

Global Investment Committee | March 29, 2023

# Annual Update of GIC Capital Market Assumptions

In these pages, we present the annual update of our capital market assumptions. These forecasts estimate the returns and volatility of global asset classes over the strategic (seven-year) and secular (20-year) horizons. The strategic estimates are key inputs for the Global Investment Committee's (GIC) strategic asset allocations. For most investors, strategic allocations serve as the "north star," anchoring plans for intermediate- and long-term wealth accumulation and preservation. We also provide the GIC strategic asset allocation models, rebalanced for our updated assumptions and current asset prices. The models are optimized each year using our goals-based framework and targeted risk parameters. Following our recent research on inflation regimes, we have further conditioned them for what we see as an end to last cycle's persistent disinflation and secular fixed income bull market.

The bottom line is that with the Fed continuing to tighten, inflation still well above policy targets and the post-COVID boom's economic resolution still not finalized, our estimates are weighed down in the early years by mean reversion. Longer term, our models project the next bull market phase as one of normalized inflation and higher neutral rates—potentially inhibiting equity multiples. Essentially, they suggest that we are entering a new regime, punctuated by the end of the 40-year bond bull market.

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One of the implications of such regime change is that stock/bond correlations—having recently turned positive, in a reversal of most of the past 20 years—may challenge diversification, with term premiums and uncertainty becoming more important return factors, as was the case from 1970 to 2000. For the seven-year period, our forecast suggests blended multi-asset-class total returns slightly below long-term averages, with public and private equity returns reset for higher structural costs of capital and fixed income and private credit returns generally at or above long-run averages.

It's important to keep in mind that these strategic models, which are developed for a seven-year horizon, do not immediately impact our tactical models. The tactical models, updates to which are published separately, have an investment horizon of 12 to 18 months and are adjusted based on the GIC's deliberations regarding factors impacting marginal cash deployment and relative asset class performance.

### Executive Summary

Every year between December and March, the Global Investment Committee convenes to update our strategic, or seven-year, and secular, or 20-year, capital market return assumptions. That process involves marking every asset class to current market conditions while weighing valuations against our historical frameworks. We strive to balance a consistent process with dynamic enhancements. These efforts seek to incorporate structural policy changes, such as those from the Federal Reserve and the federal government and those related to global trade and geopolitics. Exhibit 1 summarizes this year's major asset class updates.

2022 featured one of the worst dual bear markets for stocks and bonds in more than 50 years, as the Fed implemented an aggressive tightening campaign to fight decades-high inflation (see Exhibit 2). The impact from such a pronounced policy pivot is apt to be lagged, especially in the wake of events such as COVID-related shutdowns and subsequent historic stimulus. As such, this year's capital market assumptions update accounts for imminent economic slowing and profitability headwinds given the reality of mean reversion over the seven-year horizon. Additionally, rates have been materially reset, with genuine implications for long-run valuations, as the 40-year bull market in US interest rates has ended. While 2022's bear market repricing presents some opportunity for improved forward returns, these end-of-cycle factors are strong near-term offsets.

Essentially, we see the bear market, especially for US stocks, continuing for much of the next 12 to 18 months—a projection that is highly contingent on the timing of a soft landing or potential recession. As we go to press, recession risks are materially increasing given the emergence of a

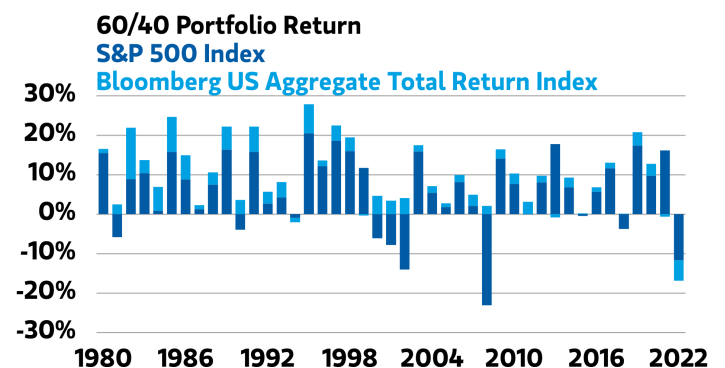
liquidity crisis among some US regional banks, adding to near-term uncertainty. While we do not see systemic risks at this time, the impact to the banking system and consumer confidence will likely produce material knock-on effects, intensifying accelerating economic slowing.

