Verus

PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS

PERIOD ENDING: December 31, 2022

Investment Performance Review for

Illinois Police Officers’ Pension Investment Fund

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Executive Summary

- Total assets grew from $5.7 billion to $8.4 billion over the quarter, as assets continued to transfer into the Fund, and investment gains for the quarter exceeded $400 million.
- The challenging market environment that persisted through most of 2022 reversed in the final two months of the year, as the S&P 500 returned 7.6% in the 4th quarter. The IPOPIF benefited from recovering markets over the quarter as well, as the Total Fund[1] returned 6.7%, which was in line with the Policy Index return of 6.6% over the same period. The Broad-Based Index performed even better with a return of 8.4% for the period, reflecting its higher equity exposure in a resurgent equity market.
- Since its inception in April of 2022, the IPOPIF Portfolio returned -9.0% through the end of the year, which is modestly better than the Policy Index of-9.3% and significantly ahead of the equity heavy Broad-Based Policy Index of -12.6%.
- As a primarily passively invested investment strategy (through the transition period), the IPOPIF Portfolio experienced minimal variation to its Policy Index in the 4th quarter. The modest variance that occurred is primarily attributable to remaining "benchmark mismatch" (which has been addressed by recent adjustments to the Policy Index approved by the Board at the February 2023 Board meeting).
- As expected, individual managers also performed in line with their strategy-specific benchmarks during the quarter with one modest exception. The SSgA Emerging Markets Equity Index fund exceeded its benchmark by 60 basis points (10.3% vs. 9.7%), reversing similar underperformance in the previous quarter. Performance variance in this fund has been due to a formulaic "fair valuation adjustment" designed to keep investors from taking advantage of timing differences across global markets.
- The IPOPIF Portfolio ranked in the 12th percentile relative to a representative universe of Public Pensions with assets greater than $1 billion for the quarter. Like the relatively low rank in previous quarters, the favorable ranking in the 4th quarter continues to be largely attributable to a relatively high public markets equity allocation and an absence of alternatives, most notably private equity, compared to peers[3].
- The investment team actively monitors current asset allocations vs. policy targets and conducts rebalancing trades as appropriate. As of 12/31/22, all asset allocation values were in line with policy targets.

Notes
[1]Total Fund assets includes Member Fund and Transition accounts that have not yet been invested in the IPOPIF Investment Portfolio.
[2]The Broad-Based Policy Index represents a passively invested 70/30 global stock/bond portfolio.
[3]IPOPIF has implemented a short-term asset allocation which is primarily passively invested in public markets. Following the Transition Period IPOPIF will move toward the long-term asset allocation, including active management and private market assets.

Investment Landscape

4th quarter summary

THE ECONOMIC CLIMATE

— Real GDP increased at a 2.9% rate in the fourth quarter (1.0% year-over-year growth), slightly exceeding expectations. Consumer spending, private inventory investment, government expenditures, and nonresidential investment were supportive of growth.

— Unemployment remained near historic lows during the quarter, at 3.5% in December. While this figure suggests a strong and resilient job market, the workforce remains much smaller than pre-pandemic times as more than two million workers remain out of the labor force.

PORTFOLIO IMPACTS

— Inflation fears continue to ease as domestic inflation fell further. Headline inflation was 6.5% year-over-year in December—the lowest since October 2021—while core inflation came in at 5.7%. Prices for most goods and services have moderated with the exception of shelter costs, which increased at a worryingly fast pace of 10.0% annualized in December.

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

THE INVESTMENT CLIMATE

— China's rapid pivot away from a "Zero Covid" policy towards the end of Q4 added a large tailwind to emerging market equity performance and the global growth outlook. Despite this positive news, an uptick in virus cases poses challenges for China's reopening.

— Credit performed well in the fourth quarter, as resilient U.S. economic growth combined with expectations for the Fed to ease their tightening cycle helped mitigate investor concerns of a near-term cyclical downturn.

ASSET ALLOCATION ISSUES

— Calendar year 2022 proved to be a year of *reversal* regarding asset class performance. Top performing investments of the past decade, such as U.S. growth and small cap stocks, suffered some of the largest losses. Meanwhile, many of the worst performing investments of the past decade, including commodities and value stocks, significantly outperformed.

— Value stocks outperformed markedly during 2022, outpacing growth stocks by 10.2% in Q4 and 21.6% for the year. Energy, industrials, and materials—sectors heavily tilted toward value—showed strong returns, with energy ending the year up 64.6%.

Markets have partially recovered as inflation fears eased

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

What drove the market in Q4?

"Has Inflation Peaked?"

HEADLINE CONSUMER PRICE INFLATION (YEAR-OVER-YEAR)

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

Article Source: Financial Times, December 8th, 2022

"The Labor Market is Still Hot"

CHANGE IN U.S. NONFARM PAYROLLS

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

Article Source: Axios, November 1st, 2022

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

FOMC MEETING RATE HIKE DECISIONS

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

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

"China's Covid Pivot Accelerates as Cities Ease Testing Rules"

CHINESE REPORTED NEW CASES (DAILY AVERAGE FOR THE MONTH)

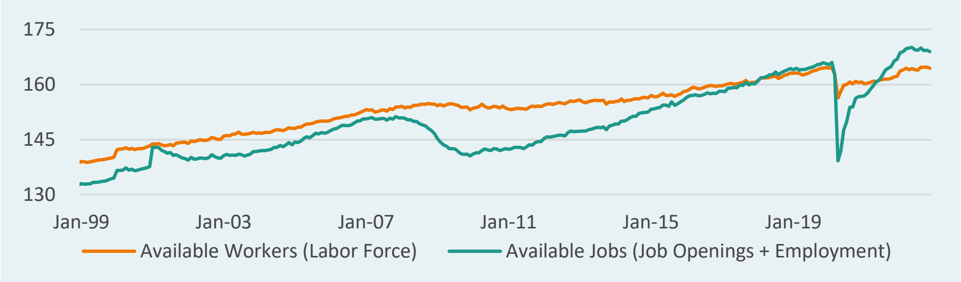
Jul	Aug	Sep	Oct	Nov	Dec
559	1,629	1,158	1,340	18,914	14,748

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

FED FUNDS RATE UPPER BOUND

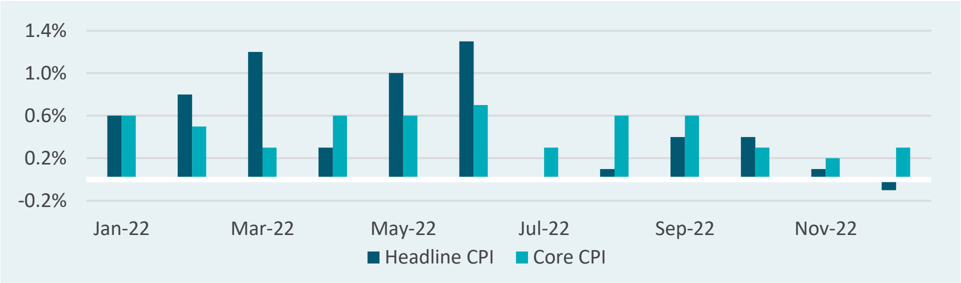
Source: Federal Reserve, as of 12/31/22

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



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

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



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

U.S. economics summary

— Real GDP increased at a 2.9% rate in Q4 (1.0% year-over-year growth). Consumer spending, private inventory investment, government expenditures, and nonresidential investment supported the economy.

— Inflation fears continue to ease as domestic inflation fell further. December headline inflation came in at 6.5% year-over-year while core inflation (excluding food & energy) came in at 5.7%. Most goods and services price rises have slowed, with the exception of shelter costs, which increased at a worryingly fast pace of 10% annualized in December.

— Unemployment remained very low during the quarter, at 3.5% in December. While this official figure suggests a strong and resilient job market, the workforce remains much smaller than pre-pandemic times as more than two million workers are missing from the labor force.

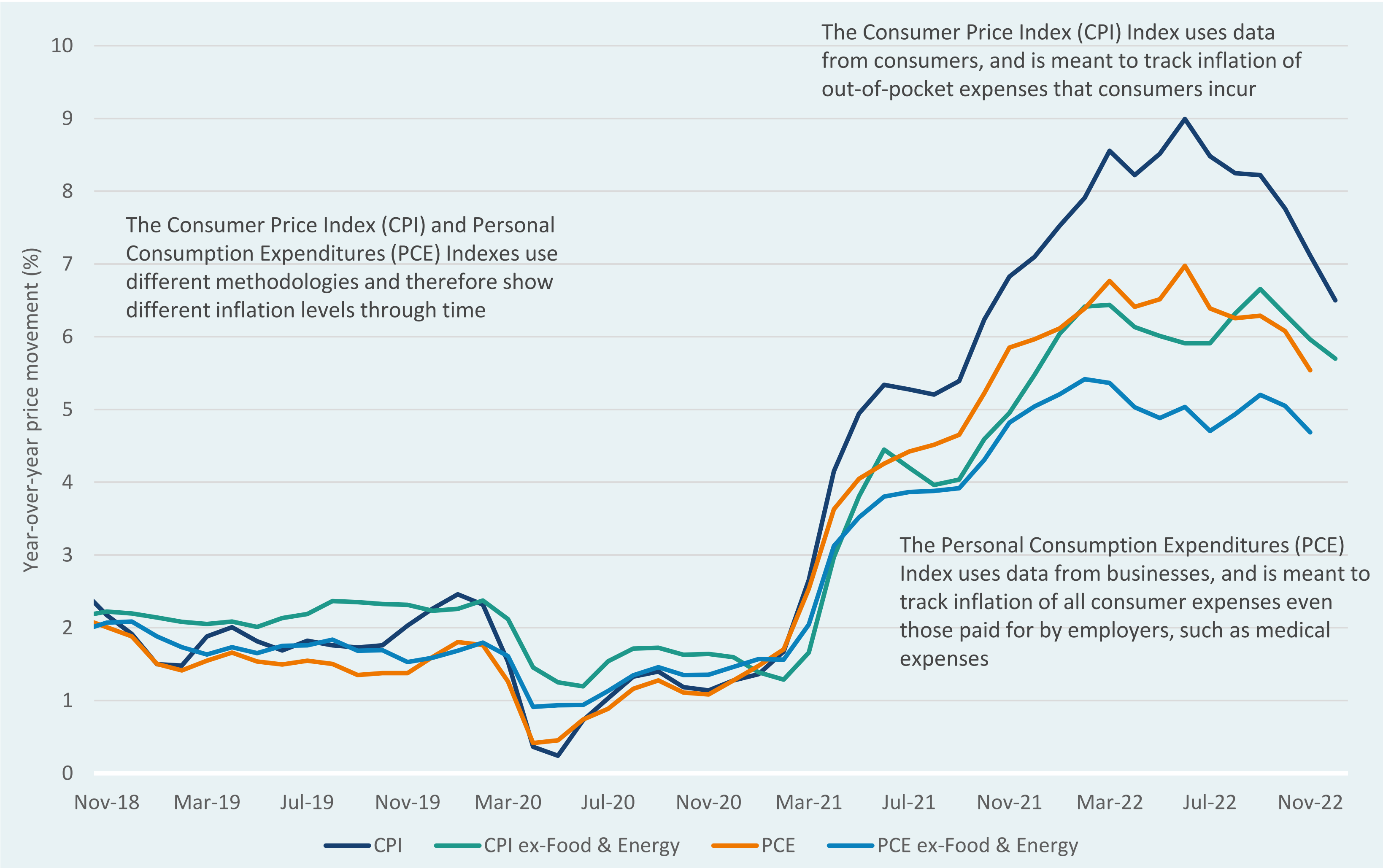
— Consumer spending kept steady though savings rates dropped to 2.3%—a depressed level not seen since the mid-2000s. A low household savings rate is sometimes seen as an indicator of strong consumer confidence and spending, though we suspect household budgets are currently being hit hard by higher costs.

— Consumer sentiment improved during Q4 but is still very downbeat. In the most recent University of Michigan survey, respondents showed less concern around inflation, reported better business conditions and long-term outlook, but were pessimistic over personal finances.

