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Capital Perspectives

Monthly investment analysis and insights from Wilmington Trust Investment Advisors

ON THE RECORD

Inflation Not Going Quietly

In this issue:

Tony Roth
Chief Investment Officer

Recent weeks have introduced significant questions as to whether the latest inflation outlook warrants recent optimism. Revisions to 2022 inflation data and hotter-than-expected releases to start the year have accompanied a blockbuster payroll report for January and strong consumer spending data. These data have many now contemplating a "no landing" scenario (in other words, not only avoidance of a recession in 2023 or early 2024, but continued strength in the economy). We do not share this optimism. In our view, persistently hot inflation and economic data will lead to higher rates than markets currently forecast. In turn, this may increase the chance of recession, albeit over an extended timeframe than first expected.

The Fed's conundrum

February produced several key inflation updates that together form a more challenging backdrop for the Fed than was understood in January. On February 10, the Bureau of Labor Statistics updated its seasonal adjustments for the Consumer Price Index (CPI), resulting in upward revisions to core CPI (excluding the volatile food and energy prices) in the second half of 2022. Then January's Producer Price Index (PPI), CPI, and Personal Consumption Expenditures Index (PCE) inflation all moved higher from the prior month, signaling that inflation could prove stickier. Markets have repriced expectations for the fed funds rate—in particular, raising the peak rate to 5.4% and removing any expectation for rate cuts in 2023 (Figure 1)—and markets have cooled. Stubborn inflation due to supply-side forces is central to our 2023 Capital Markets Forecast.

The clearest cause of worry for the Federal Reserve is undoubtedly labor market imbalance. Consumer spending on services remains robust, buoyed by an increase

Continued

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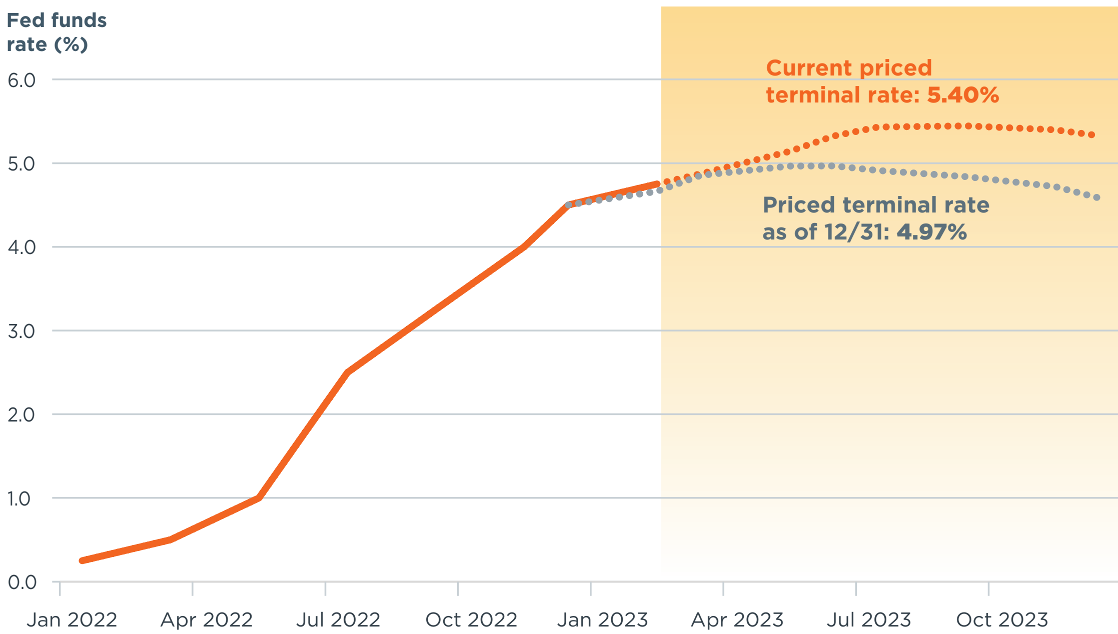
Figure 1

Market participants are pricing higher for longer from the Fed

Market pricing of the terminal fed funds rate (current vs. December 2022).



Data as of February 28, 2023.

Source: Bloomberg.

Given the haunting memory of the 1970s, those at the Fed will likely only sleep well at night when inflation is dead and buried, an outcome for which an economic recession is a key ingredient.

in real wages and pent-up demand. This force continues to drive labor demand, evidenced by the 517,000 net new jobs created in January and upward revisions to prior months. Meanwhile, the labor market faces a structural deficit caused by an acceleration of baby boomer retirements and decline in immigration.

Outsized wage growth poses a threat to inflation in core services ex-housing, as wages are the largest cost facing many service-oriented businesses. The Fed's very blunt monetary policy tool can, unfortunately, only affect the demand side of the economy. This leaves two solutions to the current labor shortage, neither of which provides a quick fix: 1) Create more workers—something that generally requires change to immigration policy; or 2) Improve productivity, which has proved elusive despite some very observable, dramatic technology improvements in recent years.

This rendition produces a challenge for the Fed. Under the "standard model," the Fed is attempting to create price stability—i.e., lower inflation—while hoping to avoid the untoward outcome of a recession. We would offer an alternative paradigm through which to consider the Fed's actions: the central bank may need to engineer a recession in order to bring inflation back to 2%. The structurally tight labor market means economic activity, wage growth, and inflation may be more intricately linked than in prior cycles. Given the haunting memory of the 1970s, those at the Fed will likely only sleep well at night when inflation is dead and buried, an outcome for which an economic recession is a key ingredient.

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Figure 2

The equity risk premium signals unattractive risk vs. reward for equity investors

Next 12-month estimate of the S&P 500's earnings yield minus the 10-year Treasury yield (excess return over the risk-free rate)

Data as of February 28, 2023.

Earnings yield is calculated as the inverse of the price-to-earnings ratio.

Sources: Bloomberg and Wilmington Trust Investment Advisors, Inc.

Past performance cannot guarantee future results. Investment in a security or strategy designed to replicate the performance of an index will incur expenses such as management fees and transaction costs which will reduce returns. There is no assurance that any investment strategy will be successful.

Importantly, we remain optimistic long term. Though the inflation picture is challenging in the near term, we affirm that it is nothing that cannot be cured by the Fed and the progression of the business cycle.

Higher for longer

The punchline for investors is that we will be grappling with higher interest rates for longer. To be sure, this creates a more challenging backdrop for risk assets. The recent increase in interest rates provides direct competition to equities via a reduced equity risk premium. One measure for the equity risk premium is the differential between the earnings yield of the S&P 500 (inverse of the price-to-earnings multiple) and the 10-year Treasury yield—now the narrowest since 2007 (Figure 2). Fourth-quarter results ex-energy have generally disappointed and represent the third consecutive quarter of declining earnings. Yes, 2020 expectations for earnings in 2023 were likely too high. Margins are under pressure and have declined by a magnitude consistent with prior recessions. An environment of disinflation can be problematic for corporate margins as it becomes more difficult to pass through stubbornly high wages and other input costs.