### Exhibit 1: Return Estimates for Equities and Fixed Income

	2023		2022	
	Annualized Return	Annualized Volatility	Annualized Return	Annualized Volatility
Global Equities	5.2	13.4	5.2	13.1
US Equities	4.4	14.9	4.1	14.1
International Equities	5.2	15.4	5.6	14.7
Emerging & Frontier Mkt. Equities	7.8	19.3	8.3	17.5
Ultrashort Fixed Income	3.7	0.8	1.6	0.7
US Taxable Fixed Income	4.8	5.2	2.0	4.9
High Yield Fixed Income	7.1	8.3	3.6	7.5
Real Assets	5.5	12.3	4.6	10.3
Absolute Return Assets	6.0	5.1	3.5	4.7
Equity Hedge Assets	6.6	9.0	5.2	6.8
Equity Return Assets	6.3	8.8	4.8	8.3

Note: Ultrashort fixed income is represented by 90-day T-bills; US taxable fixed income by the Bloomberg US Aggregate Index; and high yield fixed income by the Bloomberg Global High Yield Corporate Index.  
Source: Bloomberg, FactSet, Moody's, Haver Analytics, Morgan Stanley & Co. Research, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

### Exhibit 2: Annual Returns of the Traditional 60/40 Portfolio



Source: Bloomberg, Morgan Stanley Wealth Management GIC as of Dec. 31, 2022

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In the intermediate term, our models contemplate a resumption of a bull market in US equities, but one characterized by regime change. One dimension of that projected change relates to inflation, which we think will mean-revert following more than 12 years of persistent post-Great Financial Crisis disinflation. As we have noted many times, we believe the disinflationary drivers of that period were disproportionately shaped by structural deleveraging and the narrow technology diffusion that limited capital deepening and economic growth.

In the post-COVID business cycle, structural changes to the labor market and a step change in spending on deglobalization, decarbonization, digitization and defense are resetting inflation and natural rates of economic growth higher. Regime change of this nature has implications for market leadership, active management, stock selection and cross-asset-class valuations. These are all dynamics we have tried to capture in our inflation-regime conditioning framework, which we described in our January special report, [“What if the Future Is Inflation? Correcting Disinflationary Bias in Market Forecasts.”](#)

Another dimension of regime change is policy normalization, as we assume a departure from the persistent financial repression that characterized the post-Great Financial Crisis business cycle. A return of central bank policies that follow the business cycle has implications for volatility, uncertainty and term premiums, all of which are likely to shift stock/bond correlations (see Exhibit 3). Should we return to the positive performance correlations that persisted between stocks and bonds from 1970 to 2000, the challenges to achieving easy diversification will rise, producing more volatile portfolio return patterns and increasing the attractiveness of alternative or uncorrelated asset classes like hedge funds and private investments.

The result of these multivariate shifts is that our 2023 seven-year annual return forecast for global stocks remains essentially unchanged, at 5.2%, with projected US equity

returns improving modestly to 4.4%, which is still below the historical average. Our seven-year US bond forecast, conversely, has improved materially, moving up from last year’s 2.0% per year to this year’s 4.8%. Given our outlook for increased volatility and higher structural inflation, forecast returns for hedged strategies and commodities are also improving, to 6.0%-6.5% and 5.0%, respectively. Private assets remain among our higher-returning asset classes, with prospects for private equity and real estate dimming modestly versus history and anticipated private credit returns increasing materially. All illiquid return forecasts, however, are below last decade’s double-digit returns.

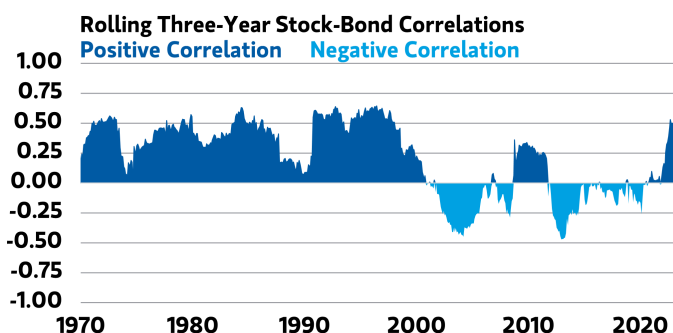
Amid these potential regime shifts, in addition to refreshing our capital market assumptions, we have updated the GIC strategic asset allocation models (see Exhibits 22 and 23). Historically elevated equity valuations and the potential secular weakness of government bonds point to lower risk-adjusted returns and more limited diversification in traditional assets. As such, the environment will likely require thoughtful portfolio construction, maximizing the benefits of active/passive decision making, manager selection, risk management and tax mitigation.

