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Investing at a Crossroads Revisited

Nine months ago, we wrote a long-term outlook, *Investing at a Crossroads*, in which we said that the economy and financial markets were going through a profound change. Both the transition and the environment on the other side would need a fresh investment playbook, very different from the one that worked over the past 20 years.

While it is still too early to confirm that we will ultimately arrive at the environment we described, interest rates have adjusted meaningfully and now appear to be reaching a near-term peak. Does the playbook we described still apply?

With *Investing at a Crossroads*, we observed that the global economy and financial markets had benefitted from four decades of significant tailwinds. Inflation moderated and stabilized; global interest rates declined; geopolitical tensions eased during the 1990s, creating the conditions for the efficiency gains of globalization; labor markets lost pricing power and grew more flexible; corporate tax burdens lifted; and fossil fuel-intensive growth raised living standards worldwide.

We argued that many of those tailwinds were turning to headwinds, that a golden era for investors in long-duration and growth-oriented assets was ending, and a new investment playbook was required. The summary of that playbook is reproduced on the next page.

OUTLOOK: Adapt to Today's New Challenges

Two multi-decade economic tailwinds are under threat. Globalization is hitting geopolitical, strategic, populist and practical roadblocks, and unsustainable growth powered by fossil fuels faces a difficult transition to ultimately more efficient growth powered by renewables.

Potential economic implications:

- A return to structurally higher inflation and more hawkish central bank policy
- A return to shorter and more volatile business cycles
- A global energy transition

Investment playbook:

- Favoring the fittest
- Rethinking regional risk
- Harvesting global macro trends, tactical dislocations and volatility premia
- Accounting for "Net-Zero"
- Prioritizing real assets: Commodities, real estate, infrastructure

RETURNS: Mind the Gap

Lower and more volatile growth, together with higher inflation and interest rates, could slow the performance of many equity and bond indices, opening a wider gap between targeted returns and return outlooks—especially real return outlooks. This "exhausted beta" phenomenon, together with the potential for higher price volatility and an upward bias in rates, is likely to make return profiles more reliant on income, illiquidity and niche-market premia, as well as active management (asset-allocation, stock-selection, corporate-engagement and operational "alpha").

Potential portfolio implications:

- Lower asset class return outlooks, with higher volatility

Investment playbook:

- Looking beyond "exhausted beta"
- Going short as well as long
- Rebalancing toward value investing
- Becoming fully flexible in fixed income and credit
- Prioritizing income across asset classes
- Integrating public- and private-market investments
- Exploiting your natural advantages while seeking effective partners

RISK: Diversify Differently

Higher volatility and economic uncertainty, as well as the use of increased portfolio risk to align return profiles with return targets, make portfolio diversification more important than ever. Diversification could be more difficult to achieve, however, as equity-bond correlation tends to rise in more inflationary environments.

Potential portfolio implications:

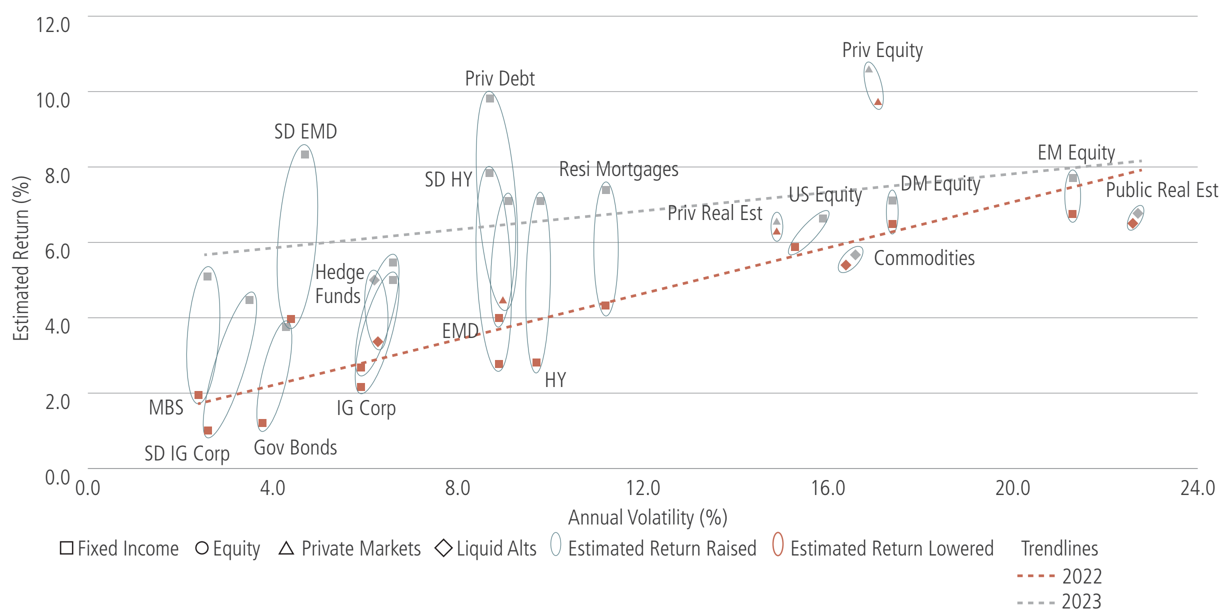
- Higher equity-bond correlation leading to higher portfolio volatility