At current price levels, investors are not being compensated to take extra risk in portfolios. Accordingly, we have recently further reduced our underweight to equities, taking down U.S. small-cap equities marginally in favor of hedge funds—or liquid alternatives, depending on the client (Figure 3). Our baseline expectation is still for a mild recession, and the strong U.S. data are merely pushing back that timeline to later in the year. Higher interest rates pose a greater burden to smaller companies than large, given their higher debt ratios. We also maintain an

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Figure 3

Defensively positioned in portfolios

High-net-worth portfolios with private markets*

	Tactical tilts	– NEUTRAL +	Positioning
Equities	U.S. Large Cap	○ ○ ○ ● ○ ○ ○	Underweight
	U.S. Small Cap	○ ○ ● ○ ○ ○ ○	
	International Developed	○ ○ ● ○ ○ ○ ○	
	Emerging Markets	○ ○ ○ ● ○ ○ ○	
Fixed Income	Investment Grade	○ ○ ○ ○ ● ○ ○	Overweight
	Tax-Exempt High Yield	○ ○ ○ ● ○ ○ ○	
Real Assets	Global REITs	○ ○ ○ ● ○ ○ ○	Neutral
	Other/Commodities	○ ○ ○ ● ○ ○ ○	
Alternatives	Equity Long/Short Hedge	○ ○ ○ ● ○ ○ ○	Neutral
Private Markets*	Equity/Debt/Real Estate	○ ○ ○ ● ○ ○ ○	Neutral
Cash		○ ○ ○ ○ ● ○ ○	Overweight

Data as of February 1, 2023.

Positioning reflects our monthly tactical asset allocation (TAA) versus the long-term strategic asset allocation (SAA) benchmark. For an overview of our asset allocation strategies, please see the disclosures.

* Private markets are only available to investors that meet Securities and Exchange Commission standards and are qualified and accredited. We recommend a strategic allocation to private markets we do not tactically adjust this asset class.

Importantly, we remain optimistic long term. Though the inflation picture is challenging in the near term, we affirm that it is nothing that cannot be cured by the Fed and the progression of the business cycle.

underweight to international developed economies, where sluggish growth, the war in Ukraine, and a strong dollar continue to present headwinds for Europe, in our view. Within equities, and especially in our remaining small-cap allocation, we are focusing on investing in high-quality companies, a strategy that we expect to excel in an environment of high interest rates and contracting earnings. (For more on this thematic strategy, see our recent Wilmington Wire blog post.)

We are playing defense with an overweight to cash and fixed income, as well as shoring up our allocation to hedge funds (now neutral versus our long-term strategic benchmark). How long we remain on defense depends on how the economy and markets unfold in coming months. For example, if the equity market reprices lower, leaving the risk vs. reward tradeoff of equities more attractive, we would be inclined to shift toward a more aggressive posture to capture the early innings of the next bull market. We also recognize the possibility that inflation data improve more rapidly, making a neutral or an even overweight allocation to equities appropriate.

Importantly, we remain optimistic long term. Though the inflation picture is challenging in the near term, we affirm that it is nothing that cannot be cured by the Fed and the progression of the business cycle.

Until next month,

Tony

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IN FOCUS

Reexamining Portfolios Through a New Strategic Lens

A behind-the-scenes look at our asset allocation process

- **The strategic asset allocation (SAA) is the foundational or anchor portfolio for our clients, updated when economic and market conditions substantially deviate from our prior assumptions, typically every three to five years; in this case critical market dynamics that have changed since the prepandemic period are rates and inflation, market cap drift, and valuations**
- **The goal of the SAA is to improve the return profile over a simple, market capitalization-weighted stock/bond mix of similar risk, known as a baseline portfolio; our work for the SAA shows that outperforming the baseline involves the inclusion of high-yield fixed income, real assets, and alternative assets**
- **In view of our consideration of market indicators, economic fundamentals, and allocations to a broad array of asset classes, we are confident our SAA will help safeguard client capital for the broad variety of market outcomes that can and will occur over time**

The world is a very different place than it was just a year ago. The changes visible in financial markets and the economy appear even more jarring when looking back three years—the last time we revised our long-term capital market assumptions and strategic asset allocation (SAA) for client portfolios. We have therefore updated our long-term assumptions for the economy and asset class returns, as well as the resultant SAA portfolio allocations.

Reanchoring client portfolios

The SAA is the foundational, or anchor, portfolio for our clients. We update the SAA whenever economic and market conditions substantially deviate from our prior assumptions, typically every three to five years. To maintain consistency with this time horizon, we project our expectations for the economy and markets over the next five years when updating the SAA.

The goal of the SAA is to improve the return profile over a simple, market capitalization-weighted stock/bond mix of similar risk, known as a "baseline" portfolio. Because the baseline is derived from market capitalization weights, it can be thought of as a portfolio that reflects the holdings of the average investor. Our work for the SAA shows that outperforming the baseline involves the inclusion of high-yield fixed income, real assets, and alternative assets (liquid alternatives, hedge funds, and/or private markets for qualified investors).*

Three critical market dynamics that have changed since the prepandemic period are:

1) Rates and inflation

The incredibly high inflation experienced in 2022 is expected to recede in 2023, but we are unlikely to return to the easy money days of zero interest-rate policies that characterized the post global financial crisis era. Instead, inflation and interest rates are likely to settle at a higher long-run rate, particularly for cash substitutes and the short-duration Treasuries, both of which tend to be more influenced by monetary policy (Figure 1).

See Glossary on page 18–20.

* Private funds are available only to certain investors who meet the specific income, experience, and investable assets thresholds set forth by the U.S. Securities and Exchange Commission's definition of "accredited investors" and/or "qualified purchasers" as necessary. For definitions of industry terms, please see the Glossary at the end of this paper.

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Figure 1

A changed environment for inflation and interest rates

Updated 5-year economic forecasts	
GDP (annualized	1.6%
Inflation (annualized)	3.0%
Fed funds rate	2.75%
3-month Treasury yield	2.7%
10-year Treasury yield	4.0%

Data as of 12/31/2022

Source: Wilmington Trust Investment Advisors, Inc. (WTIA).

2) Market cap drift

The U.S large-cap equity market has outperformed the rest of the world by 25% over the past three years,[1] making the U.S. a larger piece of the equity pie in the baseline portfolio. As a result, maintaining a home bias for a U.S.-based investor requires an increased strategic allocation to U.S. equities.

3) Valuations

One positive of the market's drawdown in 2022 is improved valuations for both equities and fixed income. The rates reset has taken the edge off fixed income valuations and improved medium-term total return prospects. Similarly, the 20% pullback in the equity market and slightly higher inflation forecast improves the return prospects for equities compared to our prior forecast.

Economic landscape

Our economic forecasts serve as the starting point for many of our strategic asset class return projections. The past year has been challenging, and while we expect some further economic stress through 2023, we anticipate that the U.S. economy will be resilient over the five-year strategic horizon. We do not believe the potential downturn resulting from the Federal Reserve's actions in fighting inflation will produce fundamental scarring of the economy; and we project average annualized real gross domestic product (GDP) growth of 1.6%. We also expect inflation to settle modestly above the Federal Reserve's 2% target by the end of the five-year horizon, averaging out to 3% annualized inflation over our forecast period. We project normalization of the economic environment to result in an upward-sloping yield curve consistent with typical economic expansion.