— U.S. home prices peaked in June 2022 and have been falling since then, according to S&P CoreLogic. Significantly higher mortgage interest rates have led to the worst home affordability on record, according to the National Association of Realtors.

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

How are inflation conditions evolving?



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

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

Labor market

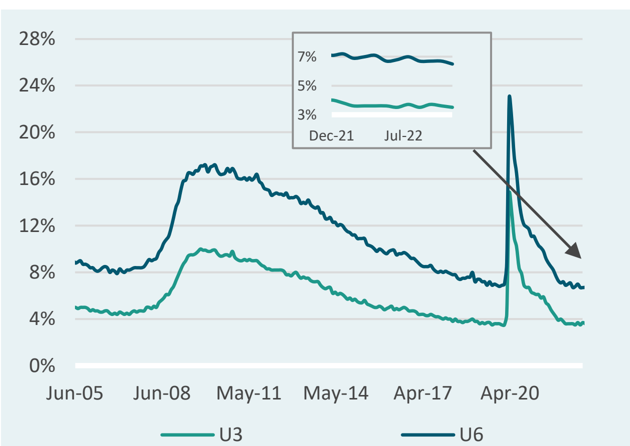
Unemployment remained very low during the quarter, at 3.5% in December. This official figure suggests a strong and resilient job market for those workers who seek employment, although this data contrasts with media reports of fairly widespread layoff activity.

The labor participation rate also remained unchanged during the quarter. Low labor participation paints a different and much weaker picture of the job market, because this figure takes into account the workers *who are not seeking employment*. More than two million workers remain out of the labor force, relative to the pre-pandemic job market. Survey and government-reported data suggests that much of this effect is due to "Long Covid" health troubles. Other variables such as early retirements, and parents taking time off to care for children, have also likely had a material impact on the size of the workforce.

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

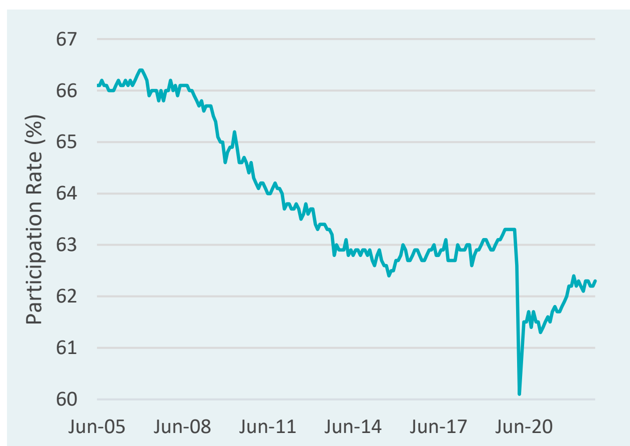
The labor market remains tight, though the size of workforce is much smaller relative to pre-pandemic times

U.S. UNEMPLOYMENT



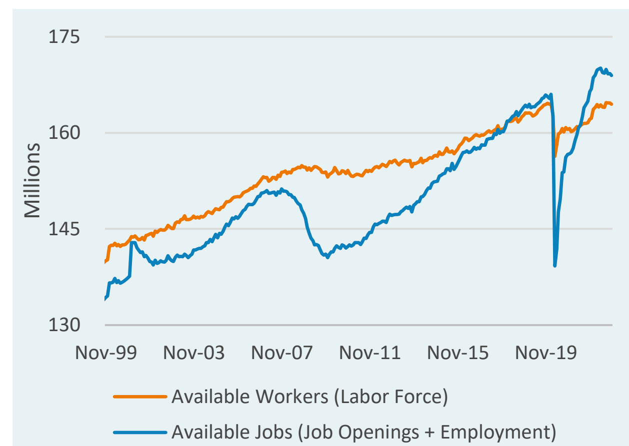
Source: FRED, as of 12/31/22

LABOR FORCE PARTICIPATION RATE



Source: FRED, as of 12/31/22

WORKERS AVAILABLE VS. AVAILABLE JOBS



Source: BLS, as of 11/30/22

The consumer

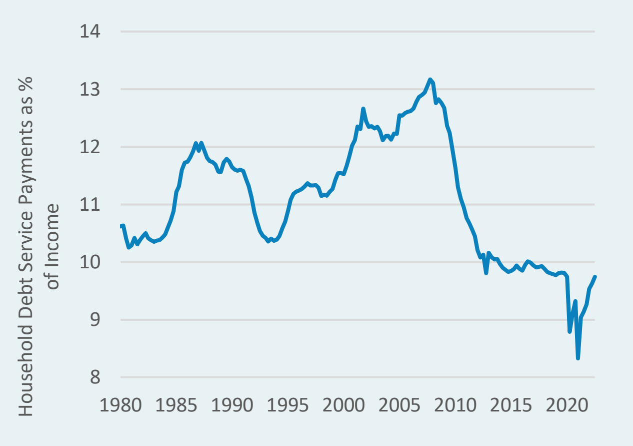
U.S. real (inflation-adjusted) personal consumption expenditures held steady in August, at 2.0% year-over-year. Households have focused spending on services rather than goods, which removed some stress from supply chains and likely helped to normalize transportation issues. Relatively strong spending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

Spending has slowed but savings rates have also dropped to 2.3%—a depressed level not seen since the mid-2000s. A low household savings rate is sometimes seen as an indicator of strong consumer confidence and spending, though in the current environment we suspect that household budgets are being hit hard by inflation and higher living costs.

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

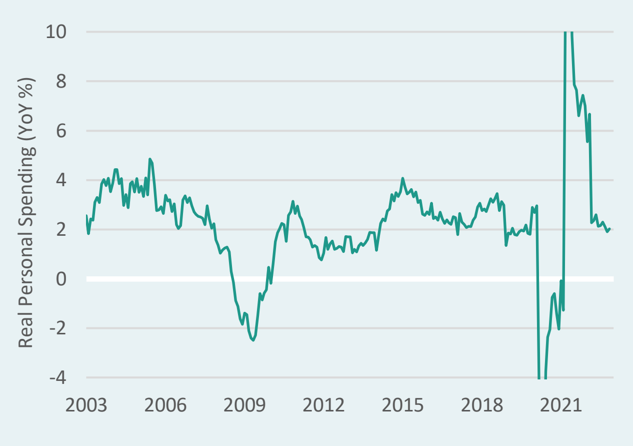
Household spending remains strong, though a very low savings rate may suggest budgets are being squeezed

DEBT SERVICE AS % HOUSEHOLD INCOME



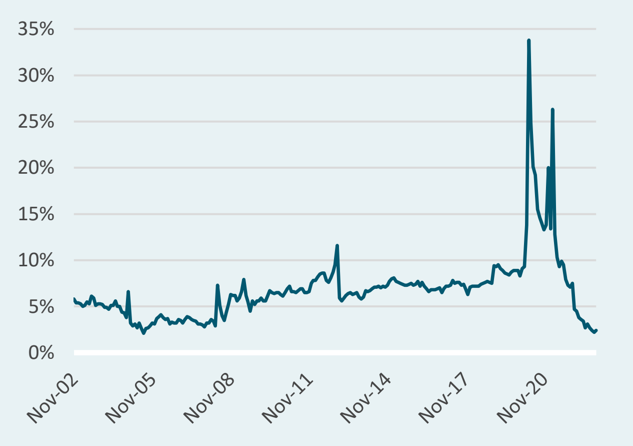
Source: FRED, as of 9/30/22

REAL PERSONAL CONSUMPTION



Source: FRED, as of 11/30/22

PERSONAL SAVINGS RATE



Source: FRED, as of 11/30/22

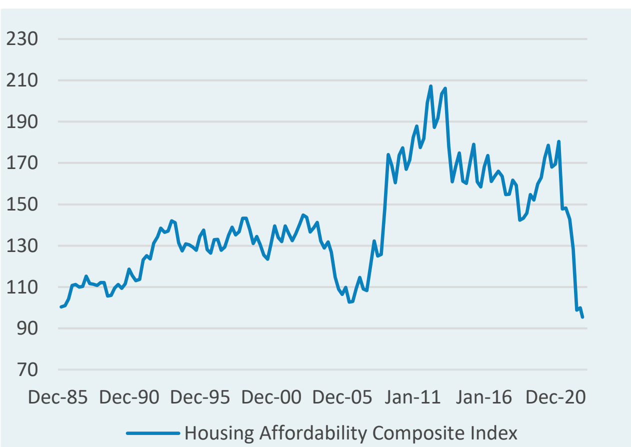
Housing

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

Higher home prices and interest rates have also resulted in a sharp slowdown in sales activity—a notable change from the frothy environment that had occurred post-pandemic. Existing home sales activity has now fallen to a rate not seen since the real estate market was recovering from the housing crisis during the early 2010s.

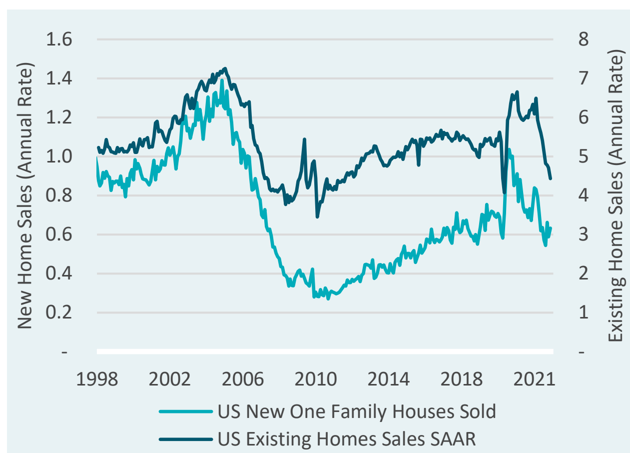
Conditions in housing today appear to be helping to *rebalance* the housing market, as suggested by the monthly supply of homes. Weaker sales volumes and worse affordability has meant that potential buyers have much more inventory to select from. The monthly supply of homes is now at 8.6 months, up from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

HOUSING AFFORDABILITY INDEX



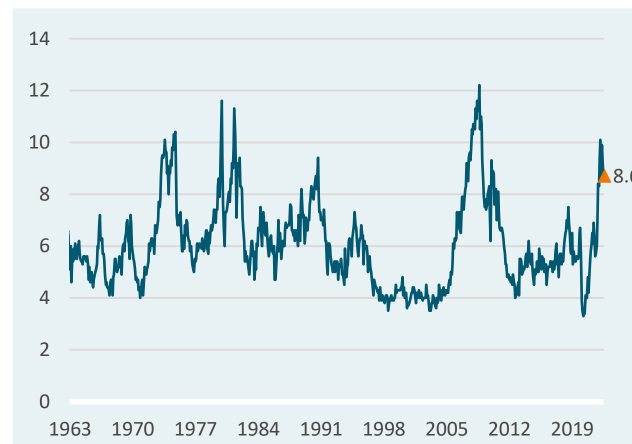
Source: NAR, as of 11/30/22

HOME SALES: NEW & EXISTING (MILLIONS)



Source: FRED, as of 10/31/22

MONTHLY SUPPLY OF HOMES



Source: FRED, as of 11/30/22

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

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International economics summary

— Economic growth expectations continued to weaken, although the GDP outlook for emerging economies is starting to paint a more optimistic picture. Developed economies, specifically across the Eurozone and United Kingdom, are still facing the negative growth impacts of tighter financial conditions as inflation remains elevated.

— Inflation in both the Eurozone and U.K. has reinforced tighter policies from the ECB and BOE. While U.K. inflation fell to 10.7% from the 11.1% peak in October, interest rates are expected to be raised further (but in smaller increments). Eurozone inflation has shown signs of moving past its peak, although core inflation hit a new high of 5.2%, stoking fears that inflation may be spreading to core goods and services.

— Unemployment rates have remained stable over the quarter. India stood out as an exception, where unemployment jumped from 6.4% to 8.3%.

— The war in Ukraine carried on despite temporary "ceasefires" declared by Russia. The fighting has intensified in Eastern Ukraine around Kharkiv, with a supporting effort in Southern Ukraine, as Russian forces attempt to secure frontline positioning in the Kherson Oblast.

