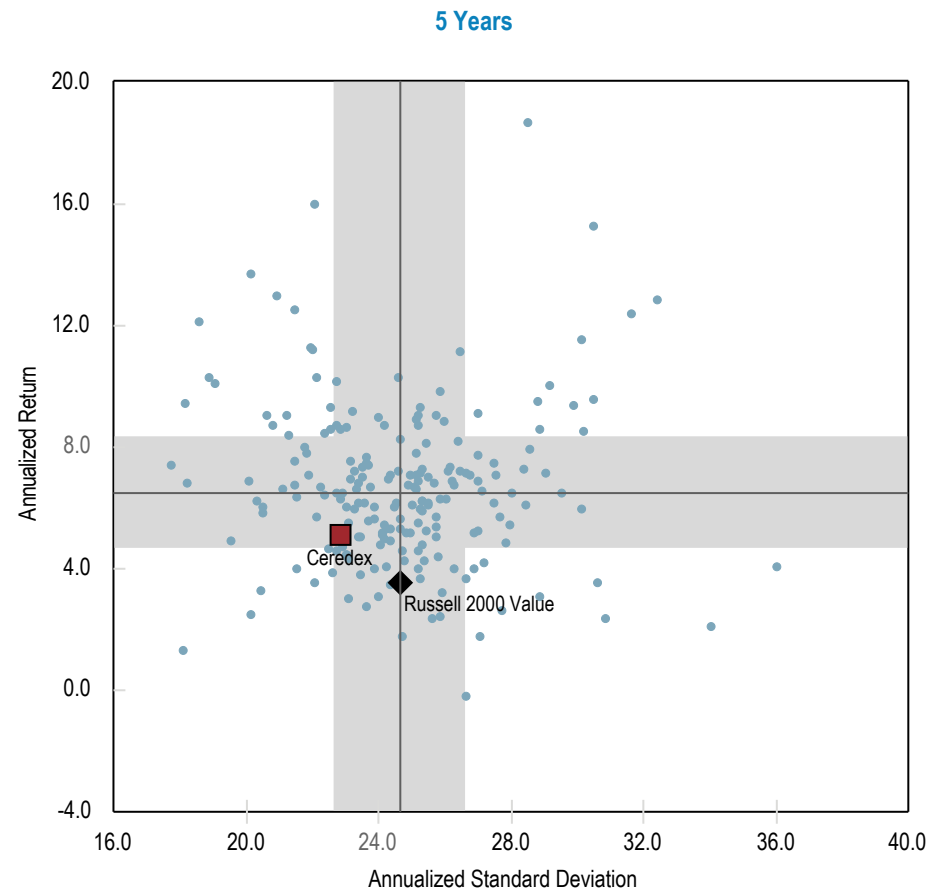
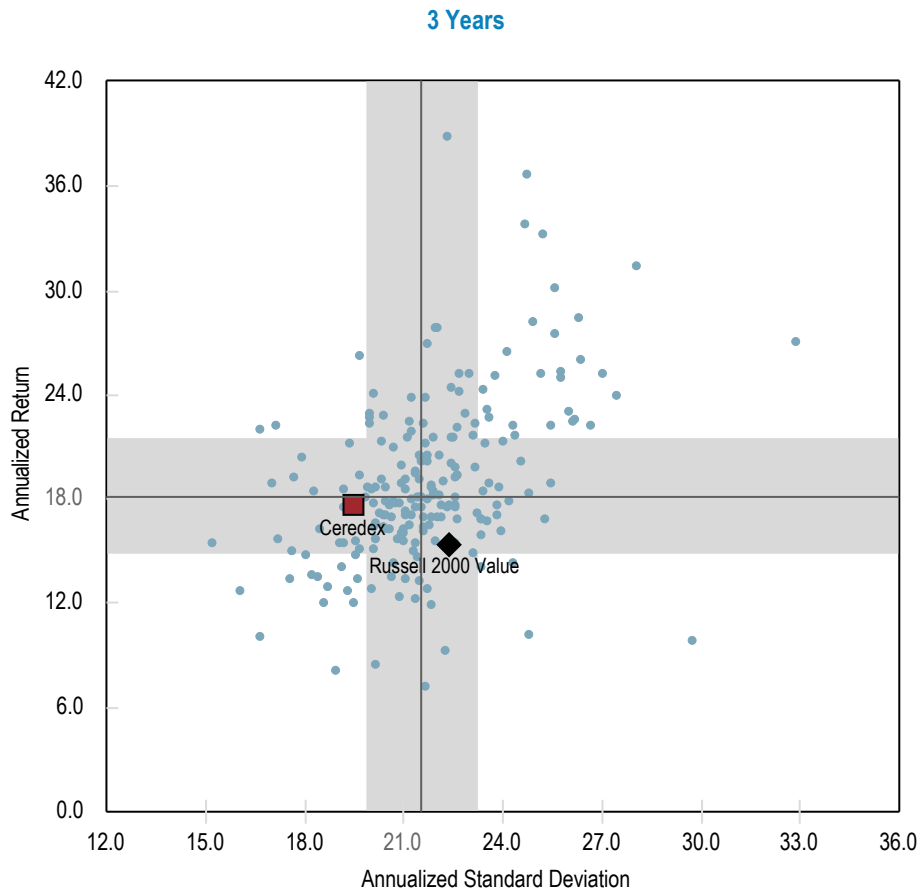
Domestic equity small cap value portfolio of companies with dividend yields and low valuations. Primary personnel include Brett Barner and David Maynard.

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	2.36 (76)	18.11 (22)	17.67 (58)	5.12 (75)	8.81 (63)	-8.46 (27)	28.37 (59)	2.32 (70)	18.36 (88)	-11.32 (29)
▲ Russell 2000 Value Index	3.18 (66)	6.01 (92)	15.43 (83)	3.54 (92)	7.29 (91)	-14.48 (79)	28.27 (60)	4.63 (54)	22.39 (71)	-12.86 (42)
5th Percentile	8.68	24.19	27.35	11.27	11.71	-0.38	44.60	21.46	33.28	-4.56
1st Quartile	5.77	17.70	21.57	7.96	10.40	-7.93	35.29	11.18	27.36	-10.81
Median	4.02	12.37	18.18	6.52	9.20	-11.12	30.49	5.32	24.42	-13.63
3rd Quartile	2.46	8.49	16.26	5.06	8.25	-13.89	26.17	1.36	21.70	-16.60
95th Percentile	0.26	4.62	12.31	2.77	6.70	-19.91	17.73	-4.58	15.95	-20.37
Population	211	211	209	201	178	219	232	246	254	265





	3 Years	3 Years	3 Years
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Ceredex	17.7	19.5	0.9
Russell 2000 Value Index	15.4	22.3	0.7
eV US Small Cap Value Equity Median	18.2	21.5	0.8
Population	209	209	209

	5 Years	5 Years	5 Years
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Ceredex	5.1	22.9	0.3
Russell 2000 Value Index	3.5	24.7	0.2
eV US Small Cap Value Equity Median	6.5	24.6	0.3
Population	201	201	201

International Equity Managers

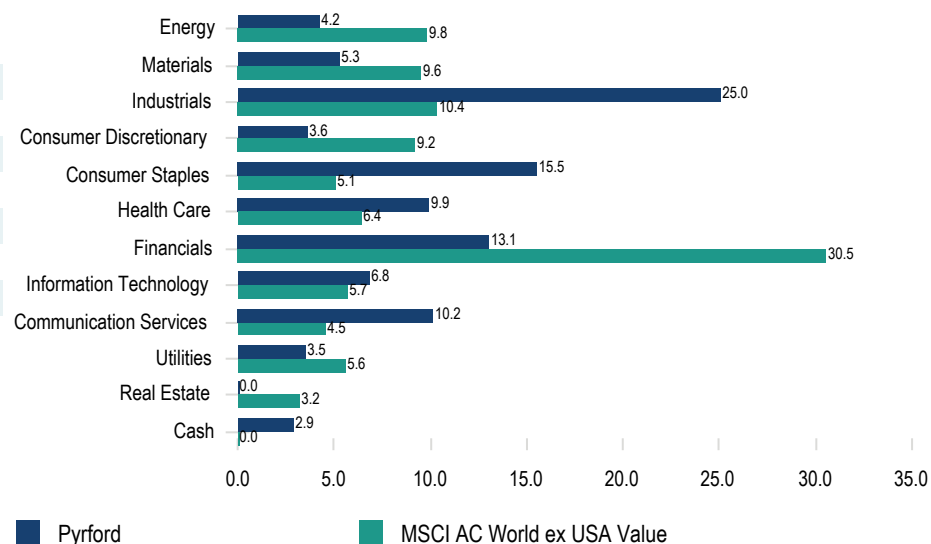
Pyrford Manager Portfolio Overview

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

Characteristics

	Portfolio	Benchmark
Number of Stocks	74	1,359
Wtd. Avg. Mkt. Cap \$M	57,686.17	62,848.62
Median Mkt. Cap \$M	24,131.21	8,551.39
Price/Earnings ratio	13.77	9.42
Price/Book ratio	2.25	1.65
Return on Equity (%)	4.71	3.61
Current Yield (%)	4.13	4.82
Beta (5 Years, Monthly)	0.75	1.00

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



Largest Holdings

	End Weight (%)	Quarterly Return (%)
Japan Tobacco Inc	3.02	6.91
Nestle SA, Cham Und Vevey	2.58	1.11
Mitsubishi Electric Corp	2.46	18.24
United Overseas Bank Ltd	2.41	-5.11
Singapore Telecommunications	2.24	-0.16
Roche Holding AG	2.19	7.02
Novartis AG	2.17	9.72
Brambles Ltd	2.15	6.64
Kddi Corp	2.07	0.11
L'Air Liquide SA	2.01	8.90

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Mitsubishi Electric Corp	2.17	18.24	0.40
SAP SE	2.59	10.11	0.26
Fielmann Group AG	0.91	27.68	0.25
Japan Tobacco Inc	3.01	6.91	0.21
L'Air Liquide SA	2.30	8.90	0.20
Novartis AG	2.06	9.72	0.20
Legrand	1.71	10.77	0.18
Deutsche Post AG	2.03	8.85	0.18
Koninklijke Philips NV	0.60	28.95	0.17
Atlas Copco AB	1.07	14.30	0.15

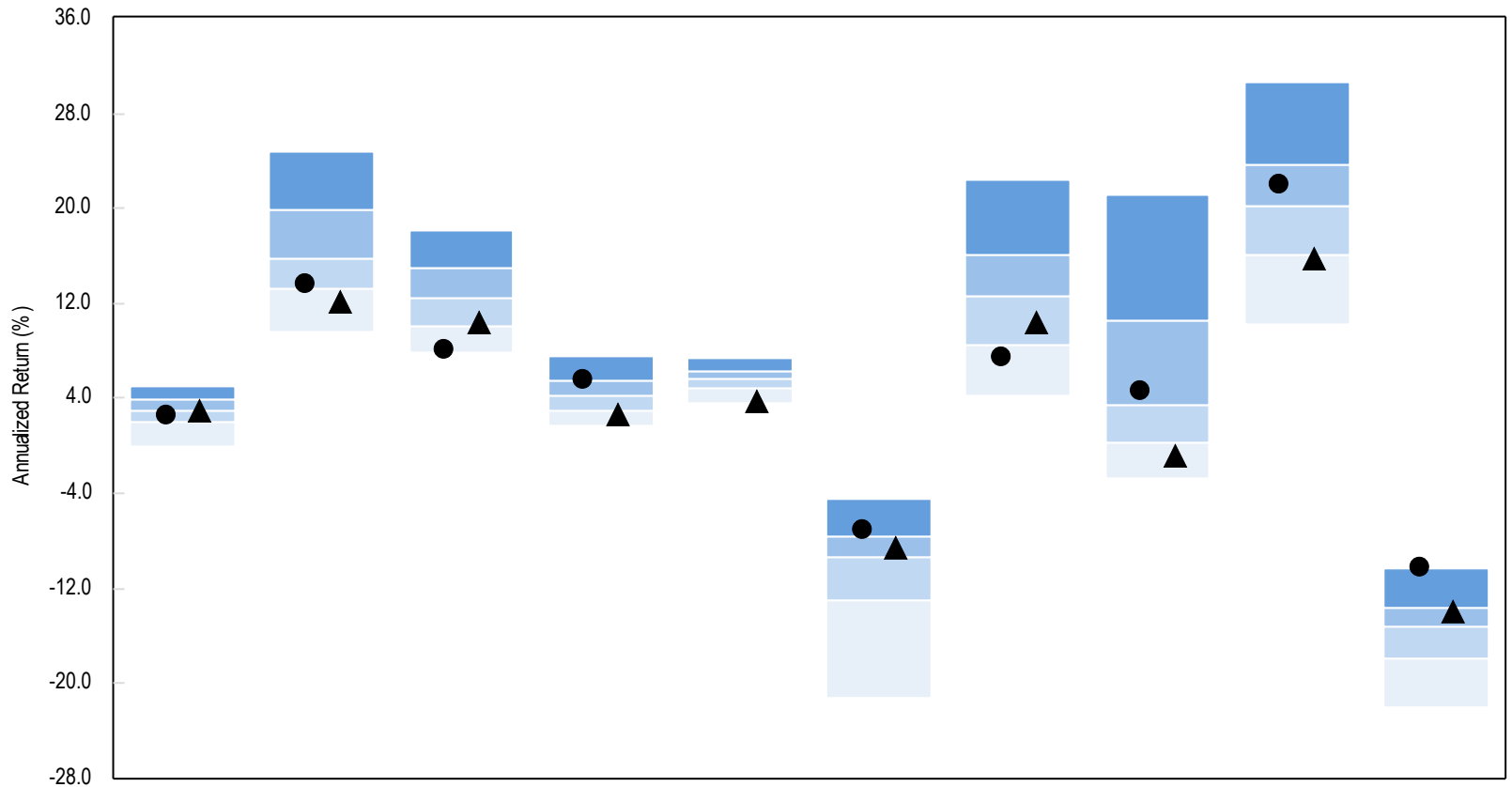
Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Telenor ASA	1.63	-9.81	-0.16
Axiata Group BHD	0.80	-16.77	-0.13
Nabtesco Corp	1.26	-9.09	-0.11
Vodafone Group Public	1.07	-10.40	-0.11
Essity Aktiebolag	1.50	-7.01	-0.10
United Overseas Bank Ltd	1.84	-5.11	-0.09
Malayan Banking Bhd Maybank	1.70	-4.80	-0.08
British American Tobacco	1.44	-5.59	-0.08
GEA Group AG	1.10	-6.25	-0.07
BP PLC	0.92	-6.72	-0.06

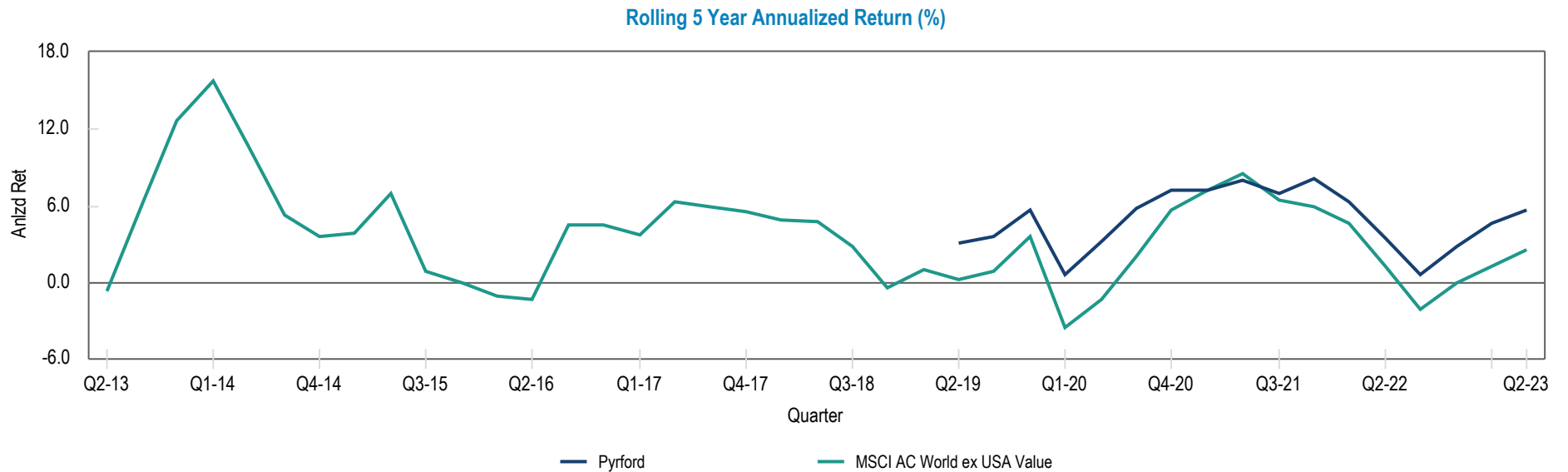
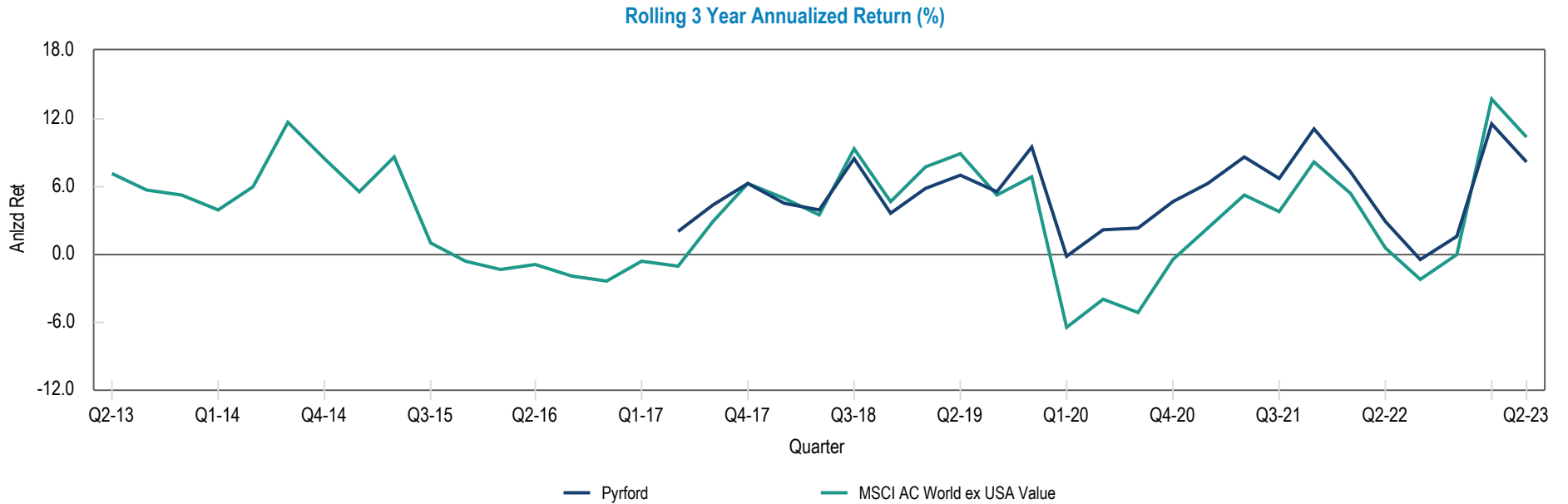
% of Portfolio 18.45 2.21 % of Portfolio 13.26 -1.01

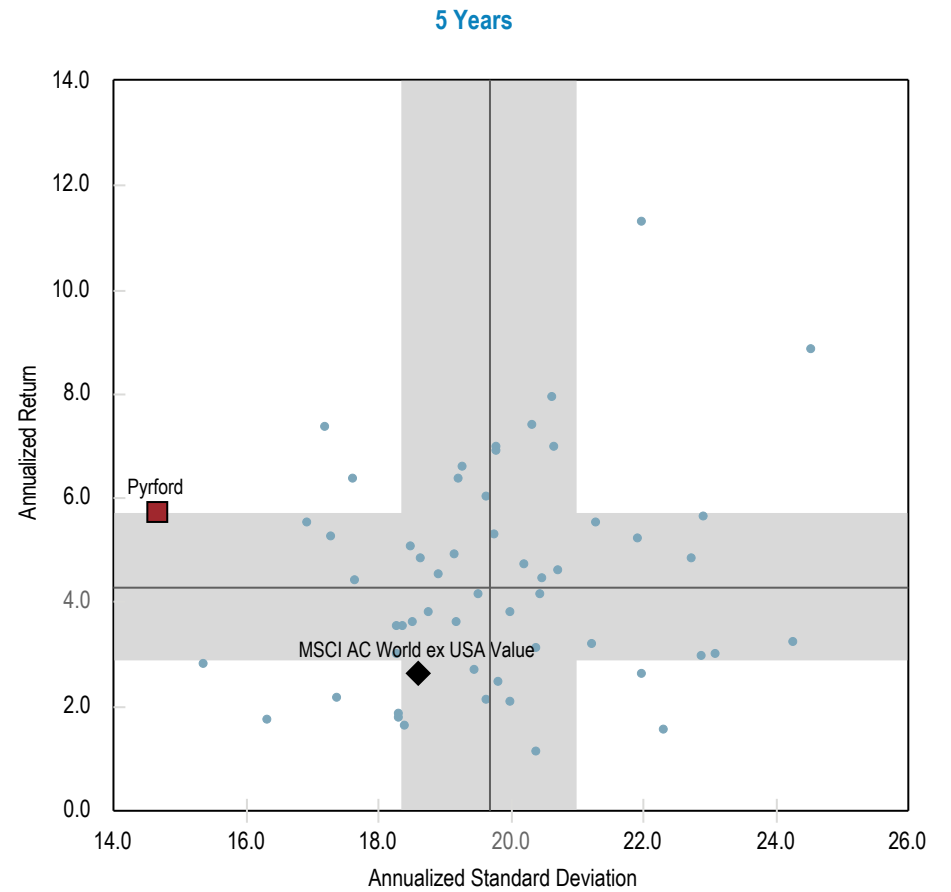
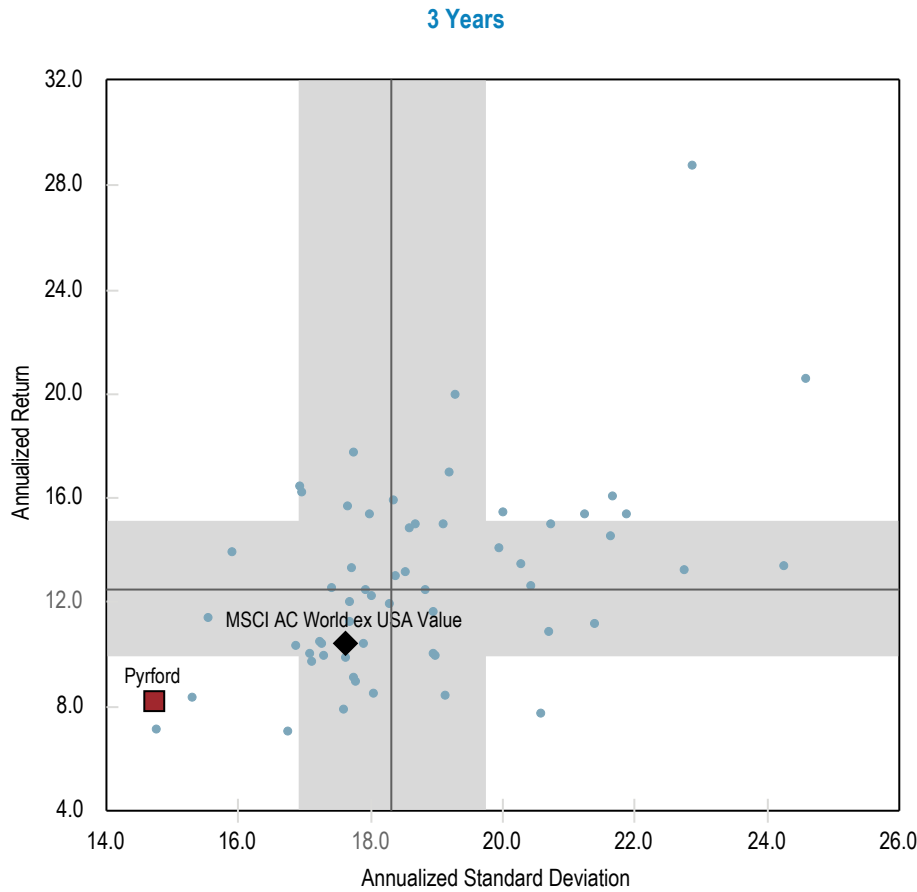
International equity value portfolio of non-US companies with low valuations at the country and stock level. Primary personnel include Tony Cousins, Daniel McDonagh, and Paul Simons.