### Starting Points Matter

One tenet of successful wealth accumulation and preservation is to play the long game and avoid market timing, based on fear or greed, around immediate events. In that regard, one of the cornerstones of our advice framework is to anchor portfolio construction choices to a strategic benchmark based on client-specific goals, risk tolerance and value preferences. When in this multiyear planning mode, the most important decisions we make are premised on understanding the prevailing economic and market regime. Is it characterized by high or low real growth? Is it accompanied by high or low inflation? And are monetary and fiscal policies aggressive or benign? These factors tend to inform volatility, correlations and cross-asset performance.

While conditioned by regime, total returns are more decisively determined by starting valuations, as they are mathematically informed by the cost of market entry. This reality is not an endorsement of market timing, as historical studies have shown that such attempts are flawed and apt to fail; rather, it is an acknowledgement that cash deployment and intra-period portfolio rebalancing should be shaped by probabilities. When valuations are cheap, risk premiums are ample, and investors are compensated for their patience and exposure to volatility. When valuations are full, investors should be cautious and realistic about how much of their future return is already embedded in prices. Here, dollar-cost-averaging strategies should be conservative and pursued over longer periods.

### Exhibit 3: Three-Year Rolling US Stock-Bond Correlations



Source: Bloomberg, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

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Thus, we come to the 2023 annual update of capital market assumptions at an especially challenging time. Almost exactly three years from the onset of COVID-related shutdowns, slightly more than a year into a textbook, policy-driven bear market and entering the later innings of a historic monetary policy response, forecasting crosscurrents abound. Our best approach in this environment is to lean even more vigorously into our analytical process, looking for historic extremes and inflection points. As luck would have it, we have both. Regarding extremes, they are found in valuations, with US stocks continuing to look rich, despite approximately a 17% drawdown from the January 2022 all-time high and the first phase of the bear market. That valuation assessment is applicable in the context of historical pricing—relative to Robert Shiller’s cyclically adjusted price/earnings multiple concept (CAPE), current sales and generic consensus forward earnings—and the risk free rate, as measured by the 10-year US Treasury yield via the equity risk premium.

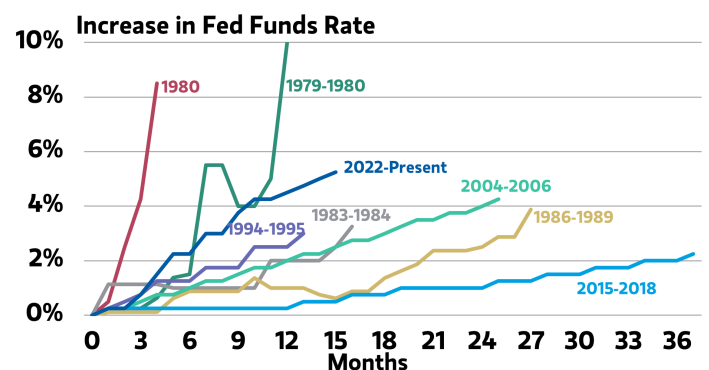
Regarding inflection points, we may not just be on the brink of potential recession; as the hiking cycle matures, with an implied terminal rate close to four times higher than estimates from slightly over a year ago, we question our inflation/growth regime. Most years, when we update our capital market assumptions, we are intra-regime and extrapolation of trends has a place. This year, however, we condition our estimates for a fundamentally different business cycle. We see it as one in which organic growth and inflation normalize on the strength of household and corporate balance sheets, innovation diffusion and improving demographics, alongside the post-COVID drivers of digitization, deglobalization, decarbonization, labor force detachment and geopolitical multipolarity. (See our January reports, [“The Next American Productivity Renaissance”](#) and [“What if the Future is Inflation? Correcting Disinflationary Bias in Market Forecasts.”](#)) Overall, these factors inform our below-average forecasts for stocks and our above-average forecasts for bonds and private credit.