— China's rapid pivot away from a "Zero Covid" policy towards the end of the quarter added a large tailwind to the global growth outlook. Despite this positive news, a rapid uptick in COVID-19 cases challenges the timeline of the reopening story. Additionally, many wonder how a large uptick in global demand might impact inflation pressures at a time when advanced economies struggle specifically to reign in spending.

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

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

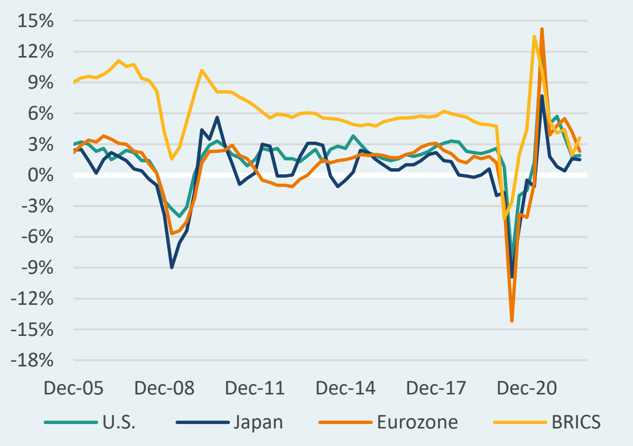
International economics

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

The outlook for emerging markets is much more optimistic. Most countries have avoided the high inflation seen in developed markets. A rapid reopening of the Chinese economy is likely providing a tailwind to growth, although the timing remains unclear due to another wave of COVID-19 infections. The 2023 GDP forecast for emerging economies per Bloomberg ticked down from 4.3% to 3.9% over the quarter, but emerging economy growth is still expected to far exceed that of developed economies (developed economy 2023 GDP expectations sit at 0.4%, according to the IMF).

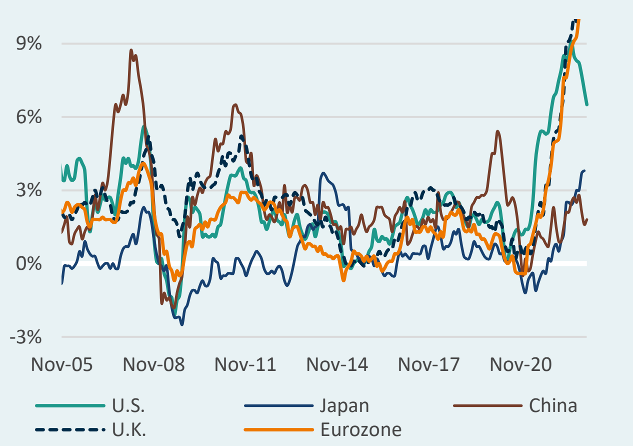
Despite the slowdown in economic growth, employment remains stable amongst the regions we track. India stood out as an exception, where unemployment jumped from 6.4% to 8.3% during Q4.

REAL GDP GROWTH (YOY)



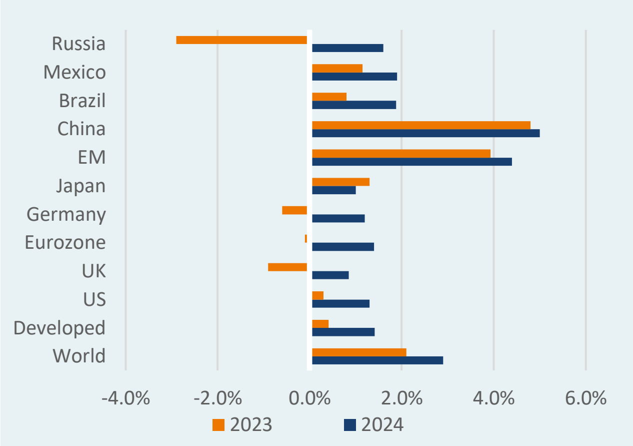
Source: Bloomberg, as of 9/30/22

INFLATION (CPI YOY)



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

ECONOMIC GROWTH FORECASTS



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

Equity environment

— U.S. equities delivered their only positive quarterly return of 2022 during Q4 (S&P 500 +7.6%), helping to dampen the index's worst calendar year performance since 2008 (-18.1% loss in 2022). Higher interest rates and recession fears contributed to poor returns.

— U.S. corporate earnings in Q3 grew 2.4% from the year prior, marking the slowest rate of growth since Q3 2020. Per FactSet, earnings are projected to decline by -4.1% in Q4, which would mark the first decline in U.S. earnings since 2020.

— Many equity markets now trade at valuation levels near historical averages as rising rates and growth concerns have contributed to more attractive pricing. The S&P 500 forward P/E ratio of 18.3 (as of November 30th) is under the five-year average of 18.6 and the ten-year average of 20.2.

— Currency movements continued to create portfolio volatility for investors with unhedged exposure to foreign currencies. The U.S. dollar depreciated sharply during Q4 which resulted in a large gain of 7.6% for investors with unhedged foreign currency exposure (+17.3% MSCI EAFE unhedged, +9.7% MSCI EAFE hedged).

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

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

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

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

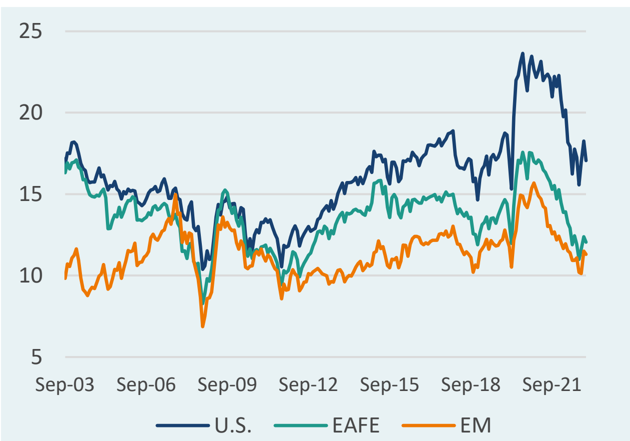
Equity valuations

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

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

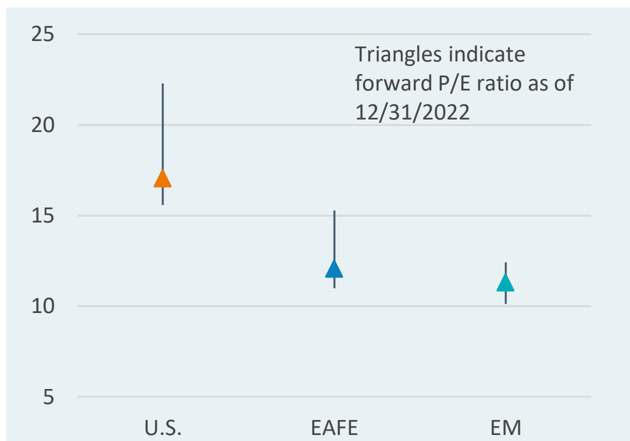
International developed equities remain extremely cheap relative to U.S. markets

FORWARD P/E RATIOS



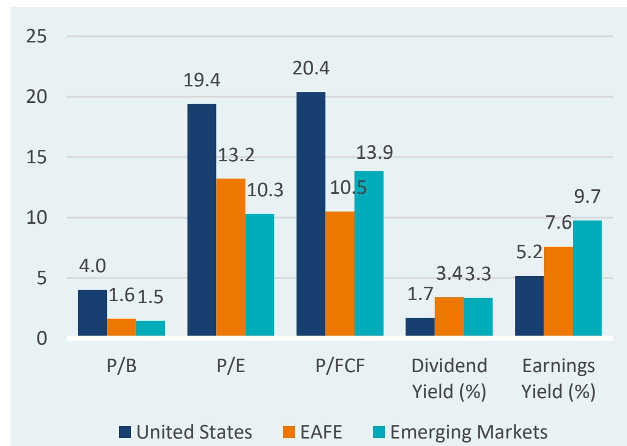
Source: MSCI, 12m forward P/E, as of 12/31/22

FORWARD P/E RATIO RANGES (DURING 2022)



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

VALUATION METRICS (3-MONTH AVERAGE)



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

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Fixed income environment

— The 10-year U.S. Treasury yield ended the quarter unchanged at 3.8%. It is possible that long-term interest rates have already reached a cyclical peak, assuming inflation continues to fall and the Federal Reserve becomes less aggressive.

— Credit performance was positive during the fourth quarter, with riskier exposures such as U.S. high yield and emerging market debt (both local and hard currency) leading the pack. Expectations for a slowdown in Federal Reserve rate hikes, and a rosier U.S. economic environment, have provided a tailwind to the credit space.

— Default activity in high yield bonds and bank loans remained subdued during Q4. Throughout the year, 17 companies defaulted totaling $26.3 billion, with large defaults concentrated in the Healthcare sector which accounted for over 36% of total dollar volume. Default rates for par-weighted U.S. high yield and bank loans remained very low at 0.8% and 1.0%, respectively.

— The U.S. yield curve inversion reached historically negative levels, with the 10-year 2-year yield spread seeing its widest inversion since 1981 (short-term interest rates being higher than long-term interest rates). The negative spread bottomed out at ~81 bps on December 5th before gradually easing during the latter half of the month.

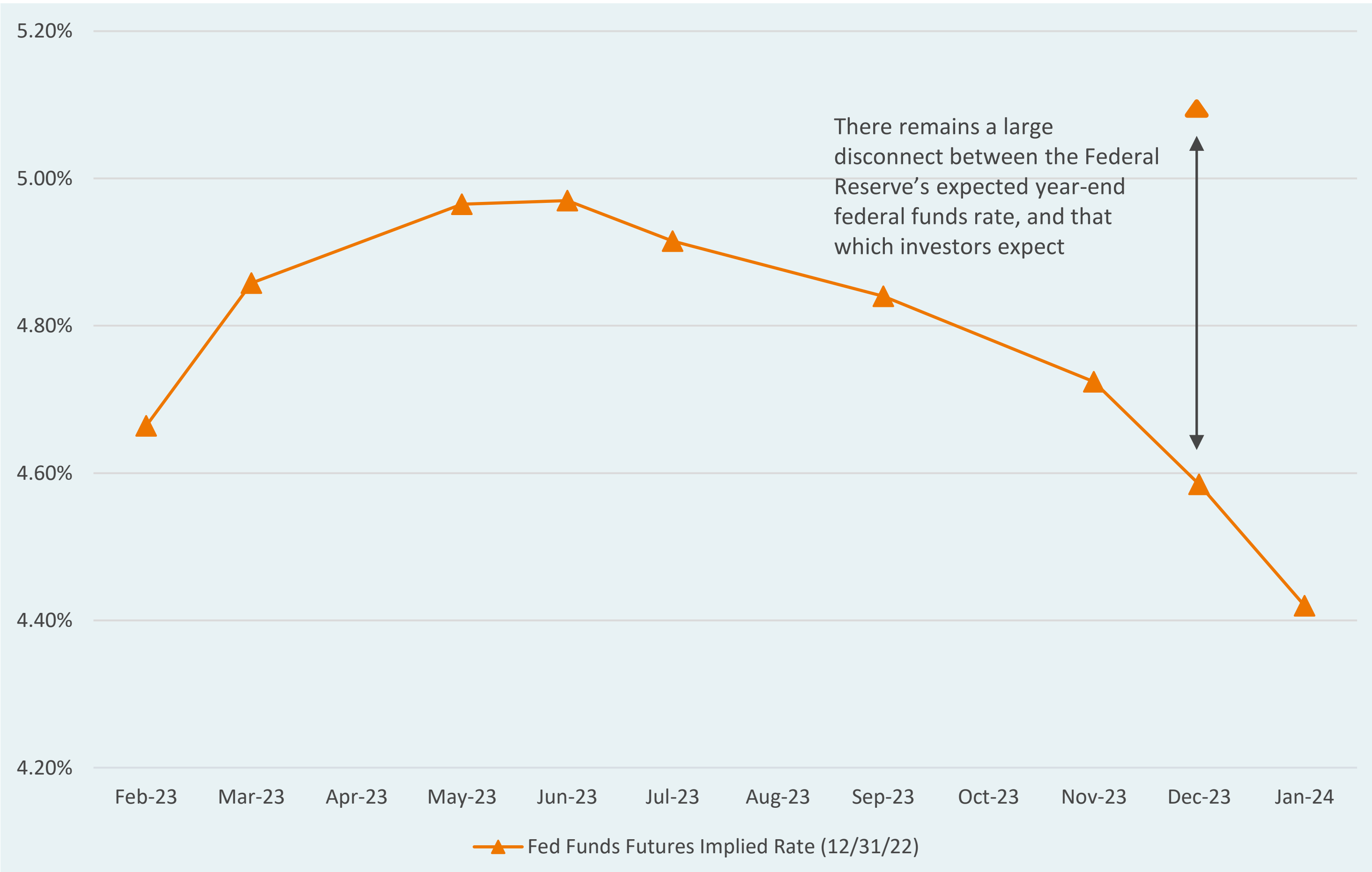
— Derivative markets are beginning to clash with Federal Reserve projections, as investors are pricing in a shorter tightening cycle relative to that indicated by comments from Federal Reserve officials. Federal Funds futures reflect a target interest rate of approximately 4.6% by the end of 2023, which compares to 5.1% indicated by the Federal Reserve's December Summary of Economic Projections.