Investment playbook:

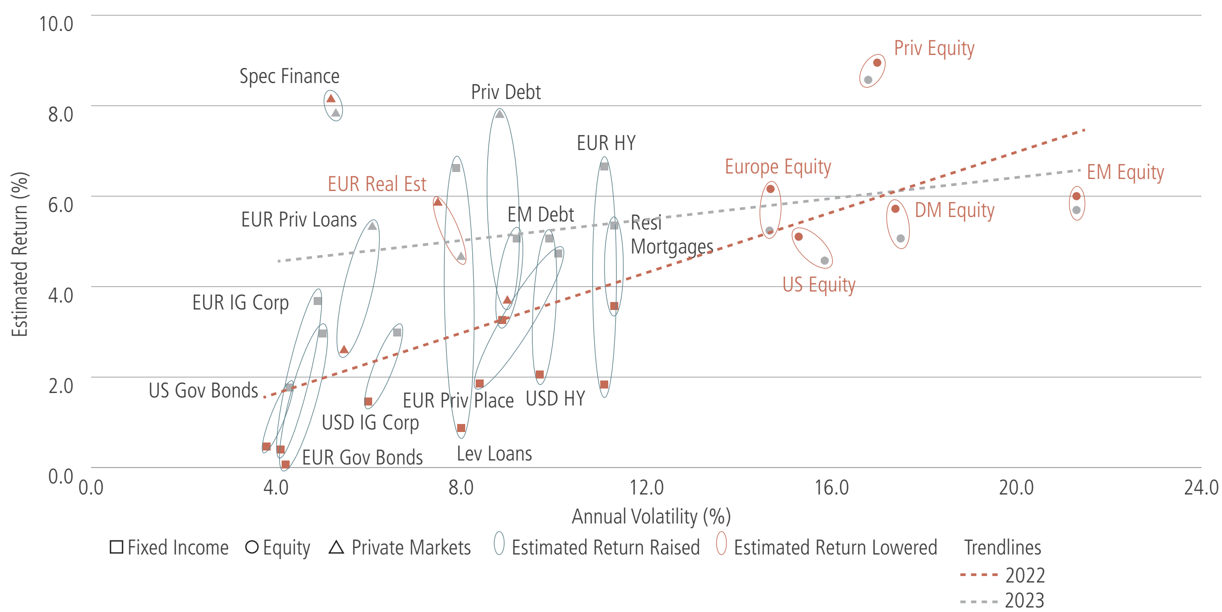
- Adding flexibility and shortening duration in fixed income
- Seeking out uncorrelated markets and strategies
- Prioritizing inflation-sensitive real and financial assets
- Identifying and hedging the tail risks that matter to you

FIGURE 1. NB CAPITAL MARKET ASSUMPTIONS: 2023 VS. 2022

Estimated annualized return and volatility, five- to seven-year term (USD base currency)



Estimated annualized return and volatility, five- to seven-year term (EUR base currency)



Source: Neuberger Berman, Bloomberg, Cambridge Associates, FactSet. Analytics as of December 31, 2021 and April 30, 2023. In the bottom chart, non-Euro assets are hedged to EUR using three-month forwards (-2.54% USD to EUR for 2023 & -0.79% USD to EUR for 2022). The performance and risk projections/estimates are hypothetical in nature and reflect the Neuberger Berman's Capital Market Assumptions. The estimates do not reflect actual investment results and are not guarantees of future results. Actual returns and volatility may vary significantly. Asset classes are represented by benchmarks and do not represent any Neuberger Berman investment product or service. Please see Additional Disclosures at the end of the presentation for asset class and index definitions and Neuberger Berman Capital Market Assumptions. Investing entails risks, including possible loss of principal.

Since then, we have updated our five- to seven-year capital market assumptions for a range of asset classes. The resulting picture looks very different from the one we faced at the start of 2022 (figure 1).

Strikingly, the line showing the average relationship between estimated return and volatility for these asset classes flattened notably over the course of 2022, rising to the left and falling to the right. There is much less marginal estimated return for each marginal unit of risk, but also a higher level of estimated return for lower-risk assets. Our research suggests that fixed income now appears significantly more favorable than equity.

The main reason for this shift in estimates is the adjustment that major asset classes went through last year. The U.S. Fed Funds Rate moved from 0.25% to 4%. The 10-year U.S. Treasury yield more than doubled from 1.5% to 3.9% and the German Bund yield rose from well below zero to 2.5%. And while benchmark global, U.S., European and emerging market equity indices were down between 10% and 20%, this was outweighed by revised estimates for narrower profit margins, and higher risk premia and lower multiples.

This is all very much in line with the argument we put forward in *Investing at a Crossroads*—that 2022 was an important long-term inflexion point and "not just another turn in the business cycle." Nonetheless, these were substantial adjustments. Have they reinforced the long-term playbook we set out six months ago, or forced a re-think?

