





PERIOD ENDING: SEPTEMBER 30, 2022

Investment Performance Review for

Imperial County Employees' Retirement System

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Verus business update

Since our last Investment Landscape webinar:

- Chief Investment Officer has nominated Verus for its 2022 Innovation Awards in the Diversity category, recognizing Verus President, Shelly Heier's work to progress the <u>Institutional Investing Diversity Cooperative (iidcoop.org)</u> mission promote greater diversity in the institutional asset management industry.
- The firm continues to grow with two new clients, located on the West Coast and in the Midwest.
- Verus has hired several new employees. Colleen Flannery, Associate Director | Public Markets;
 Jason Fajardo, Performance Analyst; Sam Geschickter, Portfolio Management Associate; Linda
 Wu, CFA, Senior Consulting Associate; and Amanda Schroeder, Director of Marketing.
- Recent research, found at verusinvestments.com/insights
 - In August, we put out a short video on our Perspectives on the recession and the economy
 - In September, we released a whitepaper on Opportunities in small caps
 - This month, we shared our 2022 Private Equity Outlook and a paper called, Minding the gap: Insights into actuarial assumed rate of return

Recent Verus research

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

Topics of interest papers

OPPORTUNITIES IN SMALL CAPS

In this Topic of Interest white paper, we first briefly walk through the original small cap premium thesis and research that led to its industry-wide recognition. Forty years have passed since much of this analysis was conducted, so in this section we take a look at whether the small cap effect has remained statistically significant. Next, we discuss active management opportunities in small caps, as these businesses are smaller and less covered by analysts. Last, many U.S. companies are staying private for longer. We cover this trend and its implications for the small cap market, which is directly impacted by the private/public decisions of younger businesses.

MINDING THE GAP: INSIGHTS INTO ACTUARIAL ASSUMED RATE OF RETURN

As consultants, we are often asked "how can we support a strategic asset allocation with an expected return (ER) that is different from the actuarial assumed rate of return (AARR)?" We believe Plan sponsors with a gap between these two metrics should work to bring the ER and AARR in line. Boards may face modest differences for three distinct reasons – each have countervailing reasons for closing the gap they cause. First, it might be argued that these forecasts are built for different purposes. Second, there is variability in ER forecasts as markets fluctuate year-to-year. Third, the timeframe over which the forecasts are used differs. In this paper, we further explain this reasoning and conclude by offering approaches for Plans to reduce any mismatch between ER and AARR to a reasonable level, which we generally believe to be less than 0.5%.

Annual research

2022 PRIVATE EQUITY OUTLOOK

In the 2022 Private Equity Outlook, we focus attention on the rise of GP-led continuation funds and what investors should consider when evaluating such opportunities. The outlook also addresses the following observations:

- Late-stage venture valuations have increased, and involvement of nontraditional investors has shifted
- Private equity deal activity has slowed in the face of rising interest rates and falling public markets
- Venture capital activity has slowed while fundraising remains strong
- Direct lending continues to drive investor interest while distressed debt and special situations credit have received more attention
- As many factors continue to impact the public markets and create volatility, the secondary market continues to grow

New Verus manager rating system

- Ratings are applied to products across all public and private market asset classes based on their distinguishing qualities around five key evaluation areas. 1) Alignment with client interests 2) Investment edge 3)
 Implementation approach 4) Optimal use of risk
 5) Understandable performance
- Our "IQ Ratings" considers the institutional quality of the product plus the conviction of our research teams:
 - Institutional Quality Rating: Investment products are rated based on insight gained from using five evaluation criteria: Alignment, Investment Edge, Implementation, Optimal Use of Risk, and Understandable Performance. Products that meet or exceed standards of fiduciary care required by institutional investors are indicated with an IQ symbol.
 - Conviction Rating: This second component 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.
- Importantly, our due diligence process has not changed, just how we communicate our relative conviction in products.

 The following table shows the ratings that may be assigned to an investment product, including their respective characteristics and Verus recommendations:

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

 Please reach out to your consultant for further details regarding your portfolio.

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3rd quarter summary

THE ECONOMIC CLIMATE

- U.S. real GDP fell in Q2 for a second consecutive quarter, down -0.6% annualized (+1.6% over the past full year).
 Forecasts suggest a potential growth turnaround in the third quarter; the Atlanta Fed GDPNow forecast indicated a growth rate of 2.8% and economists expected 0.9% as of October 14th.
- The U.S. dollar delivered an impressive rally year-to-date, appreciating approximately 15% relative to major currencies. A stronger dollar may result in slowing U.S. exports as domestic goods become more expensive to foreign buyers, and lower inflation as American businesses and households are able to purchase foreign goods at cheaper prices.

PORTFOLIO IMPACTS

- September inflation figures conveyed two stories: first, U.S. core CPI (excludes food & energy) remained elevated, rising 0.6% during the month to a new 40-year high of 6.6% year-over-year; second, headline inflation (includes all prices) continued to show another more moderate monthly print of 0.4% but remained high at 8.2% year-over-year.
- Credit performance was mixed during Q3, with lower duration exposures faring better than higher duration. Fears of a looming recession remained as the Fed's 75 basis point rate hikes in both July and September reinforced its intention to fight inflation until the "job is done."

THE INVESTMENT CLIMATE

- The Russia Ukraine war may be taking a turn, as Ukraine's counteroffensive gains steam. In a rare admission, Russia's Defense Ministry spokesman Igor Konashenkov acknowledged recent defeats: "With numerically superior tank units in the direction of Zolata Balka and Oleksandrivka, the enemy managed to forge deep into our defenses."
- The broad market selloff increased in intensity as global central banks hiked interest rates, effectively withdrawing liquidity from the financial system. Higher interest rates and central bank balance sheet winddowns mark a major change from the liquidity-driven environment of the past decade.

The broad market selloff has increased in severity, as central banks remove liquidity from the global financial system

ASSET ALLOCATION ISSUES

- Markets year-to-date have delivered sharp losses across nearly every asset class, including double digit losses of core fixed income (Bloomberg US Aggregate Bond -10.8%). Historically speaking, these moves have been highly unusual and reflect an environment where diversification has not served investors well.
- Growth stocks outperformed value stocks during the quarter (Russell 1000 Growth -3.6% vs Russell 1000 Value -5.6%), and small capitalization stocks outperformed large capitalization stocks (Russell 2000 -2.2%, Russell 1000 -4.7%).



What drove the market in Q3?

"U.S. Consumer Prices Rise Sharply Despite Fed Rate Increases"

HEADLINE CONSUMER PRICE INFLATION (YEAR-OVER-YEAR)

Apr	May	Jun	Jul	Aug	Sep
8.3%	8.6%	9.1%	8.5%	8.3%	8.2%

Article Source: Financial Times, October 13th, 2022

"U.S. Job Growth Eases, but Is Too Strong to Suit Investors"

CHANGE IN NON-FARM PAYROLLS

Apr	May	Jun	Jul	Aug	Sep
+368k	+386k	+293k	+526k	+315k	+263k

Article Source: New York Times, October 7th, 2022

"Dollar's Rise Spells Trouble for Global Economies"

U.S. DOLLAR INDEX PRICE LEVEL

Apr	May	Jun	Jul	Aug	Sep
103.0	101.8	104.7	105.9	108.8	112.1

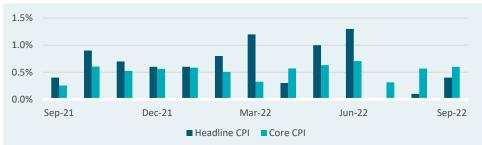
Article Source: Wall Street Journal, September 19th, 2022

"Mortgage Demand Drops as Rates Top 6%"

FREDDIE MAC U.S. 30-YEAR FIXED RATE MORTGAGE RATE

Sep 2021	May	Jun	Jul	Aug	Sep
3.01%	5.10%	5.70%	5.30%	5.66%	6.70%
Article Source: CNRC September 14th 2022					

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



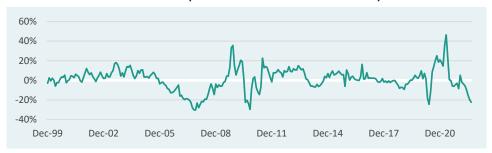
Source: Bureau of Labor Statistics, as of 9/30/22

MSCI EAFE LOCAL VS USD RETURNS, GROWTH OF \$100,000



Source: MSCI, Bloomberg, as of 9/30/22

U.S. EXISTING HOME SALES (YEAR-OVER-YEAR % CHANGE)



Source: National Association of Realtors, as of 8/31/22



Investment Landscape

4th Quarter 2022

Economic environment



U.S. economics summary

- U.S. real GDP fell in Q2 for a second consecutive quarter, down -0.6% annualized (+1.6% over the past full year). Forecasts suggest a potential growth turnaround in the third quarter; the Atlanta Fed GDPNow forecast indicated a growth rate of 2.8% and economists expected 0.9% as of October 14th.
- U.S. core CPI remained elevated in September, rising 0.6% during the month to a new 40-year high of 6.6% year-over-year. Headline inflation continued to show another more moderate monthly print of 0.4% but remained high at 8.2% year-over-year.
- Unemployment fell slightly from 3.6% in June to 3.5% in September, which did not reflect an increase in employment but rather the departure of some Americans from the job market altogether. Weekly initial jobless claims—a measure of the number of workers who filed for unemployment during any

- given week—moved higher during Q2 to 244,000 in early July but has since fallen to 193,000 in late September.
- The U.S. dollar has appreciated roughly 15% relative to major currencies. A stronger dollar may result in slowing U.S. exports as domestic goods become more expensive to foreign buyers, and lower inflation as American businesses and households are able to purchase foreign goods at cheaper prices.
- Coverage of COVID-19 has tended to focus on the health impacts in a binary way: either the infected individual recovers (and lives) or does not recover (and is deceased). There is a growing body of research by medical experts that suggests a significant portion of survivors face longer-term, often severe, health problems. These issues are known as "long COVID" and may be the primary cause for a severe shrinking of the U.S. labor force.

12.5% 6/30/21
4.0% 9/30/21
2.2% 9/30/21
0.00% – 0.25% 9/30/21
1.49% 9/30/21
4.7% 9/30/21
8.5% 9/30/21



GDP growth

U.S. real GDP fell in Q2 for a second consecutive quarter, down -0.6% annualized (+1.6% over the past full year). Most aspects of economic activity showed decline, including private investment (-2.7%), government spending (-0.3%), and imports (-0.5%). Forecasts suggest a potential growth turnaround in the third quarter; the Atlanta Fed GDPNow forecast indicated a growth rate of 2.8% and economists expected 0.9% as of October 14th.

It is possible that the U.S. has avoided technical recession, for now, especially if third quarter GDP growth shows a positive figure. Pundits remain primarily focused on the relatively strong labor market to justify their claims that the U.S. is not in fact experiencing recession, and slightly positive consumer spending growth during 2022 also adds to their argument.

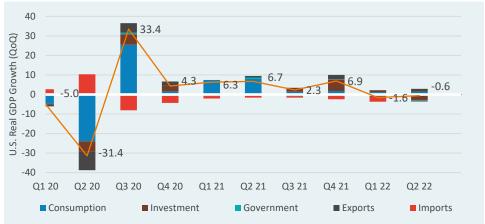
The U.S. dollar has delivered an impressive rally year-to-date, appreciating approximately 15% relative to other major currencies. Two expected economic impacts of a rising U.S. dollar, all else equal, include: a slowdown in U.S. exports as domestic goods become more expensive to foreign buyers; and lower inflation as American businesses and households are able to purchase foreign goods at cheaper prices. Other countries such as the U.K. may be seeing the opposite of these effects as their domestic currencies fall in value.

It remains unclear whether the U.S. has entered recession

U.S. REAL GROSS DOMESTIC PRODUCT



U.S. REAL GDP COMPONENTS (QOQ)



Source: FRED, as of 6/30/22

Source: FRED, as of 6/30/22



Inflation

The September inflation print conveyed two separate stories: first, that U.S. core CPI (excludes food & energy) remained elevated, rising 0.6% during the month to a new 40-year high of 6.6% year-over-year; second, headline inflation (includes all prices) continued to show another more moderate monthly print of 0.4%, but remains high at 8.2% year-over-year.

We see a variety of economic developments that suggest inflation is abating, although the level of inflation may not fall to pre-pandemic levels due to the breadth of price movement. These developments include: lower commodity prices,

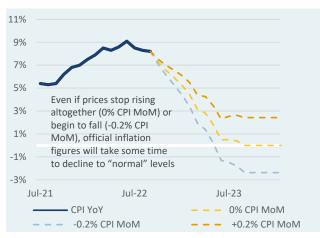
dramatically lower international shipping costs, and the general slowdown of economic activity on the back of Federal Reserve tightening.

Inflation will take some time to fall back to normal levels, even if *monthly* inflation is 0% in the future. Below we illustrate a few scenarios of *monthly* future price movement. Even if prices stop rising completely (a monthly inflation rate of 0%), the U.S. inflation rate will still likely take until spring of 2023 to fall back to 2%.

U.S. CPI (YOY)

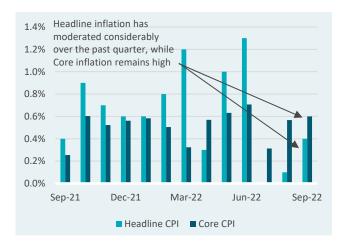


INFLATION IS A SLOW-MOVING METRIC



Source: Verus, BLS, as of 9/30/22

MONTHLY PRICE MOVEMENT



Source: BLS, as of 9/30/22



Source: BLS, as of 9/30/22

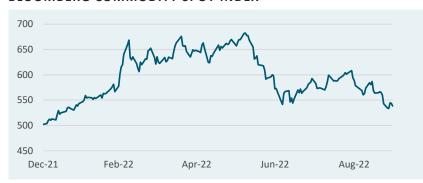
How are inflation conditions evolving?

CPI SHELTER COSTS (YEAR-OVER-YEAR)



Shelter costs account for approx. 32% of the CPI gauge and have moved considerably higher along with the broader real estate boom. However, only a small portion of these costs have been captured in official data, so far. While there is evidence that home prices and rents have stopped rising, it is not yet clear whether/when the jump in costs of recent years will flow into official CPI data.

BLOOMBERG COMMODITY SPOT INDEX



Fears of recession and its impact on commodity demand, as well as some potential easing of uncertainty around Ukraine, have likely contributed to a sharp drop in commodity prices. If weaker conditions persist, the reversal in commodity markets should have a deflationary impact on broader consumer prices, though this effect may take time to flow through to broader goods and services prices.

Source: Zillow, FRED, as of 9/30/22 (upper), Bloomberg, as of 9/30/22 (lower)

CPI USED CAR & TRUCK PRICES



Used auto prices have been dropping materially according to the Mannheim Used Auto Value Index, down more than 13% from highs. If falling prices soon are reflected in official CPI statistics, this would place downward pressure on official inflation figures.

Inflation
dynamics are
complex. This
slide shows a
few
potentially
inflationary
forces and
deflationary
forces

FREIGHTOS SHIPPING CONTAINER COST INDEX



Pandemic-related supply and demand complexities initially contributed to many supply shortages and price spikes. These shipping costs are quickly falling back towards pre-pandemic levels. We would expect the mitigation of shipping problems to have a deflationary effect on prices, assuming businesses begin to pass these cost savings on to customers.

Source: FRED, as of 9/30/22 (upper), Freightos, as of 10/7/22 (lower)



Labor market

The U.S. labor market continues to be strong, which is arguably the biggest factor empowering the Federal Reserve's aggressive policy stance. However, while employment is strong, high inflation has eaten away at household purchasing power, as demonstrated by the consistent decline in inflation-adjusted weekly earnings since mid-2020.

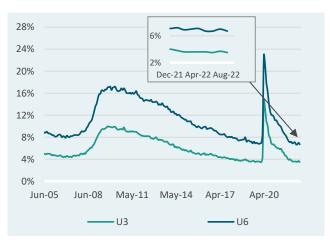
Unemployment fell slightly from 3.6% in June to 3.5% in September, which did not reflect an increase in employment but rather the departure of some Americans from the job market altogether. Weekly *initial jobless claims*—a measure of

the number of workers who filed for unemployment on any given week—moved higher during Q2 to 244,000 in early July but has since fallen to 193,000 in late September.

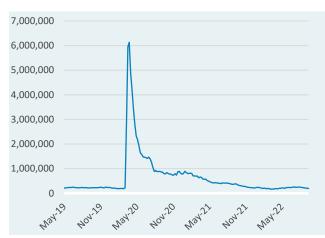
The gap in labor force participation rates across different age cohorts remains notable, with the age 55+ cohort failing to recover. Previously we had assumed that abnormally early retirements of older workers during the pandemic was likely the main cause for this effect. However, as we propose on the next page, the apparently very widespread health effects of "Long COVID" may be playing a role in this story.

The labor market appears tight according to most metrics, but workers' wages are falling on an inflationadjusted basis

U.S. UNEMPLOYMENT



INITIAL JOBLESS CLAIMS



U.S. AVERAGE WEEKLY REAL WAGES



Source: FRED, as of 9/25/22 Source: FRED, as of 6/30/22

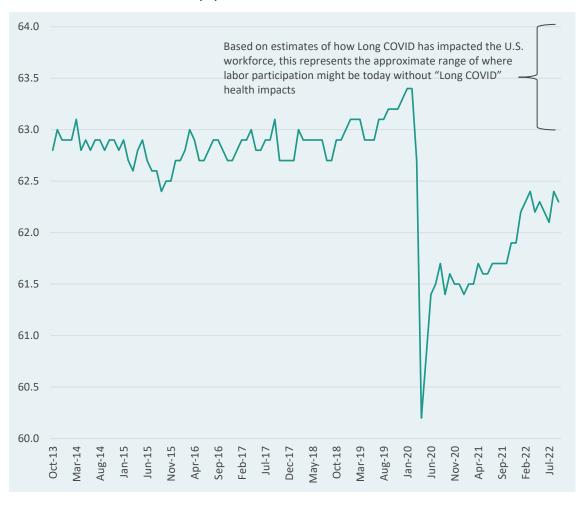
-7

Source: FRED, as of 9/30/22

Labor dynamics: Long COVID-19

- Most coverage of COVID-19 has focused on the health impacts of COVID-19 in a binary way: either the infected individual recovers (and lives) or they do not recover (and is deceased). There is a growing body of research by medical experts that suggests a significant portion of COVID-19 survivors face longer-term, often severe, health problems. These issues are known as "Long COVID".
- COVID-19 is broadly thought of as a virus that affects the lungs. However, it can severely impact the brain and heart as well. Studies vary in their projections regarding the number of Americans who are unable to work due to Long COVID health issues. We have observed estimates between half a million and 4 million workers. This chart illustrates that Long COVID could in fact be the primary reason for a shrunken American workforce and the unusual number of unfilled job openings.
- This topic should be seen as important to investors, because: a) the size of the U.S. labor force determines the productive capacity of the country and therefore the rate of economic growth, the direction of wage pressures, and likely also the actions of the Federal Reserve (as decided by metrics such as labor market tightness and household income/spending).
- We are continuing to closely follow these dynamics.
 Depending on the persistence of Long COVID, future expectations could vary from permanently reduced U.S. workforce and commensurately reduced U.S. growth prospects to continued inflow of previously ill workers back into the workforce.

LABOR PARTICIPATION RATE (%)



Source: FRED, Verus, as of 9/30/22



Investment Landscape

4th Quarter 2022

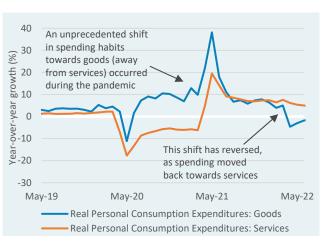
The consumer

U.S. real (inflation-adjusted) personal consumption expenditures slowed further to 1.8% year-over-year in August. The purchases of goods have fallen as consumers move back towards pre-pandemic spending habits (sales of goods have been consistently falling year-to-date, after adjusting for inflation). A moderation of goods purchased means less shipping volume and has likely helped mitigate overburdened supply chains and high international shipping costs, which have been easing materially.

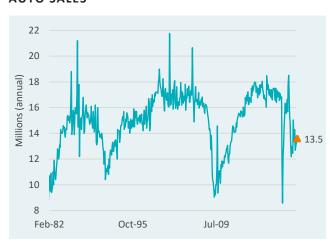
Spending has slowed while savings rates have dropped to 3.5%—a level not seen since 2008—which seems to imply that household budgets are being hit hard by inflation and higher living costs.

Auto sales activity remains very weak, although automakers have reported improvements in computer chip supplies that will allow production to rise. On the other hand, higher interest rates, diminished household budgets, and high car prices may constrain a recovery in auto sales activity despite new inventory coming online.

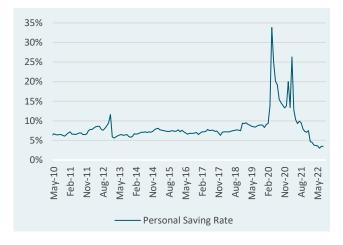
REAL PERSONAL CONSUMPTION EXPENDITURES



AUTO SALES



PERSONAL SAVINGS RATE



Source: Federal Reserve, as of 9/30/22

Source: FRED, as of 8/31/22



Source: FRED, as of 8/31/22

Sentiment

Consumer sentiment improved slightly from extremely depressed levels, according to the University of Michigan survey. In this survey, respondents mentioned better buying conditions for durable goods and a more optimistic one-year outlook, though this brighter sentiment was generally offset by a deteriorating outlook for business conditions.

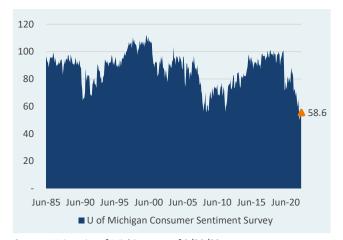
Consumer confidence measured by the Conference Board ticked up in the third quarter, as inflation expectations lessened, and more specifically as households saw prices at the pump materially contract. Consumers' assessments of current conditions and the short-term outlook improved, although

recession risks remain material. While improved confidence could bode well for spending in the fourth quarter of 2022, continued higher prices and global economic slowdowns will likely act as major headwinds.