Projecting asset class returns

We generate return projections by starting with the asset class returns implied by the current state of the market, and then blending in our own views. We believe today's market offers more attractive long-term investment opportunities than those available three years ago. For example, as of December 2019, the yield on a 10-Year U.S. Treasury bond was extremely low at 1.9%. By the end of 2022, it had roughly doubled to a more attractive 3.9% (Figure 2). Longer-term equity return projections have also improved, with consensus earnings estimates for a three- to five-year horizon rising from 6% in December of 2019 to 7.6%[2] at the close of 2022 (Figure 2). Simply put, these high-level data points reflect increased potential for attractive returns. We employ a more sophisticated approach in divining the potential returns across a fuller set of asset classes that incorporates their relative size, current pricing, risk, and interaction with one another.

[1] Compares the S&P 500 index to the MSCI ACWI ex-US Index. Source: Bloomberg.

[2] Bloomberg Long-Term Analyst Consensus Earnings.

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Figure 2

A changed environment for inflation and interest rates

	YIELD	
	December 2019	December 2022
10-Year U.S. Treasury rate	1.9%	3.9%
S&P 500 long-term returns	6.0%	7.6%

Data as of 12/31/2019, 12/31/2022.

Source: Bloomberg.

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Market implied returns

Our starting point is the market portfolio—the market capitalization weights that investors hold in financial assets globally. For example, if the total dollar value for global financial markets is $100 trillion and the U.S. large cap market cap is $40 trillion, then it would comprise 40% of the market portfolio. We use these weights, together with data on the volatility and correlation of asset classes, to calculate the implied performance (i.e., what global investors expect for different assets) via a statistical process called a “reverse optimization.” While the details of the process itself are fairly complex, the underlying logic is simple. Investors generally seek to maximize the amount of return they receive for a given level of risk. In the example above, the 40% investor allocation to U.S. large-cap stocks is high relative to the market as a whole. This means that investors also expects a high level of return for U.S. large cap relative to risk. Likewise, an asset with very low global market cap weight would have low expected return relative to risk. Taking the data on all asset classes together, we can derive the market’s expected or implied returns for each asset class. These serve as the base for our strategic expected return estimates. We then layer on modeling that is specific to each asset class to generate estimates of expected return that incorporate a broad array of relevant information (Figure 3).

Figure 3

A changed environment for inflation and interest rates

Fixed Income					Equities				Privates	Real Assets		Alts
Cash	Core Municipal	Taxable Bonds	High-Yield Taxable	High-Yield Muni	U.S. Large cap	U.S. Small cap	Int'l Developed	Emerging Markets	Private Markets	Global REITs	Commod.	Hedge Funds
Market implied returns												
Inflation, interest rates, credit spreads, market yield					GDP, inflation, dividend yield, valuations				Public/ private blended model	Overlay		

Source: WTIA.

See benchmark definitions at the end of this publication.

Fixed income

The primary source of fixed income returns is the “yield to maturity” of a fixed income security, which predominately comprises the regular coupon payments that accrue to the investor. In addition, returns can be impacted by price fluctuations due to a variety of factors, with changes in interest rates, inflation, and credit spreads being particularly impactful. As the basis for our fixed income expected returns, we start with the return an investor can expect to receive today based on yield to maturity; then add in the expected impact of price fluctuations. We use historical data to measure the relationship between fixed income asset classes and interest rates, inflation, and credit spreads. We then combine our projections for these

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Our economic projections serve as the basis for our fundamental equity outlook. In this process, the bedrock economic variables underlying expected equity returns are GDP growth and inflation.

factors with the historical asset class relationships to estimate the fixed income price fluctuations implied by our economic projections. This is added to the yield-to-maturity-based estimate to generate expected fixed income asset class returns.

Equities

Equity returns can be subdivided into two components: fundamentals and valuations. Equity fundamentals refer to the profitability and overall health of corporations, which in aggregate is primarily driven by the state of the economy. Valuations refer to the price of equities relative to their earnings and is oftentimes referred to as the "cheapness" or, alternatively, the "richness" of stocks. Although their performance is linked to economic growth, the link can be tenuous and asynchronous, especially over a short timeframe. Over our long-term SAA horizon, this relationship is more reliable.

Equity fundamentals

Our economic projections serve as the basis for our fundamental equity outlook. In this process, the bedrock economic variables underlying expected equity returns are GDP growth and inflation. Periods of stable and growing GDP have historically been a strong backdrop for equity performance. The growth of corporate earnings is a component of economic growth, so we combine our GDP growth projection with an expected earnings premium to estimate real earnings growth in equities. Inflation, on the other hand, has historically had a differentiated impact in the short and long run. In the short run, higher inflation has been a negative for equities for a number of reasons, a principal one being that higher costs take some time to pass through into prices, shrinking corporate profits. In the long run, prices have adjusted and profit margins have normalized in a process referred to as "cost pass-through." Generally speaking, the greater the degree of inflation, the longer it has taken businesses to pass inflation through to prices. Because our strategic horizon is sufficiently long to allow business to adjust to inflation, we incorporate our projected inflation as a net-positive contributor to equity returns. Lastly, we include a projection for dividend yield to round out the sources of fundamental equity return.

Valuations

As mentioned earlier, equity returns are impacted by the relative cheapness or richness of their valuations—a measure of the price of a business relative to either the assets it owns or a stream of projected future earnings. As a valuations measure, we utilize a variation of the price-to-earnings multiple—the ratio of current market prices for domestic and international equity indices to the level of earnings generated by these markets. To align our approach with the strategic investment horizon, we take the last 10 years of earnings for each market and strip out the component attributable to inflation in order to generate a long-term measure of real earnings. While valuations are unpredictable in the short term, data show that equities revert to average price-to-earnings multiples in the long-run. Thus, for expected return estimates, we project that indices rich on this metric are expected to gradually revert by repricing downward to their long-term average price-to-earnings multiple, and vice versa for indices that are priced low.

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Over the past decade, U.S. large-cap stocks produced more than

300%

in total returns while U.S. small-cap stocks lagged this number by nearly

85%.

U.S. small cap

We devoted focused attention on U.S. small cap in this round of the SAA process, as it has underperformed its large-cap counterpart over the past 10 years. We considered whether there have been structural changes that have disadvantaged smaller firms and, if so, whether those changes would persist. Over the past decade (February 2013 to February 2023), U.S. large-cap stocks (S&P 500 index) produced more than 300% in total returns while U.S. small-cap stocks (Russell 2000 Index) lagged this number by nearly 85%. This significant underperformance is a departure from their historical relationship with the U.S. market as a whole, as small cap have typically performed well in rising markets. We have identified what we believe are two key reasons for this deviation from the historical relationship with the U.S. market and regard these reasons as likely to remain intact over the SAA horizon. As such, we have accordingly reduced our return expectations for the asset class.