### Boom ... and Now

As noted above, the starting point for our 2023 capital market assumptions is extraordinarily challenged, given prevailing crosscurrents, the emergence of regional banking risks and the unprecedented nature of post-COVID structural changes impacting growth dynamics. After a V-shaped market recovery accompanied by nominal annualized gross domestic product (GDP) of more than 12% and an increase in corporate profits to roughly 20% above the long-term trend, decades-high inflation arrived, peaking in June 2022 above 9% and ushering in a classic policy-driven bear market. History suggests that such policy-driven bears don’t end until the Fed actually begins to cut and the lagged impacts of slowing growth and lower profits are fully discounted. Given that this is not a typical cycle, however, forecasting is especially fraught.

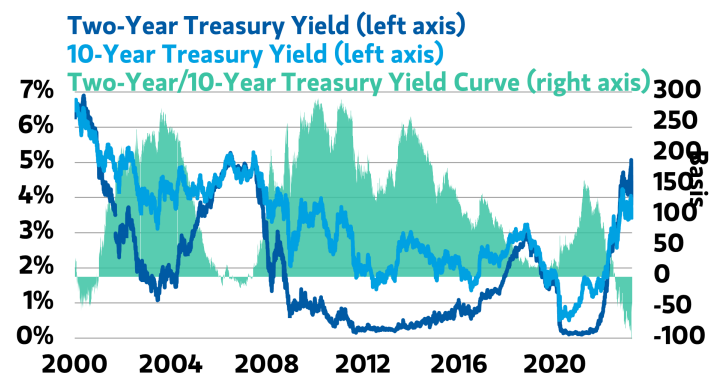
First, there’s the issue of the Fed itself. Having resisted signs of building stress around consumer prices in 2021, it remains locked in one of the most rapid hiking cycles of the last 40 years, and facing unprecedented challenges (see Exhibit 4). The hiking cycle follows a period of historic intervention when the central bank maintained negative real rates over a prolonged period. Furthermore, the Fed turned away from traditional monetary frameworks like the Phillips curve, instead favoring forward guidance based on an “average inflation-targeting” approach. Soon after, the Fed began quantitative tightening at the same time that debate around fiscal policy and the US debt ceiling was looming. Finally, the Fed supported Congress’ 2018 regulatory rollback of annual balance sheet stress testing for all banks with less than \$250 billion in assets. As we now know, the implication has been a material repricing of interest rates, steep yield curve inversion, historic bond market volatility and the emergence of a deposit funding crisis among some regional banks (see Exhibit 5).

**Exhibit 4: Current Fed Rate Hiking Path Versus Prior Hiking Campaigns**



Source: FactSet, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

**Exhibit 5: Two-Year and 10-Year US Treasury Rates and Yield Curve Slope**

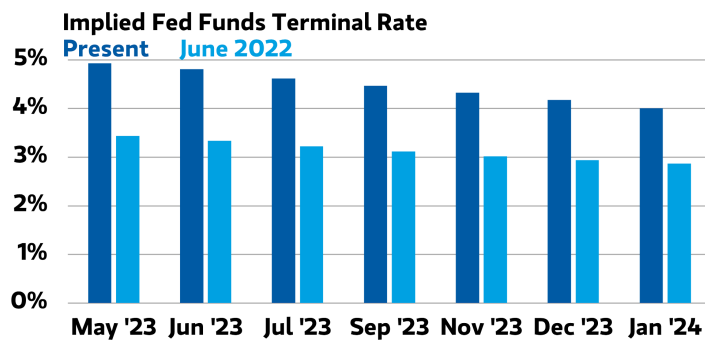


Source: FactSet, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

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This confluence of events introduces a new level of uncertainty not only for the direction and duration of central bank policy but for the real economy. In the span of the last nine months, expectations around Fed policy have shifted markedly (see Exhibit 6), while the S&P 500 Index, seemingly unfazed, has churned in a range between 3,900 and 4,100.

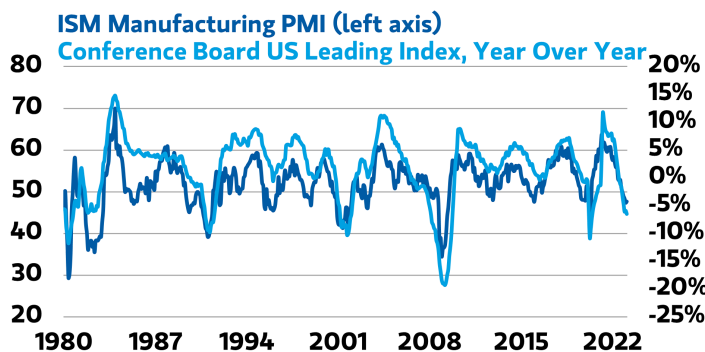
### Exhibit 6: Estimates of the Fed Funds Terminal Rate