The NFIB Small Business Optimism index improved slightly from very depressed levels. According to NFIB's Chief Economist Bill Dunkelberg, "Inflation and worker shortages continue to be the hardest challenges facing small business owners". Slightly more businesses expect healthier business conditions six months in the future (though overall sentiment is very negative on this topic), and more expect difficulties in filling open job postings.

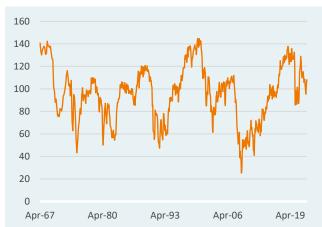
Sentiment, by most measures, is extremely poor

CONSUMER SENTIMENT



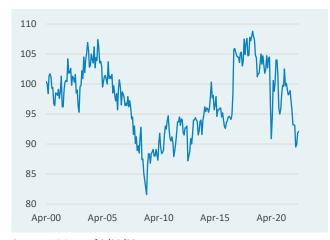
Source: University of Michigan, as of 9/30/22

CONFERENCE BOARD CONSUMER CONFIDENCE



Source: Conference Board, as of 9/30/22

NFIB SMALL BUSINESS SENTIMENT



Source: NFIB, as of 9/30/22



Housing

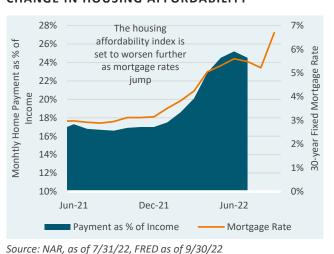
U.S. home prices fell -0.3% from June to July, according to the S&P CoreLogic Case-Shiller U.S. National Index, which might signal a reversal of the remarkable upward march in real estate values. The index suggested home prices were 15.8% higher over the past full year. Sales volumes have dropped precipitously since the beginning of 2022 which has coincided with a notable jump in monthly inventory levels.

Higher home prices and much higher mortgage interest rates have translated to the average monthly home payment rising from 16% of an average family's income to more than 24% in July, according to the National Association of Realtors. Further

increases in mortgage rates since July suggest that affordability has likely deteriorated further.

The housing market may be in the midst of a material slowdown as mortgage rates have more than doubled during 2022, from 3.1% at the beginning of the year to 6.7% at the end of the third quarter. Spiking mortgage rates in the past have coincided with a softening of the real estate market and placed downward pressure on home values. In recent years, low home inventories have been a support to markets, but this may be receding as inventories are now above average.

CHANGE IN HOUSING AFFORDABILITY



HOUSING & RENT COSTS



SUPPLY OF HOMES



Source: FRED, as of 8/31/22

Source: Zillow, FRED, as of 9/30/22

Census Bureau median family income is compared here to the monthly cost (principal + interest) of an average priced home



International economics summary

- Economic growth expectations continue to weaken around the world, and recession appears possible in some developed countries. High inflation has placed central banks in a corner, requiring a choice between tightening (lower inflation with possible recession) or accommodation (stronger economic activity with possibly continued high inflation).
- Multi-decade high inflation continues to spread across Europe, as consumer prices in September rose 10% from the prior year. Food and energy were major drivers, although the core inflation number is also elevated at 4.8%. Inflation remains a challenge in Europe and the U.S., as prices have been relatively stable in the Asia-pacific region.
- Unemployment rates have been stable and tight in most markets, though this may now be seen as a problem as central bankers work to

- slow economies and weaken labor markets in order to fight inflation.
- The Russia Ukraine war may be taking a turn, as Ukraine's counteroffensive gains steam. In a rare admission, Russia's Defense Ministry spokesman Igor Konashenkov acknowledged recent defeats: "With numerically superior tank units in the direction of Zolata Balka and Oleksandrivka, the enemy managed to forge deep into our defenses."
- Still dealing with the highest inflation seen in four-decades, the U.K. economy continues to struggle, especially as the Bank of England tightens economic conditions in the face of a recession. The situation worsened following newly elected Prime Minister Liz Truss' new growth plan announcement, which introduced a large tax cut initiatives without additional funding sources secured.

Area	GDP (Real, YoY)	Inflation (CPI, YoY)	Unemployment
United States	1.8%	8.2%	3.5%
	6/30/22	9/30/22	9/30/22
Eurozone	4.1% 6/30/22	10.0% 9/30/22	6.6% 8/31/22
Japan	1.6%	2.8%	2.5%
	6/30/22	9/30/22	8/31/22
BRICS	1.9%	4.5% 9/30/22	5.2%
Nations	6/30/22		12/31/21
Brazil	3.2% 6/30/22	7.2 % 9/30/22	8.9% 8/31/22
Russia	(4.1)%	13.7%	3.8%
	6/30/22	9/30/22	8/31/22
India	13.5% 6/30/22	7.4% 9/30/22	6.4% 9/30/22
China	0.4%	2.8%	5.3%
	6/30/22	9/30/22	8/31/22

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 have further weakened around the world, and recession appears possible in some developed countries. Throughout 2022, headline inflation remained stubbornly high in many places such as the United States and Europe. Other areas, such as Japan, had avoided the initial wave of inflation but are now seeing larger price rises in recent months.

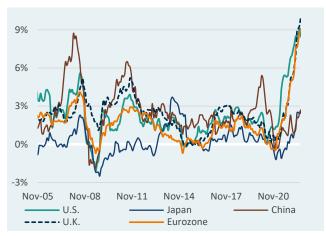
Many central banks are walking a tightrope in their fight against inflation since overly aggressive monetary policy could quickly send an economy into recession. Inflation has become a lightning rod for political leaders, as rising prices squeeze household budgets and standards of living. This is perhaps evident most recently in the U.K., where Prime Minister Liz Truss came under harsh scrutiny for a proposal to cut tax rates and spend which seemed to conflict with Bank of England efforts to combat inflation.

Unemployment rates are stable and tight in most markets, though central bankers may now see this as a problem standing in the way of efforts to slow economies and fight rising prices.

REAL GDP GROWTH (YOY)



INFLATION (CPI YOY)



Source: Bloomberg, as of 9/30/22 – or most recent release

UNEMPLOYMENT



Source: Bloomberg, as of 9/30/22 – or most recent release



Source: Bloomberg, as of 6/30/22

U.K. flash crash

Inflationary pressures have continued within the broader European complex, as a dependence on imported energy has pushed up local energy prices dramatically. Within the U.K., the Bank of England has been forced into a difficult position. The central bank increased rates at every meeting since December 2021, but headline inflation still sits at 9.9% year-over-year.

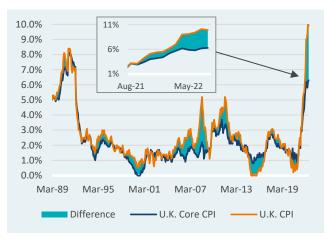
More recently, newly elected Prime Minister Liz Truss and the Chancellor of the Exchequer Kwasi Kwarteng unveiled a plan with to reignite growth and spur economic productivity through tax cuts, guarantees regarding household energy prices, and supply side reforms including infrastructure projects.

Markets reacted very poorly to the announcement. U.K. Gilt (U.K. treasury bond) yields soared, and the British pound sold off to its lowest level against the dollar in history. Markets stabilized following a commitment from the Bank of England to purchase long-dated bonds, given that many U.K. pension funds were facing margin calls on their liability-driven investment (LDI) derivative positions. The Bank of England also suspended its plans to reduce the balance sheet by selling Gilt holdings. The U.K. government then announced it would scrap its original plan to cut the top income tax rate, leading to increased volatility for the pound and U.K. sovereign debt.

U.K. BASELOAD ELECTRICITY FORWARD PRICES

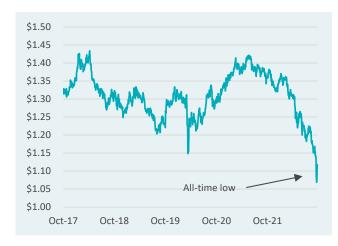


U.K. INFLATION (CPI YOY)



Source: U.K. Office for National Statistics, as of 8/31/22

VALUE OF 1 GBP IN USD



Source: Bloomberg, as of 9/30/22



Source: Bloomberg, as of 10/4/22

Fixed income rates & credit



Fixed income environment

- The 10-year U.S. Treasury yield rose materially from 2.89% to 3.83% as the Federal Reserve reaffirmed its aggressive stance and markets questioned whether interest rates might be held at higher levels for longer than previously anticipated.
- Credit performance was mixed over Q3 with lower duration exposures faring better than higher duration exposures. Fears of a looming recession remained as the Fed's 75 basis point rate hikes in July and September reinforced its intention to fight inflation until the "job is done." Leveraged loans performed the best, returning 1.2%, followed by high yield credit and investment grade credit which returned -0.6% and -4.9%, respectively.
- Default activity continued to pick up in the third quarter with seven companies defaulting on loans and bonds totaling \$16.5 billion. This was the highest quarterly total seen since the second quarter of 2020.

- Activity represented a significant jump from the \$1.6 billion and \$10.4 billion shown in Q1 and Q2, respectively.
- The U.S. Yield Curve inverted during the quarter, with the 10-year 2-year spread falling from 0.1% to -0.4%.
 An inverted curve has historically suggested recession within two years or so.
- Throughout the third quarter, the Federal Reserve continued its path to reduce the balance sheet, beginning in June with the paced redemption of maturing securities. The initial June monthly redemption caps of \$30 billion for Treasuries and \$17.5 billion for agency MBS were increased to \$60 billion and \$35 billion in September. Markets have seemingly digested the reduction well, although the total drawdown has been relatively small so far, around \$200 billion against the peak size of \$8.97 trillion in April 2022.

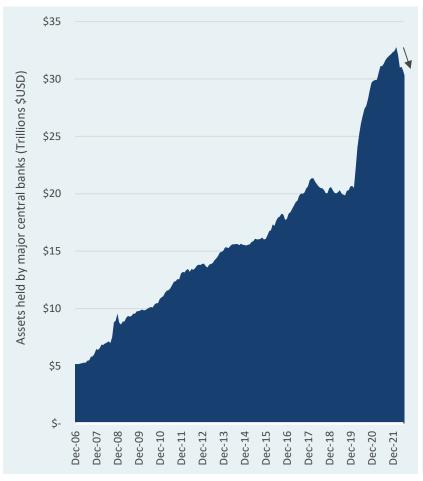
	QTD Total Return	1 Year Total Return
Core Fixed Income (Bloomberg U.S. Aggregate)	(4.8%)	(14.6%)
Core Plus Fixed Income (Bloomberg U.S. Universal)	(4.5%)	(14.9%)
U.S. Treasuries (Bloomberg U.S. Treasury)	(4.3%)	(12.9%)
U.S. High Yield (Bloomberg U.S. Corporate HY)	(0.6%)	(14.1%)
Bank Loans (S&P/LSTA Leveraged Loan)	(1.4%)	(2.5%)
Emerging Market Debt Local (JPM GBI-EM Global Diversified)	(4.7%)	(20.6%)
Emerging Market Debt Hard (JPM EMBI Global Diversified)	(4.6%)	(24.3%)
Mortgage-Backed Securities (Bloomberg MBS)	(5.3%)	(9.0%)

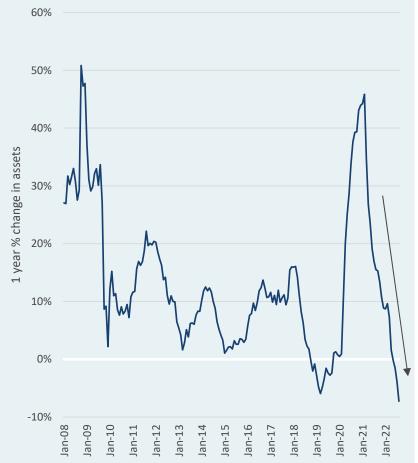
Source: Bloomberg, as of 9/30/22



The great liquidity withdrawal

Central banks are planning to remove substantial liquidity from the global financial system





Markets are entering an unusual time of mass central bank asset rolloff

Source: Bloomberg, Verus, as of 9/30/22 – includes Fed, BOE, ECB, BoJ, PBOC



The great liquidity withdrawal (continued)

CENTRAL BANK ASSETS AS % OF GDP



Central banks have accumulated very large balance sheets

Surprisingly, the U.S. Federal Reserve balance sheet is more moderate in size, relative to GDP

Source: Bloomberg, Verus, as of 9/30/22

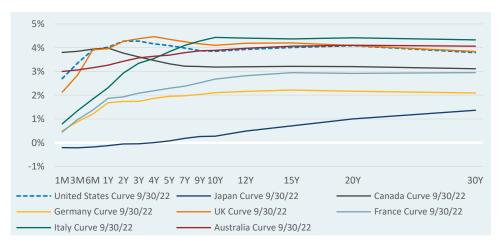


Yield environment

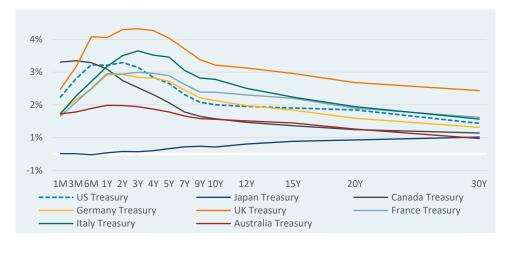
U.S. YIELD CURVE



GLOBAL GOVERNMENT YIELD CURVES



YIELD CURVE CHANGES OVER LAST FIVE YEARS



IMPLIED CHANGES OVER NEXT YEAR



Source: Bloomberg, as of 9/30/22



Credit environment

Credit market performance was mixed over the third quarter, with lower duration exposures faring better than higher duration exposures. Fears of a looming recession remained as the Fed's 75 basis point rate hikes in July and September reinforced its intention to fight inflation until the "job is done." Leveraged loans performed the best, returning 1.2%, followed by high yield corporate credit and investment grade credit which returned -0.6% and -4.9%, respectively.

Volatility and outflows contributed to investment grade credit spreads widening during the quarter. After reaching a 2022 high of 164 basis points in mid-September, investment grade credit spreads finished the third quarter at 159 basis points, an increase of 4 basis points from the

previous quarter's end. High yield spreads decreased by 17 basis points throughout the quarter to 552 basis points, though remaining above the long term non-recessionary average of 454 bps. Despite this recent decline, high yield spreads remain up 269 basis points year-to-date.

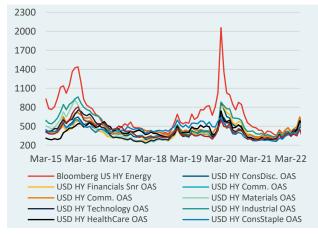
Over the course of the year, total yields have risen significantly within credit markets with the Bloomberg US High Yield Index now at 9.7%— almost double the levels of 4.9% seen at the start the year. Similarly, the yield of the Bloomberg US Corporate Investment Grade Index was 5.7%, up from 2.4% at the start of the year.

SPREADS



Source: Barclays, Bloomberg, as of 9/30/22

HIGH YIELD SECTOR SPREADS (BPS)



Source: Bloomberg, as of 9/30/22

	Credit Spread (OAS)		
Market	9/30/22	9/30/21	
Long U.S. Corp	2.0%	1.2%	
U.S. Inv Grade Corp	1.6%	0.8%	
U.S. High Yield	5.5%	2.9%	
U.S. Bank Loans*	6.0%	4.3%	

Source: Barclays, Credit Suisse, Bloomberg, as of 9/30/22

*Discount margin (4-year life)



Default & issuance

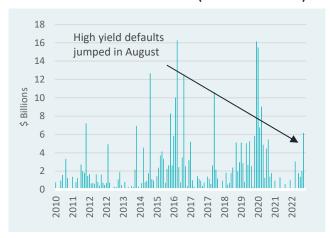
Default activity continued to pick up in the third quarter with seven companies defaulting on loans and bonds totaling \$16.5 billion. This was the highest quarterly total seen since the second quarter of 2020. Activity represented a significant jump from the \$1.6 billion and \$10.4 billion shown in Q1 and Q2, respectively.

Default rates for par-weighted US high yield and bank loans ended the quarter at 0.8% and 1.0%, respectively. While defaults rates reached a 15-month high, both values were well below the long-term historical averages of 3.2% and 3.1% for the high yield and loan markets. Given the prospects of tighter financial conditions and lower growth, default rates are expected to rise over the remainder of the year and into 2023 while

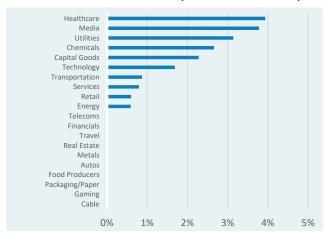
remaining well below the previously stated long-term historical averages.

Leveraged credit issuance remained very light, which was consistent with the weaker trend of 2022. The third quarter total of \$18.9 billion issued in high yield bonds marked the lightest issuance since the first quarter of 2009. A similar effect was observed in the bank loans market, which totaled \$24 billion over the third quarter, down from \$120.5 billion and \$60.6 billion in the first and second quarters of this year. Additionally, the 2022 year-to-date loan issuance total of \$205.0 billion was down 69% on a year-over-year basis.

U.S. HY MONTHLY DEFAULTS (PAR WEIGHTED)



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



Source: BofA Merrill Lynch, as of 9/30/22 – par weighted

U.S. ISSUANCE (\$ BILLIONS)



Source: BofA Merrill Lynch, as of 9/30/22



Source: BofA Merrill Lynch, as of 9/30/22





Equity environment

- Equity markets saw further losses during Q3, extending the selloff deeper into bear market territory. Emerging market equities (MSCI Emerging Markets -11.6%) experienced the greatest drawdown, on an unhedged currency basis, followed by international developed (MSCI EAFE -9.4%) and domestic equities (S&P 500 -4.9%).
- Many markets now trade at valuation levels below their historical average. According to FactSet, the S&P 500 sat at a forward price/earnings of 15.4 as of September 30th, below the five-year average of 18.6 and 10-year average of 17.1. Interestingly, earnings expectations have been fairly resilient at 7.4% for calendar year 2022 and 7.9% for 2023.
- Investors with unhedged foreign currency exposure have seen extreme losses recently. A U.S. investor with an international developed equity investment

- (MSCI EAFE) suffered a loss of -15.7% over the past year from currency movements. Investors in non-US equity (MSCI ACWI ex-US) saw a -12.0% loss. Currency risk is typically the second largest risk in institutional portfolios and is not expected to be compensated over the long term. We continue to believe that more forward-thinking currency solutions can materially improve portfolio outcomes.
- Value stocks underperformed growth stocks mildly during the quarter (Russell 1000 Value -5.6% vs Russell 1000 Growth -3.6%), and small capitalization stocks outperformed large capitalization stocks (Russell 2000 -2.2%, Russell 1000 -4.7%).
- Volatility remained elevated as the Cboe VIX Index rose further from 28.7% to 31.6%. Risk assets soldoff on concerns of Federal Reserve tightening and liquidity being broadly removed from the global financial system.

	QTD TOTAL RETURN		1 YEAR TOTAL RETURN	
	(unhedged)	(hedged)	(unhedged)	(hedged)
U.S. Large Cap (S&P 500)	(4.9	9%)	(15.	5%)
U.S. Small Cap (Russell 2000)	(2.2%)		(23.5%)	
U.S. Equity (Russell 3000)	(4.5%)		(17.6%)	
U.S. Large Value (Russell 1000 Value)	(5.6%)		(11.4%)	
US Large Growth (Russell 1000 Growth)	(3.6%)		(22.6%)	
Global Equity (MSCI ACWI)	(6.8%)	(4.6%)	(20.7%)	(15.9%)
International Large (MSCI EAFE)	(9.4%)	(2.8%)	(25.1%)	(9.4%)
Eurozone (Euro Stoxx 50)	(9.8%)	(3.1%)	(28.9%)	(14.1%)
U.K. (FTSE 100)	(10.6%)	(2.3%)	(16.5%)	1.8%
Japan (NIKKEI 225)	(7.2%)	0.2%	(31.0%)	(8.5%)
Emerging Markets (MSCI Emerging Markets)	(11.6%)	(8.2%)	(28.1%)	(22.5%)

Source: Russell Investments, MSCI, STOXX, FTSE, Nikkei, as of 9/30/22



Domestic equity

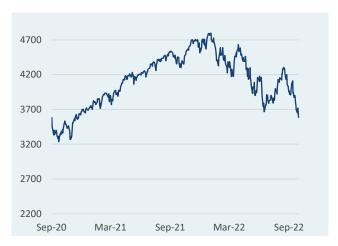
U.S. equities experienced further losses during the quarter (S&P 500 -4.9%), while outperforming international (MSCI EAFE -9.4%) and emerging markets (MSCI Emerging Markets -11.6%).

Earnings expectations have been fairly resilient at 7.4% for calendar year 2022 and 7.9% for 2023, though these forecasts have been consistently revised lower for three consecutive quarters. The energy sector continues to lift the earnings growth of the S&P 500, as overall growth would have been negative in recent quarters if energy sector profits were excluded. According to corporate earnings calls, an increasing number of

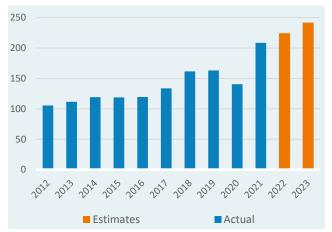
businesses reported labor costs & shortages as a significant issue, followed by supply chain disruptions & costs, and FX movement. During Q2, businesses with more than 50% of revenues from outside of the U.S. generated 13.3% earnings growth, while those with less than 50% of revenues from outside the U.S. saw only a 2.1% growth rate.

Sector performance during Q3 was disparate. Consumer discretionary (4.4%) and energy (2.3%) sectors lifted the overall index while all other sectors were in the red.

S&P 500 PRICE INDEX



S&P BOTTOM-UP EARNINGS & ESTIMATES



Source: FactSet, as of 9/30/22

O3 SECTOR PERFORMANCE



Source: Morningstar, as of 9/30/22



Source: Standard & Poor's, as of 9/30/22

Domestic equity size & style

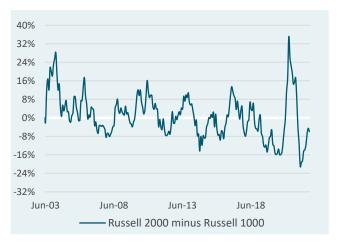
Reversing the trend from last quarter, growth stocks outperformed value stocks, although the divergence was relatively mild (Russell 1000 Growth -3.6% vs. Russell 1000 Value -5.6%). Growth outperformed despite struggles within the Telecommunications and Information Technology sectors (-12.7% and -6.2%), fueled by positive returns from Consumer Discretionary +4.4% (with Amazon and Tesla being the largest weights).