The first reason is a changed environment for the overall health and profitability of smaller firms as measured by "free cash flow margin," which measures the percentage return earned in cash relative to total revenue. In the mid-1970s, U.S. small-cap stocks briefly generated higher free cash flow margin than did U.S. large-cap stocks. By 2001, small-cap stocks lagged large-cap stocks by 2% in free cash flow margin. The widening of this gap has since accelerated to 6%.[3] By this measure and others, the health of U.S. small-cap stocks has continued to decline, with over a quarter of these stocks experiencing negative earnings over recent years. A potential factor contributing to this dynamic is the accelerating winner-take-all effect that has characterized business and financial markets. Big players such as Amazon and Microsoft have consolidated production that was once performed by a larger number of relatively smaller players, benefiting from increasing returns to scale facilitated by technological growth, globalization, and a benign regulatory backdrop.

The second reason is a tendency for the best small-cap firms to utilize private rather than public financing, particularly facilitated by the low interest rate environment that prevailed from 2008 through 2021. The value of the average private equity-backed firm is estimated to lie somewhere between $1.9 and $2.4 billion,[4] which is nearly the same as the average U.S. small-cap stock. This means that private equity directly competes with public markets as a source of funding for small-cap companies. Low rates facilitated the extensive availability of cheap debt to give private financing an edge over public markets. The healthiest small-cap businesses serve as the most attractive acquisition targets, as private equity investors have a strong preference for profitable firms with stable cash flows because they can absorb more debt. This is also visible in the phenomenon of "unicorn" companies—privately financed firms, typically tech-focused, with a valuation in excess of $1 billion. The number of unicorns surpassed 1,000 in 2022, up from 269 five years prior.[5] In other words, many of the best small-cap firms now are either acquired or otherwise eschew public financing.

[3] Small-Caps: Where We Stand | Empirical Research Partners, LLC. (empirical-research.com).

[4] Private markets are bigger than you think | PitchBook.

[5] 1,000 Unicorns: Global Billion-Dollar Private Companies Hit A Four-Digit Milestone - CB Insights Research.

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We believe that the dynamics that lead to U.S. small-cap underperformance, such as the winner-take-all effect, remain intact for the foreseeable future.

We believe that the dynamics that lead to U.S. small-cap underperformance, such as the winner-take-all effect, remain intact for the foreseeable future, although the impact of low interest rates may partly unwind over the coming years as we enter a higher-rate environment. As a result, we made a modest downward adjustment to U.S. small-cap expected returns.

Private markets

Private markets comprises myriad assets that include everything from equity to infrastructure to nontraditional investments like art. At Wilmington Trust, we categorize our private markets investment opportunities into private equity, private real estate, and private debt. Because private markets are so broad, expected returns are highly contingent on both the investment vehicle and the manager. As a starting point, we use internal estimates of returns for private equity based on an assessment of the opportunities available through Wilmington Trust's private managers. We then use 20 years of private markets data to measure the sensitivity of private real estate and private debt to private equity returns. This allows us to ensure historical consistency in the relationship among returns estimates for our private markets asset classes.

Real assets and liquid alternatives

We found that market implied returns for liquid alternatives were in line with our qualitative assessment of the asset class, and quantitative analysis showed no change in the structure of liquid alternatives performance since the previous SAA was established in 2020. Thus, our outlook for liquid alternatives remains consistent. Within real assets, we reached a similar conclusion regarding global real estate investment trusts (REITs). However, we did not find relatively low market implied returns for commodities to be consistent with our views. To align with our economic projections of an environment with moderating but modestly elevated inflation, we applied an adjustment to increase the expected returns of commodities.

Estimating risk

Risk is a critical component of any asset allocation and is typically measured as the average degree of volatility of a portfolio's return in a given year. As investors, we seek to maximize the amount of return we receive relative to the amount of risk we take on. Financial markets are inherently highly volatile, and while this volatility is quite unpredictable in the short run, it tends to revert to long-run averages over time. When taking a strategic view, it is important to capture a sufficiently long history such that our estimates reflect the entire economic cycle, incorporating periods of growth as well as recession. Estimates of correlation, or the co-movement of asset classes, are also important given that less correlated assets generally have produced more diversification benefit and a lower-risk portfolio. When modeling correlations over a long time horizon, it is likewise appropriate to incorporate a breadth of historical market environments in the calculation. For this reason, we used 20 years of historical data to estimate volatility and correlations.

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European markets, in addition to facing many of the same challenges as the U.S., have also been rocked by an energy crisis ... we believe that some of the challenges in emerging markets, and particularly in China, will persist structurally for some time.

Elevated international risk

As stated earlier, volatility tends to revert to long-run averages over time. While 2022 was a challenging year in the U.S., shocks in international markets were even greater. European markets, in addition to facing many of the same challenges as the U.S., have also been rocked by an energy crisis. Investors in emerging markets (EM) equities contested with ongoing rolling lockdowns in China. Over time, these periods of extreme market movement tend to be interspersed with longer, more placid interludes. However, we believe that some of the challenges in EM, and particularly in China, will persist structurally for some time. On top of significant pressures around the debt burden and the real estate market, China is becoming increasingly decoupled from global supply chains and financial markets. As a result, we applied an upward adjustment to our estimate for EM volatility in the belief that its elevated volatility will prove more persistent over the strategic horizon.

Risk and return projections: 2020 vs. 2023

We consolidate the implied returns, asset class specific projections, volatility projections, and correlation relationships in a cohesive fashion to generate one final set of asset class expected returns, which reflects our expectation for the return that an investor in each strategic asset class may expect to receive over our long-term investment horizon. For instance, U.S. large-cap equities are subject to estimation of market implied returns as well as both fundamental and valuations models, while private equity incorporates market implied returns and a private/public blended data model. To synthesize these results into one expected return per strategic asset, we utilize a statistical blending process called the "Black-Litterman model." This model can be thought of as a sort of average that also accounts for the historical relationship among assets. For instance, U.S. large cap and private equity tend to be positively correlated. If we project a strong market for U.S. large cap, the Black-Litterman model should also boost private equity returns on the basis of its historical relationship with large-cap stocks. The output of the Black-Litterman model is a set of expected returns for each asset class that takes into account our projections while remaining anchored to market history (Figure 4).

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Figure 4

Expected returns and risk—2020 and 2023 SAA

		2020		2023	
		Expected return	Expected risk	Expected return	Expected risk
Fixed Income	Cash	2.3	0.5	3.2	0.5
	Core Municipal	3.4	3.7	5.0	6.5
	Taxable Bonds	2.3	3.3	4.1	3.8
	High-Yield Taxable	4.5	8.5	5.7	9.2
	High-Yield Muni	3.9	5.1	6.1	9.1
Equities	U.S. Large cap	6.3	14.2	7.3	16.5
	U.S. Small cap	6.9	18.7	7.8	19.7
	Int'l Developed	6.9	15.9	7.1	16.6
	Emerging Markets	7.6	20.4	8.7	22.7
Real Assets	Global REITs	5.2	18.8	8.9	20.4
	Commodities	3.3	15.2	8.0	16.4
Alternatives	Hedge Funds	4.9	6.3	4.3	5.2
	Private Equity	11.9	23.9	12.5	19.7
	Private Real Estate	8.5	25.9	9.8	16.0
	Private Debt	6.2	13.3	8.2	9.2

Data as of 01/01/2020, 01/01/2023.