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

Source: Bloomberg, as of 12/31/22

Markets more optimistic than the Fed

FED FUNDS FUTURES IMPLIED FED RATE



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

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

Source: Bloomberg, as of 12/31/22

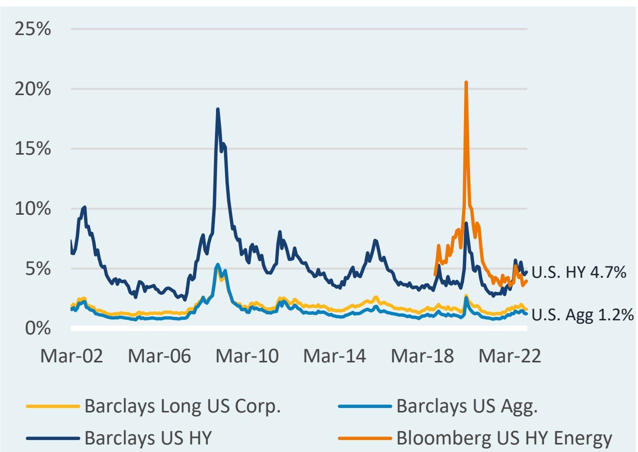
Credit environment

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

Credit spreads broadly tightened, with investment grade spreads falling to 130 bps from their high of 165 bps in Q3. High yield spreads compressed further, moving from 552 bps to 469 bps over the quarter. Despite calendar year returns of investment grade credit being the worst on record at -15.8%, and two consecutive years of negative returns, spreads have widened less than anticipated. This suggests spreads could expand from these levels if conditions deteriorate.

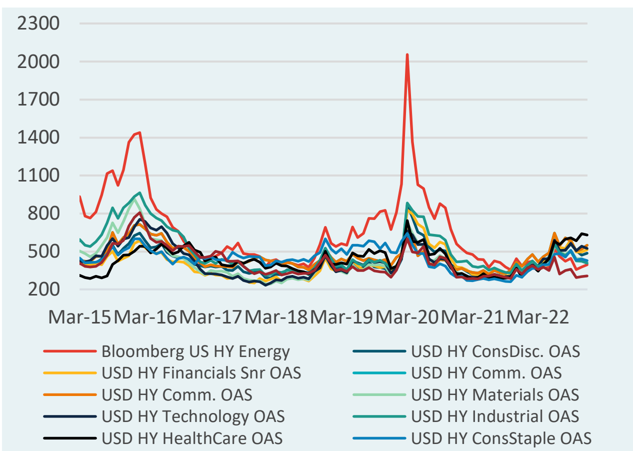
The total yield of high yield credit declined modestly throughout Q4, ending the quarter at 9.0%, which was 71 bps below Q3 yields but still elevated far above yields to start 2022. The Bloomberg US Corporate Investment Grade Index saw similar movement, with yields declining to 5.4% from 5.7% during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

SPREADS



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

HIGH YIELD SECTOR SPREADS (BPS)



Source: Bloomberg, as of 12/31/22

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

Source: Barclays, Credit Suisse, Bloomberg, as of 12/31/22
**Discount margin (4-year life)*

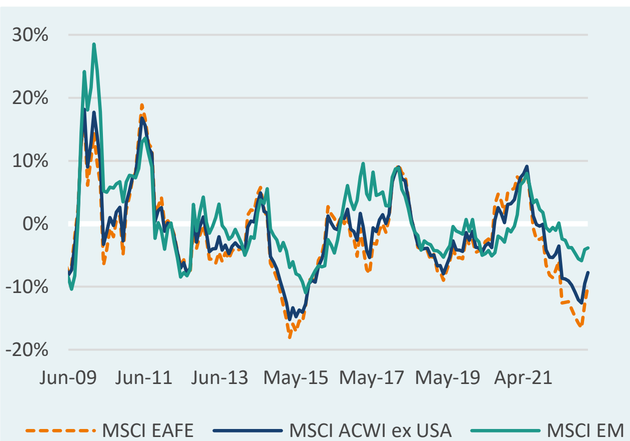
Currency

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

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

Despite currency gains seen this quarter, we believe that a thoughtful currency program may allow an investor to reduce their total portfolio risk while also increasing long-term expected returns. The MSCI Currency Factor Mix Index—a representation of a passive investment in the currency market—has shown a positive one-year rolling return over most periods with very low volatility. This contrasts to the unhedged currency exposure (what we refer to as "embedded currency") that most investors own, which has shown high volatility and frequent losses.

EFFECT OF CURRENCY (1-YEAR ROLLING)

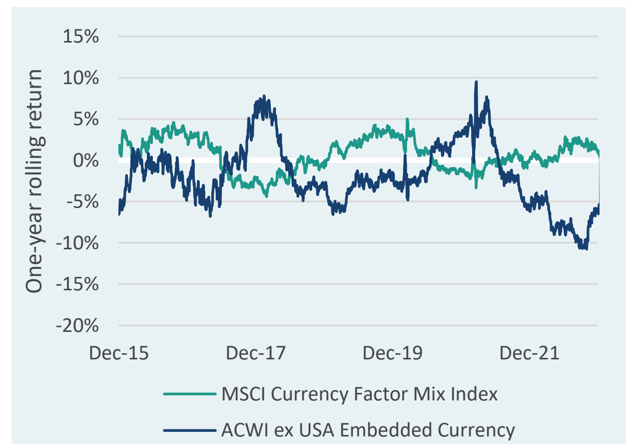


Source: MSCI, as of 12/31/22

BLOOMBERG DOLLAR SPOT INDEX

Source: Bloomberg, as of 12/31/22

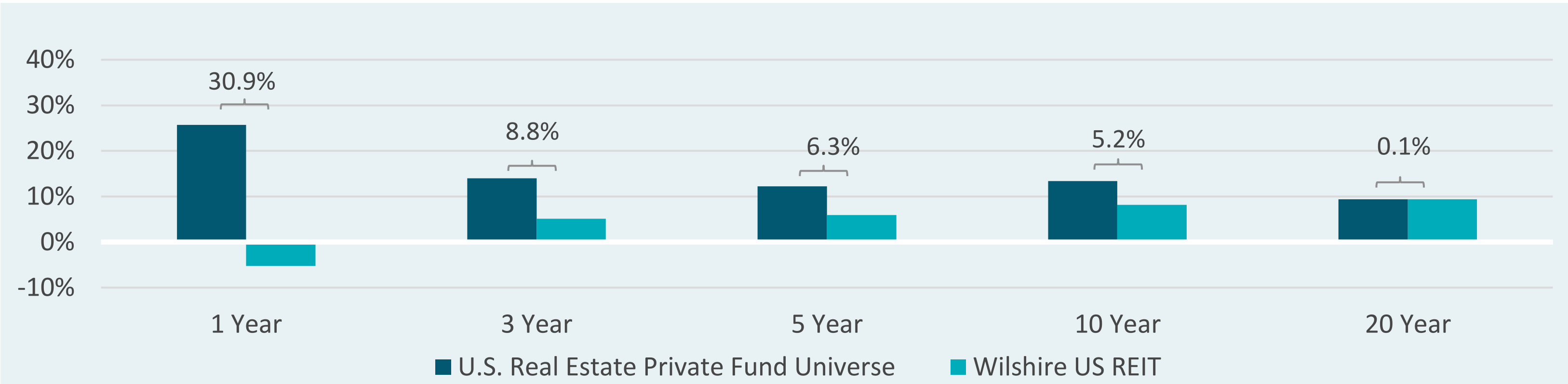
EMBEDDED CURRENCY VS CURRENCY FACTORS



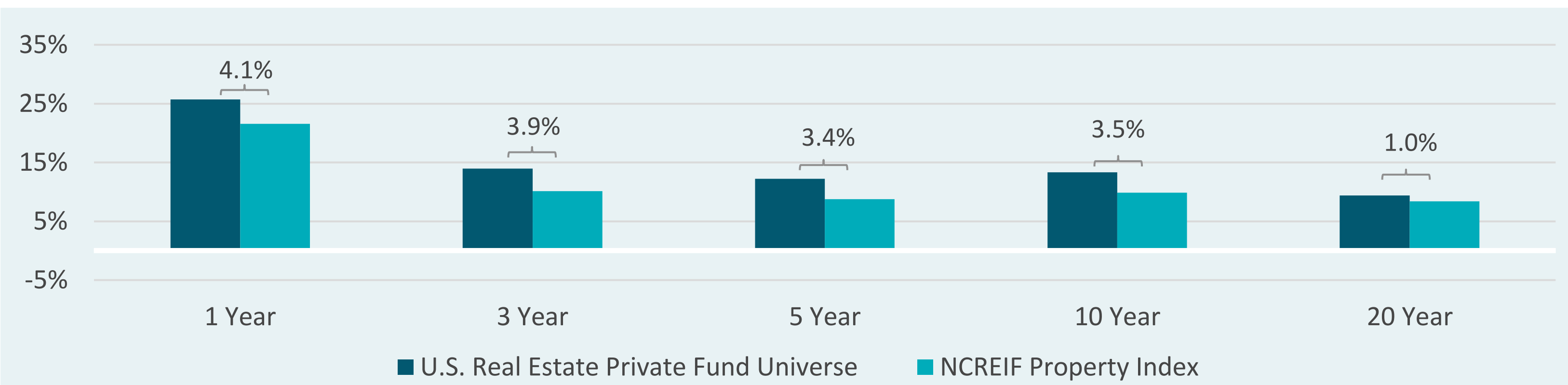
Source: Bloomberg, as of 12/31/22

Private vs. liquid and core real estate performance

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



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



U.S. Private R.E. funds outperformed the Wilshire U.S. REIT Index across all time periods, though short-term outperformance may be transitory due to appraisal lags

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

Sources: Refinitiv PME: U.S. Real Estate universes as of June 30, 2022. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real estate universes.