Despite this quarter, value has outperformed significantly over the past year. The Russell 1000 Value Index is down -17.8%, while the growth equivalent has lost -30.7%. With the Federal Reserve continuing to tighten conditions and hike rates, companies with cash flows further out in the future (those with higher durations) have seen larger negative impacts to their multiples.

Looking at size, small capitalization stocks outperformed large capitalization stocks (Russell 2000 -2.2%, Russell 1000 -4.7%), diverging from the trend seen in the second quarter of 2022.

Domestic equities have continued to be challenged regardless of size and style, as investors weigh the impacts of a tighter economic environment on company earnings.

SMALL CAP VS LARGE CAP (YOY)



VALUE VS GROWTH (YOY)



Source: FTSE, as of 9/30/22

VALUE VS. GROWTH RELATIVE VALUATIONS



Source: Standard & Poor's, as of 9/30/22



Source: FTSE, as of 9/30/22

International developed equity

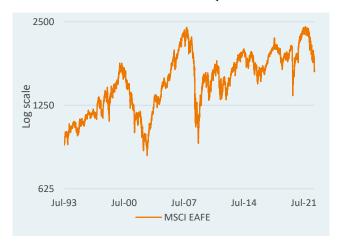
International developed equities fell alongside the global opportunity set in the third quarter. The MSCI EAFE Index dropped -9.4% in U.S. dollar terms, although most of those losses can be attributed to currency impacts, with hedged returns only experiencing a -2.8% loss. The Federal Reserve continues to set the tone for global central bank rate hikes, which has pushed the dollar higher.

Looking at sub-regional performance, Japanese equities were the best performing markets in local terms, being one of the few asset classes with positive Q3 return (+0.2%). Despite strong local returns, diverging rate policy between the BOJ

and Federal Reserve has crushed the Japanese yen, resulting in a seven percent spread between hedged and unhedged equity outcomes.

European equities also saw losses over the quarter, although local returns were strong relative to U.S. and Emerging market equities. The flash crash of the British pound had a material impact on FTSE 100 performance in U.S. dollar terms, with U.K. equities closing the quarter down -10.6%, lagging the broader European benchmark (Euro Stoxx 50 -9.8%)

INTERNATIONAL DEVELOPED EQUITY

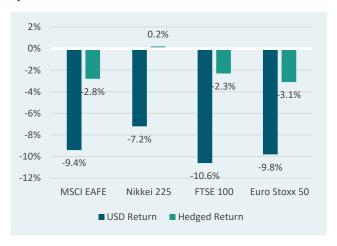


Source: MSCI, as of 9/30/22 Source: Bloomberg, as of 9/30/22

FX MOVEMENTS RELATIVE TO THE U.S. DOLLAR



O3 2022 SUBREGIONAL INDEX RETURNS



Source: MSCI, STOXX, FTSE, Nikkei, as of 9/30/22



Emerging market equity

Emerging market equities fell during the third quarter, dragged lower by a steep Chinese equity bear market (-22.5%). The MSCI EM index ended the quarter down -11.6% in U.S. dollar terms, bringing one-year total losses to -28.1%. A strong dollar had a -3.4% impact in the third quarter; significant, but not to the same extent seen in the International developed space.

Growing risks of a global recession hit equities across the board, though emerging markets have suffered more than their developed counterparts. China faces its own set of

unique problems, including the continuation of its zero-COVID policy, a property crisis, and geopolitical risks with Taiwan (though we view an invasion as highly unlikely). Despite these headwinds, the People's Bank of China is one of the few central banks implementing accommodative policy, which should provide a tailwind to the local economy.

Performance variability has significantly changed some country weights. China's weight in the index fell by 3.7%, while India moved up 2.6%, replacing Taiwan as the second largest weight.

EMERGING MARKET EQUITY



Source: MSCI, as of 9/30/22

MSCI EM INDEX TOP 10 COUNTRY WEIGHTS

Country	9/30/2022	6/30/2022	Rank Change
1. China	29.5%	33.2%	
2. India	15.3%	12.7%	
3. Taiwan	13.7%	14.3%	•
4. South Korea	10.6%	11.3%	
5. Brazil	5.8%	4.9%	
6. Saudi Arabia	4.8%	4.3%	
7. South Africa	3.4%	3.5%	
8. Mexico	2.2%	2.1%	
9. Indonesia	2.2%	1.8%	
10. Thailand	2.1%	1.9%	

Source: Bloomberg, MSCI as of 9/30/22

Q3 2022 MSCI COUNTRY RETURNS (USD)



Source: Bloomberg, MSCI as of 9/30/22, performance in USD terms



Equity valuations

Many markets now trade at valuation levels below their historical average as inflation and rising rate concerns have translated to more attractive pricing. According to FactSet, the S&P 500 traded at a forward price/earnings of 15.4 as of September 30th, which was below the five-year average of 18.6 and 10-year average of 17.1. Valuations have continued to drop within the International and Emerging market space as well, although we believe International developed equities may have further to fall, given more acute inflation and energy issues in Europe. Emerging market valuations have reached very low levels, which may act as a floor to further losses, assuming healthy earnings.

Domestic earnings were challenged in the second quarter. Businesses faced higher costs, large currency impacts, and a more budget-constrained consumer. While blended earnings grew at a 6.7% clip from the previous year, excluding the energy sector would bring that earnings figure down to -3.7%, per FactSet. While valuations have moved more in line with historical averages, all eyes are on third quarter earnings, which will likely help determine the market's direction from this point.

FORWARD P/E RATIOS



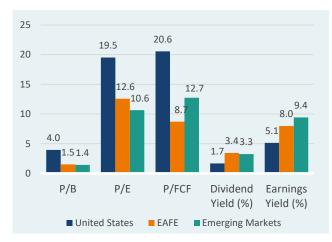
Source: MSCI, 12m forward P/E, as of 8/31/22

S&P 500 AVERAGE TRAILING P/E RATIOS



Source: Bloomberg, as of 9/30/22

VALUATION METRICS (3-MONTH AVERAGE)



Source: Bloomberg, MSCI as of 9/30/22 - trailing P/E



Equity volatility

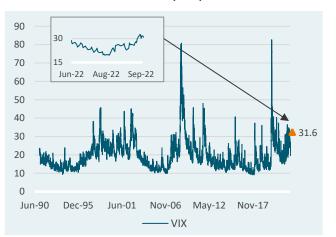
Volatility remained elevated through the quarter as the Cboe VIX Index rose further from 28.7% to 31.6%. Risk assets sold-off into a deeper bear market and concerns focused on Federal Reserve tightening and liquidity being removed from the global financial system. Inflation and Fed actions seem to exist as the greatest risk to markets, although potential for recession or a corporate earnings drawdown are also likely contributing to choppiness.

Realized volatility of equity markets over the past year has picked up from low levels. U.S. markets have shown

materially more volatility than developed or emerging markets, which has been rare historically.

The current bear market has been particularly painful given the broadness of the selloff across equity fixed income, and real assets. Currency markets also moved against investors, with U.S. dollar appreciation delivering large losses for those with unhedged international asset exposure. Commodities remain a lone bright spot regarding 2022 year-to-date performance.

U.S. IMPLIED VOLATILITY (VIX)

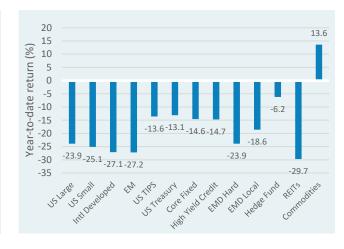


REALIZED VOLATILITY



Source: Standard & Poor's, MSCI, as of 9/30/22

BROAD SELLOFF



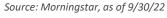
Source: MPI, as of 9/30/22



Source: Choe, as of 9/30/22

Long-term equity performance







Other assets



Asymmetric macro strategies

Macro strategies have been the top performing hedge fund strategy since 2021. Both parts of the Macro universe—Discretionary and Systematic—have done extremely well over the last 12-18 months. Systematic strategies have benefitted from strong trend following performance, which has returned to favor after a period of mediocre returns from 2016 to 2020. This periodicity is typical of trend following/CTA type strategies. Discretionary macro strategies have done well to capture the move in interest rates by shorting bonds as central banks reacted to high inflation by consistently hiking interest rates from ultra-low post-COVID levels.

Trend following funds can and have offered significant diversification from traditional asset classes due to their ability to go long or short markets depending on the current trends. As evidenced in the middle chart below, CTA funds had maintained long bond, short commodity positions for several years following the global financial crisis, though that changed significantly over the past year. Discretionary funds struggled when interest rates were zero-bound in the mid-2010s but have shown once again that they can perform well when central banks are taking action—either hiking or cutting rates—by taking positions based on fundamental economic data.

3 YEAR ROLLING RETURN FOR MACRO FUNDS



CTA FUNDS CORRELATION TO MARKETS



CUMULATIVE RETURN LAST 12 MONTHS



Source: HFR, MPI, Morningstar, SocGen, data as of 9/30/22



Currency

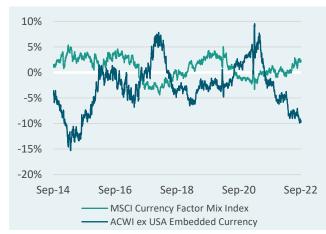
Investors with unhedged foreign currency exposure have seen extreme losses over recent periods. For example, a U.S. investor with an international developed equity investment (MSCI EAFE) suffered a loss of - 15.7% over the past year *just from currency movements*. An investor in non-US equity (MSCI ACWI ex-US) would have seen a -12.0% loss. Currency risk is typically the second largest risk in institutional portfolios, and is not expected to be compensated over the long term.

We continue to believe that forward-thinking currency solutions can materially improve portfolio outcomes. Specifically, a currency program may allow an investor to reduce their portfolio risk while also increasing the expected return of the portfolio. These characteristics are demonstrated below by comparing the unhedged currency exposure that most investors own (we refer to this as "embedded" currency) to the MSCI Currency Factor Mix Index which represents a passive investment in the currency market. This program aims to systematically capture the *return premia* within currency markets. Over the past 10 years, an unhedged exposure to foreign currencies has resulted in 5.8% portfolio volatility and a return of -4.4% per year. Meanwhile, a passive allocation the MSCI Currency Factor Mix Index has resulted in less than half of that volatility (2.5%) and with an average return of +1.2% per year.

EFFECT OF CURRENCY (1-YEAR ROLLING)



UNHEDGED CURRENCY VS CURRENCY FACTOR MIX



FOREIGN CURRENCY MOVEMENT



Source: MSCI, as of 9/30/22 Source: Bloomberg, as of 9/30/22

Verus⁷⁷

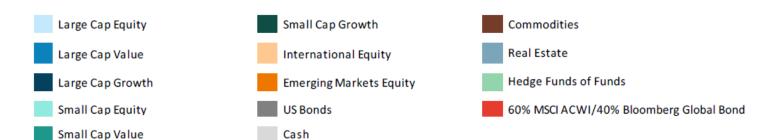
Source: MSCI, as of 9/30/22





Periodic table of returns

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	YTD	5-Year	10-Year
Commodities	31.8	14.0	25.9	56.3	26.0	34.5	32.6	39.8	5.2	79.0	29.1	14.3	18.6	43.3	13.5	13.3	31.7	37.3	6.7	36.4	38.5	28.3	13.6	12.2	13.7
Real Estate	22.8	8.4	10.3	48.5	22.2	21.4	26.9	16.2	1.4	37.2	26.9	7.8	18.1	38.8	13.2	5.7	21.3	30.2	1.9	31.4	34.6	27.6	8.7	9.0	11.6
Cash	12.2	7.3	6.7	47.3	20.7	20.1	23.5	15.8	-6.5	34.5	24.5	2.6	17.9	34.5	13.0	0.9	17.3	25.0	0.0	28.5	21.0	27.1	0.6	8.9	9.7
Hedge Funds of Funds	11.6	3.3	1.6	46.0	18.3	14.0	22.2	11.8	-21.4	32.5	19.2	1.5	17.5	33.5	11.8	0.6	12.1	22.2	-1.5	26.5	20.0	26.5	-5.9	7.0	9.2
Large Cap Value	7.0	2.8	1.0	39.2	16.5	7.5	18.4	11.6	-25.9	28.4	16.8	0.4	16.4	33.1	6.0	0.0	11.8	21.7	-3.5	25.5	18.3	25.2	-14.6	5.3	8.8
US Bonds	4.1	-2.4	-6.0	29.9	14.3	6.3	15.5	10.3	-33.8	23.3	16.1	-2.1	15.3	23.3	4.9	-0.8	11.2	14.6	-6.0	22.4	14.0	17.7	-17.8	3.6	8.6
Small Cap Value	6.0	2.5	-5.9	30.0	14.5	7.1	16.6	10.9	-28.9	27.2	16.7	0.1	16.3	32.5	5.6	-0.4	11.3	17.1	-4.8	22.0	10.3	14.8	-21.1	3.6	7.9
60/40 Global Portfolio	-3.0	-5.6	-11.4	29.7	12.9	5.3	15.1	7.0	-35.6	20.6	15.5	-2.9	14.6	12.1	4.2	-1.4	8.0	13.7	-8.3	18.6	7.8	11.3	-23.3	3.3	4.1
Large Cap Equity	-7.3	-9.1	-15.5	25.2	11.4	4.7	13.3	7.0	-36.8	19.7	13.1	-4.2	11.5	11.0	3.4	-2.5	7.1	7.8	-9.3	18.4	7.5	8.9	-24.6	2.9	3.7
Small Cap Equity	-7.8	-9.2	-15.7	23.9	9.1	4.6	10.4	5.8	-37.6	18.9	10.2	-5.5	10.5	9.0	2.8	-3.8	5.7	7.7	-11.0	8.7	4.6	6.5	-25.1	2.0	3.6
Emerging Markets Equity	-14.0	-12.4	-20.5	11.6	6.9	4.6	9.1	4.4	-38.4	11.5	8.2	-5.7	4.8	0.1	0.0	-4.4	2.6	7.0	-11.2	7.8	2.8	2.8	-27.1	1.1	1.0
International Equity	-22.4	-19.5	-21.7	9.0	6.3	4.2	4.8	-0.2	-38.5	5.9	6.5	-11.7	4.2	-2.0	-1.8	-7.5	1.0	3.5	-12.9	7.7	0.5	0.0	-27.2	-0.3	0.9
Small Cap Growth	-22.4	-20.4	-27.9	4.1	4.3	3.2	4.3	-1.6	-43.1	0.2	5.7	-13.3	0.1	-2.3	-4.5	-14.9	0.5	1.7	-13.8	6.4	0.5	-1.5	-29.3	-0.8	0.6
Large Cap Growth	-30.6	-21.2	-30.3	1.0	1.4	2.4	2.1	-9.8	-53.2	-16.9	0.1	-18.2	-1.1	-9.5	-17.0	-24.7	0.3	0.9	-14.6	2.1	-3.1	-2.5	-30.7	-1.8	-2.1

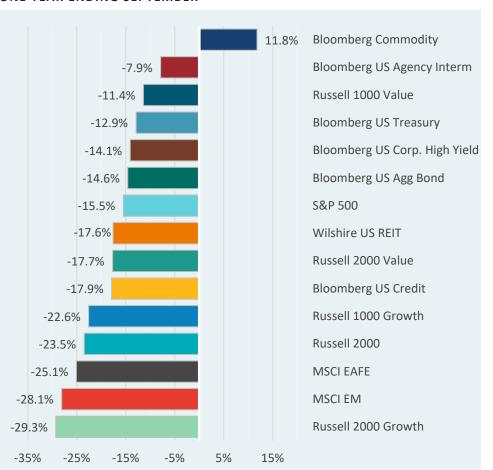


Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Growth, MSCI EAFE, MSCI EM, Bloomberg US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, Bloomberg Global Bond. NCREIF Property Index performance data as of 6/30/22.



Major asset class returns

ONE YEAR ENDING SEPTEMBER



TEN YEARS ENDING SEPTEMBER



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

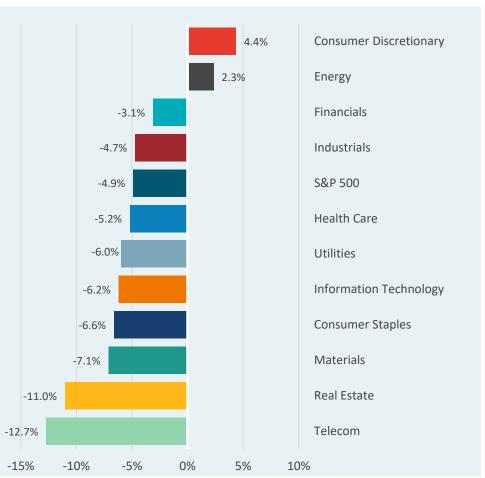
Source: Morningstar, as of 9/30/22

Source: Morningstar, as of 9/30/22

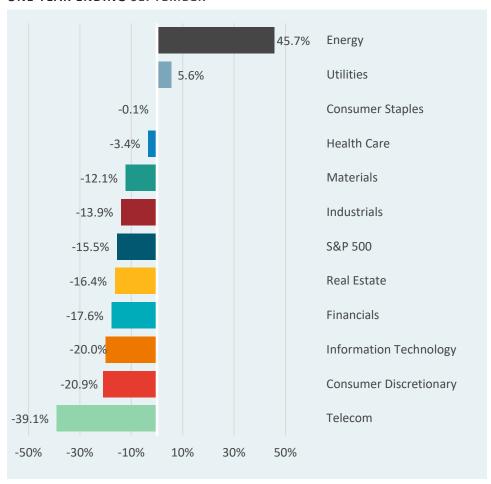


S&P 500 sector returns

QTD



ONE YEAR ENDING SEPTEMBER



Source: Morningstar, as of 9/30/22

Source: Morningstar, as of 9/30/22



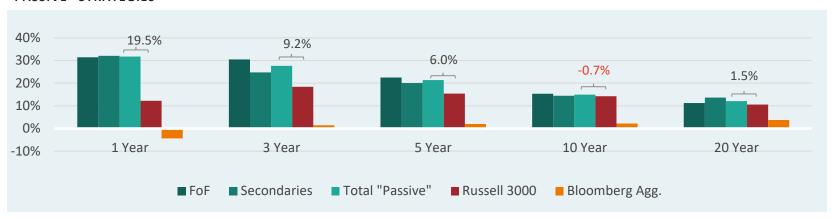
Private equity vs. traditional assets performance

DIRECT PRIVATE EQUITY FUND INVESTMENTS



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

"PASSIVE" STRATEGIES



"Passive" strategies outperformed comparable public equities across all time periods, aside from the 10-year basis.

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



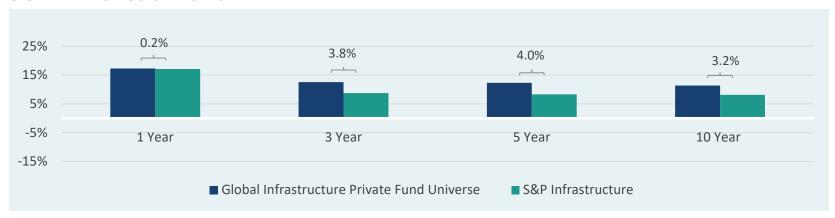
Private vs. liquid real assets performance

GLOBAL NATURAL RESOURCES FUNDS (N.R.)



N.R. funds underperformed the MSCI World Natural Resources benchmark across all time 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 March 31, 2022. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real assets universes.



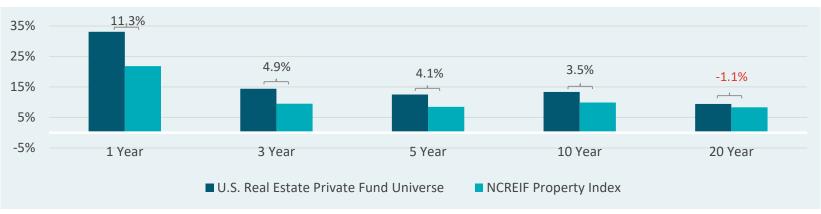
Private vs. liquid and core real estate performance

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



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

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



U.S. Private R.E. Funds outperformed the NCREIF Property Index across all time periods, aside a 20-year basis.

Sources: Refinitiv PME: U.S. Real Estate universes as of March 31, 2022. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real estate universes.