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	2.65 (61)	13.66 (71)	8.24 (94)	5.73 (23)	-	-6.97 (19)	7.57 (83)	4.66 (45)	22.07 (36)	-10.15 (5)
▲ MSCI AC World ex USA Value (Net)	2.95 (50)	12.19 (85)	10.42 (73)	2.65 (81)	3.70 (91)	-8.59 (39)	10.46 (67)	-0.77 (79)	15.72 (76)	-13.97 (28)
5th Percentile	4.96	24.75	18.10	7.62	7.45	-4.46	22.48	21.10	30.59	-10.27
1st Quartile	3.85	19.85	15.05	5.54	6.32	-7.64	16.14	10.50	23.72	-13.61
Median	2.94	15.74	12.53	4.30	5.62	-9.39	12.69	3.45	20.15	-15.20
3rd Quartile	1.96	13.26	10.14	2.99	4.90	-12.94	8.48	0.25	16.04	-17.85
95th Percentile	-0.10	9.68	7.86	1.71	3.64	-21.16	4.27	-2.73	10.31	-22.02
Population	63	63	58	54	37	64	67	68	67	66





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Pyrford	8.2	14.7	0.5
MSCI AC World ex USA Value (Net)	10.4	17.6	0.6
eV ACWI ex-US Value Equity Median	12.5	18.3	0.7
Population	58	58	58

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Pyrford	5.7	14.7	0.3
MSCI AC World ex USA Value (Net)	2.7	18.6	0.2
eV ACWI ex-US Value Equity Median	4.3	19.7	0.2
Population	54	54	54

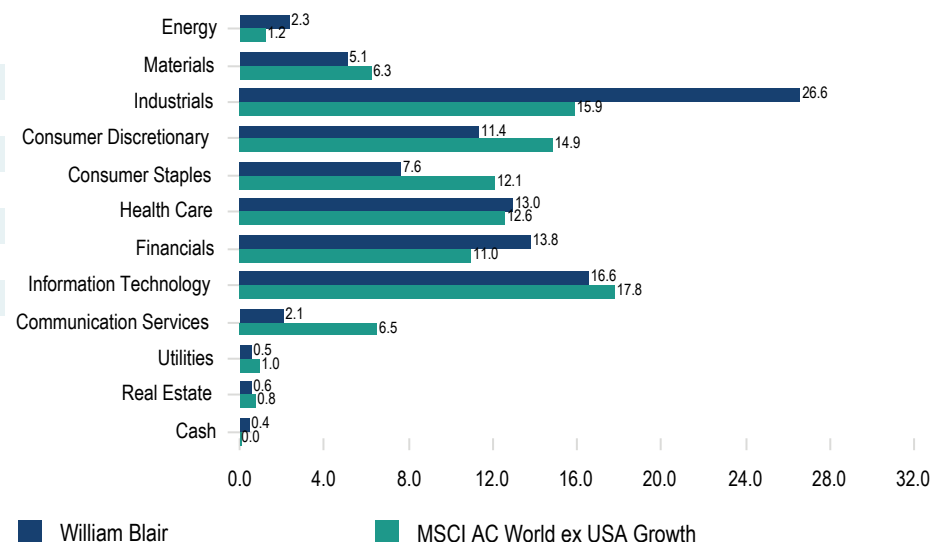
William Blair
Manager Portfolio Overview

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

Characteristics

	Portfolio	Benchmark
Number of Stocks	180	1,287
Wtd. Avg. Mkt. Cap \$M	81,951.79	112,079.92
Median Mkt. Cap \$M	12,216.28	9,627.78
Price/Earnings ratio	25.01	21.58
Price/Book ratio	4.17	3.56
Return on Equity (%)	6.68	7.08
Current Yield (%)	1.64	1.74
Beta (5 Years, Monthly)	1.05	1.00

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



Largest Holdings

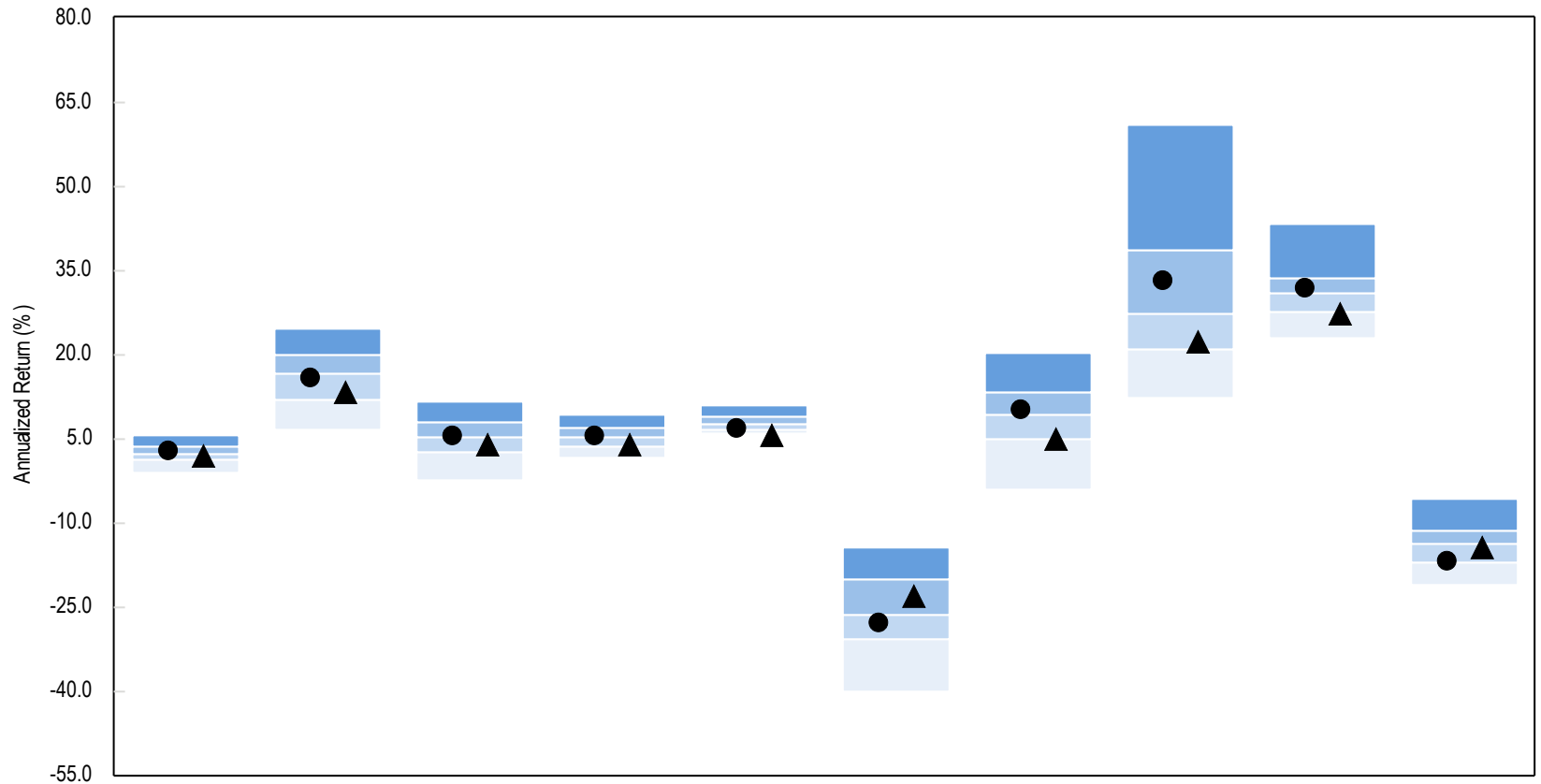
Top Contributors

Top Detractors

	End Weight (%)	Quarterly Return (%)		Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)		Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
ASML Holding NV	2.01	6.80	Icon PLC	1.15	17.14	0.20	Alibaba Group Holding Ltd	1.43	-18.99	-0.27
Taiwan Semiconductor Man.	1.96	8.49	Amadeus IT Group SA	1.43	13.51	0.19	Teleperformance	0.78	-29.19	-0.23
Novo Nordisk A/S	1.77	1.72	Compass Group PLC	1.57	12.14	0.19	China Tourism Group	0.38	-42.94	-0.16
Linde Plc	1.73	7.60	Daikin Industries Ltd	1.25	13.92	0.17	Tencent Holdings LTD	1.07	-13.28	-0.14
DSV A/S	1.61	8.53	B3 S.A.-Brasil Bolsa Balcao	0.35	47.66	0.17	Sartorius Stedim Biotech SA	0.51	-18.56	-0.09
Astrazeneca PLC	1.60	3.23	Experian Plc	0.91	17.86	0.16	Beijer Ref Ab	0.32	-27.09	-0.09
Amadeus IT Group SA	1.57	13.51	Taiwan Semiconductor Man.	1.79	8.49	0.15	Kweichow Moutai Co Ltd	0.74	-10.76	-0.08
Keyence Corp	1.56	-3.06	Dollarama Inc	1.03	13.71	0.14	Shenzhen Inovance Technology	0.57	-13.07	-0.08
Compass Group PLC	1.53	12.14	DSV A/S	1.46	8.53	0.12	Foshan Haitian Flavouring	0.25	-29.54	-0.07
Canadian Pacific Kansas City Ltd	1.51	5.17	Airbus SE	1.30	9.36	0.12	JD.com Inc	0.33	-21.75	-0.07
			% of Portfolio	12.24		1.63	% of Portfolio	6.38		-1.28

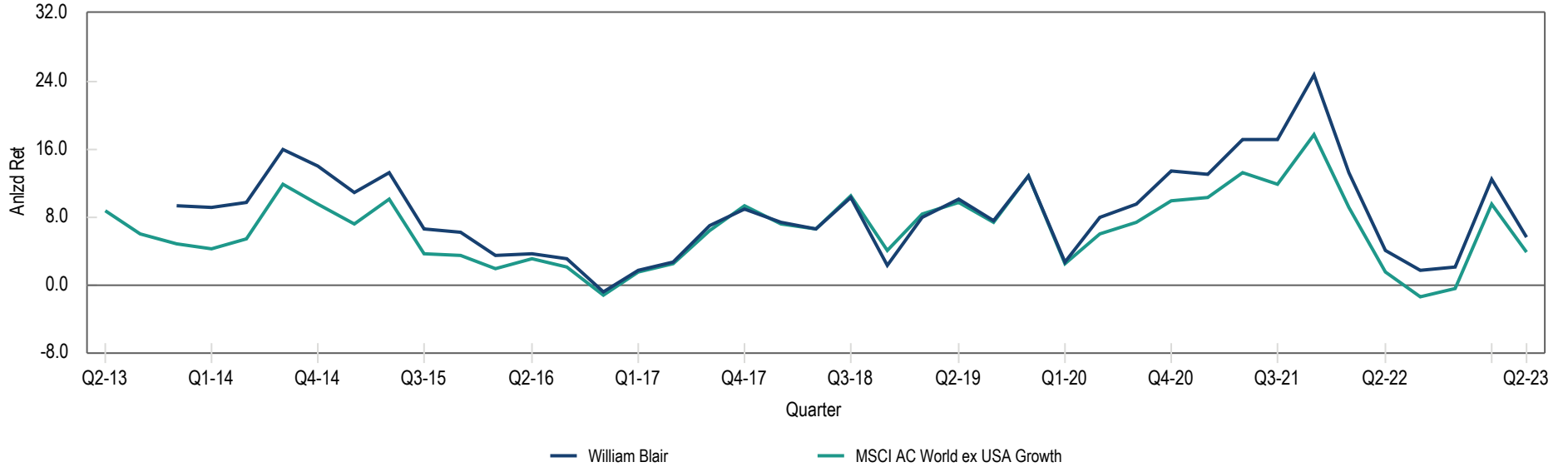
International equity growth portfolio of non-US companies with high growth rates constructed from the security level. Primary personnel include Simon Fennell and Kenneth McAtamney.

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

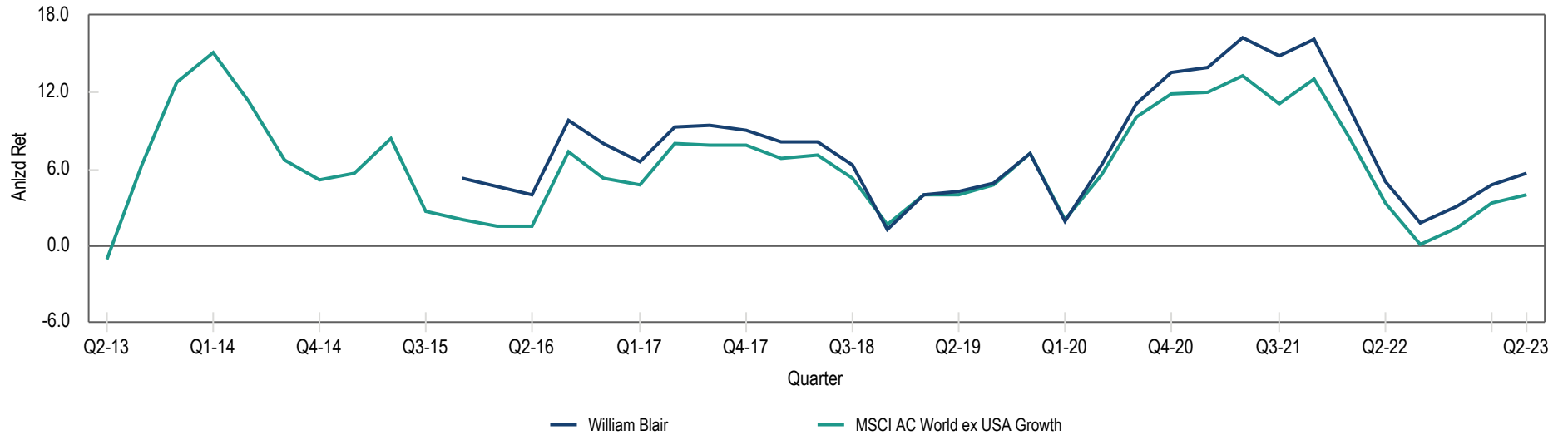


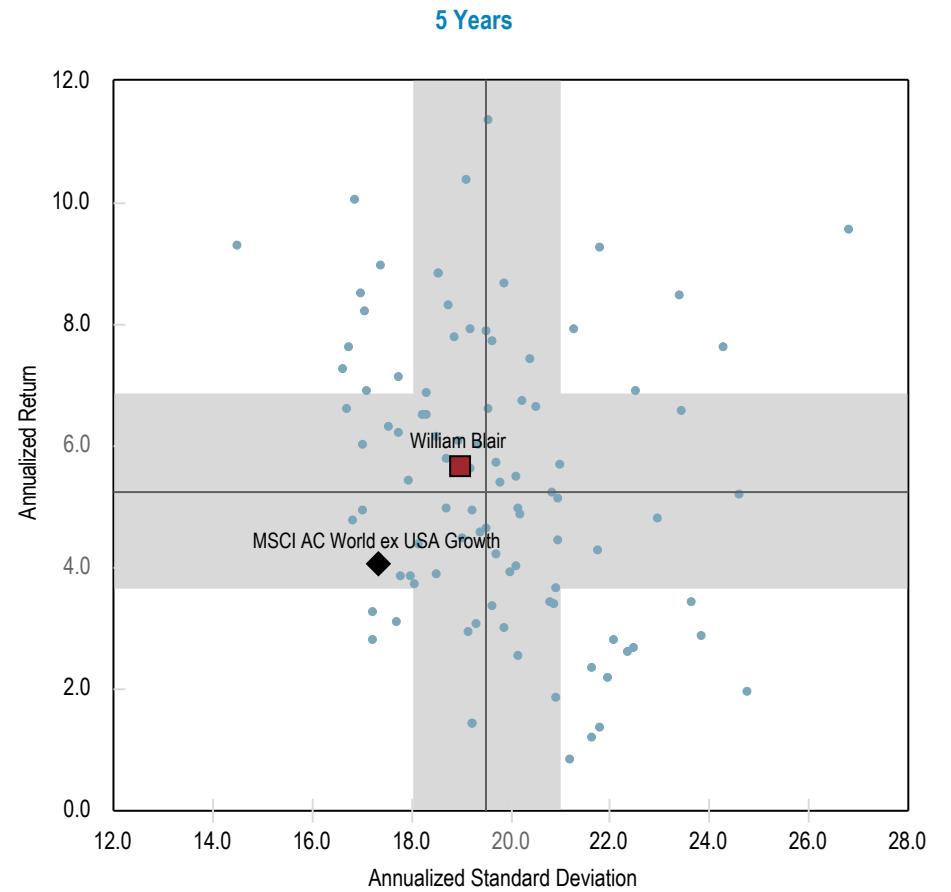
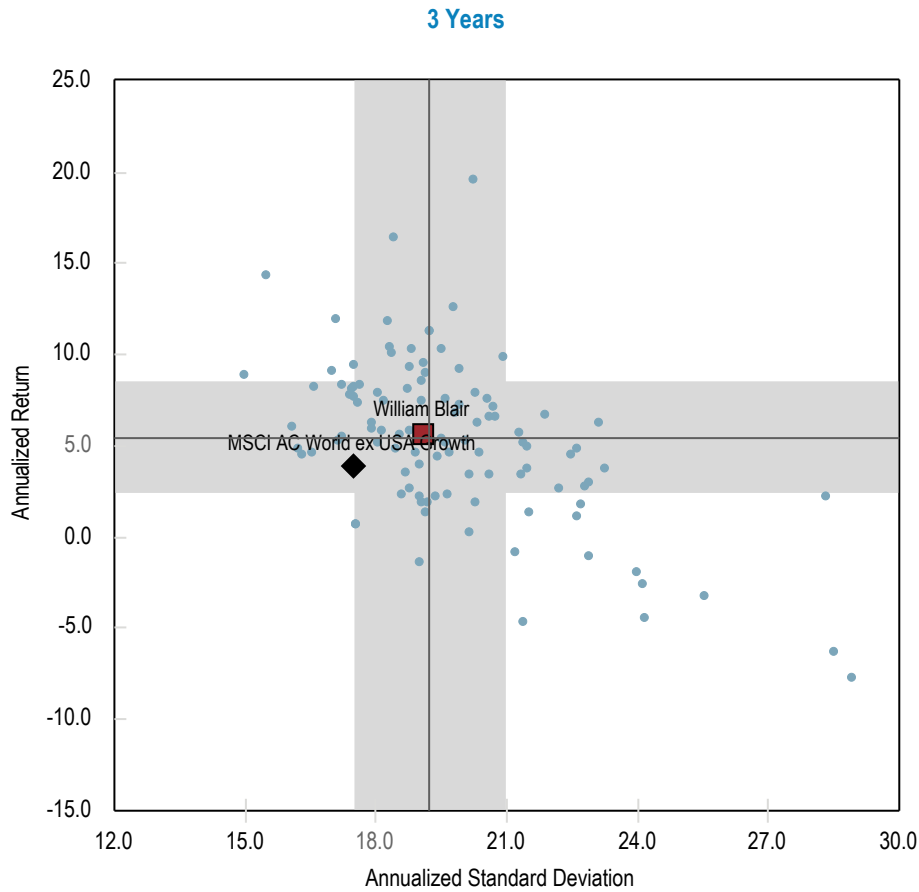
	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● William Blair	2.89 (47)	16.07 (57)	5.61 (49)	5.67 (46)	6.92 (63)	-27.75 (59)	10.48 (42)	33.25 (36)	32.01 (36)	-16.78 (72)
▲ MSCI AC World ex USA Growth	1.94 (67)	13.26 (68)	3.96 (68)	4.06 (69)	5.61 (98)	-23.05 (35)	5.09 (75)	22.20 (72)	27.34 (78)	-14.43 (55)
5th Percentile	5.53	24.66	11.74	9.29	10.89	-14.23	20.36	60.88	43.28	-5.69
1st Quartile	3.77	20.13	8.07	7.04	9.13	-19.89	13.47	38.78	33.55	-11.44
Median	2.50	16.70	5.47	5.26	7.55	-26.23	9.29	27.47	30.89	-13.53
3rd Quartile	1.23	12.09	2.76	3.56	6.75	-30.70	5.04	20.92	27.81	-16.86
95th Percentile	-0.94	6.56	-2.33	1.75	5.85	-39.90	-4.03	12.29	23.04	-20.93
Population	111	110	106	95	67	113	115	111	110	104

Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
William Blair	5.6	19.1	0.3
MSCI AC World ex USA Growth (Net)	4.0	17.5	0.2
eV ACWI ex-US Growth Equity Median	5.5	19.2	0.3
Population	106	106	106