Source: FactSet, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

The second factor is that important aspects of US economic growth—by dint of the economy’s phased closure and reopening during COVID—are notably out of sync, creating a tendency to send mixed signals. The early years of the V-shaped recovery were led by goods manufacturing powered by lean supply chains, extraordinary government stimulus and excess corporate and consumer savings that poured into capital expenditures and household durables. Since imports account for much of US goods consumption, observed inflation was immediately linked to global supply chains and assumed to be short-lived. Indicators on the manufacturing side of the economy have already been signaling a slowdown (see Exhibit 7) and, combined with inverted yield curves, have suggested the potential arrival of recession. But services demand, historically two-thirds of total US consumption, has been resurgent since last year, muddying the readings for inflation and employment.

### Exhibit 7: ISM Manufacturing PMI and Leading Economic Indicators Index Turned Negative

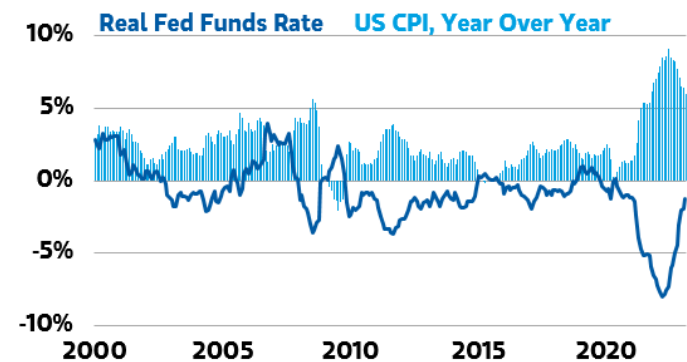


Source: FactSet, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

Consider, for instance, that pent-up demand, especially for services linked to hospitality, leisure, dining out and travel, as well as rents, indicate that services inflation is still accelerating. And services, of course, account for most of our labor shortages—from nurses, to teachers, to airline personnel, to bartenders and baristas. These dynamics are further complicated by the shift to remote/hybrid work and the migration away from traditional urban centers.

The third complicating factor is related to economic and market concentration. Not only are signs from equity indexes obscured by market capitalization dominance of a handful of companies, but the concentration of excess savings in the top wealth quintiles is confusing estimates of how much liquidity and spending power are really in the system. On another dimension, the US economy is more bifurcated than in prior cycles, with post-Great Financial Crisis banking regulation having created additional unprecedented risk—among and between the largest global systemically important banks (G-SIBs) and the rapidly expanding shadow banking system, as well as between the G-SIBs and regional and smaller banks.

### Exhibit 8: Real Federal Funds Rate Remains Negative



Source: Bloomberg, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

So, are we to model a traditional recession, a soft landing or the once-rumored “no landing”? Our near-term biases are currently more negative. With the aftermath of regional bank stress likely to result in much tighter credit, especially for commercial and industrial loans and commercial real estate, we think the odds of outright recession in the next 12 months have risen materially. This backdrop may favor an earlier exit from the Fed’s tightening campaign than originally forecast, as the central bank balances concerns for financial system stability with fighting inflation. The outcome, however, may not be the intended one over the long run. As we illustrate in Exhibit 8, pausing now would likely leave the economy with a negative real fed funds rate, at risk of going beyond “mission not accomplished” on inflation to “mission abandoned.”

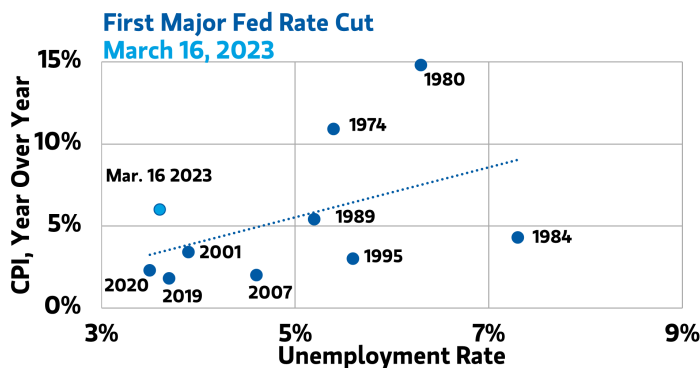
## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

This approach would open the door to stagflation and higher-for-longer term premiums and inflation expectations, ultimately resetting the neutral central bank interest rate higher. Pausing now could also leave us precariously positioned vis-a-vis the relationship between unemployment and inflation, setting up risks of persistent wage-driven price gains (see Exhibit 9).