Detailed index returns

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Core Index							
S&P 500	(9.2)	(4.9)	(23.9)	(15.5)	8.2	9.2	11.7
S&P 500 Equal Weighted	(9.2)	(4.8)	(20.7)	(13.5)	7.7	8.0	11.5
DJ Industrial Average	(8.8)	(6.2)	(19.7)	(13.4)	4.4	7.4	10.5
Russell Top 200	(9.2)	(5.0)	(24.7)	(16.4)	9.0	10.0	12.1
Russell 1000	(9.3)	(4.6)	(24.6)	(17.2)	7.9	9.0	11.6
Russell 2000	(9.6)	(2.2)	(25.1)	(23.5)	4.3	3.6	8.6
Russell 3000	(9.3)	(4.5)	(24.6)	(17.6)	7.7	8.6	11.4
Russell Mid Cap	(9.3)	(3.4)	(24.3)	(19.4)	5.2	6.5	10.3
Style Index							
Russell 1000 Growth	(9.7)	(3.6)	(30.7)	(22.6)	10.7	12.2	13.7
Russell 1000 Value	(8.8)	(5.6)	(17.8)	(11.4)	4.4	5.3	9.2
Russell 2000 Growth	(9.0)	0.2	(29.3)	(29.3)	2.9	3.6	8.8
Russell 2000 Value	(10.2)	(4.6)	(21.1)	(17.7)	4.7	2.9	7.9
INTERNATIONAL EQUITY							
Broad Index							

INTERNATIONAL EQUITY							
Broad Index							
MSCI ACWI	(9.6)	(6.8)	(25.6)	(20.7)	3.7	4.4	7.3
MSCI ACWI ex US	(10.0)	(9.9)	(26.5)	(25.2)	(1.5)	(0.8)	3.0
MSCI EAFE	(9.4)	(9.4)	(27.1)	(25.1)	(1.8)	(0.8)	3.7
MSCI EM	(11.7)	(11.6)	(27.2)	(28.1)	(2.1)	(1.8)	1.0
MSCI EAFE Small Cap	(11.5)	(9.8)	(32.1)	(32.1)	(2.2)	(1.8)	5.3
Style Index							
MSCI EAFE Growth	(9.7)	(8.5)	(33.0)	(30.3)	(1.5)	0.7	4.7
MSCI EAFE Value	(9.0)	(10.2)	(21.1)	(20.2)	(2.8)	(2.7)	2.4
Regional Index							
MSCI UK	(8.8)	(10.8)	(18.7)	(14.1)	(1.7)	(1.1)	1.9
MSCI Japan	(10.4)	(7.7)	(26.4)	(29.3)	(2.6)	(0.6)	4.8
MSCI Euro	(8.4)	(10.0)	(32.7)	(30.0)	(3.8)	(3.2)	3.2
MSCI EM Asia	(13.2)	(14.0)	(28.8)	(29.5)	(8.0)	(1.1)	3.1
MSCI EM Latin American	(3.3)	3.6	3.0	0.2	(3.4)	(2.6)	(2.3)

FIXED INC	

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
Bloomberg US TIPS	(6.6)	(5.1)	(13.6)	(11.6)	0.8	2.0	1.0
Bloomberg US Treasury Bills	0.2	0.4	0.4	0.4	0.6	1.1	0.7
Bloomberg US Agg Bond	(4.3)	(4.8)	(14.6)	(14.6)	(3.3)	(0.3)	0.9
Bloomberg US Universal	(4.3)	(4.5)	(14.9)	(14.9)	(3.1)	(0.2)	1.2
Duration							
Bloomberg US Treasury 1-3 Yr	(1.2)	(1.5)	(4.5)	(5.1)	(0.5)	0.5	0.6
Bloomberg US Treasury Long	(7.9)	(9.6)	(28.8)	(26.6)	(8.5)	(1.6)	0.6
Bloomberg US Treasury	(3.5)	(4.3)	(13.1)	(12.9)	(3.1)	(0.2)	0.5
Issuer							
Bloomberg US MBS	(5.1)	(5.3)	(13.7)	(14.0)	(3.7)	(0.9)	0.5
Bloomberg US Corp. High Yield	(4.0)	(0.6)	(14.7)	(14.1)	(0.5)	1.6	3.9
Bloomberg US Agency Interm	(1.8)	(2.4)	(7.2)	(7.9)	(1.4)	0.2	0.6
Bloomberg US Credit	(5.1)	(4.9)	(18.1)	(17.9)	(3.6)	(0.0)	1.6

OTHER							
Index							
Bloomberg Commodity	(8.1)	(4.1)	13.6	11.8	13.5	7.0	(2.1)
Wilshire US REIT	(12.3)	(10.2)	(29.7)	(17.6)	(2.2)	2.9	6.1
CS Leveraged Loans	(2.2)	1.2	(3.3)	(2.6)	2.1	3.0	3.7
S&P Global Infrastructure	(11.8)	(9.6)	(10.1)	(6.0)	(0.1)	2.1	5.7
Alerian MLP	(7.5)	8.4	19.0	20.0	3.1	1.2	1.7
Regional Index							
JPM EMBI Global Div	(6.4)	(4.6)	(23.9)	(24.3)	(7.2)	(2.6)	1.1
JPM GBI-EM Global Div	(4.9)	(4.7)	(18.6)	(20.6)	(7.1)	(3.9)	(2.4)
Hedge Funds							
HFRI Composite	(2.3)	(0.6)	(6.2)	(5.8)	6.2	4.5	4.6
HFRI FOF Composite	(0.6)	0.7	(5.9)	(5.5)	4.5	3.3	3.6
Currency (Spot)							
Euro	(2.6)	(3.9)	(13.9)	(15.5)	(3.5)	(3.7)	(2.7)
Pound Sterling	(4.1)	(8.3)	(17.6)	(17.2)	(3.2)	(3.6)	(3.6)
Yen	(4.2)	(7.7)	(20.4)	(22.9)	(9.3)	(4.9)	(6.0)

Source: Morningstar, HFRI, as of 9/30/22.



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.langerresearch.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. (https://www.nfib-sbet.org/about/)

NAHB Housing Market Index – the housing market index is a weighted average of separate diffusion induces 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 "(Good-Poor + 100)/2" to the present and future sales series and "(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: September 30, 2022



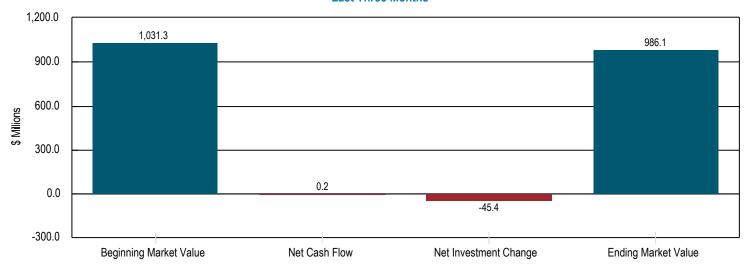
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	Last Three Months	Fiscal Year-To-Date	One Year
Beginning Market Value	\$1,031,349,701	\$1,031,349,701	\$1,121,396,683
Net Cash Flows	\$223,553	\$223,553	-\$11,084,478
Net Investment Change	-\$45,436,913	-\$45,436,913	-\$124,175,864
Ending Market Value	\$986,136,341	\$986,136,341	\$986,136,341

Change in Market Value Last Three Months



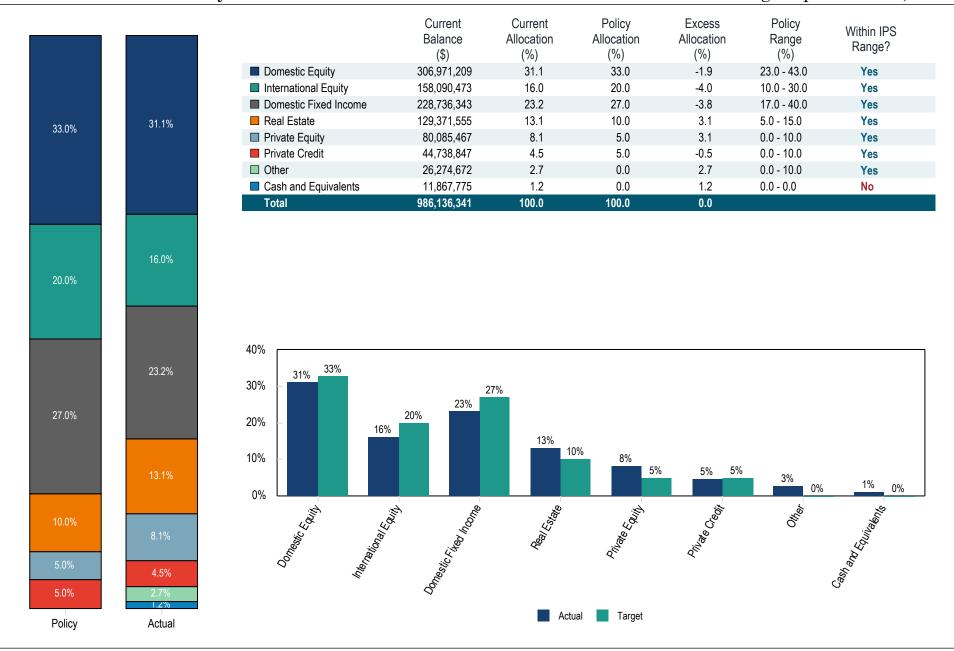
Contributions and withdrawals may include intra-account transfers between managers/funds. Fee transactions are excluded from Portfolio Reconciliation.



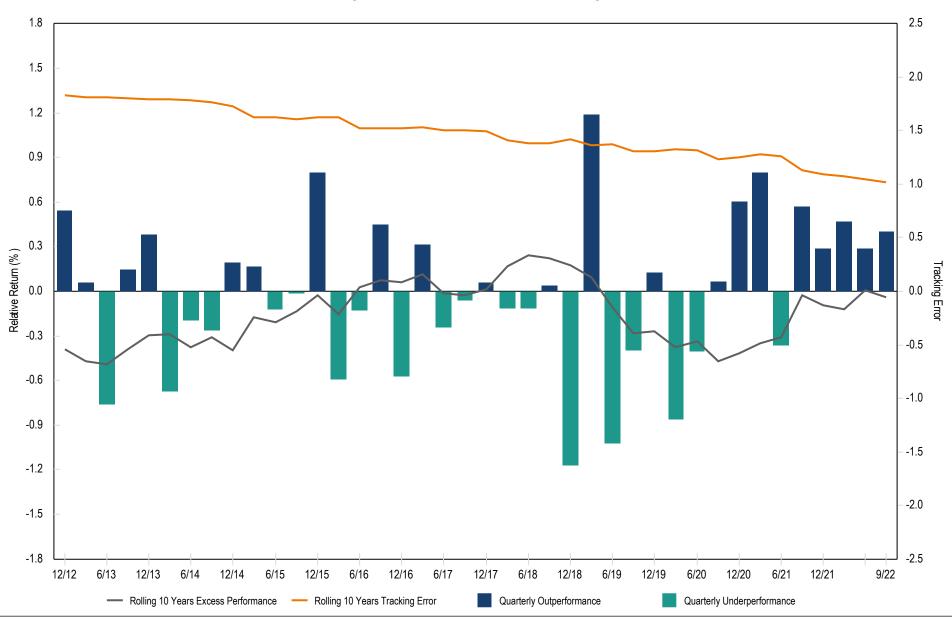
Total Fund Executive Summary (Net of Fees)

	Market Value	% of Portfolio	QTD	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
Total Fund	986,136,341	100.0	-4.4	-16.0	-4.4	-12.0	4.8	5.1	6.5
Policy Index			-4.8	-17.1	-4.8	-13.3	4.1	5.0	6.5
InvMetrics Public DB Rank			52	19	52	18	19	29	49
Total Domestic Equity	306,971,209	31.1	-4.5	-24.6	-4.5	-17.6	7.7	8.6	11.2
Russell 3000 Index			-4.5	-24.6	-4.5	-17.6	7.7	8.6	11.4
Total International Equity	158,090,473	16.0	-9.5	-26.8	-9.5	-25.5	-1.7	-1.1	2.9
MSCI AC World ex USA Index			-9.8	-26.2	-9.8	-24.8	-1.1	-0.3	3.5
Total Fixed Income	228,736,343	23.2	-4.8	-15.6	-4.8	-15.1	-2.2	0.4	1.4
Blmbg. U.S. Aggregate Index			-4.8	-14.6	-4.8	-14.6	-3.3	-0.3	0.9
Total Real Estate	129,371,555	13.1	1.4	13.0	1.4	19.2	11.6	9.6	9.9
NCREIF Property Index			0.6	9.4	0.6	16.1	9.9	8.6	9.5
Total Private Equity	80,085,467	8.1	-3.4	-2.9	-3.4	5.2	24.4	22.1	18.4
Private Equity Benchmark			-3.4	-2.9	-3.4	5.2	24.4	22.1	20.0
Total Private Credit	44,738,847	4.5	-0.1	3.9	-0.1	6.9	9.1	8.1	N/A
Private Credit Benchmark			-0.1	3.9	-0.1	6.9	10.2	8.7	N/A
Total Opportunistic	26,274,672	2.7	-7.2	7.5	-7.2	7.9	9.3	9.0	10.5
Assumption Rate + 1%			2.1	6.3	2.1	8.5	8.5	8.5	N/A

Imperial County Employees' Retirement System Period Ending: September 30, 2022

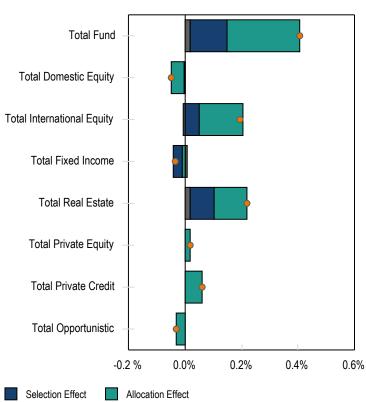


Rolling Annualized Excess Performance and Tracking Error





Attribution Effects Last Three Months



Performance Attribution

	Quarter	YTD
Wtd. Actual Return	-4.4	-16.0
Wtd. Index Return	-4.8	-17.1
Excess Return	0.4	1.0
Selection Effect	0.1	0.0
Allocation Effect	0.3	0.9
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	-4.5	-4.5	0.0	0.0	0.0	0.0	0.0
Total International Equity	-9.5	-9.8	0.3	0.0	0.2	0.0	0.2
Total Fixed Income	-4.8	-4.8	-0.1	0.0	0.0	0.0	0.0
Total Real Estate	1.4	0.6	0.8	0.1	0.1	0.0	0.2
Total Private Equity	-3.4	-3.4	0.0	0.0	0.0	0.0	0.0
Total Private Credit	-0.1	-0.1	0.0	0.0	0.1	0.0	0.1
Total Opportunistic	-7.2	2.1	-9.3	0.0	0.0	0.0	0.0
Total Fund	-4.4	-4.8	0.4	0.1	0.3	0.0	0.4

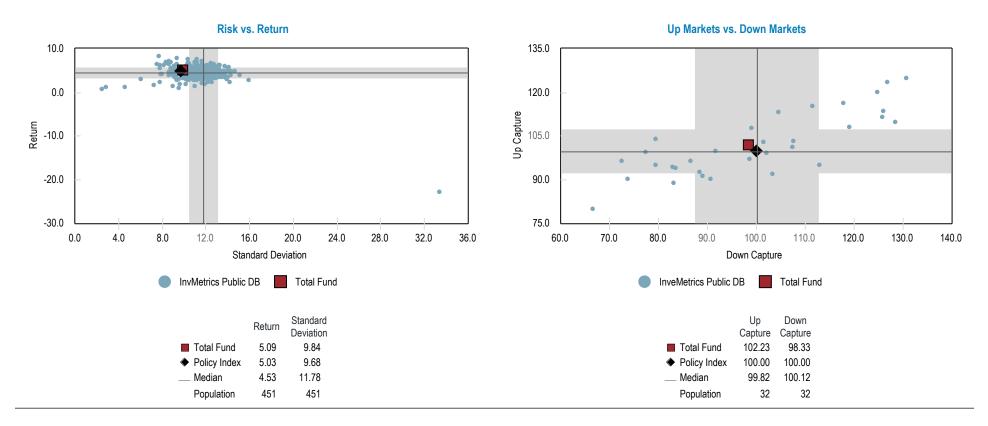
Interaction Effect

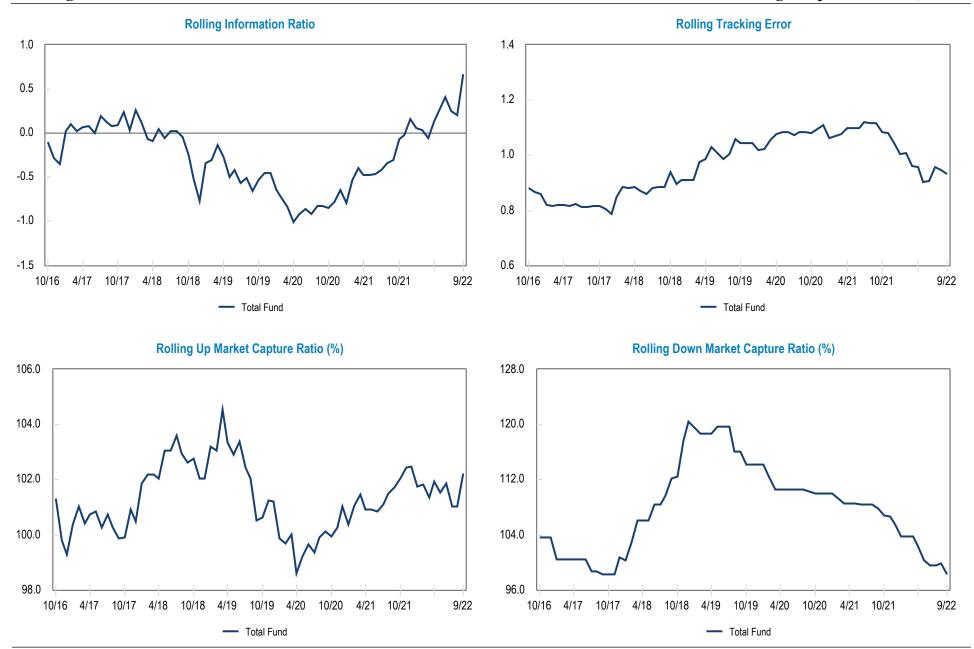
Total Effects

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

Imperial County Employees' Retirement System Period Ending: September 30, 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	5.09	4.31	9.84	0.01	1.01	1.06	0.99	0.43	0.06	101.97	102.36





Total Fund Executive Summary (Net of Fees)

Imperial County Employees' Retirement System Period Ending: September 30, 2022

	Market Value	% of Portfolio	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017	Inception	Inception Date
Total Fund	986,136,341	100.0	-4.4	-16.0	-4.4	-12.0	4.8	5.1	6.5	15.8	12.3	17.9	-4.1	16.0	8.4	Apr-89
Policy Index			-4.8	-17.1	-4.8	-13.3	4.1	5.0	6.5	14.4	13.2	18.0	-2.7	15.9	-	
InvMetrics Public DB Rank			52	19	52	18	19	29	49	20	63	75	39	27	38	
Total Domestic Equity	306,971,209	31.1	-4.5	-24.6	-4.5	-17.6	7.7	8.6	11.2	25.7	21.0	31.1	-5.2	21.2		
Russell 3000 Index			-4.5	-24.6	-4.5	-17.6	7.7	8.6	11.4	25.7	20.9	31.0	-5.2	21.1		
BlackRock Russell 3000	306,971,209	31.1	-4.5	-24.6	-4.5	-17.6	7.7	8.6	-	25.7	21.0	31.1	-5.2	21.2	10.0	Dec-15
Russell 3000 Index			-4.5	-24.6	-4.5	-17.6	7.7	8.6	-	25.7	20.9	31.0	-5.2	21.1	9.9	
eV US All Cap Core Equity Rank			46	46	46	39	33	33	-	53	44	39	46	42	14	
Total International Equity	158,090,473	16.0	-9.5	-26.8	-9.5	-25.5	-1.7	-1.1	2.9	10.1	8.1	20.7	-14.3	27.9		
MSCI AC World ex USA Index			-9.8	-26.2	-9.8	-24.8	-1.1	-0.3	3.5	8.3	11.1	22.1	-13.8	27.8		
BlackRock International Equity	119,546,300	12.1	-9.3	-26.8	-9.3	-24.8	-1.5	-0.5	3.9	11.6	8.1	22.4	-13.5	25.4	5.6	Jul-03
MSCI EAFE (Net)			-9.4	-27.1	-9.4	-25.1	-1.8	-0.8	3.7	11.3	7.8	22.0	-13.8	25.0	5.2	
eV All EAFE Equity Rank			35	39	35	37	52	37	49	50	52	49	29	61	60	
DFA Emerging Markets Value	21,713,185	2.2	-9.8	-19.0	-9.8	-18.7	0.8	-0.5	1.5	12.4	2.7	9.6	-11.9	33.8	2.7	Jan-07
MSCI Emerging Markets Value (Net)			-11.0	-23.3	-11.0	-23.6	-2.6	-2.1	-0.4	4.0	5.5	12.0	-10.7	28.1	2.1	
eV Emg Mkts All Cap Value Equity Rank			45	24	45	26	37	51	77	18	82	91	32	37	84	
Harding Loevner Emerging Markets	16,830,989	1.7	-11.0	-35.0	-11.0	-36.5	-7.9	-6.0	-	-4.3	12.4	24.0	-19.5	33.6	-1.4	Aug-16
MSCI Emerging Markets Growth Index			-12.1	-30.5	-12.1	-31.9	-1.5	-1.4	-	-8.2	31.6	25.4	-18.0	47.1	3.5	
eV Emg Mkts All Cap Growth Equity Rank			71	86	71	82	99	100	-	51	97	53	70	85	100	
Total Fixed Income	228,736,343	23.2	-4.8	-15.6	-4.8	-15.1	-2.2	0.4	1.4	0.6	9.8	9.5	-0.8	4.3		
Blmbg. U.S. Aggregate Index			-4.8	-14.6	-4.8	-14.6	-3.3	-0.3	0.9	-1.5	7.5	8.7	0.0	3.5		
Ducenta Squared	95,333,646	9.7	-4.5	-15.7	-4.5	-15.4	-2.8	0.2	1.7	-0.6	9.1	9.9	-0.1	4.3	5.2	Mar-93
Blmbg. U.S. Aggregate Index			-4.8	-14.6	-4.8	-14.6	-3.3	-0.3	0.9	-1.5	7.5	8.7	0.0	3.5	4.4	
eV US Core Plus Fixed Inc Rank			58	68	58	53	56	47	34	53	39	43	27	66	27	
MacKay Shields Core Plus Opportunities	93,407,389	9.5	-5.1	-16.5	-5.1	-16.5	-2.9	-0.1	-	-0.5	9.9	9.7	-1.0	4.5	0.6	Mar-15
Blmbg. U.S. Aggregate Index			-4.8	-14.6	-4.8	-14.6	-3.3	-0.3	-	-1.5	7.5	8.7	0.0	3.5	0.5	
eV US Core Plus Fixed Inc Rank			94	88	94	88	58	70	-	50	23	51	76	52	83	
BlackRock US TIPS	39,995,308	4.1	-5.1	-13.5	-5.1	-11.6	0.8	2.0	1.0	5.9	11.2	8.5	-1.2	3.2	3.4	Apr-07
Blmbg. U.S. TIPS	,,		-5.1	-13.6	-5.1	-11.6	0.8	2.0	1.0	6.0	11.0	8.4	-1.3	3.0	3.4	P
eV US TIPS / Inflation Fixed Inc Rank			58	63	58	54	56	40	35	28	29	31	41	39	28	

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 6/30/2022.