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
William Blair	5.7	19.0	0.3
MSCI AC World ex USA Growth (Net)	4.1	17.4	0.2
eV ACWI ex-US Growth Equity Median	5.3	19.5	0.3
Population	95	95	95

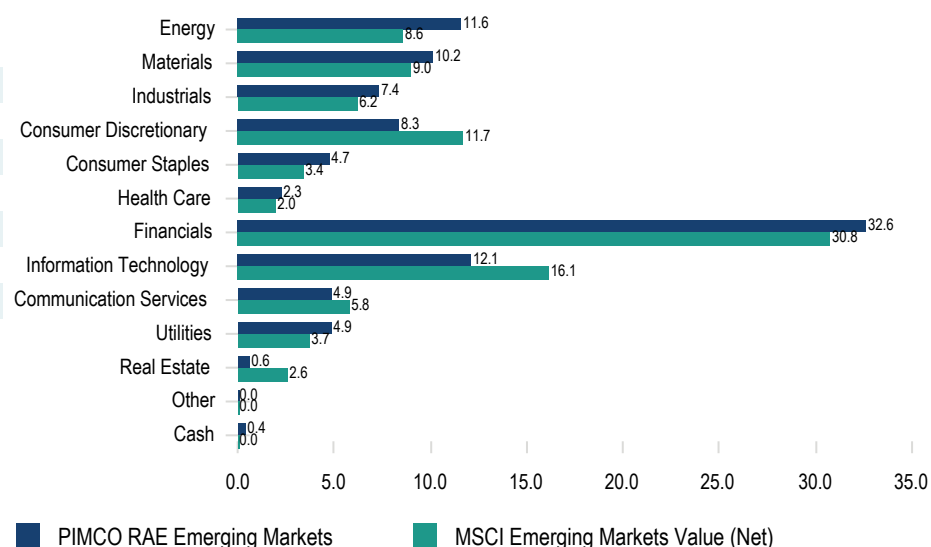
PIMCO RAE Emerging Markets
Manager Portfolio Overview

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

Characteristics

	Portfolio	Benchmark
Number of Stocks	376	831
Wtd. Avg. Mkt. Cap \$M	19,694.90	58,681.33
Median Mkt. Cap \$M	4,158.87	5,810.00
Price/Earnings ratio	6.63	8.89
Price/Book ratio	1.67	1.75
Return on Equity (%)	2.71	3.02
Current Yield (%)	5.69	4.93
Beta (5 Years, Monthly)	1.07	1.00

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



Largest Holdings

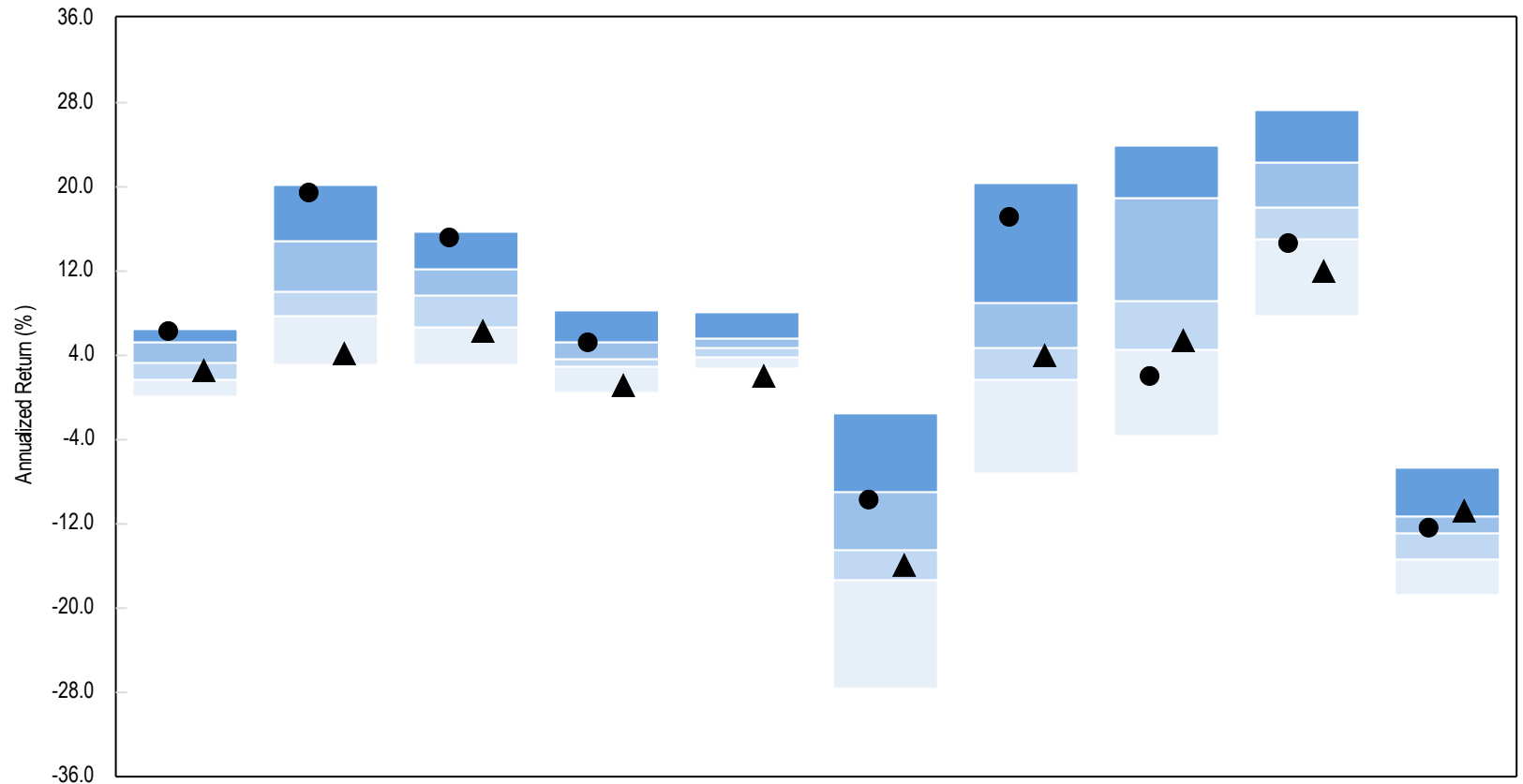
Top Contributors

Top Detractors

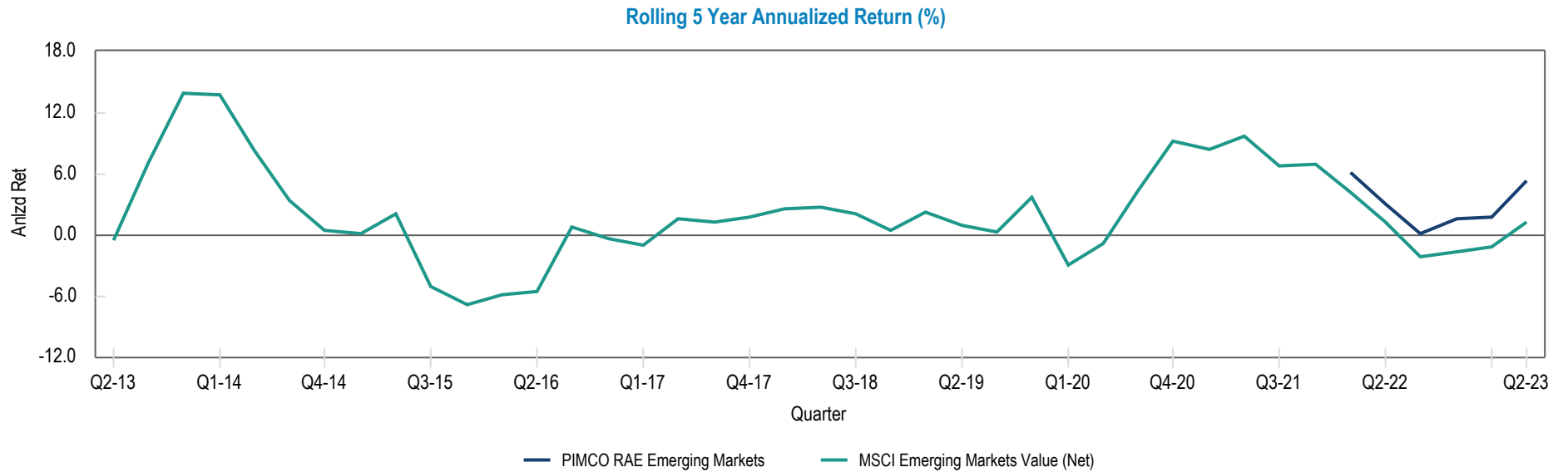
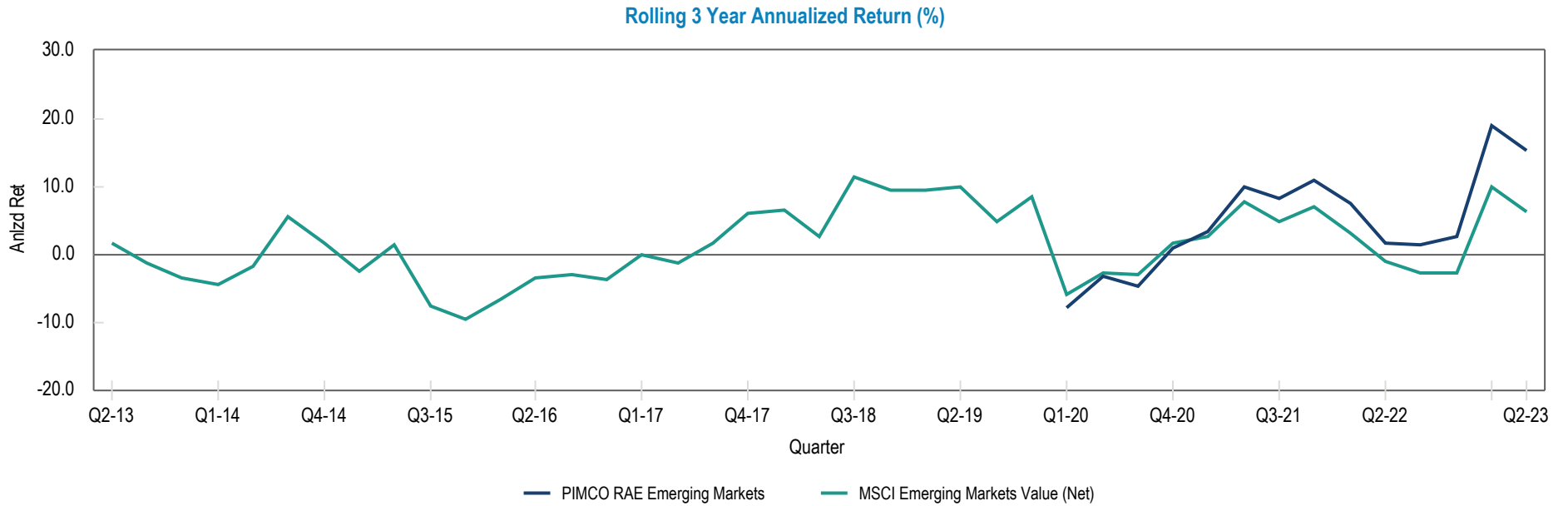
	End Weight (%)	Quarterly Return (%)		Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)		Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
China Construction Bank Corp	4.14	-0.22	Banco Do Brasil SA Bb Brasil	1.47	37.58	0.55	Turkiye Is Bankasi AS	1.33	-14.14	-0.19
Bank of China Ltd	3.11	4.50	Wistron Corp	0.34	112.11	0.39	PT Indo Tambangraya Megah	0.52	-28.43	-0.15
China Petroleum & Chemical	3.11	3.52	Posco International Corp	0.49	76.56	0.38	Haci Omer Sabanci	1.30	-10.41	-0.14
Industrial & Comm. Bank of China	2.30	0.17	Cemex SAB de CV	1.50	24.36	0.37	Akbank	1.07	-12.20	-0.13
Petrochina Co Ltd	1.91	21.99	Petrochina Co Ltd	1.59	21.99	0.35	Tupras-Turkiye Petrol	0.42	-22.90	-0.10
Cemex SAB de CV	1.85	24.36	Vedanta Ltd	1.62	16.13	0.26	Gazprom PJSC	0.72	-13.18	-0.09
Vipshop Holdings Limited	1.80	8.70	Quanta Computer Inc	0.32	79.01	0.25	Dongkuk Holdings Co Ltd	0.09	-76.46	-0.07
Hon Hai Precision Industry	1.73	6.22	ITC Ltd	1.11	20.46	0.23	PT Adaro Energy Indonesia Tbk	0.46	-15.01	-0.07
SCB X PCL	1.67	4.20	Lite-On Technology Corp	0.45	38.04	0.17	Turkcell Iletisim Hizmet AS	0.41	-16.43	-0.07
Vedanta Ltd	1.58	16.13	Inventec Corp	0.53	32.18	0.17	VTB Bank PJSC	0.50	-13.18	-0.07
			% of Portfolio	9.42		3.11	% of Portfolio	6.82		-1.07

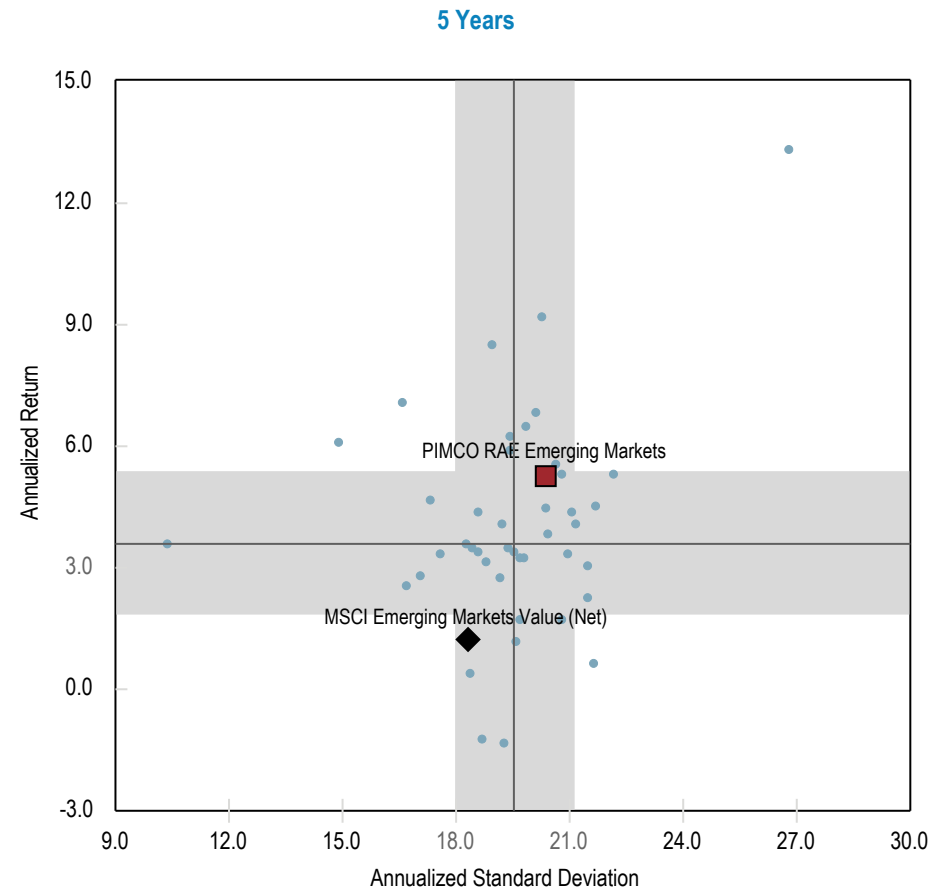
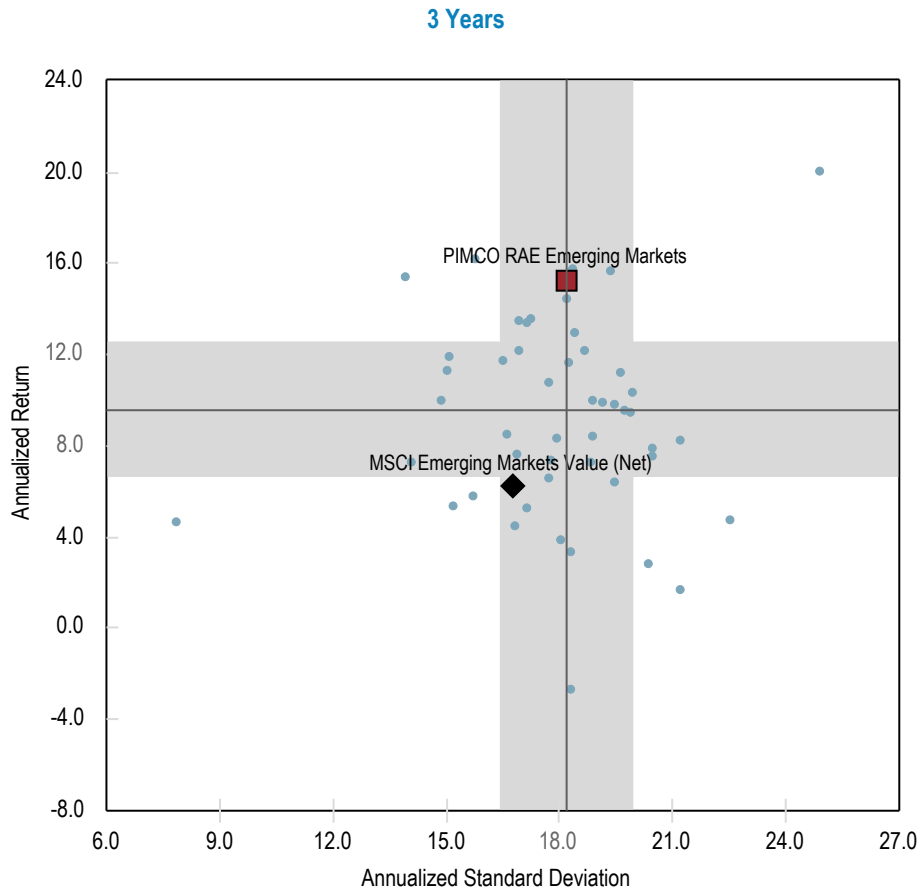
The PIMCO RAE Emerging Markets seeks to invest 80% of its assets in investments that are economically tied to emerging market countries. The portfolio is sub-advised by Research Affiliates, LLC.

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	6.36 (8)	19.49 (6)	15.28 (10)	5.28 (27)	-	-9.66 (32)	17.08 (8)	2.13 (85)	14.63 (78)	-12.30 (44)
▲ MSCI Emerging Markets Value NR	2.53 (63)	4.13 (91)	6.27 (78)	1.22 (91)	1.99 (100)	-15.83 (56)	4.00 (60)	5.48 (72)	11.96 (91)	-10.74 (21)
5th Percentile	6.48	20.15	15.75	8.30	8.10	-1.45	20.40	23.96	27.29	-6.64
1st Quartile	5.17	14.86	12.20	5.31	5.69	-8.91	9.02	18.86	22.23	-11.35
Median	3.27	10.07	9.61	3.60	4.77	-14.46	4.68	9.21	18.02	-12.83
3rd Quartile	1.68	7.78	6.58	2.98	3.78	-17.33	1.74	4.50	15.01	-15.36
95th Percentile	0.08	3.17	3.09	0.43	2.76	-27.73	-7.27	-3.63	7.68	-18.81
Population	55	55	49	44	30	58	56	59	60	57





3 Years

	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
PIMCO RAE Emerging Markets	15.3	18.2	0.8
MSCI Emerging Markets Value (Net)	6.3	16.8	0.4
eV Emg Mkts All Cap Value Equity Median	9.6	18.2	0.5
Population	49	49	49

5 Years

	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
PIMCO RAE Emerging Markets	5.3	20.4	0.3
MSCI Emerging Markets Value (Net)	1.2	18.3	0.1
eV Emg Mkts All Cap Value Equity Median	3.6	19.5	0.2
Population	44	44	44

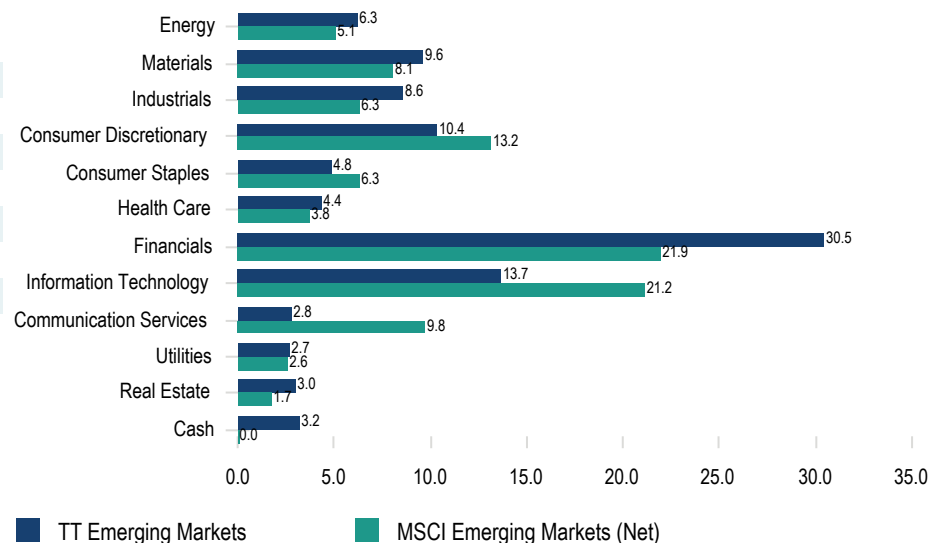
TT Emerging Markets Manager Portfolio Overview

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

Characteristics

	Portfolio	Benchmark
Number of Stocks	68	1,423
Wtd. Avg. Mkt. Cap \$M	58,623.08	101,861.57
Median Mkt. Cap \$M	15,424.96	6,404.01
Price/Earnings ratio	11.23	11.63
Price/Book ratio	2.12	2.40
Return on Equity (%)	2.94	3.79
Current Yield (%)	2.43	3.25
Beta (5 Years, Monthly)	1.13	1.00