Even if we can avoid economic recession, risks for investors remain high. As we have noted repeatedly in the past year, we don't feel that US equities are discounting the unsustainability of current financial results. Stimulus and inflation juiced nominal GDP and operating profits to levels well above historical averages. Even basic mean reversion from current nominal growth of approximately 8% to the 4%-5% range and contraction of operating margins back to the 12.5%-13.5% range would produce a profits recession of 10%-20% (see Exhibit 10).

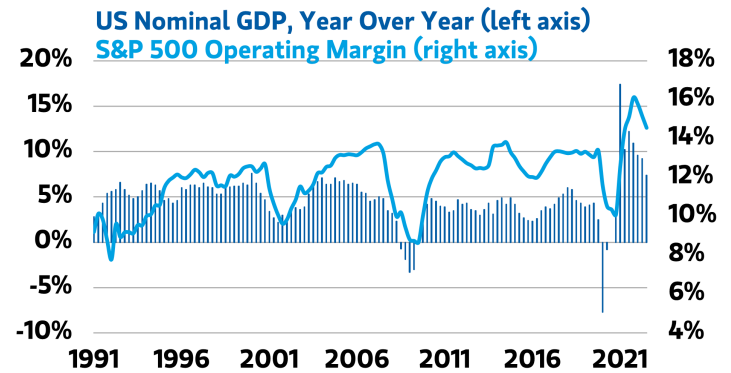
Ultimately, forward returns are premised on valuations, and on that front the data does not support US equities, which are extremely expensive despite last year's bear market. Current equity risk premiums under 220 basis points provide little support compared to other historical periods, while earnings yields of approximately 5.5%, on average, are little better than what's available in the credit market (see Exhibit 11). The decade-long dominance of US equities over global and regional peers is also increasingly tenuous, with valuation premiums suggesting that relative growth, inflation and interest rate advantages are rapidly evaporating (see Exhibit 12).

### Exhibit 9: CPI Growth and Unemployment Rate Upon First Major Fed Rate Cut



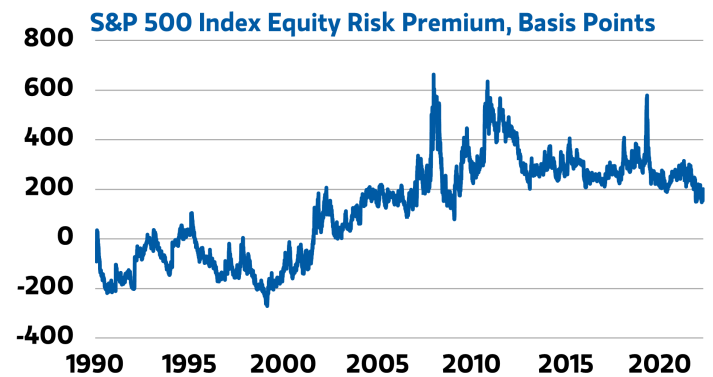
Source: Bloomberg, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

### Exhibit 10: GDP Growth Versus S&P 500 Operating Margin



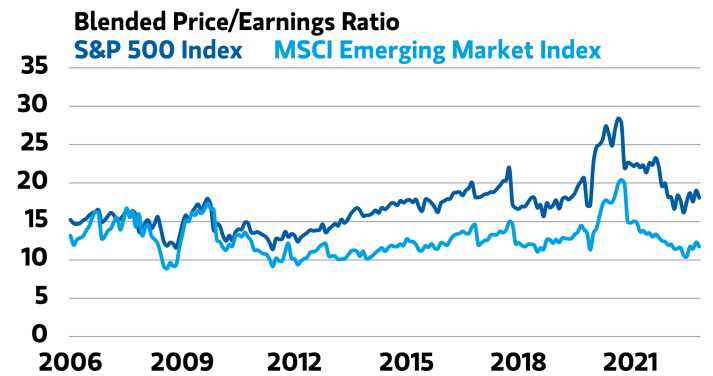
Source: Bloomberg, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

### Exhibit 11: S&P 500 Equity Risk Premium



Source: Bloomberg, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

### Exhibit 12: Relative Price/Earnings Ratio of US Versus Emerging Market Equities



Source: Bloomberg, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

## Rebalancing Our Strategic Models

As we detail below, changes in underlying financial market variables have shifted our strategic capital market assumptions, summarized in Exhibits 13 and 14. As such, we are updating and rebalancing our strategic models, as shown in Exhibits 22 and 23. We reduce allocations to equities and alternatives in favor of fixed income, particularly short-term fixed income. Within equities, we continue to show a preference for non-US equities over US.