Now that the interest rate cycle appear to be peaking, we revisit some of the key playbook themes to confirm that they have been reinforced by last year's market adjustments, not challenged by them.

Investing Strategy

CROSSROADS THEME: MIND THE GAP

With the changes in estimated returns shown in figure 1, in risk-adjusted terms fixed income now appears more favorable than equity. We would now regard fixed income as close to fair value for the new environment described in *Investing at a Crossroads*, meaning that investors in these markets have less need to "Mind the Gap" between estimated returns and their return objectives. While equity market valuations have come down, however, we do not think they have come down far enough to account for the valuation and margin headwinds of the new environment. Without a further reduction in valuations, equity investors still need to "Mind the Gap," in our view—and, as we will emphasize below, our argument for prioritizing income across asset classes has been reinforced and may be one way to close that gap in equities.

CROSSROADS THEME: PRIORITIZING INFLATION-SENSITIVE REAL AND FINANCIAL ASSETS

We urged investors to "Diversify Differently" because "equity-bond correlation tends to rise in more inflationary environments."

While the worst of the recent inflation shock appears to be behind us and bond prices now have more room to rise, we would still caution against relying too heavily on "textbook" equity-bond diversification. Bond yields can potentially hedge growth shocks at their new price levels, but their inherent duration means they cannot be relied on to hedge inflation shocks. As we anticipated, inflation has proven persistent, reinforcing our concerns about secular inflationary pressures. While the very close and sustained equity-bond correlation of 2022 may not be the new norm, we are unlikely to be heading back to the negative correlations associated with the past 20 years. Instead, we expect correlations to normalize toward the long-term average of around 0.20, with occasional spikes whenever inflation threatens to become a problem. With that outlook, inflation-sensitive assets would continue to play an important role in portfolio diversification.

CROSSROADS THEMES: EXPLOITING YOUR NATURAL ADVANTAGES & HARVESTING GLOBAL MACRO TRENDS, TACTICAL DISLOCATIONS AND VOLATILITY PREMIA

"Do you have more freedom than most to hold illiquid or more volatile investments?" we asked last year. "Shorter, more volatile cycles and less-liquid markets make value dislocations more likely: do you benefit from a lighter governance structure that makes it easier to move quickly?"

These were two examples of how to exploit natural advantages in the new investing environment. As the real economy adjusted to higher rates, it was always likely that 2023 would provide the first tests of these themes. From the attractive discounts in private equity secondaries and the difficulties at U.S. regional banks, to the storm clouds gathering around some areas of commercial real estate and real estate debt, a range of phenomena has underlined the opportunities available to liquidity providers in this environment, especially those able to step into lending and liquidity gaps left by retreating banks.

Equities

CROSSROADS THEME: LOOKING BEYOND "EXHAUSTED BETA"

When we wrote about "exhausted beta" in equities, we were referring to the factors that significantly outperformed between 2009 and 2021, when rates were declining: U.S. large- and mega-cap growth stocks. These stocks outperformed so much that they came to dominate some important broad market indices, such as those for large-cap U.S. stocks and global stocks. These distortions persist even after the market declines last year.

We argued that equity investors could exceed the modest prospects for the broad market by focusing on five major themes: quality, income, value, regional diversification and active management. We address each theme below.

CROSSROADS THEME: FAVORING THE FITTEST

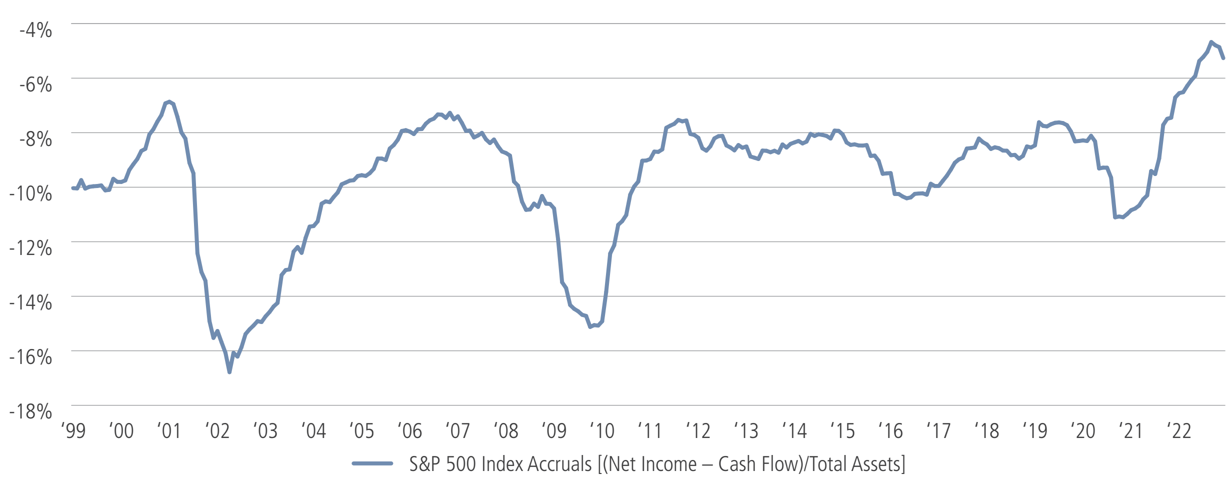
We wrote that "quality and fundamental selectivity are likely to be more important determinants of return outlooks from now on," as "owners of capital face growing headwinds."