Total Fund Executive Summary (Net of Fees)

Imperial County Employees' Retirement System Period Ending: September 30, 2022

	Market Value	% of Portfolio	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017	Inception	Inception Date
Total Real Estate	129,371,555	13.1	1.4	13.0	1.4	19.2	11.6	9.6	9.9	18.4	2.1	5.7	7.5	5.8		
NCREIF Property Index			0.6	9.4	0.6	16.1	9.9	8.6	9.5	17.7	1.6	6.4	6.7	7.0		
NCREIF ODCE Net			0.3	12.4	0.3	21.0	11.4	9.3	9.9	21.0	0.3	4.4	7.4	6.7		
ASB Real Estate	32,454,992	3.3	2.2	15.3	2.2	20.0	10.5	8.4	-	14.2	1.5	3.0	6.6	4.0	9.1	Jan-13
NCREIF Property Index			0.6	9.4	0.6	16.1	9.9	8.6	-	17.7	1.6	6.4	6.7	7.0	9.5	
NCREIF ODCE Net			0.3	12.4	0.3	21.0	11.4	9.3	-	21.0	0.3	4.4	7.4	6.7	9.9	
Clarion Lion	36,263,904	3.7	0.6	15.6	0.6	24.7	14.2	11.5	11.4	23.6	2.3	6.8	8.6	7.9	6.5	Jan-07
NCREIF Property Index			0.6	9.4	0.6	16.1	9.9	8.6	9.5	17.7	1.6	6.4	6.7	7.0	7.5	
NCREIF ODCE Net			0.3	12.4	0.3	21.0	11.4	9.3	9.9	21.0	0.3	4.4	7.4	6.7	6.3	
ARA American Strategic Value Realty	58,686,000	6.0	1.5	10.7	1.5	16.2	11.2	-	-	18.6	2.4	7.8	-	-	10.0	Jan-18
NCREIF Property Index +2%			1.1	11.0	1.1	18.4	12.1	-	-	20.0	3.6	8.5	8.9	-	10.9	
NCREIF ODCE Net			0.3	12.4	0.3	21.0	11.4	-	-	21.0	0.3	4.4	7.4	-	9.4	
1221 State St. Corp	1,966,659	0.2	0.0	0.0	0.0	0.0	2.6	1.5	2.4	0.0	0.0	7.9	0.0	0.0	1.4	Jun-08
Total Private Equity	80,085,467	8.1	-3.4	-2.9	-3.4	5.2	24.4	22.1	18.4	57.3	23.0	13.3	21.3	18.8		
Harbourvest Buyout IX	6,960,146	0.7	-3.9	-2.2	-3.9	4.1	23.2	22.0	18.5	49.6	21.3	17.6	23.6	23.2	-	Jun-11
Harbourvest Credit Ops IX	1,021,875	0.1	-5.7	8.8	-5.7	15.4	13.8	13.7	14.4	32.1	0.3	8.0	14.4	17.5	-	Jun-11
Harbourvest International PE VI	1,764,298	0.2	-2.4	-21.5	-2.4	-24.7	8.9	11.0	11.9	41.2	17.2	6.0	14.8	19.4	-	Mar-10
Harbourvest Venture IX	5,831,234	0.6	-13.5	-14.9	-13.5	-2.8	35.8	32.0	23.4	91.1	52.4	24.6	25.9	9.4	-	Jun-11
Harbourvest 2017 Global Fund	26,731,432	2.7	-6.6	0.4	-6.6	7.0	25.2	22.2	-	61.6	18.8	8.8	20.9	-	22.2	Oct-17
Harbourvest 2018 Global Fund	21,391,933	2.2	5.3	8.5	5.3	19.8	21.5	-	-	37.0	16.0	14.3	-	-	19.8	Jan-19
Harbourvest 2019 Global Fund	16,384,549	1.7	-3.8	7.7	-3.8	19.7	-	-	-	49.6	34.6	-	-	-	31.4	Dec-19
Russell 3000 + 3%			-3.8	-22.9	-3.8	-15.2	-	-	-	29.4	24.5	-	-	-	9.1	
Total Private Credit	44,738,847	4.5	-0.1	3.9	-0.1	6.9	9.1	8.1	-	16.1	4.8	9.4	6.7	-		
Portfolio Advisors Credit Strategies Fund	12,557,769	1.3	0.0	7.1	0.0	13.5	13.0	-	-	26.8	3.9	8.2	6.6	-	10.4	Oct-17
Bloomberg High Yield +2% (Lagged)			-9.4	-12.3	-9.4	-11.1	2.2	4.1	-	13.5	5.3	8.5	5.1	-	3.9	
Crescent Direct Lending Levered Fund II	2,885,182	0.3	0.0	3.7	0.0	5.7	8.7	-	-	11.5	6.0	12.4	-	-	8.6	Mar-18
Bloomberg High Yield +2% (Lagged)			-9.4	-12.3	-9.4	-11.1	2.2	-	-	13.5	5.3	8.5	-	-	3.8	
Audax Direct Lending Fund A	4,502,949	0.5	2.9	11.8	2.9	14.5	16.0	-	-	23.1	10.1	16.3	-	-	18.8	Oct-18
Bloomberg High Yield +2% (Lagged)			-9.4	-12.3	-9.4	-11.1	2.2	-	-	13.5	5.3	8.5	-	-	4.0	
Ares Capital Europe IV	6,828,067	0.7	2.2	4.6	2.2	13.3	9.2	-	-	11.8	8.2	13.1	-	-	9.9	Aug-18
Bloomberg High Yield +2% (Lagged)			-9.4	-12.3	-9.4	-11.1	2.2	-	-	13.5	5.3	8.5	-	-	4.0	
Lone Star XI	4,962,813	0.5	0.0	1.4	0.0	9.3	38.7	-	-	538.0	-62.8	-	-	-	17.6	Jun-19
Bloomberg High Yield +2% (Lagged)			-9.4	-12.3	-9.4	-11.1	2.2	-	-	13.5	5.3	-	-	-	3.2	

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 6/30/2022.



Total Fund Executive Summary (Net of Fees)

	Market Value	% of Portfolio	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017	Inception	Inception Date
Sixth Street Diversified Credit	9,422,396	1.0	-3.7	11.9	-3.7	4.2	-	-	-	-1.4	-	-	-	-	3.6	May-20
Bloomberg High Yield +2% (Lagged)			-9.4	-12.3	-9.4	-11.1	-	-	-	13.5	-	-	-	-	0.6	
Ascribe Opportunities Fund IV	3,579,670	0.4	0.0	1.7	0.0	12.4	-	-	-	-17.3	-	-	-	-	-193.6	Jul-20
Bloomberg High Yield +2% (Lagged)			-9.4	-12.3	-9.4	-11.1	-	-	-	13.5	-	-	-	-	4.8	
Total Opportunistic	26,274,672	2.7	-7.2	7.5	-7.2	7.9	9.3	9.0	10.5	18.6	0.9	-10.7	32.0	5.3		
KKR Mezzanine Partners	1,407,379	0.1	-32.5	-27.6	-32.5	-23.6	-12.2	-3.6	3.1	10.5	-15.2	-4.2	25.3	8.7	4.3	Jun-11
PIMCO BRAVO	13,617	0.0	0.0	-0.6	0.0	-0.9	-19.4	-18.8	-5.1	-21.7	-48.2	-49.1	77.8	-12.4	-1.5	May-11
TSSP Adjacent Opportunities Partners	24,853,676	2.5	-4.7	12.7	-4.7	17.3	-	-	-	26.1	-	-	-	-	19.5	Apr-20
Total Cash	11,867,775	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Cash Account	11,867,775	1.2	0.0	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
90 Day U.S. Treasury Bill			0.5	0.6	0.5	0.6	0.6	1.1	0.7	0.0	0.7	2.3	1.9	0.9	0.7	



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

	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	7.72	9.90	24.11	0.02	1.00	0.02	1.00	0.41	0.64	100.04	99.97
BlackRock International Equity	-1.51	0.46	22.14	0.33	1.00	0.12	1.00	0.02	2.83	101.00	99.19
DFA Emerging Markets Value	0.84	4.37	27.43	4.15	1.06	4.96	0.97	0.16	0.83	113.90	93.37
Harding Loevner Emerging Markets	-7.85	-4.45	28.52	-5.67	1.04	8.23	0.92	-0.15	-0.70	92.45	117.62
Ducenta Squared	-2.81	-3.21	6.61	0.71	1.07	1.82	0.93	-0.48	0.27	126.42	105.28
MacKay Shields Core Plus Opportunities	-2.86	-3.23	7.16	0.82	1.11	2.85	0.85	-0.45	0.17	134.54	109.63
BlackRock US TIPS	0.84	0.46	6.52	0.04	1.00	0.14	1.00	0.07	0.34	100.54	99.76
ASB Real Estate	10.45	9.58	4.65	1.38	0.91	2.51	0.72	2.01	0.21	104.41	77.56
Clarion Lion	14.22	13.10	6.13	0.67	1.35	2.43	0.90	2.08	1.67	143.26	184.41
ARA American Strategic Value Realty	11.23	10.28	4.13	0.22	0.91	1.26	0.92	2.40	-0.65	92.61	65.05
Portfolio Advisors Credit Strategies Fund	12.99	12.11	7.73	11.80	0.46	8.41	0.56	1.55	1.15	120.07	14.76
Crescent Direct Lending Levered Fund II	8.65	7.87	4.08	8.52	0.07	12.28	0.05	1.81	0.45	59.62	-17.63
Audax Direct Lending Fund A	16.05	14.76	6.34	15.49	0.23	11.11	0.21	2.30	1.11	124.18	-10.41
Ares Capital Europe IV	9.16	8.37	4.70	9.34	-0.02	13.58	0.00	1.78	0.44	62.14	-19.99
Lone Star XI	38.67	64.86	95.93	78.39	1.06	95.01	0.02	0.67	0.66	617.14	73.99



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

	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	7.72	9.01	20.66	0.02	1.00	0.03	1.00	0.43	0.43	100.02	99.96
BlackRock International Equity	-1.51	-0.31	18.91	0.34	1.00	0.34	1.00	-0.02	1.00	101.53	100.22
DFA Emerging Markets Value	0.84	2.56	21.03	3.96	1.06	4.58	0.96	0.12	0.84	108.39	92.38
Harding Loevner Emerging Markets	-7.85	-6.32	21.55	-5.98	0.99	8.91	0.83	-0.29	-0.69	90.23	113.38
Ducenta Squared	-2.81	-3.28	5.57	0.52	1.01	1.49	0.93	-0.58	0.32	111.79	101.76
MacKay Shields Core Plus Opportunities	-2.86	-3.28	6.47	0.97	1.15	2.29	0.89	-0.50	0.21	132.26	114.55
BlackRock US TIPS	0.84	0.48	6.80	0.04	1.00	0.11	1.00	0.07	0.44	100.69	100.22
ASB Real Estate	10.45	9.58	6.23	0.75	0.98	2.51	0.84	1.54	0.20	104.41	77.56
Clarion Lion	14.22	13.10	8.30	0.37	1.38	2.93	0.95	1.57	1.38	143.26	184.41



\$0

\$0

\$0

\$42,974

\$43,880

\$193,548

\$14,425

\$24,327

\$71,859

\$57,401

\$68,207

\$265,484

\$2

\$0

\$77

		Estimated 9/30/2022	Total	Capital	%	Remaining	Capital	Market Value	Distrib./ Paid-In	Tot. Value/ Paid-In	Net IRR Since	IRR
Vintage	Manager & Fund Name	Market Value ³	Commitment	Called	Called	Commitment	Returned	for IRR	(DPI) ¹	(TVPI) ²	Inception ⁴	Date
0044		40,000,440	* 40.000.000	* 0.505.000	0.50/	A4 475 000	A44.007.074	AT 005 074	440.40/	222.221	20.50/	2/22/22
2011	HarbourVest IX-Buyout	\$6,960,146	\$10,000,000	\$8,525,000	85%	\$1,475,000	\$11,967,371	\$7,665,971	140.4%	222.0%	20.5%	6/30/22
2011	HarbourVest IX-Credit	\$1,021,875	\$2,000,000	\$1,600,000	80%	\$400,000	\$1,673,361	\$1,021,875	104.6%	168.5%	13.6%	6/30/22
2008	HarbourVest Int'l VI ⁵	\$1,764,298	\$3,712,930	\$2,630,078	71%	\$1,082,852	\$3,847,897	\$1,900,262	146.3%	213.4%	16.0%	6/30/22
2011	HarbourVest IX-Venture	\$5,831,234	\$4,000,000	\$3,800,000	95%	\$200,000	\$7,048,991	\$6,103,767	185.5%	339.0%	26.1%	6/30/22
2017	HarbourVest 2017 Global	\$26,731,432	\$30,000,000	\$17,700,000	59%	\$12,300,000	\$9,096,303	\$27,004,913	51.4%	202.4%	30.3%	6/30/22
2018	HarbourVest 2018 Global	\$21,391,933	\$20,000,000	\$10,538,043	53%	\$9,461,957	\$2,442,005	\$21,391,933	23.2%	226.2%	38.2%	6/30/22
2019	HarbourVest 2019 Global	\$16,384,549	\$20,000,000	\$11,375,273	57%	\$8,624,727	\$0	\$15,826,386	0.0%	144.0%	63.0%	6/30/22
	Total Illiquid Private Equity%	\$80,085,467	\$89,712,930	\$56,168,394	63%	\$33,544,536	\$36,075,928	\$80,915,107	144.1%	208.3%		
	of Portfolio (Market Value)	8.1%						Management	Admin	Interest	Other	Total
	,	0.170						Fee	Fee	Expense	Expense	Expense ⁶
					-	HarbourVest IX-Buyout		\$22,437	\$0	\$0	\$653	\$23,090
						HarbourVest IX-Credit		\$4,483	\$0	\$25	\$452	\$4,960
						HarbourVest Int'l VI		\$4,781	\$0	\$50	\$57	\$4,888
						HarbourVest IX-Venture	е	\$8,993	\$0	\$0	\$137	\$9,130
						HarbourVest 2017 Glob	oal	\$66,000	\$0	\$0	\$31,808	\$97,808

HarbourVest 2018 Global

HarbourVest 2019 Global

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)

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 2Q 2022

Vintage	Manager & Fund Name	Estimated 9/30 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	\$12,557,769	\$11,250,000	\$11,250,000	100%	\$0	\$2,029,294	\$12,557,769	18.0%	129.7%	7.8%	6/30/22
2017	Crescent Direct Lending Levered Fund II	\$2,885,182	\$7,000,000	\$5,707,507	82%	\$1,292,493	\$4,108,892	\$3,070,904	72.0%	122.5%	8.8%	6/30/22
2017	Audax Direct Lending Fund A	\$4.502.949	\$7,000,000	\$5,121,503	73%	\$1,878,497	\$2,342,191	NA.	45.7%	133.7%	NM ⁶	NM ⁶
2018	Ares Capital Europe IV	\$6,828,067	\$8,000,000	\$6,762,884	85%	\$1,237,116	\$1,742,568	NA	25.8%	126.7%	NM ⁷	NM^7
2019	Lone Star Fund XI	\$4,962,813	\$5,750,000	\$3,877,643	67%	\$1,872,357	\$174,333	NA	4.5%	132.5%	NA	NA
2019	Ascribe Opportunities IV	\$3,579,670	\$6,000,000	\$3,509,262	58%	\$2,490,738	\$26,909	NA	NA	NA	NA	NA
2020	Sixth Street Diversified Credit	\$9,422,396	\$50,000,000	\$11,503,426	23%	\$38,496,574	\$3,010,235	NA	26.2%	108.1%	NA	NA
	Total Illiquid Private Credit % of Portfolio (Market Value)	\$44,738,847 4.5%	\$95,000,000	\$47,732,226	50%	\$47,267,774	\$13,434,422 Management Fee	\$15,628,673 Accrued Carried Interest	32.7% Admin Fee	60.9% Interest Expense	Other Expense	Total Expense⁵
					Portfolio Adv	risors CSF	\$0	\$0	\$0	\$0	\$0	\$0
						ect Lending II	\$41,569	\$6,553	\$10,506	\$0	\$0	\$58,628
					Audax Direc	t Lending A	\$29,800	\$0	\$0	\$0	\$65,439	\$95,239
						t Lending A						
					Audax Direc	t Lending A Europe IV	\$29,800	\$0	\$0	\$0	\$65,439	\$95,239
					Audax Direc Ares Capital	t Lending A Europe IV ortunities IV	\$29,800 \$25,291	\$0 \$26,046	\$0 \$0	\$0 \$45,784	\$65,439 \$9,706	\$95,239 \$106,827
				_	Audax Direc Ares Capital Ascribe Opp Lone Star Fu	t Lending A Europe IV ortunities IV	\$29,800 \$25,291 \$0	\$0 \$26,046 \$0	\$0 \$0 \$0	\$0 \$45,784 \$0	\$65,439 \$9,706 \$0	\$95,239 \$106,827 \$0

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)

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 2Q 2022

⁶The Fund issued its first capital call on October 26, 2018. As such it does not consider the IRR to be meaningful.

⁷Given the nature of the ACE IV strategy, Ares will begin reporting fund-level IRR metrics beginning in Q3 2019, one year after the fund's first investment.

Vintage	Manager & Fund Name	Estimated 9/30 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	\$1,407,379	\$10,000,000	\$10,011,880	100%	-\$11,880	\$14,153,380	\$1,486,790	141.4%	155.4%	7.3%	6/30/22
2011	PIMCO BRAVO 4	\$13,617	\$10,000,000	\$10,000,000	100%	\$0	\$18,212,617	\$13,617	182.1%	182.3%	-1.5%	6/30/22
2020	TSSP Adjacent Opportunities Partners	\$24,853,676	\$40,000,000	\$21,229,387	53%	\$18,770,613	\$3,919,665	NA	18.5%	135.5%	NA	NA
	Total Illiquid Opportunistic	\$26,274,672	\$60,000,000	\$41,241,267	69%	\$18,758,733	\$36,285,662	\$1,500,407	3.6%	91.6%		
	% of Portfolio (Market Value)	2.7%					Management Fee	Accrued Carried Interest	Admin Fee	Interest Expense	Other Expense	Total Expense ⁷
	% of Portfolio (Market Value)	2.7%					-					
	% of Portfolio (Market Value)	2.7%		ا	KKR Mezzai	nine	Fee \$3,341	Carried Interest	Fee \$0	Expense \$0	Expense \$2,223	
	% of Portfolio (Market Value)	2.7%			KKR Mezzai PIMCO BRA		Fee	Carried Interest	Fee	Expense	Expense	Expense ⁷
	% of Portfolio (Market Value)	2.7%			PIMCO BRA		\$3,341 \$0	Carried Interest	Fee \$0	Expense \$0	Expense \$2,223	Expense ⁷ \$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.

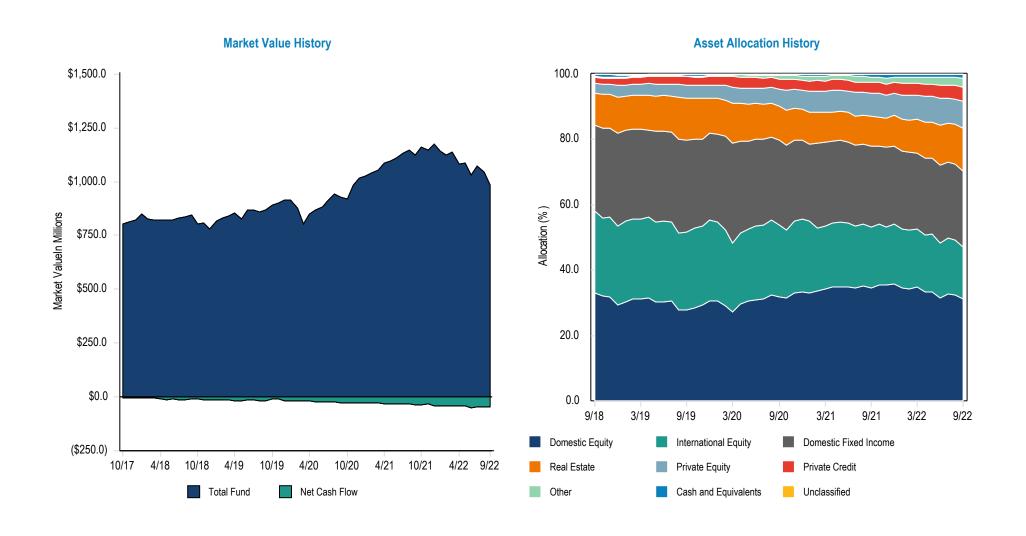
⁵Net IRR is calculated on the cash flows of all the limited partners of the fund and is net of all fees. Each IRR figure is provided by its respective manager.

