



**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**



PERIOD ENDING: DECEMBER 31, 2022

Investment Performance Review for

Imperial County Employees' Retirement System

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Investment Landscape

TAB I

Investment Performance
Review

TAB II

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

**PERSPECTIVES
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1ST QUARTER 2023
Investment Landscape

Verus business update

Since our last Investment Landscape webinar:

- Verus hired two new employees:
 - **Cholo Villanueva**, Performance Analyst – Seattle office
 - **Demitri Castaneda**, Performance Analyst – Seattle office
- Two employees passed their Level III CFA exams, earning their charters. Verus now has a total of 33 CFA charterholders.
- Verus retained a new client in Alaska, adding a fourth client to the state.
- We celebrated our 37th anniversary. Wurts Johnson & Company (founding name) was established in January 1986.
- We also enhanced our research content management system to improve how we *communicate* our conviction in managers with our new IQ Ratings system. *(details on next page)*

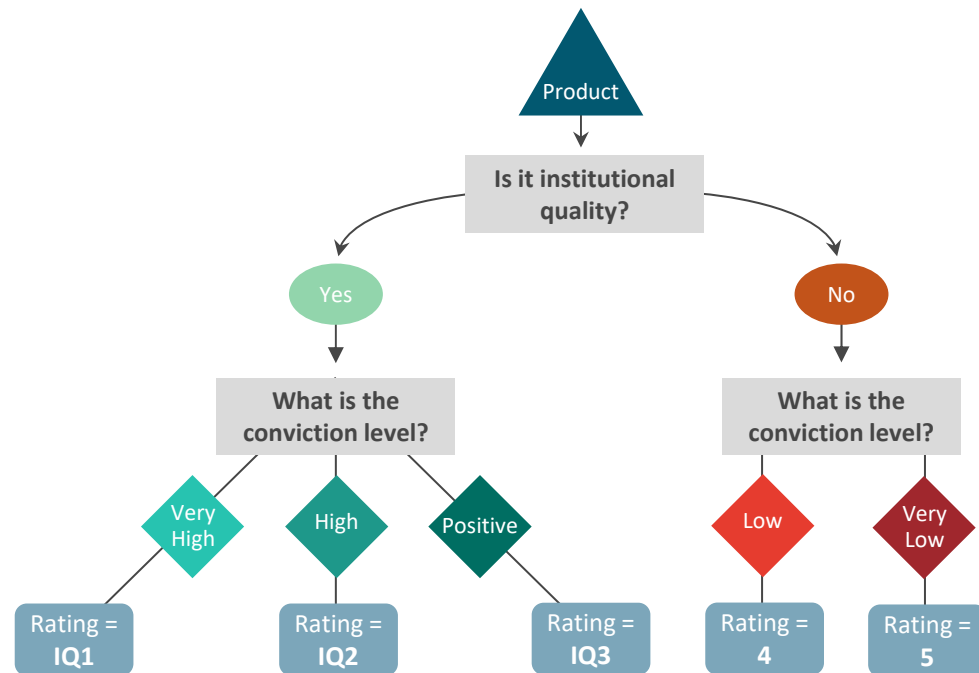
Manager rating system

The IQ Rating System communicates our conviction in investment products

There are two components to the rating:

- Institutional quality** – (IQ) The product meets or exceeds the standards of fiduciary care required by institutional investors and is suitable for use in clients’ portfolios.
- Conviction** – (1 to 5) Represents the conviction of our research teams in the distinguishing qualities of the product relative to its peers, with 1 as the highest rating and 5 the lowest.

PROCESS



Rating process simplified for illustrative purposes only

DEFINITIONS & GUIDELINES

Rating	Institutional Quality?	Conviction Level	Defining Characteristics	Recommendations
IQ1	Yes	Very High	Earns Verus’ highest conviction. Above-average characteristics most likely to achieve the strategy’s desired investment results.	Recommended for use in client portfolios. May be used in Verus discretionary portfolios.
IQ2	Yes	High	Maintains Verus’ high conviction. Above-average characteristics most likely to achieve strategy’s desired investment results.	Recommended for use in client portfolios. May be used in Verus discretionary portfolios.
IQ3	Yes	Positive	Meets institutional quality standards that can achieve desired investment results. Strengths outweigh weaknesses.	While IQ1 or IQ2 rated products are generally preferable, certain client needs may be better addressed by a highly specialized IQ3 product.
4	No	Low	Concerns with the product’s ability to meet institutional-quality standards.	Clients should re-evaluate retention or monitor closely.
5	No	Very Low	Significant issues inhibit the product’s ability to meet institutional-quality standards.	Verus recommends termination, immediately.

Recent Verus research

Visit: <https://www.verusinvestments.com/insights/>

Topics of interest papers

A BRIEF GUIDE TO THE SFA PROGRAM

In this paper, we plan to approach the Special Financial Assistance (SFA) program from an investment perspective. First, we describe the interest rate rules. Next, we offer some ways in which investors may think about their legacy assets relative to their new SFA funds. This section concludes by outlining a strategy in which SFA funds are used to cash flow match expected future liability payments. Overall, the health of a Plan will determine how much SFA funding is available, and the total amount of SFA funding awarded will likely determine the degree to which this program should reasonably impact an investor's total portfolio strategy.

IS PAINLESS DIVERSIFICATION BACK?

Low interest rates over the last few years have caused investors significant asset allocation problems. The 2022 market reversal has begun to reverse these challenges. The implications of this return to more normal conditions for investors include:

- The renewed role of fixed income in portfolios
- Greater flexibility to meet performance objectives through simple portfolio structures
- The ability of certain investors to meet return objectives while taking less market risk
- The potential for pensions to take advantage of higher interest rates and likely stronger funded status by pursuing more liability-aware investment strategies

Annual research

2023 CAPITAL MARKET ASSUMPTIONS

Some important developments occurred in the last year. Capital Market Assumptions guide our advice and recommendations. They reflect the best judgments of our research and investment teams regarding the expected behavior and associated risks of capital markets in the years ahead. During our 2023 Capital Market Assumptions webinar, we discussed:

- A significant increase in our Capital Market Assumptions, and aspects of the environment which have driven this change
- The “building blocks” of market returns and our philosophy around forecasting future asset-class performance
- Implications for investors as markets escape the *low-return environment* of recent years

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Equity 26

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4th quarter summary

THE ECONOMIC CLIMATE

- Real GDP increased at a 2.9% rate in the fourth quarter (1.0% year-over-year growth), slightly exceeding expectations. Consumer spending, private inventory investment, government expenditures, and nonresidential investment were supportive of growth.
- Unemployment remained near historic lows during the quarter, at 3.5% in December. While this figure suggests a strong and resilient job market, the workforce remains much smaller than pre-pandemic times as more than two million workers remain out of the labor force.

PORTFOLIO IMPACTS

- Inflation fears continue to ease as domestic inflation fell further. Headline inflation was 6.5% year-over-year in December—the lowest since October 2021—while core inflation came in at 5.7%. Prices for most goods and services have moderated with the exception of shelter costs, which increased at a worryingly fast pace of 10.0% annualized in December.
- U.S. real personal spending held steady at 2.0% year-over-year in August. Households focused spending on services over goods, which has removed some stress from supply chains and likely helped to normalize global transportation issues. Relatively strong spending seems to suggest it is possible that inflation moderates without a painful slowdown in the economy.

THE INVESTMENT CLIMATE

- China’s rapid pivot away from a “Zero Covid” policy towards the end of Q4 added a large tailwind to emerging market equity performance and the global growth outlook. Despite this positive news, an uptick in virus cases poses challenges for China’s reopening.
- Credit performed well in the fourth quarter, as resilient U.S. economic growth combined with expectations for the Fed to ease their tightening cycle helped mitigate investor concerns of a near-term cyclical downturn.

ASSET ALLOCATION ISSUES

- Calendar year 2022 proved to be a year of *reversal* regarding asset class performance. Top performing investments of the past decade, such as U.S. growth and small cap stocks, suffered some of the largest losses. Meanwhile, many of the worst performing investments of the past decade, including commodities and value stocks, significantly outperformed.
- Value stocks outperformed markedly during 2022, outpacing growth stocks by 10.2% in Q4 and 21.6% for the year. Energy, industrials, and materials—sectors heavily tilted toward value—showed strong returns, with energy ending the year up 64.6%.

Markets have partially recovered as inflation fears eased

Recession risks and an earnings slowdown may come into focus in 2023

What drove the market in Q4?

“Has Inflation Peaked?”

HEADLINE CONSUMER PRICE INFLATION (YEAR-OVER-YEAR)

Jul	Aug	Sep	Oct	Nov	Dec
8.5%	8.3%	8.2%	7.7%	7.1%	6.5%

Article Source: Financial Times, December 8th, 2022

“The Labor Market is Still Hot”

CHANGE IN U.S. NONFARM PAYROLLS

Jul	Aug	Sep	Oct	Nov	Dec
+537k	+292k	+269k	+284k	+263k	+223k

Article Source: Axios, November 1st, 2022

“Fed Raises Rate by 0.5 Percentage Point, Signals More Increases Likely”

FOMC MEETING RATE HIKE DECISIONS

May	Jun	July	Sep	Nov	Dec
+50 bps	+75 bps	+75 bps	+75 bps	+75 bps	+50 bps

Article Source: Wall Street Journal, December 14th, 2022

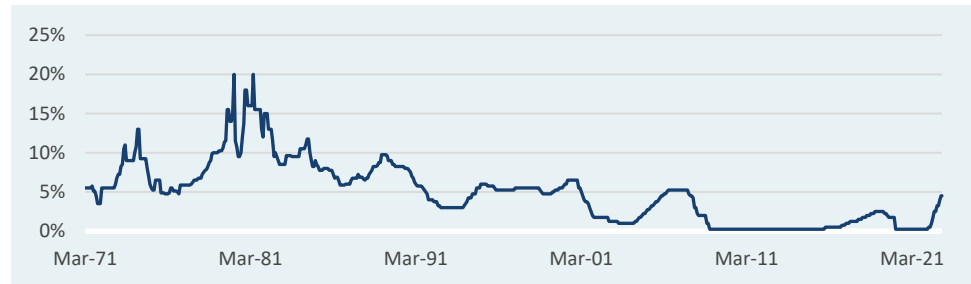
“China’s Covid Pivot Accelerates as Cities Ease Testing Rules”

CHINESE REPORTED NEW CASES (DAILY AVERAGE FOR THE MONTH)

Jul	Aug	Sep	Oct	Nov	Dec
559	1,629	1,158	1,340	18,914	14,748

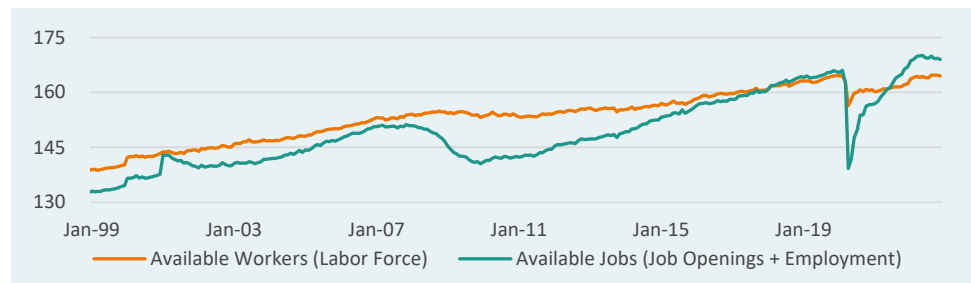
Article Source: Bloomberg, December 5th, 2022. Dataset from Our World in Data

FED FUNDS RATE UPPER BOUND



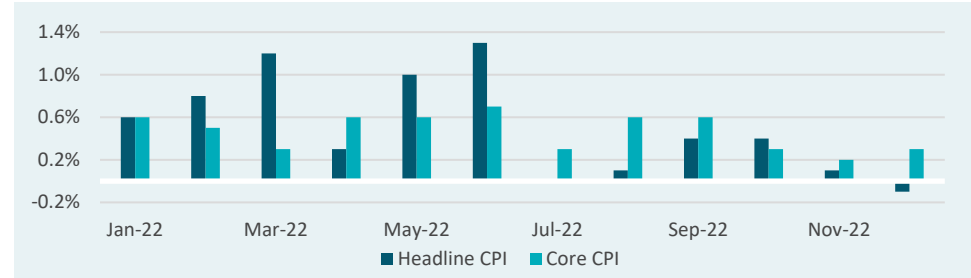
Source: Federal Reserve, as of 12/31/22

U.S. AVAILABLE WORKERS VS. AVAILABLE JOBS (MILLIONS)



Source: Bureau of Labor Statistics, as of 11/30/22

U.S. HEADLINE & CORE CPI (MONTH-OVER-MONTH)



Source: Bureau of Labor Statistics, as of 12/31/22

Economic environment

U.S. economics summary

- Real GDP increased at a 2.9% rate in Q4 (1.0% year-over-year growth). Consumer spending, private inventory investment, government expenditures, and nonresidential investment supported the economy.
- Inflation fears continue to ease as domestic inflation fell further. December headline inflation came in at 6.5% year-over-year while core inflation (excluding food & energy) came in at 5.7%. Most goods and services price rises have slowed, with the exception of shelter costs, which increased at a worryingly fast pace of 10% annualized in December.
- Unemployment remained very low during the quarter, at 3.5% in December. While this official figure suggests a strong and resilient job market, the workforce remains much smaller than pre-pandemic times as more than two million workers are missing from the labor force.
- Consumer spending kept steady though savings rates dropped to 2.3%—a depressed level not seen since the mid-2000s. A low household savings rate is sometimes seen as an indicator of strong consumer confidence and spending, though we suspect household budgets are currently being hit hard by higher costs.
- Consumer sentiment improved during Q4 but is still very downbeat. In the most recent University of Michigan survey, respondents showed less concern around inflation, reported better business conditions and long-term outlook, but were pessimistic over personal finances.
- U.S. home prices peaked in June 2022 and have been falling since then, according to S&P CoreLogic. Significantly higher mortgage interest rates have led to the worst home affordability on record, according to the National Association of Realtors.

	Most Recent	12 Months Prior
Real GDP (YoY)	1.0% 12/31/22	5.7% 12/31/21
Inflation (CPI YoY, Core)	5.7% 12/31/22	5.5% 12/31/21
Expected Inflation (5yr-5yr forward)	2.2% 12/31/22	2.3% 12/31/21
Fed Funds Target Range	4.25% – 4.50% 12/31/22	0.00% – 0.25% 12/31/21
10-Year Rate	3.87% 12/31/22	1.51% 12/31/21
U-3 Unemployment	3.5% 12/31/22	3.9% 12/31/21
U-6 Unemployment	6.5% 12/31/22	7.3% 12/31/21

GDP growth

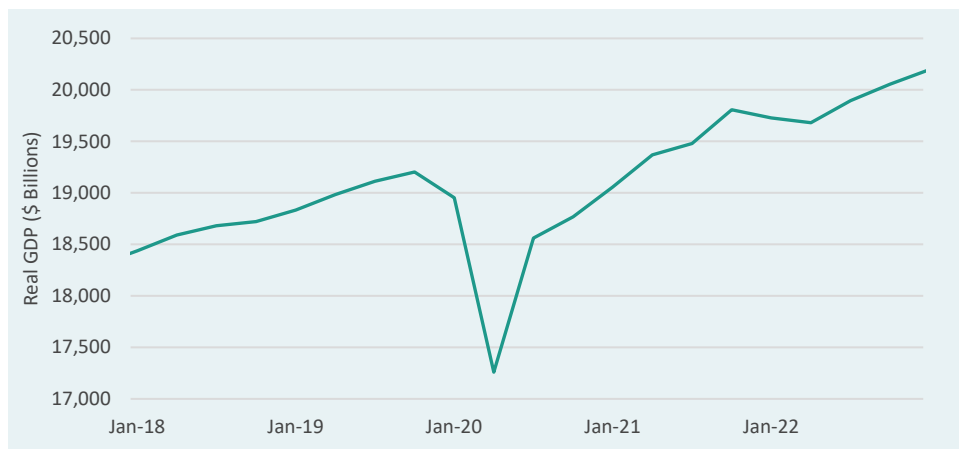
Real GDP increased at a 2.9% rate in the fourth quarter (1.0% growth year-over-year), slightly exceeding expectations of 2.8%. Consumer spending supported growth, along with gains in private inventory investment, government expenditures, and nonresidential investment. Residential fixed investment saw an extreme drop of -26.7% during the quarter as the housing market weakened. Declining exports also acted as a drag on growth.

Investors appear unsure about how to interpret the recent string of strong U.S. economic data. Although consumer sentiment is very poor by most measures, spending remains positive and the job market remains surprisingly resilient. Were the economy to avoid recession, this would be positive for businesses and for corporate

earnings, but might also lead to further aggressive Federal Reserve action and interest rate hikes, which are negative for equity prices.

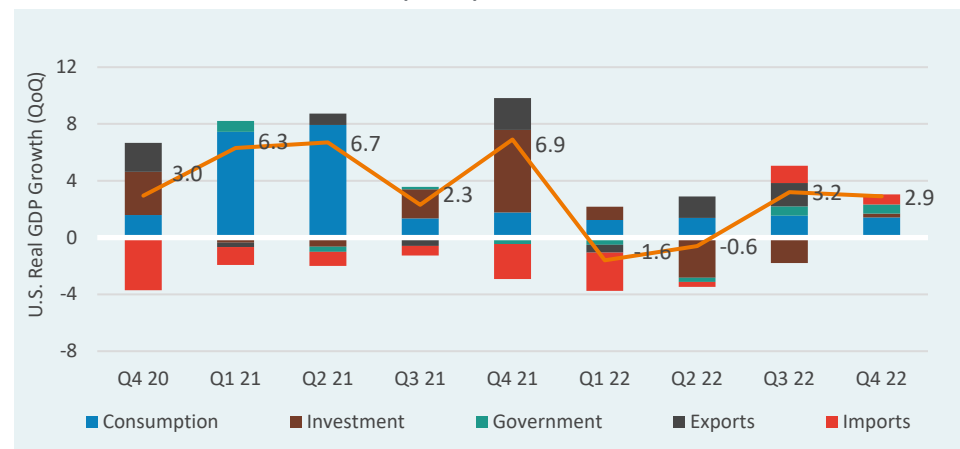
The inflation environment following the COVID-19 pandemic is unlike many past inflation cycles. Much of the price pressure has been fueled by factors *other than* a strong economy, such as an unprecedented shift in consumer spending behavior towards goods and away from services, port and international transportation issues related to lockdowns, and Russia's invasion of Ukraine. Because many of these variables are outside of the Federal Reserve's control, we believe it is possible that inflation continues to fall despite a relatively strong U.S. economy.

U.S. REAL GROSS DOMESTIC PRODUCT



Source: FRED, as of 12/31/22

U.S. REAL GDP COMPONENTS (QOQ)



Source: FRED, as of 12/31/22

Inflation

The inflation picture continued to improve in the United States, as both headline and core inflation figures declined further. December headline inflation came in at 6.5% year-over-year—the lowest since October 2021—while core inflation came in at 5.7%. Most goods and services prices have moderated with the exception of shelter, which increased at a worryingly fast pace of 10% annualized in December. Food inflation has been a large contributor to high inflation, but food price rises reassuringly slowed in December, increasing at a 3.7% annualized rate.

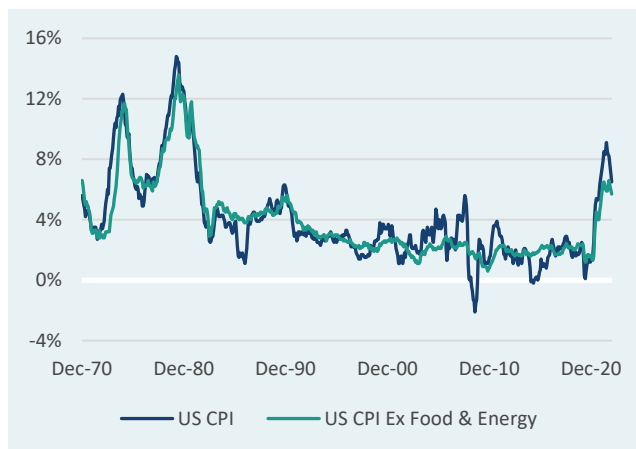
Strong increases in U.S. hourly wages over recent years have

been a welcome development for workers who are feeling the squeeze of higher prices on household budgets. But wage rises can also act as a key risk to the inflation environment. Accelerating wages might sustain higher spending and therefore persistently elevated rates of inflation. However, government data now indicates that wage growth is slowing, which mitigates the risk of a *wage-price spiral*.

Overall, we believe inflation is falling and will likely be much less of a perceived market risk in 2023. Certain persistent price pressures suggest that an inflation level of 3-4% is more likely than the 1-2% experienced throughout much of the 2010s.

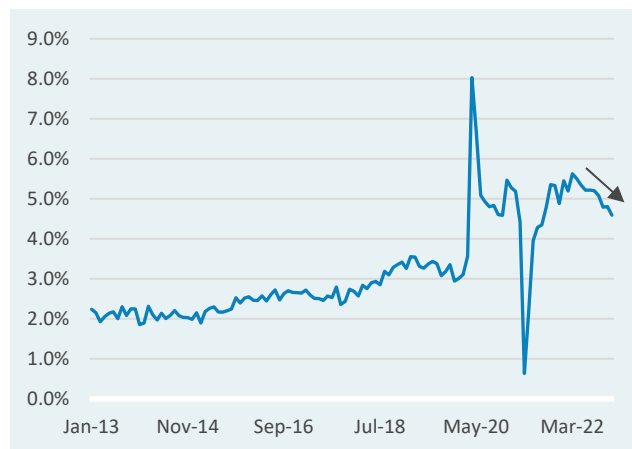
Price pressures continue to ease, adding to optimism that inflation will fall to more normal levels

U.S. CPI (YOY)



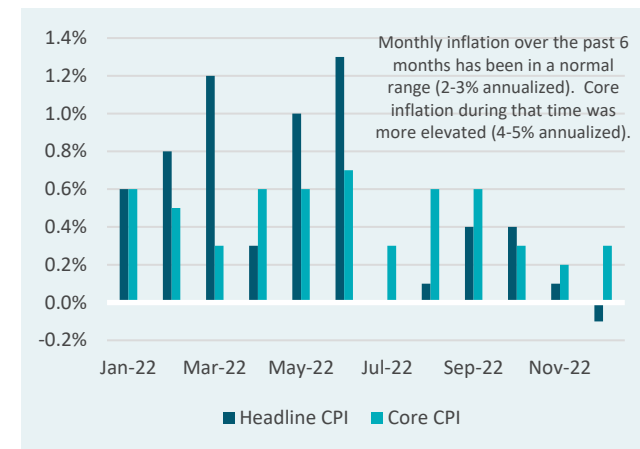
Source: BLS, as of 12/31/22

AVERAGE HOURLY EARNINGS



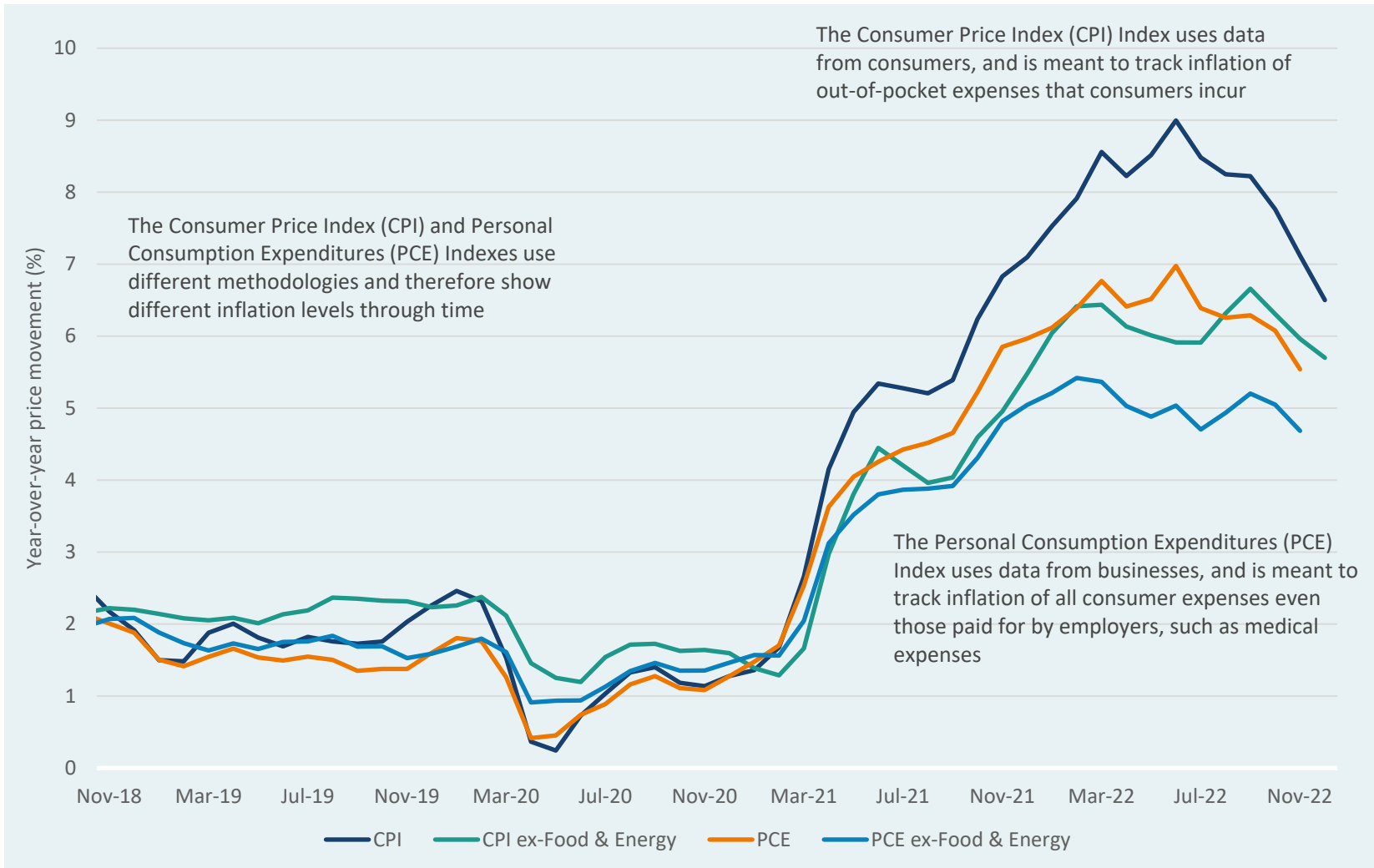
Source: BLS, as of 12/31/22

MONTHLY PRICE MOVEMENT



Source: BLS, as of 12/31/22

How are inflation conditions evolving?



Price rises have slowed considerably in recent months, which is bringing down official year-over-year inflation figures

Source: FRED, Verus, PCE data as of 11/30/22, CPI data as of 12/31/22

Labor market

Unemployment remained very low during the quarter, at 3.5% in December. This official figure suggests a strong and resilient job market for those workers who seek employment, although this data contrasts with media reports of fairly widespread layoff activity.

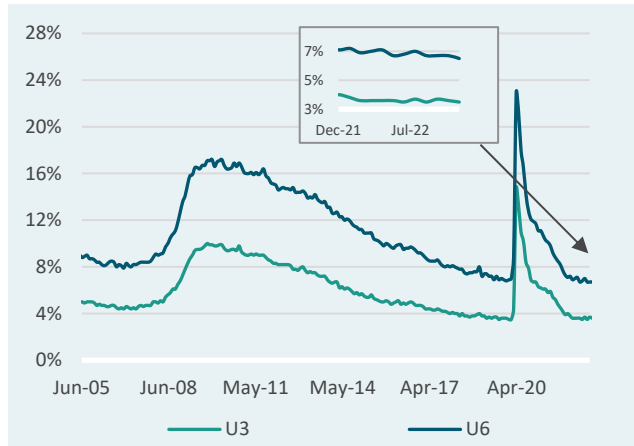
The labor participation rate also remained unchanged during the quarter. Low labor participation paints a different and much weaker picture of the job market, because this figure takes into account the workers *who are not seeking employment*. More than two million workers remain out of the labor force, relative to the pre-pandemic job market. Survey

and government-reported data suggests that much of this effect is due to “Long Covid” health troubles. Other variables such as early retirements, and parents taking time off to care for children, have also likely had a material impact on the size of the workforce.

The result of millions of Americans dropping out of the workforce has been a historically large mismatch regarding the number of jobs available and the number of workers available to fill those jobs. This gap remains wide, but has been closing recently as job openings have fallen.

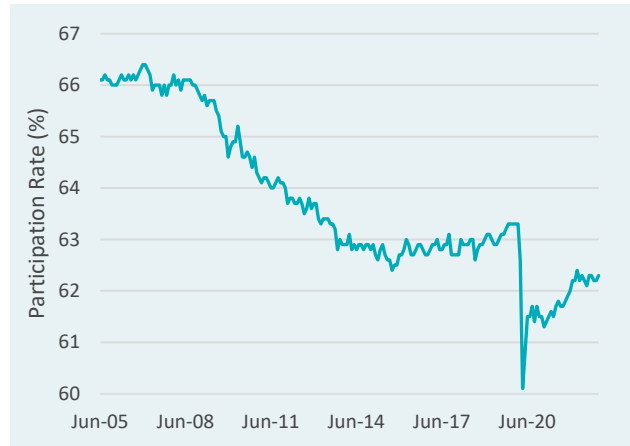
The labor market remains tight, though the size of workforce is much smaller relative to pre-pandemic times

U.S. UNEMPLOYMENT



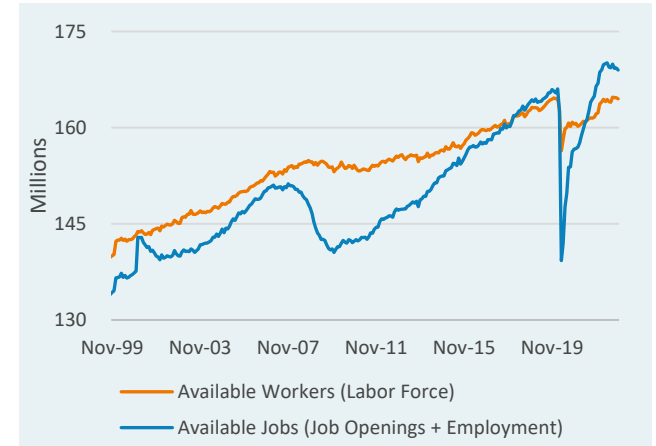
Source: FRED, as of 12/31/22

LABOR FORCE PARTICIPATION RATE



Source: FRED, as of 12/31/22

WORKERS AVAILABLE VS. AVAILABLE JOBS



Source: BLS, as of 11/30/22

The consumer

U.S. real (inflation-adjusted) personal consumption expenditures held steady in August, at 2.0% year-over-year. Households have focused spending on services rather than goods, which removed some stress from supply chains and likely helped to normalize transportation issues. Relatively strong spending seems to suggest it is possible that inflation moderates without a painful slowdown in the economy.

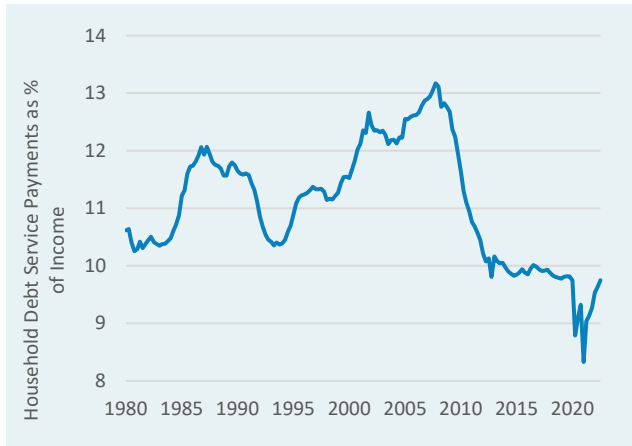
Spending has slowed but savings rates have also dropped to 2.3%—a depressed level not seen since the mid-2000s. A low household savings rate is sometimes seen as an indicator of

strong consumer confidence and spending, though in the current environment we suspect that household budgets are being hit hard by inflation and higher living costs.

Big ticket items such as automobiles have seen falling sales as higher interest rates make purchases less affordable and household budgets come under strain. The pressure of higher interest rates is reflected in *average debt payments relative to average income*—a metric which has risen towards pre-pandemic levels.

Household spending remains strong, though a very low savings rate may suggest budgets are being squeezed

DEBT SERVICE AS % HOUSEHOLD INCOME



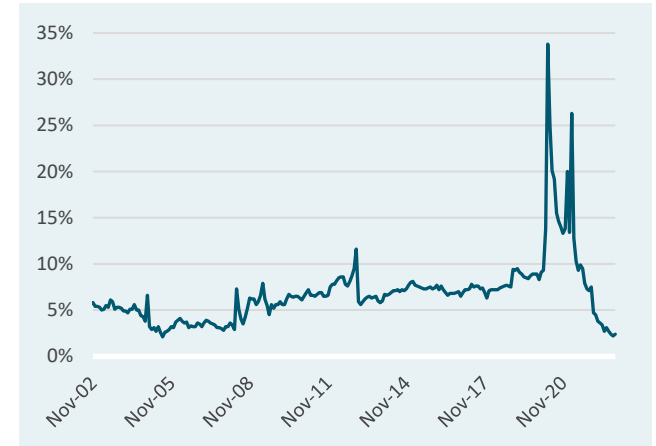
Source: FRED, as of 9/30/22

REAL PERSONAL CONSUMPTION



Source: FRED, as of 11/30/22

PERSONAL SAVINGS RATE



Source: FRED, as of 11/30/22

Sentiment

Consumer sentiment improved again during the fourth quarter, but remains very downbeat, according to the University of Michigan. In the most recent survey, respondents expressed less concerns over inflation, reported better business conditions and long-term outlook, though pessimism around current and future personal finances remained.

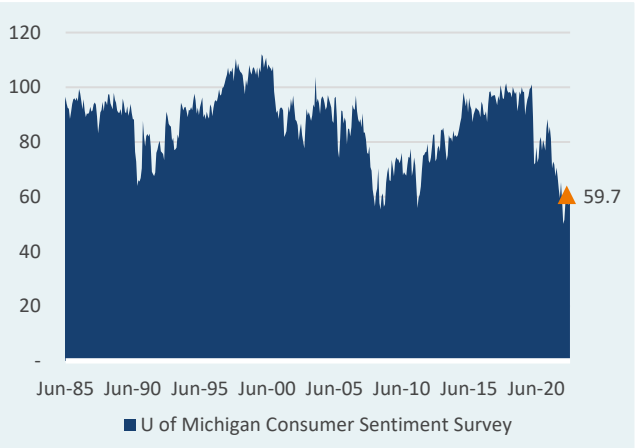
Consumer confidence measured by the Conference Board improved slightly in the fourth quarter—at the highest level since April. According to the Conference Board, views around

current conditions and future conditions improved as households were more upbeat regarding the economy and jobs. Inflation expectations continued to fall (improve), driven by lower gas prices in particular.

The NFIB Small Business Optimism index deteriorated slightly during the quarter, reflecting a very poor business outlook. Thirty-two percent of business owners expressed inflation as their greatest concern for business operations. Other concerns included difficulties in filling open job positions and an inability to raise prices to keep up with inflation.

Sentiment, by most measures, remains very poor

CONSUMER SENTIMENT



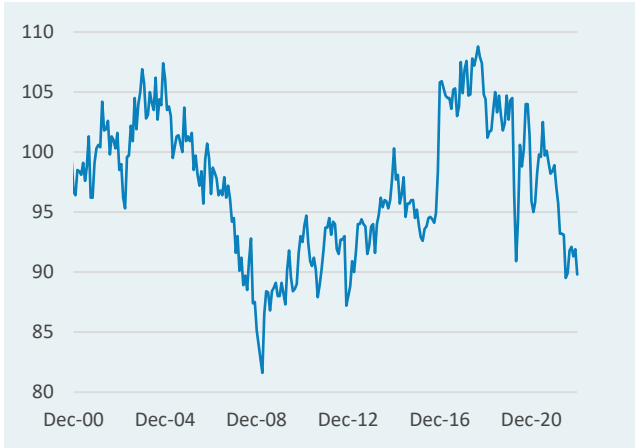
Source: University of Michigan, as of 12/31/22

CONFERENCE BOARD CONSUMER CONFIDENCE



Source: Conference Board, as of 12/31/22

NFIB SMALL BUSINESS SENTIMENT



Source: NFIB, as of 12/31/22

Housing

U.S. home prices peaked in June 2022 and have been falling since that time, according to the S&P CoreLogic Case-Shiller U.S. National Index. Significantly higher mortgage interest rates have led to the worst home affordability on record, as indicated by the National Association of Realtors.

Higher home prices and interest rates have also resulted in a sharp slowdown in sales activity—a notable change from the frothy environment that had occurred post-pandemic. Existing home sales activity has now fallen to a rate not seen since the real estate market was recovering from the housing

crisis during the early 2010s.

Conditions in housing today appear to be helping to *rebalance* the housing market, as suggested by the monthly supply of homes. Weaker sales volumes and worse affordability has meant that potential buyers have much more inventory to select from. The monthly supply of homes is now at 8.6 months, up from an all-time-low of 3.3 months in August 2020. As homes sit on the market unsold for longer, prices may need to fall further to attract buyers.

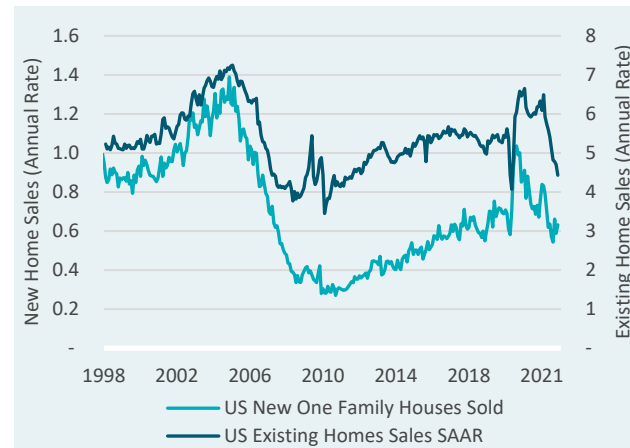
HOUSING AFFORDABILITY INDEX



Source: NAR, as of 11/30/22

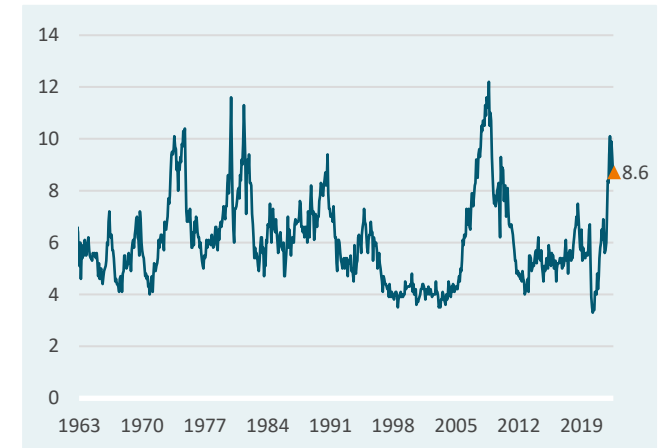
The Monthly Housing Affordability Index measures whether or not a typical family earns enough income to qualify for a mortgage loan on a typical home at the national and regional levels based on the most recent monthly price and income data

HOME SALES: NEW & EXISTING (MILLIONS)



Source: FRED, as of 10/31/22

MONTHLY SUPPLY OF HOMES



Source: FRED, as of 11/30/22

International economics summary

- Economic growth expectations continued to weaken, although the GDP outlook for emerging economies is starting to paint a more optimistic picture. Developed economies, specifically across the Eurozone and United Kingdom, are still facing the negative growth impacts of tighter financial conditions as inflation remains elevated.
- Inflation in both the Eurozone and U.K. has reinforced tighter policies from the ECB and BOE. While U.K. inflation fell to 10.7% from the 11.1% peak in October, interest rates are expected to be raised further (but in smaller increments). Eurozone inflation has shown signs of moving past its peak, although core inflation hit a new high of 5.2%, stoking fears that inflation may be spreading to core goods and services.
- Unemployment rates have remained stable over the quarter.

India stood out as an exception, where unemployment jumped from 6.4% to 8.3%.

- The war in Ukraine carried on despite temporary “ceasefires” declared by Russia. The fighting has intensified in Eastern Ukraine around Kharkiv, with a supporting effort in Southern Ukraine, as Russian forces attempt to secure frontline positioning in the Kherson Oblast.
- China’s rapid pivot away from a “Zero Covid” policy towards the end of the quarter added a large tailwind to the global growth outlook. Despite this positive news, a rapid uptick in COVID-19 cases challenges the timeline of the reopening story. Additionally, many wonder how a large uptick in global demand might impact inflation pressures at a time when advanced economies struggle specifically to reign in spending.

Area	GDP (Real, YoY)	Inflation (CPI, YoY)	Unemployment
United States	1.0% 12/31/22	6.5% 12/31/22	3.5% 12/31/22
Eurozone	2.3% 9/30/22	9.2% 12/31/22	6.5% 11/30/22
Japan	1.5% 9/30/22	4.0% 12/31/22	2.4% 11/30/22
BRICS Nations	3.6% 9/30/22	3.5% 12/31/22	5.2% 12/31/21
Brazil	3.6% 9/30/22	5.8% 12/31/22	8.3% 10/31/22
Russia	(3.7%) 9/30/22	11.9% 12/31/22	3.7% 11/30/22
India	6.3% 9/30/22	5.7% 12/31/22	8.3% 12/31/22
China	3.9% 9/30/22	1.8% 12/31/22	5.7% 11/30/22

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

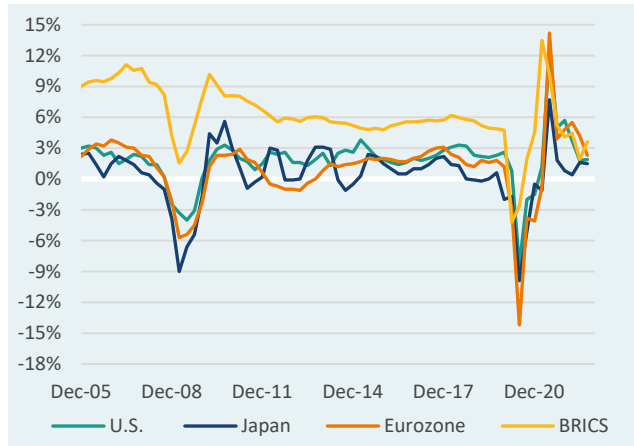
Growth expectations outside of the U.S. contracted over the quarter, with the largest moves coming from developed economies. The IMF cut its GDP forecast by 0.7% and 0.2% for the Eurozone and U.K. in their October outlook (now expecting 2023 GDP of 0.5% and 0.3%, respectively) as the European Central Bank and Bank of England struggle to rein in record high inflation. Japan saw a smaller downward revision of 0.1%, with 2023 growth expectations now at 1.6%.