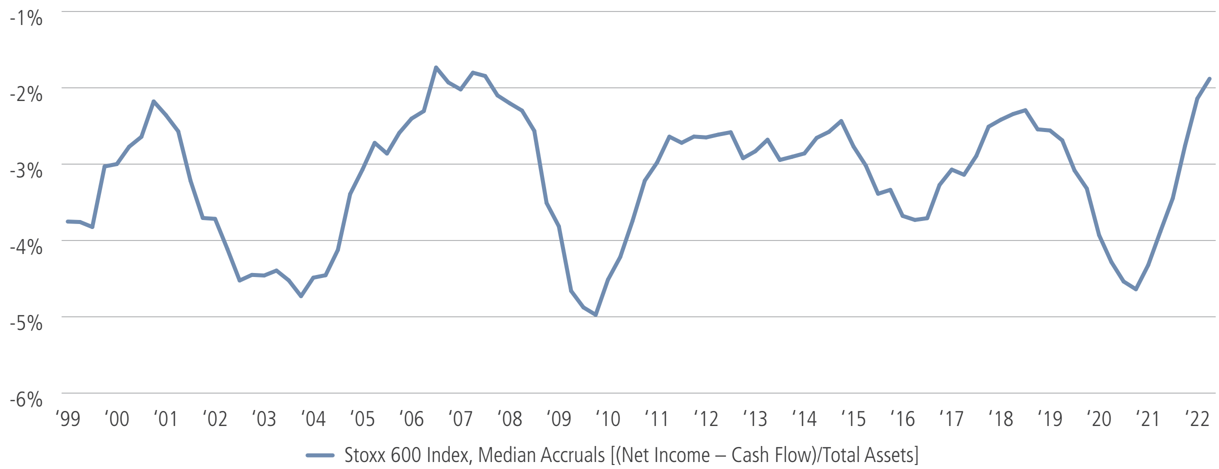
This is an important reason why last year's valuation adjustment has not improved estimated risk-adjusted returns for equity indices to the same extent as for fixed income assets. Much of last year's equity market adjustment reflected the shift to higher rates. A further adjustment is required to account for weaker earnings as those higher rates begin to bite into the economy, in our view.

A weaker economy will be difficult for most companies, but more difficult for lower-quality companies. We think aggressive use of accounting accruals—which essentially represent best-case financial assumptions and create disconnects between reported net income and actual cash flow—is an important indicator of lower quality. As figure 2 suggests, accruals have been at a multi-year high, and they tend to get written down severely when the business cycle turns negative.

FIGURE 2. CORPORATE EARNINGS QUALITY AT MULTI-YEAR LOWS

Level of accrued earnings, U.S. and Europe





Source: FactSet, Piper Sandler, Neuberger Berman. Data as of December 31, 2022.

While equity indices have generally performed well, they have been driven by a very concentrated group of high-quality technology stocks.

CROSSROADS THEMES: PRIORITIZING INCOME ACROSS ASSET CLASSES & REBALANCING TOWARD VALUE INVESTING

These two equity themes were based on an anticipated rise in rates and bond yields, together with an expectation that valuations would be volatile and sideways-trending, hurting longer-duration assets and making income a bigger proportion of total return.

That is not how things have turned out so far in 2023—although, as we mentioned above, while the performance of some technology stocks has driven equity indices higher, the factor that appears to have outperformed this year is quality rather than growth.

Longer term, we believe these themes will continue to play out. The flattening of the capital market line seen in figure 1 makes fixed income favorable over equity at the asset class level, and income favorable to growth within equities. If we thought that we might return to the low rates of 2009 – 21 from today's higher levels, we would be more favorable toward growth stocks again, at today's lower valuations. But we do not think that. We believe higher inflation and rates are structural and long-lasting, and that favors value and income: "cash today" is more attractive than "cash tomorrow" everywhere we look, at our five- to seven-year horizon.

There may be times, like the first half of 2023, when growth stocks outperform value stocks, but we think the decade-long period of outperformance up to 2022 was an anomaly that is unlikely to be repeated.