Detailed index returns

DOMESTIC EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Core Index							
S&P 500	(5.8)	7.6	(18.1)	(18.1)	7.7	9.4	12.6
S&P 500 Equal Weighted	(4.7)	11.6	(11.4)	(11.4)	9.0	9.1	12.4
DJ Industrial Average	(4.1)	16.0	(6.9)	(6.9)	7.3	8.4	12.3
Russell Top 200	(6.0)	6.6	(19.8)	(19.8)	7.9	9.9	12.9
Russell 1000	(5.8)	7.2	(19.1)	(19.1)	7.3	9.1	12.4
Russell 2000	(6.5)	6.2	(20.4)	(20.4)	3.1	4.1	9.0
Russell 3000	(5.9)	7.2	(19.2)	(19.2)	7.1	8.8	12.1
Russell Mid Cap	(5.4)	9.2	(17.3)	(17.3)	5.9	7.1	11.0
Style Index							
Russell 1000 Growth	(7.7)	2.2	(29.1)	(29.1)	7.8	11.0	14.1
Russell 1000 Value	(4.0)	12.4	(7.5)	(7.5)	6.0	6.7	10.3
Russell 2000 Growth	(6.4)	4.1	(26.4)	(26.4)	0.6	3.5	9.2
Russell 2000 Value	(6.6)	8.4	(14.5)	(14.5)	4.7	4.1	8.5

INTERNATIONAL EQUITY

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

FIXED INCOME

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

OTHER

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

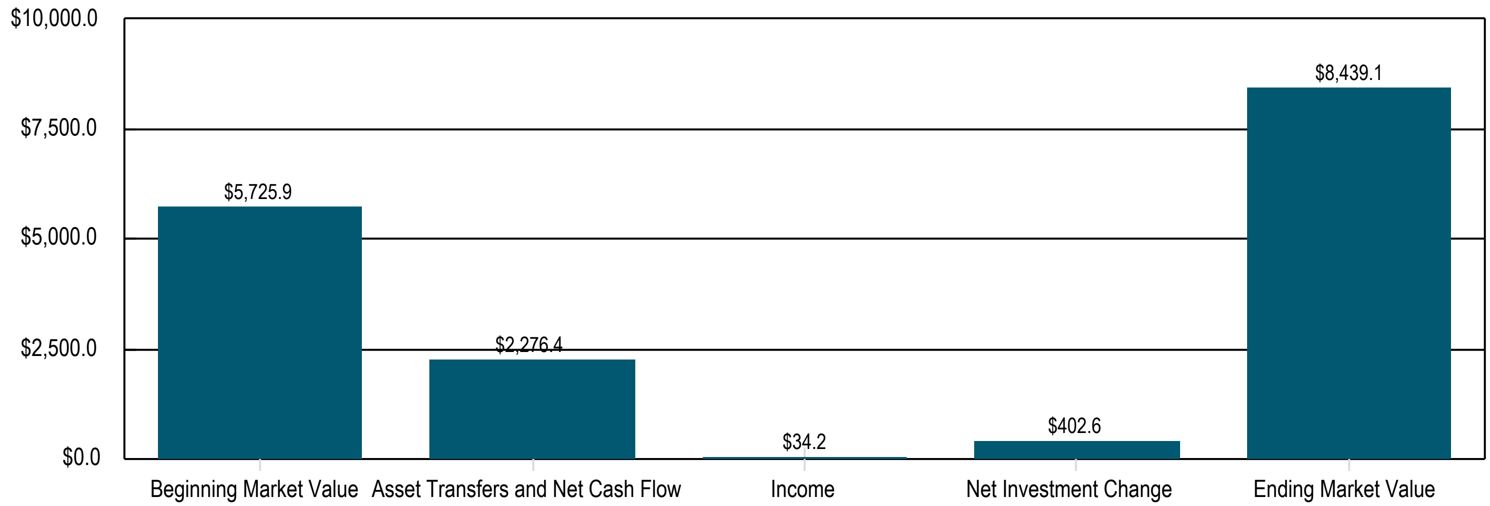
Source: Morningstar, HFRI, as of 12/31/22.

Investment Performance

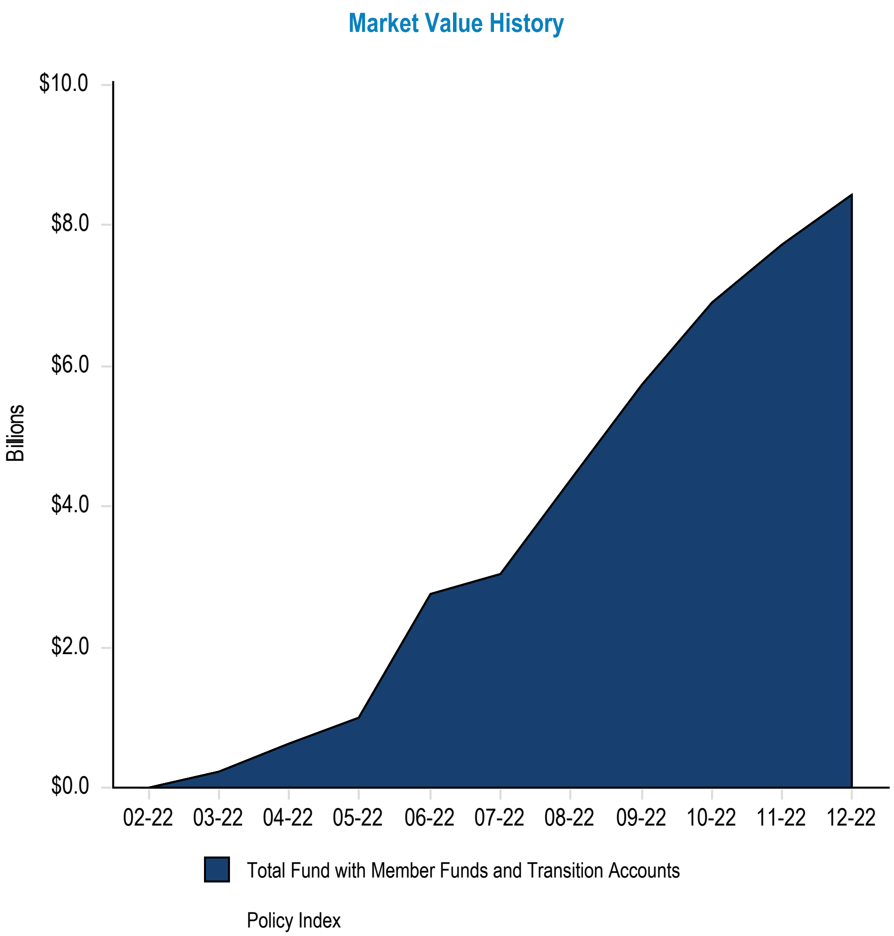
Portfolio Reconciliation

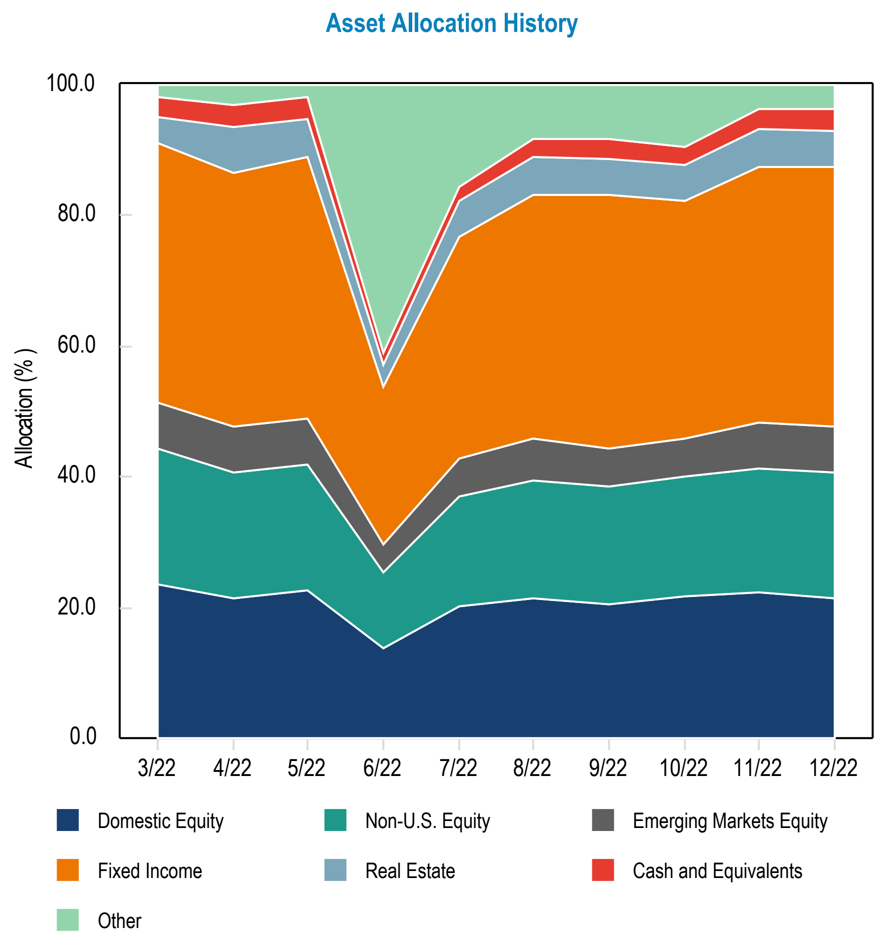
	Quarter-To-Date
Beginning Market Value	$5,725,892,654
Asset Transfers and Net Cash Flow	$2,276,402,324
Income	$34,217,421
Net Investment Change	$402,611,437
Ending Market Value	$8,439,123,835

Change in Market Value
Last Three Months

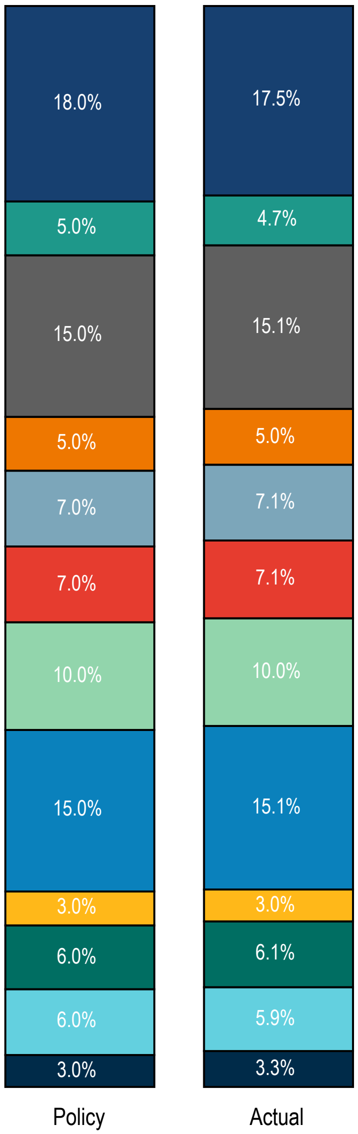


The portfolio reconciliation includes the Member Funds and Transition Account.
Income excludes Member Funds and Transition Account. Income is calculated using the actual dividend and income received from separate accounts and estimated income and dividends for commingled funds. The income and dividends for RhumbLine Russell 1000 Index, RhumbLine Russell 2000 Index, SSgA US TIPS Index and Cash are sourced from State Street custodial reports. The income and dividends for the SSGA commingled funds are an estimate based on the current yield for bond funds and the dividend yield for equity funds. SSGA can use dividend and income to cover fund expenses, so the actual income that flows to the IPOPIF may be different than reported. Income for the Principal RE fund is based on a monthly income spreadsheet received from Principal via email.





**Market value and asset class history includes Transition Accounts and Member Funds as represented by the Other category in the asset allocation history chart. The Other category reflects the June 24th transfers into the Members Funds account.*



	Current Balance ($)	Current Allocation (%)	Policy Allocation (%)	Excess Allocation (%)	Excess Allocation ($)	Policy Range (%)	Within IPS Range?
Domestic Equity Large Cap	1,419,543,922	17.5	18.0	-0.5	-42,880,901	16.0 - 20.0	Yes
Domestic Equity Small Cap	385,767,696	4.7	5.0	-0.3	-20,461,421	4.0 - 6.0	Yes
International Equity Large Cap	1,227,651,529	15.1	15.0	0.1	8,964,177	13.0 - 17.0	Yes
International Equity Small Cap	409,690,499	5.0	5.0	0.0	3,461,382	4.0 - 6.0	Yes
Emerging Markets Equity	579,104,090	7.1	7.0	0.1	10,383,325	6.0 - 8.0	Yes
Domestic Fixed Income Core	573,459,757	7.1	7.0	0.1	4,738,992	6.0 - 8.0	Yes
Domestic Fixed Income High Yield	814,479,099	10.0	10.0	0.0	2,020,865	9.0 - 11.0	Yes
Domestic Fixed Income Short Term	1,227,903,318	15.1	15.0	0.1	9,215,966	14.0 - 16.0	Yes
Domestic Fixed Income Real Return	243,800,835	3.0	3.0	0.0	63,365	2.5 - 3.5	Yes
Emerging Markets Fixed Income	499,100,060	6.1	6.0	0.1	11,625,119	5.0 - 7.0	Yes
Real Estate	476,734,650	5.9	6.0	-0.1	-10,740,291	5.0 - 7.0	Yes
Cash and Equivalents	267,346,893	3.3	3.0	0.3	23,609,423	0.0 - 5.0	Yes
Total	**8,124,582,347**	**100.0**	**100.0**	**0.0**			

Asset Allocation reflects short-term policy targets and excludes the Transition Account and Member Funds.