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



Largest Holdings

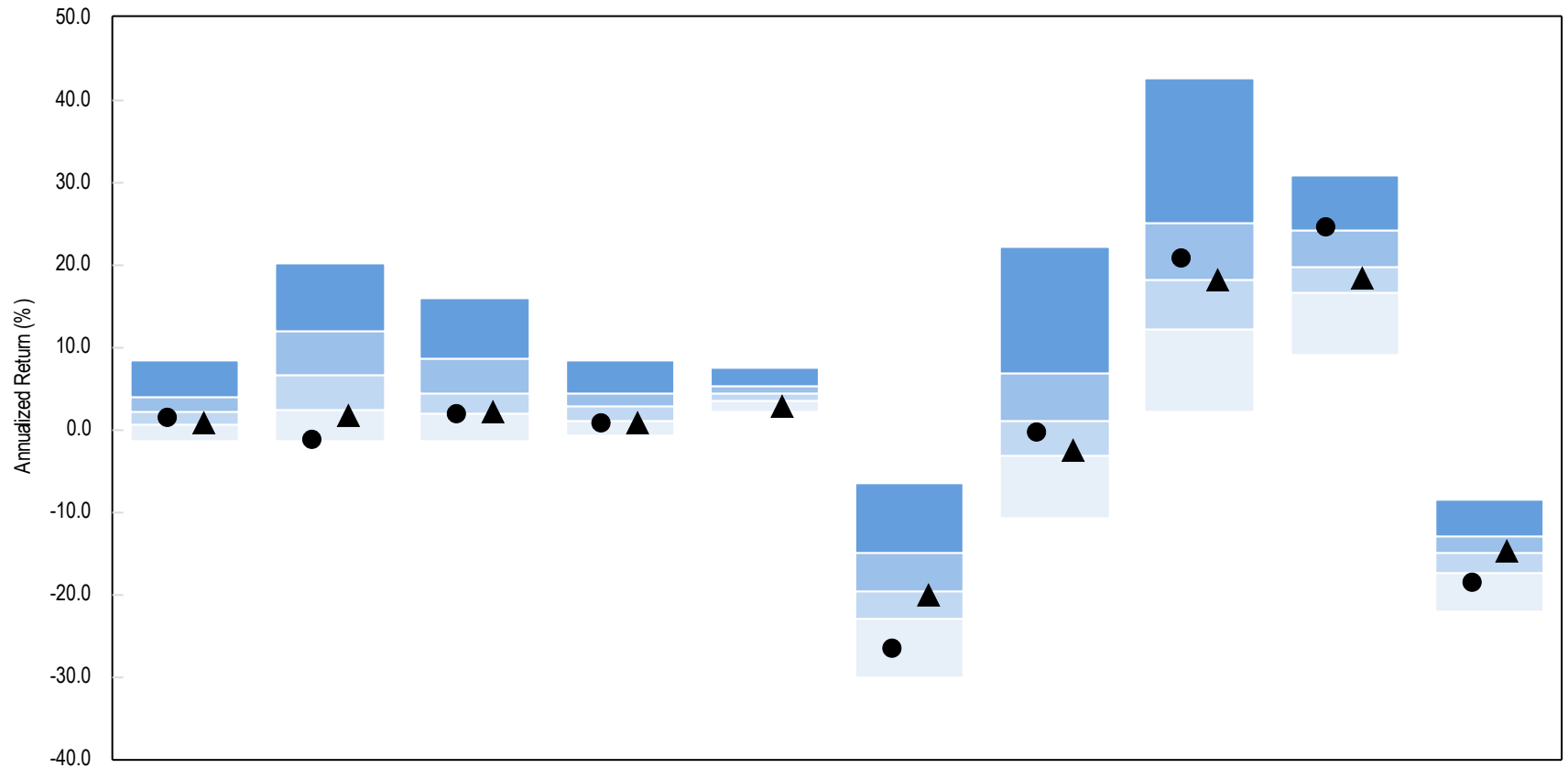
Top Contributors

Top Detractors

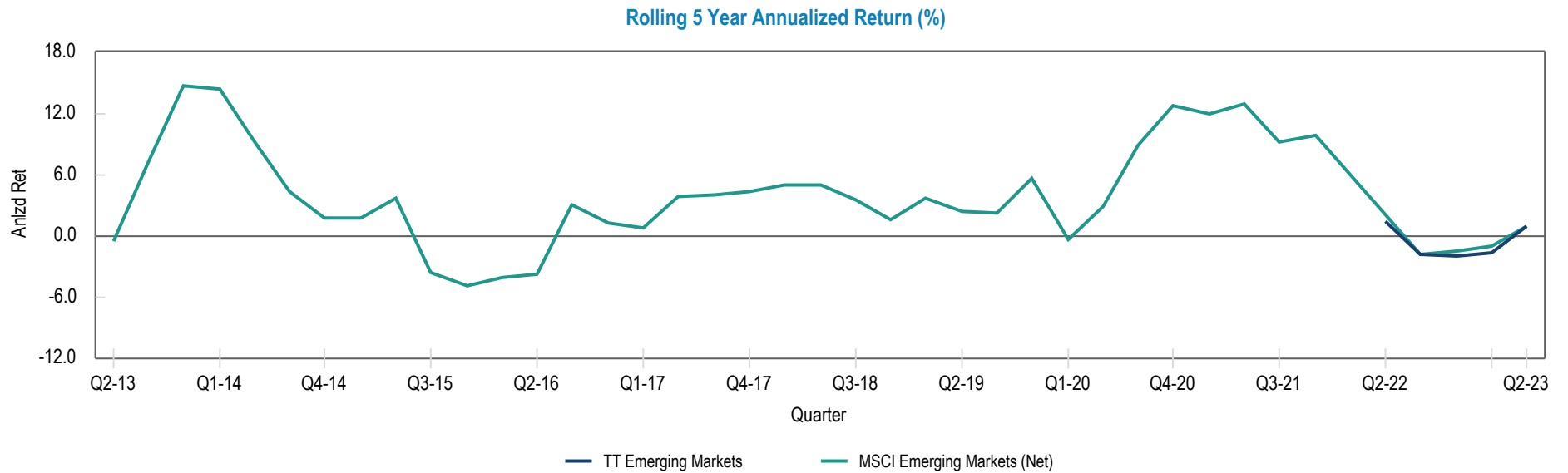
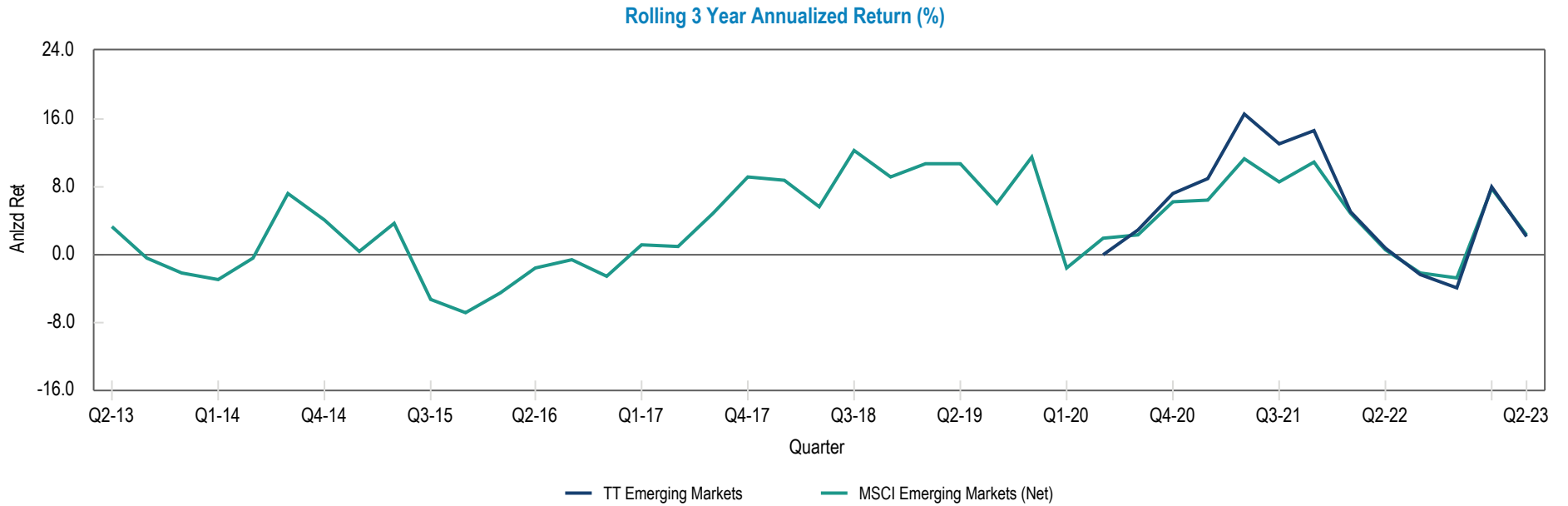
	End Weight (%)	Quarterly Return (%)		Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)		Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Axis Bank Ltd	5.17	15.23	XP Inc	1.31	97.64	1.28	Alibaba Group Holding Ltd	5.41	-18.99	-1.03
Nova Ljubljanska Banka d.d	5.14	9.82	Lojas Renner SA	2.44	28.81	0.70	JD.com Inc	1.58	-21.05	-0.33
Grupo Financiero Banorte	4.34	7.41	Hapvida Participacoes	0.99	59.02	0.58	Ming Yang Smart Energy	1.07	-27.74	-0.30
Samsung Electronics Co Ltd	3.82	9.07	Axis Bank Ltd	3.55	15.23	0.54	L & F Co	1.20	-23.42	-0.28
Alibaba Group Holding Ltd	3.32	-18.99	Zomato Ltd	1.10	47.42	0.52	AngloGold Ashanti Ltd	2.17	-12.81	-0.28
Reliance Industries Ltd	3.23	9.60	Taiwan Semiconductor Man.	8.57	5.65	0.48	Beijing Oriental Waterproof	1.22	-22.69	-0.28
Emaar Properties	2.95	19.34	Emaar Properties	2.40	19.34	0.46	Alibaba Group Holding Ltd	1.39	-18.43	-0.26
Samsung Electronics Co Ltd	2.91	11.46	Samsung Electronics Co Ltd	3.84	11.46	0.44	Tencent Holdings LTD	1.69	-13.28	-0.22
Ypf Sociedad Anonima	2.86	43.64	Centrais Eletricas Brasileiras	1.99	21.66	0.43	LUFAX HOLDING LTD	0.77	-27.99	-0.21
Centrais Eletricas Brasileiras	2.52	21.66	Ypf Sociedad Anonima	0.98	35.61	0.35	Qifu Technology Inc	1.96	-10.18	-0.20
			% of Portfolio	27.17		5.80	% of Portfolio	18.46		-3.39

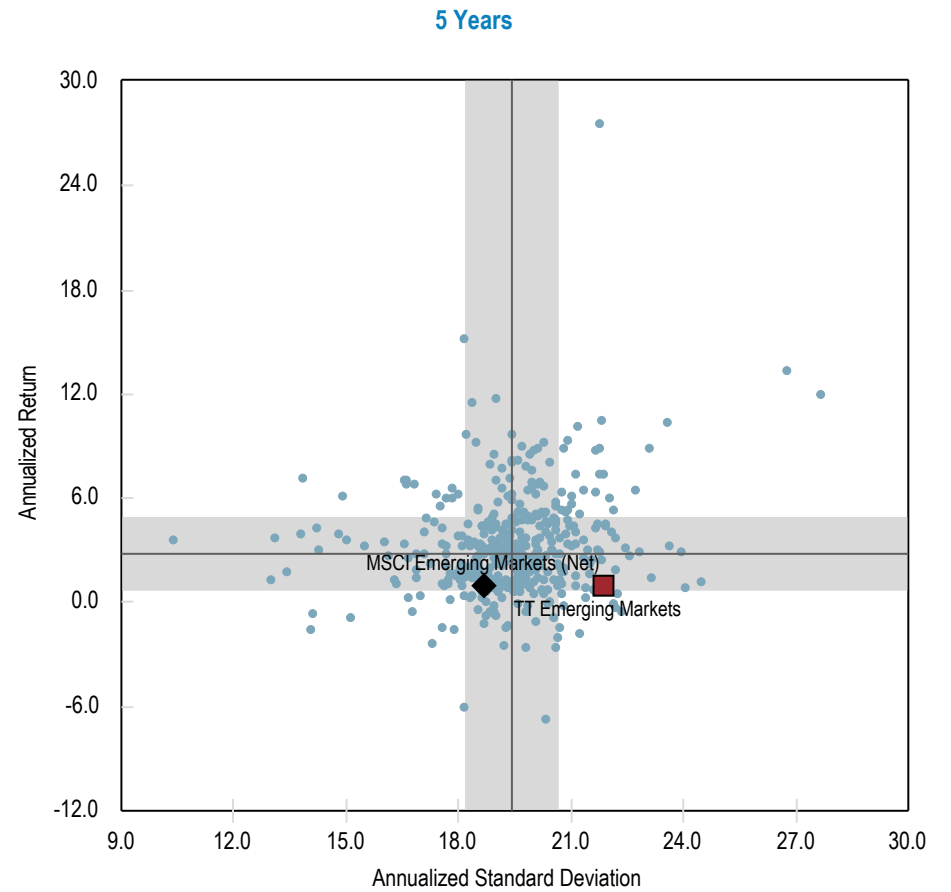
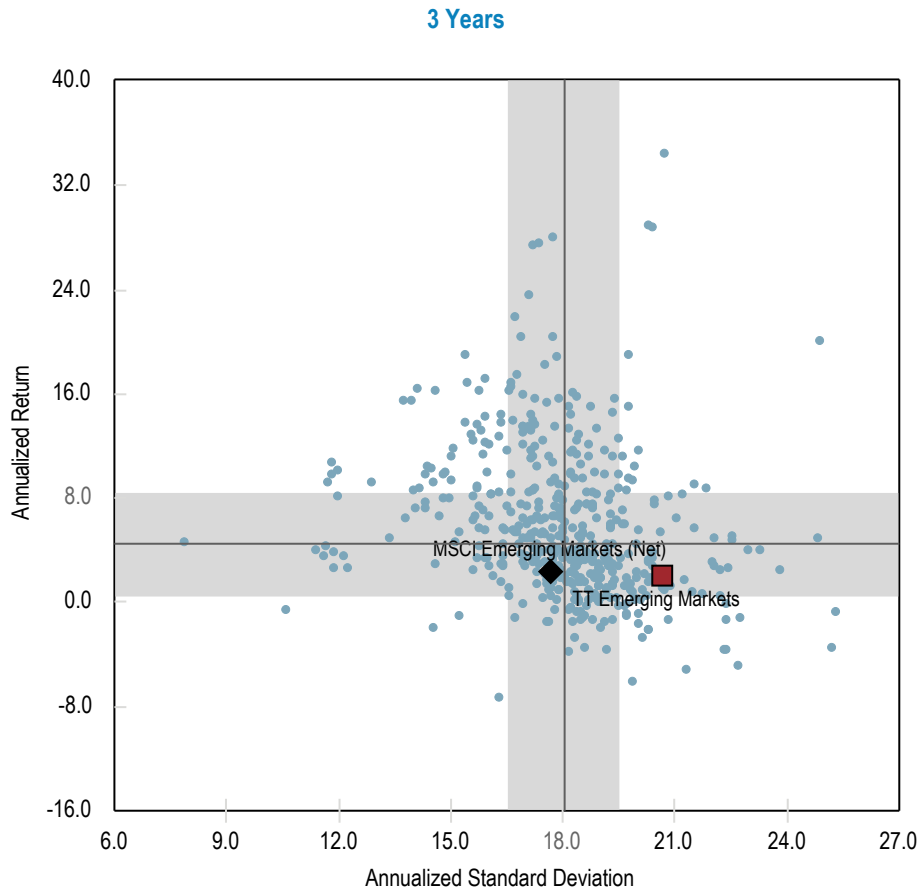
The Emerging Markets Unconstrained strategy aims to outperform its benchmark, MSCI Emerging Markets Index by 5% per annum over a three-year rolling period. It targets high returns and long term capital growth by investing in a focused portfolio of primarily equity and equity-related securities traded 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	1.53 (61)	-1.22 (95)	2.09 (75)	0.95 (80)	-	-26.36 (90)	-0.23 (58)	20.79 (38)	24.77 (24)	-18.39 (82)
▲ MSCI Emerging Markets	0.90 (73)	1.75 (81)	2.32 (72)	0.93 (81)	2.95 (87)	-20.09 (56)	-2.54 (72)	18.31 (51)	18.42 (62)	-14.57 (45)
5th Percentile	8.34	20.33	16.04	8.51	7.45	-6.52	22.27	42.65	30.98	-8.51
1st Quartile	4.06	12.01	8.76	4.51	5.34	-14.92	6.94	25.05	24.31	-12.78
Median	2.17	6.61	4.48	2.82	4.39	-19.54	1.02	18.32	19.68	-14.88
3rd Quartile	0.77	2.38	2.04	1.20	3.50	-22.98	-3.12	12.26	16.59	-17.33
95th Percentile	-1.28	-1.33	-1.26	-0.57	2.18	-29.99	-10.69	2.11	9.12	-22.04
Population	529	527	487	436	306	554	572	575	598	586





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
TT Emerging Markets	2.1	20.7	0.1
MSCI Emerging Markets (Net)	2.3	17.7	0.1
eV Emg Mkts Equity Median	4.5	18.0	0.3
Population	487	487	487

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
TT Emerging Markets	1.0	21.9	0.1
MSCI Emerging Markets (Net)	0.9	18.7	0.1
eV Emg Mkts Equity Median	2.8	19.4	0.2
Population	436	436	436

Global Equity Managers

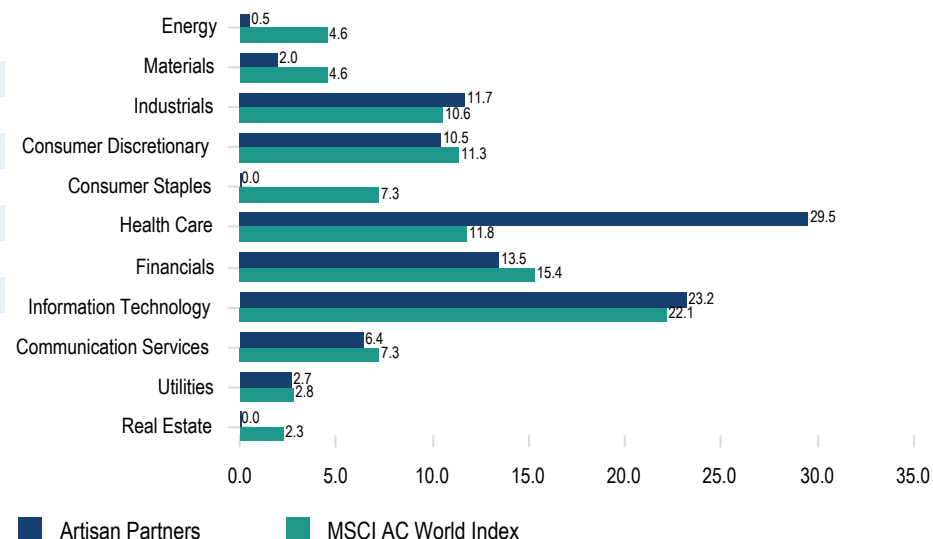
Artisan Partners Manager Portfolio Overview

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

Characteristics

	Portfolio	Benchmark
Number of Stocks	46	2,935
Wtd. Avg. Mkt. Cap \$M	172,926.94	434,410.30
Median Mkt. Cap \$M	64,519.23	12,016.95
Price/Earnings ratio	34.13	18.22
Price/Book ratio	4.78	3.52
Return on Equity (%)	3.66	5.74
Current Yield (%)	0.71	2.18
Beta (5 Years, Monthly)	0.99	1.00

Sector Allocation (%) vs. MSCI AC World Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
Veeva Systems Inc	6.26	7.58
Boston Scientific Corp	4.72	8.11
Advanced Micro Devices Inc	4.59	16.22
Novo Nordisk A/S	4.28	1.72
LONZA GROUP AG	4.07	0.12
Techtronic Industries Co Ltd	3.76	1.67
Astrazeneca PLC	3.35	3.23
ON Semiconductor Corp	3.32	14.89
London Stock Exchange Group	3.06	10.37
Intuit Inc.	3.02	2.95

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Advanced Micro Devices Inc	5.69	16.22	0.92
Nu Holdings Ltd	1.22	65.76	0.80
Chipotle Mexican Grill Inc	2.54	25.21	0.64
Netflix Inc	2.21	27.50	0.61
Veeva Systems Inc	5.92	7.58	0.45
ON Semiconductor Corp	2.92	14.89	0.43
Boston Scientific Corp	4.66	8.11	0.38
Alphabet Inc	2.36	15.40	0.36
Amazon.com Inc	1.17	26.21	0.31
London Stock Exchange Group	2.89	10.37	0.30

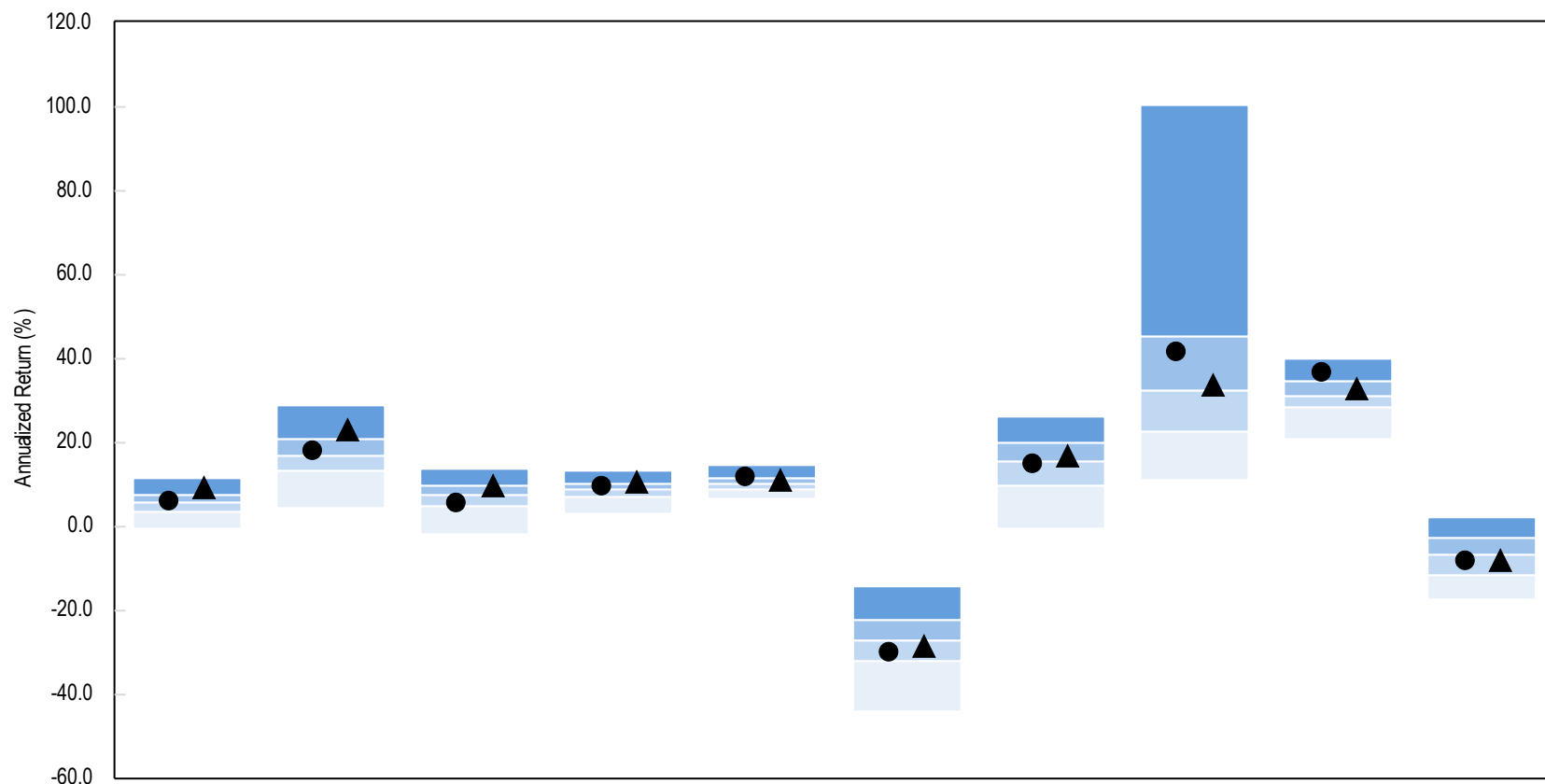
Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Progressive Corp (The)	3.00	-7.41	-0.22
Neste OYJ	0.77	-22.06	-0.17
Vestas Wind Systems A/S	1.75	-8.39	-0.15
BioNTech SE	1.05	-13.36	-0.14
Tencent Holdings LTD	1.04	-13.28	-0.14
Danaher Corp	2.56	-4.67	-0.12
NextEra Energy Inc	3.25	-3.13	-0.10
Aptiv Plc	1.04	-9.00	-0.09
Keyence Corp	3.01	-3.06	-0.09
CNH Industrial N.V.	2.36	-3.18	-0.07