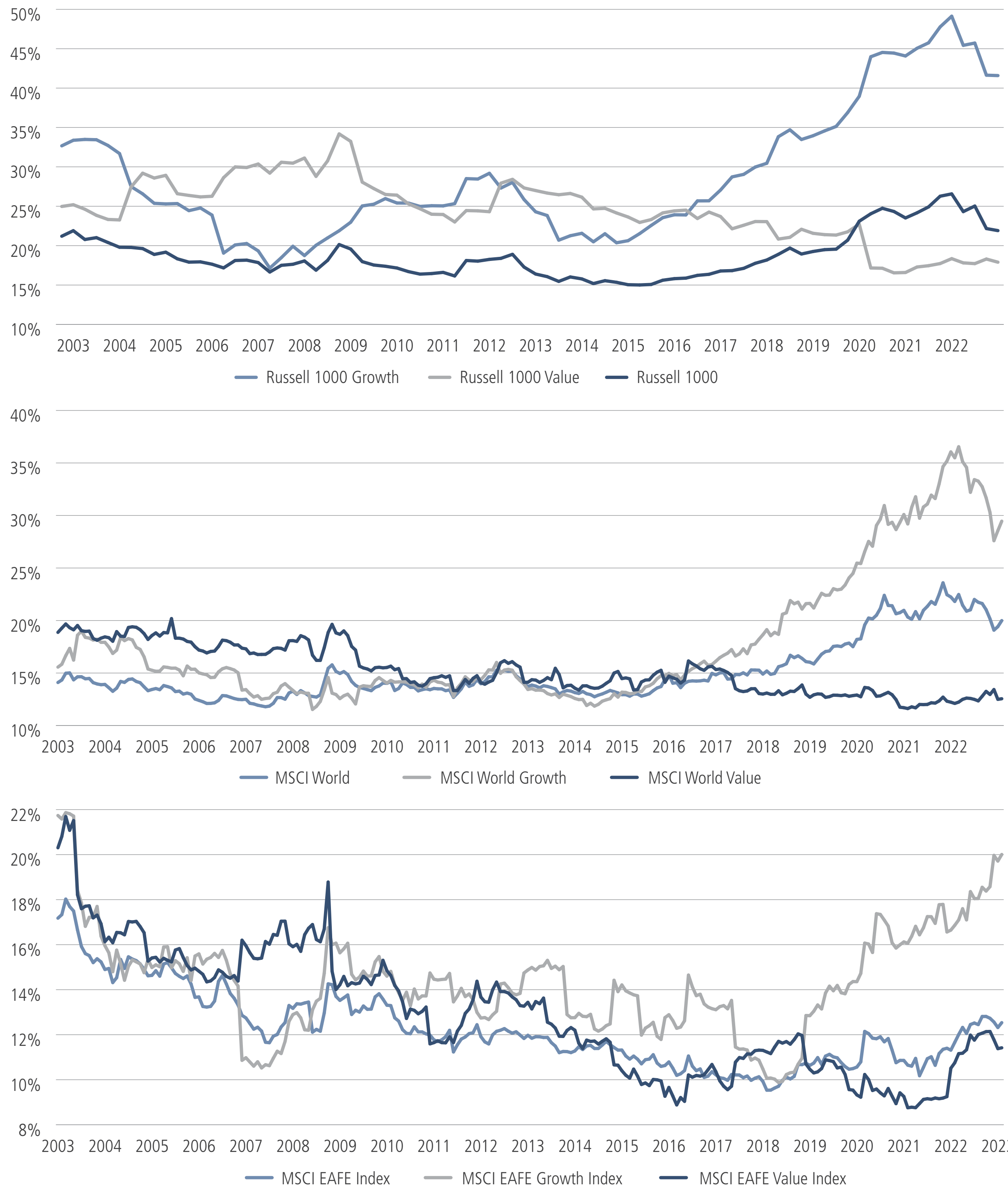
CROSSROADS THEME: RETHINKING REGIONAL RISK

As we already mentioned, growth stocks have become dominant not only in U.S. large-cap equity indices, but in global and global-developed equity indices, too.

By contrast, while growth stocks outperformed in non-U.S. markets until 2022, they have not come to dominate the core indices (figure 3). It is our view that they were simply not a big enough part of the market to begin with, and they didn't outperform as much as U.S. growth stocks. For the same reason, large-cap index-level valuations outside the U.S. appear more attractive to us than those within the U.S.

FIGURE 3. GROWTH NOW DOMINATES U.S. AND WORLD INDICES, BUT NOT EX-U.S. INDICES

Proportion of index market capitalization accounted for by the top percentile of stocks by size



Source: MSCI, FactSet, Neuberger Berman. Data as of February 27, 2023. Information on historical observations about markets, asset or sub-asset classes is not intended to represent or predict future events. Historical trends do not imply, forecast or guarantee future results. **Past performance is no guarantee of future results.**

CROSSROADS THEME: INTEGRATING PRIVATE AND PUBLIC MARKET INVESTMENTS

One important exception to our "cash-today-not-tomorrow" preference is the favorable positioning of private and less-liquid markets in the map of our new capital market assumptions in figure 1.

There are three reasons for this. First, a genuine liquidity premium could counterbalance a long-duration earnings profile. Second, we think the new environment is likely to favor active management, as idiosyncratic dispersion between winners and losers widens against a more difficult economic backdrop. Private equity can be seen as an extension of this tilt toward active management, as private owners have more scope to pursue operational improvements in their portfolio companies and more flexibility to respond to tougher conditions. And third, as we mentioned above, the current environment offers a lot of opportunity for liquidity providers, and this is particularly true in private markets: less liquidity and fewer exit routes has led to attractive pricing in private equity secondary markets; and a contraction in bank lending has opened a space for private credit and capital solutions providers.