Source: WTIA.

Past performance cannot guarantee future results. Indices are not available for direct investment. Investment in a security or strategy designed to replicate the performance of an index will incur expenses such as management fees and transaction costs which will reduce returns. There is no assurance that any investment strategy will be successful.

See benchmark definitions at the end of this publication.

The full table of expected returns and risk displays some notable changes between our current SAA and the iteration from 2020. The main takeaways are:

- **The current environment may provide significant opportunity for long-term investors**
  Our expected returns estimates have increased across the board. In today's higher rate environment, fixed income now has the potential to offer attractive returns to investors, particularly in high-yield municipal bonds.

- **Domestic equities are structurally advantaged**
  Within equities, we believe that U.S. large cap and U.S. small cap look relatively more appealing when compared to international given structural challenges in Europe and in EM, particularly China.

- **Risk levels have increased, so prudent investing is critical**
  Risk estimates have likewise increased for most asset classes. At the beginning of 2020, financial markets were on the tail end of a long period of historically low volatility. Dual shocks of COVID-19 and inflation have since driven markets so pronouncedly that it has moved the needle even on long-term volatility calculations. Given the potential risks to global economies over the strategic horizon, we believe this higher volatility is an accurate measure of the current state of the world.

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Figure 5

Asset class allocations: baseline portfolio, 2020 SAA, and 2023 SAA

		Allocations			2023 SAA Differences	
		Baseline	2020 SAA	2023 SAA	vs. baseline	vs. 2020 SAA
Fixed Income	Cash	2.0	2.0	2.0	0.0	0.0
	Core Municipal	35.0	28.5	27.0	-8.9	-1.5
	Taxable Bonds	0.0	0.0	0.0	0.0	0.0
	High-Yield Taxable	0.0	0.0	0.0	0.0	0.0
	High-Yield Muni	0.0	2.0	3.0	3.0	1.0
Equities	U.S. Large cap	36.0	31.5	36.5	2.7	5.0
	U.S. Small cap	3.0	5.5	4.0	0.6	-1.5
	Int'l Developed	18.5	16.0	14.0	-7.5	-2.0
	Emerging Markets	5.5	5.5	5.5	2.1	0.0
Real Assets	U.S. Inflation-Linked Bonds	0.0	1.0	0.0	0.0	-1.0
	Global REITs	0.0	1.5	1.5	1.5	0.0
	Commodities	0.0	1.5	1.5	1.5	0.0
Alternatives	Liquid Alternatives	0.0	5.0	5.0	5.0	0.0
	Private Markets	0.0	0.0	0.0	0.0	0.0

Data as of 01/01/2020, 01/01/2023.

Source: WTIA.

Past performance cannot guarantee future results. Indices are not available for direct investment. Investment in a security or strategy designed to replicate the performance of an index will incur expenses such as management fees and transaction costs which will reduce returns. There is no assurance that any investment strategy will be successful.

See benchmark definitions at the end of this publication.

Client portfolios

Once we have generated a final set of estimates for expected risk and returns, we translate these views into an asset allocation via optimization—a statistical calculation that determines, given our strategic views, the asset allocation that generates the highest expected return for a particular level of risk. This optimized allocation is then subject to extensive discussion and analysis by the seasoned investors in our Investment Committee. The end result of this process is our 2023 SAA (Figure 5).

This SAA is the allocation for a Growth & Income High-Net-Worth client portfolio without private markets. We note the following when comparing against the baseline portfolio as well the prior SAA established in 2020:

2023 SAA vs. baseline

The diversified SAA allocation contains a much broader mix of asset classes than does the baseline. High-yield municipal, global REITs, commodities, and liquid alts are all asset classes with different return and risk profiles than equity markets. Overall, the SAA contains less equities and fixed income exposure than does the baseline to account for allocations to these diversifying asset classes. We also note the domestic tilt, with higher allocations to U.S. large-cap and U.S. small-cap equities compared to the baseline. This reflects our constructive view of the U.S. economy relative to structural challenges facing Europe and EM.

Continued

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2023 SAA vs. 2020 SAA

The most notable difference when comparing the new SAA allocation to the previous SAA is the increase in risk assets via higher U.S. large-cap and high-yield municipal allocations. This reflects our view that domestic equity valuations and fixed income yields are attractive given a backdrop of strong U.S. economic fundamentals. These increases come in part from a reduced allocation to more conservative core municipal fixed income. We have also reduced U.S. small cap, which faces structural concerns as many of the strongest small-cap firms have remained private, and international developed equities, where persistent geopolitical and energy risks weigh on future prospects. Lastly, we have trimmed the allocation to U.S. inflation-linked bonds, as the conditions that allow for this asset class to outperform—future inflation paired with stable real yields—are unlikely to recur over this economic cycle.

In summary

Ultimately, financial markets have a great degree of inherent volatility and unpredictability. While we cannot know exactly the form that this volatility will take, we as investors can still position our investments in an effort to protect against uncertainty. In view of our consideration of market indicators, economic fundamentals, and allocations to a broad array of asset classes, we are confident our SAA will help safeguard client capital for the broad variety of market outcomes that can and will occur over time.

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ASSET CLASS OVERVIEW

Taxable Fixed Income

Ping Gu, CFA
Head of Credit Research

	AS OF FEBRUARY 28, 2023		
	Month to date	YTD	Trailing 12-month return
Bloomberg U.S. Aggregate Bond Index	-2.59%	0.41%	-9.72%
Bloomberg U.S. Investment Grade Credit Index	-3.18%	0.70%	-10.43%
Bloomberg Ba High Yield Index	-1.29%	2.47%	-5.46%
Bloomberg U.S. Mortgage Backed Securities Index	-2.64%	0.57%	-9.10%

Sources: FactSet, Bloomberg. Investing involves risks and you may incur a profit or a loss. Past performance cannot guarantee future results. Indices are not available for direct investment.

What we are seeing now

Interest rates have moved higher over the past month in response to a much stronger-than-expected employment report. The inversion of the yield curve has become more pronounced as short-term interest rates moved higher than long-term interest rates. The 2-year Treasury yield is at 4.79% which is up 59 basis points, or bps (0.59%), over the past month, while the 10-year Treasury yield is at 3.94%, up 44bps over the same period. The Federal Reserve (Fed) raised rates by 2bps at its February meeting; this increase was the smallest since the beginning of the tightening cycle in 2022. The fed funds target rate is now at 4.5% to 4.75%—its highest level since 2007.

The credit market rally faded mid-month in February as the market digested hot inflation data and took hawkish messaging from the Fed's Federal Open Market Committee at face value. Still, investment-grade (IG) corporate bonds have outperformed Treasury bonds thus far in 2023, producing 61bps of excess return, as inflows to the bond market have been relatively strong since the beginning of this year. Also in February, the Bloomberg Corporate Bond Index OAS widened 7bps month over month to 124bps; this figure is 6bps tighter than that of 2022 year end.