% of Portfolio 31.58 5.21 % of Portfolio 19.83 -1.30

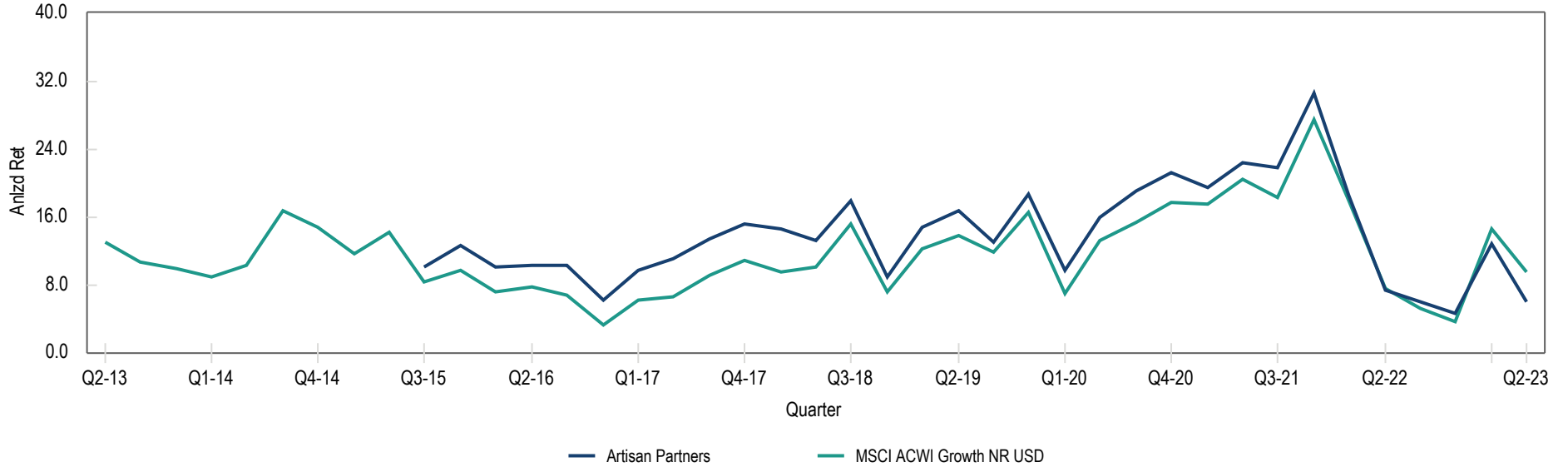
Global equity portfolio of companies that is benchmark agnostic with accelerating profit cycles and a focus on capital allocation. Primary personnel include James Hamel, Craigh Cepukenas, and Matthew Kamm.

Artisan Partners vs. eV Global Growth Equity Gross Universe



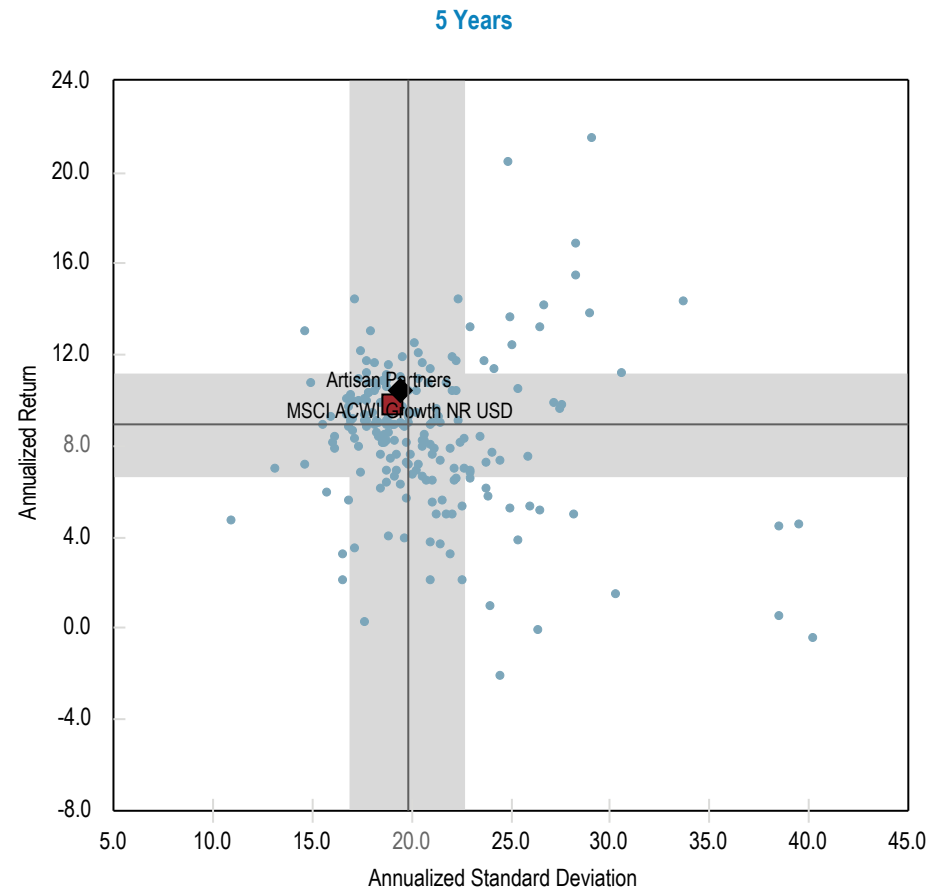
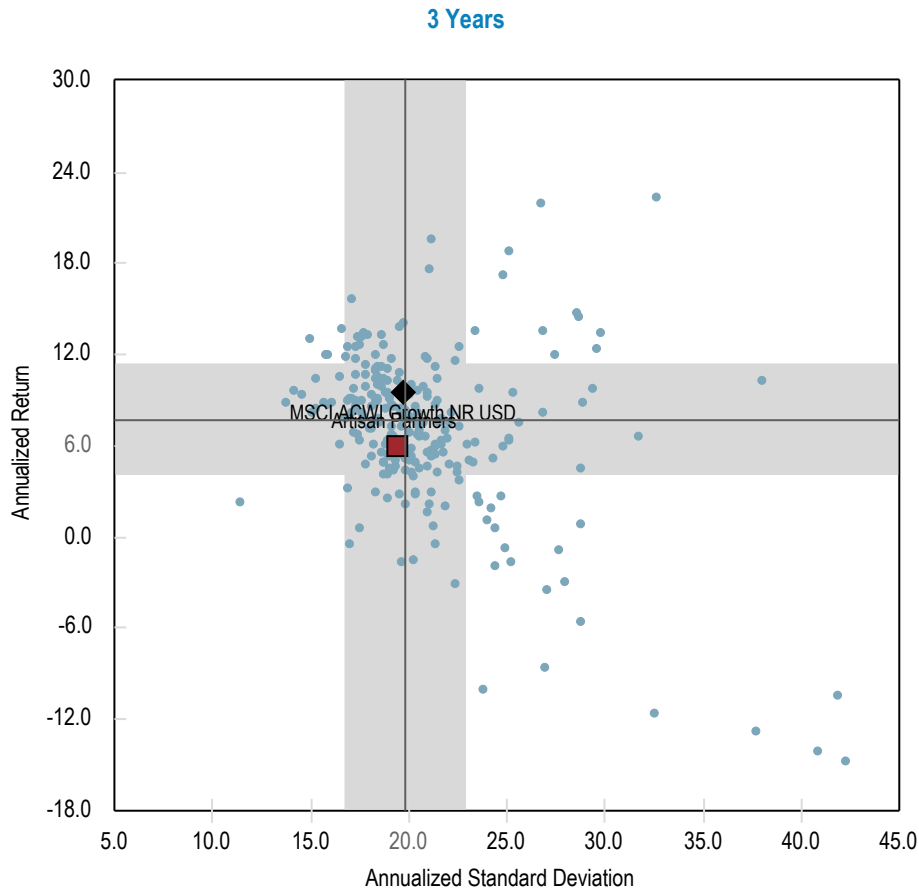
	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● Artisan Partners	6.12 (46)	18.18 (44)	5.96 (67)	9.88 (31)	12.10 (19)	-29.59 (60)	14.99 (56)	41.66 (34)	37.00 (12)	-7.94 (60)
▲ MSCI ACWI Growth NR USD	9.20 (13)	23.05 (18)	9.57 (29)	10.45 (24)	11.00 (35)	-28.61 (55)	17.10 (43)	33.60 (49)	32.72 (36)	-8.13 (60)
5th Percentile	11.49	28.93	13.59	13.31	14.52	-14.24	26.08	100.32	39.95	2.08
1st Quartile	7.55	21.01	9.88	10.38	11.34	-22.30	19.80	45.12	34.63	-2.88
Median	5.84	17.07	7.73	8.93	10.18	-27.27	15.55	32.38	31.24	-6.59
3rd Quartile	3.39	13.46	5.02	6.93	9.06	-31.80	9.70	22.87	28.32	-11.53
95th Percentile	-0.37	4.58	-1.67	3.13	6.52	-43.97	-0.26	11.16	20.85	-17.41
Population	273	268	243	199	121	273	263	250	233	216

Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Artisan Partners	6.0	19.4	0.3
MSCI ACWI Growth NR USD	9.6	19.8	0.5
eV Global Growth Equity Median	7.7	19.8	0.4
Population	243	243	243

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Artisan Partners	9.9	19.0	0.5
MSCI ACWI Growth NR USD	10.4	19.4	0.5
eV Global Growth Equity Median	8.9	19.8	0.5
Population	199	199	199

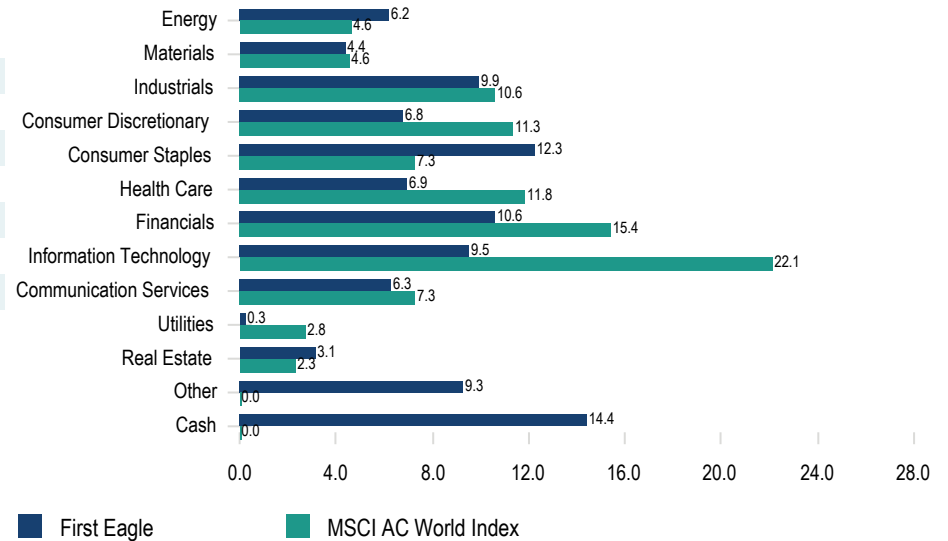
First Eagle
Manager Portfolio Overview

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

Characteristics

	Portfolio	Benchmark
Number of Stocks	134	2,935
Wtd. Avg. Mkt. Cap \$M	138,461.82	434,410.30
Median Mkt. Cap \$M	26,431.72	12,016.95
Price/Earnings ratio	18.40	18.22
Price/Book ratio	2.49	3.52
Return on Equity (%)	-89.03	5.74
Current Yield (%)	2.08	2.18
Beta (5 Years, Monthly)	0.76	1.00

Sector Allocation (%) vs. MSCI AC World Index



Largest Holdings

	End Weight (%)	Quarterly Return (%)
SPDR Gold Trust	9.31	-2.70
Oracle Corp	3.39	28.71
Meta Platforms Inc	2.43	35.41
Exxon Mobil Corp	2.17	-1.35
Schlumberger Ltd	2.02	0.57
HCA Healthcare Inc	1.92	15.09
Comcast Corp	1.88	10.44
Cie Financiere Richemont	1.67	6.14
Philip Morris International Inc	1.38	1.71
Alphabet Inc	1.34	16.32

Top Contributors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
Oracle Corp	3.35	28.71	0.96
Meta Platforms Inc	2.08	35.41	0.74
HCA Healthcare Inc	1.94	15.09	0.29
Universal Health Services	1.01	24.32	0.25
Alphabet Inc	1.33	16.32	0.22
Fomento Economico Mexican	1.22	17.68	0.22
Comcast Corp	1.99	10.44	0.21
Microsoft Corp	1.08	18.38	0.20
Ambev SA	1.04	12.77	0.13
Mitsubishi Electric Corp	0.69	18.24	0.13

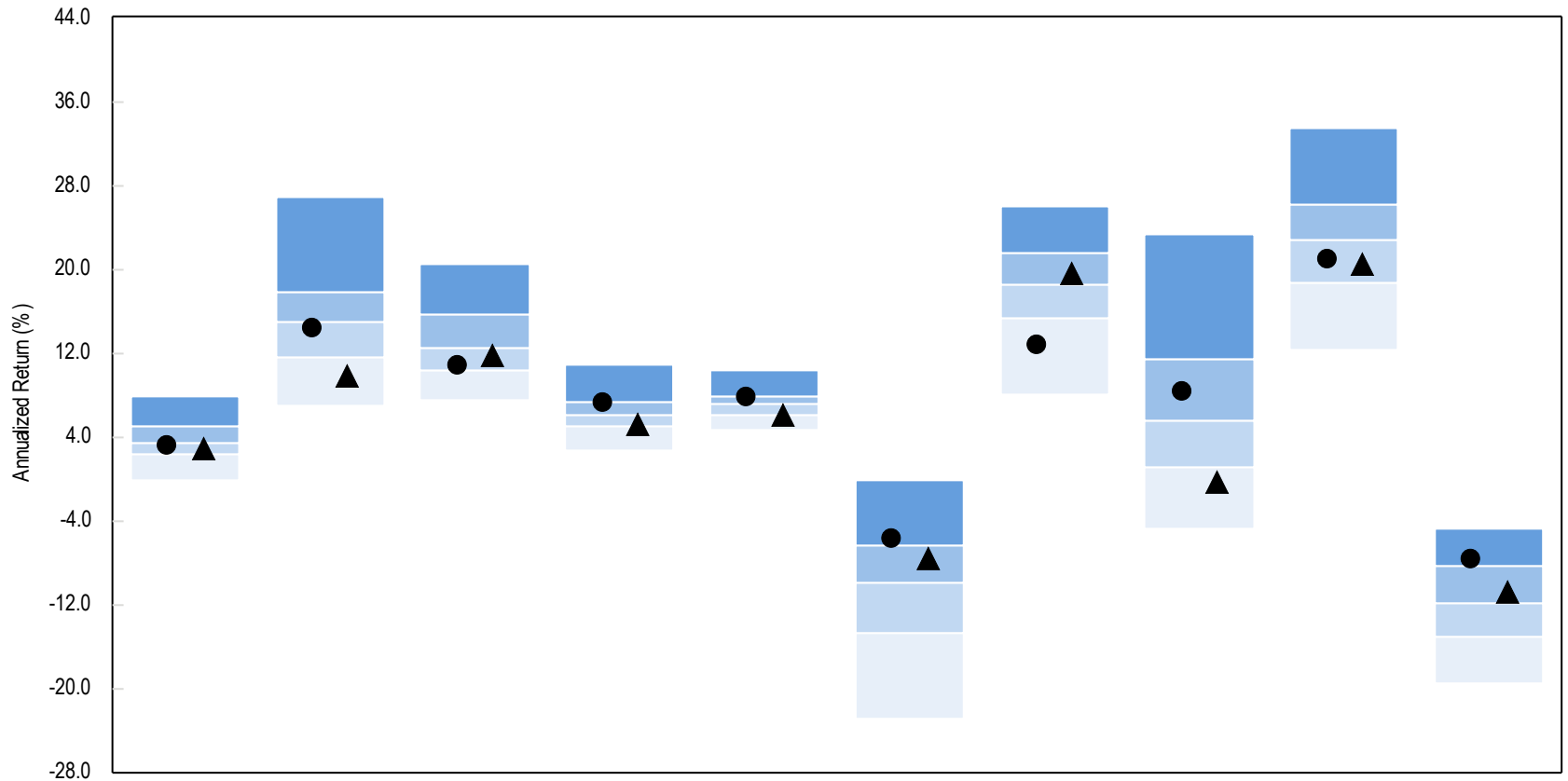
Top Detractors

	Portfolio Weight (%)	Quarterly Return (%)	Contribution to Return (%)
SPDR Gold Trust	11.09	-2.70	-0.30
Alibaba Group Holding Ltd	1.04	-18.99	-0.20
NOV Inc	1.08	-13.34	-0.14
Nutrien Ltd	0.72	-19.32	-0.14
Newmont Corporation	0.97	-12.12	-0.12
UGI Corp	0.47	-21.36	-0.10
British American Tobacco	1.63	-5.59	-0.09
Wheaton Precious Metals Corp	0.89	-9.98	-0.09
C.H. Robinson Worldwide Inc.	1.66	-4.44	-0.07
Barrick Gold Corp	0.89	-8.29	-0.07

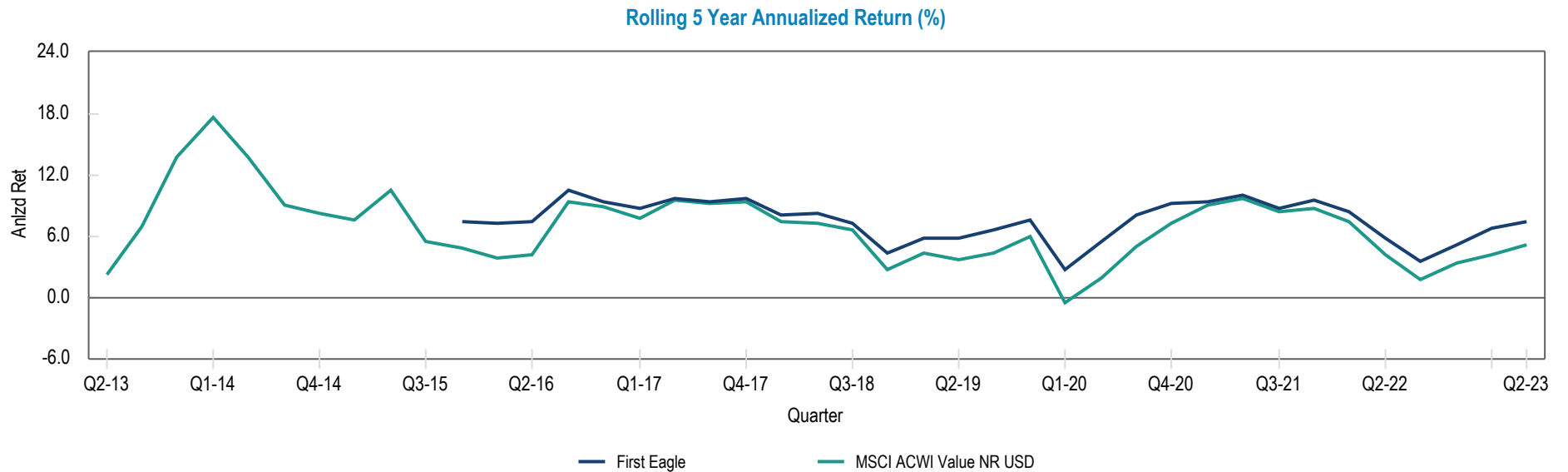
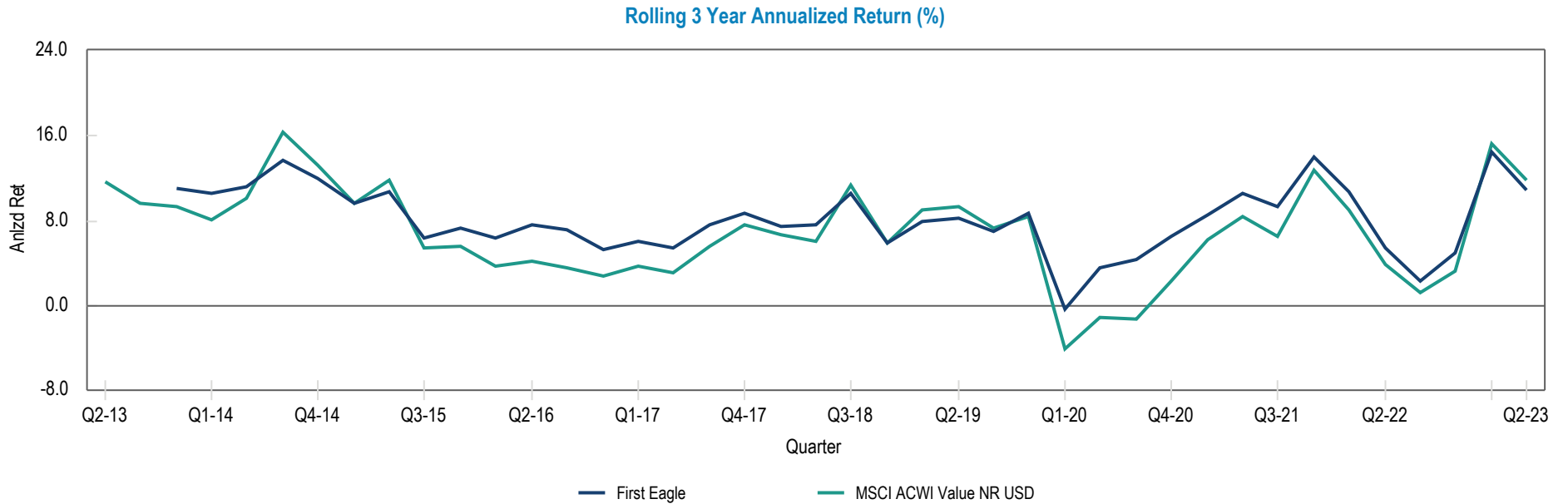
% of Portfolio 15.73 3.34 % of Portfolio 20.44 -1.33