The outlook for emerging markets is much more optimistic. Most countries have avoided the high inflation seen in developed markets. A rapid reopening of the Chinese economy

is likely providing a tailwind to growth, although the timing remains unclear due to another wave of COVID-19 infections. The 2023 GDP forecast for emerging economies per Bloomberg ticked down from 4.3% to 3.9% over the quarter, but emerging economy growth is still expected to far exceed that of developed economies (developed economy 2023 GDP expectations sit at 0.4%, according to the IMF).

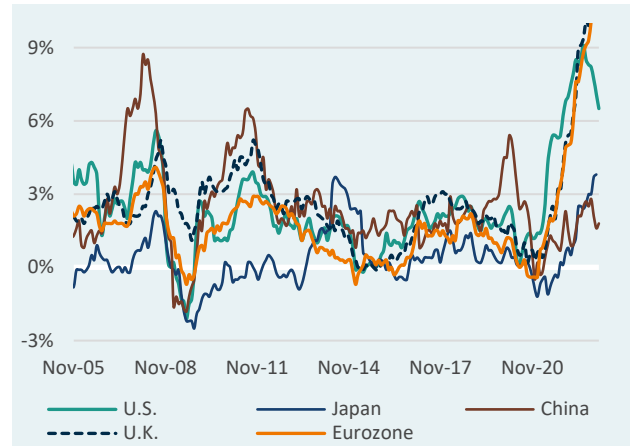
Despite the slowdown in economic growth, employment remains stable amongst the regions we track. India stood out as an exception, where unemployment jumped from 6.4% to 8.3% during Q4.

REAL GDP GROWTH (YOY)



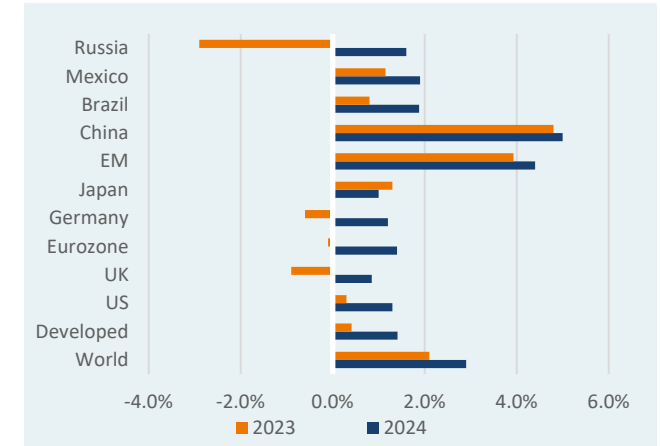
Source: Bloomberg, as of 9/30/22

INFLATION (CPI YOY)



Source: Bloomberg, as of 12/31/22 – or most recent release

ECONOMIC GROWTH FORECASTS



Source: Bloomberg, as of 12/31/22 – or most recent release

Fixed income rates & credit

Fixed income environment

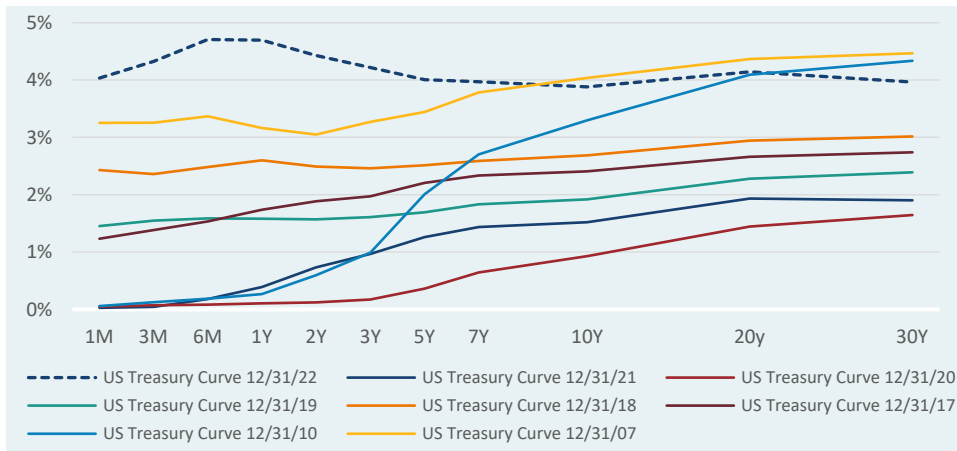
- The 10-year U.S. Treasury yield ended the quarter unchanged at 3.8%. It is possible that long-term interest rates have already reached a cyclical peak, assuming inflation continues to fall and the Federal Reserve becomes less aggressive.
- Credit performance was positive during the fourth quarter, with riskier exposures such as U.S. high yield and emerging market debt (both local and hard currency) leading the pack. Expectations for a slowdown in Federal Reserve rate hikes, and a rosier U.S. economic environment, have provided a tailwind to the credit space.
- Default activity in high yield bonds and bank loans remained subdued during Q4. Throughout the year, 17 companies defaulted totaling \$26.3 billion, with large defaults concentrated in the Healthcare sector which accounted for over 36% of total dollar volume. Default rates for par-weighted U.S. high yield and bank loans remained very low at 0.8% and 1.0%, respectively.
- The U.S. yield curve inversion reached historically negative levels, with the 10-year 2-year yield spread seeing its widest inversion since 1981 (short-term interest rates being higher than long-term interest rates). The negative spread bottomed out at ~81 bps on December 5th before gradually easing during the latter half of the month.
- Derivative markets are beginning to clash with Federal Reserve projections, as investors are pricing in a shorter tightening cycle relative to that indicated by comments from Federal Reserve officials. Federal Funds futures reflect a target interest rate of approximately 4.6% by the end of 2023, which compares to 5.1% indicated by the Federal Reserve's December Summary of Economic Projections.

	QTD Total Return	1 Year Total Return
Core Fixed Income (Bloomberg U.S. Aggregate)	1.9%	(13.0%)
Core Plus Fixed Income (Bloomberg U.S. Universal)	2.2%	(13.0%)
U.S. Treasuries (Bloomberg U.S. Treasury)	0.7%	(12.5%)
U.S. High Yield (Bloomberg U.S. Corporate HY)	4.2%	(11.2%)
Bank Loans (S&P/LSTA Leveraged Loan)	2.7%	(0.6%)
Emerging Market Debt Local (JPM GBI-EM Global Diversified)	8.5%	(11.7%)
Emerging Market Debt Hard (JPM EMBI Global Diversified)	8.1%	(17.8%)
Mortgage-Backed Securities (Bloomberg MBS)	2.1%	(11.8%)

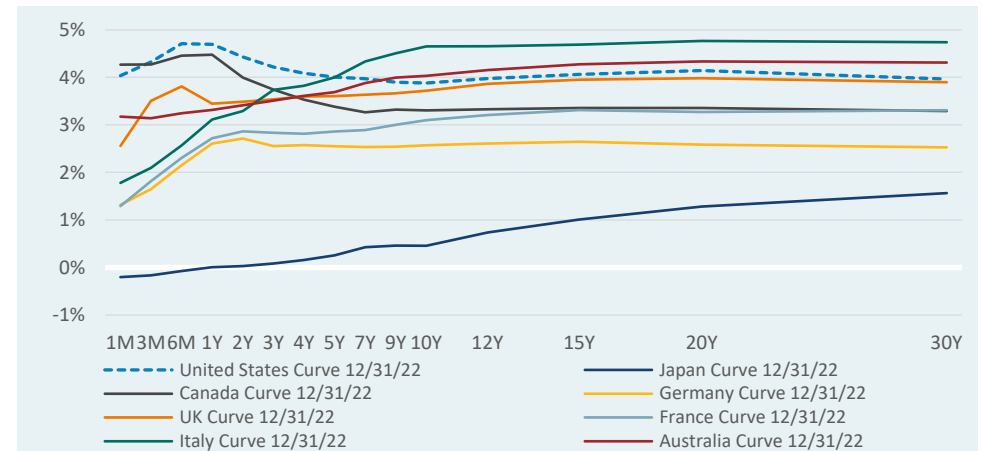
Source: Bloomberg, as of 12/31/22

Yield environment

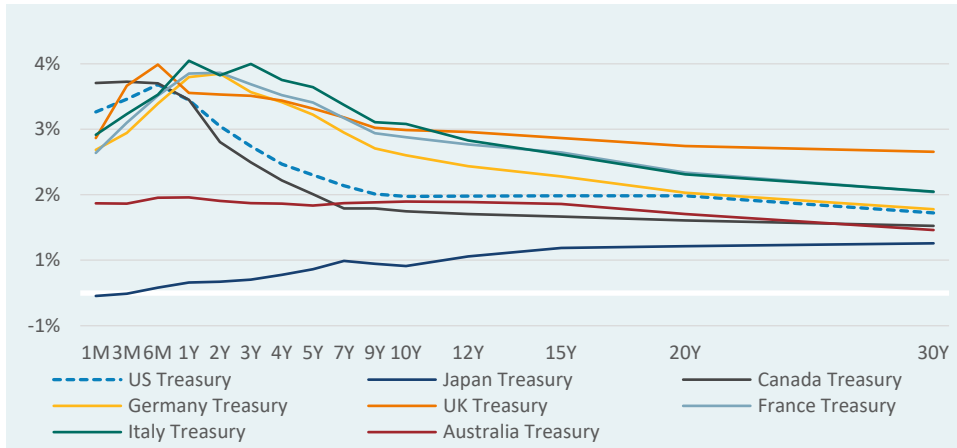
U.S. YIELD CURVE



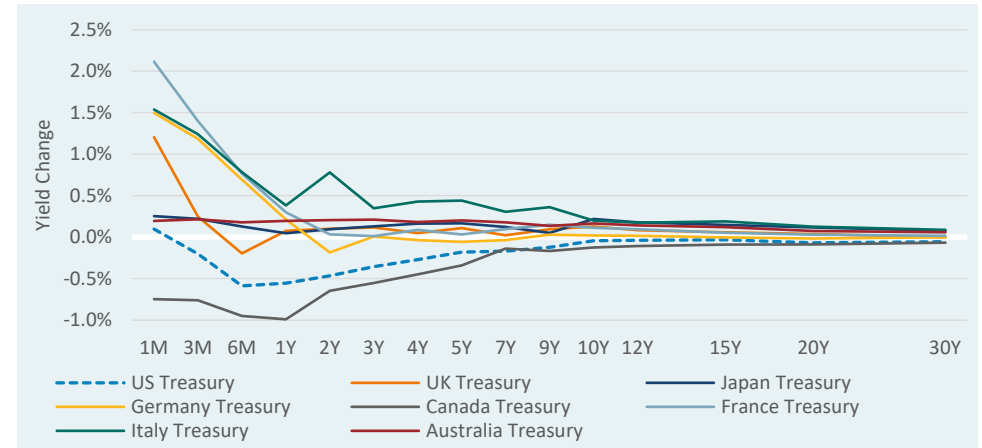
GLOBAL GOVERNMENT YIELD CURVES



YIELD CURVE CHANGES OVER LAST FIVE YEARS



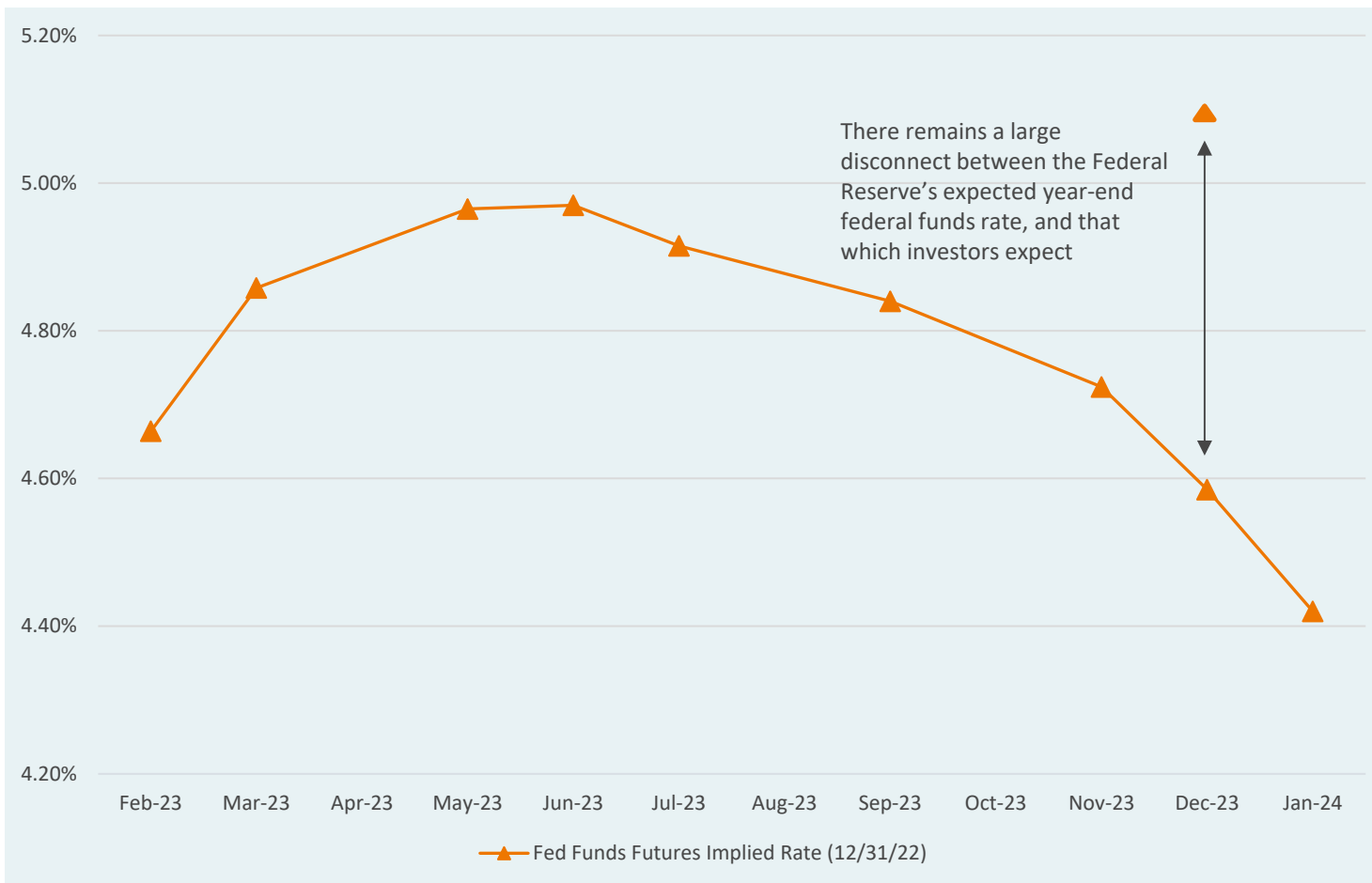
IMPLIED CHANGES OVER NEXT YEAR



Source: Bloomberg, as of 12/31/22

Markets more optimistic than the Fed

FED FUNDS FUTURES IMPLIED FED RATE



Markets expected the federal funds rate to rise to a peak of near 5.0% in Spring of 2023, followed by rate cuts throughout the remainder of the year

This contrasts sharply with forecasts from the Federal Reserve, which indicates a federal funds rate projection for the end of 2023 of **5.1%**

Source: Bloomberg, as of 12/31/22

Credit environment

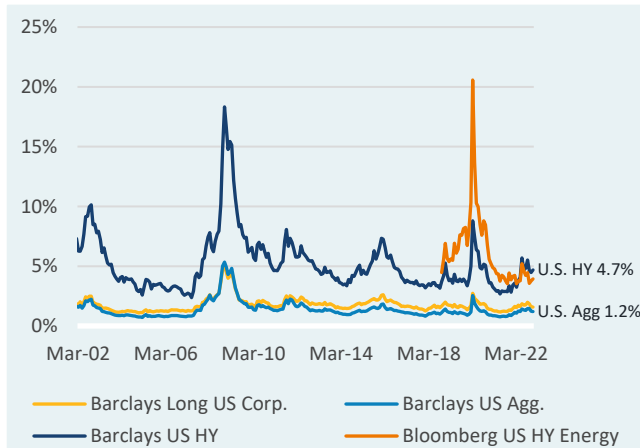
During the fourth quarter, markets began pricing in an eventual end to the Federal Reserve rate hiking cycle. This supported the performance of credit assets, as well as stronger-than-expected U.S. economic data which helped alleviate recession fears. High yield credit returns led the way with 4.2%, followed by 3.6% from investment grade credit and 2.3% from bank loans.

Credit spreads broadly tightened, with investment grade spreads falling to 130 bps from their high of 165 bps in Q3. High yield spreads compressed further, moving from 552 bps to 469 bps over the quarter. Despite calendar year returns of investment grade credit being the worst on record at -15.8%, and two consecutive years of negative returns, spreads have

widened less than anticipated. This suggests spreads could expand from these levels if conditions deteriorate.

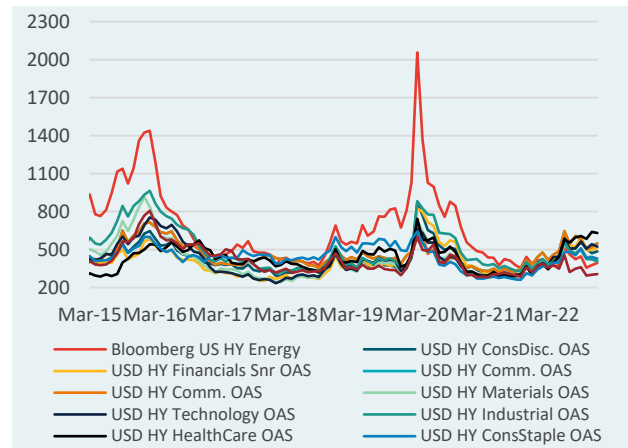
The total yield of high yield credit declined modestly throughout Q4, ending the quarter at 9.0%, which was 71 bps below Q3 yields but still elevated far above yields to start 2022. The Bloomberg US Corporate Investment Grade Index saw similar movement, with yields declining to 5.4% from 5.7% during the quarter, though still significantly higher than 2.4% to start the year. More attractive yield levels have the potential to drive demand for fixed income broadly, though concerns around growth and recession may act as headwinds to the spread-sensitive performance of higher risk credit.

SPREADS



Source: Barclays, Bloomberg, as of 12/31/22

HIGH YIELD SECTOR SPREADS (BPS)



Source: Bloomberg, as of 12/31/22

Market	Credit Spread (OAS)	
	12/31/22	12/31/21
Long U.S. Corp	1.6%	1.3%
U.S. Inv Grade Corp	1.3%	0.9%
U.S. High Yield	4.7%	2.8%
U.S. Bank Loans*	5.9%	4.3%

Source: Barclays, Credit Suisse, Bloomberg, as of 12/31/22

*Discount margin (4-year life)

Default & issuance

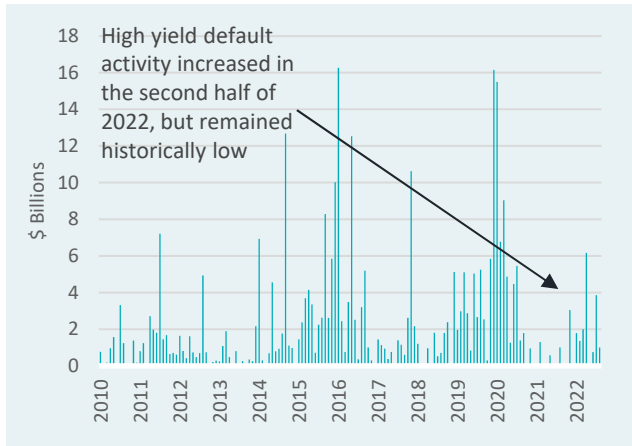
Default activity in high yield bonds and bank loans remained subdued during Q4. Throughout the year, 17 companies defaulted totaling \$26.3 billion, with large defaults concentrated in the Healthcare sector which accounted for over 36% of total dollar volume. Default rates for par-weighted U.S. high yield and bank loans remained very low at 0.8% and 1.0%, respectively. While these levels are well below long-term historical averages, defaults are widely expected to increase amid sustained higher interest rates, tighter financial conditions, and weaker economic growth.

Default recovery rates of high yield and bank loans remained strong for a second consecutive year. High yield recovery rates ended the year at 55% (above the long-term average of 40%) while the recovery rate of bank loans

ended the year at 58% (below the long-term average of 64%).

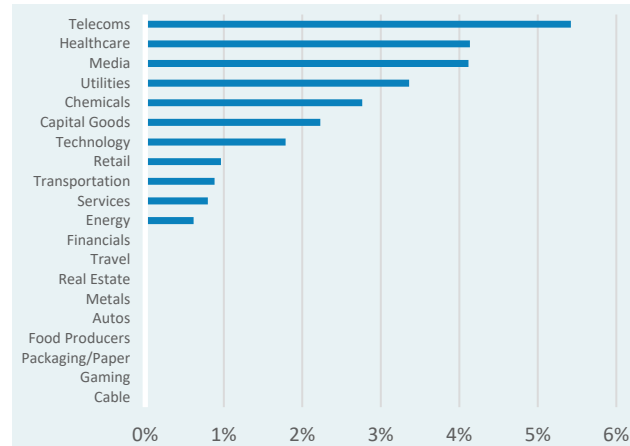
Investment grade credit issuance remained light, with \$195 billion of issuance in Q4 being the lowest quarter of the year. During 2022, \$1.2 trillion of investment grade bond issuance was 12% lower than 2021 but still in line with the past five-year average. Levered credit also saw quarterly lows of issuance, with \$16.5 billion and \$47.6 billion in the high yield and levered loan spaces, respectively. The year-over-year declines in issuance within high yield and bank loans have been dramatic, down around 70% since 2021.

U.S. HY MONTHLY DEFAULTS (PAR WEIGHTED)



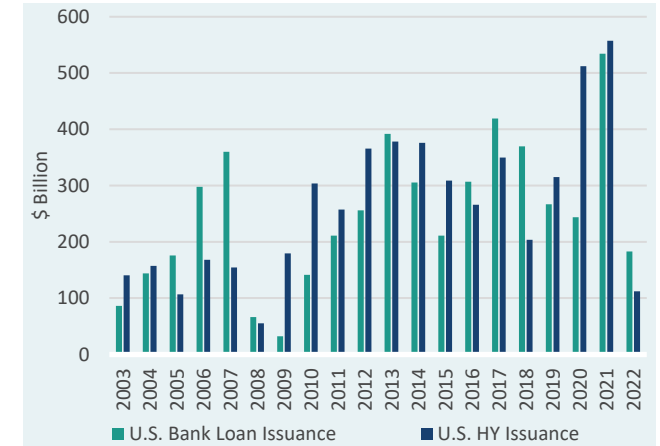
Source: BofA Merrill Lynch, as of 12/31/22

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



Source: BofA Merrill Lynch, as of 12/31/22 – par weighted

U.S. ISSUANCE (\$ BILLIONS)



Source: BofA Merrill Lynch, as of 12/31/22

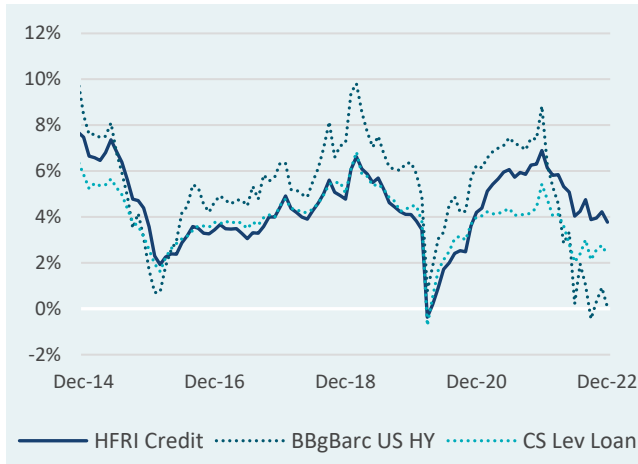
Alternative credit

Credit hedge fund strategies held up well in 2022 despite continued pressure on high yield and duration-sensitive assets. The HFRI Credit Index, which typically delivers performance between that of high yield and bank loans, only lost -2.6% for the year despite widening credit spreads and exposure to duration (which has been very painful for traditional credit).

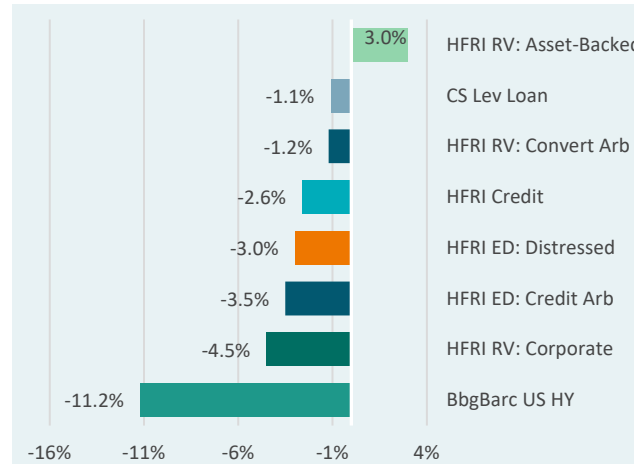
Looking more closely at hedge fund credit, asset-backed strategies were the strongest performers throughout the year. These strategies gained 3% while most other alternative credit funds were modestly negative, in line with bank loans.

We believe asset-backed and distressed strategies remain the most interesting in the space. Asset-backed funds have found attractive yields in off-the-run securitized credit markets, while distressed funds benefited from value investing coming back into favor, and increasing corporate stress which provides new trading opportunities.

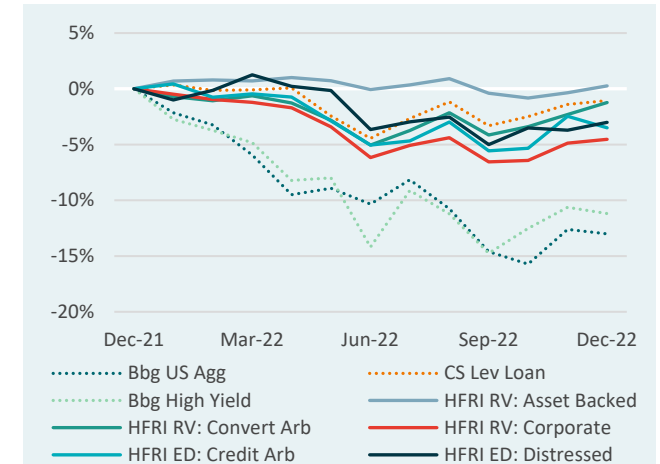
3-YEAR ROLLING RETURN



2022 RETURN



2022 CUMULATIVE RETURN



Source: MPI, Morningstar, HFR, Bloomberg, as of 12/31/22

Equity

Equity environment

- U.S. equities delivered their only positive quarterly return of 2022 during Q4 (S&P 500 +7.6%), helping to dampen the index’s worst calendar year performance since 2008 (-18.1% loss in 2022). Higher interest rates and recession fears contributed to poor returns.
- U.S. corporate earnings in Q3 grew 2.4% from the year prior, marking the slowest rate of growth since Q3 2020. Per FactSet, earnings are projected to decline by -4.1% in Q4, which would mark the first decline in U.S. earnings since 2020.
- Many equity markets now trade at valuation levels near historical averages as rising rates and growth concerns have contributed to more attractive pricing. The S&P 500 forward P/E ratio of 18.3 (as of November 30th) is under the five-year average of 18.6 and the ten-year average of 20.2.
- Currency movements continued to create portfolio volatility for investors with unhedged exposure to foreign currencies. The U.S. dollar depreciated sharply during Q4 which resulted in a large gain of 7.6% for investors with unhedged foreign currency exposure (+17.3% MSCI EAFE unhedged, +9.7% MSCI EAFE hedged).
- Value stocks outpaced growth stocks by 10.2% in Q4 and by 21.6% for the year. Energy, industrials, and materials—sectors which are heavily tilted toward value—showed strong returns, with energy ending the year up 64.6%.
- Implied volatility fell significantly over the quarter, as the Cboe VIX Index moved from 31.6 to 21.7. Equity markets advanced on cooling inflation, potential for less aggressive central bank action, and perhaps optimism around China’s reopening.

	QTD TOTAL RETURN		1 YEAR TOTAL RETURN	
	(unhedged)	(hedged)	(unhedged)	(hedged)
U.S. Large Cap (S&P 500)	7.6%		(18.1%)	
U.S. Small Cap (Russell 2000)	6.2%		(20.4%)	
U.S. Equity (Russell 3000)	7.2%		(19.2%)	
U.S. Large Value (Russell 1000 Value)	12.4%		(7.5%)	
US Large Growth (Russell 1000 Growth)	2.2%		(29.1%)	
Global Equity (MSCI ACWI)	9.8%	7.6%	(18.4%)	(15.5%)
International Large (MSCI EAFE)	17.3%	9.7%	(14.5%)	(4.6%)
Eurozone (EURO STOXX 50)	24.8%	15.7%	(15.1%)	(7.0%)
U.K. (FTSE 100)	17.1%	9.3%	(7.0%)	5.9%
Japan (NIKKEI 225)	11.3%	1.4%	(18.9%)	(5.2%)
Emerging Markets (MSCI Emerging Markets)	9.7%	6.7%	(20.1%)	(16.3%)

Source: Russell Investments, MSCI, STOXX, FTSE, Nikkei, as of 12/31/22

Domestic equity

U.S. equities notched their only positive quarterly return for the year during Q4 (S&P 500 +7.6%), helping to dampen the index's worst annual performance since 2008 (-18.1% loss in 2022). Domestic shares were negatively impacted by higher interest rates and growing recession fears due to tightening from the Federal Reserve. While performance over the quarter was positive, U.S. equities trailed emerging market and international developed equities.

Earnings in the third quarter grew 2.4% from the year prior, marking the slowest rate of growth since Q3 2020. Energy dominated the narrative,

as earnings grew an incredible 137% from the previous year. U.S. energy companies experienced margin expansion due to materially higher commodity prices, specifically within oil and natural gas. Per FactSet, earnings are projected to decline by -4.1% in Q4, which would mark the first decline in U.S. earnings since 2020. A potential recession could pose challenges for the earnings outlook.

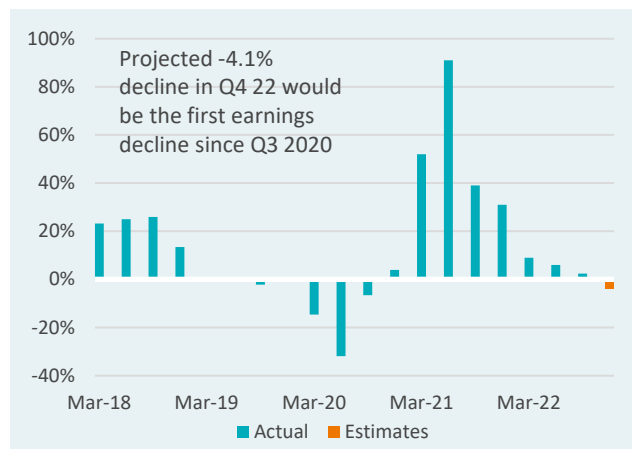
Energy dominated sector performance in the quarter (+22.8), leading the positive performance seen in most sectors, while telecommunications (-1.4%) and consumer discretionary (-10.2%) saw negative returns.

S&P 500 PRICE INDEX



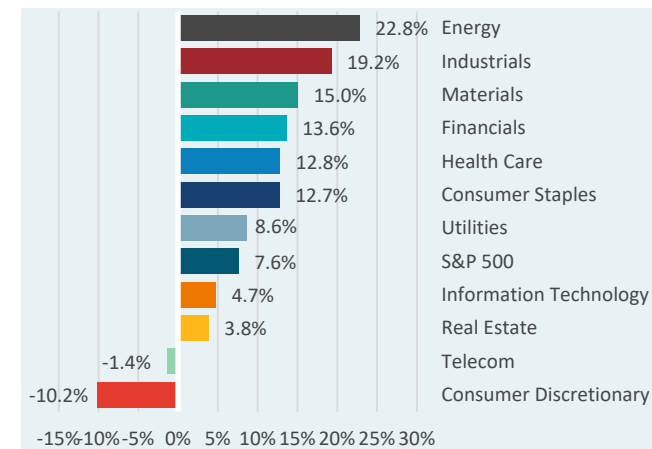
Source: Standard & Poor's, as of 12/31/22

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



Source: FactSet, as of 12/31/22

Q4 SECTOR PERFORMANCE



Source: Morningstar, as of 12/31/22

Domestic equity size & style

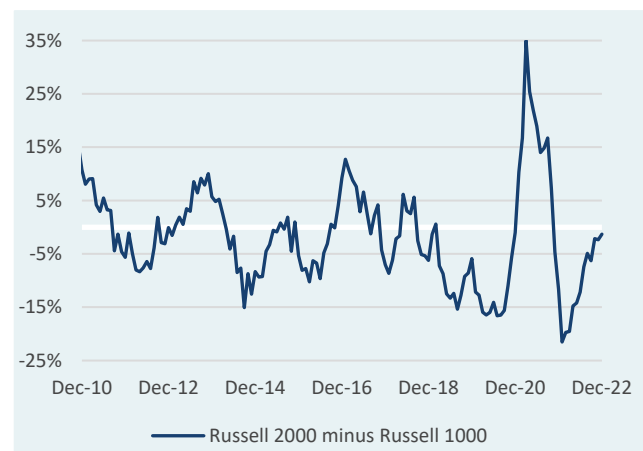
Value stocks outpaced growth stocks by 10.2% in Q4 and by 21.6% for the year. Energy, industrials, and materials —sectors which are heavily tilted toward value—showed strong returns, with the energy sector ending the year up 64.6%.

Markets adjusted to Federal Reserve rate hikes in the fourth quarter and throughout the year. Profitless and high-growth companies suffered the most as investors favored higher yielding fixed income and preferred stocks with strong fundamentals.

Small capitalization stocks underperformed large capitalization stocks (Russell 2000 +6.2%, Russell 1000 +7.2%), and remain relatively rich in valuations despite recent performance pain.

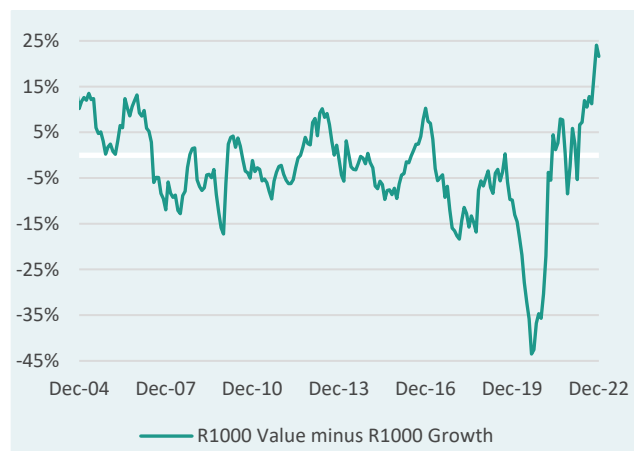
Domestic equities made a modest recovery in Q4 as inflation appears to have peaked and the end of the Fed’s hiking cycle is in sight. These dynamics will likely help determine the relative performance of style factors in the near-term.

SMALL CAP VS LARGE CAP (YOY)



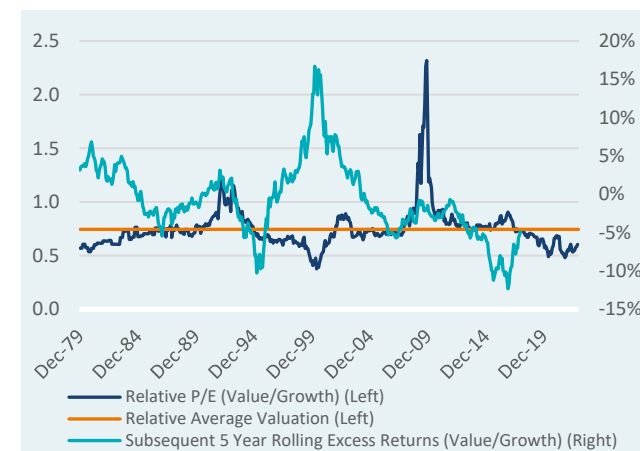
Source: FTSE, as of 12/31/22

VALUE VS GROWTH (YOY)



Source: FTSE, as of 12/31/22

VALUE VS. GROWTH RELATIVE VALUATIONS



Source: FTSE, Bloomberg, as of 12/31/22

International developed equity

International developed equities rallied significantly in the fourth quarter, driven by strong gains from Eurozone equities and favorable currency movements. The MSCI EAFE Index finished the quarter up 17.3% on an unhedged currency basis, handily outperforming emerging market and U.S. equities.

A bounce back from European shares helped drive the double-digit returns seen from the MSCI EAFE Index. Investors showed preference towards larger names, as the EURO STOXX 50—a gauge of the largest companies in the

Eurozone—rose 24.8%, outpacing the 19.7% gain from the broader EURO STOXX 600 Index. Both indices were trading at 2022 lows at the start of the fourth quarter.

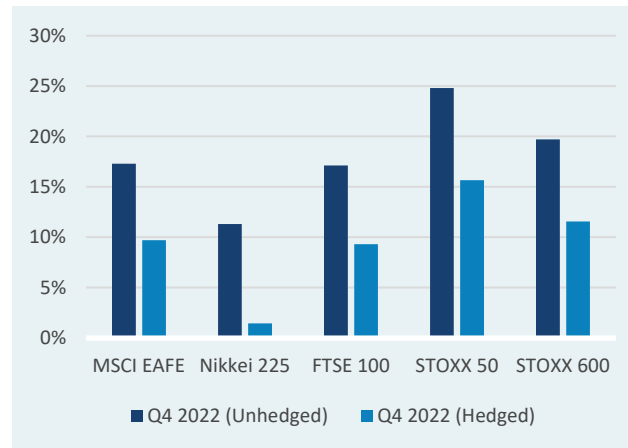
Currency movements played a large role in unhedged Eurozone performance and also boosted the unhedged returns of Japan and the United Kingdom. The U.S. dollar sharply pivoted on market views that the Federal Reserve may follow a shorter tightening cycle. As a result, exchange rates for the Euro, Pound, and Yen appreciated relative to the greenback.

INTERNATIONAL DEVELOPED EQUITY



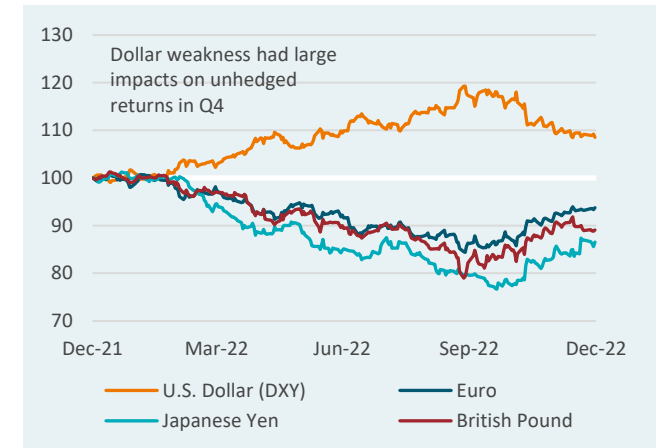
Source: MSCI, as of 12/31/22

Q4 2022 REGIONAL INDEX RETURNS



Source: MSCI, STOXX, FTSE, Nikkei, as of 12/31/22

2022 CURRENCY MOVEMENTS (BASE OF 100)



Source: Bloomberg, as of 12/31/22

Emerging market equity

Emerging market equities advanced alongside global equities as the MSCI EM Index finished the quarter up 9.7%. Performance was volatile over the quarter, as losses in October were pared by a 13.2% rally over November and December. Despite the rally to close out the year, the index still ended down -20.1%, underperforming both international developed and U.S. equity benchmarks.

Returns in the fourth quarter were driven by gains in Chinese equities, which jumped following a rapid pivot away from the Chinese Communist Party's "Zero Covid" policy. While

Chinese shares still dominate the index (around 30%), strong performance from countries with smaller weights also played a large role.

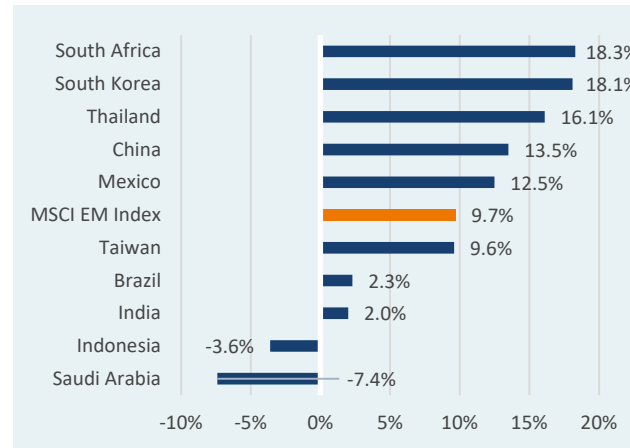
Indian shares, which hold the second largest weight in the index, acted as a drag on returns during the quarter but still ended in positive territory. Despite a modest 2.0% quarterly gain, the Indian market was one of the best performers of 2022, finishing the year down -8.0%. This compared to double-digit losses from other regional indices.