Investors should keep in mind that our strategic models are based on an investment horizon of at least seven years and are designed to maximize risk-adjusted returns and minimize turnover.

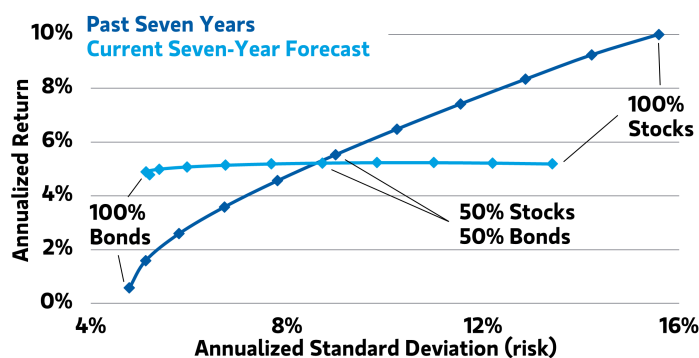
Investors who are seeking to take advantage of short-term market opportunities and are comfortable with 12-to-18-month holding periods should consider the GIC’s tactical model portfolios, which can make opportunistic or defensive short-term adjustments as the GIC deems appropriate.

We significantly reduce our underweight allocation to fixed income relative to the benchmark, in response to significantly higher yields compared to one year ago. Within fixed income, we reduce duration risk by increasing allocations to short-term fixed income relative to US taxable fixed income.

We reduce our overall equity allocation, primarily by decreasing US large-cap exposure. We modestly reduce international equities, although our preference for international over US equities remains intact. This increases our underweight to equities relative to the benchmark.

The allocation to alternatives is also reduced, although the allocation remains overweight alternatives relative to the benchmark.

### Exhibit 13: Next-Seven-Year Outlook Is Flatter as Fixed Income Return Expectations Improve Significantly Relative to Equities



Note: Stocks are represented by the MSCI All Country World Index and bonds by the Bloomberg US Aggregate Index.  
Source: FactSet, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

The reductions are used to increase allocations to fixed income. These investment strategies attempt to reduce exposure to broad equity movements; hedge the portfolio during major market drawdowns; and generate higher returns than high-quality fixed income, a traditional portfolio diversifier.

For clients with more than \$25 million in investable assets, we similarly reduce our allocations to private investments, in favor of reducing our underweight to fixed income given its improved risk-adjusted performance expectations for the strategic horizon.

### Exhibit 14: The GIC's New Strategic Return, Volatility and Correlation Forecasts

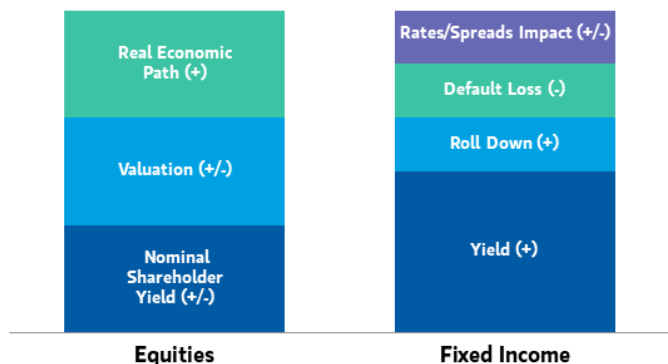
	Annualized Return	Annualized Volatility	Correlation to Equities
Equities	5.2	13.4	1.00
REITs	4.0	16.0	0.71
Energy Infrastructure/MLPs	7.5	17.6	0.62
Commodities	5.0	15.3	0.22
Private Real Estate	5.0	16.7	0.39
Equity Hedge Assets	6.6	9.0	0.40
US Taxable Fixed Income	4.8	5.2	0.21

Note: Seven-year annualized forecast  
Source: Robert J. Shiller of Yale University, Bloomberg, FactSet, Moody's, Haver Analytics, Datastream/IBES, Morgan Stanley & Co. Research, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