	Market Value	% of Portfolio	3 Mo	Since 04/01/2022
Total Fund with Member Funds and Transition Accounts	**8,439,123,835**	**100.0**	**6.7**	**-8.8**
Policy Index			*6.6*	*-9.3*
Policy Index- Broad Based			*8.4*	*-12.6*
IPOPIF Investment Portfolio	**8,124,582,347**	**96.3**	**6.8**	**-9.0**
Policy Index			*6.6*	*-9.3*
Policy Index- Broad Based			*8.4*	*-12.6*
Growth	**4,021,757,736**	**47.7**	**11.0**	**-12.8**
Growth Benchmark			*10.4*	*-13.2*
Income	**1,313,579,159**	**15.6**	**5.8**	**-9.1**
Income Benchmark			*5.7*	*-6.8*
Inflation Protection	**720,535,485**	**8.5**	**0.7**	**-9.1**
Inflation Protection Benchmark			*1.5*	*-11.6*
Risk Mitigation	**2,068,709,968**	**24.5**	**1.1**	**-2.8**
Risk Mitigation Benchmark			*1.2*	*-2.7*
Transition Accounts	280,635,591	3.3		
Member Accounts	33,905,897	0.4		

Policy Index constituents include 3% 90 day T-bill, 15% Bloomberg 1-3 Year Gov/Credit Index, 7% Bloomberg U.S. Aggregate Index, 3% Bloomberg U.S. TIPS 0-5 Year, 10% Bloomberg U.S. Corporate High Yield Index, 6% 50/50 JPM EMBI/GBI EM Global Diversified, 23% Russell 3000, 20% MSCI AC World Ex USA IMI (Net), 7% MSCI Emerging Markets IMI (Net), 4% Wilshire US REIT Index and 2% NCREIF Property Index. Broad Based Policy Index constituents: 70% MSCI ACWI IMI (Net), 30% Bloomberg Global Multiverse. The growth, income, inflation protection and risk mitigation benchmarks are underlying asset class benchmarks normalized for composite weights.

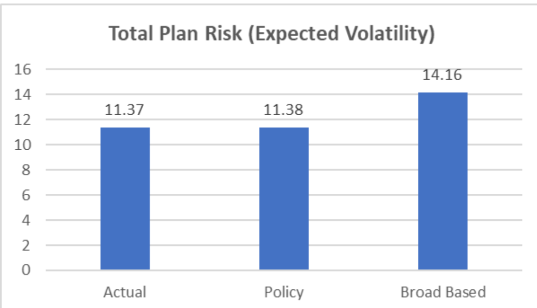
	Market Value	% of Portfolio	3 Mo	Since 04/01/2022
Total Fund with Member Funds and Transition Accounts	**8,439,123,835**	**100.0**	**6.7**	**-8.8**
Policy Index			*6.6*	*-9.3*
Policy Index- Broad Based			*8.4*	*-12.6*
All Public Plans > $1B-Total Fund Rank			*12*	*66*
IPOPIF Investment Portfolio	**8,124,582,347**	**96.3**	**6.8**	**-9.0**
Policy Index			*6.6*	*-9.3*
Policy Index- Broad Based			*8.4*	*-12.6*
All Public Plans > $1B-Total Fund Rank			*12*	*76*
Growth	**4,021,757,736**	**47.7**	**11.0**	**-12.8**
Growth Benchmark			*10.4*	*-13.2*
RhumbLine Russell 1000 Index	1,419,543,922	16.8	7.2	-14.9
Russell 1000 Index			*7.2*	*-14.8*
eV US Large Cap Core Equity Rank			*76*	*86*
RhumbLine Russell 2000 Index	385,767,696	4.6	6.2	-14.2
Russell 2000 Index			*6.2*	*-14.0*
eV US Small Cap Core Equity Rank			*85*	*81*
SSgA Non-US Developed Index	1,227,651,529	14.5	16.2	-9.7
MSCI World ex U.S. (Net)			*16.2*	*-10.0*
eV EAFE Core Equity Rank			*54*	*45*
SSgA Non-US Developed SC Index	409,690,499	4.9	15.1	-14.1
MSCI World ex U.S. Small Cap Index (Net)			*15.2*	*-14.4*
eV EAFE Small Cap Core Rank			*79*	*77*
SSgA Emerging Markets Equity Index	579,104,090	6.9	10.3	-13.3
MSCI Emerging Markets (Net)			*9.7*	*-14.1*
eV Emg Mkts Equity Rank			*53*	*51*
Income	**1,313,579,159**	**15.6**	**5.8**	**-9.1**
Income Benchmark			*5.7*	*-6.8*
SSgA High Yield Corporate Credit	814,479,099	9.7	4.4	-7.7
Bloomberg U.S. High Yield Very Liquid Ind			*4.3*	*-7.4*
eV US High Yield Fixed Inc Rank			*32*	*88*
SSgA EMD Hard Index Fund	499,100,060	5.9	8.2	-10.7
JPM EMBI Global Diversified Index			*8.1*	*-9.3*
Emerging Markets Bond Rank			*70*	*96*

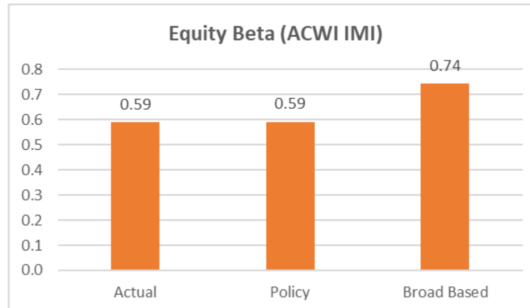
Policy Index constituents include 3% 90 day T-bill, 15% Bloomberg 1-3 Year Gov/Credit Index, 7% Bloomberg U.S. Aggregate Index, 3% Bloomberg U.S. TIPS 0-5 Year, 10% Bloomberg U.S. Corporate High Yield Index, 6% 50/50 JPM EMBI/GBI EM Global Diversified, 23% Russell 3000, 20% MSCI AC World Ex USA IMI (Net), 7% MSCI Emerging Markets IMI (Net), 4% Wilshire US REIT Index and 2% NCREIF Property Index. Broad Based Policy Index constituents: 70% MSCI ACWI IMI (Net), 30% Bloomberg Global Multiverse. Principal USPA does not show a Since 4/1/2022 return because the fund was incepted on 4/6/2022.

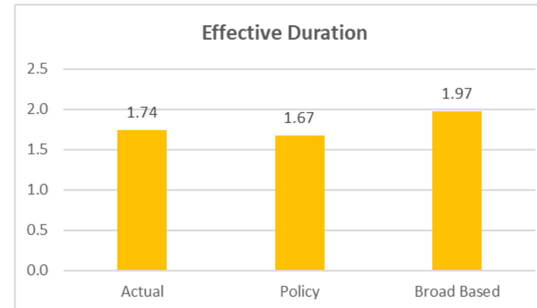
	Market Value	% of Portfolio	3 Mo	Since 04/01/2022
Inflation Protection	**720,535,485**	**8.5**	**0.7**	**-9.1**
Inflation Protection Benchmark			*1.5*	*-11.6*
SSgA US TIPS Index	243,800,835	2.9	1.3	-2.9
Blmbg. U.S. TIPS 0-5 Year			*1.3*	*-2.5*
eV US TIPS / Inflation Fixed Inc Rank			*98*	*1*
SSgA REITs Index	299,184,364	3.5	4.7	-23.1
Dow Jones U.S. Select REIT			*4.8*	*-23.1*
eV US REIT Rank			*28*	*80*
Principal USPA	177,550,286	2.1	-6.0	-
NCREIF ODCE			*-5.2*	*-0.6*
Risk Mitigation	**2,068,709,968**	**24.5**	**1.1**	**-2.8**
Risk Mitigation Benchmark			*1.2*	*-2.7*
SSgA Core Fixed Income Index	573,459,757	6.8	1.7	-7.8
Blmbg. U.S. Aggregate Index			*1.9*	*-7.5*
eV US Core Fixed Inc Rank			*66*	*72*
SSgA Short-Term Gov't/Credit Index	1,227,903,318	14.6	0.9	-1.2
Blmbg. 1-3 Year Gov/Credit index			*0.9*	*-1.2*
eV US Short Duration Fixed Inc Rank			*83*	*53*
Cash	267,346,893	3.2	0.5	0.8
90 Day U.S. Treasury Bill			*0.8*	*1.4*
Transition Account	280,635,591	3.3		
Member Accounts	33,905,897	0.4		

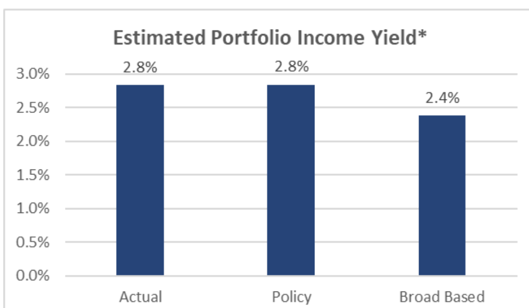
Policy Index constituents include 3% 90 day T-bill, 15% Bloomberg 1-3 Year Gov/Credit Index, 7% Bloomberg U.S. Aggregate Index, 3% Bloomberg U.S. TIPS 0-5 Year, 10% Bloomberg U.S. Corporate High Yield Index, 6% 50/50 JPM EMBI/GBI EM Global Diversified, 23% Russell 3000, 20% MSCI AC World Ex USA IMI (Net), 7% MSCI Emerging Markets IMI (Net), 4% Wilshire US REIT Index and 2% NCREIF Property Index. Broad Based Policy Index constituents: 70% MSCI ACWI IMI (Net), 30% Bloomberg Global Multiverse. Principal USPA does not show a Since 4/1/2022 return because the fund was incepted on 4/6/2022.