EMERGING MARKET EQUITY



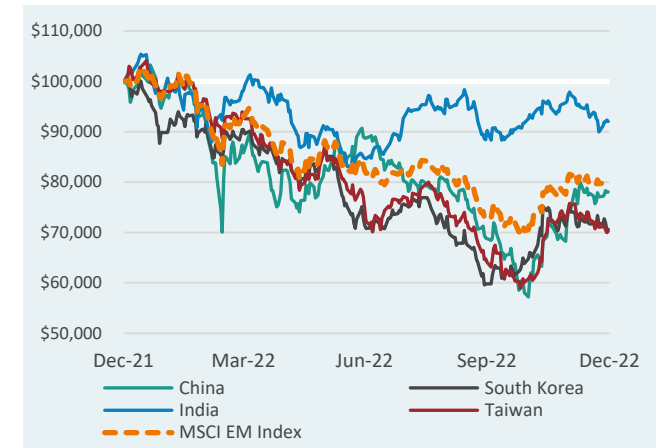
Source: MSCI, as of 12/31/22

Q4 2022 MSCI COUNTRY RETURNS (USD)



Source: Bloomberg, MSCI, as of 12/31/22

GROWTH OF \$100K IN 2022 (EM WEIGHTS >10%)



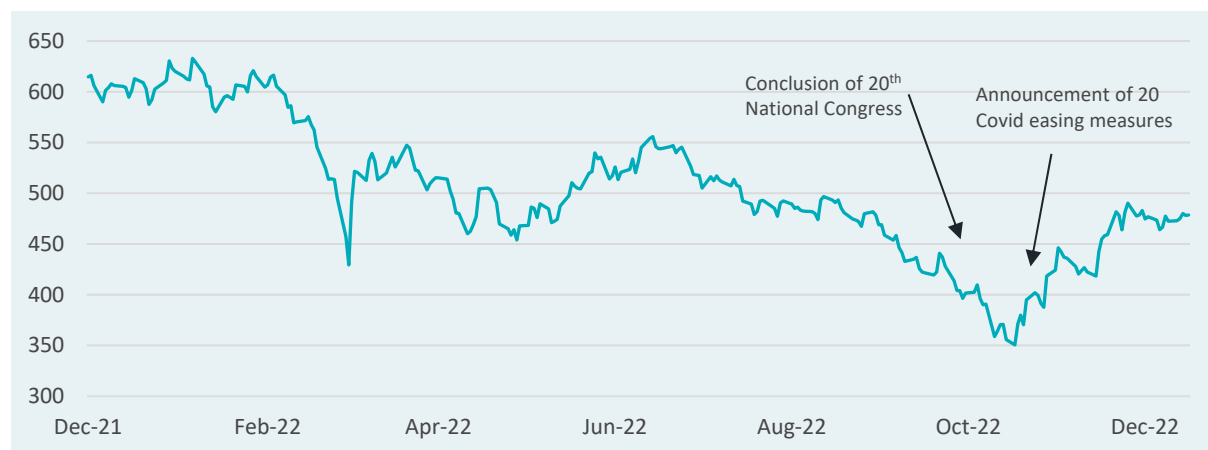
Source: Bloomberg, MSCI, as of 12/31/22 - performance in USD

Recent developments in China

China has continued to make global headlines, though two stories seemed to dominate the narrative. First, the 20th National Congress of the Chinese Communist Party (CCP) resulted in greater concentration of power and an unprecedented third-term for CCP General Secretary Xi Jinping. Second, China communicated a sharp reversal of its “Zero Covid” policy, as the government swiftly reopened major cities from stringent lockdowns, which has contributed to a new wave of COVID-19 cases.

Chinese equity markets dropped sharply following the 20th National Congress, but quickly reversed course following a string of economic reopening announcements. Markets moved even higher during the latter half of the quarter, fueled by the reopening story and prospects for easier monetary and fiscal policy relative to the rest of the world. While the reopening of the world’s largest economy presents a tailwind to economic growth, concerns remain around the timeline of recovery, the net impact of eased supply chains and increased global demand, as well as the new concentration of power within the government.

MSCI CHINA INDEX (USD)



Source: Bloomberg, as of 12/31/22

CHINESE LEADERSHIP SINCE MAO ZEDONG

Leader	Electing Central Committee
Mao Zedong	6th (1928 - 1945)
	7th
	8th
	9th
	10th (1973 - 1977)
Hua Guofeng	11th (1977 - 1982)
Hu Yaobang	11th (1977 - 1982)
	12th (1982 - 1987)
Zhao Ziyang	12th (1982 - 1987)
	13th (1987 - 1992)
Jiang Zemin	13th (1987 - 1992)*
	14th (1992 - 1997)
	15th (1997 - 2002)
Hu Jintao	16th (2002 - 2007)
	17th (2007 - 2012)
Xi Jinping	18th (2012 - 2017)
	19th (2017 - 2022)
	20th (2022 - 2027)

*Replaced Zhao Ziyang mid-term in 1989

First third-term election since Mao Zedong

Equity valuations

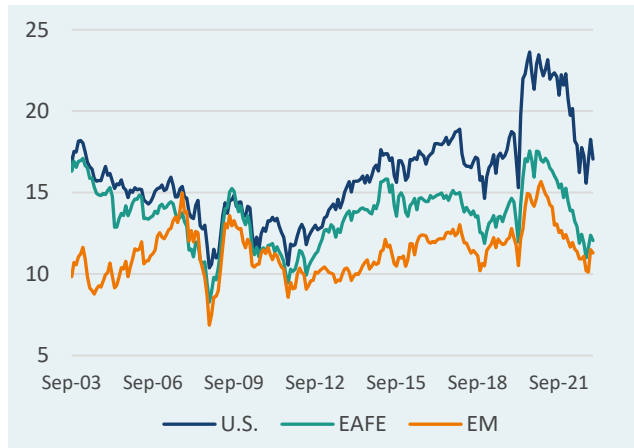
Many markets now trade at valuation levels near their historical average as inflation and rising interest rates have brought prices down. The S&P 500 forward P/E ratio of 17.1 is below the five- and ten-year averages of 18.6 and 20.2, respectively. The Federal Reserve remains in focus for U.S. investors as valuations over the past decade have been lifted by low interest rates. International equity valuations are depressed but may be further challenged by inflation and recession. Emerging market equities appear to be poised for a strong recovery, given a more positive growth outlook, and

as China's reopening could improve fundamentals and bring the asset class back into favor.

International developed equities remain inexpensive relative to U.S. equities, but developed markets face significant long-term headwinds. In Q4, gains in the Euro and Yen and an easing energy crisis boosted international developed equity returns, but high inflation, high debt and low growth in Japan, poor demographics, and a hawkish ECB make for a challenged long-term outlook.

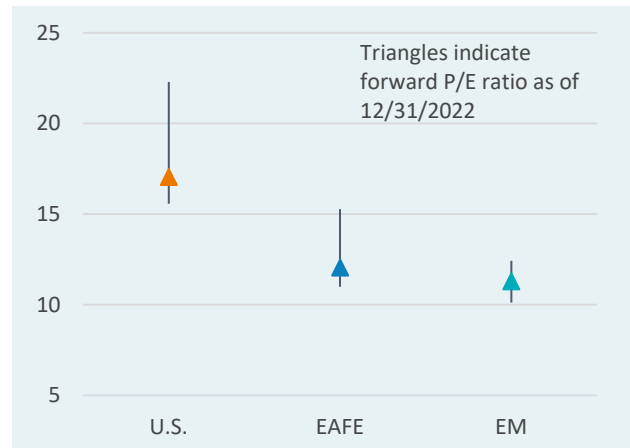
International developed equities remain extremely cheap relative to U.S. markets

FORWARD P/E RATIOS



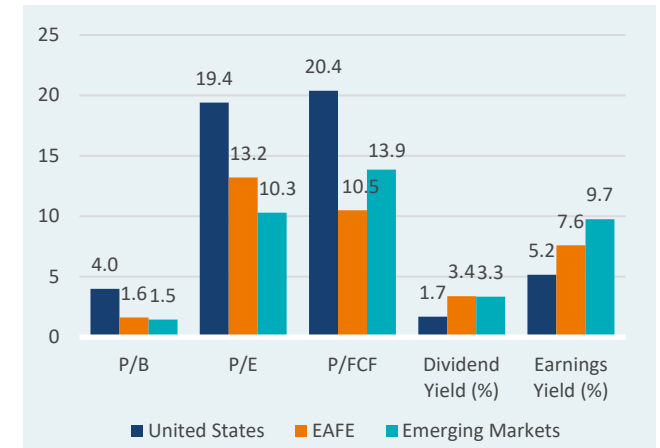
Source: MSCI, 12m forward P/E, as of 12/31/22

FORWARD P/E RATIO RANGES (DURING 2022)



Source: MSCI, 12m forward P/E, as of 12/31/22

VALUATION METRICS (3-MONTH AVERAGE)



Source: Bloomberg, MSCI, as of 12/31/22 - trailing P/E

Equity volatility

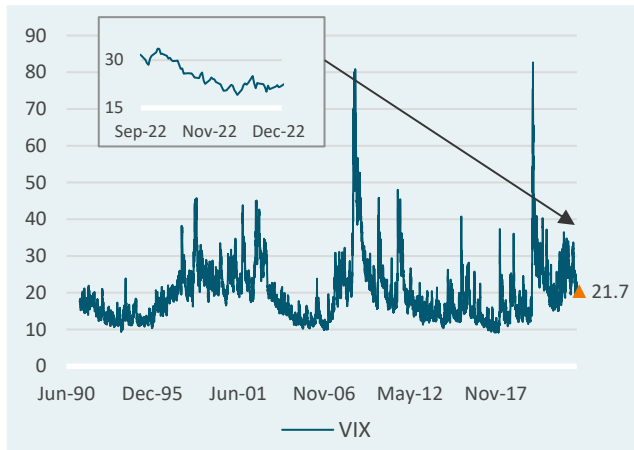
Implied volatility fell significantly over the quarter. The Cboe VIX Index moved from 31.6 to 21.7. Equity markets advanced on cooling inflation, potential for less aggressive central bank action, and perhaps optimism around China’s reopening.

In contrast, realized volatility increased from the prior quarter. Volatility rose across S&P 500, MSCI EAFE, and MSCI EM Indices. Realized volatility in the domestic market remained the highest—a trend consistent with last quarter—as markets swung around inflation prints, two Federal

Reserve interest rate decisions, and growing concerns over a potential 2023 recession.

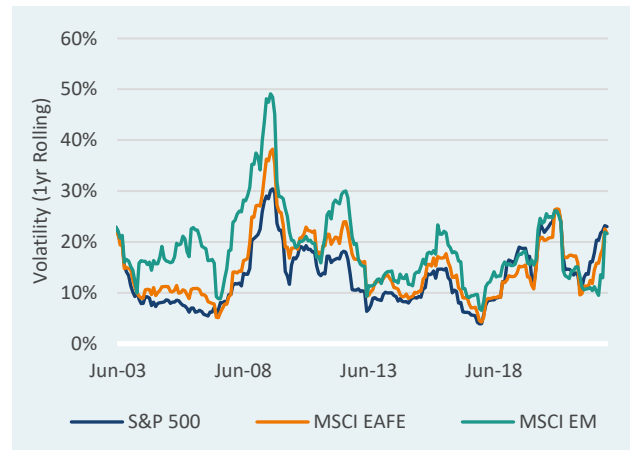
Historically speaking, the S&P 500 delivered exceptionally poor performance in line with some of the worst of the index’s history. Looking all the way back to 1929, this year was the seventh worst in the index’s history and the worst calendar year performance since 2008.

U.S. IMPLIED VOLATILITY (VIX)



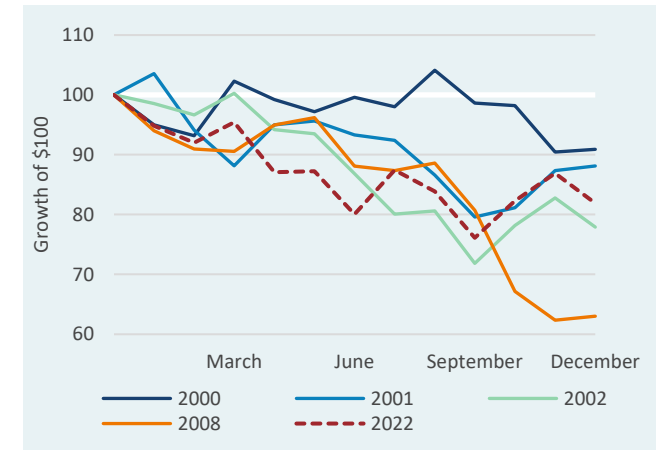
Source: Cboe, as of 12/31/22

REALIZED VOLATILITY



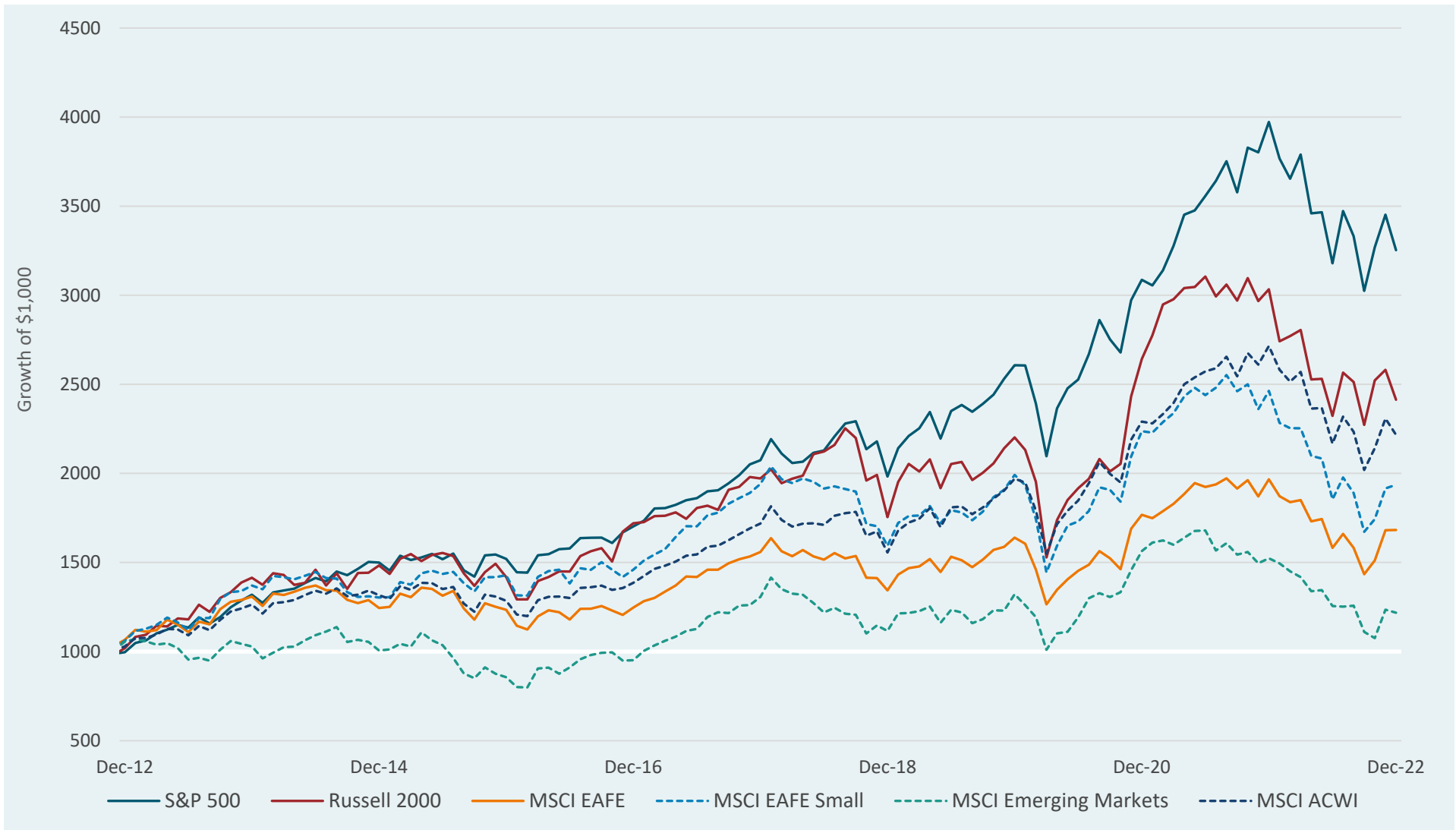
Source: S&P, MSCI, as of 12/31/22

S&P 500 FIVE WORST YEARS SINCE 1988



Source: S&P, Bloomberg, as of 12/31/22 – since 1988

Long-term equity performance



Source: MPI, as of 12/31/22

Other assets

Currency

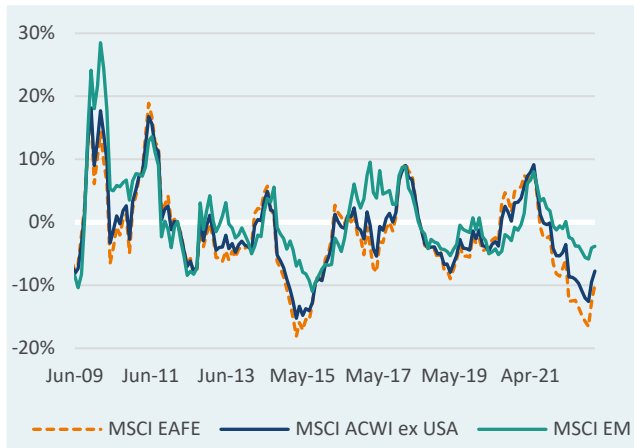
Currency volatility has translated to much higher portfolio volatility for investors with unhedged exposure to foreign currencies. The U.S. dollar depreciated relative to major currencies during the fourth quarter which resulted in large gains for investors with unhedged foreign currency exposure. These currency gains amounted to 7.6% for investors with unhedged exposure to the MSCI EAFE Index (+17.3% MSCI EAFE unhedged, +9.7% MSCI EAFE hedged).

U.S. dollar strength of 2022 was reversed in Q4 as markets began pricing in a shorter Federal Reserve tightening cycle. Expectations for lower rates in the U.S., combined with an ongoing struggle to control high inflation (and therefore tighter financial policies from respective central banks)

within developed economies, likely played a major role in the U.S. dollar sell-off.

Despite currency gains seen this quarter, we believe that a thoughtful currency program may allow an investor to reduce their total 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 (what we refer to as “embedded currency”) that most investors own, which has shown high volatility and frequent losses.

EFFECT OF CURRENCY (1-YEAR ROLLING)



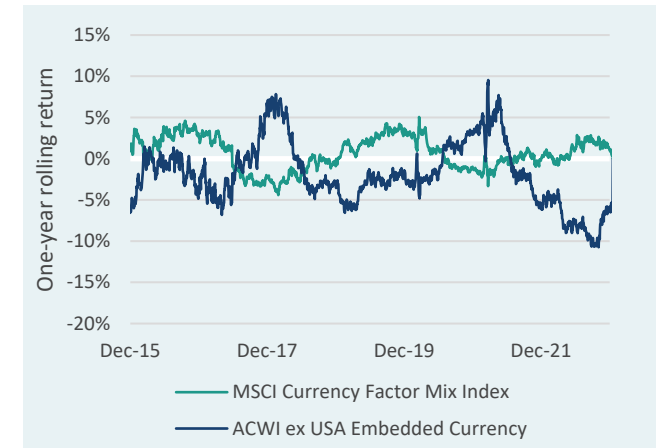
Source: MSCI, as of 12/31/22

BLOOMBERG DOLLAR SPOT INDEX



Source: Bloomberg, as of 12/31/22

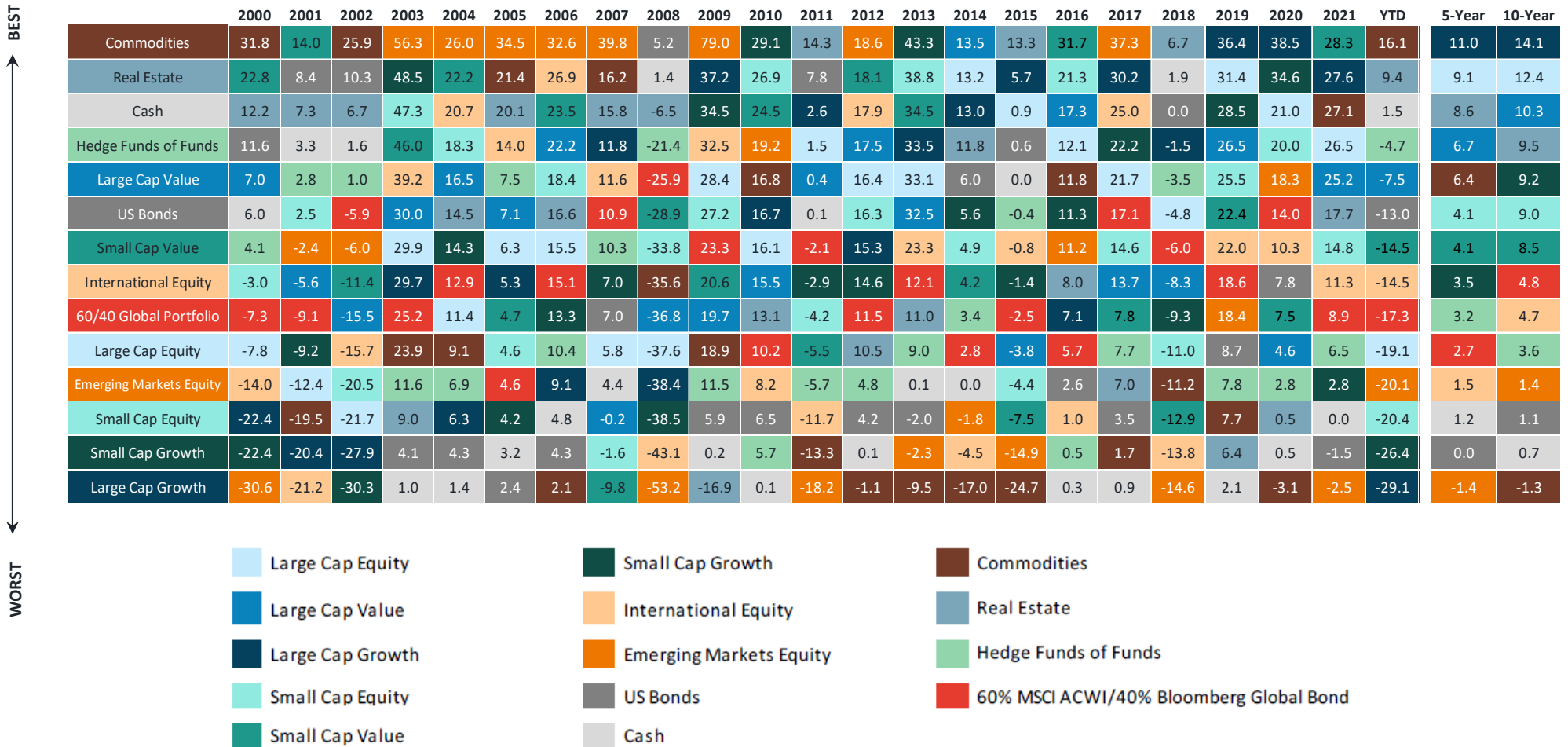
EMBEDDED CURRENCY VS CURRENCY FACTORS



Source: Bloomberg, as of 12/31/22

Appendix

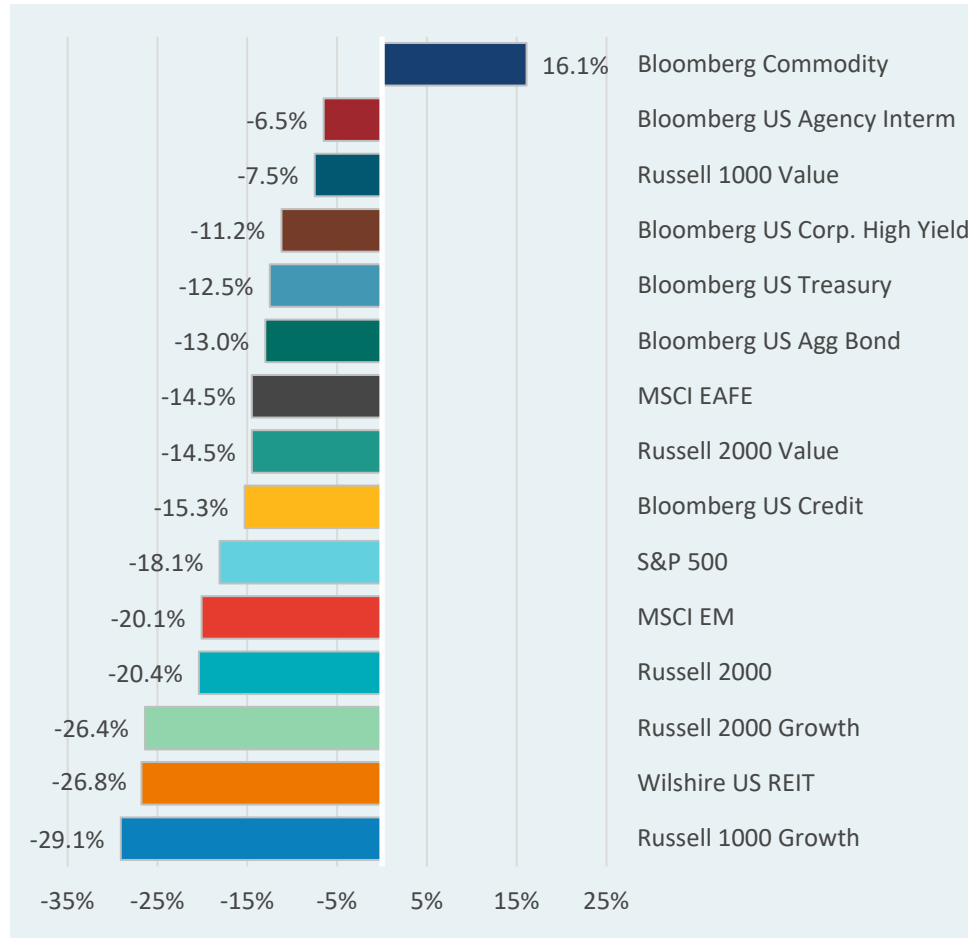
Periodic table of returns



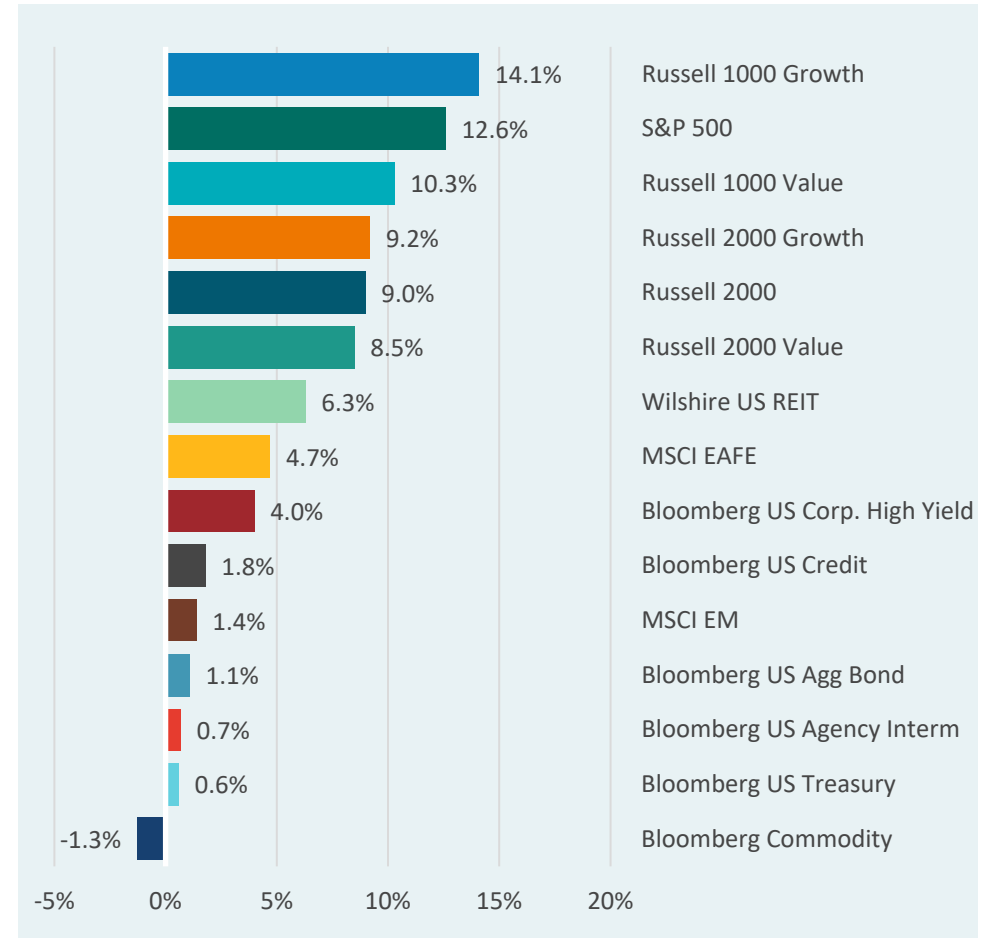
Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Growth, Russell 2000, Russell 2000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, Bloomberg US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, Bloomberg Global Bond as of 12/31/22. NCREIF Property Index performance data as of 9/30/22.

Major asset class returns

ONE YEAR ENDING DECEMBER



TEN YEARS ENDING DECEMBER



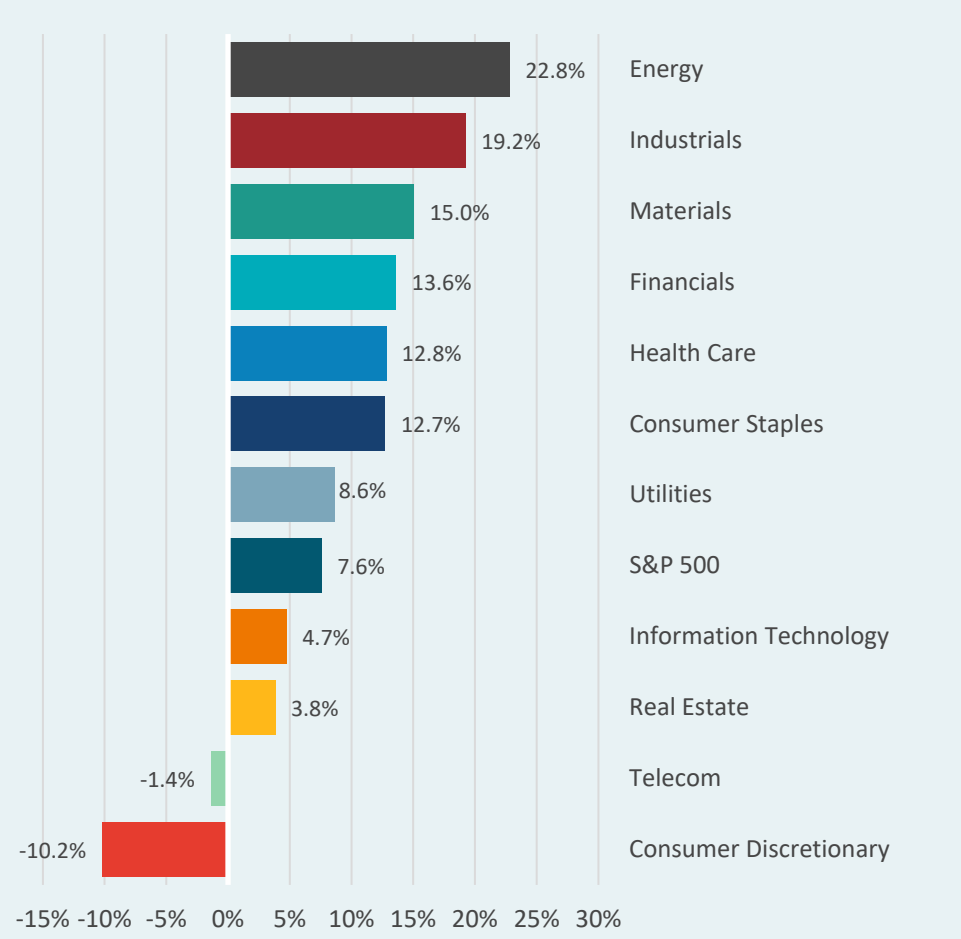
*Only publicly traded asset performance is shown here. Performance of private assets is typically released with a 3- to 6-month delay.

Source: Morningstar, as of 12/31/22

Source: Morningstar, as of 12/31/22

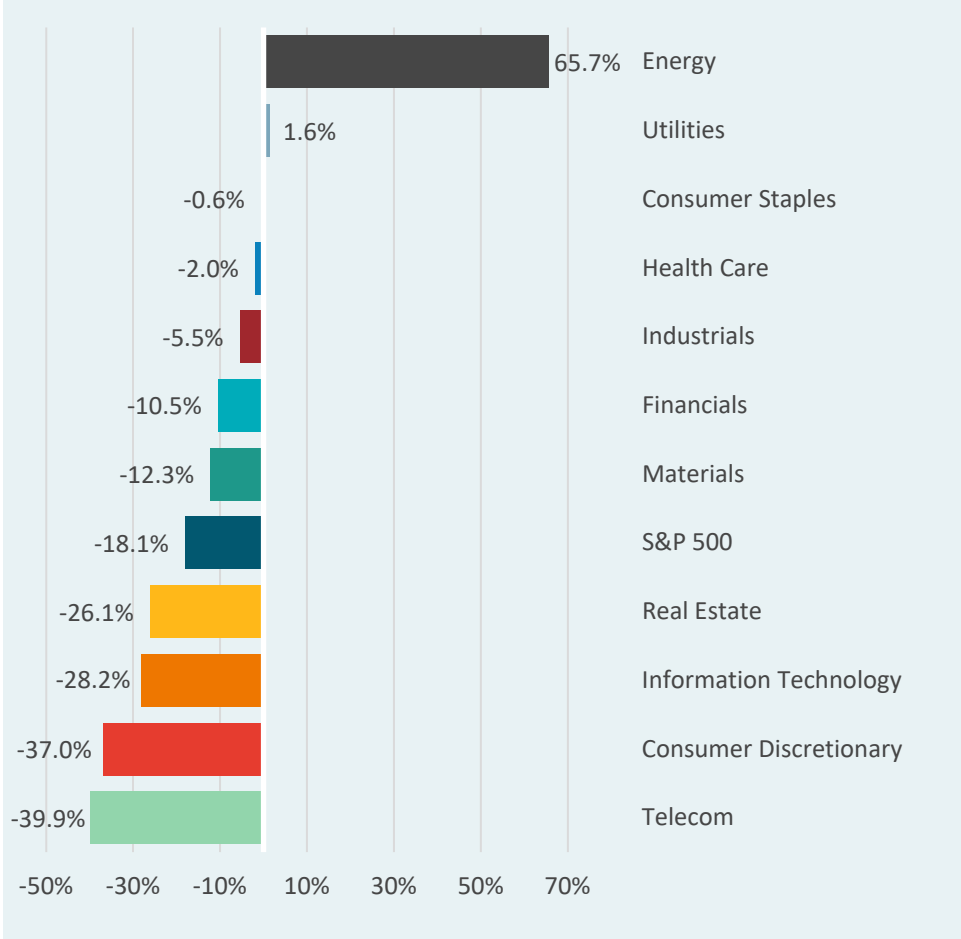
S&P 500 sector returns

QTD



Source: Morningstar, as of 12/31/22

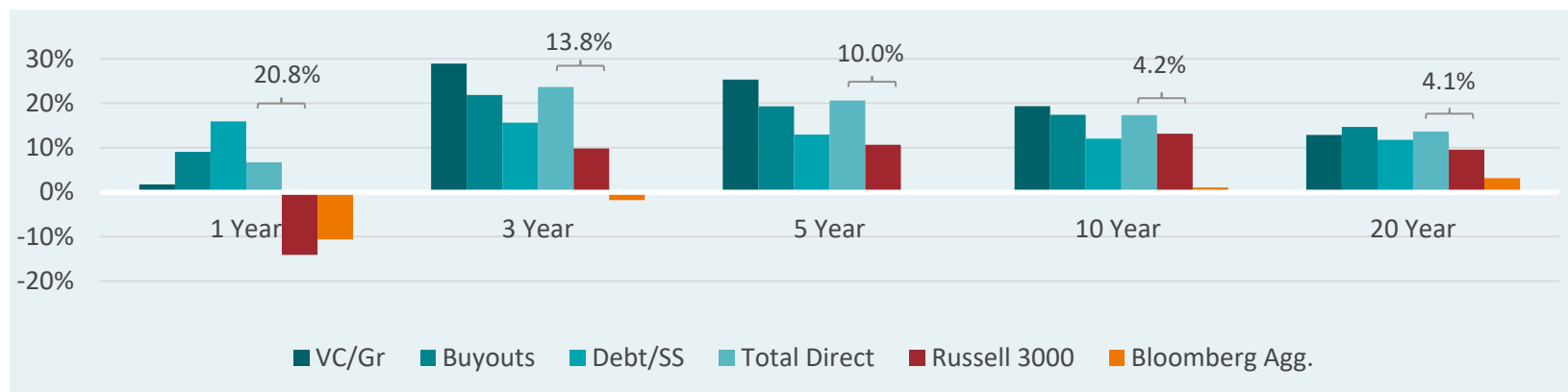
ONE YEAR ENDING DECEMBER



Source: Morningstar, as of 12/31/22

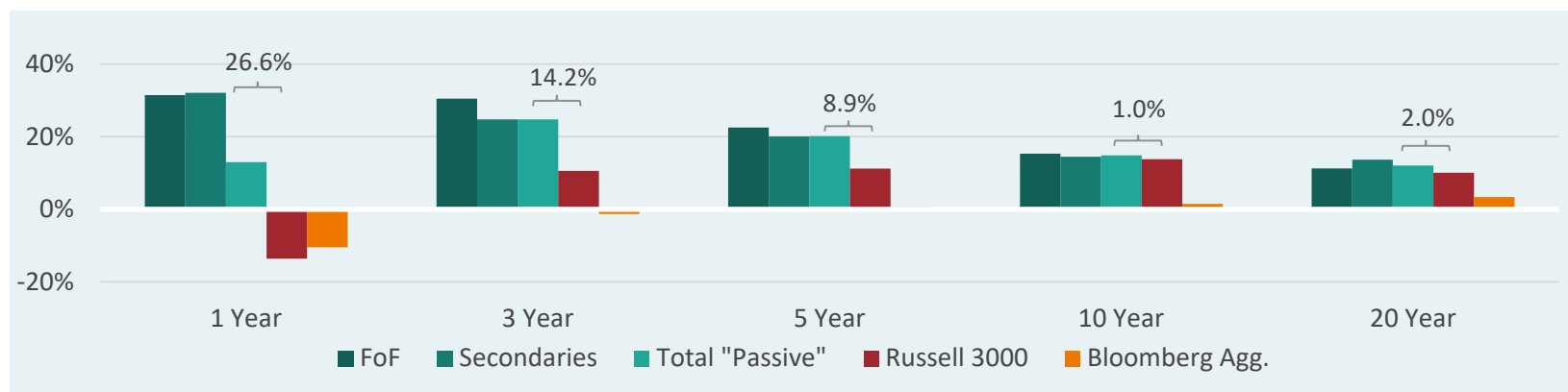
Private equity vs. traditional assets performance

DIRECT PRIVATE EQUITY FUND INVESTMENTS



Direct P.E Fund Investments outperformed over all time periods, though elevated short-term outperformance may be transitory due to appraisal lags

"PASSIVE" STRATEGIES

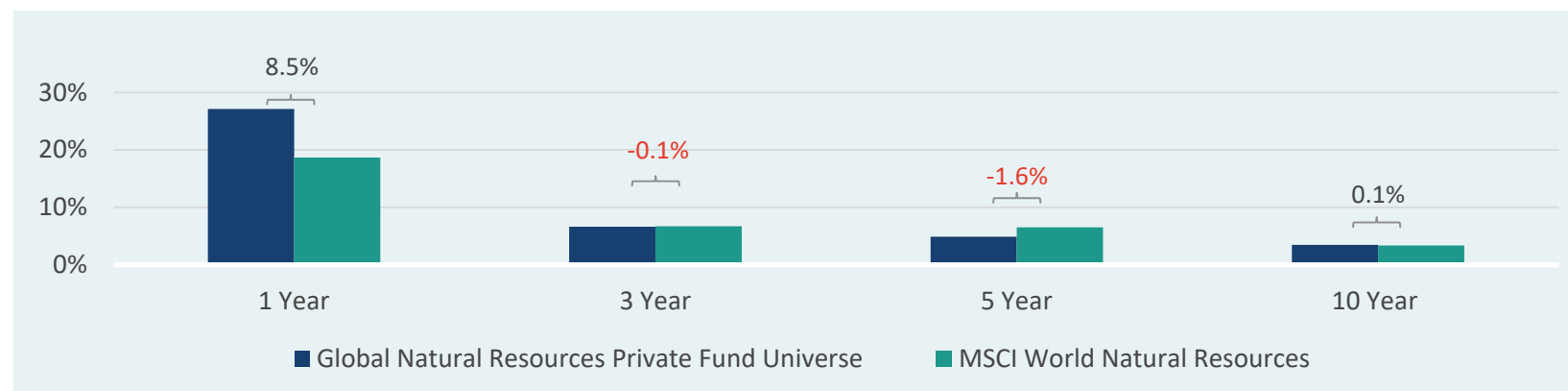


"Passive" strategies outperformed over all periods

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

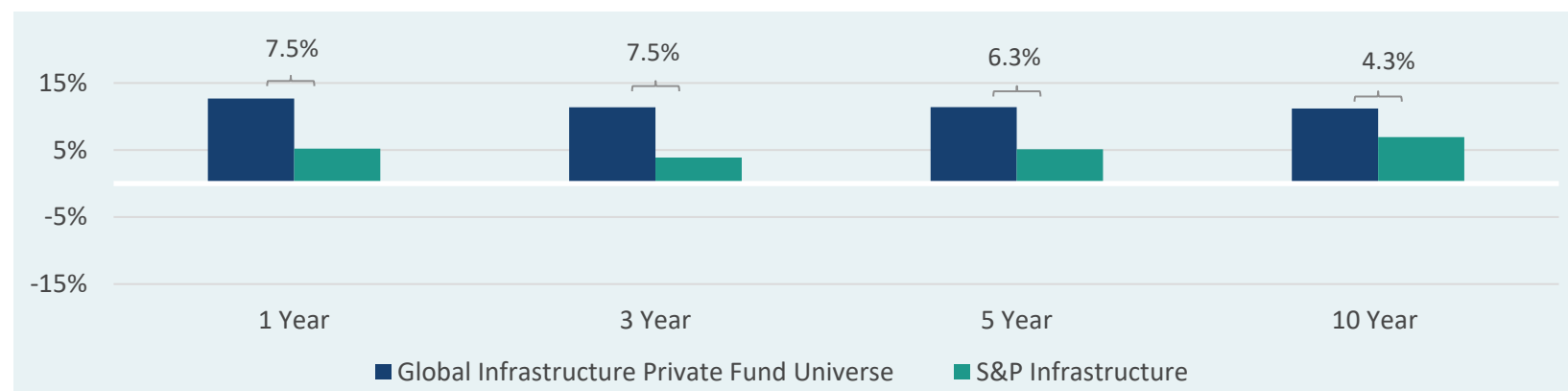
Private vs. liquid real assets performance

GLOBAL NATURAL RESOURCES FUNDS



N.R. funds outperformed the MSCI World Natural Resources benchmark across 1- and 10-year periods

GLOBAL INFRASTRUCTURE FUNDS

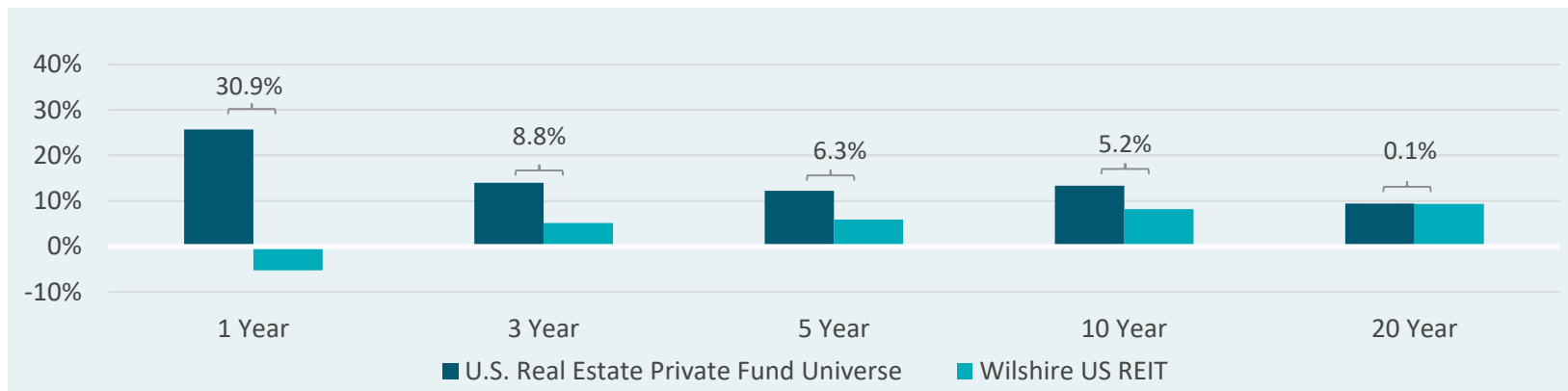


Infra. funds outperformed the S&P Infra. across all periods

Sources: Refinitiv PME: Global Natural Resources (vintage 1999 and later, inception of MSCI World Natural Resources benchmark) and Global Infrastructure (vintage 2002 and later, inception of S&P Infrastructure benchmark) universes as of June 30, 2022. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real assets universes.