Fixed Income

CROSSROADS THEME: PRIORITIZING INCOME ACROSS ASSET CLASSES

As we mentioned above, figure 1 shows capital market assumptions that favor fixed income over equity.

The estimated return for high yield bonds has increased by some two to four percentage points, with negligible change in estimated volatility. We now estimate that high yield medium-term returns will be the same as equity returns, with around half the volatility. We believe the challenging conditions over the next few years are a substantial threat to earnings (and therefore to equity market prices), but relatively strong balance sheets and a maturity wall that is still two years away make these conditions less of a threat to bond coupons. Moreover, we believe the attractive yields now available from cash and short-duration, high quality credit mean investors face very little opportunity cost for waiting for better opportunities in equities and other risky assets.

CROSSROADS THEME: ADDING FLEXIBILITY AND SHORTENING DURATION IN FIXED INCOME

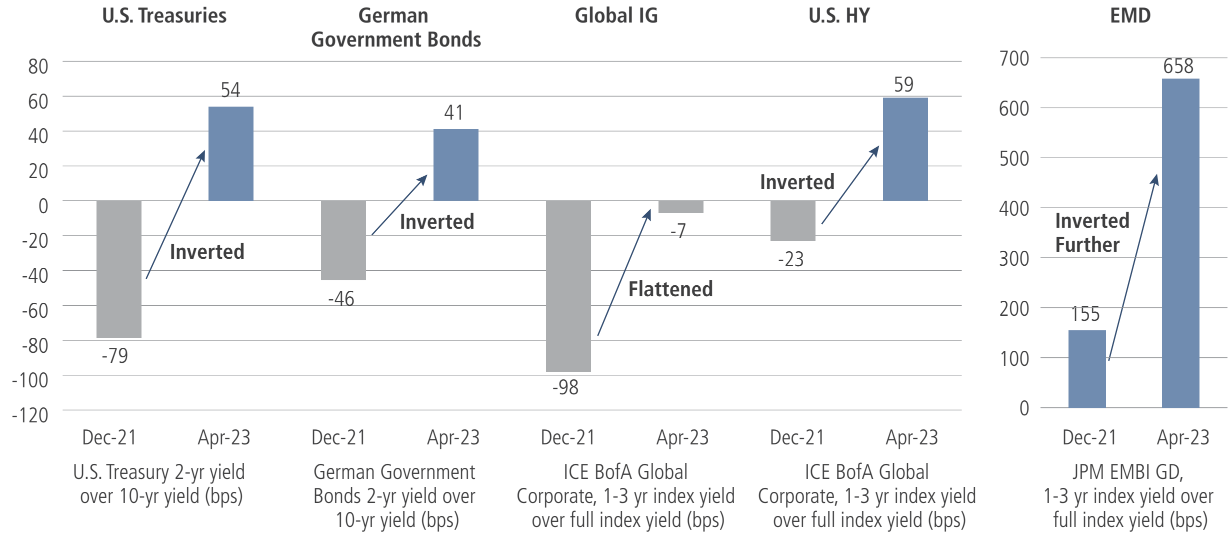
Let's consider the two aspects of this theme one after the other.

Before the adjustment in bond yields that came in 2022, shortening duration was all about maintaining fixed-income allocations while limiting exposure to the price decline that would result from a shift up in yields.

Now that interest rates have risen, we believe the case for short duration is just as strong, but different. As usual, the front end of yield curves has moved more than the long end. The combination of high inflation, a very rapid rate-hiking cycle and low long-term growth expectations led to quite an extreme yield-curve inversion. In U.S. and German government bond markets as well as credit markets, investors can now get substantially higher yields at the front end of the curve than at the long end—although it should be noted that the credit spread curve, with risk-free rates stripped out, has steepened.

FIGURE 4. RISK-FREE AND CREDIT YIELD CURVES HAVE ALL FLATTENED OR INVERTED

Spread of short-duration yields over long-duration or full-index yields (basis points), Dec 2021 and Apr 2023



Source: FactSet, Neuberger Berman. Yield to worst.

On flexibility in fixed income portfolios, the case before 2022 was often couched in terms of the search for yield. As rates declined, it was tempting to try to maintain yield targets by simply holding longer-dated bonds, investing in lower-grade securities and accepting less liquidity—but these choices all came with added risk, and the lengthened duration turned out to be the key one.

We wrote that "a flexible approach that enables investment and rotation across the widest range of fixed income markets" was "more likely to meet portfolio yield targets with a more diverse spread of risk exposures."

Today, nearer the peak of the rate-hiking cycle, fixed income markets are less volatile and no longer low-yielding. When you can earn more than 8% from high yield and more than 4% from investment grade bonds, what is the benefit of flexibility and a diverse set of asset classes?

Look again at figure 1. We have already observed that we estimate high yield returns will be the same as equity returns, with around half the volatility. But look at what occupies the space in the top-left of our map of capital market assumptions. If you can consider less-liquid markets (such as leveraged loans) or fully illiquid markets (such as private direct lending), we believe there is the potential to decrease your volatility again without giving up any estimated return—you may even enhance return estimates. Moreover, these investments are often higher in capital structures and may come with protective covenants that you don't get with bonds, helping to reduce risk exposure as the economy slows and defaults start to become more likely.