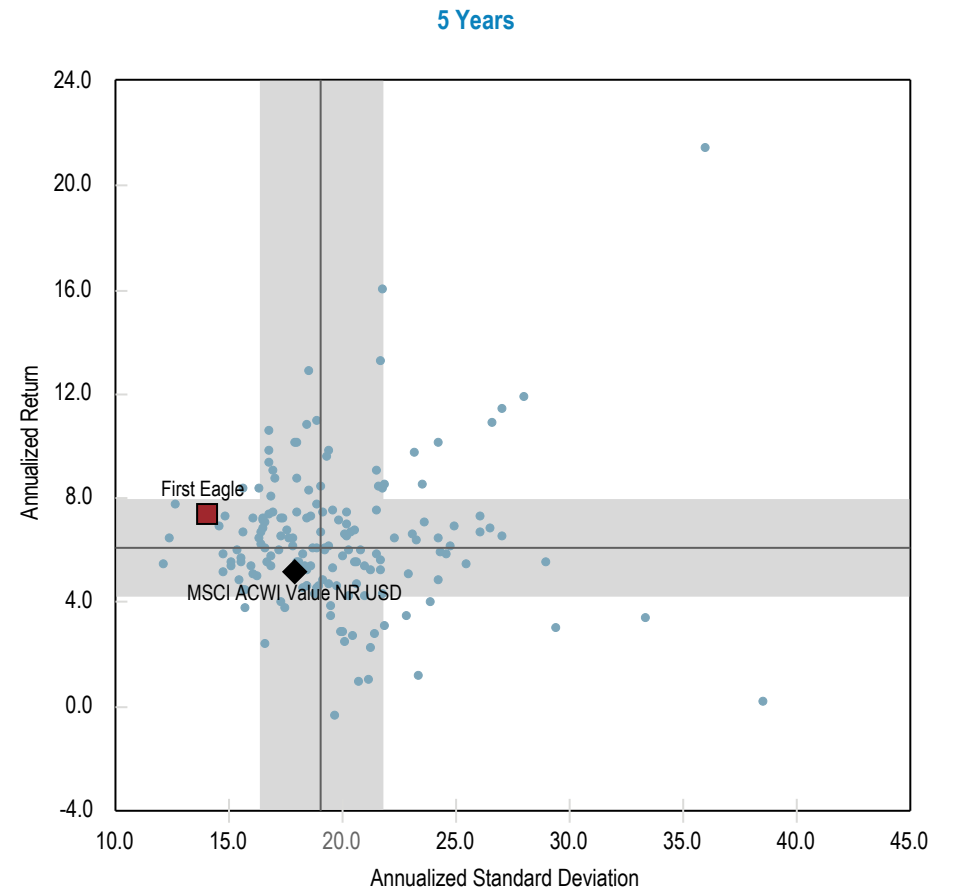
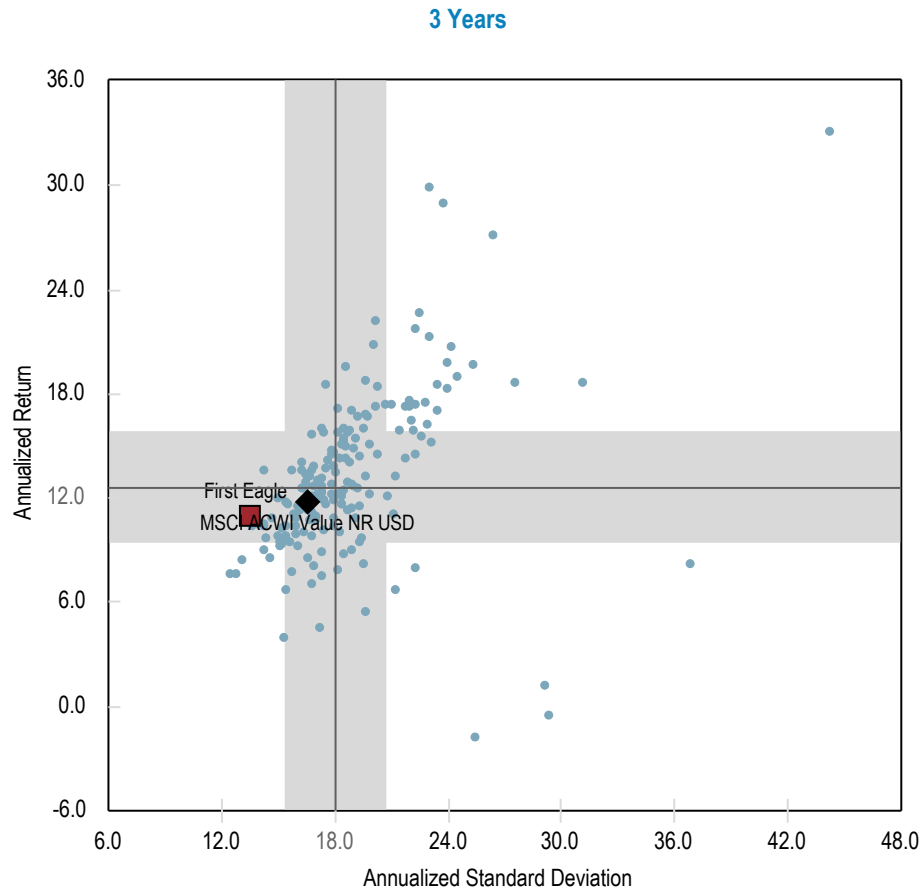
Global equity portfolio that is benchmark agnostic comprised of companies with low valuations. Primary personnel include Matt McLennan and Kimball Brooker.

First Eagle vs. eV Global Value Equity Gross Universe



	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● First Eagle	3.38 (56)	14.48 (56)	10.96 (70)	7.39 (25)	7.84 (28)	-5.61 (20)	12.95 (85)	8.47 (33)	21.01 (64)	-7.64 (18)
▲ MSCI ACWI Value NR USD	2.98 (65)	9.95 (85)	11.82 (62)	5.16 (74)	6.19 (75)	-7.55 (34)	19.62 (41)	-0.33 (82)	20.59 (67)	-10.79 (45)
5th Percentile	7.84	27.00	20.56	10.86	10.40	-0.11	26.05	23.35	33.42	-4.71
1st Quartile	5.14	17.81	15.70	7.36	7.97	-6.35	21.53	11.39	26.19	-8.34
Median	3.54	14.94	12.62	6.10	7.16	-9.94	18.60	5.69	22.80	-11.84
3rd Quartile	2.37	11.63	10.43	5.03	6.18	-14.65	15.34	1.23	18.82	-14.96
95th Percentile	-0.06	7.07	7.58	2.77	4.79	-22.91	8.15	-4.79	12.29	-19.42
Population	203	201	185	162	118	204	213	224	217	222





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
First Eagle	11.0	13.5	0.7
MSCI ACWI Value NR USD	11.8	16.6	0.7
eV Global Value Equity Median	12.6	18.0	0.7
Population	185	185	185

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
First Eagle	7.4	14.0	0.5
MSCI ACWI Value NR USD	5.2	17.9	0.3
eV Global Value Equity Median	6.1	19.1	0.3
Population	162	162	162

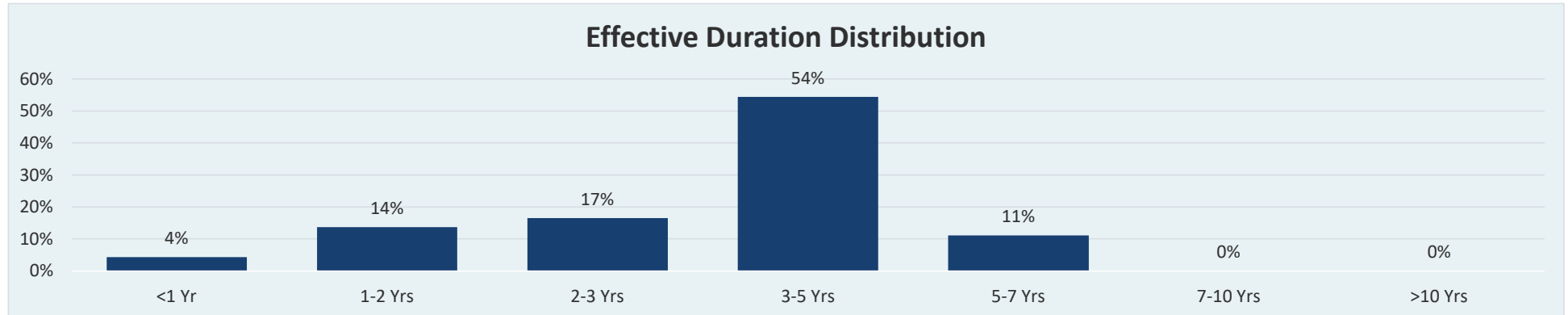
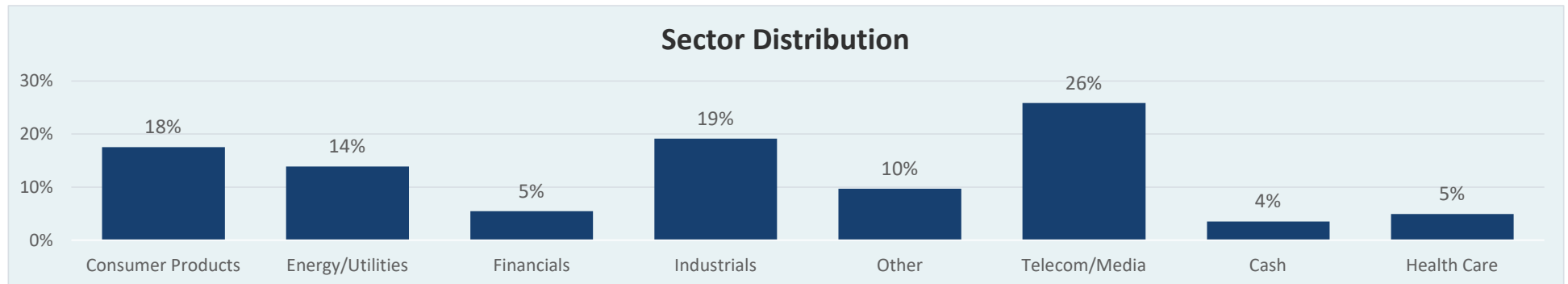
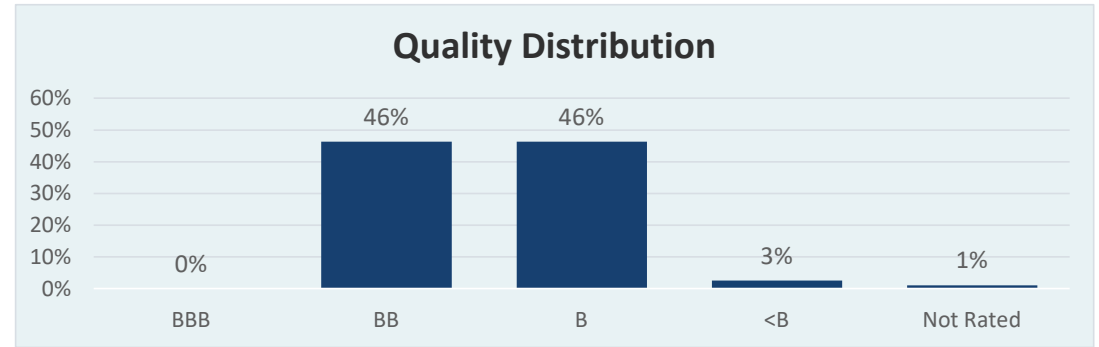
High Yield Managers

Voya Global Investors
 Manager Portfolio Overview

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

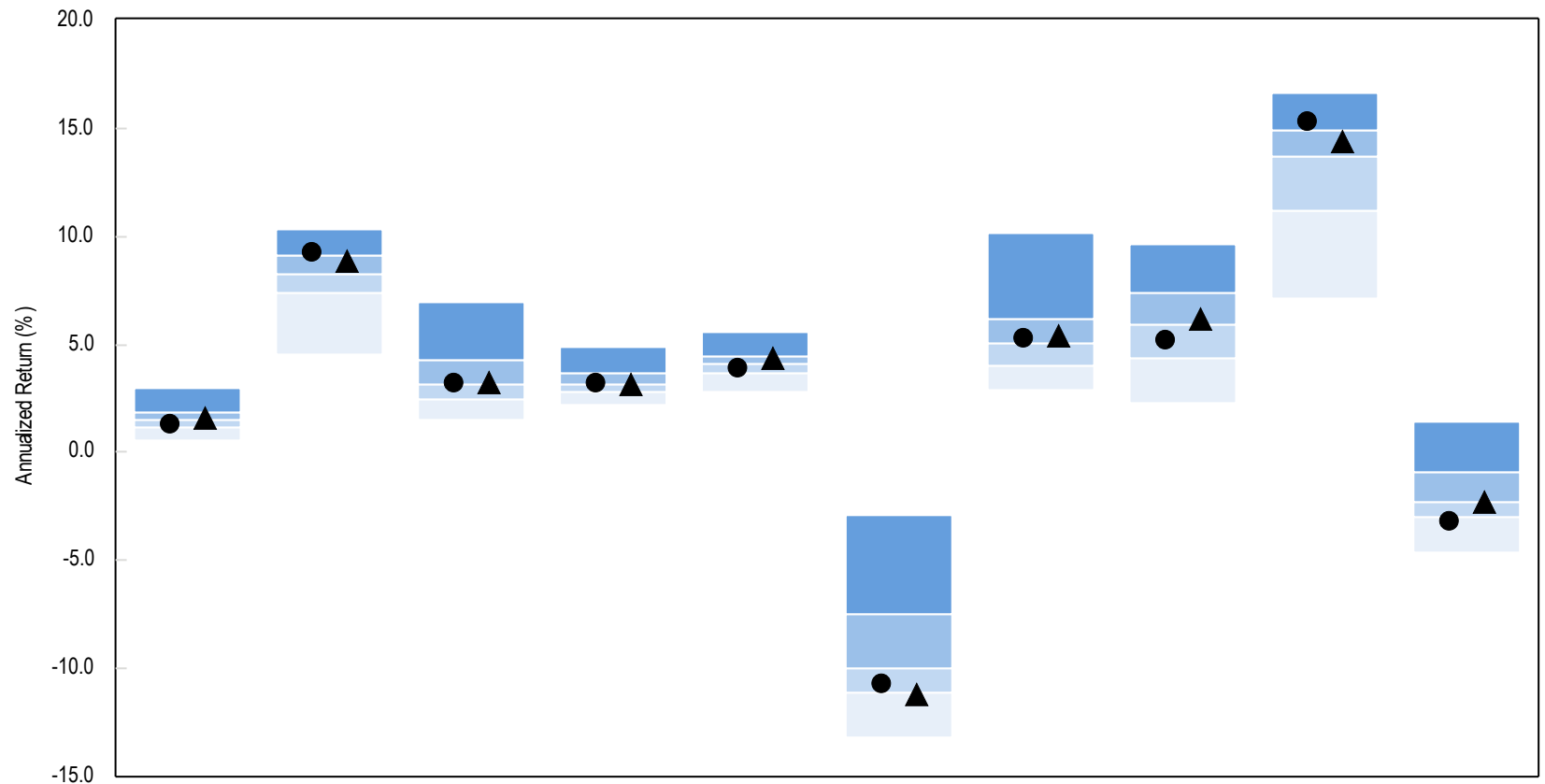
Domestic high yield fixed income portfolio with a focus on security selection. Primary personnel include Douglas Forsyth, Justin Kass, William Stickney, and Michael Yee.

	Voya	ICE BofAML HY Master II
Effective Duration	3.50	3.70
Yield to Maturity	7.6%	8.6%
Average Quality	B1	B1
Average Coupon	6.7%	5.9%



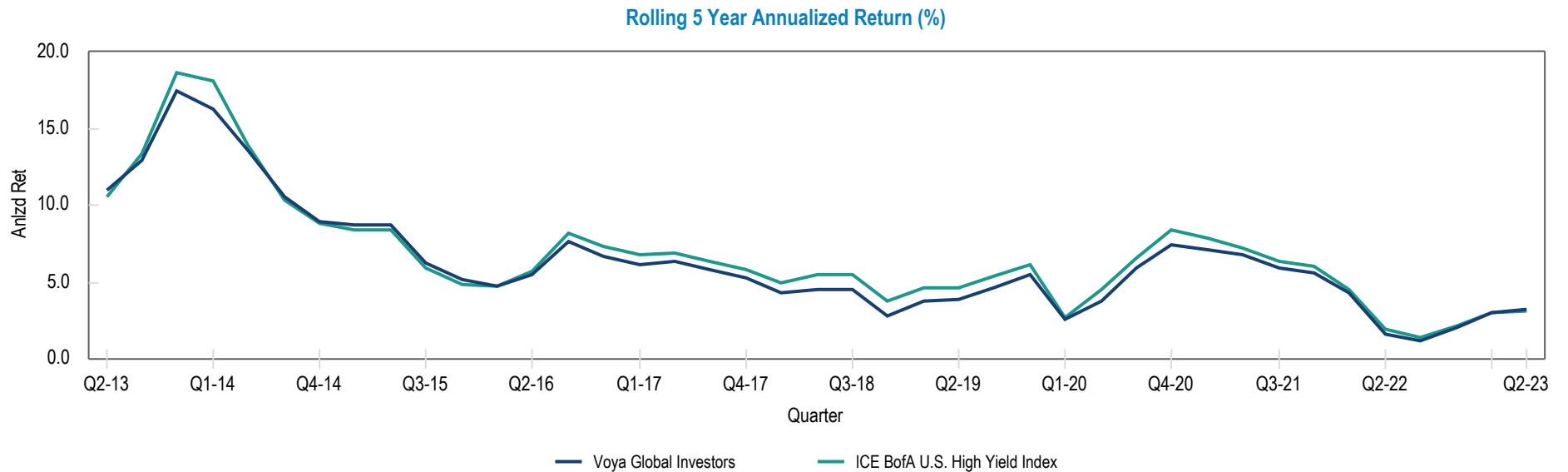
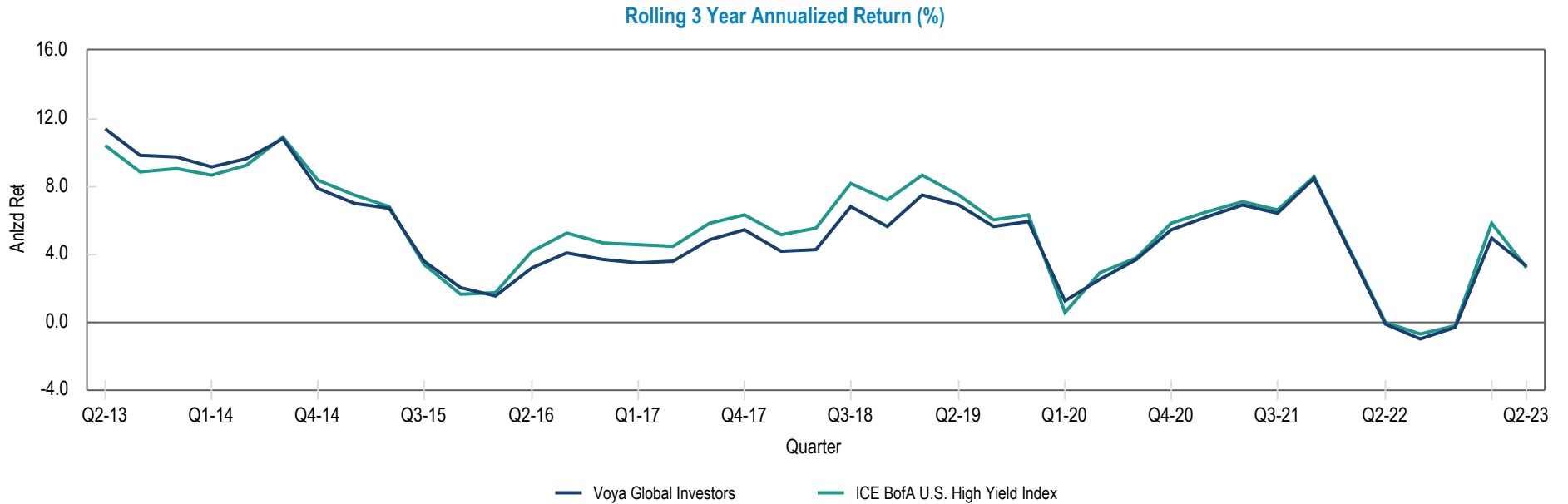
Quality distribution excludes cash.