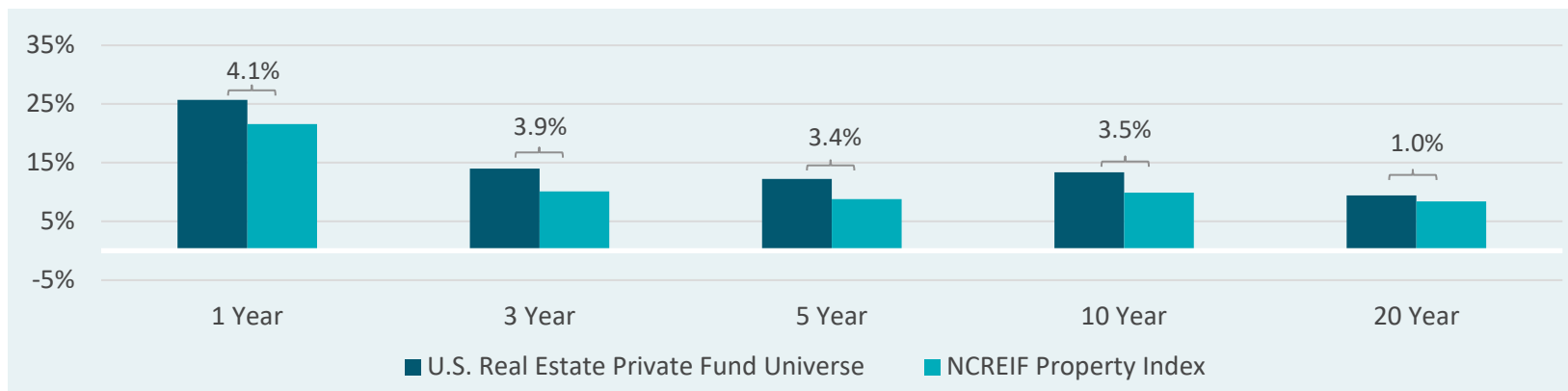
Private vs. liquid and core real estate performance

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, though short-term outperformance may be transitory due to appraisal lags

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



U.S. Private R.E. Funds outperformed across all periods

Sources: Refinitiv PME: U.S. Real Estate universes as of June 30, 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	(5.8)	7.6	(18.1)	(18.1)	7.7	9.4	12.6
S&P 500 Equal Weighted	(4.7)	11.6	(11.4)	(11.4)	9.0	9.1	12.4
DJ Industrial Average	(4.1)	16.0	(6.9)	(6.9)	7.3	8.4	12.3
Russell Top 200	(6.0)	6.6	(19.8)	(19.8)	7.9	9.9	12.9
Russell 1000	(5.8)	7.2	(19.1)	(19.1)	7.3	9.1	12.4
Russell 2000	(6.5)	6.2	(20.4)	(20.4)	3.1	4.1	9.0
Russell 3000	(5.9)	7.2	(19.2)	(19.2)	7.1	8.8	12.1
Russell Mid Cap	(5.4)	9.2	(17.3)	(17.3)	5.9	7.1	11.0
Style Index							
Russell 1000 Growth	(7.7)	2.2	(29.1)	(29.1)	7.8	11.0	14.1
Russell 1000 Value	(4.0)	12.4	(7.5)	(7.5)	6.0	6.7	10.3
Russell 2000 Growth	(6.4)	4.1	(26.4)	(26.4)	0.6	3.5	9.2
Russell 2000 Value	(6.6)	8.4	(14.5)	(14.5)	4.7	4.1	8.5

INTERNATIONAL EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
MSCI ACWI	(3.9)	9.8	(18.4)	(18.4)	4.0	5.2	8.0
MSCI ACWI ex US	(0.7)	14.3	(16.0)	(16.0)	0.1	0.9	3.8
MSCI EAFE	0.1	17.3	(14.5)	(14.5)	0.9	1.5	4.7
MSCI EM	(1.4)	9.7	(20.1)	(20.1)	(2.7)	(1.4)	1.4
MSCI EAFE Small Cap	1.1	15.8	(21.4)	(21.4)	(0.9)	(0.0)	6.2
Style Index							
MSCI EAFE Growth	(1.1)	15.0	(22.9)	(22.9)	0.5	2.5	5.6
MSCI EAFE Value	1.3	19.6	(5.6)	(5.6)	0.6	0.2	3.5
Regional Index							
MSCI UK	(0.4)	17.0	(4.8)	(4.8)	0.3	1.0	3.1
MSCI Japan	0.3	13.2	(16.6)	(16.6)	(1.0)	0.2	5.6
MSCI Euro	(0.5)	23.0	(17.2)	(17.2)	0.5	0.8	4.3
MSCI EM Asia	(0.8)	10.8	(21.1)	(21.1)	(1.3)	(0.6)	3.6
MSCI EM Latin American	(4.0)	5.7	8.9	8.9	(4.8)	(1.1)	(2.1)

FIXED INCOME

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
Bloomberg US TIPS	(1.0)	2.0	(11.8)	(11.8)	1.2	2.1	1.1
Bloomberg US Treasury Bills	0.4	0.9	1.3	1.3	0.7	1.2	0.8
Bloomberg US Agg Bond	(0.5)	1.9	(13.0)	(13.0)	(2.7)	0.0	1.1
Bloomberg US Universal	(0.3)	2.2	(13.0)	(13.0)	(2.5)	0.2	1.3
Duration							
Bloomberg US Treasury 1-3 Yr	0.2	0.7	(3.8)	(3.8)	(0.5)	0.7	0.7
Bloomberg US Treasury Long	(1.7)	(0.6)	(29.3)	(29.3)	(7.4)	(2.2)	0.6
Bloomberg US Treasury	(0.5)	0.7	(12.5)	(12.5)	(2.6)	(0.1)	0.6
Issuer							
Bloomberg US MBS	(0.4)	2.1	(11.8)	(11.8)	(3.2)	(0.5)	0.7
Bloomberg US Corp. High Yield	(0.6)	4.2	(11.2)	(11.2)	0.0	2.3	4.0
Bloomberg US Agency Interm	0.0	0.8	(6.5)	(6.5)	(1.3)	0.4	0.7
Bloomberg US Credit	(0.4)	3.4	(15.3)	(15.3)	(2.9)	0.4	1.8

OTHER

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Index							
Bloomberg Commodity	(2.4)	2.2	16.1	16.1	12.7	6.4	(1.3)
Wilshire US REIT	(5.6)	4.0	(26.8)	(26.8)	(0.5)	3.4	6.3
CS Leveraged Loans	0.4	2.3	(1.1)	(1.1)	2.3	3.2	3.8
S&P Global Infrastructure	(2.2)	11.0	(0.2)	(0.2)	1.7	3.9	6.5
Alerian MLP	(4.7)	10.5	31.4	31.4	8.3	3.6	2.1
Regional Index							
JPM EMBI Global Div	0.3	8.1	(17.8)	(17.8)	(5.3)	(1.3)	1.6
JPM GBI-EM Global Div	2.2	8.5	(11.7)	(11.7)	(6.1)	(2.5)	(2.0)
Hedge Funds							
HFRI Composite	(0.4)	2.2	(4.3)	(4.3)	5.7	4.4	4.7
HFRI FOF Composite	0.9	2.4	(4.7)	(4.7)	3.9	3.2	3.6
Currency (Spot)							
Euro	3.7	8.9	(6.2)	(6.2)	(1.7)	(2.3)	(2.1)
Pound Sterling	1.0	7.8	(11.2)	(11.2)	(3.2)	(2.3)	(3.0)
Yen	5.8	9.7	(12.7)	(12.7)	(6.3)	(3.1)	(4.1)

Source: Morningstar, HFRI, as of 12/31/22.

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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Imperial County Employees' Retirement System

Investment Performance Review
Period Ending: December 31, 2022



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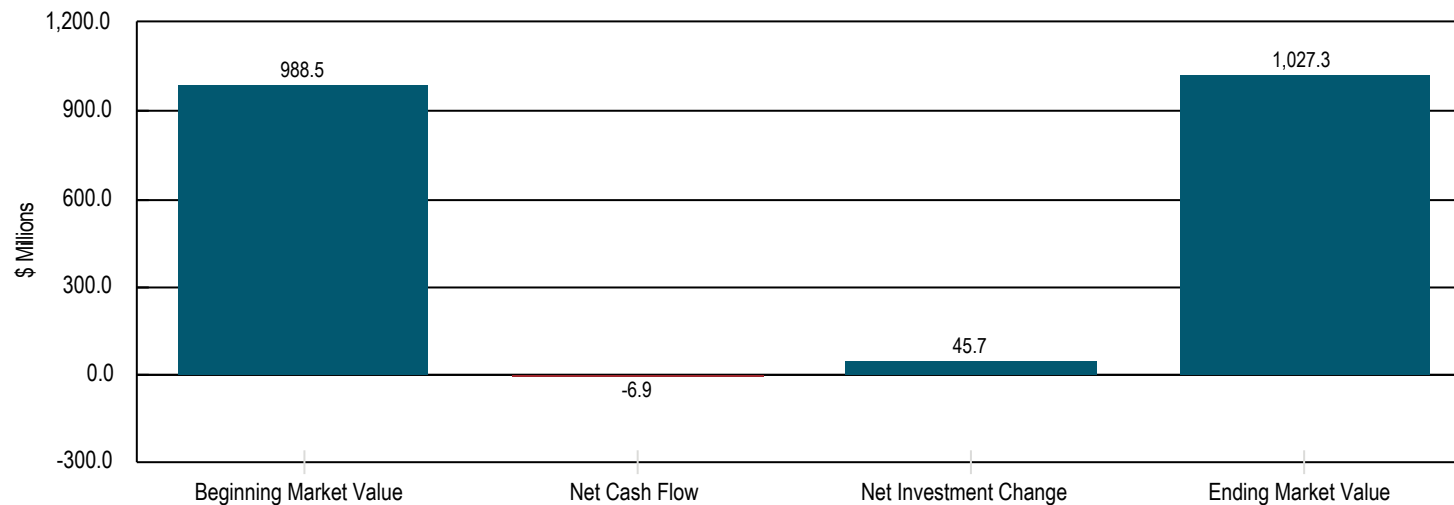
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SAN FRANCISCO 415.362.3484

Portfolio Reconciliation

	Last Three Months	Fiscal Year-To-Date	One Year
Beginning Market Value	\$988,479,522	\$1,031,485,668	\$1,172,501,869
Net Cash Flows	-\$6,907,911	-\$4,529,670	-\$11,379,687
Net Investment Change	\$45,680,107	\$295,720	-\$133,870,464
Ending Market Value	\$1,027,251,718	\$1,027,251,718	\$1,027,251,718

Change in Market Value
Last Three Months



Contributions and withdrawals may include intra-account transfers between managers/funds. Fee transactions are excluded from Portfolio Reconciliation.

Total Fund
Executive Summary (Net of Fees)

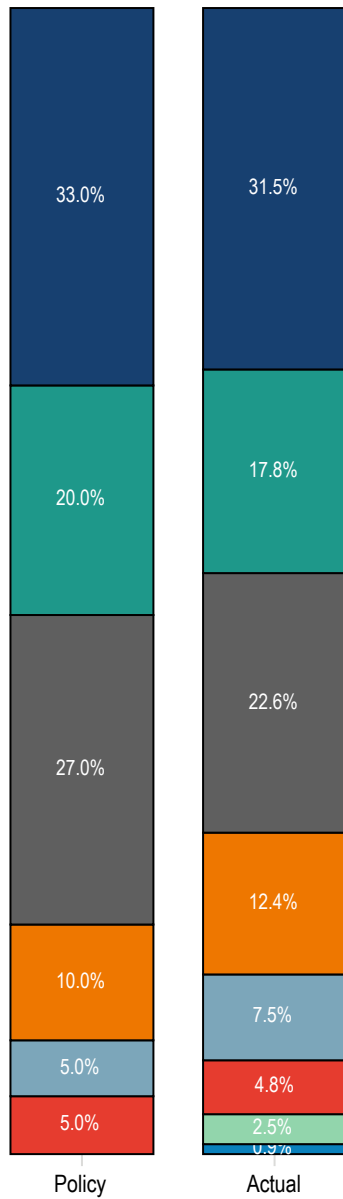
Imperial County Employees' Retirement System
Period Ending: December 31, 2022

	Market Value	% of Portfolio	QTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
Total Fund	1,027,251,718	100.0	4.6	0.0	-11.8	4.7	5.3	6.8
<i>Policy Index</i>			5.5	0.4	-12.4	4.3	5.4	6.9
<i>InvMetrics Public DB Rank</i>			87	95	20	18	33	57
Total Domestic Equity	323,242,289	31.5	7.2	2.4	-19.2	7.1	8.8	11.9
<i>Russell 3000 Index</i>			7.2	2.4	-19.2	7.1	8.8	12.1
Total International Equity	182,641,510	17.8	15.7	4.6	-15.4	0.2	0.8	3.7
<i>MSCI AC World ex USA Index</i>			14.4	3.2	-15.6	0.5	1.4	4.3
Total Fixed Income	232,616,435	22.6	1.7	-3.3	-14.2	-1.8	0.6	1.5
<i>Blmbg. U.S. Aggregate Index</i>			1.9	-3.0	-13.0	-2.7	0.0	1.1
Total Real Estate	126,978,849	12.4	-2.4	-1.1	10.3	10.0	8.7	9.4
<i>NCREIF Property Index</i>			-3.5	-3.0	5.5	8.1	7.5	8.8
Total Private Equity	76,960,161	7.5	-0.9	-4.3	-0.8	24.3	21.4	18.8
<i>Private Equity Benchmark</i>			-0.9	-4.3	-0.8	24.3	21.4	20.1
Total Private Credit	49,807,842	4.8	1.0	0.8	4.9	8.5	8.3	N/A
<i>Private Credit Benchmark</i>			1.0	0.8	4.9	9.5	8.9	N/A
Total Opportunistic	25,498,535	2.5	-6.7	-13.5	0.4	6.3	7.2	8.8
<i>Assumption Rate + 1%</i>			2.1	4.2	8.5	8.5	8.5	N/A

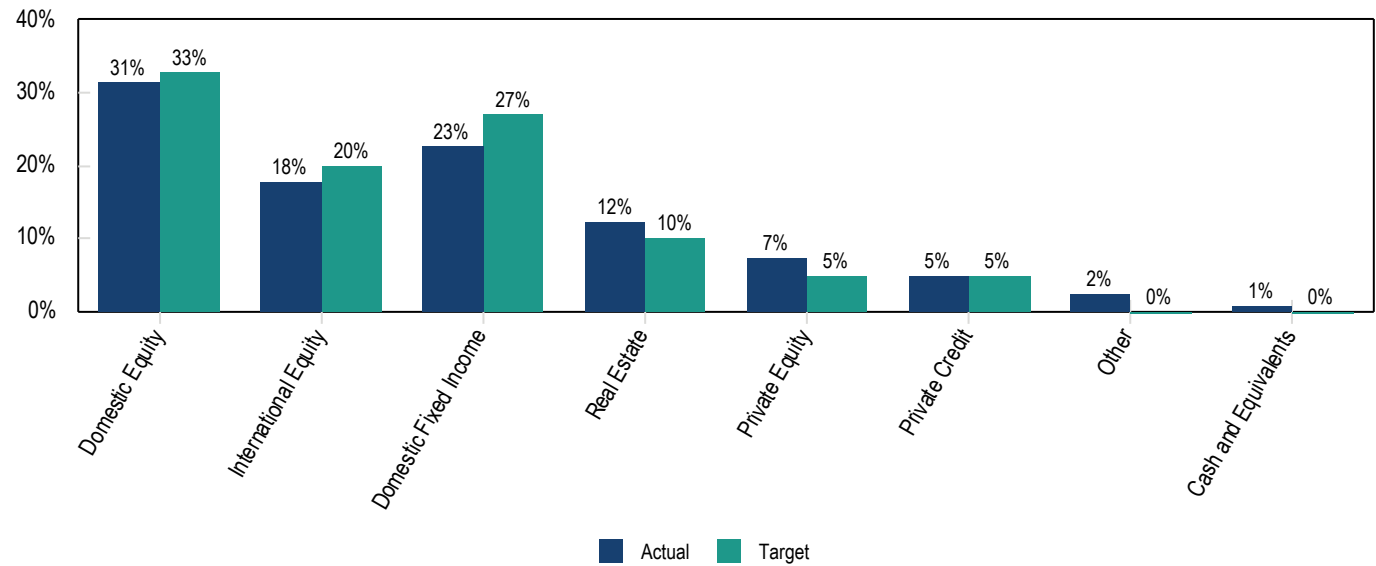
New Policy Index (as of 8/1/2020): 33% Russell 3000, 20% MSCI ACWI ex USA Gross, 27% Bloomberg Aggregate, 10% NCREIF Property, 2% Bloomberg Aggregate, 5% Private Equity Benchmark, 3% Private Credit Benchmark. Prior quarter Private Equity returns, and index data are used. All returns are Net of fees. 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. As of 10/1/20 the SAA Target for equity changed to 33% Russell 3000 + 20% ACWI ex-US (see Exhibit B attached).

Total Fund
Asset Allocation vs. Policy

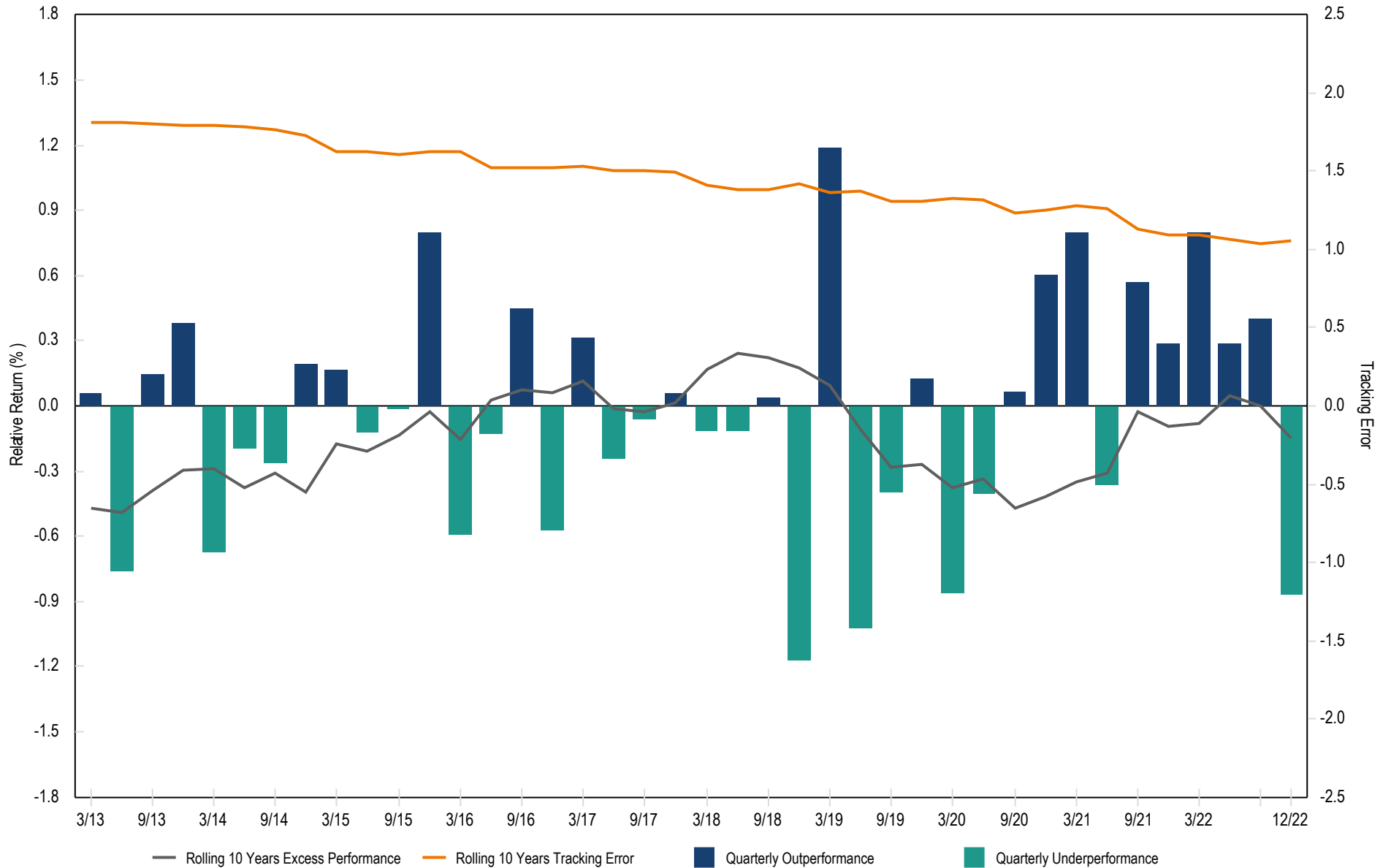
Imperial County Employees' Retirement System
Period Ending: December 31, 2022



	Current Balance (\$)	Current Allocation (%)	Policy Allocation (%)	Excess Allocation (%)	Policy Range (%)	Within IPS Range?
Domestic Equity	323,242,289	31.5	33.0	-1.5	23.0 - 43.0	Yes
International Equity	182,641,510	17.8	20.0	-2.2	10.0 - 30.0	Yes
Domestic Fixed Income	232,616,435	22.6	27.0	-4.4	17.0 - 40.0	Yes
Real Estate	126,978,849	12.4	10.0	2.4	5.0 - 15.0	Yes
Private Equity	76,960,161	7.5	5.0	2.5	0.0 - 10.0	Yes
Private Credit	49,807,842	4.8	5.0	-0.2	0.0 - 10.0	Yes
Other	25,498,535	2.5	0.0	2.5	0.0 - 10.0	Yes
Cash and Equivalents	9,506,096	0.9	0.0	0.9	0.0 - 0.0	No
Total	1,027,251,718	100.0	100.0	0.0		



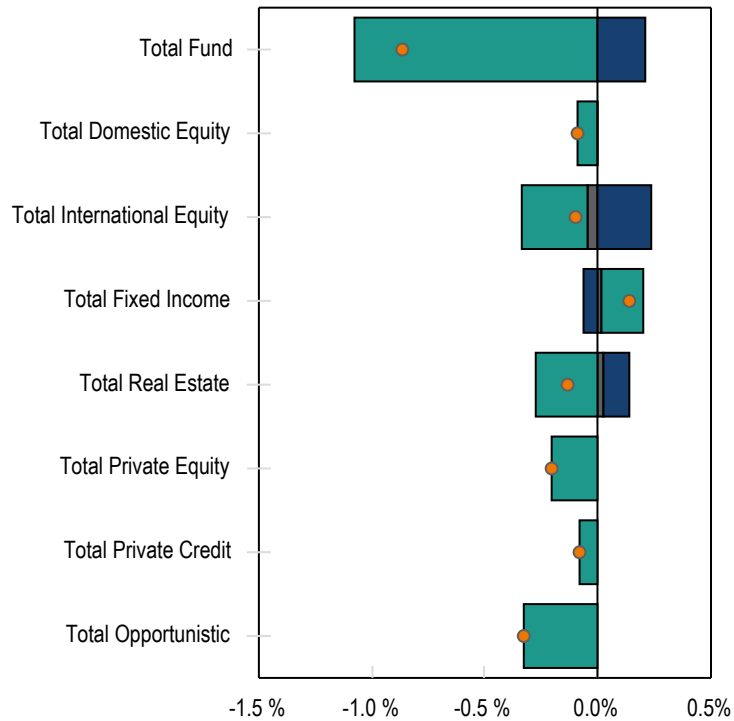
Rolling Annualized Excess Performance and Tracking Error



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

Imperial County Employees' Retirement System
 Period Ending: December 31, 2022

Attribution Effects
 Last Three Months



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

Performance Attribution

	Quarter	YTD
Wtd. Actual Return	4.6	-11.8
Wtd. Index Return	5.5	-12.4
Excess Return	-0.9	0.7
Selection Effect	0.3	0.4
Allocation Effect	-1.1	0.1
Interaction Effect	0.0	0.1

Attribution Summary
 Last Three Months

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Total Domestic Equity	7.2	7.2	0.0	0.0	-0.1	0.0	-0.1
Total International Equity	15.7	14.4	1.3	0.2	-0.3	0.0	-0.1
Total Fixed Income	1.7	1.9	-0.2	0.0	0.2	0.0	0.1
Total Real Estate	-2.4	-3.5	1.1	0.1	-0.3	0.0	-0.1
Total Private Equity	-0.9	-0.9	0.0	0.0	-0.2	0.0	-0.2
Total Private Credit	1.0	1.0	0.0	0.0	-0.1	0.0	-0.1
Total Opportunistic	-6.7	2.1	-8.8	0.0	-0.3	0.0	-0.3
Total Fund	4.6	5.5	-0.9	0.3	-1.1	0.0	-0.9

Weighted returns shown in attribution analysis may differ from actual returns.

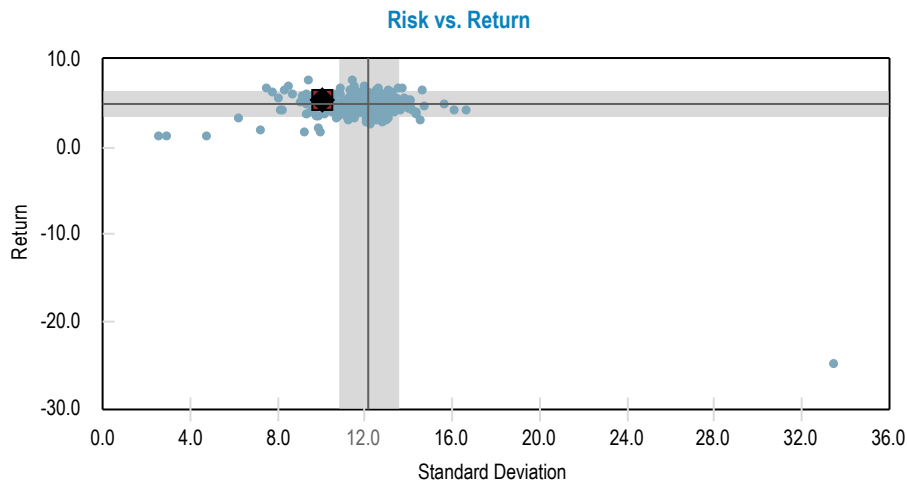
Total Fund

Risk Analysis - 5 Years (Net of Fees)

Imperial County Employees' Retirement System

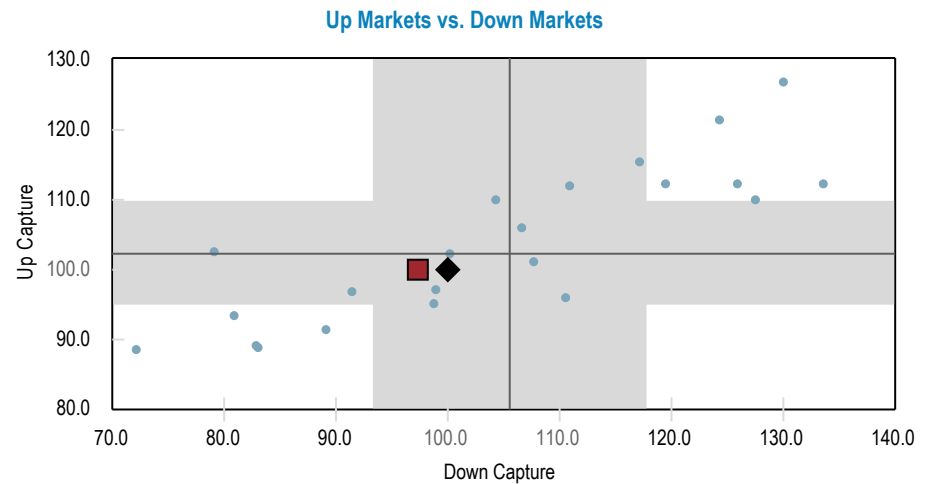
Period Ending: December 31, 2022

	Annualized Return	Annualized Excess Return	Annualized Standard Deviation	Annualized Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Information Ratio	Up Capture	Down Capture
Total Fund	5.35	4.48	10.07	-0.04	1.00	1.15	0.99	0.44	-0.05	100.59	101.39



● InvMetrics Public DB ■ Total Fund

	Return	Standard Deviation
■ Total Fund	5.35	10.07
◆ Policy Index	5.41	10.03
— Median	4.96	12.19
Population	340	340



● InveMetrics Public DB ■ Total Fund

	Up Capture	Down Capture
■ Total Fund	100.10	97.28
◆ Policy Index	100.00	100.00
— Median	102.39	105.48
Population	22	22

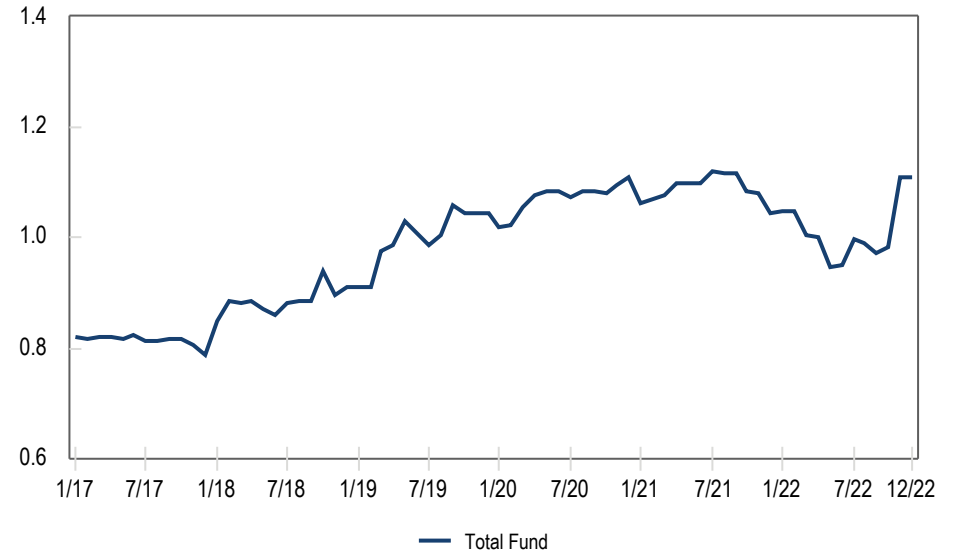
Total Fund
Rolling Risk Statistics

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

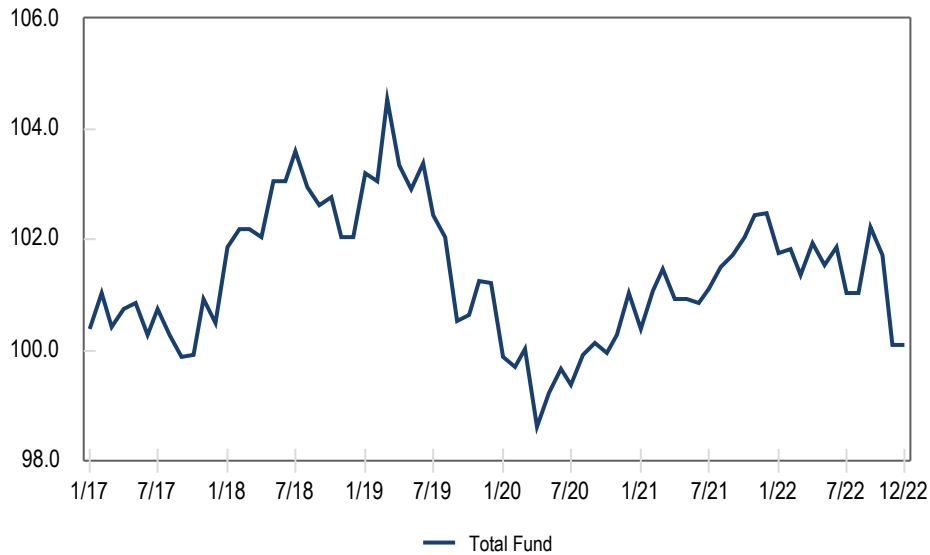
Rolling Information Ratio



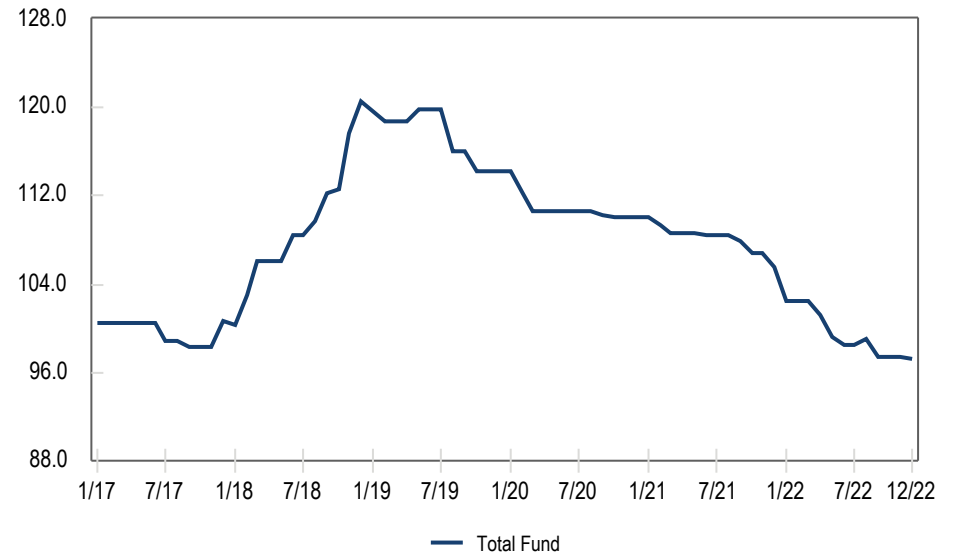
Rolling Tracking Error



Rolling Up Market Capture Ratio (%)



Rolling Down Market Capture Ratio (%)



Total Fund
Executive Summary (Net of Fees)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Total Fund	1,027,251,718	100.0	4.6	0.0	-11.8	4.7	5.3	6.8	-11.8	15.8	12.3	17.9	-4.1	8.5	Apr-89
<i>Policy Index</i>			5.5	0.4	-12.4	4.3	5.4	6.9	-12.4	14.4	13.2	18.0	-2.7	-	
<i>InvMetrics Public DB Rank</i>			87	95	20	18	33	57	20	21	63	75	40	24	
Total Domestic Equity	323,242,289	31.5	7.2	2.4	-19.2	7.1	8.8	11.9	-19.2	25.7	21.0	31.1	-5.2		
<i>Russell 3000 Index</i>			7.2	2.4	-19.2	7.1	8.8	12.1	-19.2	25.7	20.9	31.0	-5.2		
BlackRock Russell 3000	323,242,289	31.5	7.2	2.4	-19.2	7.1	8.8	-	-19.2	25.7	21.0	31.1	-5.2	10.7	Dec-15
<i>Russell 3000 Index</i>			7.2	2.4	-19.2	7.1	8.8	-	-19.2	25.7	20.9	31.0	-5.2	10.6	
<i>eV US All Cap Core Equity Rank</i>			67	64	58	45	38	-	58	54	43	39	46	20	
Total International Equity	182,641,510	17.8	15.7	4.6	-15.4	0.2	0.8	3.7	-15.4	10.1	8.1	20.7	-14.3		
<i>MSCI AC World ex USA Index</i>			14.4	3.2	-15.6	0.5	1.4	4.3	-15.6	8.3	11.1	22.1	-13.8		
BlackRock International Equity	140,312,070	13.7	17.3	6.4	-14.1	1.2	1.9	5.0	-14.1	11.6	8.1	22.4	-13.5	6.4	Jul-03
<i>MSCI EAFE (Net)</i>			17.3	6.4	-14.5	0.9	1.5	4.7	-14.5	11.3	7.8	22.0	-13.8	6.0	
<i>eV All EAFE Equity Rank</i>			37	23	36	45	36	48	36	52	52	49	29	61	
DFA Emerging Markets Value	23,644,040	2.3	10.3	-0.5	-10.7	1.0	-0.1	1.8	-10.7	12.4	2.7	9.6	-11.9	3.2	Jan-07
<i>MSCI Emerging Markets Value (Net)</i>			9.8	-2.3	-15.8	-2.6	-1.6	0.1	-15.8	4.0	5.5	12.0	-10.7	2.6	
<i>eV Emg Mkts All Cap Value Equity Rank</i>			87	78	36	41	64	88	36	20	82	91	33	83	
Harding Loevner Emerging Markets	18,685,400	1.8	10.7	-1.5	-28.1	-8.2	-5.0	-	-28.1	-4.3	12.4	24.0	-19.5	0.2	Aug-16
<i>MSCI Emerging Markets Growth Index</i>			9.7	-3.5	-23.7	-2.7	-1.1	-	-23.7	-8.2	31.6	25.4	-18.0	4.9	
<i>eV Emg Mkts All Cap Growth Equity Rank</i>			27	50	73	99	98	-	73	51	96	54	69	98	
Total Fixed Income	232,616,435	22.6	1.7	-3.3	-14.2	-1.8	0.6	1.5	-14.2	0.6	9.8	9.5	-0.8		
<i>Blmbg. U.S. Aggregate Index</i>			1.9	-3.0	-13.0	-2.7	0.0	1.1	-13.0	-1.5	7.5	8.7	0.0		
Ducenta Squared	96,256,431	9.4	0.9	-3.6	-14.9	-2.6	0.3	1.7	-14.9	-0.6	9.1	9.9	-0.1	5.2	Mar-93
<i>Blmbg. U.S. Aggregate Index</i>			1.9	-3.0	-13.0	-2.7	0.0	1.1	-13.0	-1.5	7.5	8.7	0.0	4.4	
<i>eV US Core Plus Fixed Inc Rank</i>			100	96	93	85	70	44	93	53	39	44	26	26	
MacKay Shields Core Plus Opportunities	95,612,474	9.3	2.4	-2.9	-14.5	-2.2	0.3	-	-14.5	-0.5	9.9	9.7	-1.0	0.9	Mar-15
<i>Blmbg. U.S. Aggregate Index</i>			1.9	-3.0	-13.0	-2.7	0.0	-	-13.0	-1.5	7.5	8.7	0.0	0.7	
<i>eV US Core Plus Fixed Inc Rank</i>			26	72	89	56	66	-	89	51	22	53	75	79	
BlackRock US TIPS	40,747,531	4.0	1.9	-3.3	-11.9	1.2	2.1	1.1	-11.9	5.9	11.2	8.5	-1.2	3.5	Apr-07
<i>Blmbg. U.S. TIPS</i>			2.0	-3.2	-11.8	1.2	2.1	1.1	-11.8	6.0	11.0	8.4	-1.3	3.5	
<i>eV US TIPS / Inflation Fixed Inc Rank</i>			69	73	66	53	49	29	66	28	32	32	41	33	

Tortoise is now Ducenta Squared. TSSP Adjacent funded 4/16/2020. Portfolio Advisors, Crescent Direct Lending, Lone Star, and Ascribe Opportunities Fund market value as of 9/30/2022. PIMCO BRAVO liquidated 12/30/2022.