This continues to support not only our theme of adding flexibility to fixed income portfolios, but also our theme of integrating private and public market investments. We see advantages in being able to share knowledge and make relative-value judgments across the full fixed income spectrum, particularly as often the same borrowers are active in both loan and bond, public and private debt markets.

New Phase of the Game, Same Playbook

When we set out our views in *Investing at a Crossroads*, we did so assuming that we were going through a major economic and market transition into a profoundly different set of conditions. The challenge was to develop a playbook that was fit for the longer-term outlook, but also robust during the transition itself. We believe that, so far, the playbook we set out six months ago has stood the test.

This is not to say that the rationale for our themes has not changed. It has. During the transition to our new conditions, the themes of quality, value versus growth and regional diversification in equities, and the themes of short duration and flexible credit allocations in fixed income, were primarily about managing downside risk as the interest rate environment changed. Today, as interest rates begin to peak, they are more about positioning for what we consider to be the most attractive return opportunities in that new environment.

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Index Definitions

The **Bloomberg Euro Treasury Index** consists of fixed-rate, investment-grade public obligations of the sovereign countries participating in the European Monetary Union. This index currently contains euro-denominated issues from 18 countries. The index was created in 1998, with history backfilled to 1 June 1998.

The **Bloomberg Euro Corporate Bond Index** is a broad-based benchmark that measures the investment grade, euro-denominated, fixed-rate corporate bond market. Inclusion is based on currency denomination of a bond and not country of risk of the issuer. The Index was launched on 1 June 1998.

The **Bloomberg Euro High Yield Index** measures the market of non-investment grade, fixed-rate corporate bonds denominated in Euro. Inclusion is based on the currency of issue and not the domicile of the issuer. The index excludes emerging market debt. It was created in 1999 and is part of the Global High Yield Index.

The **Markit iBoxx EUR Liquid Non-Financials Index** is a subset of the Markit iBoxx EUR Non-Financials bonds universe and contains up to 20 investment grade rated non-financial securities with maturity 5 – 7yrs and a BBB rating. All bonds need to have an average rating of investment grade from Fitch Ratings, Moody's Investor Service and Standard & Poor's Rating Services.

The **MSCI Europe Index** captures large and mid cap representation across 15 Developed Markets countries in Europe. With 427 constituents, the index covers approximately 85% of the free float-adjusted market capitalization across the European Developed Markets equity universe.

The **MSCI Europe Large Cap Index** captures large cap representation across 15 Developed Markets (DM) countries in Europe. With 199 constituents, the index covers approximately 70% of the free float-adjusted market capitalization across the European Developed Markets equity universe.

The **S&P Eurozone Sovereign Bond Index** seeks to measure the performance of fixed-rate locally denominated sovereign debt publicly issued by Eurozone country governments for their domestic markets.

The **Bloomberg U.S. Government Index** includes Treasuries (public obligations of the U.S. Treasury that have remaining maturities of more than one year) and U.S. agency debentures (publicly issued debt of U.S. Government agencies, quasi-federal corporations, and corporate or foreign debt guaranteed by the U.S. Government).

The **Bloomberg U.S. Corporate Index** measures the investment grade, fixed-rate, taxable corporate bond market. It includes USD-denominated securities publicly issued by U.S. and non-U.S. industrial, utility and financial issuers that meet specified maturity, liquidity and quality requirements. The Index was launched on January 1, 1973.

The **Bloomberg U.S. Corporate High Yield Bond Index** covers the USD-denominated, non-investment grade, fixed-rate, taxable corporate bond market. Securities are classified as high-yield if the middle rating of Moody's Fitch, and S&P is Ba1/BB+/BB+ or below. The index excludes Emerging Markets debt. The Index was created in 1986, with index history backfilled to January 1, 1983.

The **Credit Suisse Leveraged Loan Index** tracks the investable market of the U.S. dollar-denominated leveraged loan market. It consists of issues rated "5B" or lower, meaning that the highest rated issues included in this index are Moody's/S&P ratings of Baa1/BB+ or Ba1/BBB+. All loans are funded term loans with a tenor of at least one year and are made by issuers domiciled in developed countries.

The **JPMorgan Emerging Markets Bond Global Diversified Index (EMBI GD)** includes U.S. dollar-denominated Brady bonds, Eurobonds, and traded loans issued by sovereign and quasi-sovereign entities.

The **JPMorgan Corporate Emerging Markets Bond Index (CEMBI)** is a market-capitalization weighted index of corporate bonds issued by entities in emerging countries.

The **Bloomberg U.S. MBS Index** tracks fixed-rate agency mortgage-backed pass-through securities guaranteed by Ginnie Mae (GNMA), Fannie Mae (FNMA), and Freddie Mac (FHLMC).

The **S&P 500 Index** consists of 500 U.S. stocks chosen for market size, liquidity and industry group representation. It is a market value-weighted index (stock price times number of shares outstanding), with each stock's weight in the Index proportionate to its market value.