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 2Q 2022

Total Fund Cash Flow by Manager (Last Three Months)

	Beginning Market Value	Contributions	Withdrawals	Net Cash Flows	Capital Appreciation	Income	Ending Market Value
BlackRock Russell 3000	\$324,955,266	\$0	-\$3,813,618	-\$3,813,618	-\$14,170,439	\$0	\$306,971,209
BlackRock International Equity	\$131,763,759	\$0	\$0	\$0	-\$12,217,459	\$0	\$119,546,300
DFA Emerging Markets Value	\$24,073,089	\$0	\$0	\$0	-\$2,359,904	\$0	\$21,713,185
Harding Loevner Emerging Markets	\$18,862,010	\$0	\$0	\$0	-\$2,031,022	\$0	\$16,830,989
Ducenta Squared	\$99,736,470	\$0	\$0	\$0	-\$4,402,824	\$0	\$95,333,646
MacKay Shields Core Plus Opportunities	\$98,434,982	\$0	\$0	\$0	-\$5,027,593	\$0	\$93,407,389
BlackRock US TIPS	\$46,133,531	\$0	-\$3,804,103	-\$3,804,103	-\$2,334,120	\$0	\$39,995,308
ASB Real Estate	\$31,743,731	\$0	\$0	\$0	\$711,261	\$0	\$32,454,992
Clarion Lion	\$36,130,468	\$211,622	-\$295,573	-\$83,951	\$217,387	\$0	\$36,263,904
ARA American Strategic Value Realty	\$57,843,717	\$0	\$0	\$0	\$842,284	\$0	\$58,686,000
1221 State St. Corp	\$1,961,582	\$20,476	-\$15,399	\$5,077	\$0	\$0	\$1,966,659
Harbourvest Buyout IX	\$7,980,151	\$0	-\$705,825	-\$705,825	-\$314,180	\$0	\$6,960,146
Harbourvest Credit Ops IX	\$1,084,104	\$0	\$0	\$0	-\$62,229	\$0	\$1,021,875
Harbourvest International PE VI	\$1,947,034	\$0	-\$135,964	-\$135,964	-\$46,772	\$0	\$1,764,298
Harbourvest Venture IX	\$7,058,306	\$0	-\$272,533	-\$272,533	-\$954,539	\$0	\$5,831,234
Harbourvest 2017 Global Fund	\$28,925,800	\$0	-\$273,481	-\$273,481	-\$1,920,887	\$0	\$26,731,432
Harbourvest 2018 Global Fund	\$20,318,844	\$0	\$0	\$0	\$1,073,089	\$0	\$21,391,933
Harbourvest 2019 Global Fund	\$16,446,387	\$1,000,000	-\$441,837	\$558,163	-\$620,001	\$0	\$16,384,549
Portfolio Advisors Credit Strategies Fund	\$12,557,769	\$0	\$0	\$0	\$0	\$0	\$12,557,769
Crescent Direct Lending Levered Fund II	\$3,070,904	\$0	-\$185,722	-\$185,722	\$0	\$0	\$2,885,182
Audax Direct Lending Fund A	\$4,485,698	\$500,827	-\$621,297	-\$120,470	\$137,721	\$0	\$4,502,949
Ares Capital Europe IV	\$6,797,725	\$0	-\$117,190	-\$117,190	\$147,532	\$0	\$6,828,067
Lone Star XI	\$3,370,122	\$1,663,848	-\$71,156	\$1,592,691	\$0	\$0	\$4,962,813
Sixth Street Diversified Credit	\$9,169,011	\$891,803	-\$295,850	\$595,953	-\$342,568	\$0	\$9,422,396
Ascribe Opportunities Fund IV	\$2,915,814	\$663,856	\$0	\$663,856	\$0	\$0	\$3,579,670
KKR Mezzanine Partners	\$2,201,086	\$0	-\$79,411	-\$79,411	-\$714,296	\$0	\$1,407,379
PIMCO BRAVO	\$13,621	\$0	\$0	\$0	-\$4	\$0	\$13,617
TSSP Adjacent Opportunities Partners	\$21,384,314	\$4,516,712	\$0	\$4,516,712	-\$1,047,350	\$0	\$24,853,676
Cash Account	\$9,984,407	\$2,046,606	-\$163,238	\$1,883,368	\$0	\$0	\$11,867,775
Total Fund	\$1,031,349,701	\$11,515,749	-\$11,292,197	\$223,553	-\$45,436,913	\$0	\$986,136,341





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	58,686,000	5.95	666,860	1.14
Ares Capital Europe IV	1.38 % of Assets	6,828,067	0.69	94,227	1.38
ASB Real Estate	1.25 % of First \$5 M 1.00 % of Next \$10 M 0.75 % Thereafter	32,454,992	3.29	293,412	0.90
Ascribe Opportunities Fund IV	1.50 % of Assets	3,579,670	0.36	53,695	1.50
Audax Direct Lending Fund A	0.85 % of Assets	4,502,949	0.46	38,275	0.85
BlackRock International Equity	0.15 % of First \$50 M 0.10 % of Next \$50 M 0.00 % Thereafter	119,546,300	12.12	125,000	0.10
BlackRock Russell 3000	0.03 % of Assets	306,971,209	31.13	92,091	0.03
BlackRock US TIPS	0.07 % of Assets	39,995,308	4.06	27,997	0.07
Cash Account		11,867,775	1.20	-	-
Clarion Lion	1.25 % of First \$10 M 1.00 % of Next \$15 M 0.85 % Thereafter	36,263,904	3.68	370,743	1.02
Crescent Direct Lending Levered Fund II	Minimum Fee: \$25,280	2,885,182	0.29	25,280	0.88
DFA Emerging Markets Value	0.41 % of Assets	21,713,185	2.20	89,024	0.41
Ducenta Squared	0.29 % of First \$100 M 0.25 % of Next \$100 M 0.00 % Thereafter	95,333,646	9.67	271,701	0.28
Harbourvest 2017 Global Fund	Minimum Fee: \$262,500	26,731,432	2.71	262,500	0.98
Harbourvest 2018 Global Fund	Minimum Fee: \$138,000	21,391,933	2.17	138,000	0.65
Harbourvest 2019 Global Fund	0.45 % of Assets	16,384,549	1.66	73,730	0.45
Harbourvest Buyout IX	Minimum Fee: \$100,000	6,960,146	0.71	100,000	1.44
Harbourvest Credit Ops IX	Minimum Fee: \$20,000	1,021,875	0.10	20,000	1.96
Harbourvest International PE VI	Minimum Fee: \$35,000	1,764,298	0.18	35,000	1.98
Harbourvest Venture IX	Minimum Fee: \$40,000	5,831,234	0.59	40,000	0.69
Harding Loevner Emerging Markets	1.05 % of Assets	16,830,989	1.71	176,725	1.05
KKR Mezzanine Partners	Minimum Fee: \$150,000	1,407,379	0.14	150,000	10.66
Lone Star XI	0.71 % of Assets	4,962,813	0.50	35,186	0.71
MacKay Shields Core Plus Opportunities	0.35 % of Assets	93,407,389	9.47	326,926	0.35
PIMCO BRAVO	1.90 % of Assets	13,617	0.00	259	1.90
Portfolio Advisors Credit Strategies Fund	Minimum Fee: \$180,000	12,557,769	1.27	180,000	1.43

*HarbourVest, KKR and PIMCO BRAVO 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.

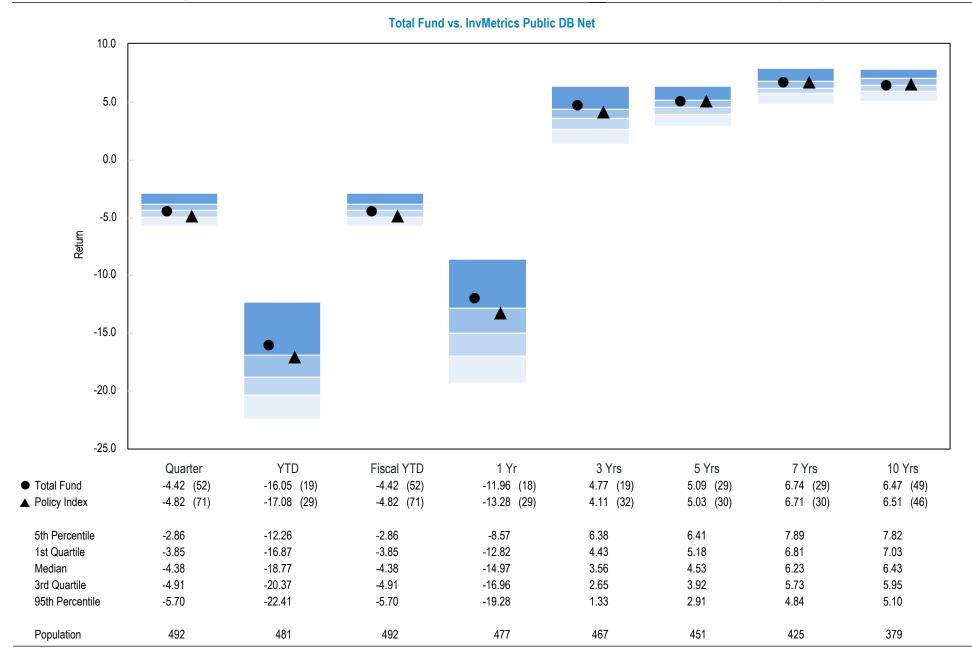
*Portfolio Advisors fee is 0.20% on committed capital and 1.00% on invested capital.



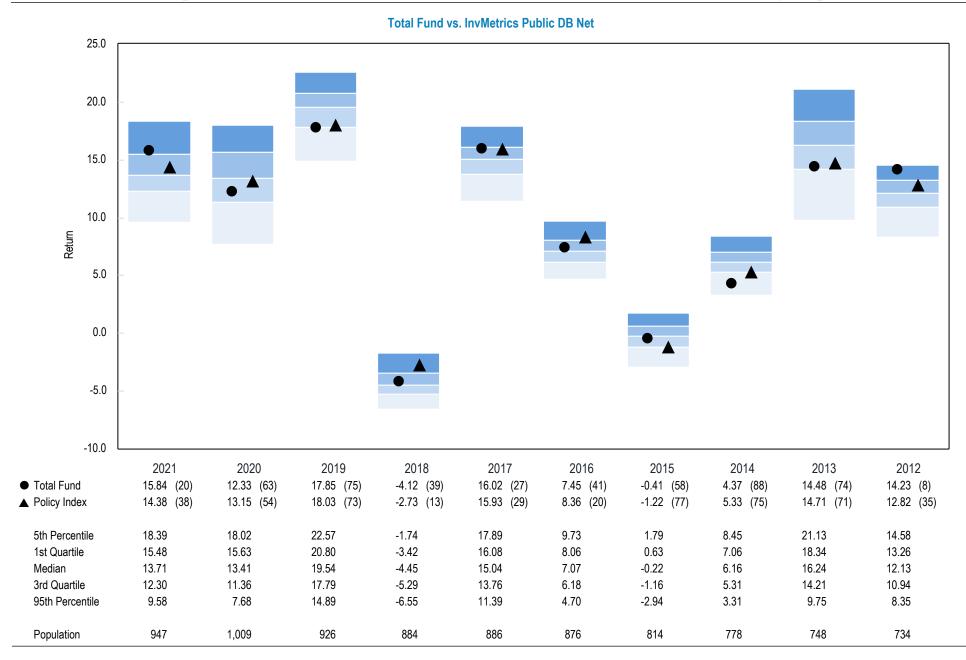
Total Fund Investment Fund Fee Analysis

Account	Fee Schedule	Market Value	% of Portfolio	Estimated Annual Fee (\$)	Estimated Annual Fee (%)
Sixth Street Diversified Credit	1.35 % of Assets	9,422,396	0.96	127,202	1.35
TSSP Adjacent Opportunities Partners		24,853,676	2.52	-	-
Investment Management Fee		986,136,341	100.00	3,813,835	0.39

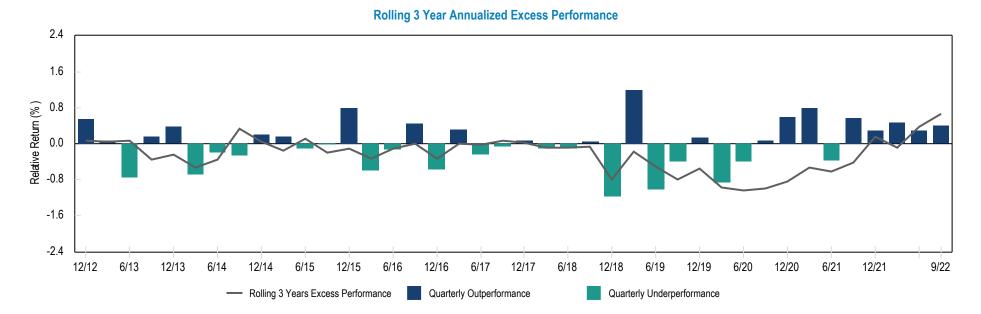




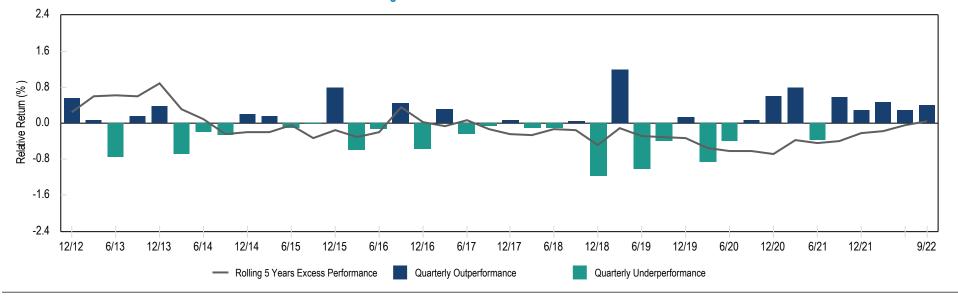












	Market Value	% of Portfolio	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017
Total Domestic Equity	306,971,209	100.0	-4.5	-24.6	-4.5	-17.6	7.7	8.6	11.2	25.7	21.0	31.1	-5.2	21.2
Russell 3000 Index			-4.5	-24.6	-4.5	-17.6	7.7	8.6	11.4	25.7	20.9	31.0	-5.2	21.1
BlackRock Russell 3000	306,971,209	100.0	-4.5	-24.6	-4.5	-17.6	7.7	8.6	-	25.7	21.0	31.1	-5.2	21.2
Russell 3000 Index			-4.5	-24.6	-4.5	-17.6	7.7	8.6	-	25.7	20.9	31.0	-5.2	21.1
eV US All Cap Core Equity Rank			46	46	46	39	33	33	-	53	44	39	46	42

U.S. Effective Style Map 3 Years Ending: September 30, 2022



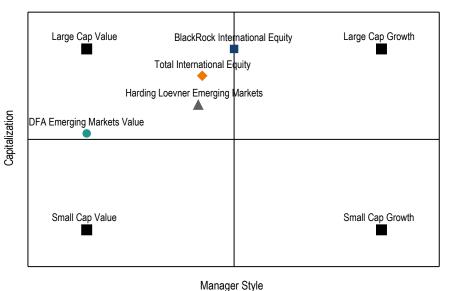
U.S Effective Style Map 5 Years Ending: March 31, 2022



	Market Value	% of Portfolio	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017
Total International Equity	158,090,473	100.0	-9.5	-26.8	-9.5	-25.5	-1.7	-1.1	2.9	10.1	8.1	20.7	-14.3	27.9
MSCI AC World ex USA Index			-9.8	-26.2	-9.8	-24.8	-1.1	-0.3	3.5	8.3	11.1	22.1	-13.8	27.8
BlackRock International Equity	119,546,300	75.6	-9.3	-26.8	-9.3	-24.8	-1.5	-0.5	3.9	11.6	8.1	22.4	-13.5	25.4
MSCI EAFE (Net)			-9.4	-27.1	-9.4	-25.1	-1.8	-0.8	3.7	11.3	7.8	22.0	-13.8	25.0
eV All EAFE Equity Rank			35	39	35	37	52	37	49	50	52	49	29	61
DFA Emerging Markets Value	21,713,185	13.7	-9.8	-19.0	-9.8	-18.7	8.0	-0.5	1.5	12.4	2.7	9.6	-11.9	33.8
MSCI Emerging Markets Value (Net)			-11.0	-23.3	-11.0	-23.6	-2.6	-2.1	-0.4	4.0	5.5	12.0	-10.7	28.1
eV Emg Mkts All Cap Value Equity Rank			45	24	45	26	37	51	77	18	82	91	32	37
Harding Loevner Emerging Markets	16,830,989	10.6	-11.0	-35.0	-11.0	-36.5	-7.9	-6.0	-	-4.3	12.4	24.0	-19.5	33.6
MSCI Emerging Markets Growth Index			-12.1	-30.5	-12.1	-31.9	-1.5	-1.4	-	-8.2	31.6	25.4	-18.0	47.1
eV Emg Mkts All Cap Growth Equity Rank			71	86	71	82	99	100	-	51	97	53	70	85

Capitalization

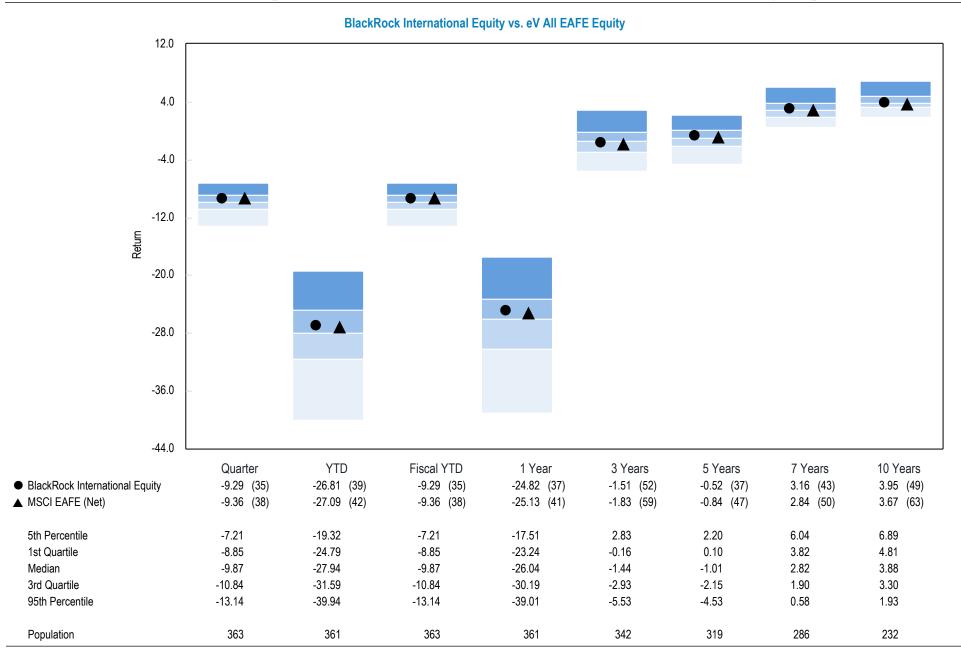
MSCI Effective Style Map 3 Years Ending: September 30, 2022



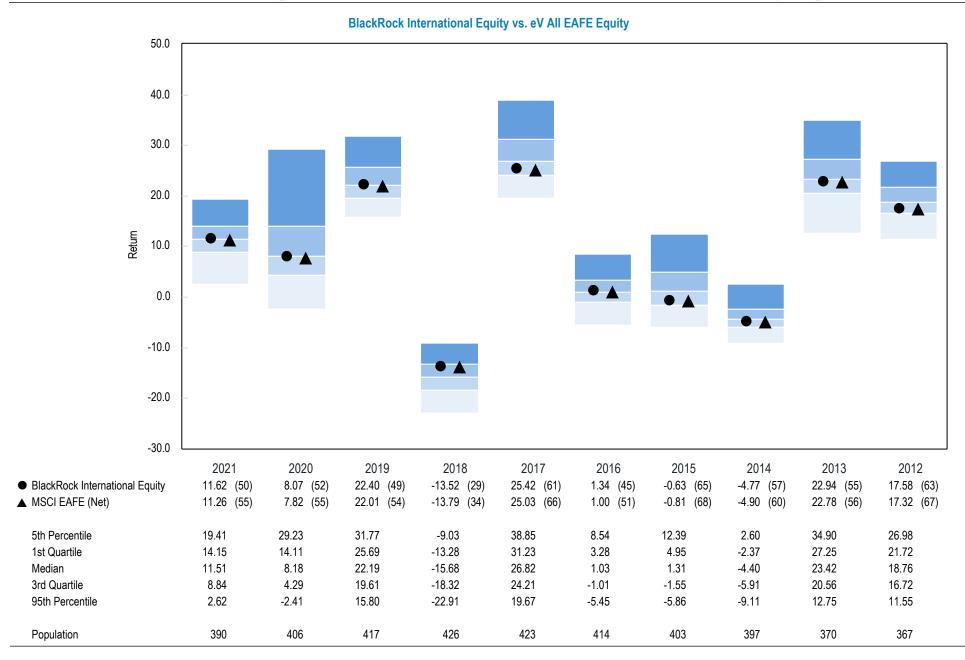
MSCI Effective Style Map 5 Years Ending: September 30, 2022