Total Fund
Executive Summary (Net of Fees)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Total Real Estate	126,978,849	12.4	-2.4	-1.1	10.3	10.0	8.7	9.4	10.3	18.4	2.1	5.7	7.5		
NCREIF Property Index			-3.5	-3.0	5.5	8.1	7.5	8.8	5.5	17.7	1.6	6.4	6.7		
NCREIF ODCE Net			-5.1	-4.8	6.6	9.0	7.7	9.1	6.6	21.0	0.3	4.4	7.4		
ASB Real Estate	31,152,268	3.0	-4.0	-1.9	10.7	8.7	7.1	8.4	10.7	14.2	1.5	3.0	6.6	8.4	Jan-13
NCREIF Property Index			-3.5	-3.0	5.5	8.1	7.5	8.8	5.5	17.7	1.6	6.4	6.7	8.8	
NCREIF ODCE Net			-5.1	-4.8	6.6	9.0	7.7	9.1	6.6	21.0	0.3	4.4	7.4	9.1	
Clarion Lion	34,307,174	3.3	-5.2	-4.6	9.6	11.5	9.9	10.5	9.6	23.6	2.3	6.8	8.6	6.1	Jan-07
NCREIF Property Index			-3.5	-3.0	5.5	8.1	7.5	8.8	5.5	17.7	1.6	6.4	6.7	7.1	
NCREIF ODCE Net			-5.1	-4.8	6.6	9.0	7.7	9.1	6.6	21.0	0.3	4.4	7.4	5.8	
ARA American Strategic Value Realty	59,546,000	5.8	0.0	1.5	10.7	10.4	-	-	10.7	18.6	2.4	7.8	-	9.5	Jan-18
NCREIF Property Index +2%			-3.0	-2.0	7.6	10.2	9.6	-	7.6	20.0	3.6	8.5	8.9	9.6	
NCREIF ODCE Net			-5.1	-4.8	6.6	9.0	7.7	-	6.6	21.0	0.3	4.4	7.4	7.7	
1221 State St. Corp	1,973,407	0.2	0.0	0.0	0.0	0.0	1.5	2.4	0.0	0.0	0.0	7.9	0.0	1.4	Jun-08
Total Private Equity	76,960,161	7.5	-0.9	-4.3	-0.8	24.3	21.4	18.8	-0.8	57.3	23.0	13.3	21.3		
Harbourvest Buyout IX	6,343,281	0.6	-3.8	-7.6	-6.0	19.5	19.9	18.4	-6.0	49.6	21.3	17.6	23.6	-	Jun-11
Harbourvest Credit Ops IX	963,189	0.1	2.0	-3.9	11.0	13.7	12.7	13.9	11.0	32.1	0.3	8.0	14.4	-	Jun-11
Harbourvest International PE VI	1,792,538	0.2	7.9	5.3	-15.3	12.0	11.3	12.6	-15.3	41.2	17.2	6.0	14.8	-	Mar-10
Harbourvest Venture IX	5,553,519	0.5	-1.2	-14.6	-15.9	34.8	30.9	23.5	-15.9	91.1	52.4	24.6	25.9	-	Jun-11
Harbourvest 2017 Global Fund	24,826,789	2.4	-1.7	-8.3	-1.3	23.7	20.0	-	-1.3	61.6	18.8	8.8	20.9	20.7	Oct-17
Harbourvest 2018 Global Fund	20,723,928	2.0	1.1	6.4	9.7	20.3	-	-	9.7	37.0	16.0	14.3	-	18.8	Jan-19
Harbourvest 2019 Global Fund	16,756,917	1.6	-2.1	-5.8	5.4	28.5	-	-	5.4	49.6	34.6	-	-	27.6	Dec-19
Russell 3000 + 3%			8.0	3.9	-16.8	10.3	-	-	-16.8	29.4	24.5	-	-	11.1	
Total Private Credit	49,807,842	4.8	1.0	0.8	4.9	8.5	8.3	-	4.9	16.1	4.8	9.4	6.7		
Portfolio Advisors Credit Strategies Fund	11,885,582	1.2	0.0	-1.8	5.2	11.5	9.8	-	5.2	26.8	3.9	8.2	6.6	9.5	Oct-17
Bloomberg High Yield +2% (Lagged)			-0.2	-9.5	-12.4	1.5	3.6	-	-12.4	13.5	5.3	8.5	5.1	3.7	
Crescent Direct Lending Levered Fund II	2,786,189	0.3	0.0	2.1	5.9	7.8	-	-	5.9	11.5	6.0	12.4	-	8.6	Mar-18
Bloomberg High Yield +2% (Lagged)			-0.2	-9.5	-12.4	1.5	-	-	-12.4	13.5	5.3	8.5	-	3.6	
Audax Direct Lending Fund A	4,779,520	0.5	3.3	6.3	15.5	16.1	-	-	15.5	23.1	10.1	16.3	-	18.5	Oct-18
Bloomberg High Yield +2% (Lagged)			-0.2	-9.5	-12.4	1.5	-	-	-12.4	13.5	5.3	8.5	-	3.7	
Ares Capital Europe IV	6,867,020	0.7	2.4	4.6	7.0	9.0	-	-	7.0	11.8	8.2	13.1	-	9.9	Aug-18
Bloomberg High Yield +2% (Lagged)			-0.2	-9.5	-12.4	1.5	-	-	-12.4	13.5	5.3	8.5	-	3.8	
Lone Star XI	5,266,325	0.5	0.0	4.7	10.5	37.8	-	-	10.5	538.0	-62.8	-	-	19.1	Jun-19
Bloomberg High Yield +2% (Lagged)			-0.2	-9.5	-12.4	1.5	-	-	-12.4	13.5	5.3	-	-	3.0	

Tortoise is now Ducenta Squared. TSSP Adjacent funded 4/16/2020. Portfolio Advisors, Crescent Direct Lending, Lone Star, and Ascribe Opportunities Fund market value as of 9/30/2022. PIMCO BRAVO liquidated 12/30/2022.

Total Fund
Executive Summary (Net of Fees)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018	Inception	Inception Date
Sixth Street Diversified Credit	13,232,331	1.3	1.2	-2.5	13.2	-	-	-	13.2	-1.4	-	-	-	3.7	May-20
<i>Bloomberg High Yield +2% (Lagged)</i>			-0.2	-9.5	-12.4	-	-	-	-12.4	13.5	-	-	-	0.5	
Ascribe Opportunities Fund IV	4,990,875	0.5	0.0	1.0	2.8	-	-	-	2.8	-17.3	-	-	-	-194.6	Jul-20
<i>Bloomberg High Yield +2% (Lagged)</i>			-0.2	-9.5	-12.4	-	-	-	-12.4	13.5	-	-	-	4.2	
Total Opportunistic	25,498,535	2.5	-6.7	-13.5	0.4	6.3	7.2	8.8	0.4	18.6	0.9	-10.7	32.0		
KKR Mezzanine Partners	1,341,790	0.1	-4.7	-35.6	-31.0	-13.5	-4.9	1.9	-31.0	10.5	-15.2	-4.2	25.3	3.7	Jun-11
TSSP Adjacent Opportunities Partners	24,156,745	2.4	-6.9	-11.3	5.0	-	-	-	5.0	26.1	-	-	-	14.6	Apr-20
Total Cash	9,506,096	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Cash Account	9,506,096	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	Sep-07
<i>90 Day U.S. Treasury Bill</i>			0.8	1.3	1.5	0.7	1.3	0.8	1.5	0.0	0.7	2.3	1.9	0.7	

Tortoise is now Ducenta Squared. TSSP Adjacent funded 4/16/2020. Portfolio Advisors, Crescent Direct Lending, Lone Star, and Ascribe Opportunities Fund market value as of 9/30/2022. PIMCO BRAVO liquidated 12/30/2022.

Investment Manager
Risk Analysis by Manager - 3 Years (Net of Fees)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

	Annualized Return	Annualized Excess Return	Annualized Standard Deviation	Annualized Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Information Ratio	Up Capture	Down Capture
BlackRock Russell 3000	7.08	9.13	23.96	0.01	1.00	0.02	1.00	0.38	0.41	100.02	99.97
BlackRock International Equity	1.19	3.38	23.75	0.32	1.00	0.12	1.00	0.14	2.59	100.80	99.19
DFA Emerging Markets Value	1.02	4.43	27.49	4.40	1.06	4.91	0.97	0.16	0.89	115.17	93.37
Harding Loevner Emerging Markets	-8.20	-4.99	28.33	-4.73	1.06	8.33	0.92	-0.18	-0.58	96.09	117.62
Ducenta Squared	-2.64	-3.17	6.64	0.21	1.04	1.91	0.92	-0.48	0.06	111.87	105.28
Mackay Shields Core Plus Opportunities	-2.22	-2.69	7.34	0.87	1.11	2.86	0.86	-0.37	0.21	132.17	109.63
BlackRock US TIPS	1.19	0.68	6.57	-0.02	1.00	0.17	1.00	0.10	-0.11	99.53	99.76
ASB Real Estate	8.66	7.84	5.86	0.76	0.98	2.48	0.82	1.27	0.24	107.22	106.46
Clarion Lion	11.47	10.58	7.75	0.26	1.39	2.83	0.94	1.31	1.18	143.97	155.53
ARA American Strategic Value Realty	10.39	9.38	4.40	2.67	0.75	2.18	0.85	2.01	0.05	91.40	9.28
Portfolio Advisors Credit Strategies Fund	11.49	10.64	8.20	10.57	0.51	7.98	0.61	1.27	1.13	120.03	21.59
Crescent Direct Lending Levered Fund II	7.77	6.91	3.80	7.80	0.02	12.77	0.01	1.64	0.41	49.02	-25.54
Audax Direct Lending Fund A	16.10	14.68	6.34	15.70	0.24	11.06	0.22	2.28	1.18	121.46	-22.98
Ares Capital Europe IV	9.01	8.10	4.69	9.18	-0.02	13.59	0.00	1.72	0.48	57.14	-28.99
Lone Star XI	37.82	63.99	95.91	78.69	0.96	95.16	0.02	0.67	0.66	618.38	40.26

Investment Manager
Risk Analysis by Manager - 5 Years (Net of Fees)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

	Annualized Return	Annualized Excess Return	Annualized Standard Deviation	Annualized Alpha	Annualized Beta	Tracking Error	R-Squared	Sharpe Ratio	Information Ratio	Up Capture	Down Capture
BlackRock Russell 3000	7.08	8.46	21.48	0.01	1.00	0.03	1.00	0.39	0.28	100.00	99.97
BlackRock International Equity	1.19	2.47	20.01	0.32	1.00	0.34	1.00	0.12	0.96	101.34	100.22
DFA Emerging Markets Value	1.02	2.83	22.15	4.22	1.07	4.56	0.96	0.13	0.90	109.72	93.23
Harding Loevner Emerging Markets	-8.20	-6.63	22.49	-5.32	0.96	9.33	0.83	-0.29	-0.58	89.70	109.08
Ducenta Squared	-2.64	-3.22	5.98	0.09	1.00	1.54	0.93	-0.53	0.06	107.59	104.44
Mackay Shields Core Plus Opportunities	-2.22	-2.73	6.85	0.90	1.13	2.30	0.90	-0.39	0.25	126.57	112.51
BlackRock US TIPS	1.19	0.71	6.94	-0.02	1.00	0.15	1.00	0.10	-0.12	100.59	100.88
ASB Real Estate	8.66	7.84	6.82	0.56	1.00	2.50	0.87	1.14	0.24	107.22	106.46
Clarion Lion	11.47	10.59	9.02	0.19	1.39	3.14	0.95	1.16	1.06	143.97	155.53
Portfolio Advisors Credit Strategies Fund	11.49	10.63	9.28	11.11	0.36	10.91	0.18	1.14	0.84	84.12	1.14

Private Equity
Non Marketable Securities Overview

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

Vintage	Manager & Fund Name	Estimated 12/31/2022 Market Value ³	Total Commitment	Capital Called	% Called	Remaining Commitment	Capital Returned	Market Value for IRR	Distrib./ Paid-In (DPI) ¹	Tot. Value/ Paid-In (TVPI) ²	Net IRR Since Inception ⁴	IRR Date	
2011	HarbourVest IX-Buyout	\$6,343,281	\$10,000,000	\$8,525,000	85%	\$1,475,000	\$12,318,145	\$6,960,146	144.5%	218.9%	18.7%	9/30/22	
2011	HarbourVest IX-Credit	\$963,189	\$2,000,000	\$1,600,000	80%	\$400,000	\$1,752,243	\$1,021,875	109.5%	169.7%	13.4%	9/30/22	
2008	HarbourVest Int'l VI ⁵	\$1,792,538	\$3,712,930	\$2,630,078	71%	\$1,082,852	\$3,958,975	\$1,764,298	150.5%	218.7%	15.0%	9/30/22	
2011	HarbourVest IX-Venture	\$5,553,519	\$4,000,000	\$3,800,000	95%	\$200,000	\$207,793	\$5,831,234	5.5%	151.6%	23.0%	9/30/22	
2017	HarbourVest 2017 Global	\$24,826,789	\$30,000,000	\$17,700,000	59%	\$12,300,000	\$10,538,697	\$26,731,432	59.5%	199.8%	23.0%	9/30/22	
2018	HarbourVest 2018 Global	\$20,723,928	\$20,000,000	\$10,538,043	53%	\$9,461,957	\$3,345,431	\$21,391,933	31.7%	228.4%	28.6%	9/30/22	
2019	HarbourVest 2019 Global	\$16,756,917	\$20,000,000	\$12,175,273	61%	\$7,824,727	\$2,487,529	\$16,384,549	20.4%	158.1%	34.3%	9/30/22	
Total Illiquid Private Equity		\$76,960,161	\$89,712,930	\$56,968,394	64%	\$32,744,536	\$34,608,813	\$80,085,467	140.6%	201.3%			
% of Portfolio (Market Value)		7.5%											
								Management Fee	Admin Fee	Interest Expense	Other Expense	Total Expense⁶	
								HarbourVest IX-Buyout	\$0	\$0	\$1,291	\$23,715	
								HarbourVest IX-Credit	\$0	\$169	\$1,024	\$5,673	
								HarbourVest Int'l VI	\$0	\$247	\$436	\$5,588	
								HarbourVest IX-Venture	\$0	\$1,312	\$379	\$10,679	
								HarbourVest 2017 Global	\$0	\$2,557	\$136,958	\$205,515	
								HarbourVest 2018 Global	\$0	\$720	\$27,832	\$72,143	
								HarbourVest 2019 Global	\$0	\$861	\$37,078	\$82,249	
									\$194,698	\$0	\$5,866	\$204,996	\$405,562

¹(DPI) is equal to (capital returned / capital called)

²(TVPI) is equal to (market value + capital returned) / capital called

³Last known market value + capital calls - distributions (preliminary MV's as of 12/31/2022)

⁴Net IRR is calculated on the cash flows of all the limited partners of the fund and is net of all fees. Each IRR figure is provided by its HarbourVest.

⁵HarbourVest International Private Equity Partners VI-Partnership Fund L.P. values are originally presented in euros and are calculated to dollars using XE™.

⁶All fees and expenses are for 3Q 2022

HarbourVest 2017 Global Fund first capital call issued 9/21/2017. Portfolio Advisors first capital call issued 10/5/2017. HarbourVest 2018 Global Fund first capital call issued 12/13/2018.

Private Credit
Non Marketable Securities Overview

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

Vintage	Manager & Fund Name	Estimated 12/31 Market Value ³	Total Commitment	Capital Called	% Called	Remaining Commitment	Capital Returned	Market Value for IRR	Distrib./ Paid-In (DPI) ¹	Tot. Value/ Paid-In (TVPI) ²	Net IRR Since Inception ⁴	IRR Date		
2013	Portfolio Advisors Credit Strategies Fund	\$11,885,582	\$11,250,000	\$11,250,000	100%	\$0	\$2,478,768	\$12,557,769	22.0%	127.7%	9.3%	6/30/22		
2017	Crescent Direct Lending Levered Fund II	\$2,786,189	\$7,000,000	\$5,707,507	82%	\$1,292,493	\$4,268,210	\$3,070,904	74.8%	123.6%	9.0%	9/30/22		
2017	Audax Direct Lending Fund A	\$4,779,520	\$7,000,000	\$5,249,502	75%	\$1,750,498	\$2,342,191	\$4,623,419	44.6%	135.7%	16.6%	6/30/22		
2018	Ares Capital Europe IV	\$6,867,020	\$8,000,000	\$6,762,884	85%	\$1,237,116	\$1,866,078	\$6,945,257	27.6%	129.1%	10.6%	6/30/22		
2019	Lone Star Fund XI	\$5,266,325	\$5,750,000	\$3,877,643	67%	\$1,872,357	\$185,006	\$3,506,089	4.8%	140.6%	24.8%	6/30/22		
2019	Ascribe Opportunities IV	\$4,990,875	\$6,000,000	\$4,920,467	82%	\$1,079,533	\$26,909	\$2,915,814	0.5%	102.0%	11.5%	6/30/22		
2020	Sixth Street Diversified Credit	\$13,232,331	\$50,000,000	\$15,153,212	30%	\$34,846,788	\$3,306,085	NA	21.8%	109.1%	NA	NA		
Total Illiquid Private Credit		\$49,807,842	\$95,000,000	\$52,921,215	55.7%	\$42,078,785	\$14,473,247	\$33,619,252	63.5%	90.9%				
% of Portfolio (Market Value)		4.8%												
								Management Fee	Accrued Carried Interest	Admin Fee	Interest Expense	Other Expense	Total Expense⁵	
								Portfolio Advisors CSF	\$0	\$0	\$0	\$0	\$0	\$0
								Crescent Direct Lending II	\$42,318	\$6,553	\$3,703	\$0	\$0	\$52,574
								Audax Direct Lending A	\$31,556	\$0	\$0	\$0	\$110,254	\$141,810
								Ares Capital Europe IV	\$26,595	\$28,691	\$0	\$24,157	\$3,548	\$82,991
								Ascribe Opportunities IV	\$0	\$0	\$0	\$0	\$0	\$0
								Lone Star Fund XI	\$0	\$0	\$0	\$0	\$0	\$0
								Sixth Street Diversified Credit	\$0	\$0	\$0	\$0	\$0	\$0
									\$100,469	\$35,244	\$3,703	\$24,157	\$113,802	\$277,375

¹(DPI) is equal to (capital returned / capital called)

²(TVPI) is equal to (market value + capital returned) / capital called

³Last known market value + capital calls - distributions (preliminary MV's as of 12/31/2022)

⁴Net IRR is calculated on the cash flows of all the limited partners of the fund and is net of all fees. Each IRR figure is provided by its respective manager.

⁵All fees and expenses except Audax Direct Lending are for 3Q 2022

Portfolio Advisors first capital call issued 10/5/2017. Crescent Direct Lending first called 3/13/2018. Ares IV first called 8/13/2018. Audax Direct Lending first called 10/26/2018.

Opportunistic Non Marketable Securities Overview

Imperial County Employees' Retirement System Period Ending: December 31, 2022

Vintage	Manager & Fund Name	Estimated 12/31 Market Value ³	Total Commitment	Capital Called	% Called	Remaining Commitment	Capital Returned	Market Value for IRR	Distrib./ Paid-In (DPI) ¹	Tot. Value/ Paid-In (TVPI) ²	Net IRR Since Inception ⁵	IRR Date		
2010	KKR Mezzanine ⁶	\$1,341,790	\$10,000,000	\$10,011,880	100%	-\$11,880	\$14,153,380	\$1,407,379	141.4%	154.8%	5.5%	9/30/22		
2020	TSSP Adjacent Opportunities Partners	\$24,156,745	\$40,000,000	\$21,229,387	53%	\$18,770,613	\$3,919,665	NA	18.5%	132.3%	NA	NA		
Total Illiquid Opportunistic		\$25,498,535	\$50,000,000	\$31,241,267	62%	\$18,758,733	\$18,073,045	\$1,420,996	4.5%	62.4%				
% of Portfolio (Market Value)		2.5%												
								Management Fee	Accrued Carried Interest	Admin Fee	Interest Expense	Other Expense	Total Expense⁷	
								KKR Mezzanine	\$3,341	\$0	\$0	\$0	\$2,223	\$5,564
								PIMCO BRAVO	\$0	\$1	\$0	\$0	\$18	\$19
								TSSP Adjacent Opportunities P	\$0	\$0	\$0	\$0	\$0	\$0
									\$3,341	\$0	\$0	\$0	\$2,223	\$5,564

¹(DPI) is equal to (capital returned / capital called)

²(TVPI) is equal to (market value + capital returned) / capital called

³Last known market value + capital calls - distributions (preliminary MV's as of 9/30/2022)

⁴Investment period ended, no further capital to be called.

⁵Net IRR is calculated on the cash flows of all the limited partners of the fund and is net of all fees. Each IRR figure is provided by its respective manager.

⁶KKR: Total capital called is \$12,536,525 which includes recycled distributions. Unused capital commitment is \$314,979 after including distribution proceeds available for reinvestment

⁷All fees and expenses are for 3Q 2022

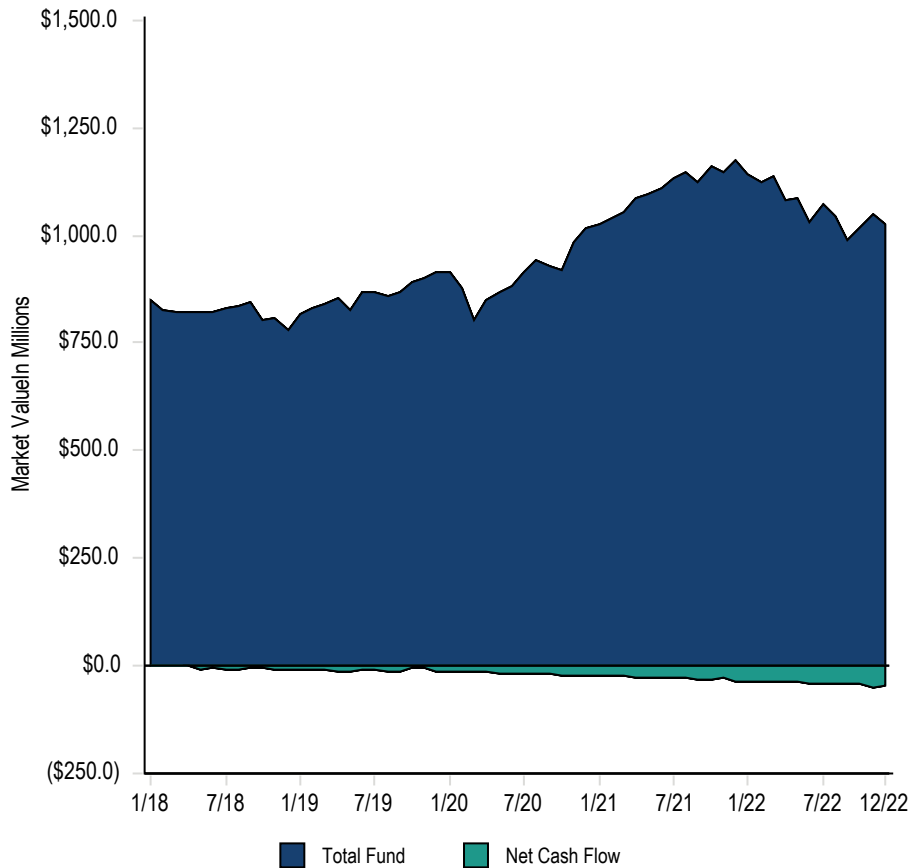
Total Fund
Cash Flow by Manager (Last Three Months)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

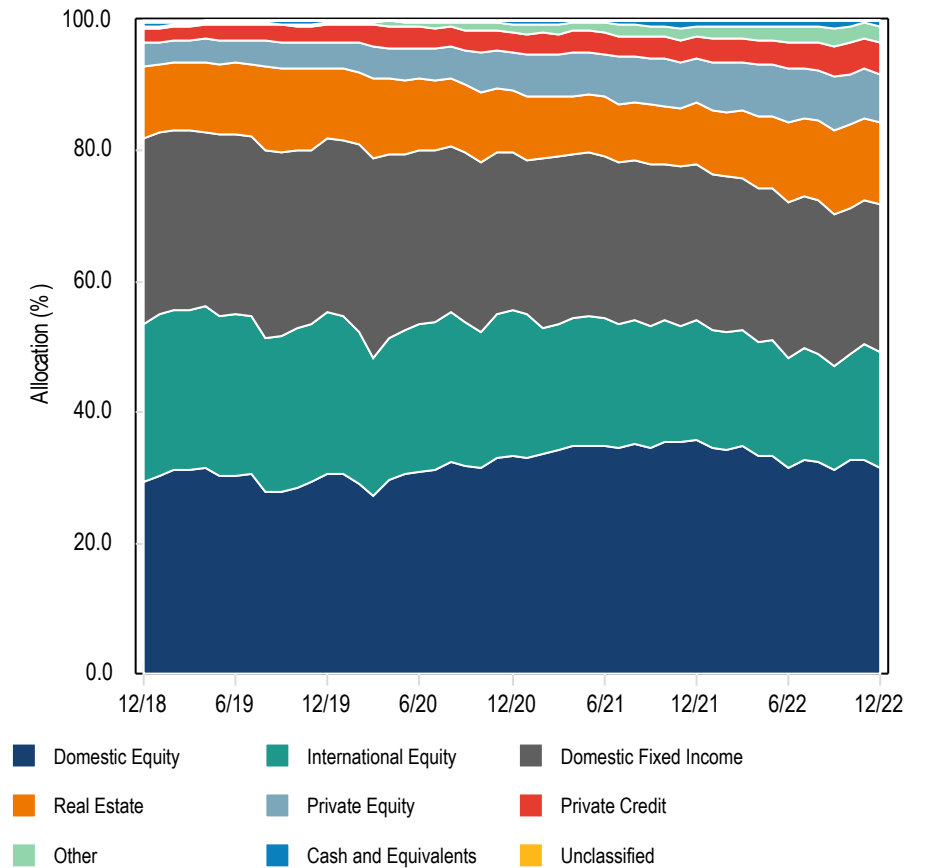
	Beginning Market Value	Contributions	Withdrawals	Net Cash Flows	Capital Appreciation	Ending Market Value
BlackRock Russell 3000	\$306,971,209	\$0	-\$5,956,873	-\$5,956,873	\$22,227,953	\$323,242,289
BlackRock International Equity	\$119,546,300	\$0	\$0	\$0	\$20,765,770	\$140,312,070
DFA Emerging Markets Value	\$21,713,185	\$0	-\$301,857	-\$301,857	\$2,232,713	\$23,644,040
Harding Loevner Emerging Markets	\$16,830,989	\$0	\$0	\$0	\$1,854,411	\$18,685,400
Ducenta Squared	\$95,333,646	\$0	\$0	\$0	\$922,785	\$96,256,431
MacKay Shields Core Plus Opportunities	\$93,407,389	\$0	\$0	\$0	\$2,205,085	\$95,612,474
BlackRock US TIPS	\$39,995,308	\$0	\$0	\$0	\$752,223	\$40,747,531
ASB Real Estate	\$32,454,992	\$0	\$0	\$0	-\$1,302,724	\$31,152,268
Clarion Lion	\$36,263,904	\$203,286	-\$289,734	-\$86,448	-\$1,870,282	\$34,307,174
ARA American Strategic Value Realty	\$58,686,000	\$860,000	\$0	\$860,000	\$0	\$59,546,000
1221 State St. Corp	\$1,967,751	\$12,290	-\$6,634	\$5,656	\$0	\$1,973,407
Harbourvest Buyout IX	\$6,960,146	\$0	-\$350,774	-\$350,774	-\$266,091	\$6,343,281
Harbourvest Credit Ops IX	\$1,021,875	\$0	-\$78,882	-\$78,882	\$20,196	\$963,189
Harbourvest International PE VI	\$1,764,298	\$0	-\$111,078	-\$111,078	\$139,318	\$1,792,538
Harbourvest Venture IX	\$5,831,234	\$0	-\$207,793	-\$207,793	-\$69,922	\$5,553,519
Harbourvest 2017 Global Fund	\$26,731,432	\$0	-\$1,442,394	-\$1,442,394	-\$462,249	\$24,826,789
Harbourvest 2018 Global Fund	\$21,391,933	\$0	-\$903,426	-\$903,426	\$235,421	\$20,723,928
Harbourvest 2019 Global Fund	\$16,384,549	\$800,000	-\$83,038	\$716,962	-\$344,594	\$16,756,917
Portfolio Advisors Credit Strategies Fund	\$12,113,819	\$0	-\$228,237	-\$228,237	\$0	\$11,885,582
Crescent Direct Lending Levered Fund II	\$2,945,507	\$0	-\$159,318	-\$159,318	\$0	\$2,786,189
Audax Direct Lending Fund A	\$4,502,949	\$127,998	\$0	\$127,998	\$148,573	\$4,779,520
Ares Capital Europe IV	\$6,828,067	\$0	-\$123,510	-\$123,510	\$162,463	\$6,867,020
Lone Star XI	\$5,276,998	\$0	-\$10,673	-\$10,673	\$0	\$5,266,325
Sixth Street Diversified Credit	\$11,797,229	\$1,285,253	\$0	\$1,285,253	\$149,849	\$13,232,331
Ascribe Opportunities Fund IV	\$3,616,366	\$1,411,205	\$0	\$1,411,205	-\$36,696	\$4,990,875
KKR Mezzanine Partners	\$1,407,379	\$0	\$0	\$0	-\$65,589	\$1,341,790
TSSP Adjacent Opportunities Partners	\$24,853,676	\$1,007,956	\$0	\$1,007,956	-\$1,704,887	\$24,156,745
Cash Account	\$11,867,775	\$5,203,983	-\$7,565,662	-\$2,361,679	\$0	\$9,506,096
Total Fund	\$988,479,522	\$10,911,972	-\$17,819,883	-\$6,907,911	\$45,680,107	\$1,027,251,718

Harbourvest and KKR Mezzanine market values as of 09/30/2022 +/- 3Q22 and 4Q22 calls/distributions. Portfolio Advisors, Crescent Direct Lending, Audax Direct Lending, Ares Capital, Lone Star Fund, Sixth Street Diversified Credit, Ascribe, and Sixth Street TAO Partners market values as of 09/30/2022 +/- 4Q22 calls/distributions.

Market Value History



Asset Allocation History



Total Fund Investment Fund Fee Analysis

Imperial County Employees' Retirement System Period Ending: December 31, 2022

Account	Fee Schedule	Market Value	% of Portfolio	Estimated Annual Fee (\$)	Estimated Annual Fee (%)
ARA American Strategic Value Realty	1.25 % of First \$10 M 1.20 % of Next \$15 M 1.10 % of Next \$25 M 1.00 % Thereafter	59,546,000	5.80	675,460	1.13
Ares Capital Europe IV	1.38 % of Assets	6,867,020	0.67	94,765	1.38
ASB Real Estate	1.25 % of First \$5 M 1.00 % of Next \$10 M 0.75 % Thereafter	31,152,268	3.03	283,642	0.91
Ascribe Opportunities Fund IV	1.50 % of Assets	4,990,875	0.49	74,863	1.50
Audax Direct Lending Fund A	0.85 % of Assets	4,779,520	0.47	40,626	0.85
BlackRock International Equity	0.15 % of First \$50 M 0.10 % of Next \$50 M 0.00 % Thereafter	140,312,070	13.66	125,000	0.09
BlackRock Russell 3000	0.03 % of Assets	323,242,289	31.47	96,973	0.03
BlackRock US TIPS	0.07 % of Assets	40,747,531	3.97	28,523	0.07
Cash Account		9,506,096	0.93	-	-
Clarion Lion	1.25 % of First \$10 M 1.00 % of Next \$15 M 0.85 % Thereafter	34,307,174	3.34	354,111	1.03
Crescent Direct Lending Levered Fund II	Minimum Fee: \$25,280	2,786,189	0.27	25,280	0.91
DFA Emerging Markets Value	0.41 % of Assets	23,644,040	2.30	96,941	0.41
Ducenta Squared	0.29 % of First \$100 M 0.25 % of Next \$100 M 0.00 % Thereafter	96,256,431	9.37	274,331	0.29
Harbourvest 2017 Global Fund	Minimum Fee: \$262,500	24,826,789	2.42	262,500	1.06
Harbourvest 2018 Global Fund	Minimum Fee: \$138,000	20,723,928	2.02	138,000	0.67
Harbourvest 2019 Global Fund	0.45 % of Assets	16,756,917	1.63	75,406	0.45
Harbourvest Buyout IX	Minimum Fee: \$100,000	6,343,281	0.62	100,000	1.58
Harbourvest Credit Ops IX	Minimum Fee: \$20,000	963,189	0.09	20,000	2.08
Harbourvest International PE VI	Minimum Fee: \$35,000	1,792,538	0.17	35,000	1.95
Harbourvest Venture IX	Minimum Fee: \$40,000	5,553,519	0.54	40,000	0.72
Harding Loevner Emerging Markets	1.05 % of Assets	18,685,400	1.82	196,197	1.05
KKR Mezzanine Partners	Minimum Fee: \$150,000	1,341,790	0.13	150,000	11.18
Lone Star XI	0.71 % of Assets	5,266,325	0.51	37,338	0.71
MacKay Shields Core Plus Opportunities	0.35 % of Assets	95,612,474	9.31	334,644	0.35
Portfolio Advisors Credit Strategies Fund	Minimum Fee: \$180,000	11,885,582	1.16	180,000	1.51
Sixth Street Diversified Credit	1.35 % of Assets	13,232,331	1.29	178,636	1.35

*HarbourVest and KKR fees are estimated gross management fees only and do not include incentive allocations or offsetting cash flows received by the fund.

*HarbourVest International Private Equity VI fees are based on committed Euros, actual US Dollar amount will fluctuate based on exchange rates.

*Verus advisory fee shown for disclosure purposes only and is not included in total investment management fee calculations.

*Portfolio Advisors fee is 0.20% on committed capital and 1.00% on invested capital.

Total Fund
Investment Fund Fee Analysis

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

Account	Fee Schedule	Market Value	% of Portfolio	Estimated Annual Fee (\$)	Estimated Annual Fee (%)
TSSP Adjacent Opportunities Partners		24,156,745	2.35	-	-
Investment Management Fee		1,027,251,718	100.00	3,918,235	0.38

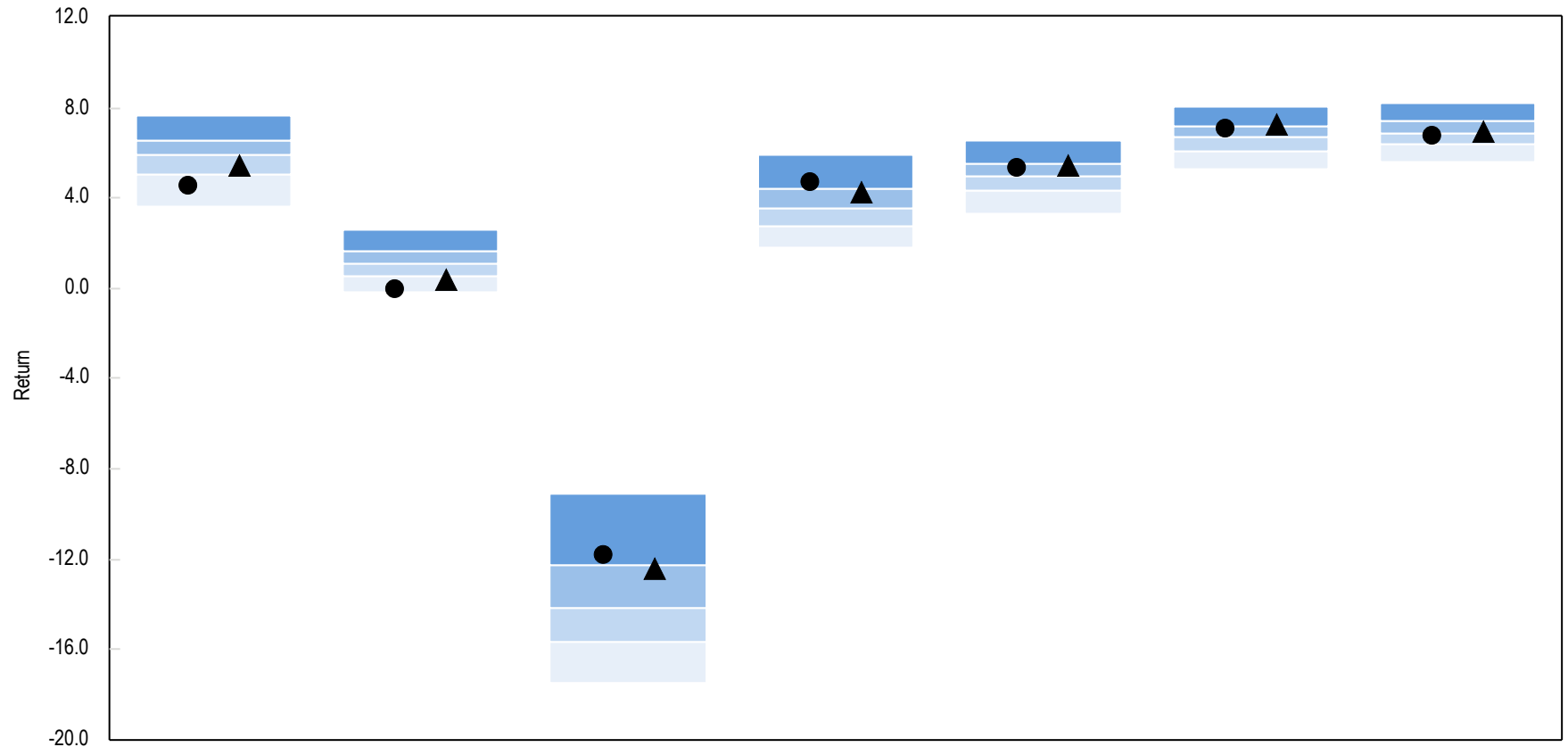
*HarbourVest and KKR fees are estimated gross management fees only and do not include incentive allocations or offsetting cash flows received by the fund.

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*Portfolio Advisors fee is 0.20% on committed capital and 1.00% on invested capital.