The **MSCI Emerging Markets Index** is a market-value weighted index designed to represent the performance of large- and mid-cap securities in 26 emerging markets.

The **Cambridge Associates Global Buyout Index** is a capitalization-weighted composite IRR of the buyout fund performances across all geographic focus reported to Cambridge Associates; all historical IRRs are subject to, and regularly undergo, revision.

The **Bloomberg U.S. Corporate BB High Yield (1 – 3 years) Index** measures the USD-denominated, high yield, fixed-rate corporate bond market with maturities of 1 – 3 years and a BB rating.

The **STOXX Europe 600 Index** is a subset of the STOXX Global 1800 Index. With a fixed number of 600 components, the Index represents large, mid and small capitalization companies across 17 countries of the European region: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

The **MSCI World Index** tracks the performance of large- and mid-cap stocks across 23 developed markets countries.

The **MSCI World Value Index** tracks the performance of large- and mid-cap stocks across 23 developed markets countries that exhibit overall value style characteristics.

The **MSCI World Growth Index** tracks the performance of large- and mid-cap stocks across 23 developed markets countries that exhibit overall growth style characteristics.

The **MSCI EAFE Index** tracks the performance of large- and mid-cap stocks across 21 developed markets countries in Europe, Australasia and the Far East, excluding the U.S. and Canada.

The **MSCI EAFE Value Index** tracks the performance of large- and mid-cap stocks across 21 developed markets countries in Europe, Australasia and the Far East, excluding the U.S. and Canada that exhibit overall value style characteristics.

The **MSCI EAFE Growth Index** tracks the performance of large- and mid-cap stocks across 21 developed markets countries in Europe, Australasia and the Far East, excluding the U.S. and Canada that exhibit overall growth style characteristics.

The **ICE BofAML U.S. High Yield Index (0-3 Years)** tracks the performance of below investment grade, but not in default, U.S. dollar-denominated corporate bonds, and includes issues with a credit rating of BBB or below, as rated by Moody's and S&P, with less than five years remaining term to final maturity, and a minimum amount outstanding of $100m.

Asset Class Assumptions & Estimates

Capital market assumptions used herein reflect Neuberger Berman's forward-looking estimates of the benchmark return or volatility associated with an asset class. Estimated returns and volatilities are hypothetical return and risk estimates generated by Neuberger Berman's Institutional Solutions Group. Estimated returns and volatilities do not reflect the alpha of any investment manager or investment strategy/vehicle within an asset class. Information is not intended to be representative of any investment product or strategy and does not reflect the fees and expenses associated with managing a portfolio or any other related charges, such as commissions and surrender charges. Estimated returns and volatilities are hypothetical and generated by Neuberger Berman based on various assumptions and inputs, including current market conditions, historical market conditions and subjective views and estimates. Capital market assumptions shown reflect Neuberger Berman's long-term (20+ years into the future) estimates or intermediate-term (5-7 years into the future) estimates which are reviewed at least annually. Results will differ depending on whether they are based on Neuberger Berman's long-term (20+ years into the future) or intermediate-term (5-7 years into the future) capital market assumptions. Neuberger Berman's capital market assumptions are derived using a building block approach that reflects historical, current, and projected market environments, forward-looking trends of return drivers, and the historical relationships asset classes have to one another. These hypothetical returns are used for discussion purposes only and are not intended to represent, and should not be construed to represent, predictions of future rates of return. Actual returns may vary significantly. Neuberger Berman makes no representations regarding the reasonableness or completeness of any such assumptions and inputs. Assumptions, inputs, and estimates are periodically revised and subject to change without notice. Estimated returns and volatilities should not be used, or relied upon, to make investment decisions.

Rate of Return Estimate: Rate of return or geometric return is a measure of average returns of an investment over a period of time. Geometric rate of returns are typically referred to as annualized compound rate of returns and are always less than or equal to the arithmetic mean return of the same time series. Geometric rate of returns are used for straight-line calculations within the analysis, for example, the cash flow calculations. In straight-line calculations, each year is represented as a gain, so the compound (geometric mean) rate of return is used to adjust for the amount needed to make up for a loss in a given year. For example, if you lose 5% in one year, and gain 5% the year after, you still have less than you started with at the beginning of year one.

Arithmetic Mean Estimate: Arithmetic mean or average return is calculated by dividing the sum of a series of numbers by the number of overall items. This is more typically thought of as an "average" of the data set. Arithmetic mean or average return ignores the impact of compounding in the context of analyzing investment returns and is the simple average of returns observed over a period of time. Arithmetic mean returns are used in this material and, if applicable, the Efficient Frontier, because, through randomization, losses and gains are being accounted for each year.

Standard Deviation: A statistical measure of the volatility based on the distribution of a set of data from its mean (average value). For example, a portfolio with an average return of 10% and a standard deviation of 15% would return a result between -5% and +25% the majority of the time (68% probability or 1 standard deviation), almost all of the time the return would be between -20% and +40% (95% probability or 2 standard deviations). If there were 0 standard deviation then the result would always be 10%. Generally, more aggressive portfolios have a higher standard deviation and more conservative portfolios have a lower standard deviation.

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