The High Yield Index has produced 255bps of excess return in 2023 thus far, with a total return of 247bps in the first two months of this year. The average risk premium for the High Yield index is now 412bps, versus 469bps at the start of the year. At month end, the High Yield index yielded 8.68%, an increase from 8.2% on January 31, 2023, but a decline from the 8.99% yield at year-end 2022.

What's changing

In U.S. IG, heavy supply and pronounced yield curve flattening resulted in steepening spread curves and decompression across ratings in February. So, front-end spreads were 0–2 bps wider, month over month, intermediates widened 7bps, and long-end spreads backed up 12–13 bps. Across the credit spectrum, BBBs underperformed as spreads widened 7bps month over month (excess return -60bps) and 10 bps from the month-to-date tights, while single-As widened 6bps (excess return -51bps) and AAs widened 4 bps (-34bps of excess return). The pullback in the second half of the month ended a four-month stretch of positive excess returns.

At the sector level, long duration segments experienced the most pronounced credit curve steepening, including Cable & Satellite (-158bps), Railroads (-140bps), Health Insurance (-109bps), Restaurants (-107bps), and Pharma (-98bps), as spreads widened 11–17bs month over month. Short duration sectors outperformed, with notable excess return gains in Auto (+2bps) after better-than-expected 4Q earnings results.

What we expect

By now, most IG public issuers have released the 4Q results. The actual earnings were -0.1% below expectations at the start of the season—the weakest surprise since 1Q 2020 at the peak of the COVID pandemic and significantly below the +3.7% pre-COVID average. We expect downgrades to increase in the high-yield market, particularly for lower-rated issuers, despite a benign start to the year. In contrast, rating trends in the IG market have remained positive, with BBB-to-A upgrades outpacing downgrades by a historic proportion.

February brought $154 billion in IG supply, which is the highest on record for the calendar month. Elevated supply and weaker market tone resulted in a large negative impact on secondary spreads. In addition, we expect the heavy February volumes will result in smaller borrowing needs in the near term. As a result, we expect the recent underperformance to reverse, and our team of analysts continues to screen large issuers with recent supply in an effort to identify attractively priced bonds.

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Alternative assets, such as strategies that invest in hedge funds, can present greater risk and are not suitable for all investors.

Any positioning information provided does not include all positions that were taken in client accounts and may not be representative of current positioning. It should not be assumed that the positions described are or will be profitable or that positions taken in the future will be profitable or will equal the performance of those described.

Indices are not available for direct investment. Investment in a security or strategy designed to replicate the performance of an index will incur expenses, such as management fees and transaction costs that will reduce returns.

An overview of our asset allocation strategies:

Wilmington Trust offers seven asset allocation models for taxable (high-net-worth) and tax-exempt (institutional) investors across five strategies reflecting a range of investment objectives and risk tolerances: Aggressive, Growth, Growth & Income, Income & Growth, and Conservative. The seven models are High-Net-Worth (HNW), HNW with Liquid Alternatives, HNW with Private Markets, HNW Tax Advantaged, Institutional, Institutional with Hedge LP, and Institutional with Private Markets. As the names imply, the strategies vary with the type and degree of exposure to hedge strategies and private market exposure, as well as with the focus on taxable or tax-exempt income.

Model Strategies may include exposure to the following asset classes: U.S. large-capitalization stocks, U.S. small-cap stocks, developed international stocks, emerging market stocks, U.S. and international real asset securities (including inflation-linked bonds and commodity-related and real estate-related securities), U.S. and international investment-grade bonds (corporate for Institutional or Tax Advantaged, municipal for other HNW), U.S. and international speculative grade (high-yield) corporate bonds and floating-rate notes, emerging markets debt, and cash equivalents. Model Strategies employing nontraditional hedge and private market investments will, naturally, carry those exposures as well. **Each asset class carries a distinct set of risks, which should be reviewed and understood prior to investing.**

Allocations:

Each strategy group is constructed with target policy weights for each asset class. Wilmington Trust periodically adjusts the policy weights' target allocations and may shift from the target allocations within certain ranges. Such tactical allocation adjustments are generally considered on a monthly basis in response to market conditions.

The asset classes and their current proxies are:

- Large–cap U.S. stocks: Russell 1000® Index
- Small–cap U.S. stocks: Russell 2000® Index
- Developed international stocks: MSCI EAFE® (Net) Index
- Emerging market stocks: MSCI Emerging Markets Index

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Disclosures Continued

- U.S. inflation-linked bonds: Bloomberg US Treasury Inflation Notes TR Index Value Unhedged*
- International inflation-linked bonds: Bloomberg World ex US ILB (Hedged) Index
- Commodity-related securities: Bloomberg Commodity Index
- U.S. REITs: S&P US REIT Index
- International REITs: Dow Jones Global ex US Select RESI Index
- Private markets: S&P Listed Private Equity Index
- Hedge funds: HFRX Global Hedge Fund Index
- U.S. taxable, investment-grade bonds: Bloomberg U.S. Aggregate Index
- U.S. high-yield corporate bonds: Bloomberg U.S. Corporate High Yield Index
- U.S. municipal, investment-grade bonds: S&P Municipal Bond Index
- U.S. municipal high-yield bonds: 60% Bloomberg High Yield Municipal Bond Index / 40% Municipal Bond Index
- International taxable, investment-grade bonds: Bloomberg Global Aggregate ex US
- Emerging bond markets: Bloomberg EM USD Aggregate
- Cash equivalent: 30-day U.S. Treasury bill rate

All investments carry some degree of risk. Return volatility, as measured by standard deviation, of asset classes is often used as a proxy for illustrating risk. Volatility serves as a collective, quantitative estimate of risks present to varying degrees in the respective asset classes (e.g., liquidity, credit, and default risks). Certain types of risk may be underrepresented by this measure. **Investors should develop a thorough understanding of the risks of any investment prior to committing funds.**

Quality ratings are used to evaluate the likelihood of default by a bond issuer. Independent rating agencies, such as Moody's Investors Service and Standard & Poors, analyze the financial strength of each bond's issuer. Ratings range from Aaa or AAA (highest quality) to C or D (lowest quality). Bonds rated Baa3 or BBB and better are considered **Investment Grade.** Bonds rated Ba1 or BB and below are **Speculative Grade** (also **High Yield**.)

Paragon
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Glossary

30-day U.S. Treasury bill rate Bank of America Merrill Lynch U.S. 3-Month Treasury Bill Index measures the performance of a single U.S. Treasury bill added to the index at the beginning of the month and held for a full month; the issue is replaced with a newly selected issue at each month-end and the index will often hold the Treasury bill issued at the most recent three-month auction, it is also possible for a seasoned six-month bill to be selected.

Alpha is a measure of performance on a risk-adjusted basis. The excess return of a strategy relative to the return of the benchmark index is a strategy's alpha.

Basis points refers to a common unit of measure for interest rates and other percentages in finance. One basis point is equal to 1/100th of 1%, or 0.01%, or 0.0001, and is used to denote the percentage change in a financial instrument.