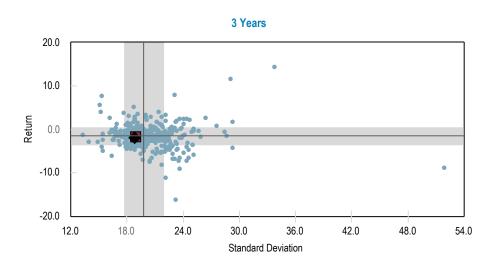
Manager Style

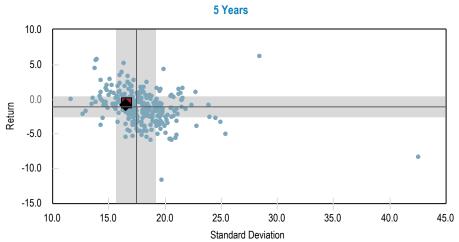










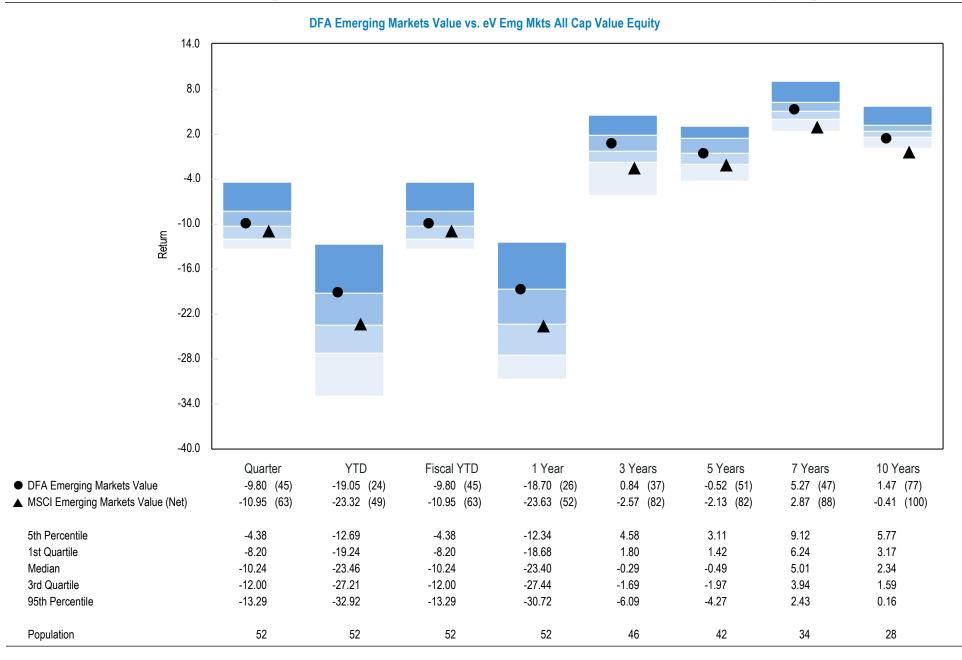


eV All EAFE Equity

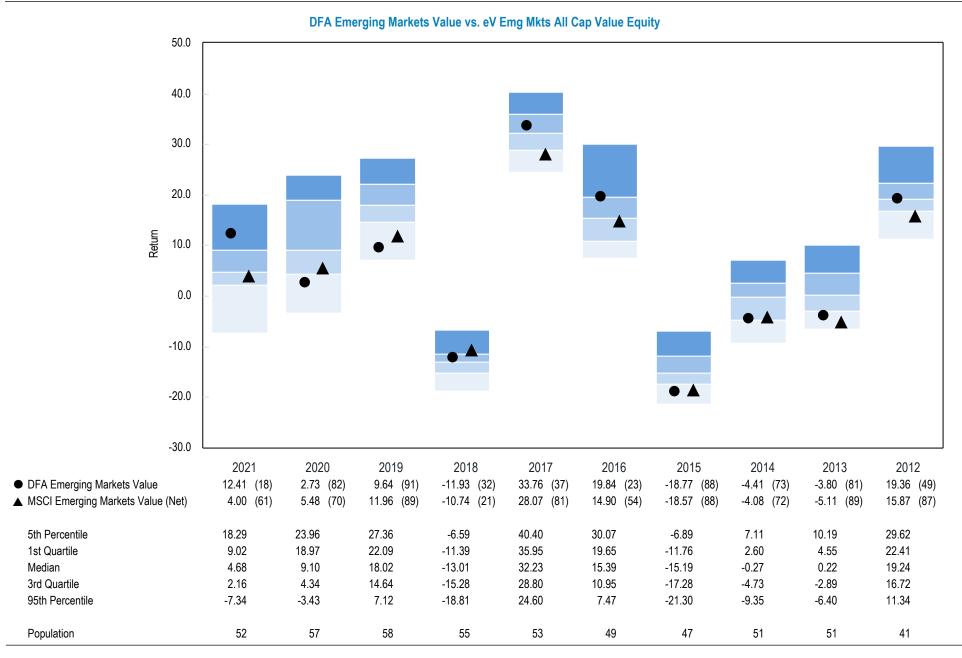
	Return	Standard Deviation
■ BlackRock International Equity	-1.51	18.91
MSCI EAFE (Net)	-1.83	18.85
Median	-1.44	19.83
Population	342	342

eV All EAFE Equity

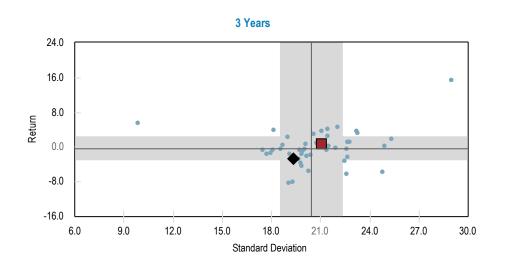
	Return	Standard Deviation
■ BlackRock International Equity	-0.52	16.56
◆ MSCI EAFE (Net)	-0.84	16.51
Median	-1.01	17.43
Population	319	319

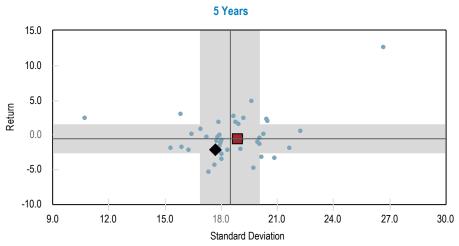










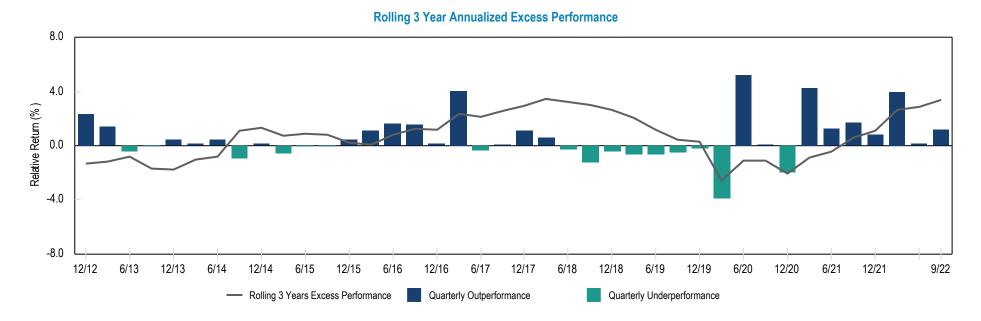


eV Emg Mkts All Cap Value Equity

	Return	Standard Deviation
■ DFA Emerging Markets Value	0.84	21.03
◆ MSCI Emerging Markets Value (Net)	-2.57	19.33
Median	-0.29	20.45
Population	46	46

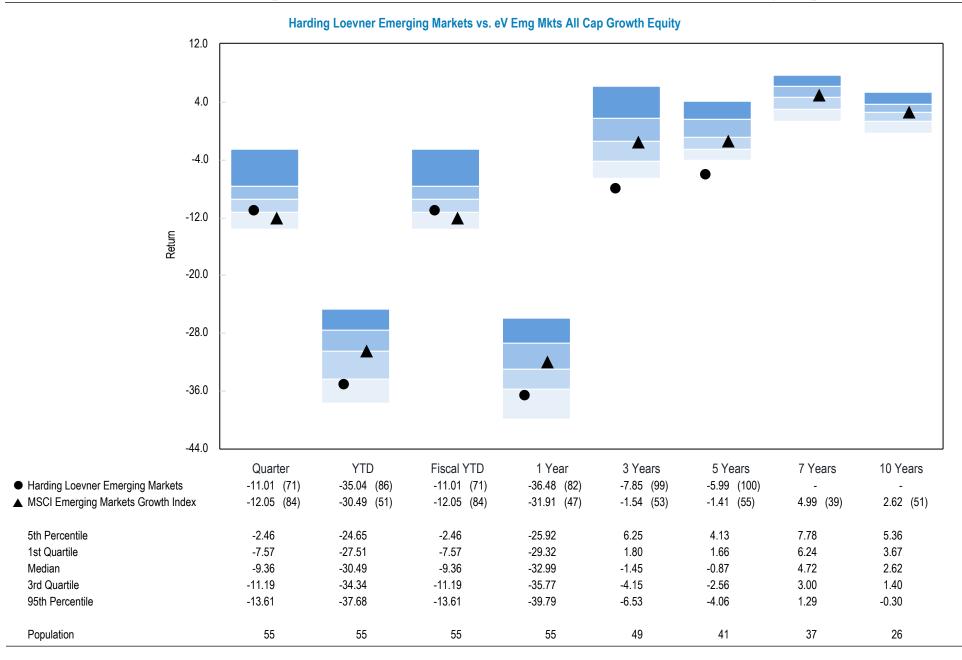
eV Emg Mkts All Cap Value Equity

	Return	Standard Deviation
■ DFA Emerging Markets Value	-0.52	18.87
 MSCI Emerging Markets Value (Net) 	-2.13	17.69
Median	-0.49	18.48
Population	42	42

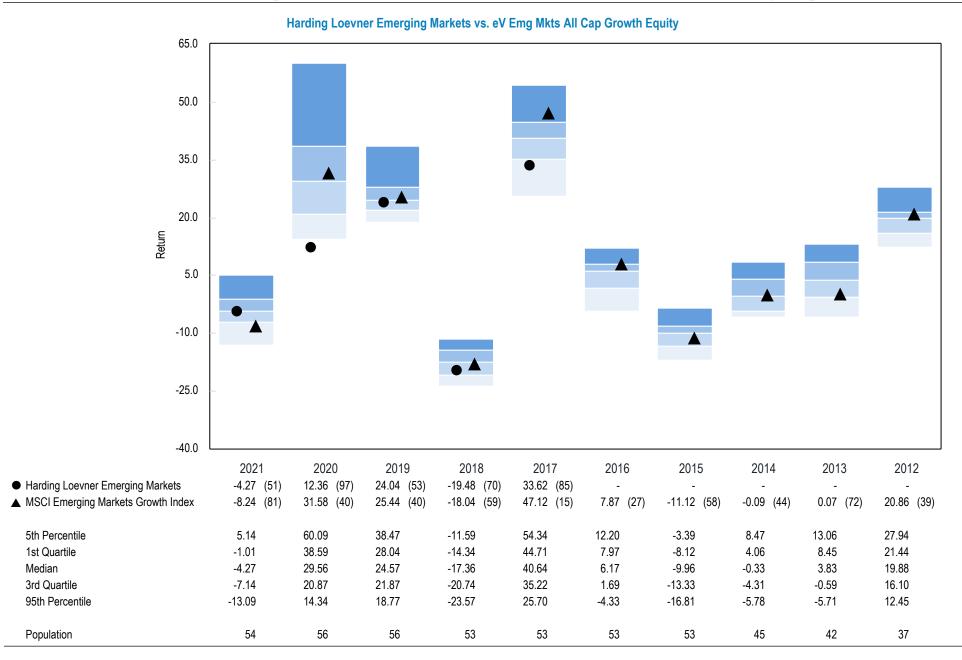




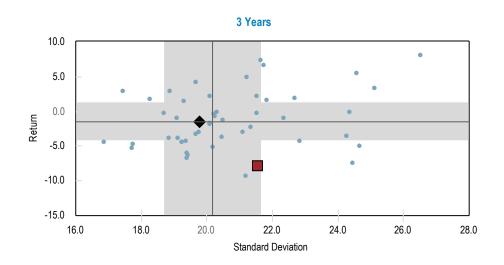


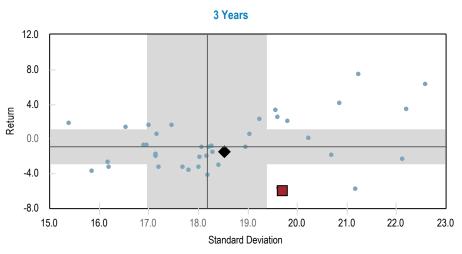












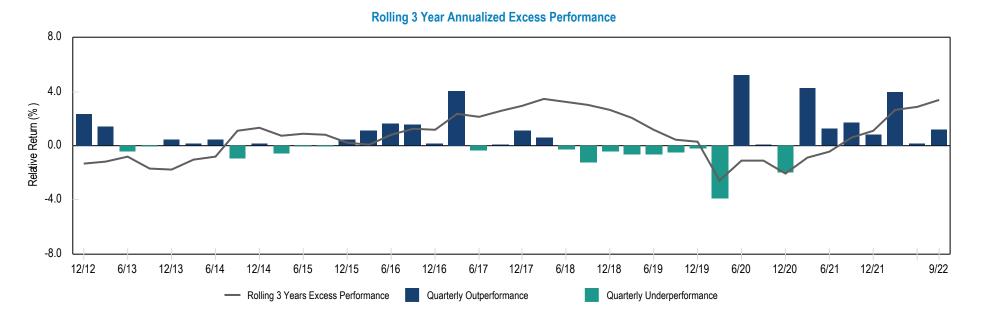
eV Emg Mkts All Cap Growth Equity

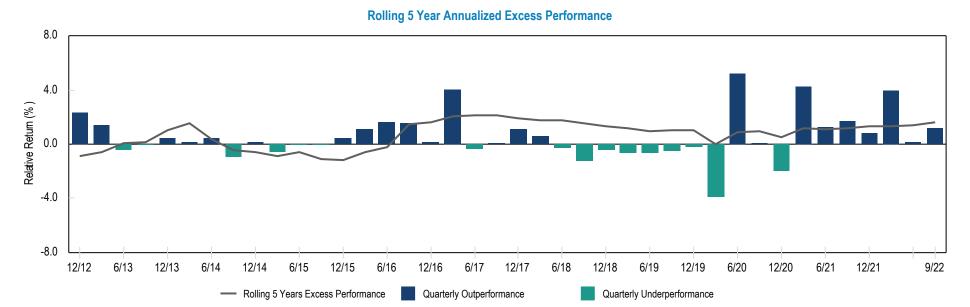
	Return	Deviation
Harding Loevner Emerging Markets	-7.85	21.55
 MSCI Emerging Markets Growth Index 	-1.54	19.77
Median	-1.45	20.17
Population	49	49

eV Emg Mkts All Cap Growth Equity

	Return	Standard Deviation
Harding Loevner Emerging Markets	-5.99	19.70
 MSCI Emerging Markets Growth Index 	-1.41	18.52
Median	-0.87	18.17
Population	41	41

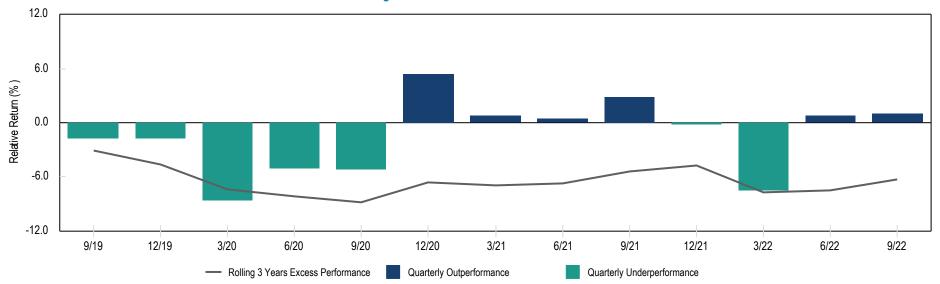




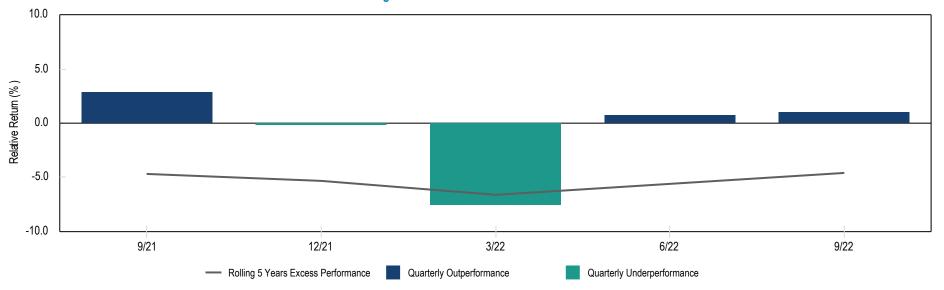








Rolling 5 Year Annualized Excess Performance





	Market Value	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017
Total Fixed Income	228,736,343	-4.8	-15.6	-4.8	-15.1	-2.2	0.4	1.4	0.6	9.8	9.5	-0.8	4.3
Blmbg. U.S. Aggregate Index		-4.8	-14.6	-4.8	-14.6	-3.3	-0.3	0.9	-1.5	7.5	8.7	0.0	3.5
Ducenta Squared	95,333,646	-4.5	-15.7	-4.5	-15.4	-2.8	0.2	1.7	-0.6	9.1	9.9	-0.1	4.3
Blmbg. U.S. Aggregate Index		-4.8	-14.6	-4.8	-14.6	-3.3	-0.3	0.9	-1.5	7.5	8.7	0.0	3.5
eV US Core Plus Fixed Inc Rank		58	68	58	53	56	47	34	53	39	43	27	66
MacKay Shields Core Plus Opportunities	93,407,389	-5.1	-16.5	-5.1	-16.5	-2.9	-0.1	-	-0.5	9.9	9.7	-1.0	4.5
Blmbg. U.S. Aggregate Index		-4.8	-14.6	-4.8	-14.6	-3.3	-0.3	-	-1.5	7.5	8.7	0.0	3.5
eV US Core Plus Fixed Inc Rank		94	88	94	88	58	70	-	50	23	51	76	52
BlackRock US TIPS	39,995,308	-5.1	-13.5	-5.1	-11.6	8.0	2.0	1.0	5.9	11.2	8.5	-1.2	3.2
Blmbg. U.S. TIPS		-5.1	-13.6	-5.1	-11.6	0.8	2.0	1.0	6.0	11.0	8.4	-1.3	3.0
eV US TIPS / Inflation Fixed Inc Rank		58	63	58	54	56	40	35	28	29	31	41	39

Fixed Income Style Map Fixed Income Style Map 3 Years Ending September 30, 2022 5 Years Ending September 30, 2022 Corp Bonds Govt Bonds Corp Bonds Govt Bonds Capitalization Capitalization MBS Bonds Muni Bonds MBS Bonds Muni Bonds Manager Style Manager Style Total Fixed Income Ducenta Squared Total Fixed Income Ducenta Squared MacKay Shields Core Plus Opportunities BlackRock US TIPS MacKay Shields Core Plus Opportunities BlackRock US TIPS



Total Fixed Income Asset Class Overview (Net of Fees)

Imperial County Employees' Retirement System Period Ending: September 30, 2022

	Market Value	% of Portfolio	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017
Total Fixed Income	228,736,343	100.0	-4.8	-15.6	-4.8	-15.1	-2.2	0.4	1.4	0.6	9.8	9.5	-0.8	4.3
Blmbg. U.S. Aggregate Index			-4.8	-14.6	-4.8	-14.6	-3.3	-0.3	0.9	-1.5	7.5	8.7	0.0	3.5
Ducenta Squared	95,333,646	41.7	-4.5	-15.7	-4.5	-15.4	-2.8	0.2	1.7	-0.6	9.1	9.9	-0.1	4.3
Blmbg. U.S. Aggregate Index			-4.8	-14.6	-4.8	-14.6	-3.3	-0.3	0.9	-1.5	7.5	8.7	0.0	3.5
MacKay Shields Core Plus Opportunities	93,407,389	40.8	-5.1	-16.5	-5.1	-16.5	-2.9	-0.1	-	-0.5	9.9	9.7	-1.0	4.5
Blmbg. U.S. Aggregate Index			-4.8	-14.6	-4.8	-14.6	-3.3	-0.3	-	-1.5	7.5	8.7	0.0	3.5
BlackRock US TIPS	39,995,308	17.5	-5.1	-13.5	-5.1	-11.6	0.8	2.0	1.0	5.9	11.2	8.5	-1.2	3.2
Blmbg. U.S. TIPS			-5.1	-13.6	-5.1	-11.6	0.8	2.0	1.0	6.0	11.0	8.4	-1.3	3.0

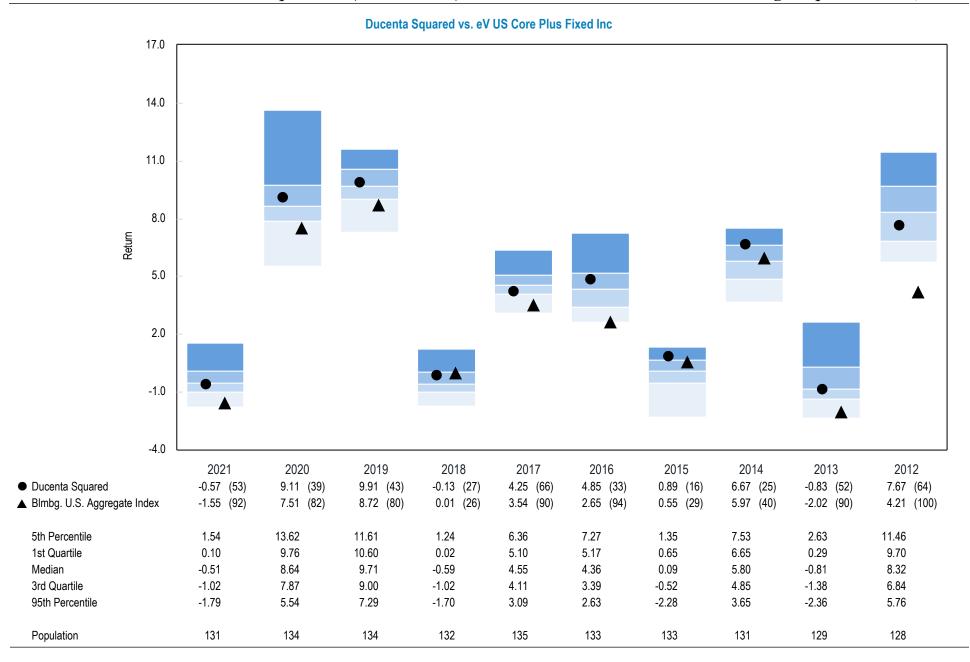
	Total Fixed Income	Ducenta Squared	MacKay Shields Core Plus Opportunities	BlackRock US TIPS	Blmbg. U.S. Aggregate Index
Total Fixed Income	1.00				
Ducenta Squared	0.99	1.00			
MacKay Shields Core Plus Opportunities	0.99	0.99	1.00		
BlackRock US TIPS	0.93	0.87	0.90	1.00	
Blmbg. U.S. Aggregate Index	0.96	0.96	0.95	0.86	1.00



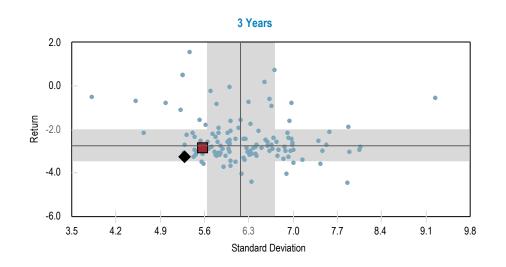
Imperial County Employees' Retirement System Period Ending: September 30, 2022