Total Fund vs. InvMetrics Public DB Net

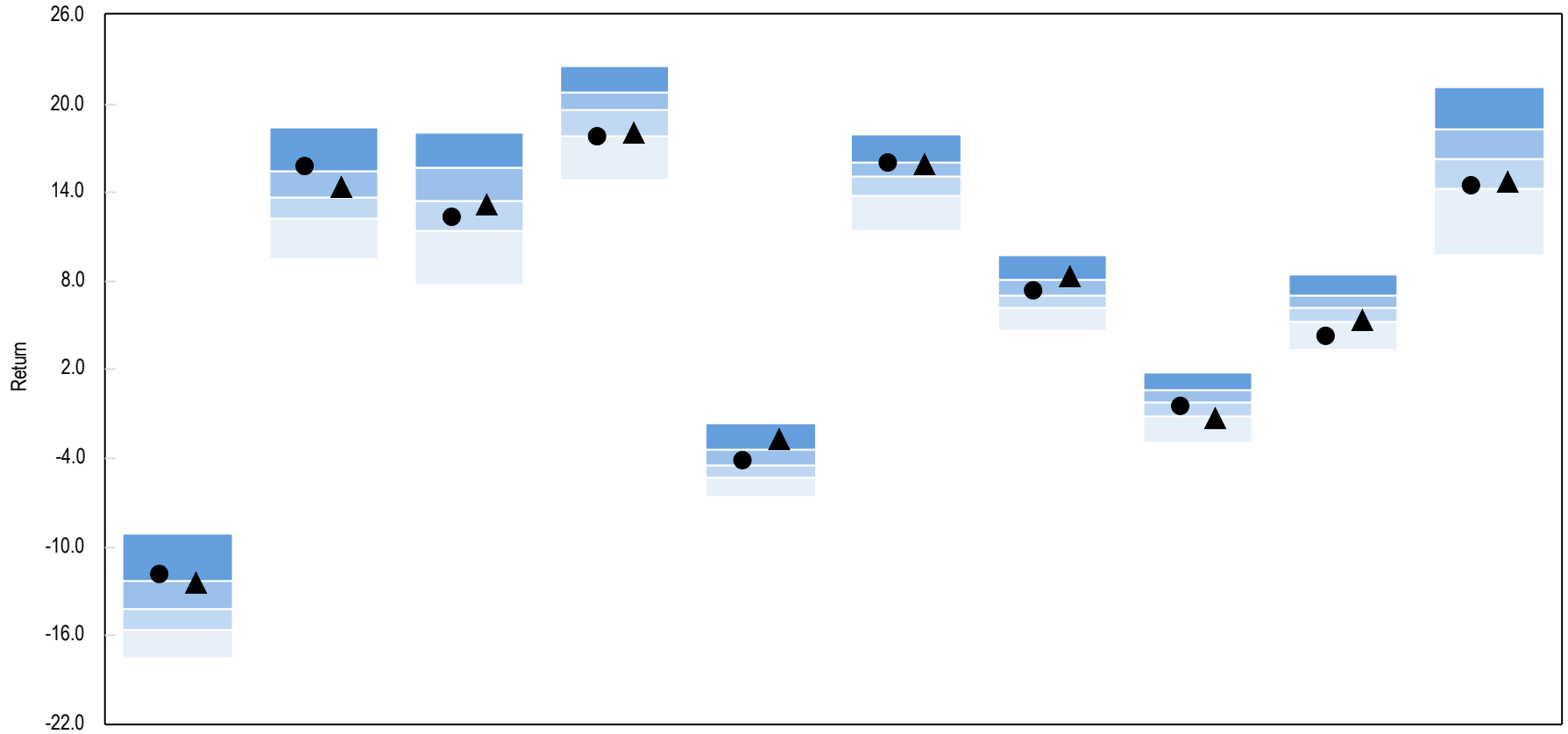


	Quarter	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs
● Total Fund	4.59 (87)	-0.03 (95)	-11.75 (20)	4.72 (18)	5.35 (33)	7.11 (28)	6.77 (57)
▲ Policy Index	5.45 (62)	0.37 (86)	-12.41 (27)	4.27 (28)	5.41 (31)	7.28 (22)	6.91 (47)
5th Percentile	7.63	2.58	-9.09	5.89	6.56	8.03	8.18
1st Quartile	6.54	1.64	-12.26	4.43	5.56	7.17	7.43
Median	5.95	1.08	-14.16	3.52	4.96	6.70	6.86
3rd Quartile	5.05	0.58	-15.62	2.74	4.30	6.08	6.36
95th Percentile	3.62	-0.13	-17.45	1.78	3.34	5.29	5.59
Population	369	369	364	356	340	320	272

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

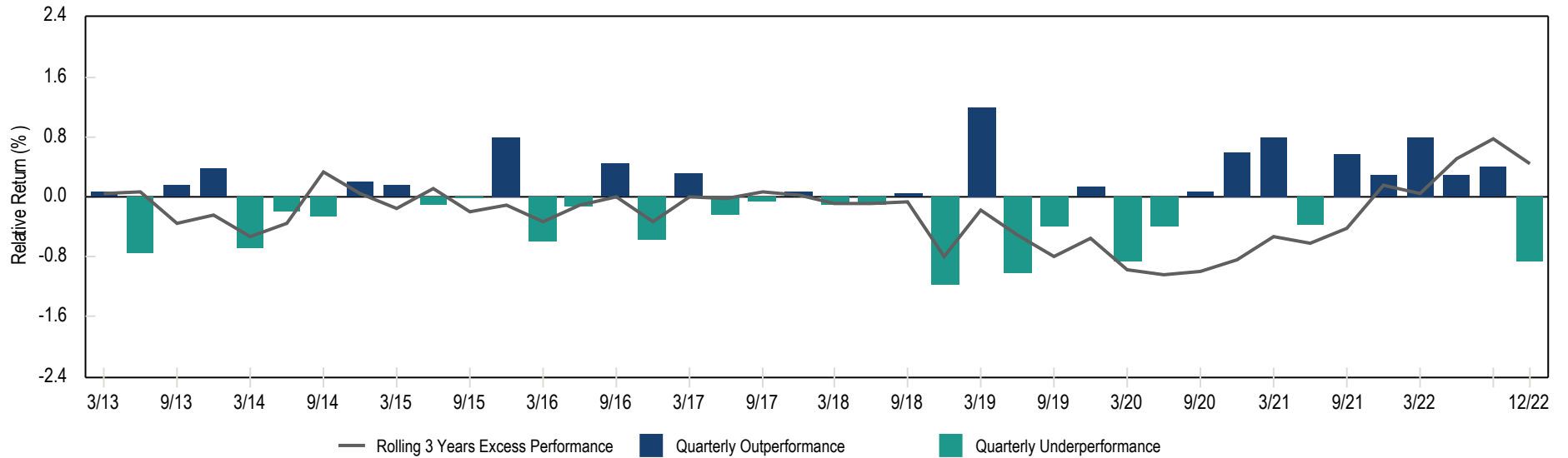
Imperial County Employees' Retirement System
Period Ending: December 31, 2022

Total Fund vs. InvMetrics Public DB Net

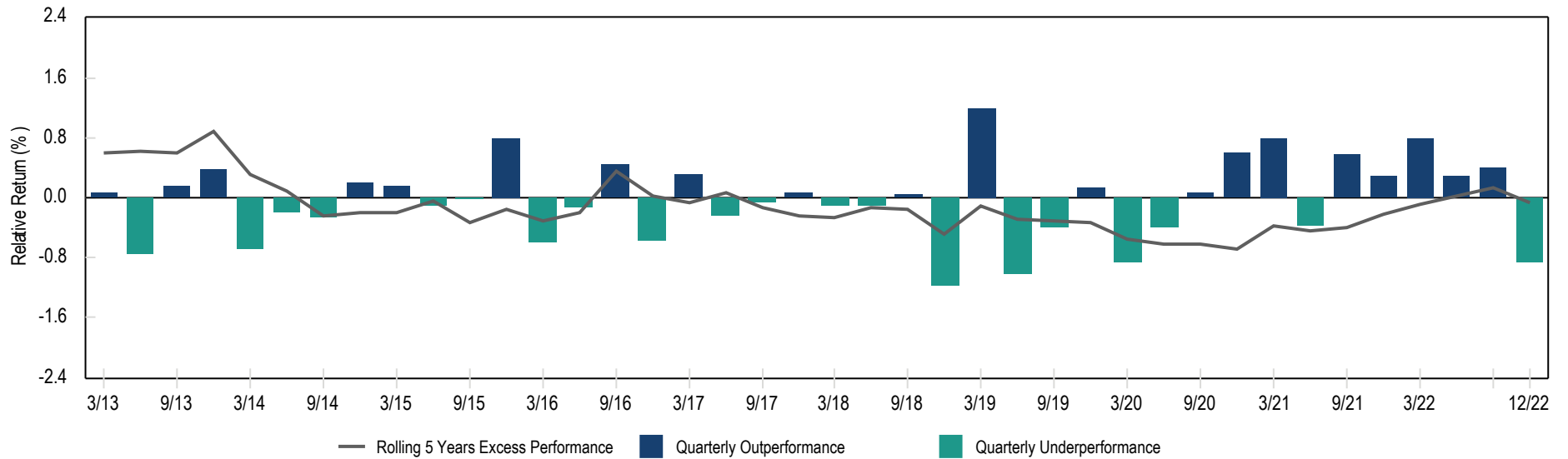


	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
● Total Fund	-11.75 (20)	15.84 (21)	12.33 (63)	17.85 (75)	-4.12 (40)	16.02 (27)	7.45 (41)	-0.41 (57)	4.37 (88)	14.48 (74)
▲ Policy Index	-12.41 (27)	14.38 (38)	13.15 (54)	18.03 (73)	-2.73 (13)	15.93 (29)	8.36 (20)	-1.22 (76)	5.33 (75)	14.71 (72)
5th Percentile	-9.09	18.40	18.11	22.61	-1.61	17.89	9.72	1.82	8.48	21.13
1st Quartile	-12.26	15.48	15.64	20.80	-3.42	16.10	8.06	0.63	7.07	18.35
Median	-14.16	13.70	13.41	19.54	-4.46	15.06	7.06	-0.22	6.18	16.26
3rd Quartile	-15.62	12.30	11.37	17.77	-5.28	13.77	6.18	-1.17	5.31	14.28
95th Percentile	-17.45	9.56	7.71	14.87	-6.54	11.39	4.67	-2.94	3.31	9.81
Population	364	957	1,018	935	893	894	884	822	786	756

Rolling 3 Year Annualized Excess Performance



Rolling 5 Year Annualized Excess Performance

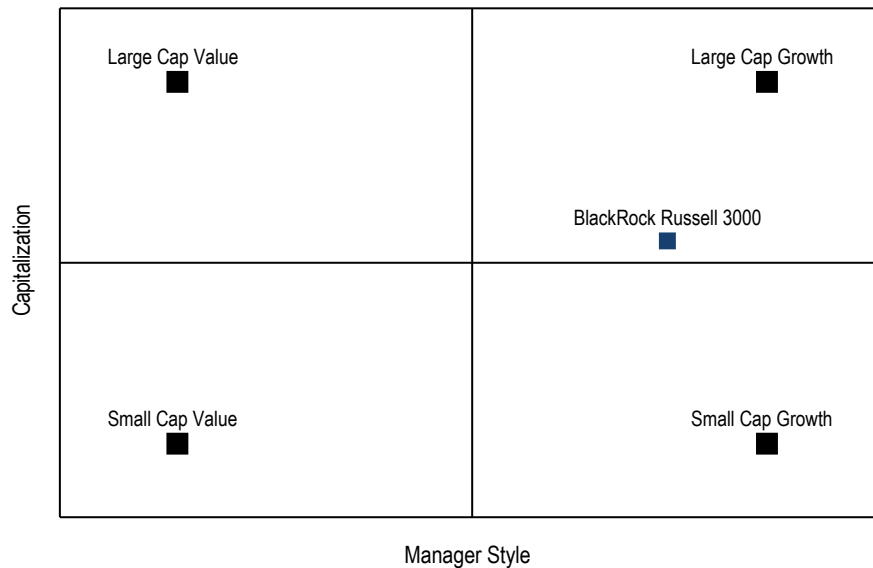


Total Domestic Equity
Asset Class Overview (Net of Fees)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018
Total Domestic Equity	323,242,289	100.0	7.2	2.4	-19.2	7.1	8.8	11.9	-19.2	25.7	21.0	31.1	-5.2
<i>Russell 3000 Index</i>			7.2	2.4	-19.2	7.1	8.8	12.1	-19.2	25.7	20.9	31.0	-5.2
BlackRock Russell 3000	323,242,289	100.0	7.2	2.4	-19.2	7.1	8.8	-	-19.2	25.7	21.0	31.1	-5.2
<i>Russell 3000 Index</i>			7.2	2.4	-19.2	7.1	8.8	-	-19.2	25.7	20.9	31.0	-5.2
<i>eV US All Cap Core Equity Rank</i>			67	64	58	45	38	-	58	54	43	39	46

U.S. Effective Style Map
3 Years Ending: December 31, 2022



U.S. Effective Style Map
5 Years Ending: December 31, 2022

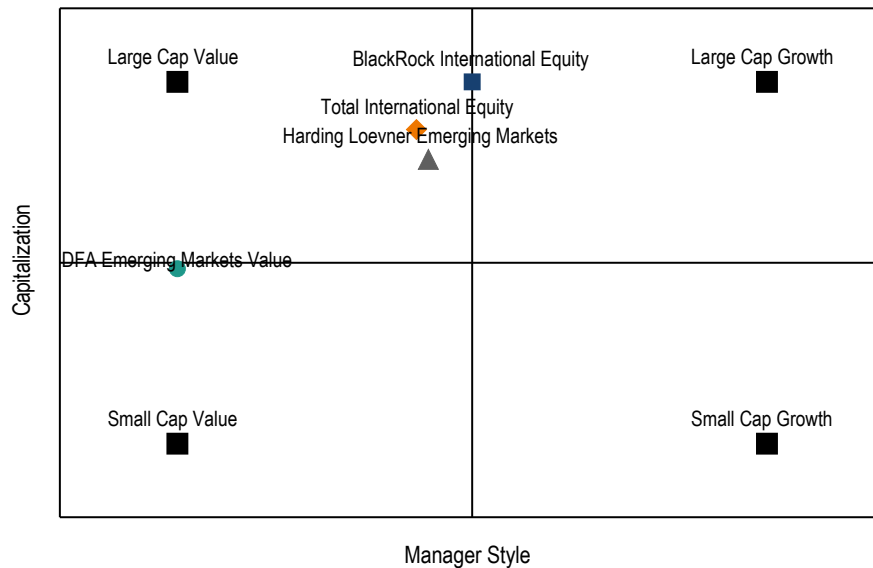


Total International Equity Asset Class Overview (Net of Fees)

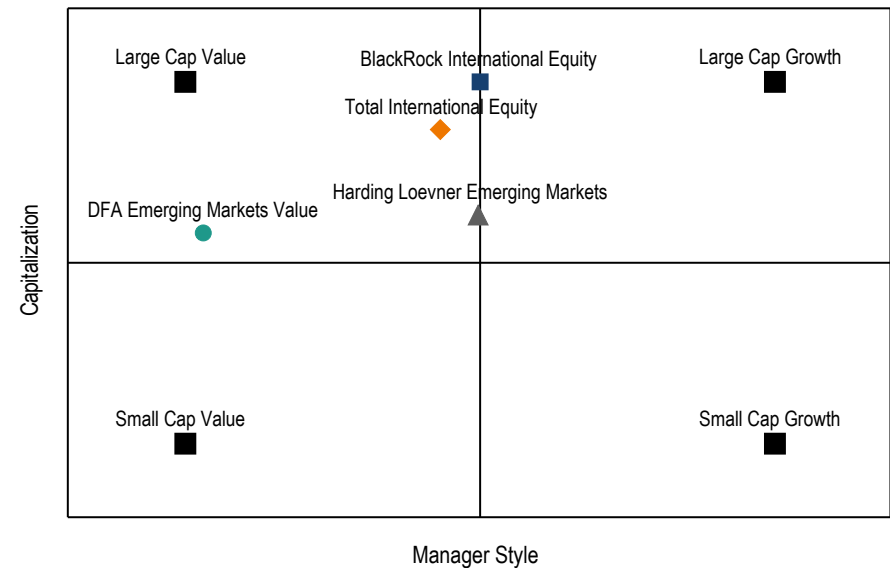
Imperial County Employees' Retirement System Period Ending: December 31, 2022

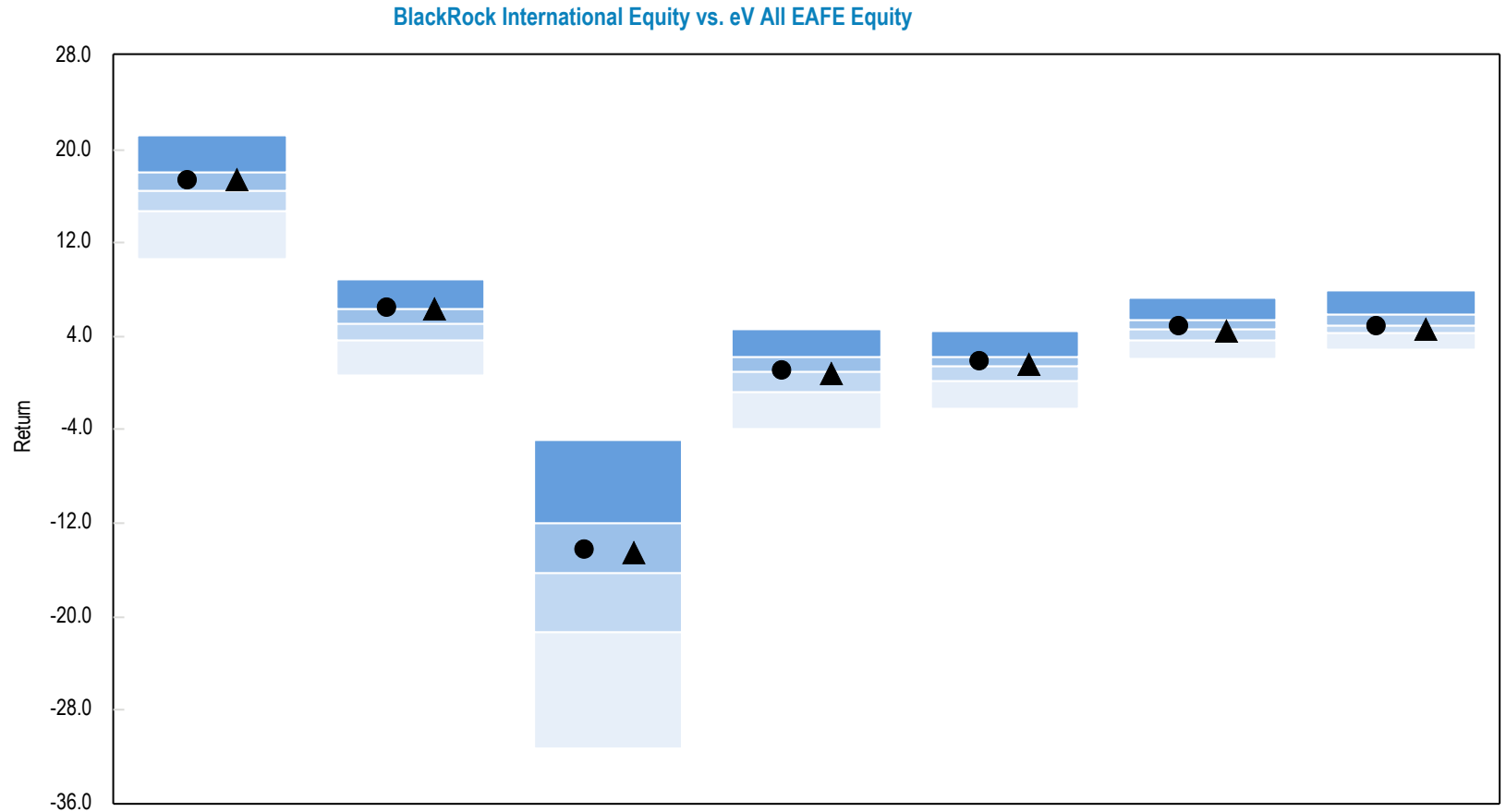
	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018
Total International Equity	182,641,510	100.0	15.7	4.6	-15.4	0.2	0.8	3.7	-15.4	10.1	8.1	20.7	-14.3
<i>MSCI AC World ex USA Index</i>			14.4	3.2	-15.6	0.5	1.4	4.3	-15.6	8.3	11.1	22.1	-13.8
BlackRock International Equity	140,312,070	76.8	17.3	6.4	-14.1	1.2	1.9	5.0	-14.1	11.6	8.1	22.4	-13.5
<i>MSCI EAFE (Net)</i>			17.3	6.4	-14.5	0.9	1.5	4.7	-14.5	11.3	7.8	22.0	-13.8
<i>eV All EAFE Equity Rank</i>			37	23	36	45	36	48	36	52	52	49	29
DFA Emerging Markets Value	23,644,040	12.9	10.3	-0.5	-10.7	1.0	-0.1	1.8	-10.7	12.4	2.7	9.6	-11.9
<i>MSCI Emerging Markets Value (Net)</i>			9.8	-2.3	-15.8	-2.6	-1.6	0.1	-15.8	4.0	5.5	12.0	-10.7
<i>eV Emg Mkts All Cap Value Equity Rank</i>			87	78	36	41	64	88	36	20	82	91	33
Harding Loevner Emerging Markets	18,685,400	10.2	10.7	-1.5	-28.1	-8.2	-5.0	-	-28.1	-4.3	12.4	24.0	-19.5
<i>MSCI Emerging Markets Growth Index</i>			9.7	-3.5	-23.7	-2.7	-1.1	-	-23.7	-8.2	31.6	25.4	-18.0
<i>eV Emg Mkts All Cap Growth Equity Rank</i>			27	50	73	99	98	-	73	51	96	54	69

**MSCI Effective Style Map
3 Years Ending: December 31, 2022**



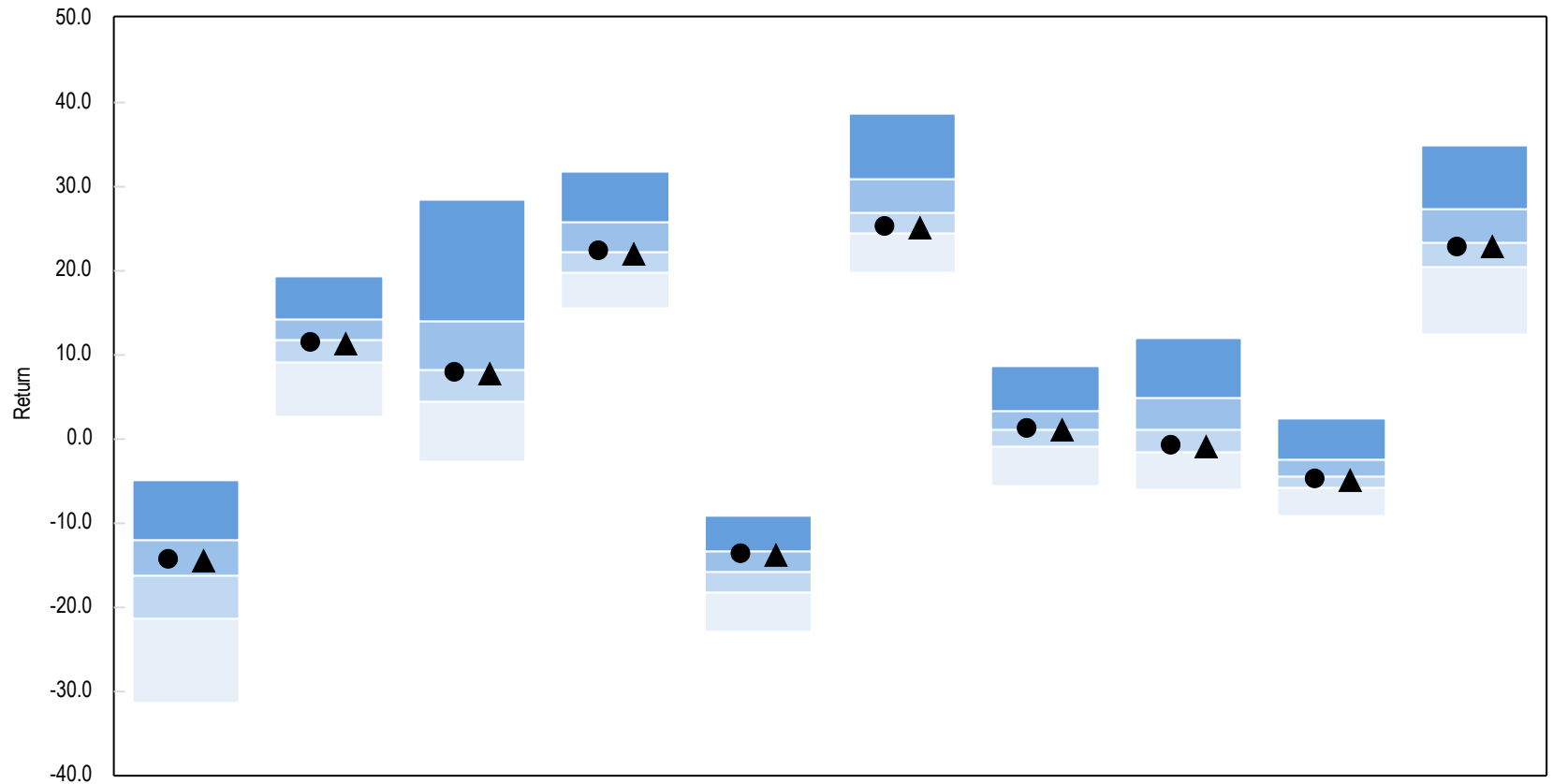
**MSCI Effective Style Map
5 Years Ending: December 31, 2022**



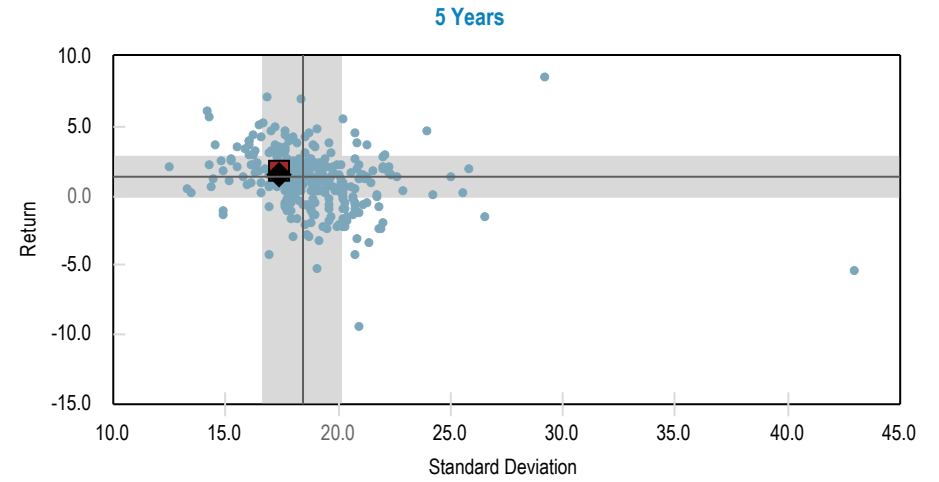
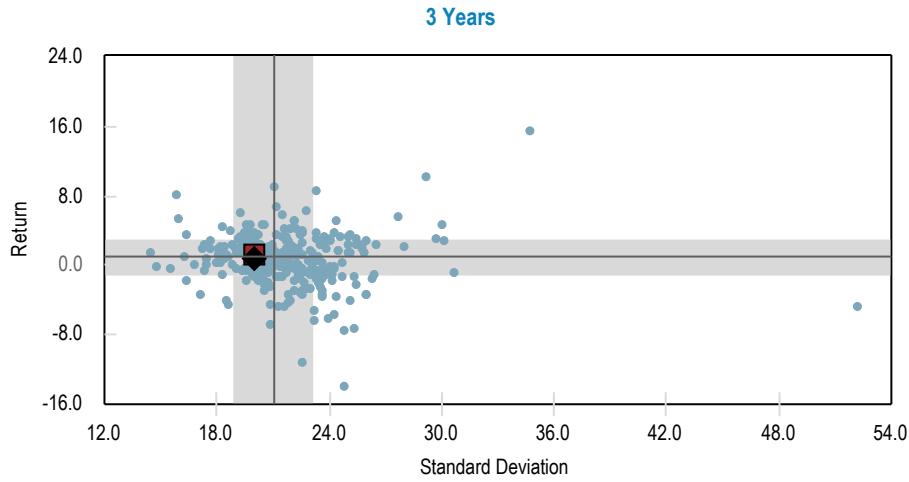


	Quarter	Fiscal YTD	1 Year	3 Years	5 Years	7 Years	10 Years
● BlackRock International Equity	17.34 (37)	6.44 (23)	-14.12 (36)	1.19 (45)	1.86 (36)	4.86 (44)	4.95 (48)
▲ MSCI EAFE (Net)	17.34 (37)	6.36 (25)	-14.45 (41)	0.87 (52)	1.54 (46)	4.53 (53)	4.67 (63)
5th Percentile	21.19	8.86	-4.89	4.61	4.43	7.38	7.99
1st Quartile	18.03	6.36	-11.95	2.26	2.24	5.47	5.93
Median	16.47	5.04	-16.18	0.95	1.38	4.65	4.91
3rd Quartile	14.78	3.63	-21.32	-0.70	0.17	3.68	4.37
95th Percentile	10.54	0.64	-31.23	-4.00	-2.25	2.06	2.84
Population	343	341	341	327	306	275	227

BlackRock International Equity vs. eV All EAFE Equity



	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
● BlackRock International Equity	-14.12 (36)	11.62 (52)	8.07 (52)	22.40 (49)	-13.52 (29)	25.42 (63)	1.34 (45)	-0.63 (65)	-4.77 (57)	22.94 (55)
▲ MSCI EAFE (Net)	-14.45 (41)	11.26 (57)	7.82 (55)	22.01 (54)	-13.79 (34)	25.03 (68)	1.00 (52)	-0.81 (68)	-4.90 (60)	22.78 (56)
5th Percentile	-4.89	19.36	28.38	31.77	-9.00	38.72	8.70	12.02	2.53	34.90
1st Quartile	-11.95	14.14	14.11	25.82	-13.26	30.98	3.42	4.87	-2.39	27.25
Median	-16.18	11.79	8.18	22.19	-15.75	26.99	1.05	1.17	-4.38	23.39
3rd Quartile	-21.32	9.06	4.38	19.67	-18.29	24.40	-0.96	-1.57	-5.89	20.52
95th Percentile	-31.23	2.64	-2.58	15.63	-22.95	19.71	-5.47	-6.04	-9.11	12.53
Population	341	417	433	443	451	447	437	426	418	390



eV All EAFE Equity

	Return	Standard Deviation
■ BlackRock International Equity	1.19	20.01
◆ MSCI EAFE (Net)	0.87	19.96
— Median	0.95	21.04
Population	327	327

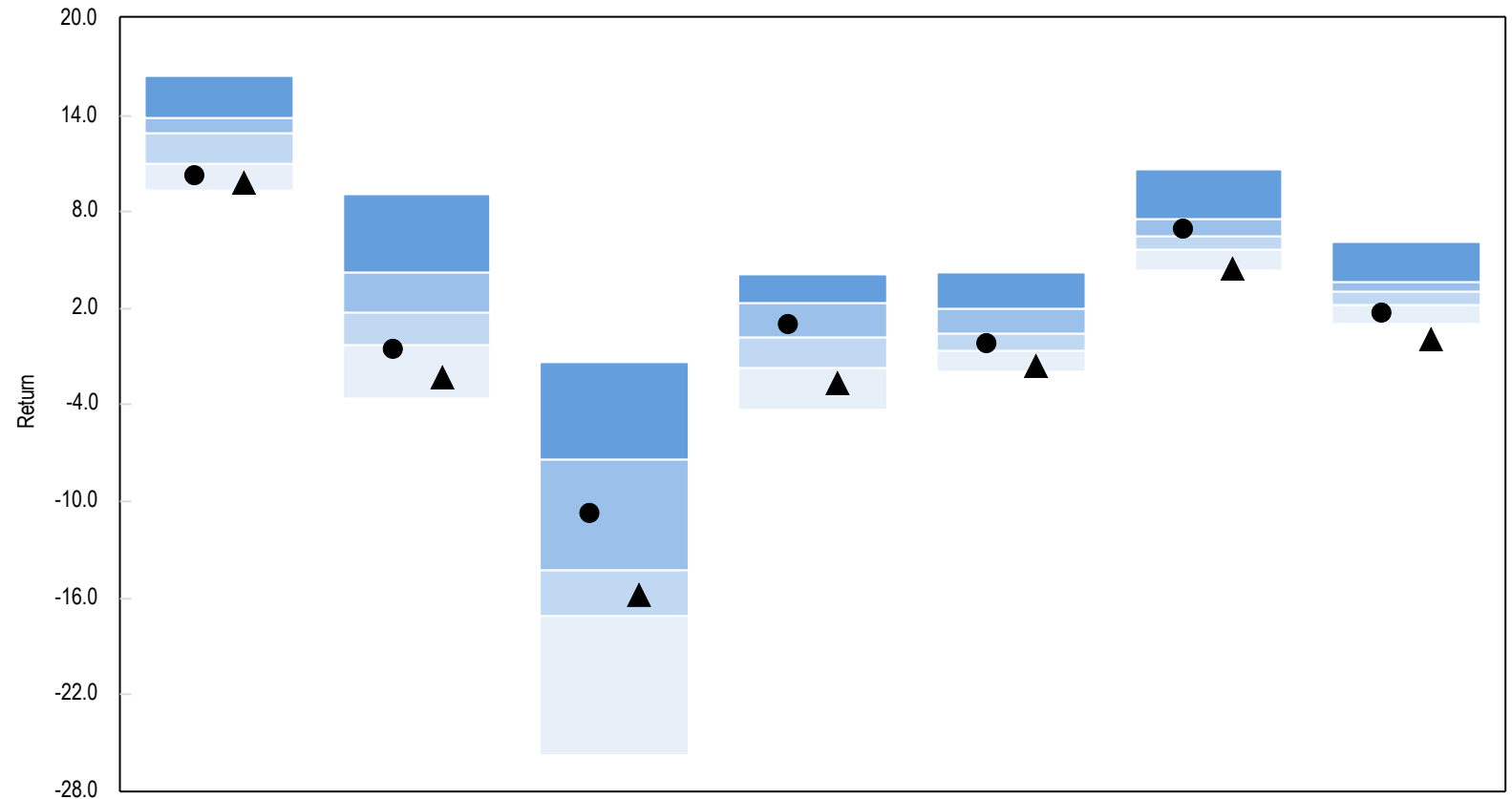
eV All EAFE Equity

	Return	Standard Deviation
■ BlackRock International Equity	1.86	17.41
◆ MSCI EAFE (Net)	1.54	17.37
— Median	1.38	18.40
Population	306	306

DFA Emerging Markets Value
Cumulative Performance Comparison (Net of Fees)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

DFA Emerging Markets Value vs. eV Emg Mkts All Cap Value Equity

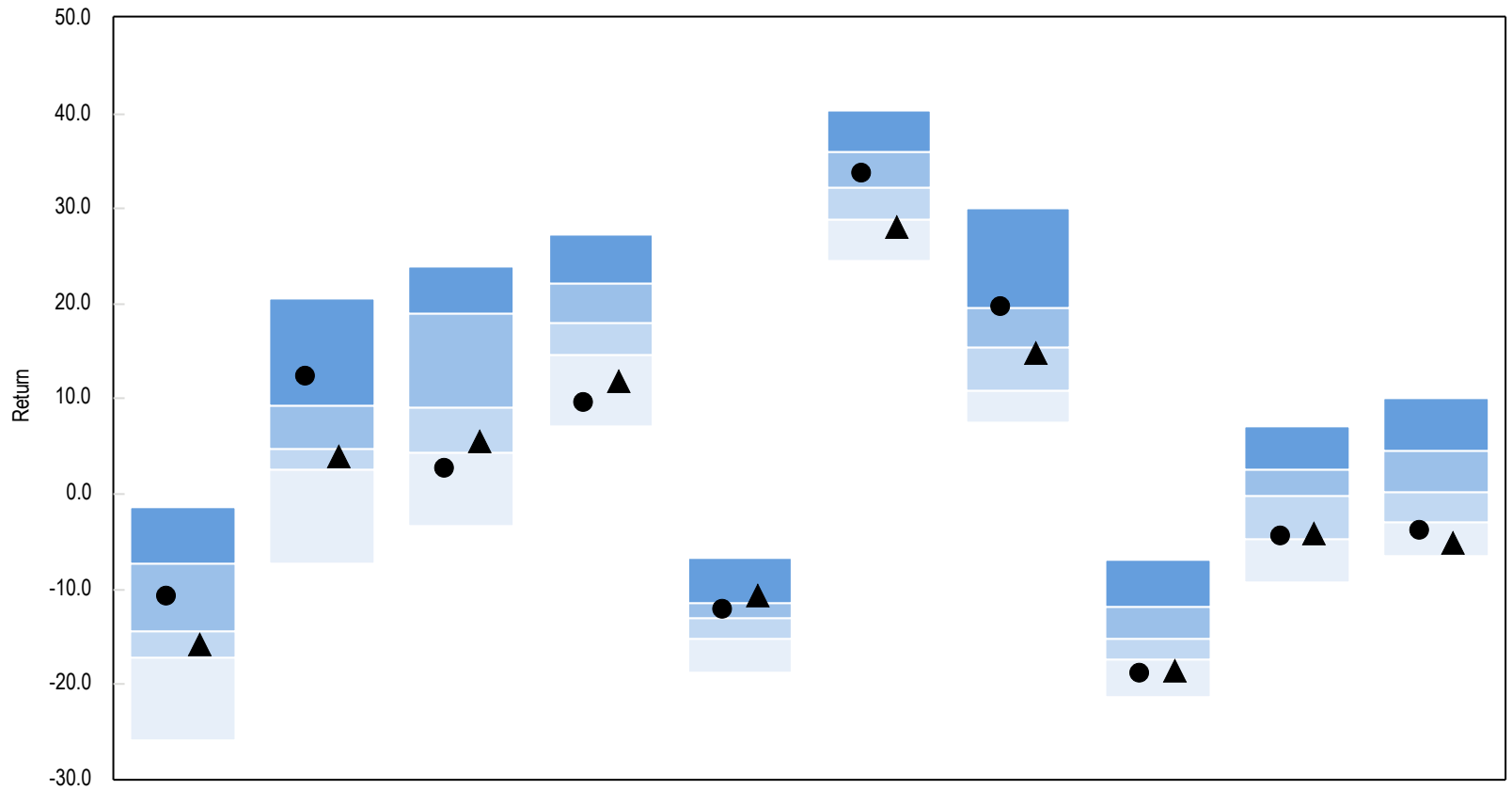


	Quarter	Fiscal YTD	1 Year	3 Years	5 Years	7 Years	10 Years
● DFA Emerging Markets Value	10.27 (87)	-0.54 (78)	-10.74 (36)	1.02 (41)	-0.09 (64)	6.90 (47)	1.77 (88)
▲ MSCI Emerging Markets Value (Net)	9.77 (93)	-2.26 (89)	-15.83 (57)	-2.62 (89)	-1.59 (88)	4.47 (93)	0.06 (100)
5th Percentile	16.40	9.09	-1.31	4.17	4.18	10.59	6.17
1st Quartile	13.80	4.22	-7.37	2.38	2.03	7.60	3.65
Median	12.84	1.72	-14.31	0.21	0.50	6.45	3.01
3rd Quartile	11.03	-0.30	-17.13	-1.64	-0.62	5.63	2.20
95th Percentile	9.30	-3.55	-25.79	-4.27	-1.94	4.31	1.08
Population	49	49	49	45	38	32	26

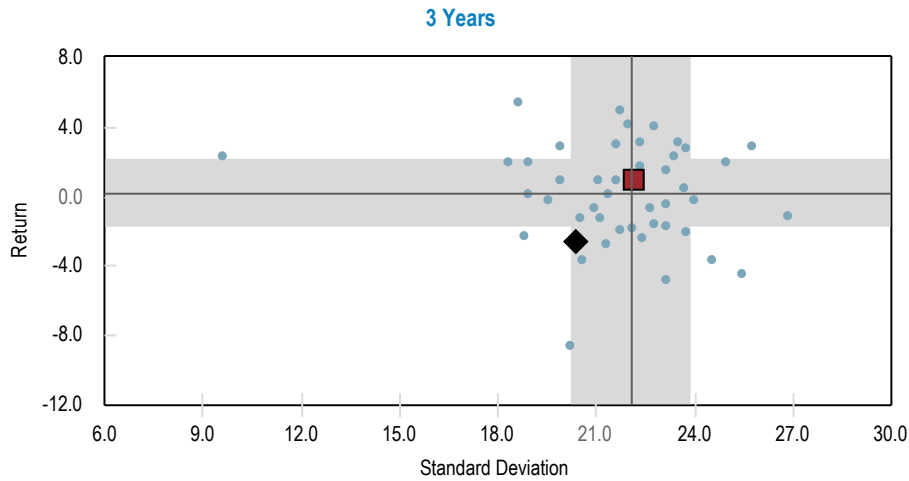
DFA Emerging Markets Value
Consecutive Performance Comparison (Net of Fees)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

DFA Emerging Markets Value vs. eV Emg Mkts All Cap Value Equity

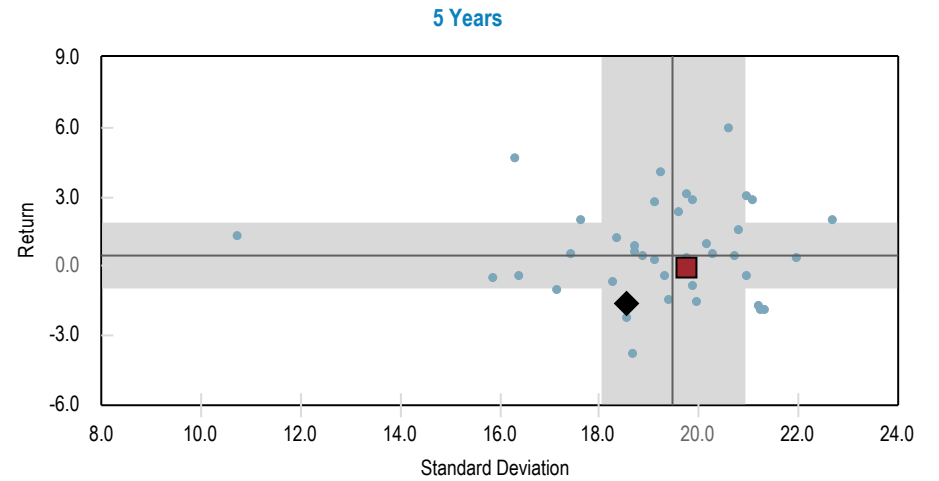


	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
● DFA Emerging Markets Value	-10.74 (36)	12.41 (20)	2.73 (82)	9.64 (91)	-11.93 (33)	33.76 (37)	19.84 (23)	-18.77 (88)	-4.41 (73)	-3.80 (81)
▲ MSCI Emerging Markets Value (Net)	-15.83 (57)	4.00 (61)	5.48 (70)	11.96 (89)	-10.74 (20)	28.07 (81)	14.90 (54)	-18.57 (88)	-4.08 (72)	-5.11 (89)
5th Percentile	-1.31	20.57	23.96	27.28	-6.62	40.40	30.07	-6.89	7.11	10.19
1st Quartile	-7.37	9.32	18.92	22.09	-11.41	35.95	19.65	-11.76	2.60	4.55
Median	-14.31	4.68	9.16	18.00	-12.92	32.23	15.39	-15.19	-0.27	0.22
3rd Quartile	-17.13	2.49	4.40	14.69	-15.24	28.80	10.95	-17.28	-4.73	-2.89
95th Percentile	-25.79	-7.27	-3.43	7.18	-18.81	24.60	7.47	-21.30	-9.35	-6.40
Population	49	54	58	59	56	53	49	47	51	51



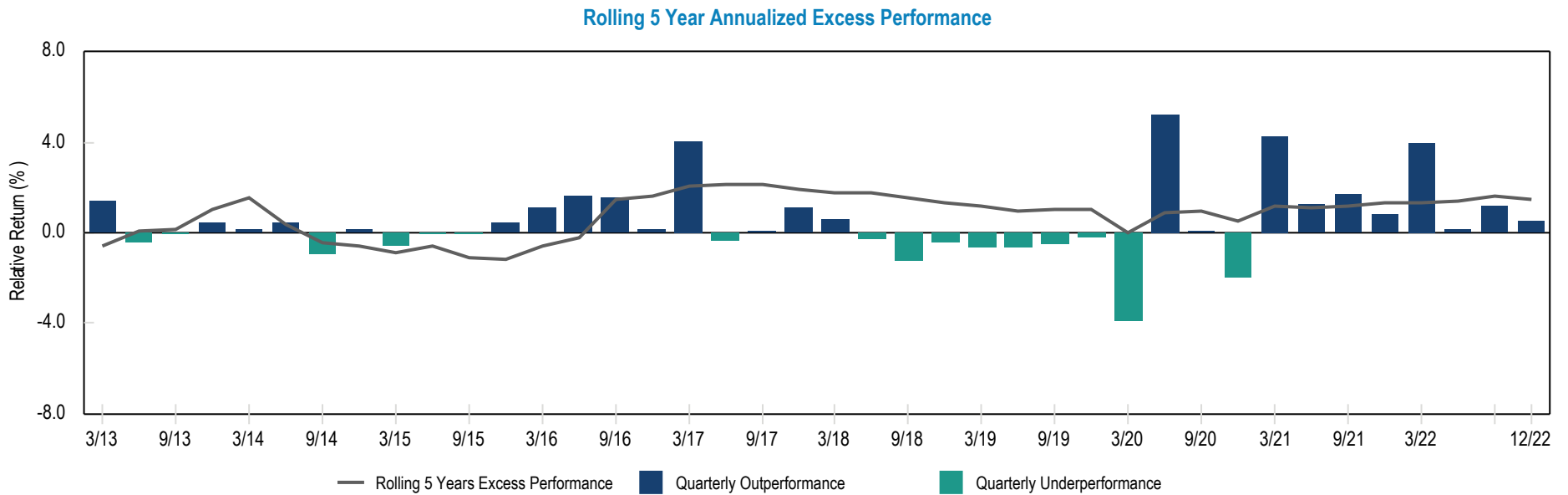
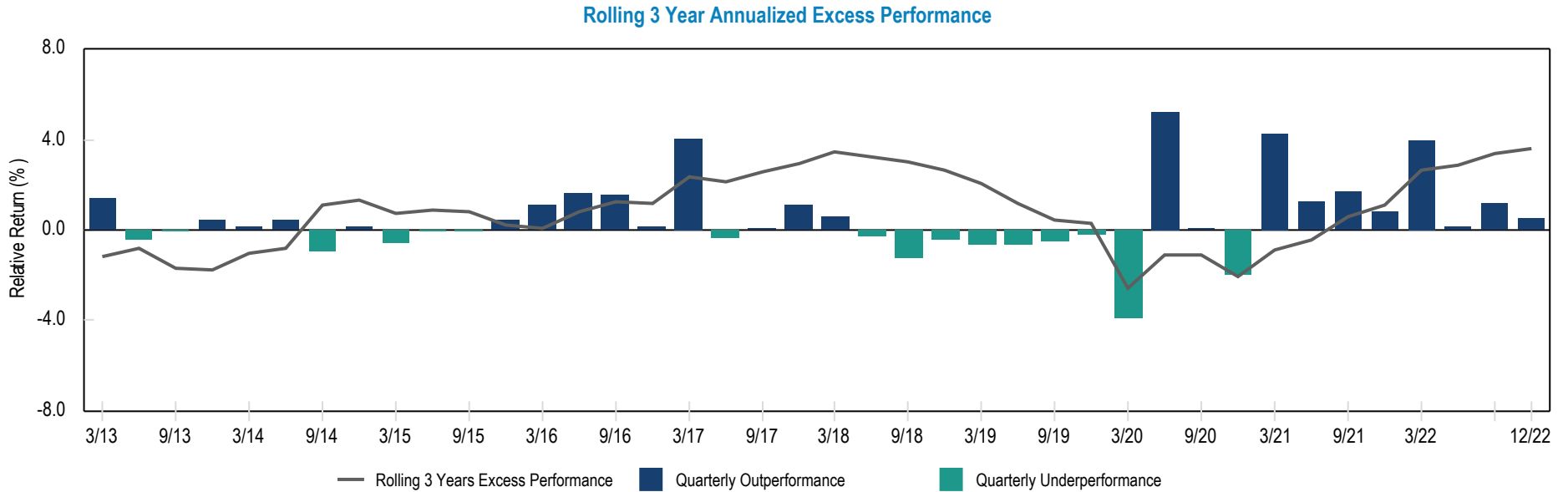
eV Emg Mkts All Cap Value Equity