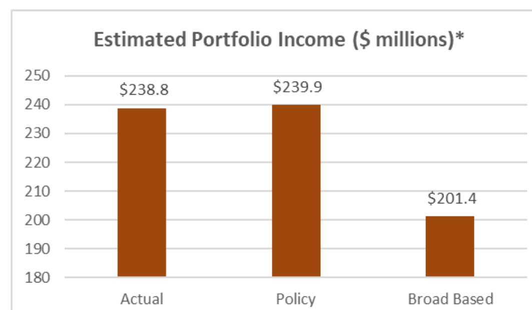
Portfolio Characteristics











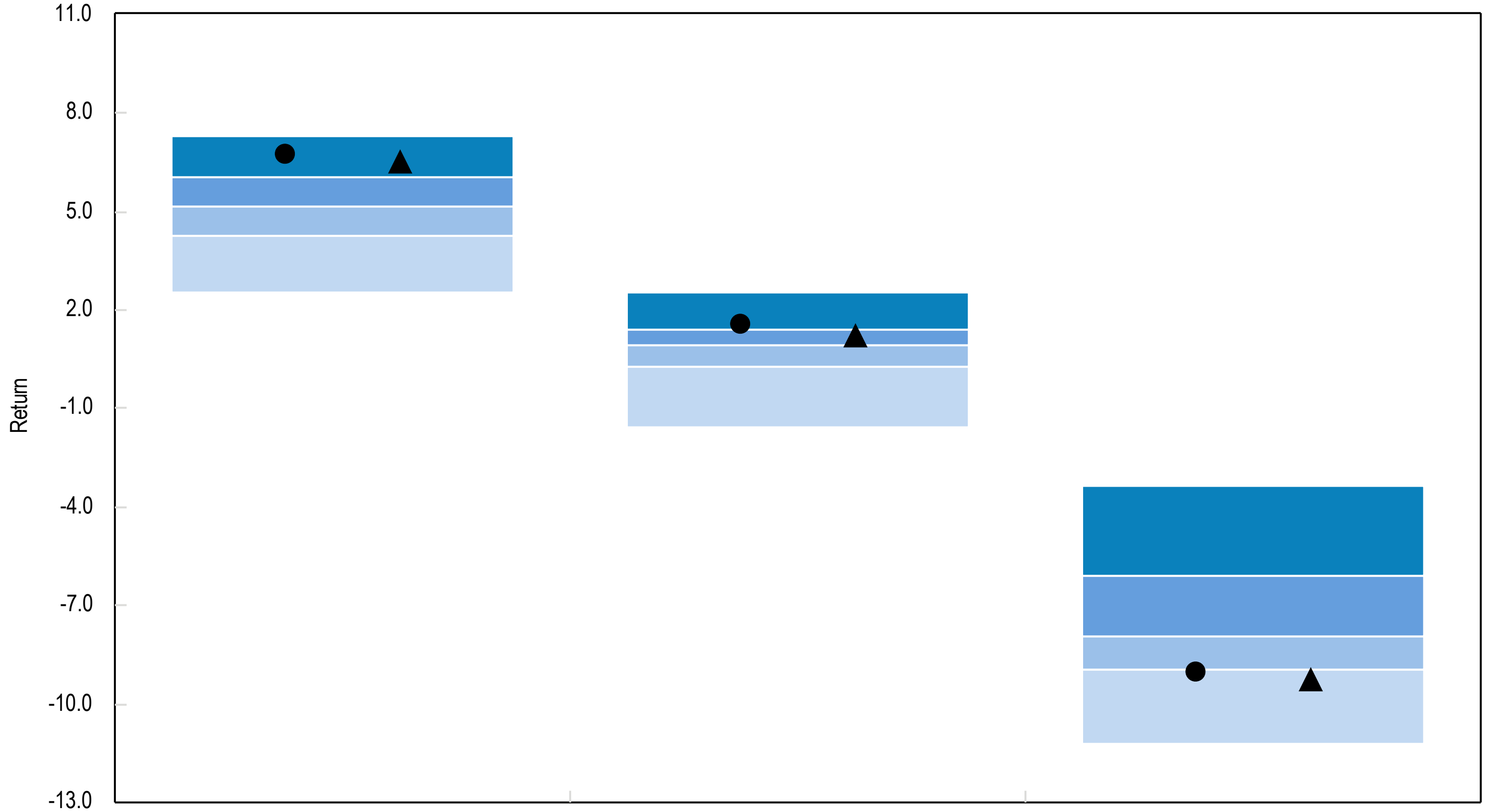
*Income Yield and Income are estimated based on dividend yields and coupon rates applied to benchmark weights and does not include factors such as dividend re-investment rates.
Source: Barra One using index holdings as representative proxies

Name	Asset Class	Vehicle Type	Market Value	% of Portfolio	Estimated Fee Value	Expense Fee (%)
RhumbLine Russell 1000 Index	Domestic Equity	Separate Account	$1,419,543,922	17.4722	$70,977	0.005
RhumbLine Russell 2000 Index	Domestic Equity	Separate Account	$385,767,696	4.7482	$19,288	0.005
SSgA Non-US Developed Index	Non-U.S. Equity	Commingled Fund	$1,227,651,529	15.1103	$196,424	0.016
SSgA Non-US Developed SC Index	Non-U.S. Equity	Commingled Fund	$409,690,499	5.0426	$65,550	0.016
SSgA Emerging Markets Equity Index	Emerging Markets Equity	Commingled Fund	$579,104,090	7.1278	$92,657	0.016
SSgA High Yield Corporate Credit	Fixed Income	Commingled Fund	$814,479,099	10.0249	$130,317	0.016
SSgA EMD Hard Index Fund	Fixed Income	Commingled Fund	$499,100,060	6.1431	$79,856	0.016
SSgA US TIPS Index	Fixed Income	Separate Account	$243,800,835	3.0008	$39,008	0.016
Principal USPA	Real Estate	Commingled Fund	$177,550,286	2.1853	$1,420,402	0.800
SSgA REITs Index	Real Estate	Commingled Fund	$299,184,364	3.6825	$47,869	0.016
SSgA Core Fixed Income Index	Fixed Income	Commingled Fund	$573,459,757	7.0583	$91,754	0.016
SSgA Short-Term Gov't/Credit Index	Fixed Income	Commingled Fund	$1,227,903,318	15.1134	$196,465	0.016
Cash	Cash and Equivalents	Commingled Fund	$267,346,893	3.2906		
IPOPIF Investment Portfolio			**$8,124,582,347**	**100.0000**	**$2,450,568**	**0.030**

SSGA charges a flat 0.0155% fee through 2022 and an aggregate asset-based fee thereafter.

Name	Beginning Market Value	Contributions	Distributions	Net Cash Flows	Income	Net Investment Change	Ending Market Value
RhumbLine Russell 1000 Index	$918,224,466	$463,615,912	-$30,000,000	$433,615,912	$4,784,628	$62,918,916	$1,419,543,922
RhumbLine Russell 2000 Index	$258,500,642	$121,961,398	-$10,000,000	$111,961,398	$1,403,743	$13,901,913	$385,767,696
SSgA Non-US Developed Index	$772,835,123	$373,391,077	-$64,000,000	$309,391,077	$5,015,108	$140,410,222	$1,227,651,529
SSgA Non-US Developed SC Index	$248,834,737	$130,717,536	-$16,000,000	$114,717,536	$1,502,631	$44,635,595	$409,690,499
SSgA Emerging Markets Equity Index	$348,737,532	$185,080,527	-	$185,080,527	$2,217,825	$43,068,206	$579,104,090
SSgA High Yield Corporate Credit	$535,666,126	$253,166,887	-	$253,166,887	$6,834,326	$18,811,761	$814,479,099
SSgA EMD Hard Index Fund	$309,251,249	$157,733,663	-	$157,733,663	$3,709,329	$28,405,820	$499,100,060
SSgA US TIPS Index	$168,606,330	$72,859,994	-	$72,859,994	$151,771	$2,182,741	$243,800,835
Principal USPA	$150,200,989	$37,418,183	-	$37,418,183	$1,020,763	-$11,089,649	$177,550,286
SSgA REITs Index	$172,312,336	$116,799,027	-	$116,799,027	$1,399,947	$8,673,054	$299,184,364
SSgA Core Fixed Income Index	$373,858,495	$191,298,639	-	$191,298,639	$2,161,339	$6,141,283	$573,459,757
SSgA Short-Term Gov't/Credit Index	$826,841,690	$427,113,380	-$35,000,000	$392,113,380	$3,399,059	$5,549,190	$1,227,903,318
Cash	$166,369,677	$129,307,826	-$29,429,452	$99,878,374	$616,953	$481,889	$267,346,893
Transition Account	$457,977,873	$2,238,478,848	-$2,431,237,396	-$192,758,548	-	$15,416,266	$280,635,591
Member Accounts	$17,675,391	$2,211,825,984	-$2,218,699,709	-$6,873,724	-	$23,104,230	$33,905,897
Total Fund with Member Funds and Transition Accounts	**$5,725,892,654**	**$7,110,768,881**	**-$4,834,366,557**	**$2,276,402,324**	**$34,217,421**	**$402,611,437**	**$8,439,123,835**

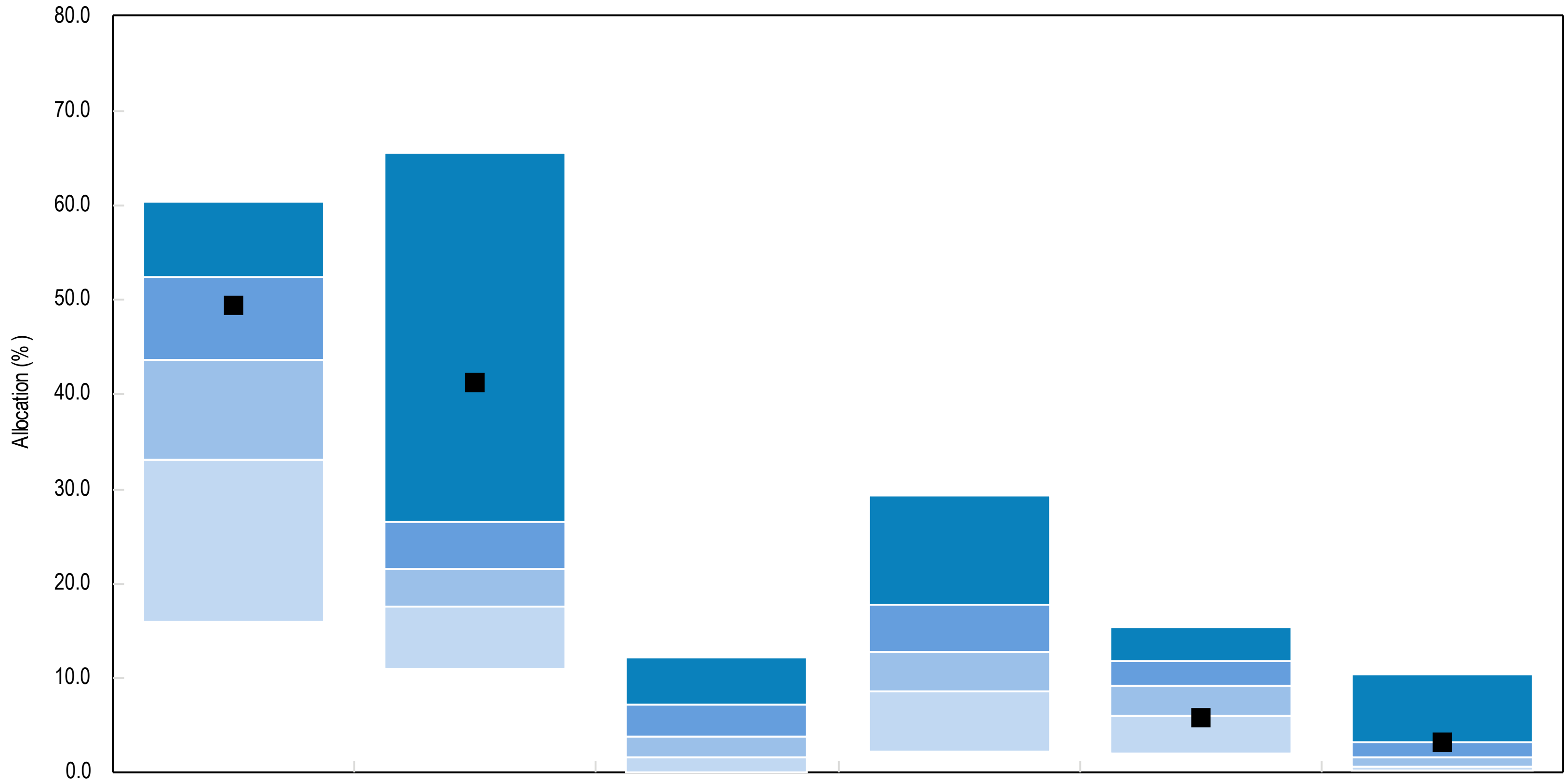
IPOPIF Investment Portfolio vs. All Public Plans > $1B-Total Fund



	Quarter	2 Quarters	3 Quarters
● IPOPIF Investment Portfolio	6.8 (12)	1.6 (21)	-9.0 (76)
▲ Policy Index	6.6 (13)	1.2 (37)	-9.3 (79)
5th Percentile	7.3	2.5	-3.4
1st Quartile	6.1	1.4	-6.1
Median	5.2	0.9	-7.9
3rd Quartile	4.2	0.3	-8.9
95th Percentile	2.5	-1.6	-11.2
Population	141	140	136

Parentheses contain percentile rankings. Performance shown for IPOPIF Investment Fund which excludes the Transition Account and Member Funds.