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

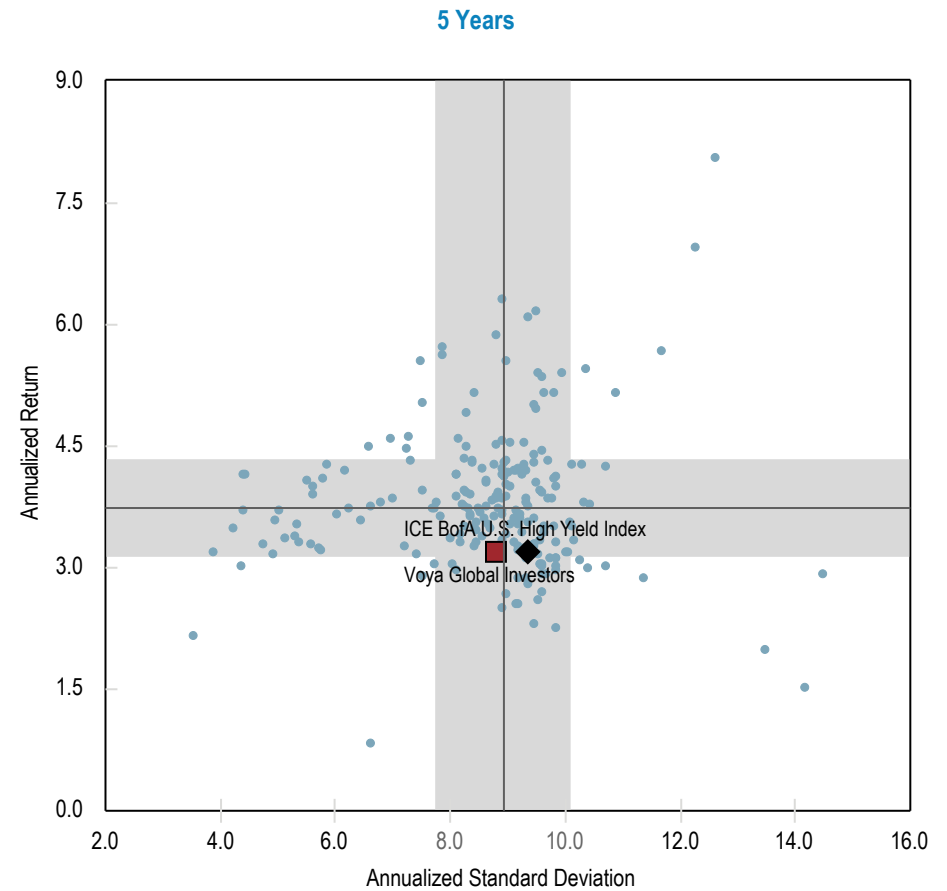
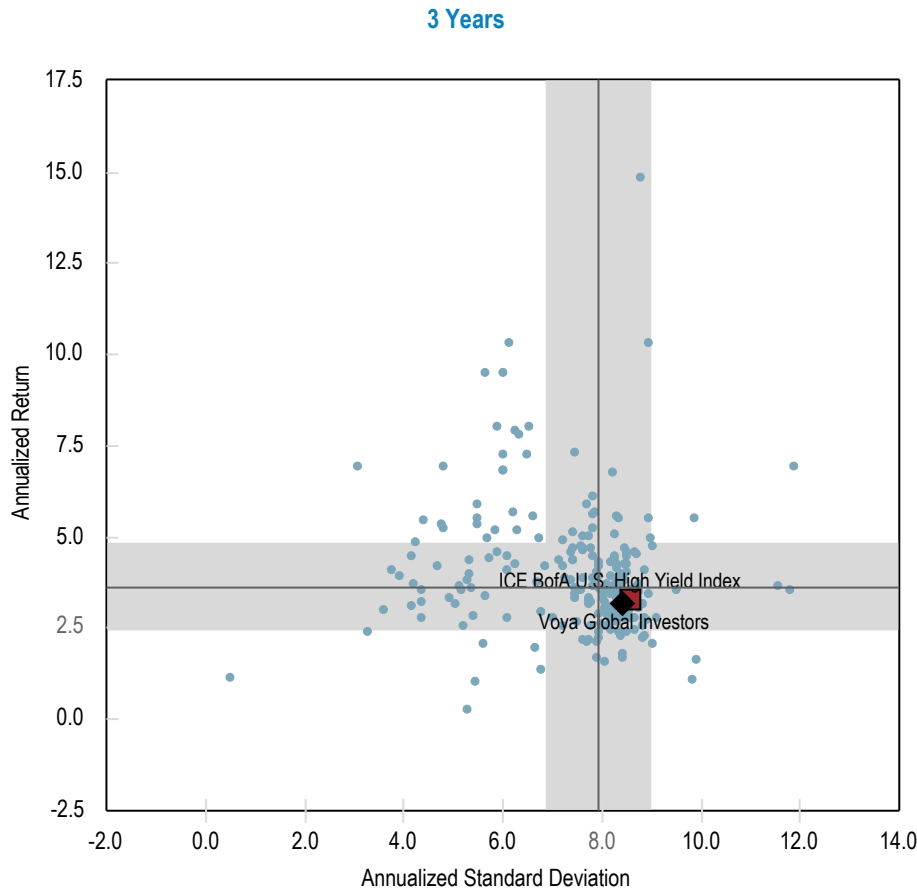


	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● Voya Global Investors	1.31 (62)	9.27 (22)	3.27 (46)	3.19 (50)	3.89 (62)	-10.64 (66)	5.34 (43)	5.18 (65)	15.32 (19)	-3.20 (78)
▲ ICE BofA U.S. High Yield Index	1.63 (36)	8.87 (35)	3.21 (48)	3.18 (51)	4.34 (32)	-11.22 (77)	5.36 (42)	6.17 (42)	14.41 (36)	-2.27 (50)
5th Percentile	2.99	10.32	6.94	4.88	5.56	-2.91	10.18	9.67	16.61	1.43
1st Quartile	1.82	9.14	4.25	3.65	4.44	-7.48	6.17	7.40	14.94	-0.92
Median	1.47	8.29	3.16	3.19	4.07	-9.99	5.05	5.88	13.67	-2.28
3rd Quartile	1.14	7.38	2.45	2.82	3.65	-11.09	4.05	4.34	11.15	-3.01
95th Percentile	0.60	4.54	1.51	2.20	2.82	-13.18	2.91	2.30	7.08	-4.60
Population	225	224	217	207	173	237	240	248	254	256

Voya Financial acquired Allianz Global Investors in 2022.



Voya Financial acquired Allianz Global Investors in 2022.



	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Voya Global Investors	3.3	8.6	0.3
ICE BofA U.S. High Yield Index	3.2	8.4	0.3
eV US High Yield Fixed Inc Median	3.6	7.9	0.3
Population	224	224	224

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
Voya Global Investors	3.2	8.8	0.2
ICE BofA U.S. High Yield Index	3.2	9.3	0.2
eV US High Yield Fixed Inc Median	3.7	8.9	0.3
Population	213	213	213

Voya Financial acquired Allianz Global Investors in 2022.

Real Estate Managers

Adelante Manager Portfolio Overview

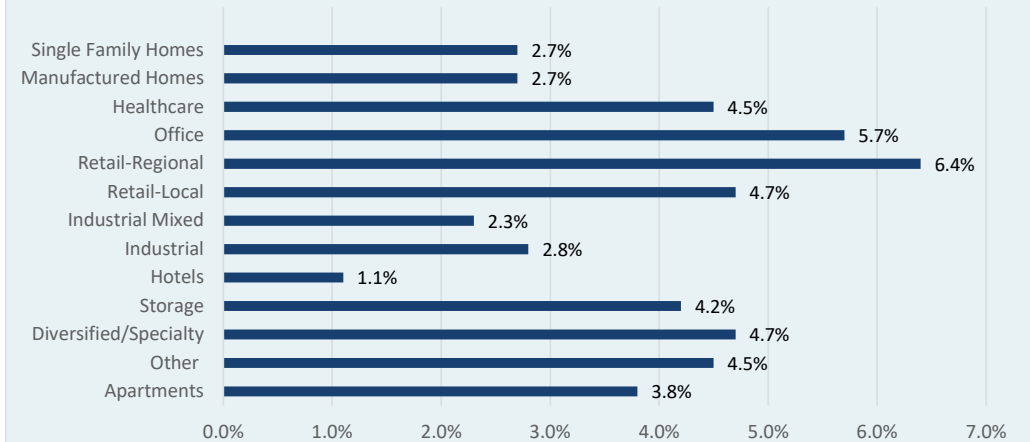
Contra Costa County Employees' Retirement Association
Period Ending: June 30, 2023

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

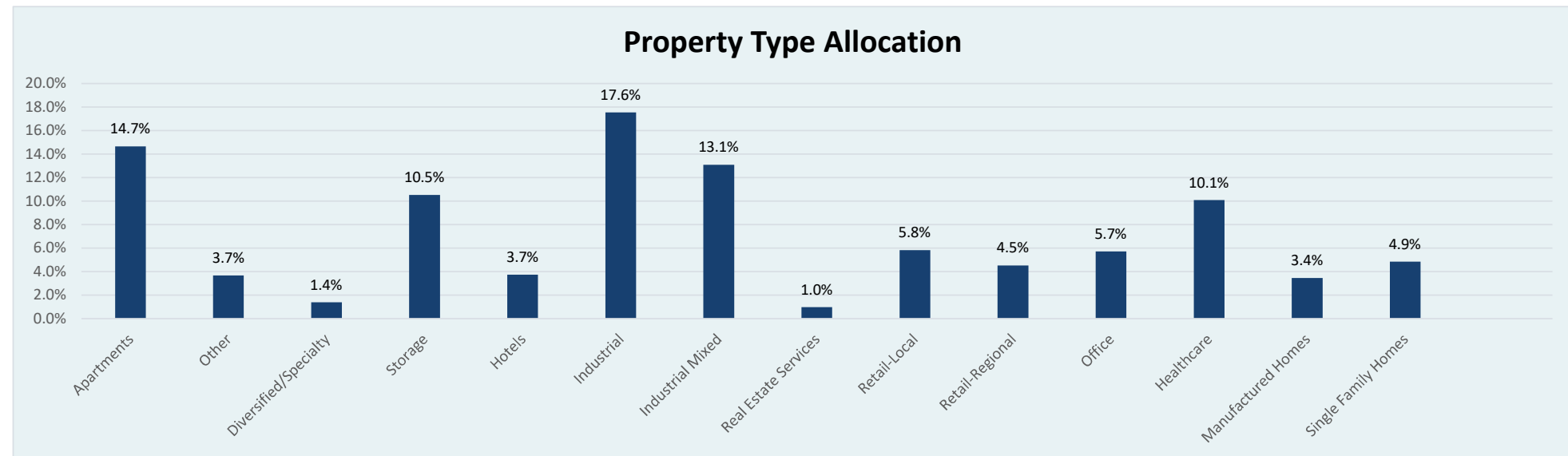
Top Five Holdings

Company	Property Type	Allocation
ProLogis Inc.	Industrial	14.5%
Equinix Inc.	Industrial Mixed	9.7%
Welltower Inc.	Healthcare	6.0%
Public Storage	Storage	6.0%
Equity Residential	Apartments	5.9%

Dividend Yield by Property Type



Property Type Allocation



0.0224% is allocated to Cash and Cash Equivalents.

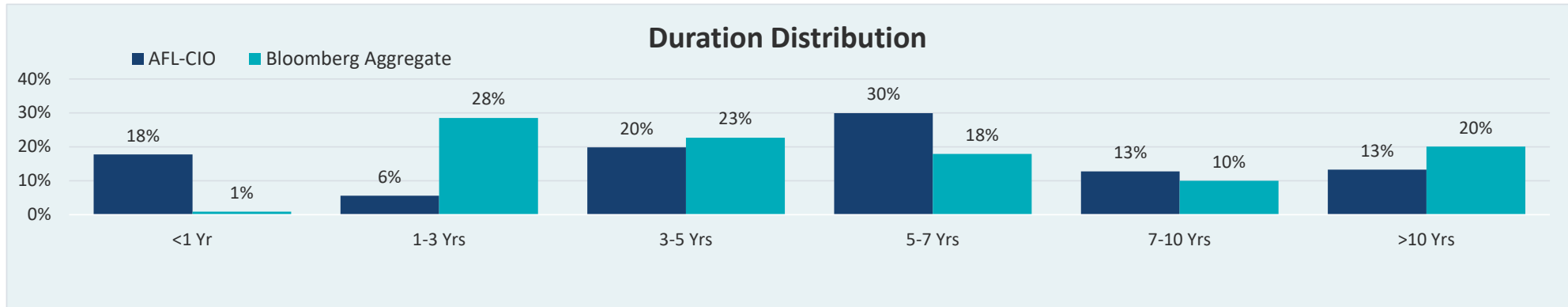
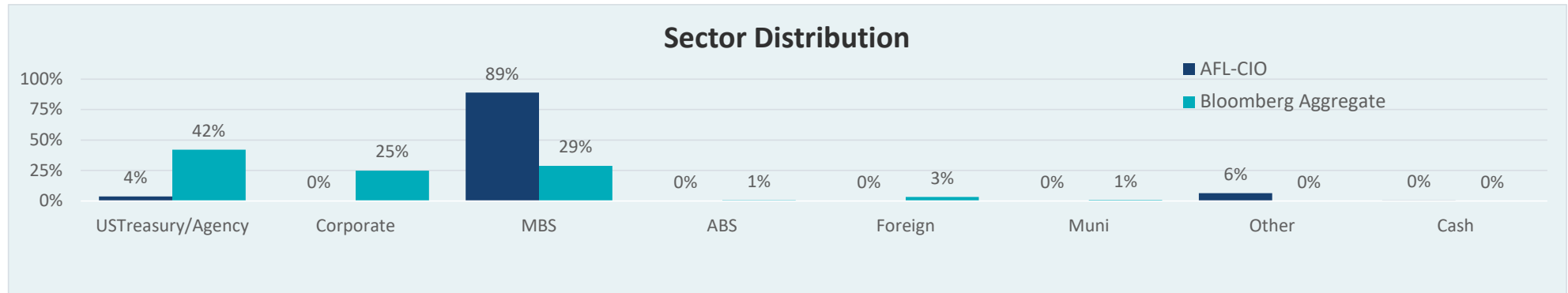
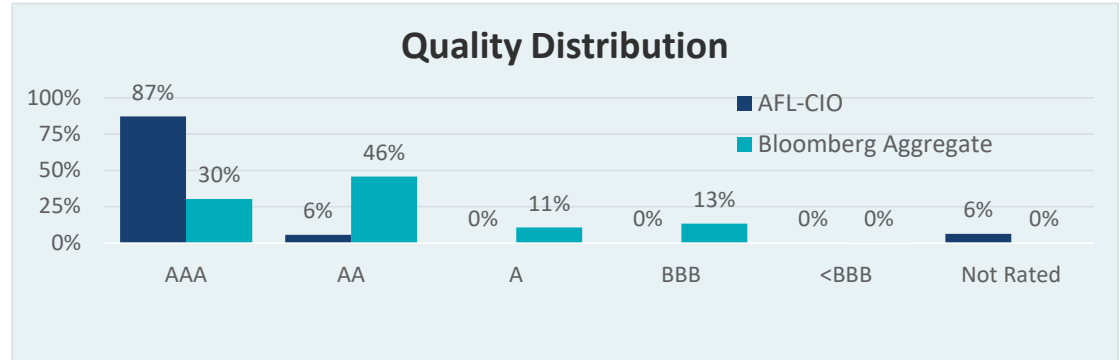
Diversifying Fixed Income Managers

AFL-CIO Manager Portfolio Overview

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

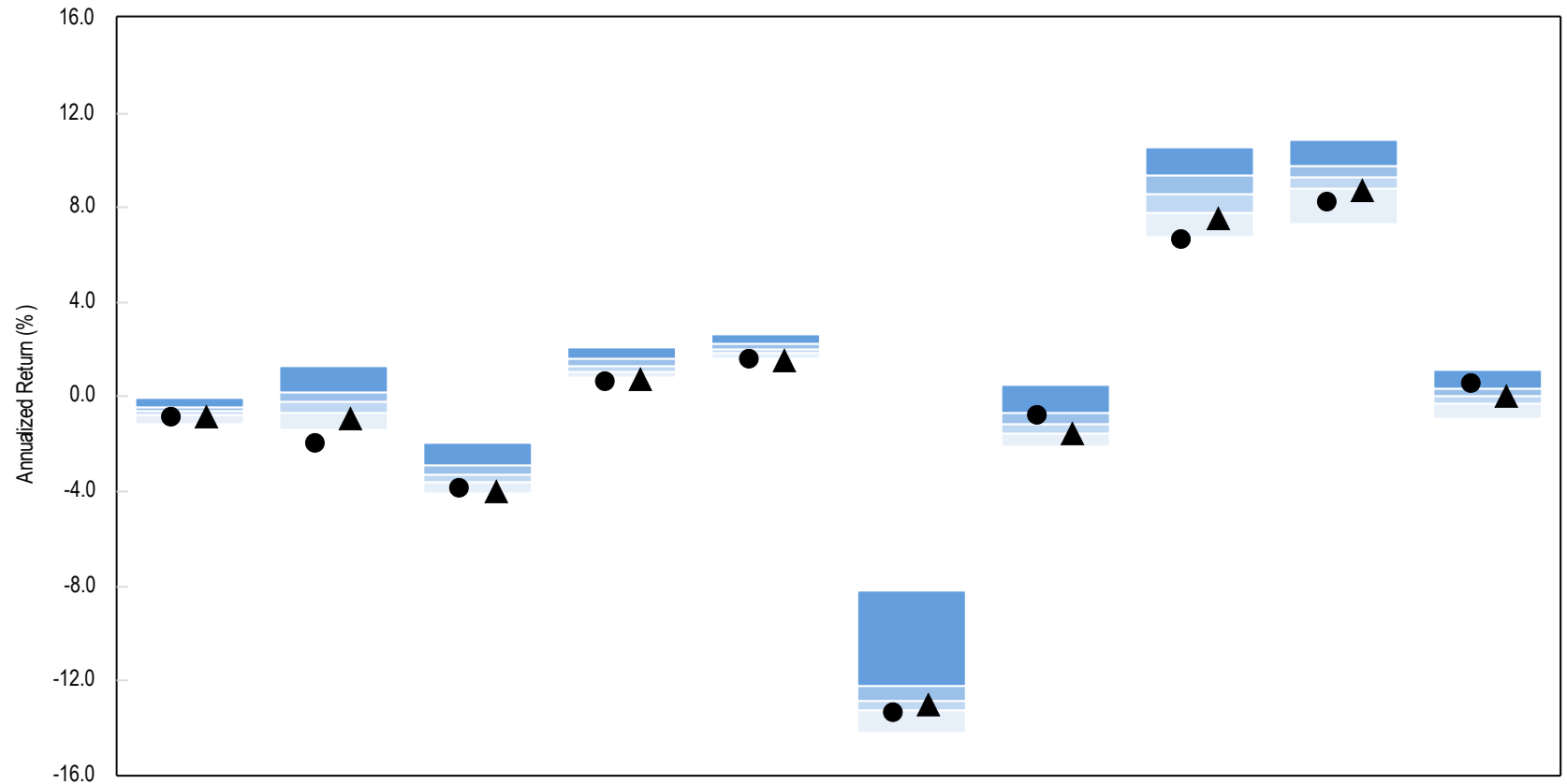
Domestic core fixed income portfolio with an exclusive focus on mortgage-related securities. Primary personnel include Stephen Coyle and Chang Su.

	AFL-CIO	Bloomberg Aggregate
Effective Duration	6.02	6.30
Yield to Maturity	3.8%	8.8%
Average Quality	AAA	AA
Average Coupon	3.4%	3.0%

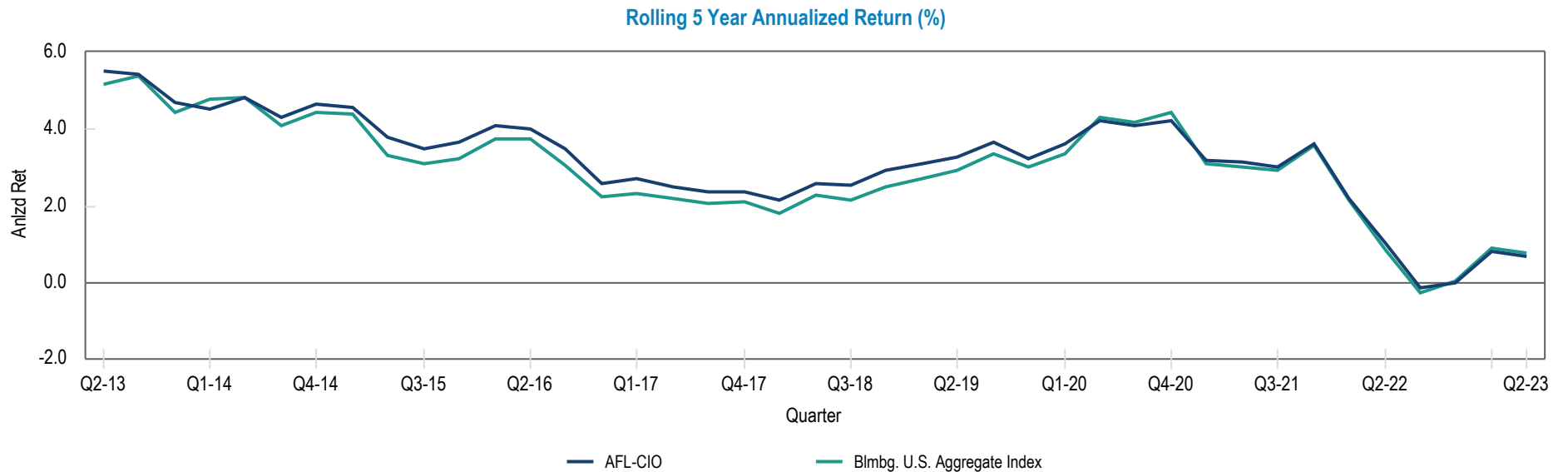
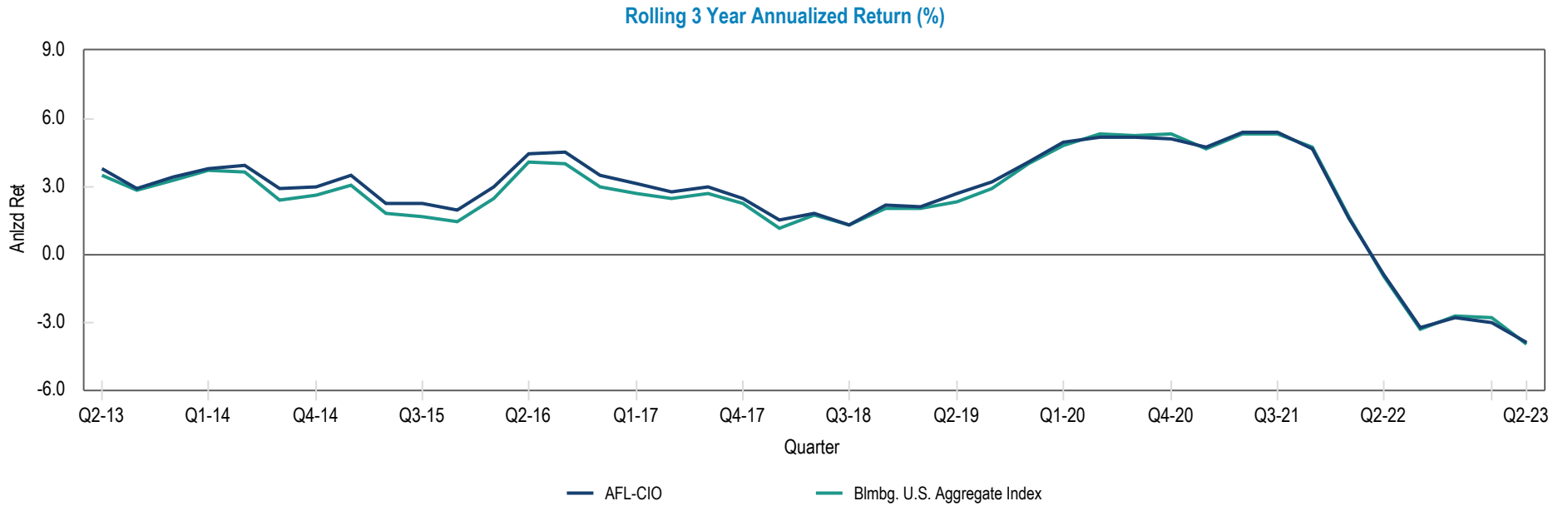