	Return	Standard Deviation
■ DFA Emerging Markets Value	1.02	22.15
◆ MSCI Emerging Markets Value (Net)	-2.62	20.37
— Median	0.21	22.06
Population	45	45

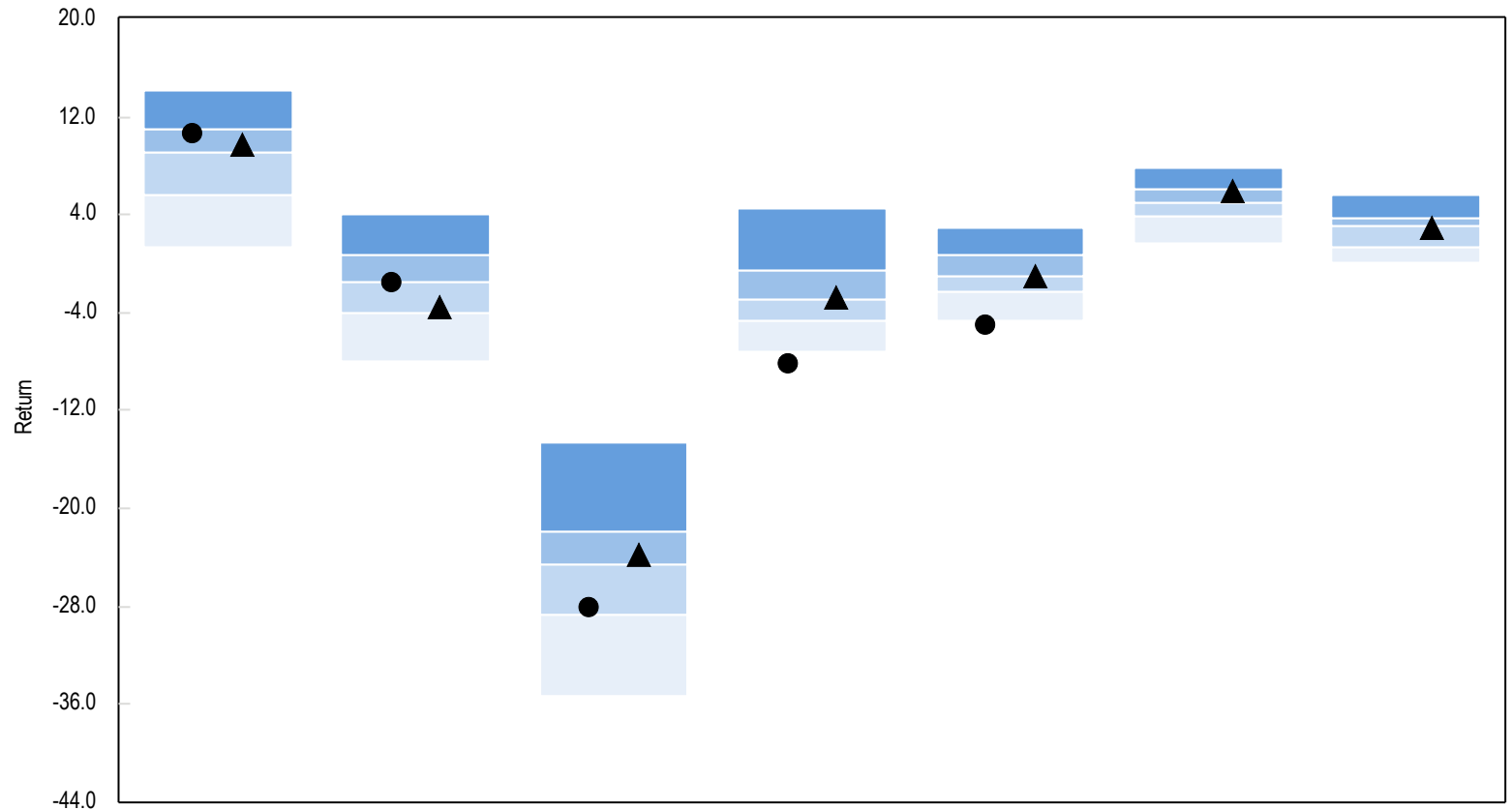


eV Emg Mkts All Cap Value Equity

	Return	Standard Deviation
■ DFA Emerging Markets Value	-0.09	19.74
◆ MSCI Emerging Markets Value (Net)	-1.59	18.56
— Median	0.50	19.49
Population	38	38

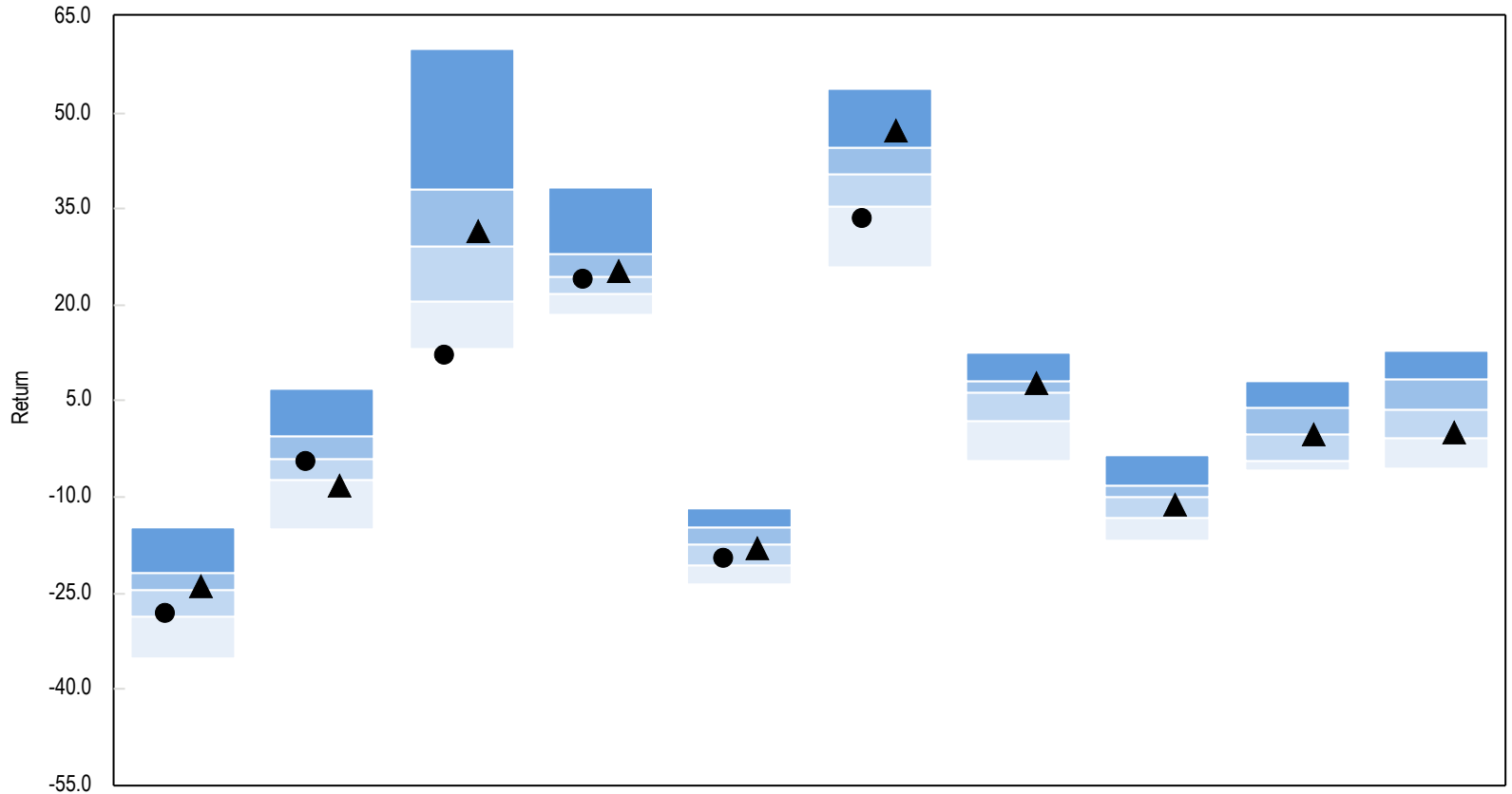


Harding Loevner Emerging Markets vs. eV Emg Mkts All Cap Growth Equity



	Quarter	Fiscal YTD	1 Year	3 Years	5 Years	7 Years	10 Years
● Harding Loevner Emerging Markets	10.74 (27)	-1.46 (50)	-28.07 (73)	-8.20 (99)	-5.02 (98)	-	-
▲ MSCI Emerging Markets Growth Index	9.71 (44)	-3.51 (65)	-23.74 (41)	-2.72 (50)	-1.09 (53)	5.99 (26)	2.93 (51)
5th Percentile	14.07	4.05	-14.64	4.46	2.92	7.81	5.54
1st Quartile	11.06	0.79	-21.82	-0.59	0.79	6.12	3.80
Median	9.06	-1.52	-24.51	-2.85	-1.04	5.05	3.03
3rd Quartile	5.57	-3.99	-28.72	-4.66	-2.31	3.84	1.33
95th Percentile	1.40	-7.98	-35.27	-7.14	-4.59	1.71	0.13
Population	54	54	54	49	40	36	27

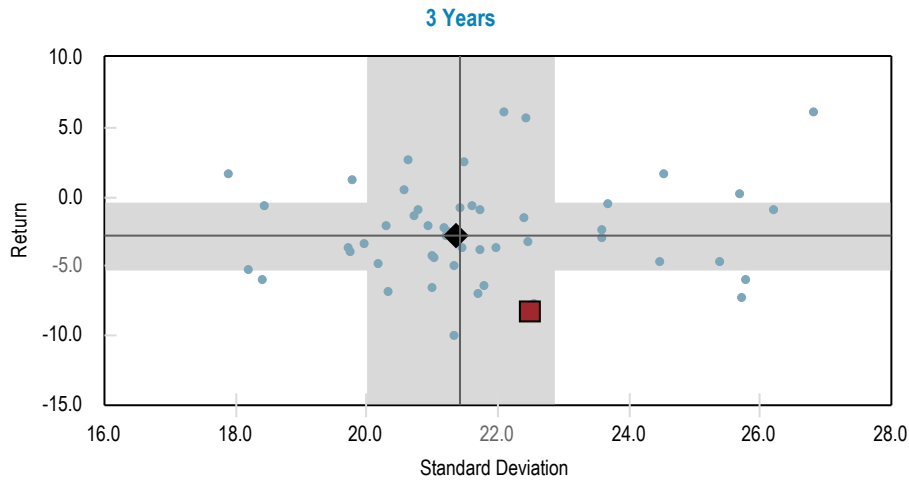
Harding Loevner Emerging Markets vs. eV Emg Mkts All Cap Growth Equity



	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
● Harding Loevner Emerging Markets	-28.07 (73)	-4.27 (51)	12.36 (96)	24.04 (54)	-19.48 (69)	33.62 (85)	-	-	-	-
▲ MSCI Emerging Markets Growth Index	-23.74 (41)	-8.24 (79)	31.58 (38)	25.44 (40)	-18.04 (59)	47.12 (14)	7.87 (32)	-11.12 (60)	-0.09 (46)	0.07 (72)
5th Percentile	-14.64	7.07	59.96	38.20	-11.71	53.65	12.44	-3.54	8.10	12.88
1st Quartile	-21.82	-0.53	37.92	28.03	-14.62	44.46	8.23	-8.13	4.03	8.44
Median	-24.51	-4.16	29.16	24.49	-17.39	40.41	6.34	-9.92	-0.31	3.80
3rd Quartile	-28.72	-7.42	20.48	21.62	-20.57	35.26	1.77	-13.18	-4.32	-0.64
95th Percentile	-35.27	-15.09	13.10	18.34	-23.70	25.86	-4.22	-16.74	-5.74	-5.59
Population	54	61	61	61	58	58	58	58	48	45

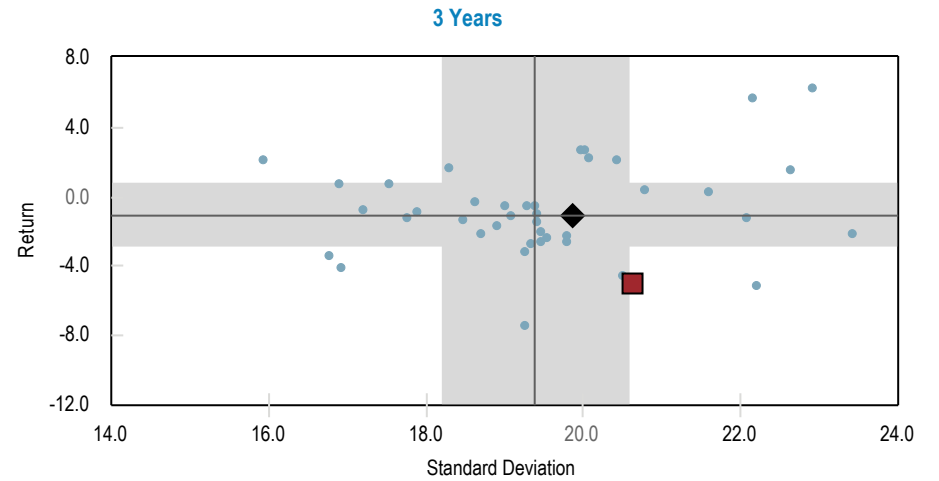
Harding Loevner Emerging Markets
Risk vs Return Three & Five Year (Net of Fees)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022



eV Emg Mkts All Cap Growth Equity

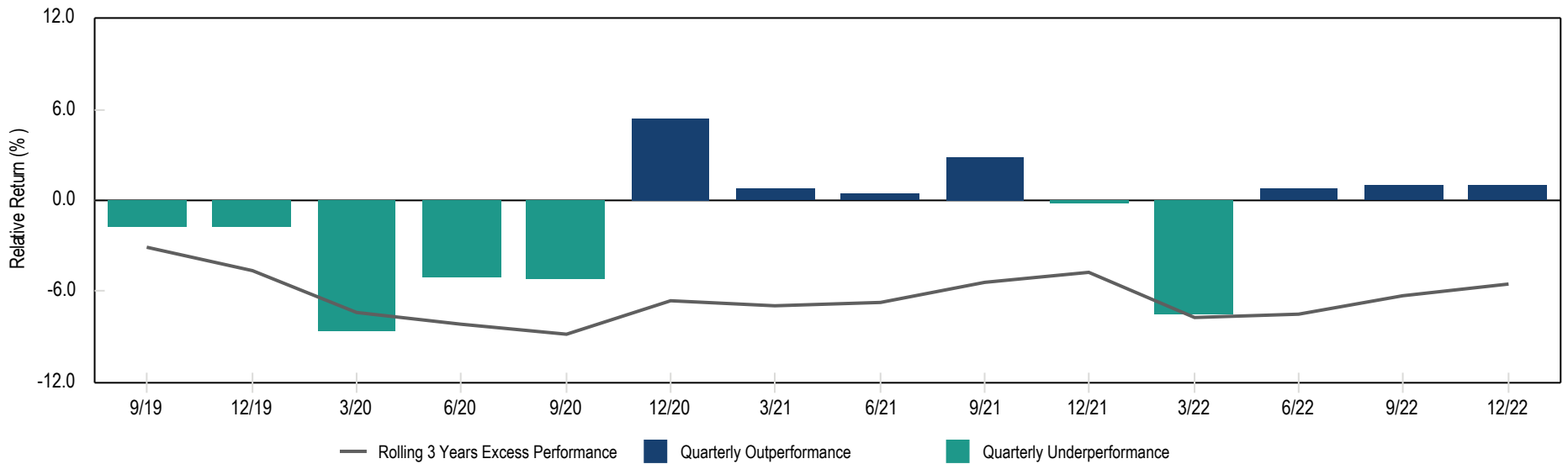
	Return	Standard Deviation
■ Harding Loevner Emerging Markets	-8.20	22.49
◆ MSCI Emerging Markets Growth Index	-2.72	21.35
— Median	-2.85	21.43
Population	49	49



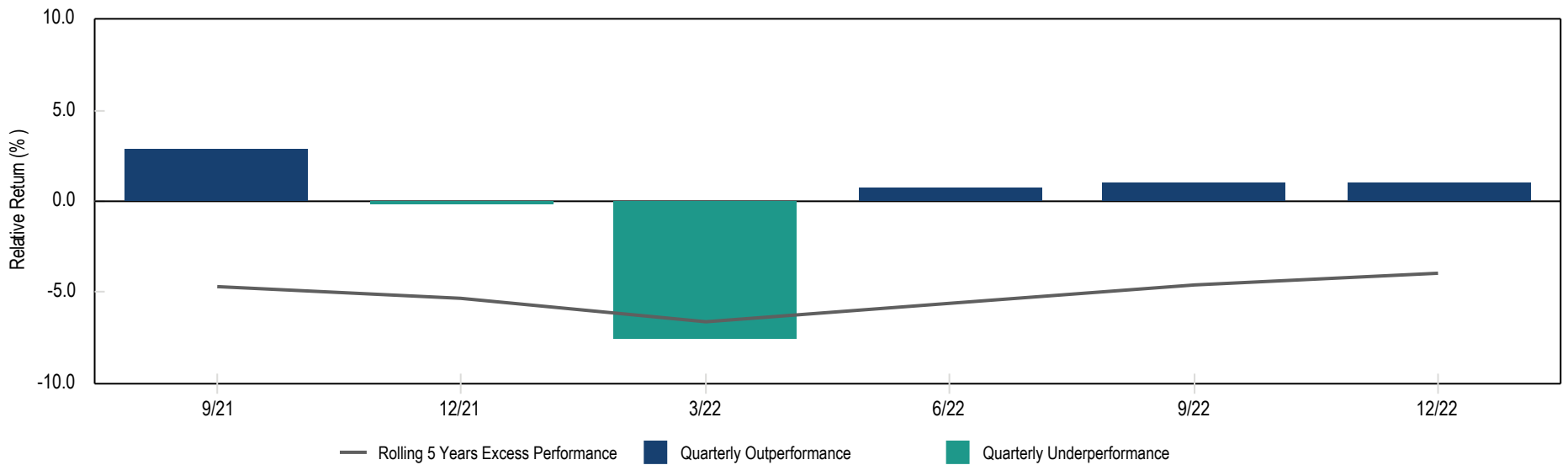
eV Emg Mkts All Cap Growth Equity

	Return	Standard Deviation
■ Harding Loevner Emerging Markets	-5.02	20.62
◆ MSCI Emerging Markets Growth Index	-1.09	19.86
— Median	-1.04	19.39
Population	40	40

Rolling 3 Year Annualized Excess Performance



Rolling 5 Year Annualized Excess Performance

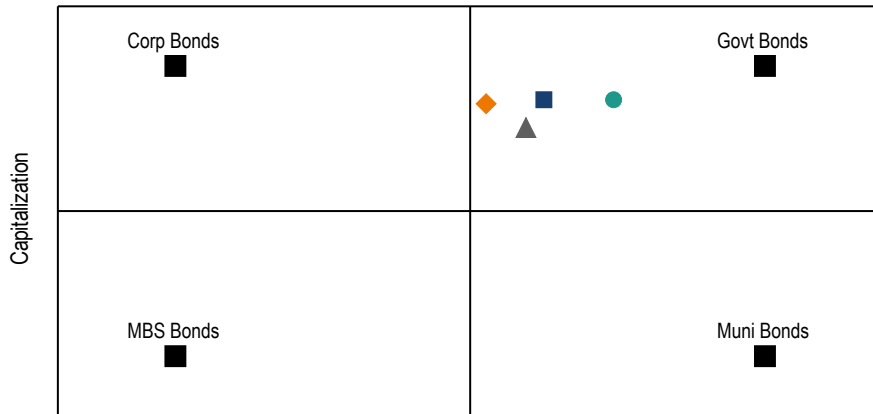


Total Fixed Income
Asset Class Overview (Net of Fees)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018
Total Fixed Income	232,616,435	1.7	-3.3	-14.2	-1.8	0.6	1.5	-14.2	0.6	9.8	9.5	-0.8
<i>Blmbg. U.S. Aggregate Index</i>		1.9	-3.0	-13.0	-2.7	0.0	1.1	-13.0	-1.5	7.5	8.7	0.0
Ducenta Squared	96,256,431	0.9	-3.6	-14.9	-2.6	0.3	1.7	-14.9	-0.6	9.1	9.9	-0.1
<i>Blmbg. U.S. Aggregate Index</i>		1.9	-3.0	-13.0	-2.7	0.0	1.1	-13.0	-1.5	7.5	8.7	0.0
<i>eV US Core Plus Fixed Inc Rank</i>		100	96	93	85	70	44	93	53	39	44	26
MackKay Shields Core Plus Opportunities	95,612,474	2.4	-2.9	-14.5	-2.2	0.3	-	-14.5	-0.5	9.9	9.7	-1.0
<i>Blmbg. U.S. Aggregate Index</i>		1.9	-3.0	-13.0	-2.7	0.0	-	-13.0	-1.5	7.5	8.7	0.0
<i>eV US Core Plus Fixed Inc Rank</i>		26	72	89	56	66	-	89	51	22	53	75
BlackRock US TIPS	40,747,531	1.9	-3.3	-11.9	1.2	2.1	1.1	-11.9	5.9	11.2	8.5	-1.2
<i>Blmbg. U.S. TIPS</i>		2.0	-3.2	-11.8	1.2	2.1	1.1	-11.8	6.0	11.0	8.4	-1.3
<i>eV US TIPS / Inflation Fixed Inc Rank</i>		69	73	66	53	49	29	66	28	32	32	41

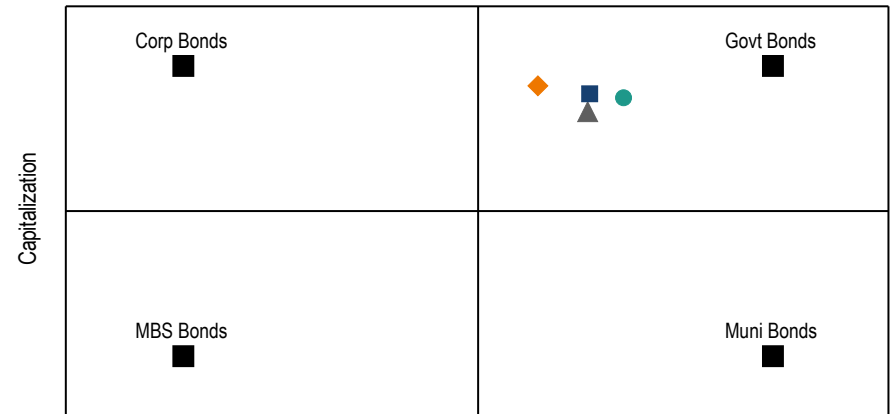
Fixed Income Style Map
3 Years Ending December 31, 2022



Manager Style

- Total Fixed Income
- Ducenta Squared
- MacKay Shields Core Plus Opportunities
- BlackRock US TIPS

Fixed Income Style Map
5 Years Ending December 31, 2022



Manager Style

- Total Fixed Income
- Ducenta Squared
- MacKay Shields Core Plus Opportunities
- BlackRock US TIPS

Total Fixed Income
Asset Class Overview (Net of Fees)

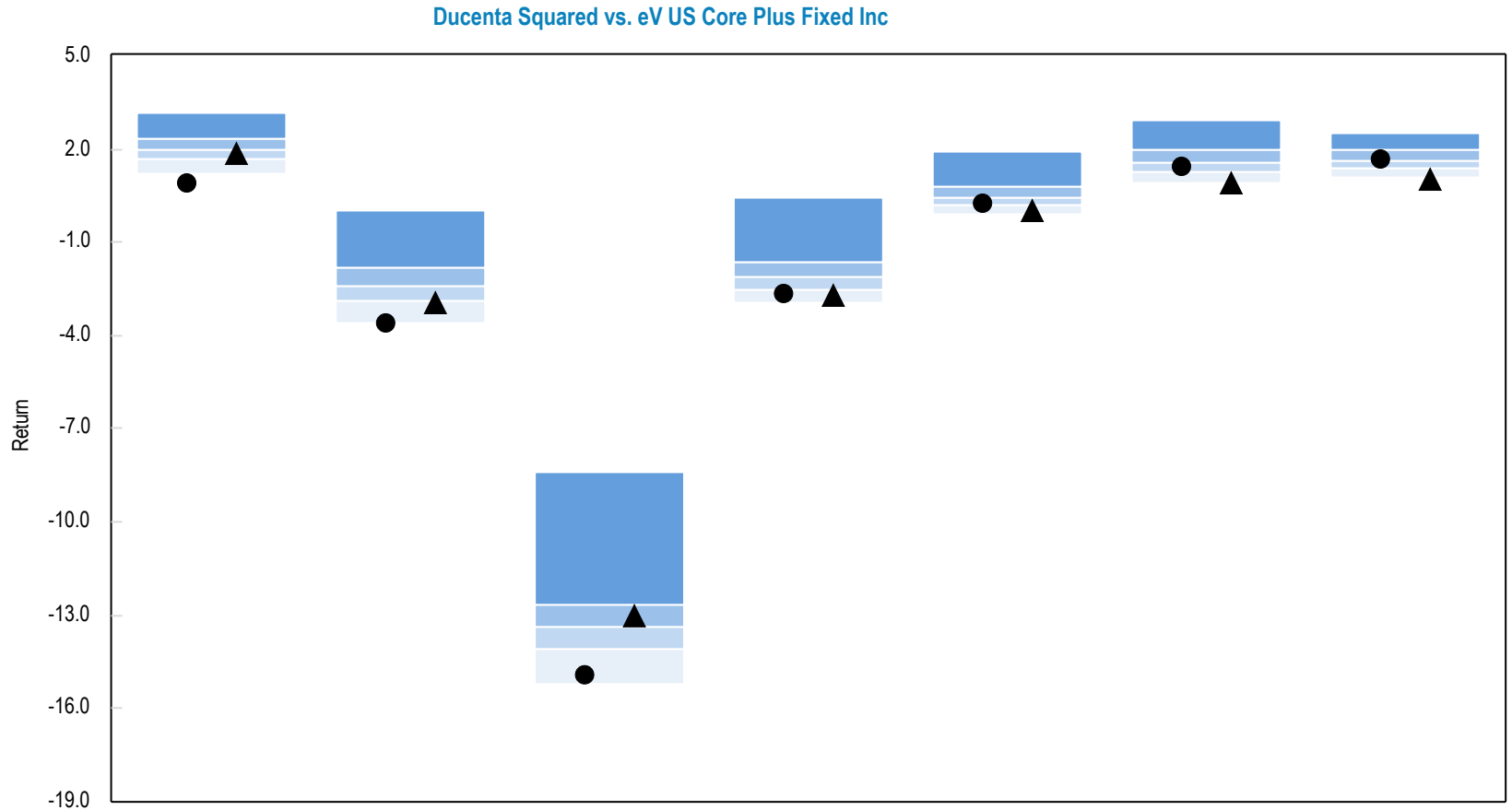
Imperial County Employees' Retirement System
Period Ending: December 31, 2022

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018
Total Fixed Income	232,616,435	100.0	1.7	-3.3	-14.2	-1.8	0.6	1.5	-14.2	0.6	9.8	9.5	-0.8
<i>Blmbg. U.S. Aggregate Index</i>			1.9	-3.0	-13.0	-2.7	0.0	1.1	-13.0	-1.5	7.5	8.7	0.0
Ducenta Squared	96,256,431	41.4	0.9	-3.6	-14.9	-2.6	0.3	1.7	-14.9	-0.6	9.1	9.9	-0.1
<i>Blmbg. U.S. Aggregate Index</i>			1.9	-3.0	-13.0	-2.7	0.0	1.1	-13.0	-1.5	7.5	8.7	0.0
MacKay Shields Core Plus Opportunities	95,612,474	41.1	2.4	-2.9	-14.5	-2.2	0.3	-	-14.5	-0.5	9.9	9.7	-1.0
<i>Blmbg. U.S. Aggregate Index</i>			1.9	-3.0	-13.0	-2.7	0.0	-	-13.0	-1.5	7.5	8.7	0.0
BlackRock US TIPS	40,747,531	17.5	1.9	-3.3	-11.9	1.2	2.1	1.1	-11.9	5.9	11.2	8.5	-1.2
<i>Blmbg. U.S. TIPS</i>			2.0	-3.2	-11.8	1.2	2.1	1.1	-11.8	6.0	11.0	8.4	-1.3

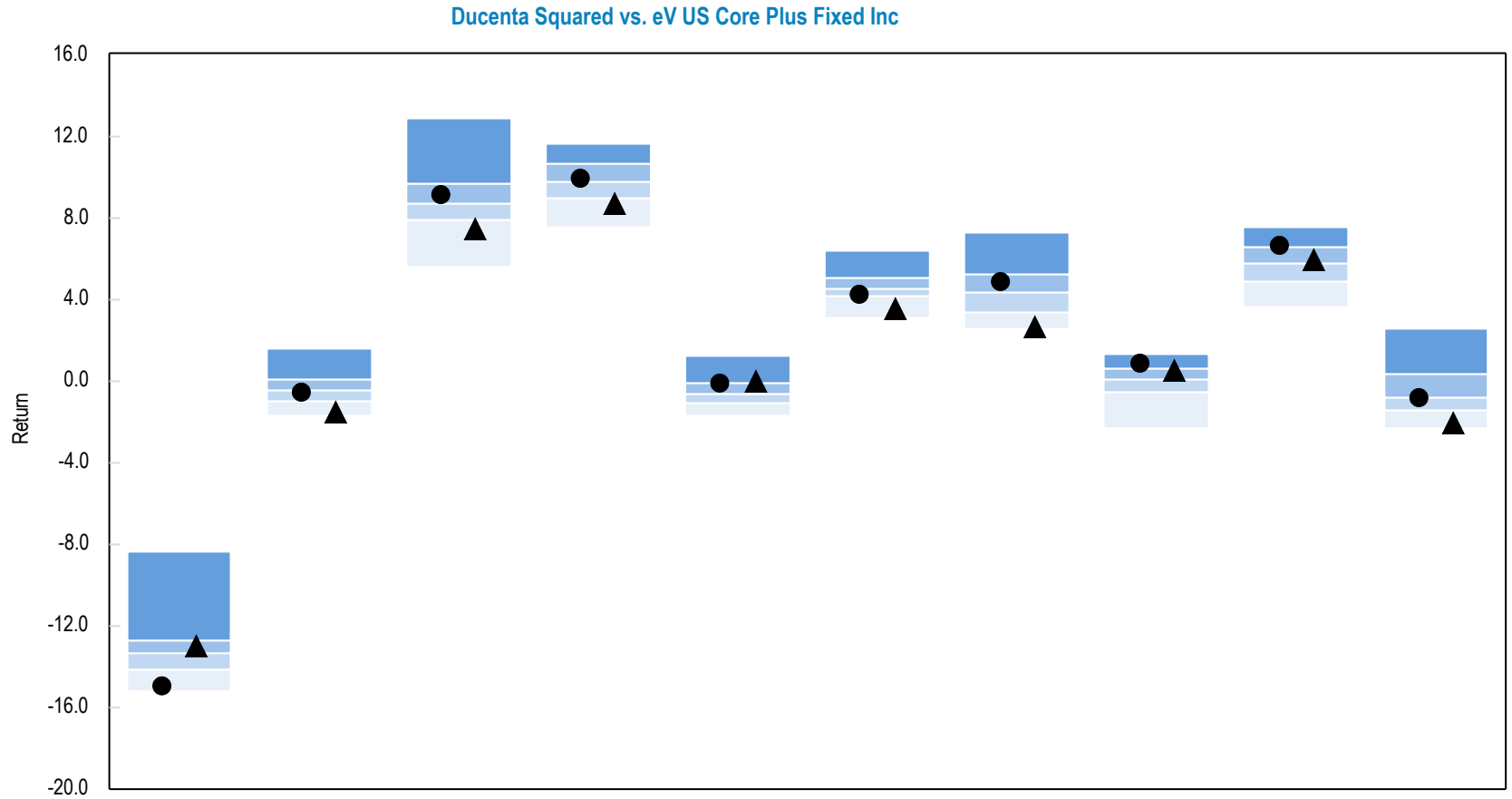
	Total Fixed Income	Ducenta Squared	MacKay Shields Core Plus Opportunities	BlackRock US TIPS	Blmbg. U.S. Aggregate Index
Total Fixed Income	1.00				
Ducenta Squared	0.99	1.00			
MacKay Shields Core Plus Opportunities	0.99	0.99	1.00		
BlackRock US TIPS	0.91	0.84	0.87	1.00	
Blmbg. U.S. Aggregate Index	0.96	0.97	0.95	0.83	1.00

Ducenta Squared
Cumulative Performance Comparison (Net of Fees)

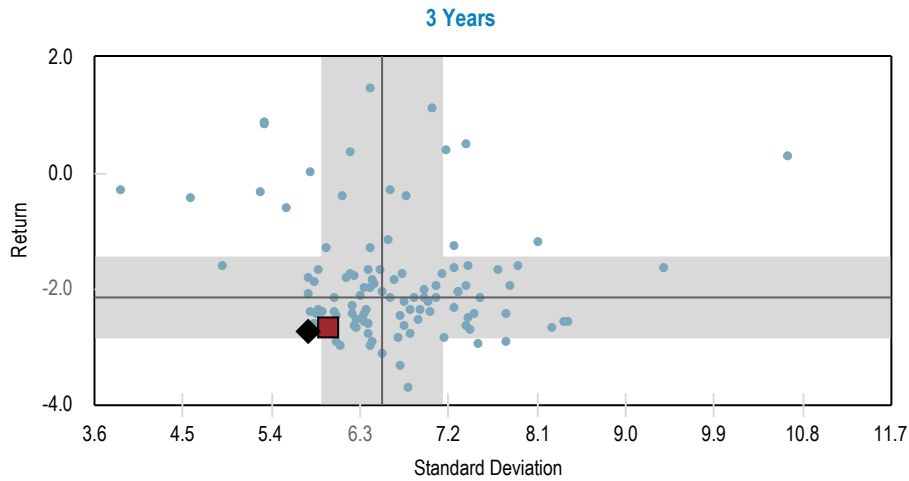
Imperial County Employees' Retirement System
Period Ending: December 31, 2022



	Quarter	Fiscal YTD	1 Year	3 Years	5 Years	7 Years	10 Years
● Ducenta Squared	0.92 (100)	-3.60 (96)	-14.94 (93)	-2.64 (85)	0.26 (70)	1.47 (62)	1.68 (44)
▲ Blmbg. U.S. Aggregate Index	1.87 (59)	-2.97 (79)	-13.01 (38)	-2.71 (88)	0.02 (89)	0.89 (97)	1.06 (97)
5th Percentile	3.15	0.00	-8.39	0.41	1.91	2.92	2.54
1st Quartile	2.36	-1.84	-12.67	-1.65	0.77	1.96	1.96
Median	2.01	-2.38	-13.37	-2.13	0.43	1.56	1.62
3rd Quartile	1.68	-2.90	-14.11	-2.52	0.21	1.30	1.38
95th Percentile	1.21	-3.59	-15.19	-2.92	-0.12	0.93	1.07
Population	111	111	110	106	99	95	87

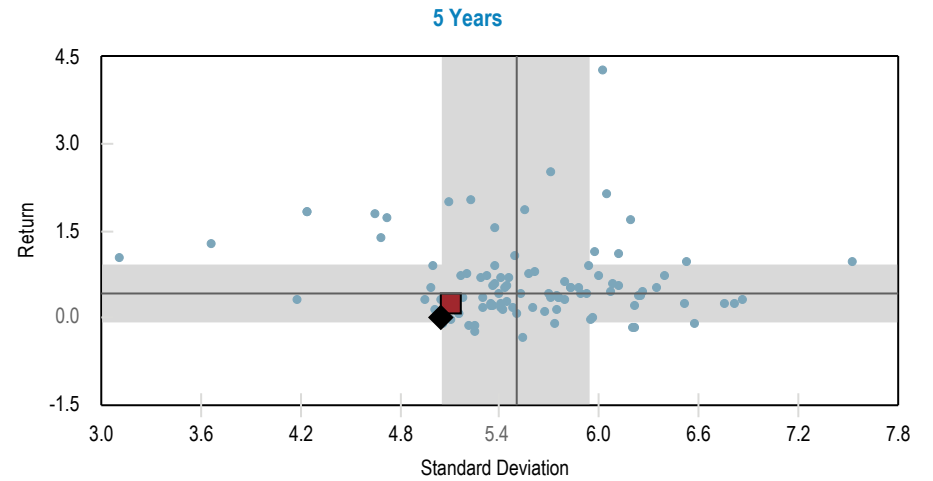


	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
● Ducenta Squared	-14.94 (93)	-0.57 (53)	9.11 (39)	9.91 (44)	-0.13 (26)	4.25 (67)	4.85 (33)	0.89 (15)	6.67 (24)	-0.83 (53)
▲ Blmbg. U.S. Aggregate Index	-13.01 (38)	-1.55 (92)	7.51 (82)	8.72 (81)	0.01 (25)	3.54 (91)	2.65 (93)	0.55 (28)	5.97 (42)	-2.02 (91)
5th Percentile	-8.39	1.64	12.86	11.64	1.20	6.41	7.29	1.35	7.53	2.57
1st Quartile	-12.67	0.08	9.66	10.62	-0.07	5.10	5.21	0.60	6.60	0.38
Median	-13.37	-0.43	8.71	9.74	-0.61	4.56	4.36	0.11	5.81	-0.77
3rd Quartile	-14.11	-1.01	7.91	9.02	-1.03	4.14	3.39	-0.52	4.85	-1.39
95th Percentile	-15.19	-1.72	5.63	7.53	-1.67	3.10	2.58	-2.27	3.67	-2.29
Population	110	139	142	143	141	142	139	138	136	134



eV US Core Plus Fixed Inc

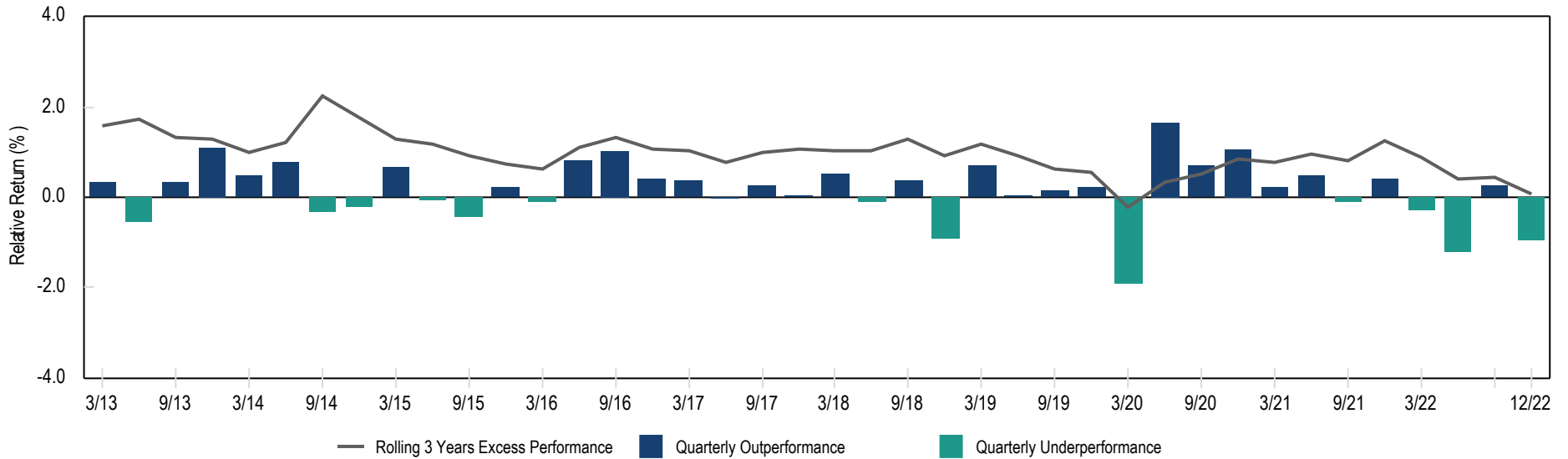
	Return	Standard Deviation
■ Ducenta Squared	-2.64	5.98
◆ Blmbg. U.S. Aggregate Index	-2.71	5.77
— Median	-2.13	6.52
Population	106	106



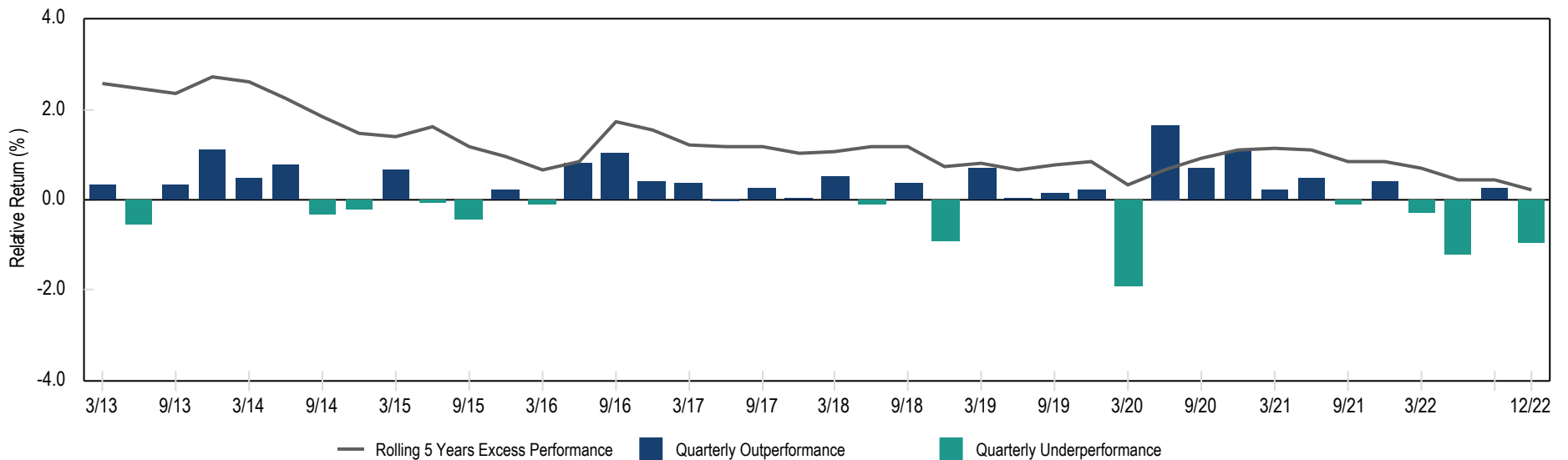
eV US Core Plus Fixed Inc

	Return	Standard Deviation
■ Ducenta Squared	0.26	5.11
◆ Blmbg. U.S. Aggregate Index	0.02	5.04
— Median	0.43	5.50
Population	99	99