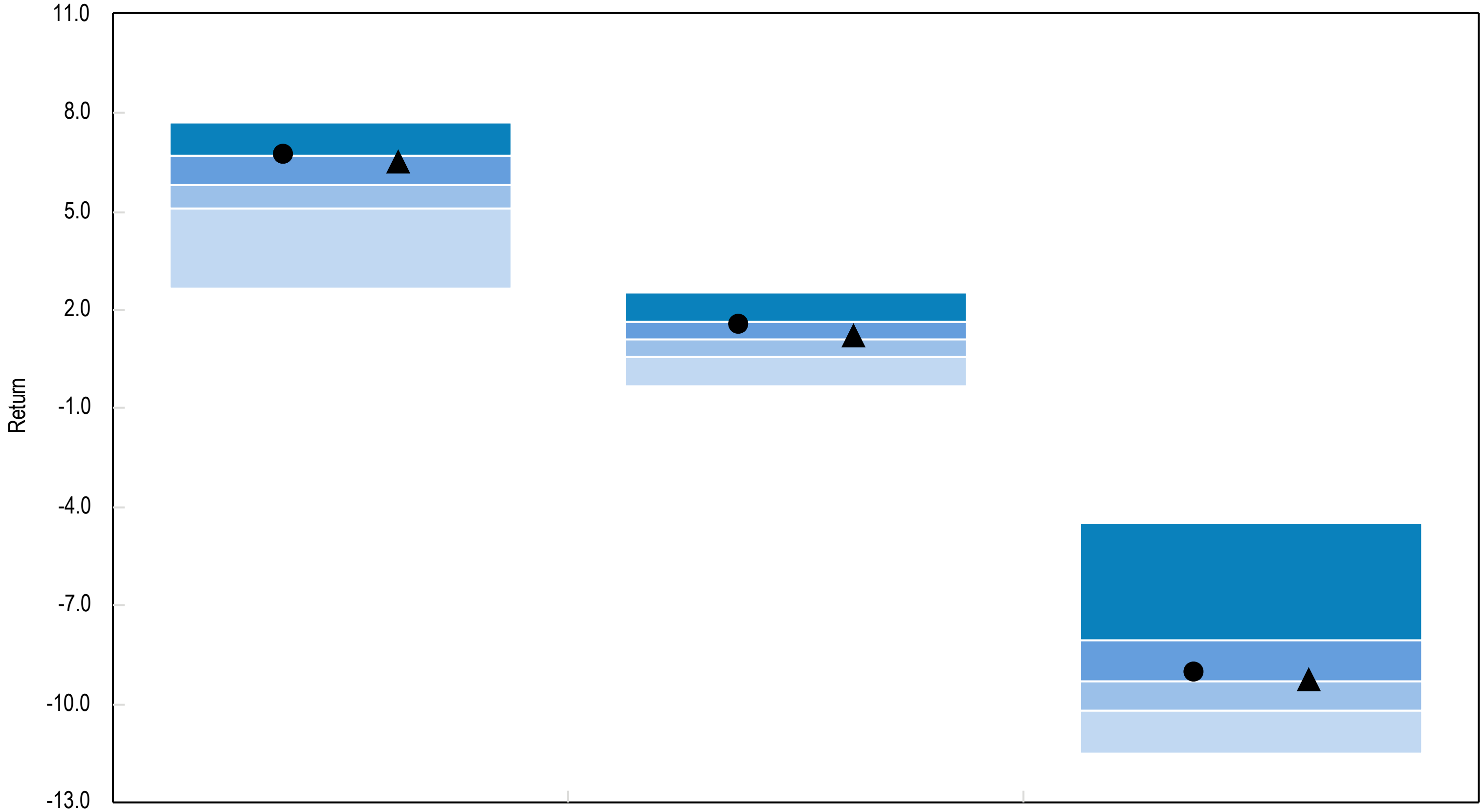
Total Plan Allocation vs. All Public Plans > $1B-Total Fund
As of December 31, 2022



	Total Equity	Total Fixed Income	Hedge Funds	Private Equity	Total Real Estate	Cash & Equivalents
■ IPOPIF Investment Portfolio	49.5 (33)	41.3 (7)	-	-	5.9 (76)	3.3 (24)
5th Percentile	60.5	65.7	12.1	29.4	15.4	10.3
1st Quartile	52.5	26.5	7.1	17.8	11.7	3.2
Median	43.7	21.6	3.8	12.7	9.2	1.6
3rd Quartile	33.1	17.6	1.6	8.6	5.9	0.7
95th Percentile	15.9	10.9	0.1	2.1	2.0	0.2
Population	128	136	34	52	104	93

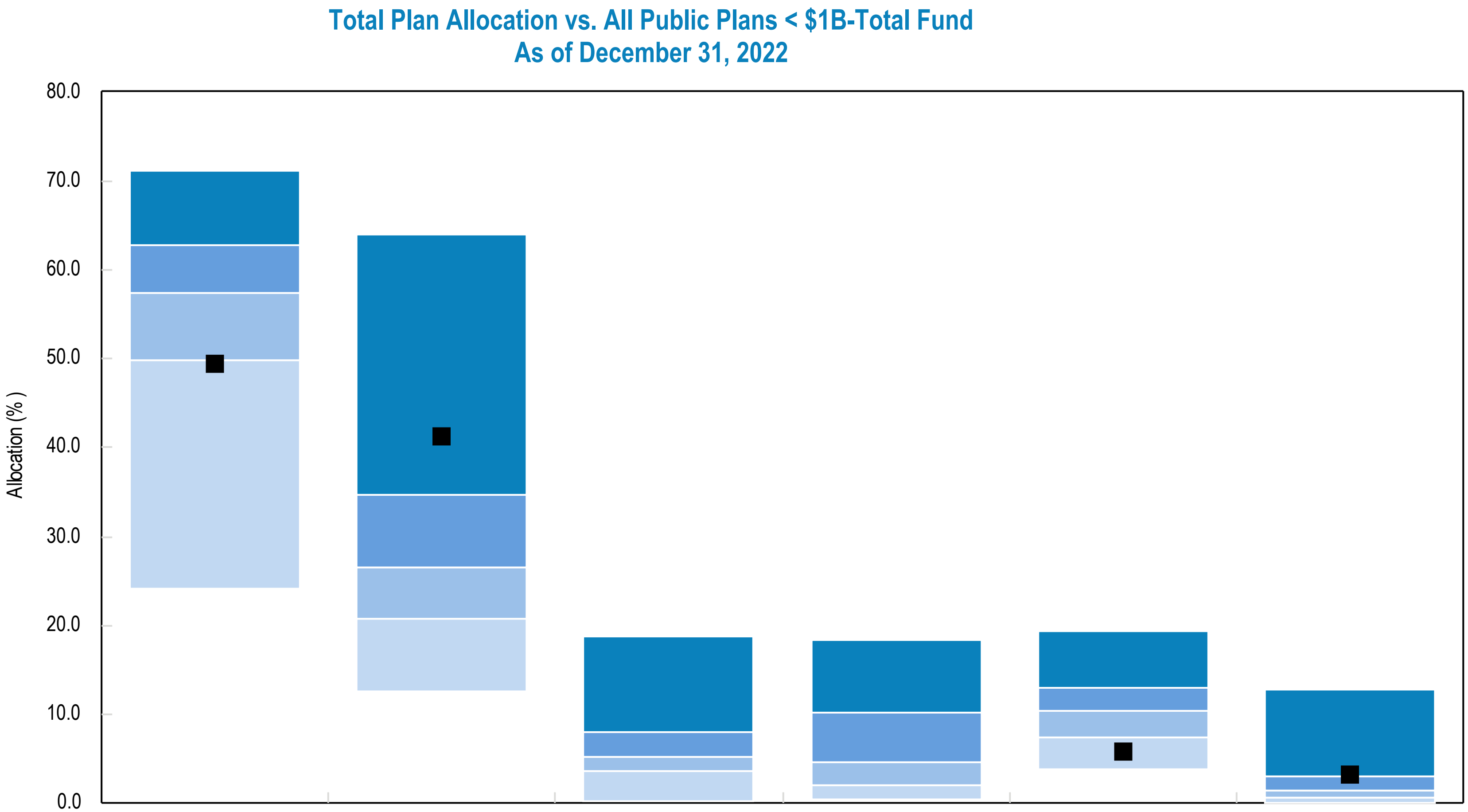
Parentheses contain percentile rankings. Excludes Transition Account and Member Funds. Real Assets contains Core Real Estate and REITs.

IPOPIF Investment Portfolio vs. All Public Plans < $1B-Total Fund



	Quarter	2 Quarters	3 Quarters
● IPOPIF Investment Portfolio	6.8 (24)	1.6 (29)	-9.0 (43)
▲ Policy Index	6.6 (30)	1.2 (45)	-9.3 (49)
5th Percentile	7.7	2.5	-4.5
1st Quartile	6.7	1.7	-8.1
Median	5.8	1.1	-9.3
3rd Quartile	5.1	0.6	-10.2
95th Percentile	2.7	-0.3	-11.5
Population	361	357	349

Parentheses contain percentile rankings.Performance shown for IPOPIF Investment Fund which excludes the Transition Account and Member Funds.



	Total Equity	Total Fixed Income	Hedge Funds	Private Equity	Total Real Estate	Cash & Equivalents
■ IPOPIF Investment Portfolio	49.5 (77)	41.3 (11)	-	-	5.9 (84)	3.3 (22)
5th Percentile	71.3	64.1	18.8	18.3	19.4	12.7
1st Quartile	62.9	34.8	8.0	10.1	12.9	3.0
Median	57.4	26.6	5.1	4.6	10.4	1.5
3rd Quartile	49.9	20.8	3.6	2.0	7.5	0.7
95th Percentile	24.2	12.6	0.3	0.5	3.8	0.1
Population	555	611	72	131	354	465

Parentheses contain percentile rankings. Excludes Transition Account and Member Funds. Real Assets contains Core Real Estate and REITs.

Performance Return Calculations

Performance is calculated using 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
RhumbLine Russell 1000 Index Fund	3/15/2022	State Street
RhumbLine Russell 2000 Index Fund	3/15/2022	State Street
SSgA Non-US Developed Index Fund	3/10/2022	State Street
SSgA Non-US Developed SC Index Fund	3/10/2022	State Street
SSgA Emerging Markets Equity Index Fund	3/10/2022	State Street
SSgA High Yield Corporate Credit	3/18/2022	State Street
iShares JPM Emerging Market Bond Index ETF	3/14/2022	State Street

Manager	Inception Date	Data Source
SSgA US TIPS Index Fund	3/17/2022	State Street
Principal USPA	4/6/2022	State Street
SSgA REITs Index Fund	3/10/2022	State Street
SSgA Core Fixed Income Index Fund	3/17/2022	State Street
SSgA Short-Term Gov't/Credit Index Fund	3/17/2022	State Street
Cash	3/22/2022	State Street

Policy Index Composition

As of 3/31/2022	Policy	Growth	Income	Inflation Protection	Risk Mitigation
Russell 3000	23%	46.0%			
MSCI ACWI ex USA IMI	20%	40.0%			
MSCI Emerging Markets IMI	7%	14.0%			
Bloomberg US Aggregate Index	7%				28.0%
Bloomberg 1-3 Year Gov/Credit Index	15%				60.0%
Bloomberg US Corporate High Yield Index	10%		62.5%		
Bloomberg US TIPS 0-5 Year	3%			33.3%	
50% JPM EMBI GD/50% JPM GBI EM GD	6%		37.5%		
NCREIF Property Index	2%			22.2%	
Wilshire US REIT Index	4%			44.5%	
90 Day US Treasury Bill Index	3%				12.0%

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 the exact opposite direction over time. Correlation is used as a measure to help maximize the benefits of diversification when constructing an investment portfolio.

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

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

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

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

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

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

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

Sharpe Ratio: A measure of portfolio efficiency. The Sharpe Ratio indicates excess portfolio return for each unit of risk associated with achieving the excess return. The higher the Sharpe Ratio, the more efficient the portfolio. Sharpe ratio is calculated as: 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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