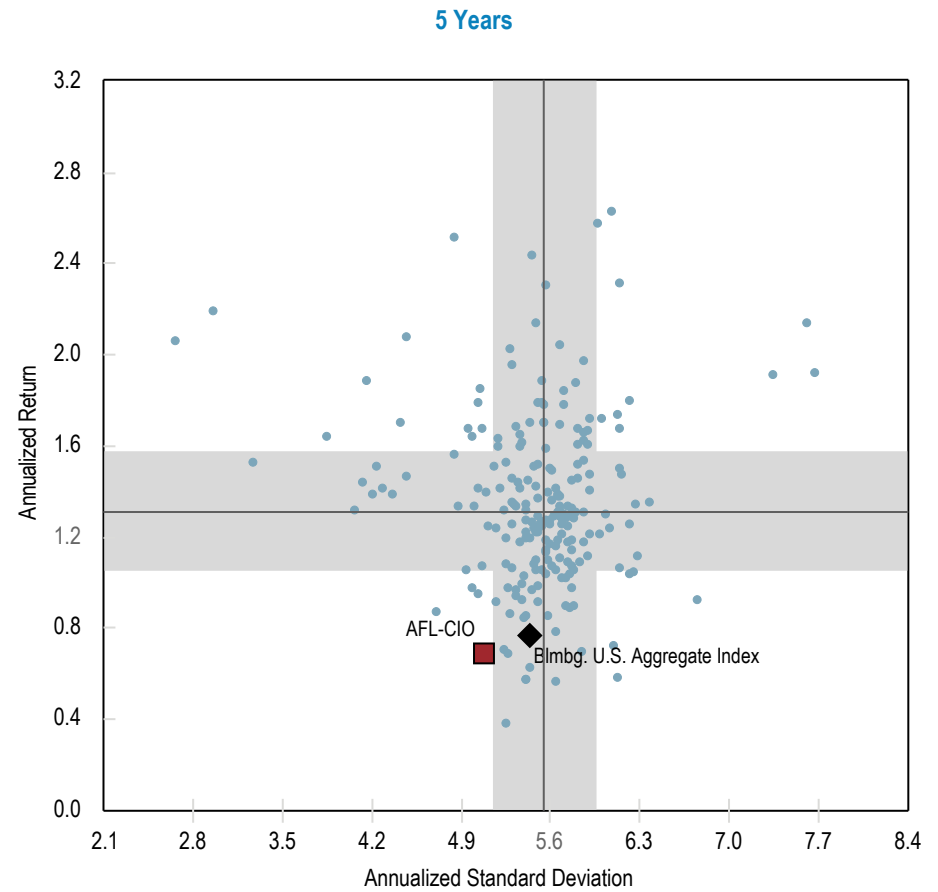
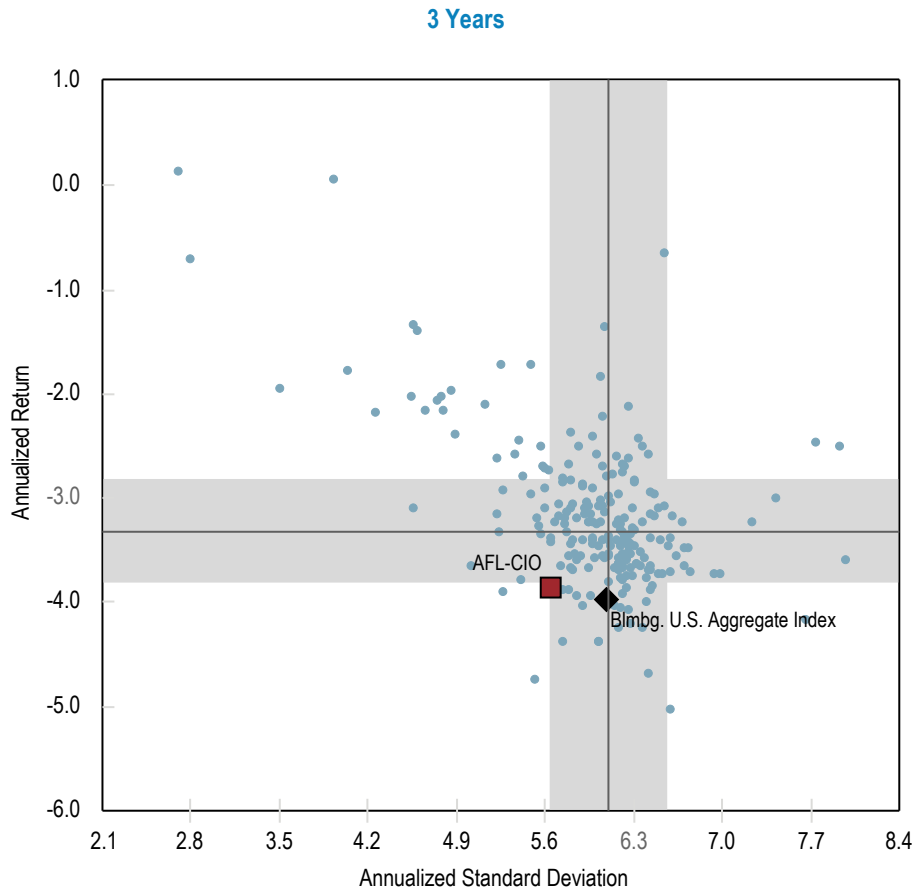
Duration and Quality distributions exclude cash.

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



	Quarter	1 Year	3 Years	5 Years	10 Years	2022	2021	2020	2019	2018
● AFL-CIO	-0.85 (84)	-1.92 (100)	-3.86 (90)	0.69 (98)	1.65 (93)	-13.27 (76)	-0.73 (32)	6.65 (96)	8.25 (88)	0.59 (14)
▲ Blmbg. U.S. Aggregate Index	-0.84 (84)	-0.94 (85)	-3.97 (94)	0.77 (96)	1.52 (97)	-13.01 (64)	-1.55 (77)	7.51 (85)	8.72 (78)	0.01 (53)
5th Percentile	0.00	1.33	-1.94	2.06	2.65	-8.21	0.50	10.57	10.86	1.11
1st Quartile	-0.47	0.23	-2.88	1.59	2.24	-12.20	-0.64	9.38	9.76	0.34
Median	-0.62	-0.22	-3.32	1.32	2.03	-12.82	-1.14	8.57	9.31	0.03
3rd Quartile	-0.78	-0.64	-3.63	1.10	1.85	-13.26	-1.53	7.79	8.84	-0.28
95th Percentile	-1.15	-1.38	-4.05	0.82	1.59	-14.22	-2.11	6.76	7.30	-0.87
Population	231	230	221	212	200	246	255	258	264	271





	3 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
AFL-CIO	-3.9	5.7	-0.9
Blmbg. U.S. Aggregate Index	-4.0	6.1	-0.8
eV US Core Fixed Inc Median	-3.3	6.1	-0.7
Population	221	221	221

	5 Years		
	Anlzd Return (%)	Anlzd Standard Deviation (%)	Sharpe Ratio
AFL-CIO	0.7	5.1	-0.1
Blmbg. U.S. Aggregate Index	0.8	5.4	-0.1
eV US Core Fixed Inc Median	1.3	5.6	0.0
Population	212	212	212

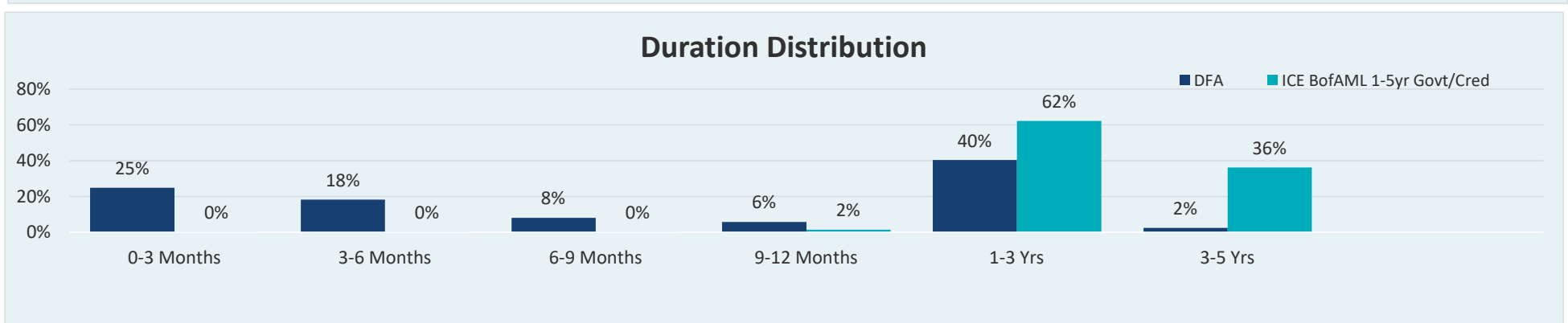
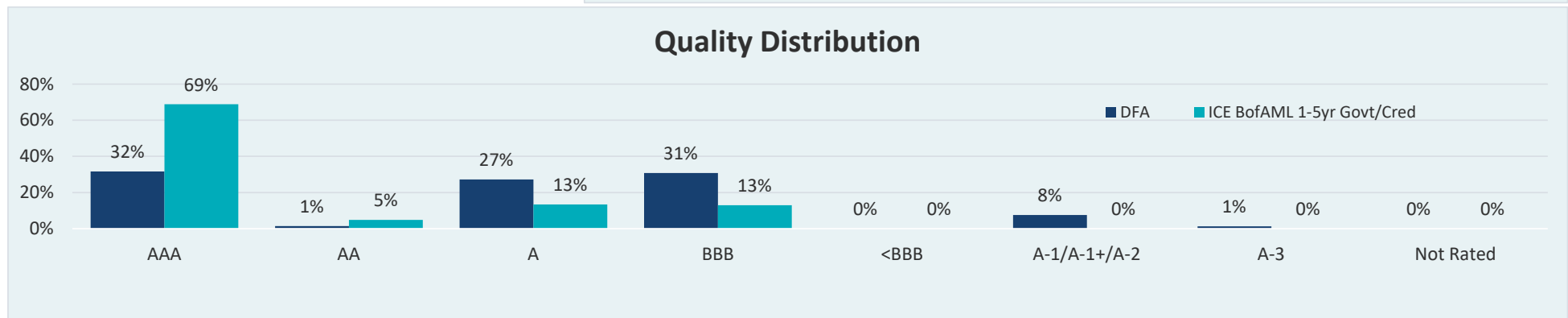
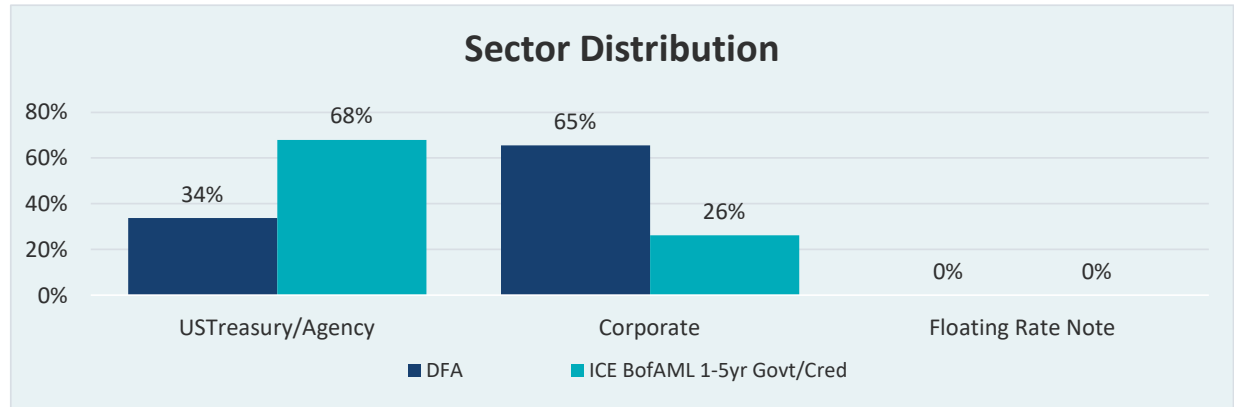
Liquidity Managers

DFA Short Credit Manager Portfolio Overview

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

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

	DFA	ICE BofAML 1-5yr Govt/Cred
Effective Duration	1.01	2.58
Yield to Maturity	5.99	5.01
Average Quality	A+	Aa1
Average Coupon	2.37%	2.53%

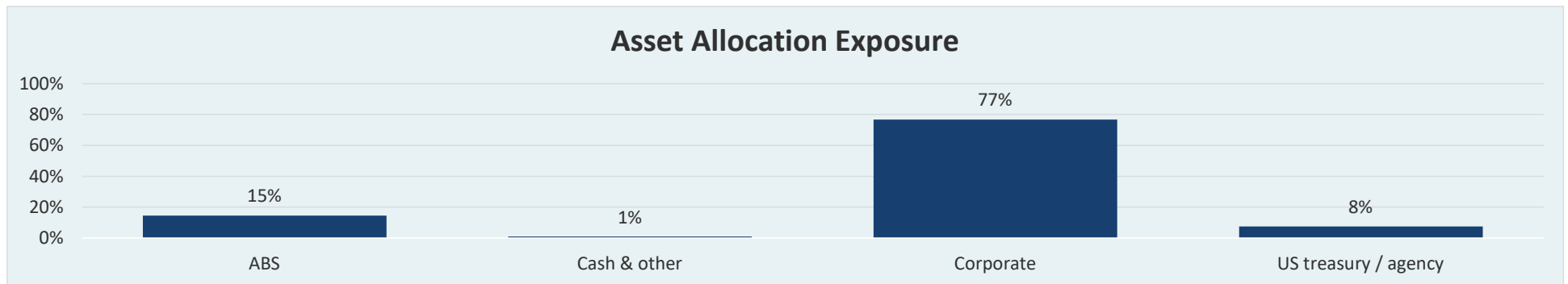
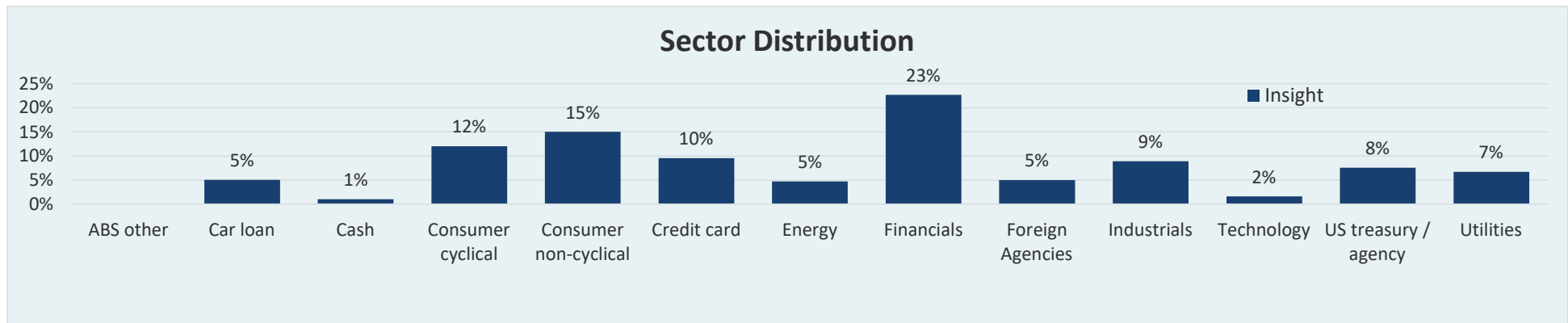
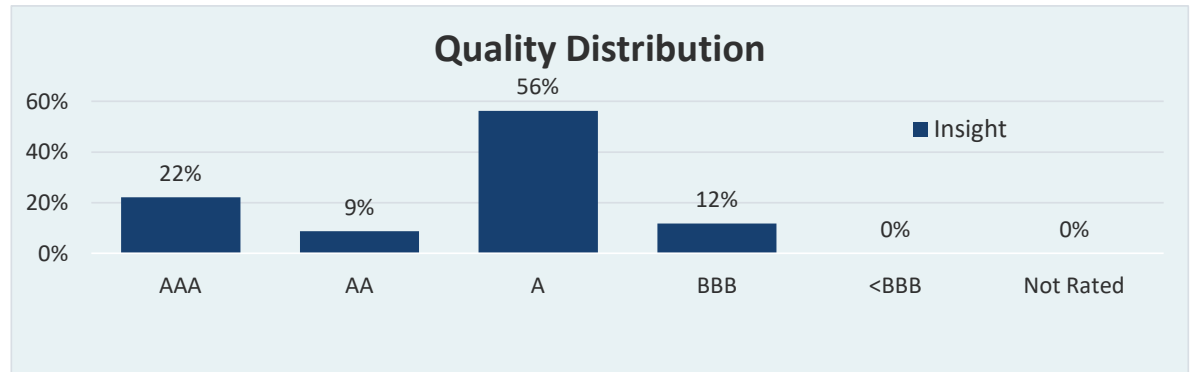


Insight Short Duration Manager Portfolio Overview

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

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

	Insight	Bloomberg 1-3yr Govt
Effective Duration	0.98	1.90
Yield to Maturity	5.45	N/A
Average Quality	A+	AAA
Average Coupon	2.92%	2.10%

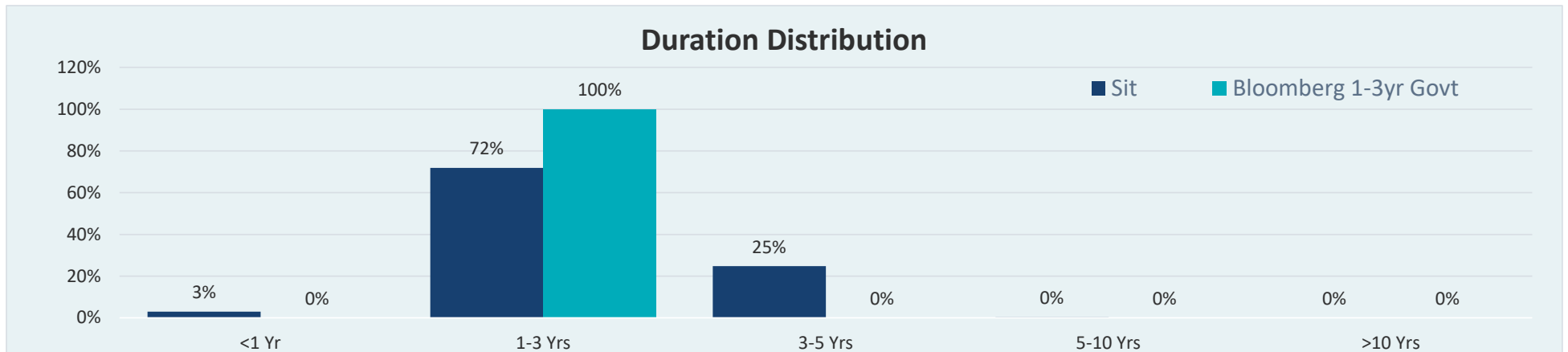
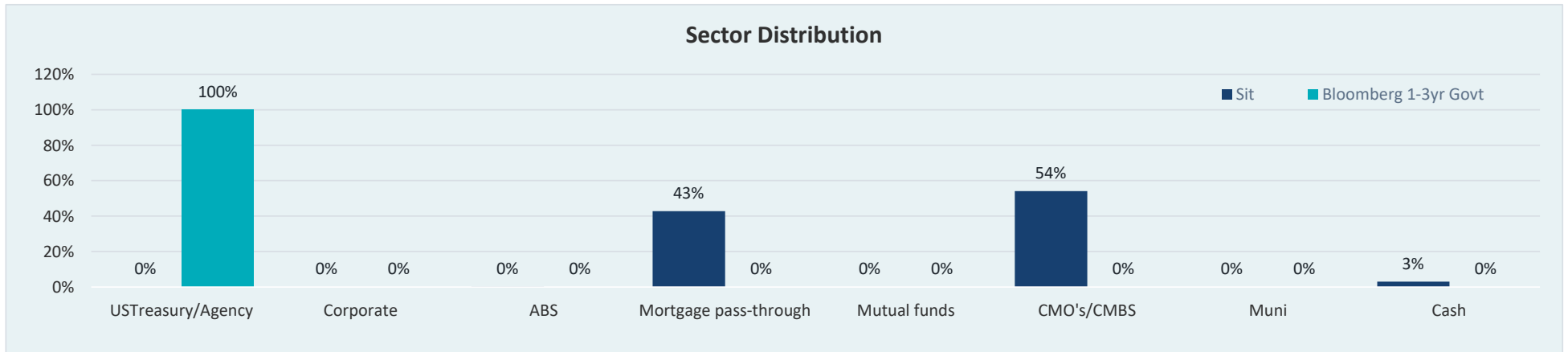


Sit Short Duration Manager Portfolio Overview

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

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

	Sit	Bloomberg 1-3yr Govt
Modified Duration	2.90	1.90
Yield to Maturity	5.70	N/A
Average Quality	AAA	AAA
Average Coupon	5.8%	2.10%



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 (7/1/2022 - present)	16% Russell 3000, 15% MSCI ACWI ex-US (Gross), 9% MSCI ACWI (Net), 1.5% ICE BofA High Yield Master II, 2% Wilshire REIT, 8% Private Real Estate composite returns, 13% Private Equity composite returns, 8% Private Credit composite returns, 17% Bloomberg 1-3 Yr Gov/Credit, 2.5% Bloomberg US Aggregate, 3% 60% MSCI ACWI Net/40% Bloomberg Global Aggregate 2.5% FTSE 3-month T-Bill +5%, 2.5% Bloomberg US Aggregate +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.

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

Other Disclosures

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

Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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