Rolling 3 Year Annualized Excess Performance

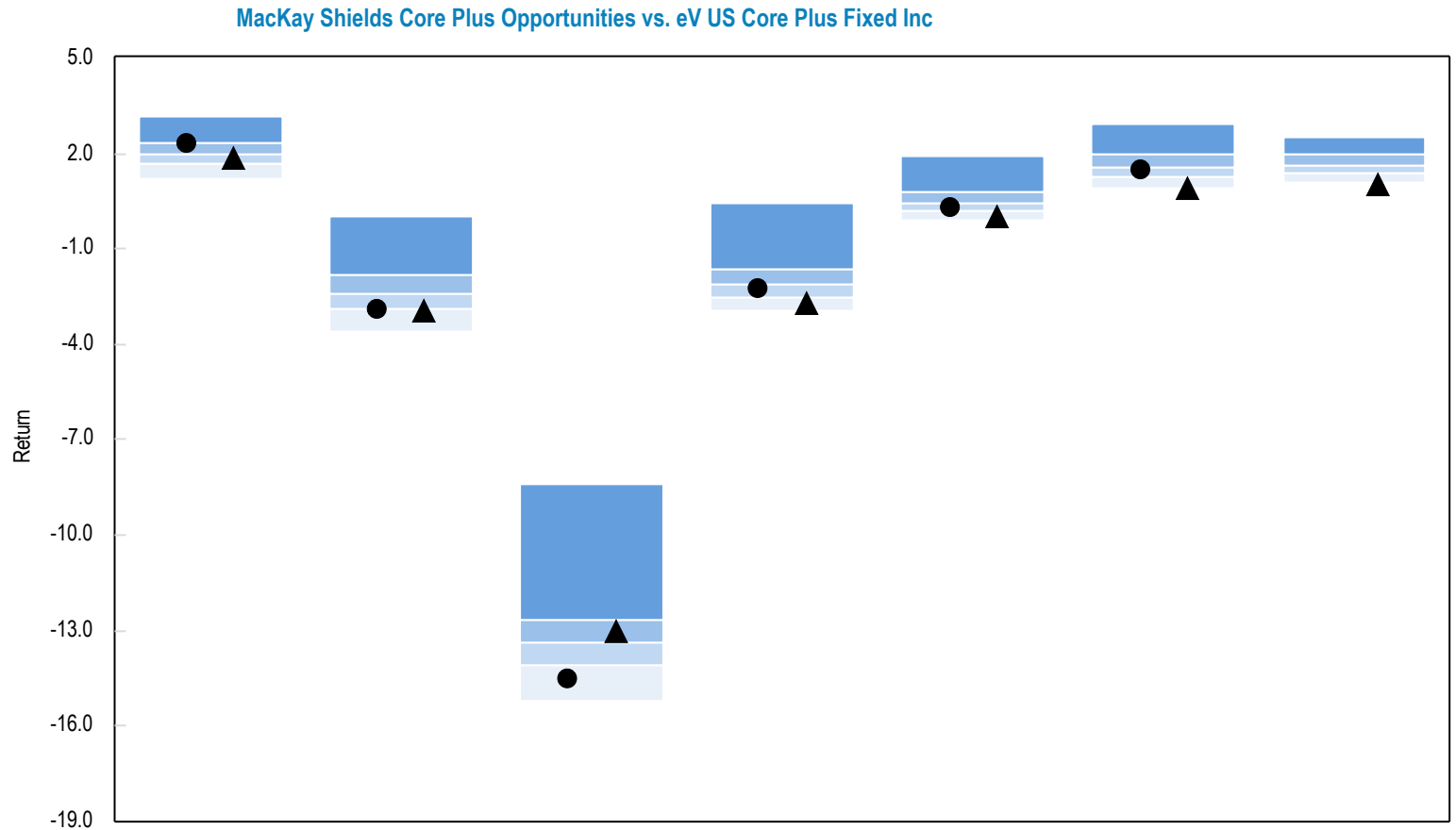


Rolling 5 Year Annualized Excess Performance



MacKay Shields Core Plus Opportunities
Cumulative Performance Comparison (Net of Fees)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

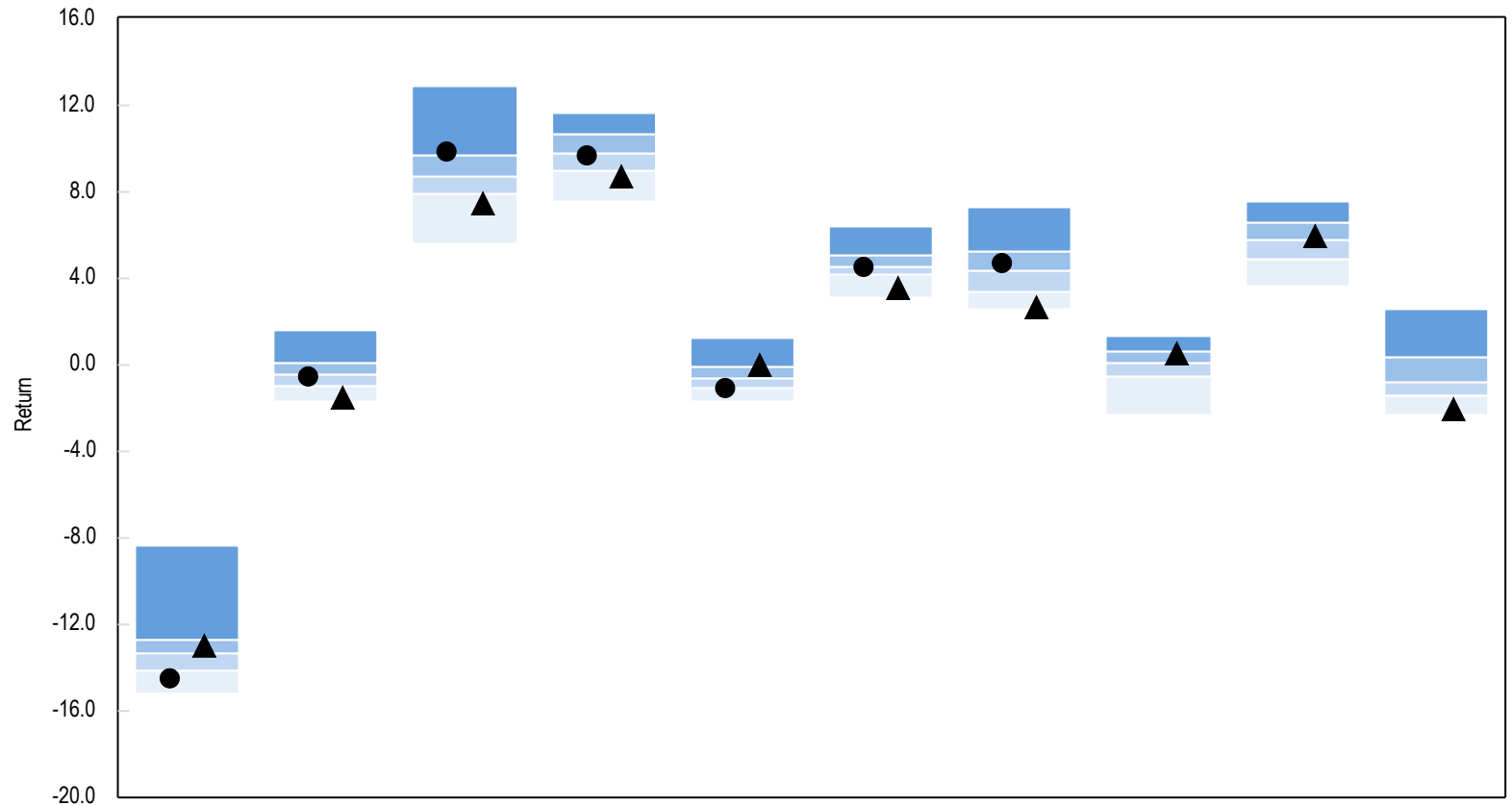


	Quarter	Fiscal YTD	1 Year	3 Years	5 Years	7 Years	10 Years
● MacKay Shields Core Plus Opportunities	2.36 (26)	-2.87 (72)	-14.51 (89)	-2.22 (56)	0.29 (66)	1.51 (57)	-
▲ Blmbg. U.S. Aggregate Index	1.87 (59)	-2.97 (79)	-13.01 (38)	-2.71 (88)	0.02 (89)	0.89 (97)	1.06 (97)
5th Percentile	3.15	0.00	-8.39	0.41	1.91	2.92	2.54
1st Quartile	2.36	-1.84	-12.67	-1.65	0.77	1.96	1.96
Median	2.01	-2.38	-13.37	-2.13	0.43	1.56	1.62
3rd Quartile	1.68	-2.90	-14.11	-2.52	0.21	1.30	1.38
95th Percentile	1.21	-3.59	-15.19	-2.92	-0.12	0.93	1.07
Population	111	111	110	106	99	95	87

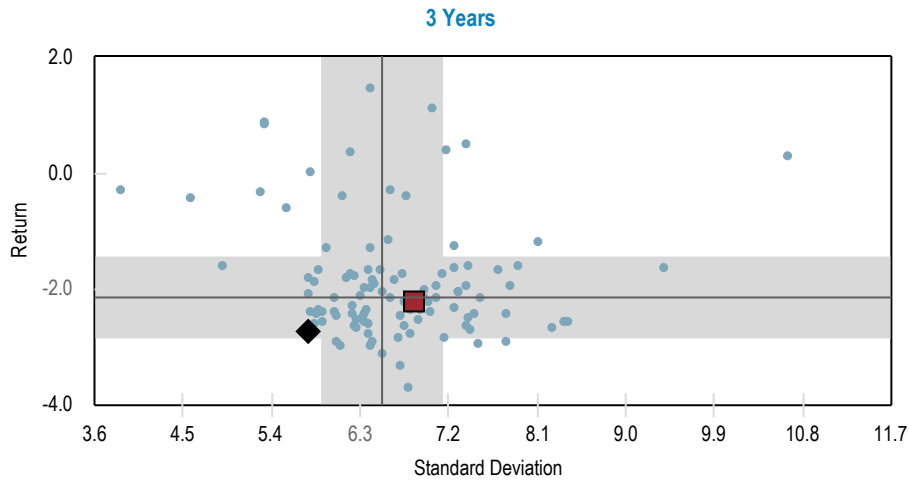
MacKay Shields Core Plus Opportunities
 Consecutive Performance Comparison (Net of Fees)

Imperial County Employees' Retirement System
 Period Ending: December 31, 2022

MacKay Shields Core Plus Opportunities vs. eV US Core Plus Fixed Inc

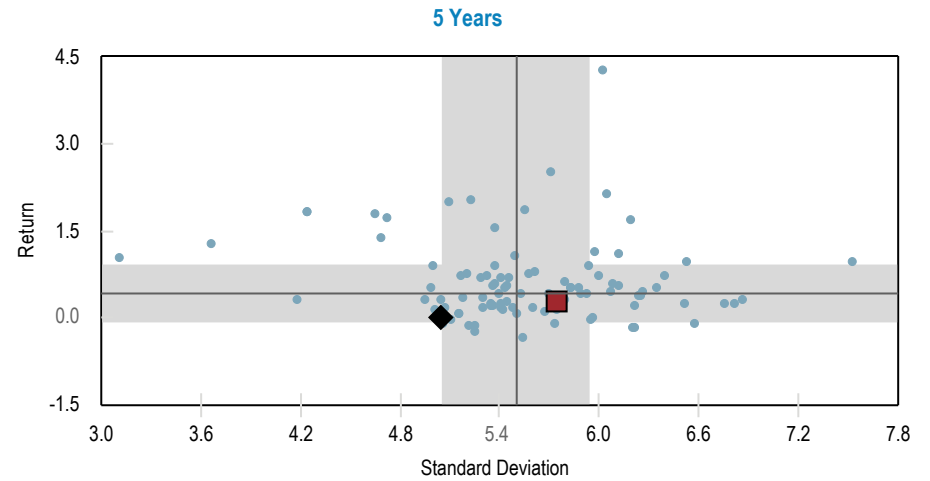


	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
● MacKay Shields Core Plus Opportunities	-14.51 (89)	-0.49 (51)	9.91 (22)	9.67 (53)	-1.03 (75)	4.53 (52)	4.69 (38)	-	-	-
▲ Blmbg. U.S. Aggregate Index	-13.01 (38)	-1.55 (92)	7.51 (82)	8.72 (81)	0.01 (25)	3.54 (91)	2.65 (93)	0.55 (28)	5.97 (42)	-2.02 (91)
5th Percentile	-8.39	1.64	12.86	11.64	1.20	6.41	7.29	1.35	7.53	2.57
1st Quartile	-12.67	0.08	9.66	10.62	-0.07	5.10	5.21	0.60	6.60	0.38
Median	-13.37	-0.43	8.71	9.74	-0.61	4.56	4.36	0.11	5.81	-0.77
3rd Quartile	-14.11	-1.01	7.91	9.02	-1.03	4.14	3.39	-0.52	4.85	-1.39
95th Percentile	-15.19	-1.72	5.63	7.53	-1.67	3.10	2.58	-2.27	3.67	-2.29
Population	110	139	142	143	141	142	139	138	136	134



eV US Core Plus Fixed Inc

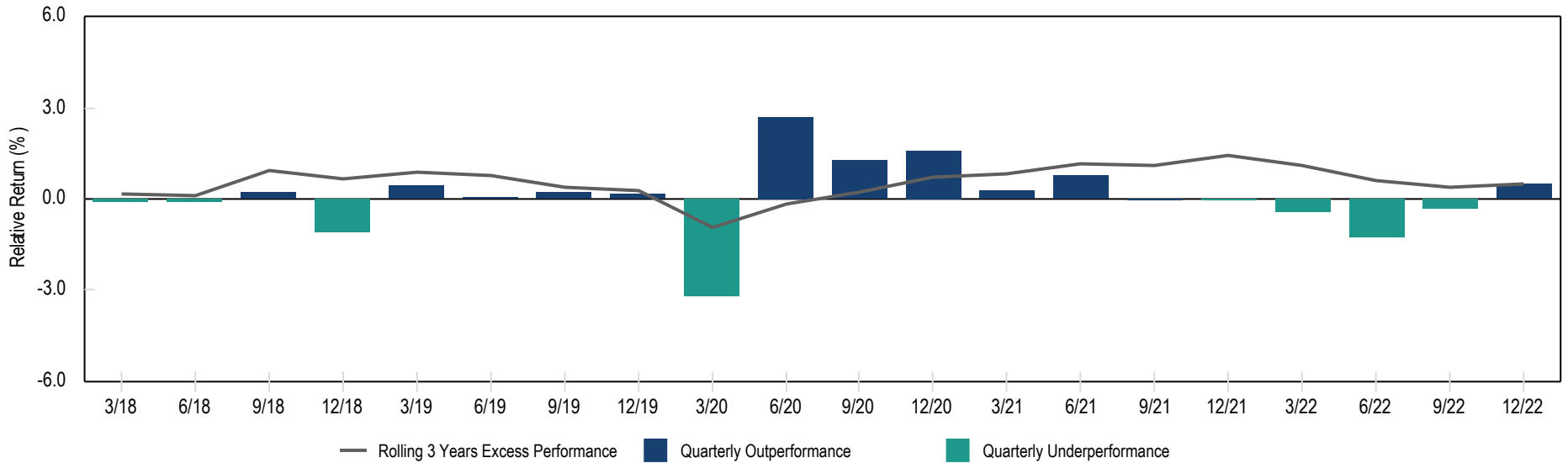
	Return	Standard Deviation
■ MacKay Shields Core Plus Opportunities	-2.22	6.85
◆ Blmbg. U.S. Aggregate Index	-2.71	5.77
— Median	-2.13	6.52
Population	106	106



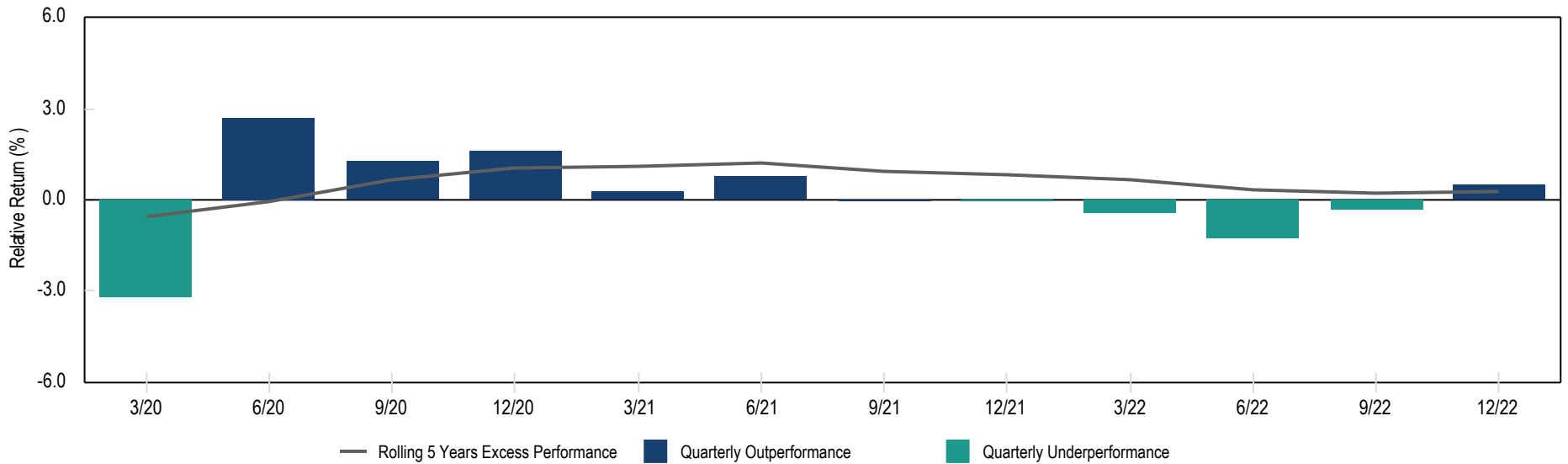
eV US Core Plus Fixed Inc

	Return	Standard Deviation
■ MacKay Shields Core Plus Opportunities	0.29	5.74
◆ Blmbg. U.S. Aggregate Index	0.02	5.04
— Median	0.43	5.50
Population	99	99

Rolling 3 Year Annualized Excess Performance

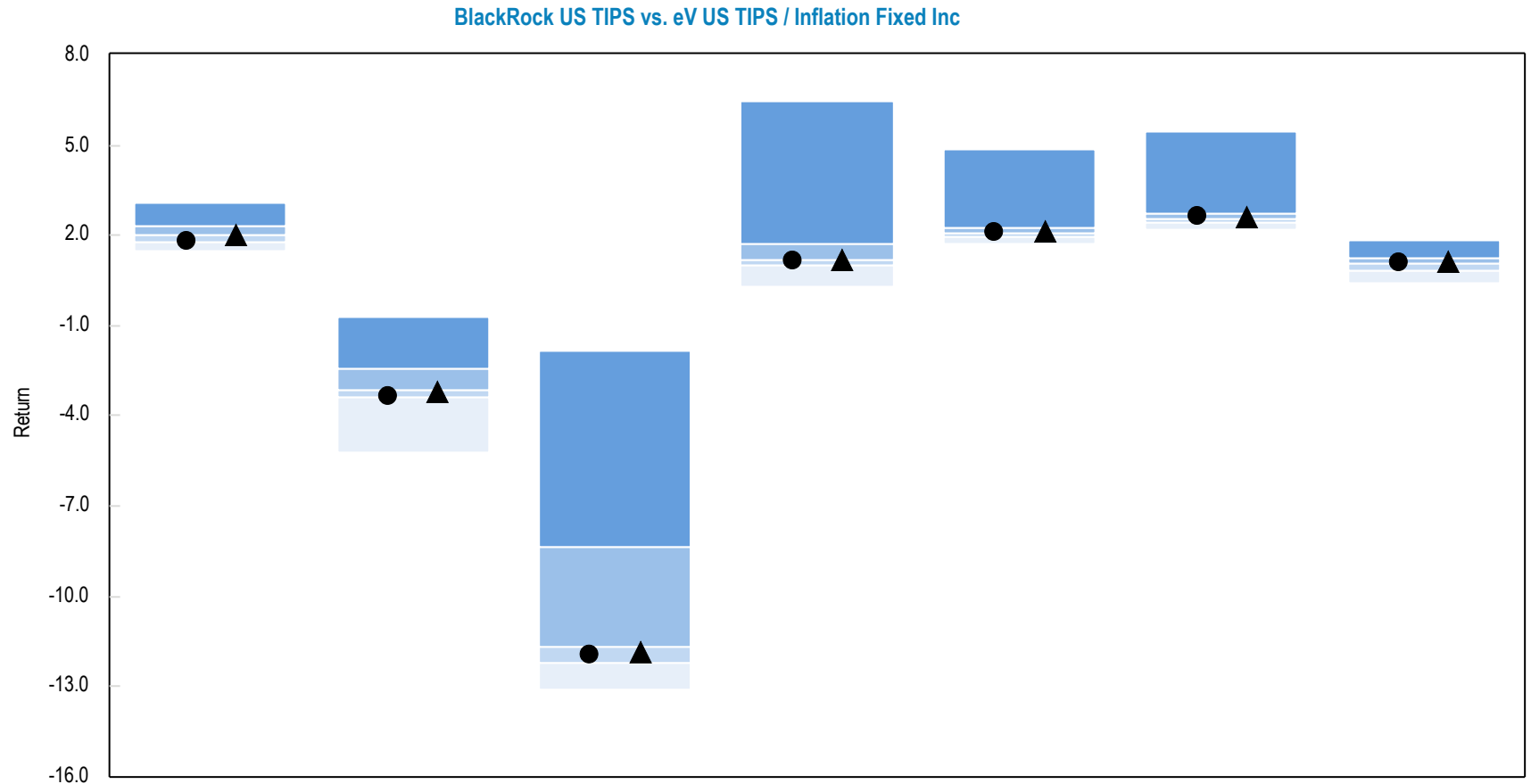


Rolling 5 Year Annualized Excess Performance



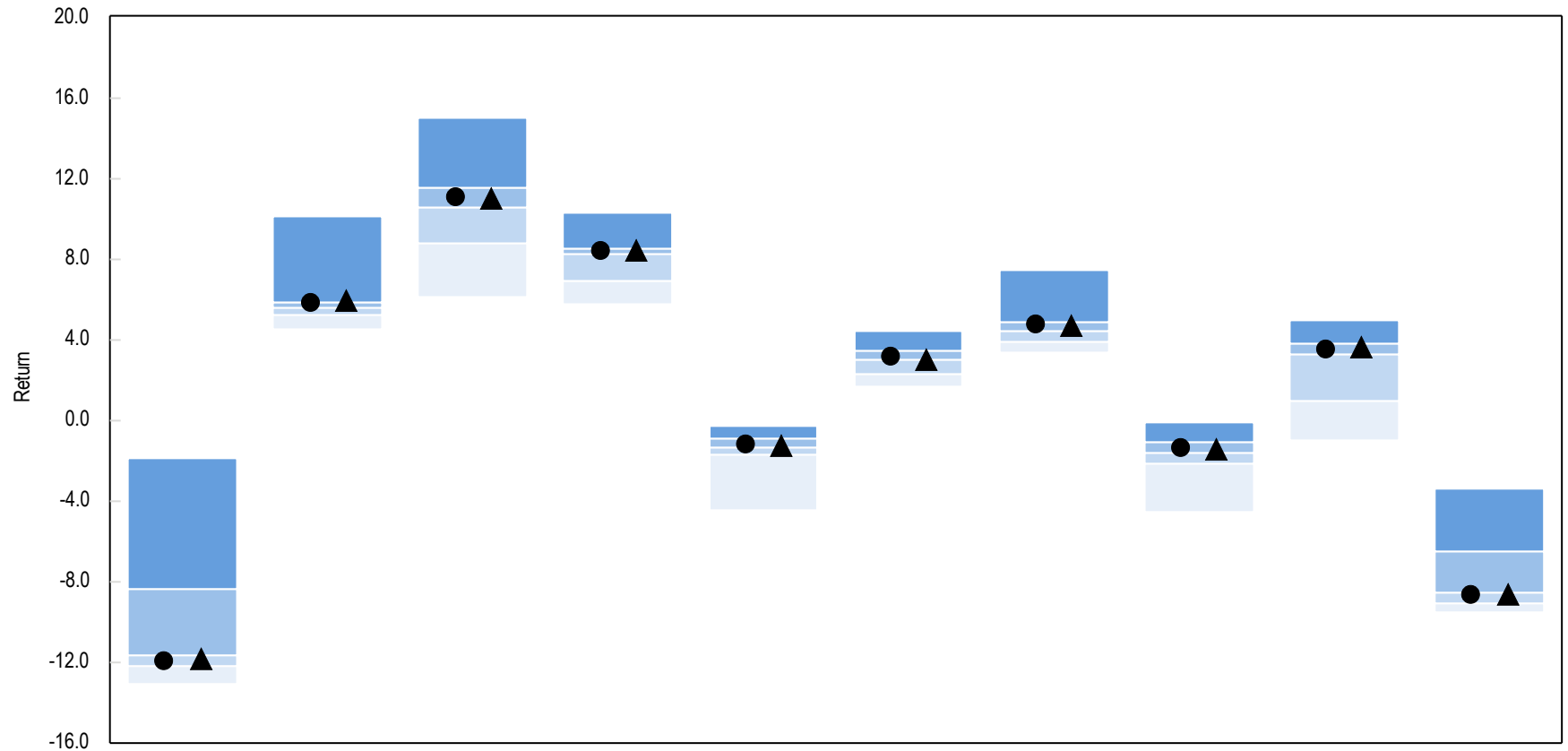
BlackRock US TIPS
Cumulative Performance Comparison (Net of Fees)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

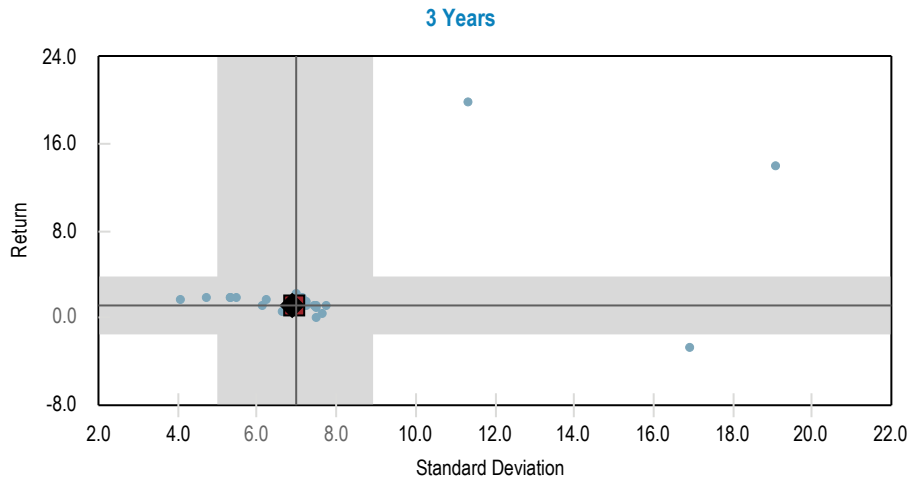


	Quarter	Fiscal YTD	1 Year	3 Years	5 Years	7 Years	10 Years
● BlackRock US TIPS	1.86 (69)	-3.33 (73)	-11.94 (66)	1.19 (53)	2.12 (49)	2.64 (38)	1.15 (29)
▲ Blmbg. U.S. TIPS	2.04 (45)	-3.21 (66)	-11.85 (61)	1.21 (51)	2.11 (49)	2.60 (44)	1.12 (31)
5th Percentile	3.06	-0.68	-1.86	6.46	4.83	5.46	1.85
1st Quartile	2.34	-2.42	-8.35	1.73	2.24	2.74	1.25
Median	2.00	-3.12	-11.68	1.21	2.09	2.56	1.06
3rd Quartile	1.79	-3.38	-12.18	1.03	1.93	2.42	0.82
95th Percentile	1.47	-5.22	-13.10	0.31	1.70	2.19	0.39
Population	34	34	34	34	33	32	29

BlackRock US TIPS vs. eV US TIPS / Inflation Fixed Inc

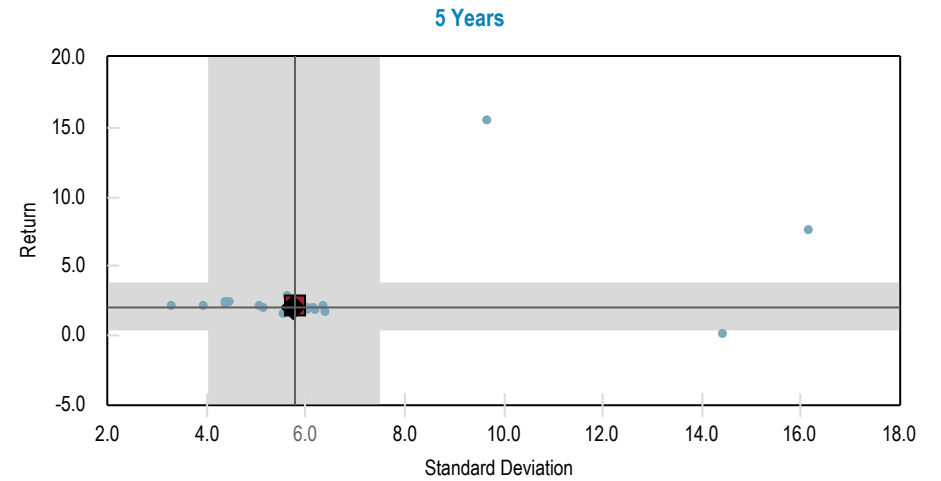


	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
● BlackRock US TIPS	-11.94 (66)	5.86 (28)	11.15 (32)	8.46 (32)	-1.19 (41)	3.17 (40)	4.77 (31)	-1.31 (35)	3.56 (37)	-8.61 (55)
▲ Blmbg. U.S. TIPS	-11.85 (61)	5.96 (21)	10.99 (37)	8.43 (33)	-1.26 (45)	3.01 (50)	4.68 (36)	-1.44 (38)	3.64 (32)	-8.61 (55)
5th Percentile	-1.86	10.09	15.03	10.31	-0.22	4.40	7.48	-0.08	5.01	-3.37
1st Quartile	-8.35	5.86	11.53	8.55	-0.87	3.43	4.89	-1.08	3.80	-6.48
Median	-11.68	5.58	10.60	8.30	-1.33	3.00	4.43	-1.61	3.26	-8.51
3rd Quartile	-12.18	5.25	8.80	6.90	-1.68	2.28	3.95	-2.15	0.98	-9.02
95th Percentile	-13.10	4.52	6.15	5.76	-4.43	1.65	3.35	-4.50	-0.95	-9.54
Population	34	45	45	47	52	54	57	59	62	64



eV US TIPS / Inflation Fixed Inc

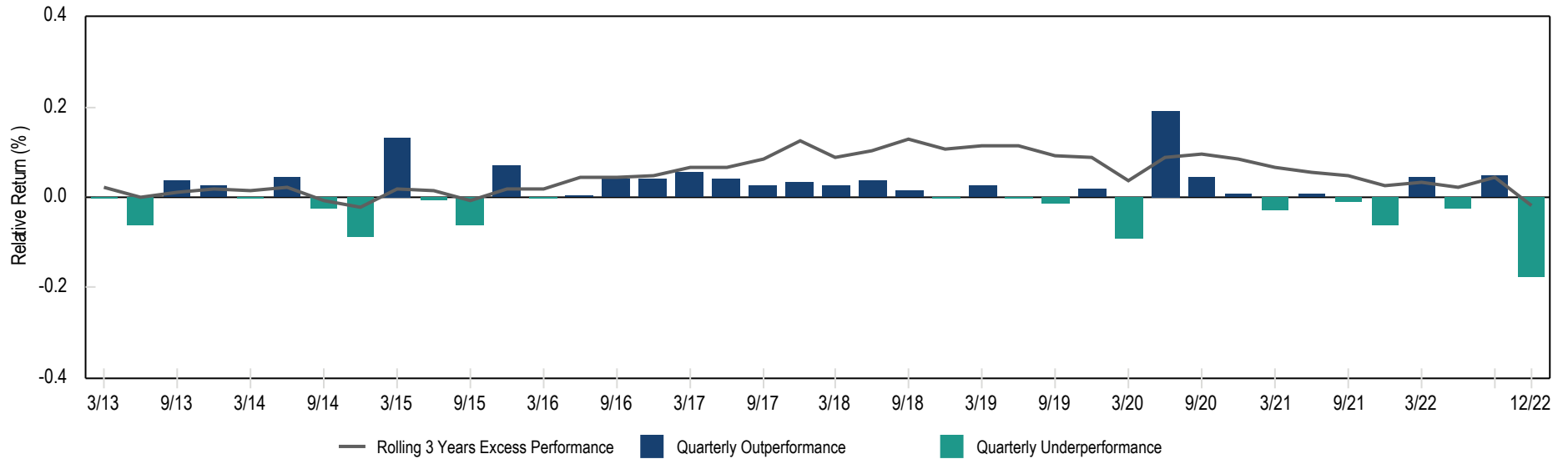
	Return	Standard Deviation
■ BlackRock US TIPS	1.19	6.94
◆ Blimbg. U.S. TIPS	1.21	6.91
— Median	1.21	6.98
Population	34	34



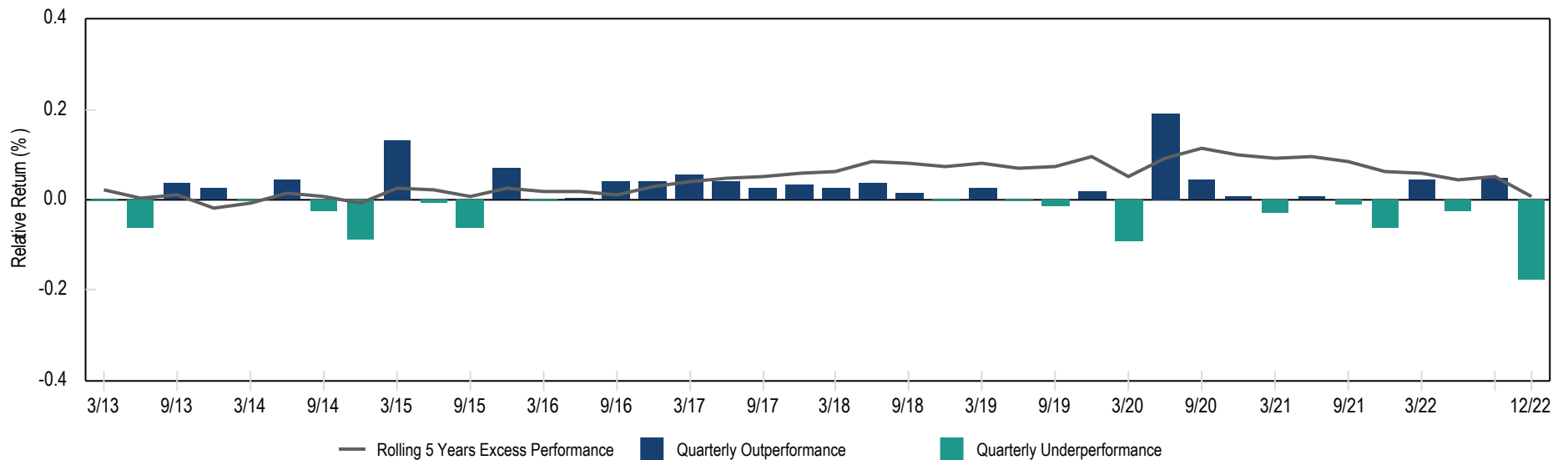
eV US TIPS / Inflation Fixed Inc

	Return	Standard Deviation
■ BlackRock US TIPS	2.12	5.78
◆ Blimbg. U.S. TIPS	2.11	5.76
— Median	2.09	5.78
Population	33	33

Rolling 3 Year Annualized Excess Performance



Rolling 5 Year Annualized Excess Performance



Total Real Estate
Asset Class Overview (Net of Fees)

Imperial County Employees' Retirement System
Period Ending: December 31, 2022

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2022	2021	2020	2019	2018
Total Real Estate	126,978,849	100.0	-2.4	-1.1	10.3	10.0	8.7	9.4	10.3	18.4	2.1	5.7	7.5
<i>NCREIF Property Index</i>			-3.5	-3.0	5.5	8.1	7.5	8.8	5.5	17.7	1.6	6.4	6.7
<i>NCREIF ODCE</i>			-5.0	-4.5	7.5	9.9	8.4	9.3	7.5	22.2	1.2	5.3	7.1
ASB Real Estate	31,152,268	24.5	-4.0	-1.9	10.7	8.7	7.1	8.4	10.7	14.2	1.5	3.0	6.6
<i>NCREIF Property Index</i>			-3.5	-3.0	5.5	8.1	7.5	8.8	5.5	17.7	1.6	6.4	6.7
<i>NCREIF ODCE</i>			-5.0	-4.5	7.5	9.9	8.4	9.3	7.5	22.2	1.2	5.3	7.1
Clarion Lion	34,307,174	27.0	-5.2	-4.6	9.6	11.5	9.9	10.5	9.6	23.6	2.3	6.8	8.6
<i>NCREIF Property Index</i>			-3.5	-3.0	5.5	8.1	7.5	8.8	5.5	17.7	1.6	6.4	6.7
<i>NCREIF ODCE</i>			-5.0	-4.5	7.5	9.9	8.4	9.3	7.5	22.2	1.2	5.3	7.1
ARA American Strategic Value Realty	59,546,000	46.9	0.0	1.5	10.7	10.4	-	-	10.7	18.6	2.4	7.8	-
<i>NCREIF Property Index +2%</i>			-3.0	-2.0	7.6	10.2	9.6	-	7.6	20.0	3.6	8.5	8.9
<i>NCREIF ODCE +2%</i>			-4.5	-3.5	9.6	12.1	10.5	-	9.6	24.6	3.2	7.4	8.9
1221 State St. Corp	1,973,407	1.6	0.0	0.0	0.0	0.0	1.5	2.4	0.0	0.0	0.0	7.9	0.0

Data Sources & 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.

Manager Line Up

Manager	Inception Date	Data Source	Manager	Inception Date	Data Source
BlackRock Russell 3000	12/10/2015	J.P. Morgan	1221 State Street Corp	9/30/2008	ICERS/Union Bank
BlackRock International Equity	7/3/2003	J.P. Morgan	Cash	-	J.P. Morgan
DFA Emerging Markets Value	1/11/2007	J.P. Morgan	HarbourVest IX-Buyout HarbourVest	2011 ¹	HarbourVest
Harding Loevner	7/5/2016	Harding Loevner	IX-Credit	2011 ¹	HarbourVest
Bradford & Marzec Fixed (Tortoise Capital)	12/1/1992	J.P. Morgan	HarbourVest International VI	2008 ¹	HarbourVest
MacKay Shields Core Plus Ops BlackRock	3/2/2015	CITCO	Harbourvest IX-Venture Harbourvest	2011 ¹	HarbourVest
US TIPS	4/11/2007	J.P. Morgan ASB	2017 Global Harbourvest 2018 Global	2017 ¹	HarbourVest
ASB Real Estate	12/31/2012	Real Estate	Harbourvest 2019 Global	2018 ¹	HarbourVest
Clarion Lion	12/31/2006	Clarion Lion	KKR Mezzanine	2019 ¹	HarbourVest KKR
Portfolio Advisors	10/31/2017	Portfolio Advisors	ARA American Strategic Value Realty	2010 ¹	ARA
TSSP Adjacent Opportunities Partners Sixth	4/16/2020	Sixth Street Sixth		01/04/2018	
Street Diversified Credit	5/29/2020	Street			

¹Represents fund vintage year.

Policy & Custom Index Composition

Policy Index (8/1/2020- Current)	33% Russell 3000, 20% MSCI ACWI ex USA Gross, 29% Bloomberg Aggregate, 10% NCREIF Property, 5% Private Equity Benchmark, 3% Private Credit Benchmark.
Policy Index (1/1/2020-7/31/2020)	29% Russell 3000, 24% MSCI ACWI ex USA Gross, 27% Bloomberg Aggregate, 10% NCREIF Property, 1% Russell 3000, 2% Bloomberg Aggregate, 4% Private Equity Benchmark, 3% Private Credit Benchmark.
Policy Index (10/1/2018-12/31/2019)	29% Russell 3000, 24% MSCI ACWI ex USA Gross, 27% Bloomberg Aggregate, 10% NCREIF Property, 5% Russell 3000 +3% (Lagged), 5% Bloomberg High Yield +2% (Lagged).
Policy Index (10/1/2016-9/30/2018)	29% Russell 3000, 24% MSCI ACWI ex USA Gross, 27% Bloomberg Aggregate, 5% NCREIF Property, 5% NCREIF Property +2%, 5% Russell 3000 +3% (Lagged), 5% Bloomberg High Yield +2% (Lagged).
Policy Index (7/1/2014-9/30/2016)	29% Russell 3000, 25% MSCI ACWI ex-US (Gross), 30% Barclays U.S. Aggregate, 6% NCREIF Property Index, 5% Bloomberg Commodity Index, 5% Russell 3000 +3% (Lagged).

Private Equity Benchmark and Private Credit Benchmarks are equal to the actual private equity and private credit returns, respectively.

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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