Beta is a measure of how an individual asset moves when the overall stock market increases or decreases. Thus, beta is a useful measure of the contribution of an individual asset to the risk of the market portfolio when it is added in small quantity.

The Bloomberg Agriculture Subindex Total Return (BCOMAGTR), formerly known as Dow Jones-UBS Agriculture Subindex Total Return (DJUBAGTR), is a commodity group subindex of the Bloomberg CITR composed of futures contracts on coffee, corn, cotton, soybeans, soybean oil, soybean meal, sugar and wheat and reflects the return on fully collateralized futures positions and is quoted in USD.

The Bloomberg Commodity Index is composed of futures contracts and reflects the returns on a fully collateralized investment in the BCOM; it combines the returns of the BCOM with the returns on cash collateral invested in 13 week (3 Month) U.S. Treasury Bills.

The Bloomberg Commodity Total Return index (BCOMTR) is composed of futures contracts and reflects the returns on a fully collateralized investment in the BCOM and combines the returns of BCOM with the returns on cash collateral invested in 13 week (3 Month) U.S. Treasury Bills.

The Bloomberg Dollar Spot Index tracks the performance of a basket of 10 leading global currencies versus the U.S. Dollar. It has a dynamically updated composition and represents a diverse set of currencies that are important from trade and liquidity perspectives.

The Bloomberg Energy Subindex Total Return (BCOMENTR), formerly known as Dow Jones-UBS Energy Subindex Total Return (DJUBENTR), is a commodity group subindex of the Bloomberg CITR composed of futures contracts on crude oil, heating oil, unleaded gasoline and natural gas and reflects the return on fully collateralized futures positions and is quoted in USD

The Bloomberg Global Aggregate Bond Index measures the performance of global investment-grade fixed-rate debt markets, including the U.S., Pan-European, Asian-Pacific, Global Treasury, Eurodollar, Euro-Yen, Canadian, and investment-Grade 144A index-eligible securities.

The Bloomberg Industrial Metals Subindex Total Return Index (BCOMTNT), formerly known as Dow Jones-UBS Industrial Metals Subindex Total Return (DJUBINTR), is a commodity group subindex of the Bloomberg CITR composed of longer-dated futures contracts on aluminum, copper, nickel and zinc and reflects the return on fully collateralized futures positions and is quoted in USD.

The Bloomberg Precious Metals Subindex Total Return (BCOMPRTR), formerly known as Dow Jones-UBS Precious Metals Subindex Total Return (DJUBPRTR), is a commodity group subindex of the Bloomberg CITR composed of futures contracts on gold and silver. It reflects the return on fully collateralized futures positions and is quoted in USD.

The Bloomberg U.S. Aggregate Index measures the performance of the entire U.S. market of taxable, fixed-rate, investment-grade bonds. Each issue in the index has at least one year left until maturity and an outstanding par value of at least $250 million.

The Bloomberg US Credit Index measures the investment grade, US dollar-denominated, fixed-rate, taxable corporate and government related bond markets. It is composed of the US Corporate Index and a non-corporate component that includes foreign agencies, sovereigns, supranationals and local authorities.

The Bloomberg U.S. High Yield Corporate Index, formerly Lehman Brothers U.S. High Yield Corporate Index, measures the performance of taxable, fixed-rate bonds issued by industrial, utility, and financial companies and rated below investment grade. Each issue in the index has at least one year left until maturity and an outstanding par value of at least $150 million.

The Bloomberg U.S. Mortgage Backed Securities Index measures the performance of investment grade fixed-rate mortgage-backed pass-through securities of GNMA, FNMA, and FHLMC.

The Bloomberg US Treasury US TIPS TR USD index measures the performance of rules-based, market value-weighted inflation-protected securities issued by the U.S. Treasury. It is a subset of the Bloomberg US Treasury Inflation-Linked Bond Index (Series-L), which measures the performance of the US Treasury Inflation Protected Securities (TIPS) market. Federal Reserve holdings of US TIPS are not index eligible and are excluded from the face amount outstanding of each bond in the index.

Consumer price index measures the price of consumer goods and how they're trending and is a tool for measuring how the economy as a whole is faring when it comes to inflation or deflation.

Coupon rate, coupon, or coupon payment is the annual interest rate paid on a bond, expressed as a percentage of the face value and paid from issue date until maturity.

Dow Jones Global ex. US Select RESI Index tracks the performance of equity real estate investment trusts (REITs) and real estate operating companies (REOCs) traded globally, excluding the U.S.

Drawdown measures the potential drop in portfolio asset values for the most recent stock market peak to the most recent stock market trough.

Drift occurs when an asset or investment diverges significantly from its objective or investment style, such as market capitalization. It can result naturally from capital appreciation in one asset relative to others in a portfolio, a change in a fund's management, or a manager who begins to diverge from the portfolio's mandate. It can be corrected by rebalancing the fund to optimal weights.

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Glossary Continued

Duration risk is the risk associated with the sensitivity of a bond's price to a one percent change in interest rates. The higher a bond's duration, the greater its sensitivity to interest rates changes.

Equity risk premium is the extra return that's available to equity investors above the return they could get by investing in a riskless investment like T-Bills or T-Bonds or cash.

ESG is a strategy that integrates environmental, social, and governance (ESG) factors into the investment process may avoid or sell investments that do not meet criteria set forth by the investment manager. Such investments may perform better than investments selected utilizing ESG factors.

Event-driven hedge fund strategies attempt to take advantage of temporary stock mispricing before or after a corporate event takes place. An event-driven strategy exploits the tendency of a company's stock price to suffer during a period of change.

Federal funds rate is the interest rate at which depository institutions lend reserve balances to other depository institutions overnight on an uncollateralized basis.

Global intangible low-taxed income (GILTI) is a category of income that is earned abroad by U.S.-controlled foreign corporations (CFCs) and is subject to special treatment under the U.S. tax code.

Gold can be significantly affected by international monetary and political developments as well as supply and demand for gold and operational costs associated with mining.

Headline inflation is a measure of the total inflation within an economy, including commodities such as food and energy prices, which tend to be much more volatile and prone to inflationary spikes.

HFR® (HedgeFundResearch) Indices are the established global leader in the indexation, analysis and research of the hedge fund industry. They are broadly constructed indices designed to capture the breadth of hedge fund performance trends across all strategies and regions.

HFRX Absolute Return Index and the HFRX Global Hedge Fund Index represent the overall composition of the hedge fund universe and comprise all eligible hedge fund strategies and selects constituents that characteristically exhibit lower volatilities and lower correlations to standard directional benchmarks of equity market and hedge fund industry performance.

HFRX Global Hedge Fund Index is designed to be representative of the overall composition of the hedge fund universe and are asset weighted based on the distribution of assets in the hedge fund industry.

Inflation-linked bonds are a specific type of index-linked securities that are tied to the costs of consumer goods as measured by the Consumer Price Index (CPI) or another index. Their values increase during inflationary periods, which reduces the risk of uncertainty.