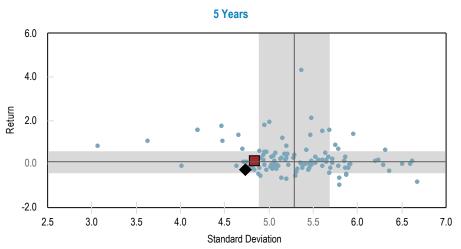
Ducenta Squared vs. eV US Core Plus Fixed Inc 5.0 2.0 -1.0 -4.0 Return -7.0 -10.0 -13.0 -16.0 -19.0 YTD Fiscal YTD 1 Year 3 Years 7 Years 10 Years Quarter 5 Years -4.48 (58) -15.71 (68) -4.48 (58) -15.38 (53) -2.81 (56) 0.16 (47) 1.28 (42) 1.69 (34) Ducenta Squared -14.61 (32) -4.75 (80) -14.60 (34) -3.26 (88) -0.27 (89) 0.54 (97) 0.89 (97) ▲ Blmbg. U.S. Aggregate Index -4.75 (80) 5th Percentile -1.69 -10.08 -1.69 -10.54 -0.20 1.58 2.47 2.58 1st Quartile -4.03 -14.37 -4.03 -14.38 -2.13 0.48 1.60 1.79 Median -4.39 -15.24 -4.39 -15.22 -2.72 0.10 1.20 1.48 3rd Quartile -4.70 -16.03 -4.70 -16.08 -3.07 -0.12 0.94 1.27 95th Percentile -5.34 -17.29 -5.34 -17.33 -0.54 0.60 0.95 -3.55 Population 125 124 125 124 122 113 108 101











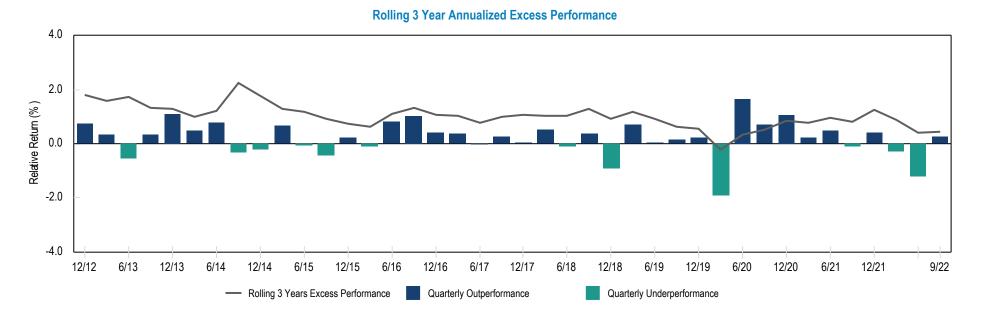
eV US Core Plus Fixed Inc

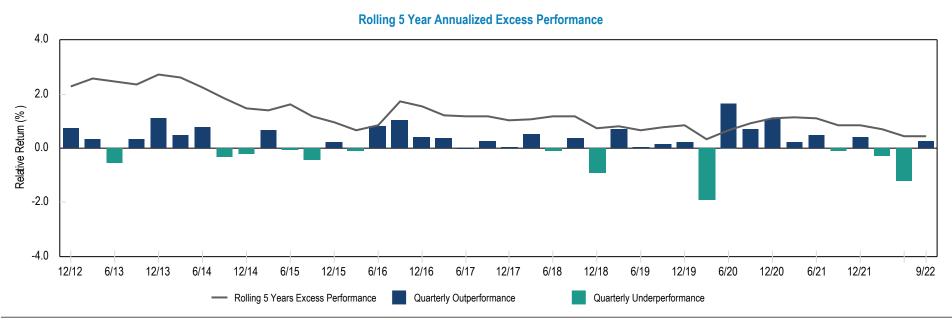
	Return	Standard Deviation
Ducenta Squared	-2.81	5.57
 Blmbg. U.S. Aggregate Index 	-3.26	5.29
Median	-2.72	6.17
Population	122	122

eV US Core Plus Fixed Inc

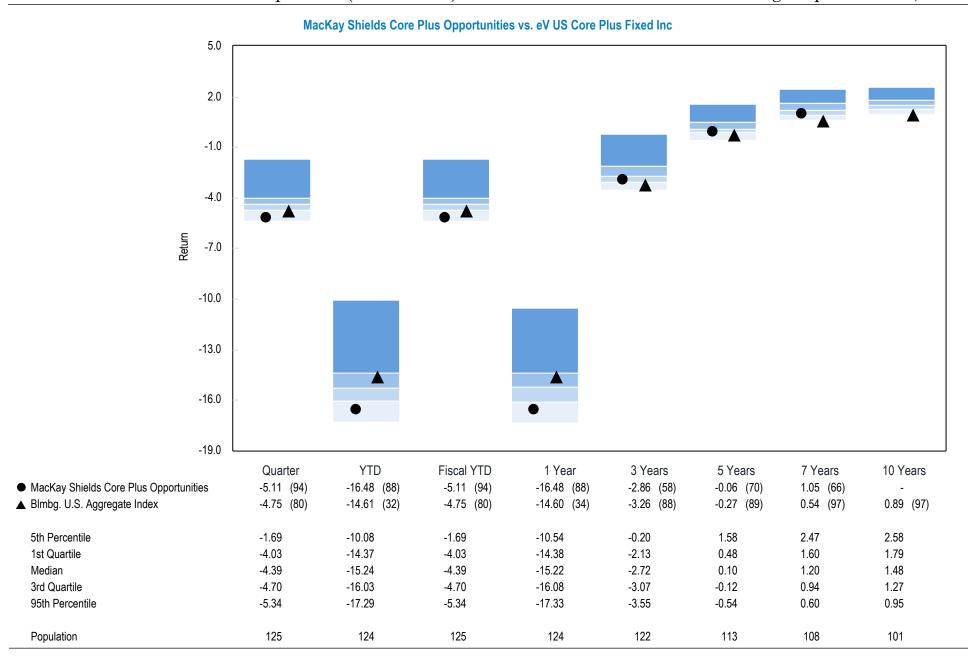
	Return	Standard Deviation
■ Ducenta Squared	0.16	4.83
Blmbg. U.S. Aggregate Index	-0.27	4.73
Median	0.10	5.29
Population	113	113



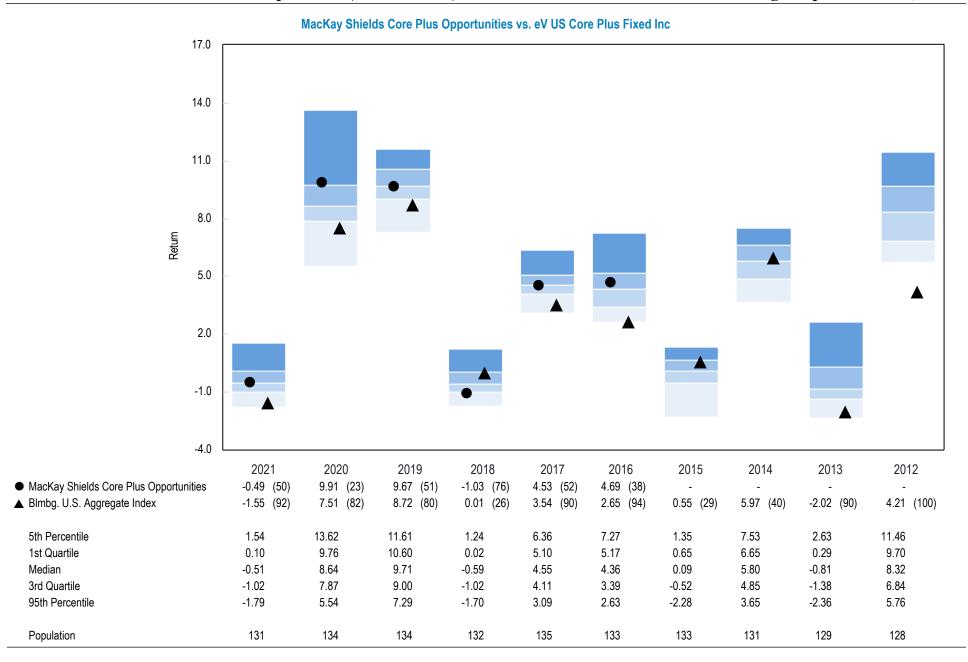




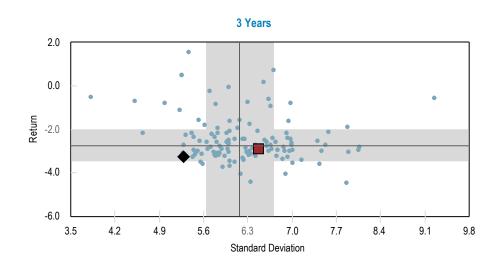


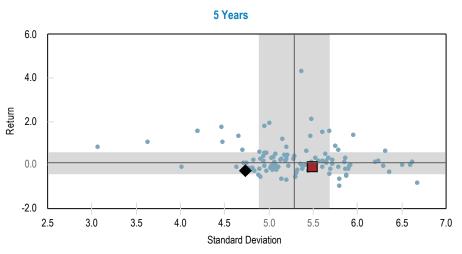












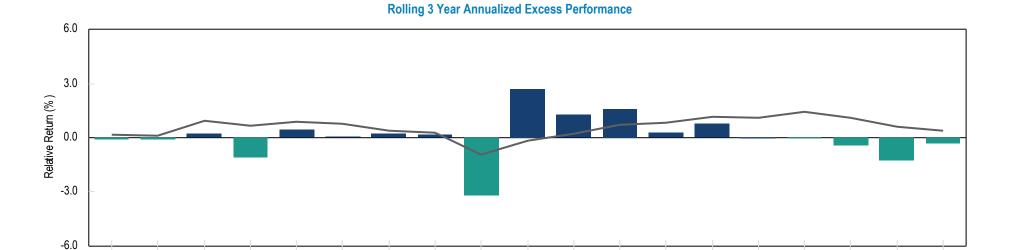
eV US Core Plus Fixed Inc

	Return	Standard Deviation
■ MacKay Shields Core Plus Opportunities	-2.86	6.47
Blmbg. U.S. Aggregate Index	-3.26	5.29
Median	-2.72	6.17
Population	122	122

eV US Core Plus Fixed Inc

	Return	Standard Deviation
■ MacKay Shields Core Plus Opportunities	-0.06	5.49
Blmbg. U.S. Aggregate Index	-0.27	4.73
Median	0.10	5.29
Population	113	113







6/20

9/20

12/20

3/21

Quarterly Underperformance

6/21

9/21

12/21

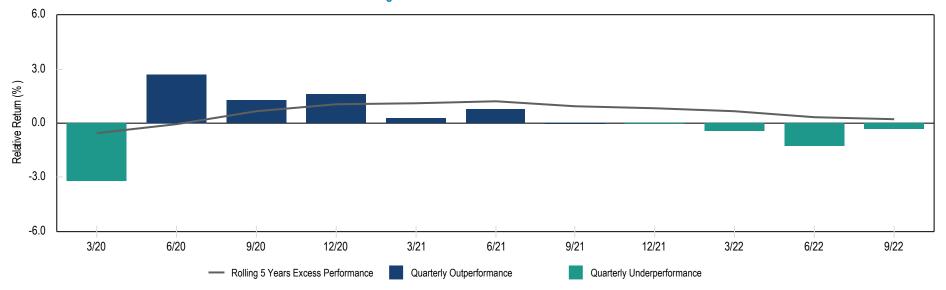
3/22

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Quarterly Outperformance





3/18

6/18

9/18

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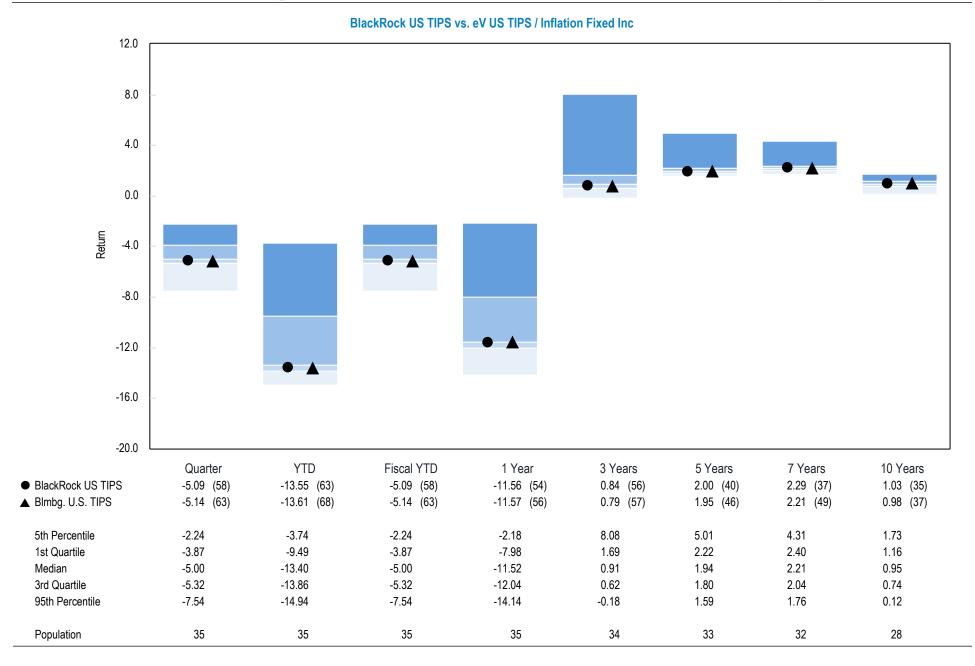
3/19

6/19

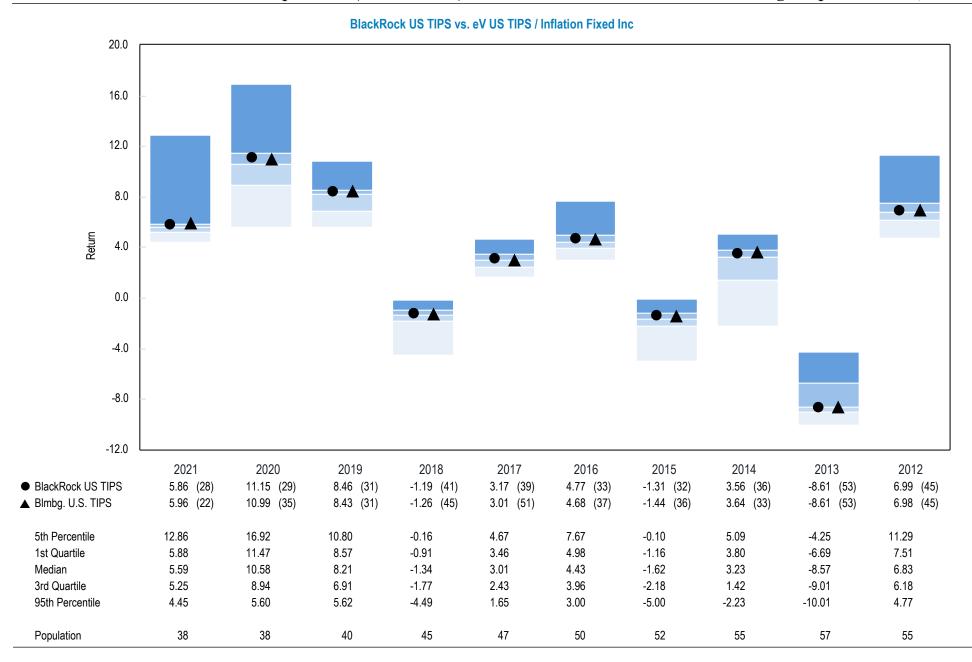
- Rolling 3 Years Excess Performance

9/19

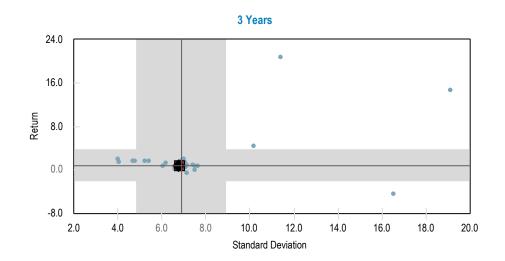
12/19

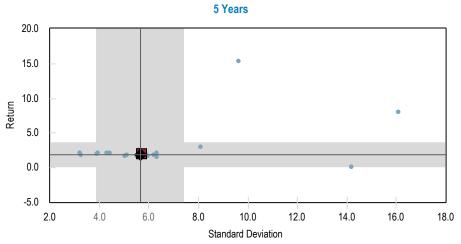










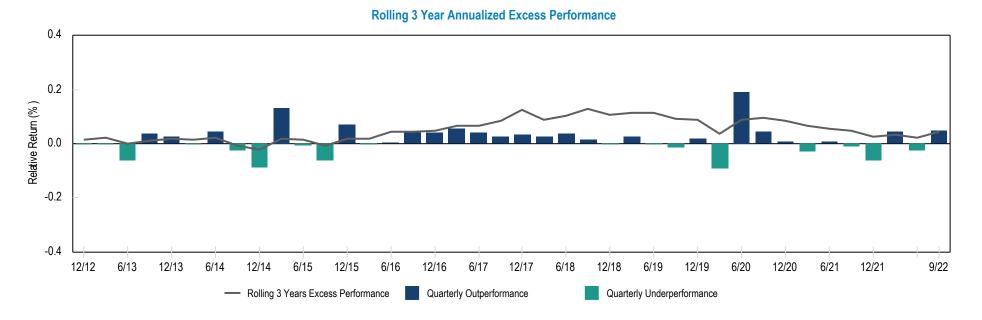


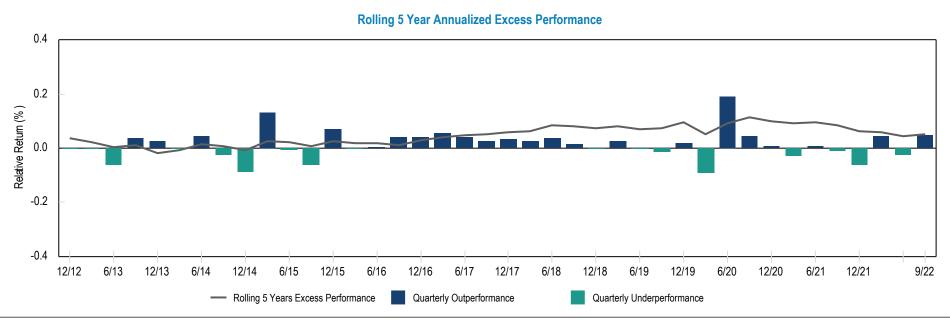
eV US TIPS / Inflation Fixed Inc

	Return	Standard Deviation
■ BlackRock US TIPS	0.84	6.80
Blmbg. U.S. TIPS	0.79	6.77
Median	0.91	6.88
Population	34	34

eV US TIPS / Inflation Fixed Inc

	Return	Standard Deviation
■ BlackRock US TIPS	2.00	5.69
Blmbg. U.S. TIPS	1.95	5.67
Median	1.94	5.66
Population	33	33





Total Real Estate Asset Class Overview (Net of Fees)

Imperial County Employees' Retirement System Period Ending: September 30, 2022

	Market Value	% of Portfolio	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017
Total Real Estate	129,371,555	100.0	1.4	13.0	1.4	19.2	11.6	9.6	9.9	18.4	2.1	5.7	7.5	5.8
NCREIF Property Index			0.6	9.4	0.6	16.1	9.9	8.6	9.5	17.7	1.6	6.4	6.7	7.0
NCREIF ODCE			0.5	13.1	0.5	22.1	12.4	9.9	10.1	22.2	1.2	5.3	7.1	7.0
ASB Real Estate	32,454,992	25.1	2.2	15.3	2.2	20.0	10.5	8.4	-	14.2	1.5	3.0	6.6	4.0
NCREIF Property Index			0.6	9.4	0.6	16.1	9.9	8.6	9.5	17.7	1.6	6.4	6.7	7.0
NCREIF ODCE			0.5	13.1	0.5	22.1	12.4	9.9	10.1	22.2	1.2	5.3	7.1	7.0
Clarion Lion	36,263,904	28.0	0.6	15.6	0.6	24.7	14.2	11.5	11.4	23.6	2.3	6.8	8.6	7.9
NCREIF Property Index			0.6	9.4	0.6	16.1	9.9	8.6	9.5	17.7	1.6	6.4	6.7	7.0
NCREIF ODCE			0.5	13.1	0.5	22.1	12.4	9.9	10.1	22.2	1.2	5.3	7.1	7.0
ARA American Strategic Value Realty	58,686,000	45.4	1.5	10.7	1.5	16.2	11.2	-	-	18.6	2.4	7.8	-	-
NCREIF Property Index +2%			1.1	11.0	1.1	18.4	12.1	-	-	20.0	3.6	8.5	8.9	-
NCREIF ODCE +2%			1.0	14.8	1.0	24.5	14.6	-	-	24.6	3.2	7.4	8.9	-
1221 State St. Corp	1,966,659	1.5	0.0	0.0	0.0	0.0	2.6	1.5	2.4	0.0	0.0	7.9	0.0	0.0

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	2011 ¹	HarbourVest
Harding Loevner	7/5/2016	Harding Loevner	HarbourVest 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	3/2/2015	CITCO	Harbourvest IX-Venture	2011 ¹	HarbourVest
BlackRock US TIPS	4/11/2007	J.P. Morgan	Harbourvest 2017 Global	2017 ¹	HarbourVest
ASB Real Estate	12/31/2012	ASB Real Estate	Harbourvest 2018 Global	2018 ¹	HarbourVest
Clarion Lion	12/31/2006	Clarion Lion	Harbourvest 2019 Global	2019 ¹	HarbourVest
Portfolio Advisors	10/31/2017	Portfolio Advisors	KKR Mezzanine	2010 ¹	KKR
TSSP Adjacent Opportunities Partners	4/16/2020	Sixth Street	PIMCO BRAVO	2011 ¹	PIMCO
Sixth Street Diversified Credit	5/29/2020	Sixth Street	ARA American Strategic Value Realty	01/04/2018	ARA

¹Represents fund vintage year.

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Policy	7 X (** IIIS	tom In	idey (omposi	tion

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).



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: Portfolio Return [Risk free Rate + Portfolio Beta x (Market Return 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 lock step, 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 lock step, 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 lock step, 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 lock step, 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 lock step, 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 lock step, 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 lock step, 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 lock step, 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 lock step, 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 lock step, 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 lock step, a correlation of 1 means the returns of 1 me

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: Portfolio Excess Return / 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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