The ISM manufacturing index, also known as the purchasing managers' index (PMI), is a monthly indicator of U.S. economic activity based on a survey of purchasing managers at more than 300 manufacturing firms and is considered to be a key indicator of the state of the U.S. economy.

ISM Non-Manufacturing Index is an economic index based on surveys of more than 400 non-manufacturing (or services) firms' purchasing and supply executives and is part of the ISM Report On Business—Manufacturing (PMI) and Services (PMI).

ISM Services Prices Paid Index is a diffusion index calculated by adding the percent of responses indicating they paid more for inputs plus one-half of those responding who paid the same; resulting in a single number that is seasonally adjusted.

LIBOR is the average interbank interest rate at which a selection of banks on the London money market are prepared to lend to one another.

Long, or a long position, describes an investor's expectation of a holding's future value. A position that the investor expects will rise in value and plans to hold for a long period of time is often described as "held long." It is the opposite of short, or a short position.

M2 money supply is a measure of the money supply that includes cash, checking deposits, and other types of deposits that are readily convertible to cash such as CDs.

Macro hedge fund strategies generally focus on financial instruments that are broad in scope and move based on systemic or market risk (not security specific). In general, portfolio managers who trade within the context of macro strategies focus on currency strategies, interest rates strategies, and stock index strategies.

MSCI AC Asia ex Japan Index captures large- and mid-cap representation across two of three developed markets countries (excluding Japan) and nine emerging markets countries in Asia. The index covers approximately 85% of the free float-adjusted market capitalization in each country.

MSCI All Country World Index (ACWI) is a stock index designed to track broad global equity-market performance. Maintained by Morgan Stanley Capital International (MSCI), the index comprises the stocks of about 3,000 companies from 23 developed countries and 26 emerging markets.

MSCI China Index captures large- and mid-cap representation across China A shares, H shares, B shares, Red chips, P chips and foreign listings (e.g. ADRs). The index covers about 85% of this China equity universe. Currently, the index includes large-cap A and mid-cap A shares represented at 20% of their free float adjusted market capitalization.

MSCI EAFE Growth Index captures large- and mid-cap securities exhibiting overall growth style characteristics across developed markets countries around the world, excluding the U.S. and Canada.

MSCI EAFE Index is an equity index which captures large and mid-cap representation across 21 Developed Markets countries around the world, excluding the US and Canada. With 902 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

MSCI EAFE® (net) Index measures the performance of approximately 20 developed equity markets, excluding those of the United States and Canada; total returns of the index are net of the maximum tax withholding rates that apply in many countries to dividends paid to non-resident investors.

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Glossary Continued

MSCI Emerging Markets (net) Index captures large- and mid-cap representation across 27 emerging markets countries. With 1,407 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

MSCI EAFE Value Index captures large- and mid-cap securities exhibiting overall value style characteristics across developed markets countries around the world, excluding the U.S. and Canada.

MSCI Emerging Markets Index captures large- and mid-cap representation across 26 emerging markets countries. The index covers approximately 85% of the free float-adjusted market capitalization in each country.

MSCI Europe Index captures large- and mid-cap representation across 15 developed markets (DM) countries in Europe. The index covers approximately 85% of the free float-adjusted market capitalization across the European DM equity universe.

MSCI Japan Index is designed to measure the performance of the large- and mid-cap segments of the Japanese market. The index covers approximately 85% of the free float-adjusted market capitalization in Japan.

MSCI United Kingdom Index is designed to measure the performance of the large- and mid-cap segments of the UK market. The index covers approximately 85% of the free float-adjusted market capitalization in the UK.

Personal consumption expenditures is the primary measure of consumer spending on goods and services in the U.S. economy and is the primary engine that drives future economic growth.

Price-to-earnings (P/E) ratio measures a company's current share price relative to its earnings per share (EPS).

Producer Price Index (PPI) is a family of indexes measuring the average change in selling prices received by domestic producers of goods and services.

Real estate investment trusts, or REITs, are companies that own, operate, or finance income-generating real estate. Similar to mutual funds, REITs pool the capital of numerous investors, allowing them to earn dividends from real estate investments without having to buy, manage, or finance properties themselves.

Relative value hedge fund strategies cover a variety of low-volatility trading strategies with the consistent theme of attempting to reduce market risk, i.e., the manager seeks to generate a profit regardless of which direction the markets are moving. All relative value strategies minimize market risk by taking offsetting long and short positions in related stocks, bonds, and other types of securities.

Reverse optimization uses risk estimates and optimal portfolio weights (asset allocations) to derive the forward-looking returns that generate the highest expected risk-adjusted return for the portfolio; in contrast, traditional optimization uses risk estimates and forward-looking return assumptions to derive the portfolio weights (asset allocations) that generate the highest expected risk-adjusted return for the portfolio. Reverse optimization can be used to test or validate market outcomes in addition to (not as a replacement for) other methods of analysis.

Risk assets refers to assets that are not risk-free, such as currencies, equities, and other financial instruments. Treasuries are not included.

Russell 1000® Index measures the performance of the 1,000 largest companies in the Russell 3000 Index, representing approximately 92% of the total market capitalization of the Russell 3000 Index.

Russell 1000 Growth is a market capitalization-weighted index that measures the performance of the large-cap growth segment of U.S. equity securities; it includes the Russell 1000 index companies with higher price-to-book ratios and higher forecasted growth values.

Russell 1000 Value is a market capitalization-weighted index that measures the performance of the large-cap value segment of U.S. equity securities; it includes the Russell 1000 index companies with lower price-to-book ratios and lower expected growth values.

Russell 2000® Index measures the performance of the 2,000 smallest companies in the Russell 3000 Index, which represents approximately 8% of the total market capitalization of the Russell 3000 Index.

S&P 500 index measures the stock performance of 500 large companies listed on stock exchanges in the U.S. and is one of the most commonly followed equity indices.

The S&P Developed Property index defines and measures the investable universe of publicly traded property companies domiciled in developed markets. The companies in the index are engaged in real estate related activities, such as property ownership, management, development, rental and investment.

S&P Listed Private Equity Index comprises the leading listed private equity companies that meet specific size, liquidity, exposure, and activity requirements. The index is designed to provide tradable exposure to the leading publicly-listed companies that are active in the private equity space.

The S&P Municipal Bond Index is a broad, market value-weighted index that seeks to measure the performance of the U.S. municipal bond marke

S&P US REIT Index measures the investable U.S. real estate investment trust market and maintains a constituency that reflects the market's overall composition.

Short-duration Treasury securities are backed by the full faith and credit of the U.S. government. They typically mature in one year or less.

Short, or short position, refers to a trading technique in which an investor sells a security with plans to buy it later; it is used when an investor expects the price of a security to fall in the short term.

Stagflation is persistent high inflation combined with high unemployment and stagnant demand in a country's economy.

Value sectors or stocks, generally refer to those trading at levels perceived to be below their fundamentals.

Yield curve plots yields (interest rates) of bonds having equal credit quality but differing maturity dates. The slope of the yield curve gives an idea of future interest rate changes and economic activity.

Yield to maturity is the estimated total return on a bond if the bond is held until it matures.

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