## Building Our Forecasts

While we forecast strategic equity and fixed income returns by maintaining a methodology that is largely similar to last year's, we have refined certain calculation parameters as we continue to improve the methodology. For equities, we build return estimates by combining the nominal return to shareholders (including share repurchases and dividends), the impact of changes in valuation and the likely inflation-adjusted economic path over the next seven years. For fixed income, we construct estimates starting with current yields, add the return due to expected “roll down”—the price appreciation that comes as bonds near maturity, given a positively sloping yield curve—and make adjustments for potential losses from defaults, and changing interest rates and credit spreads (see Exhibit 15). For other asset classes, we project returns based on our estimates for equities and fixed income, the likely economic path over the strategic horizon and specific analysis of each individual asset class.

Exhibit 15: Building Blocks of Our Return Estimates



Source: Morgan Stanley Wealth Management GIC

## Equities: Our Strategic Methodology

Our methodology for forecasting strategic equity returns has three main components. First, we examine what nominal earnings companies are likely to pay out to investors, either through dividends or share repurchases. Second, we anticipate the effects of potential repricing by considering current valuations and assuming asset prices will, to some extent, converge to historical averages during the seven-year period. Finally, we assess the likely influence of the inflation-adjusted economic path on earnings growth. By breaking our forecasts into these components, we can contextualize our estimates in the current market environment.

### What Yields Will Companies Deliver to Investors?

Financial asset prices are fundamentally determined by the present value of cash flows paid to the investor. Accordingly, our analysis begins by assessing the extent to which equity owners receive cash distributions through dividends and share repurchases, which we term “shareholder yield.”

We measure shareholder yield by examining what companies in each region have paid out in both forms over the previous 10 years, tracking a market cycle. We compute nominal shareholder yields by analyzing historical index-level shareholder payout ratios and forward-looking earnings yield estimates. This calculation avoids the attempt to differentiate between dividends and share repurchases and instead groups the two sources of returns under a single metric. Consistent with last year, we chose to consider a 10-year period because this longer-term horizon mitigates the observed cyclicality in payout ratios. Compared to last year, shareholder yields have risen modestly across different equity segments, driven by increased forward-looking earnings yield estimates. These estimates of nominal shareholder yield (see Exhibit 16) form the base of our return forecasts, to which we add effects from changes in valuation and real earnings growth.

Exhibit 16: Emerging Markets and International Equities to Outperform US Large Cap

	Nominal Shareholder Yield	Valuation	Real Economic Path	Total (%)
US Large-Cap Equities	3.9	-1.4	1.8	4.3
US Small-/Mid-Cap Equities	2.3	-0.3	2.8	4.8
European Equities	4.0	-0.4	1.3	4.9
Japan Equities	3.0	1.1	0.6	4.8
Asia Pacific ex Japan Equities	4.3	-0.1	2.8	7.0
Canadian Equities	3.6	0.0	1.8	5.4
Developed International Equities	3.8	-0.1	1.5	5.2
Emerging Market Equities	2.8	0.4	4.6	7.8
Global Equities	3.7	-0.6	2.1	5.2

Source: Robert J. Shiller of Yale University, Bloomberg, FactSet, Haver Analytics, Datastream/IBES, Morgan Stanley & Co., Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

### Are Valuations Likely to Boost or Drag Down Returns?

Return forecasts are not simply a matter of projecting what companies are likely to earn and return to investors, but also whether the pricing, or valuation, of that cash flow is attractive or unattractive in a historical context. We focus on two measures of valuation appropriate to a multiyear horizon: cyclically adjusted price/earnings (CAPE) multiples, which compare market price levels to the average real earnings generated over the course of a business cycle, and the equity risk premium, which compares the yield generated by an equity position to the yield of a comparable fixed income substitute. We believe that, by combining these two measures of valuation rather than relying on either individually, we can evaluate equity valuations both in absolute terms compared to their own history and on a relative basis versus bonds, which could improve the accuracy of our forecasts.

First, we estimate valuation-driven returns based on the CAPE ratio. This metric attempts to smooth volatile swings in company earnings that can occur over the course of a business cycle and adjusts for inflation in order to gain a better picture of the true earnings potential of the equity market, in aggregate, and how much investors are paying for it. Popularized by Yale University professor Robert Shiller, a version of the CAPE ratio that employs a 10-year average to smooth earnings has exhibited a negative historical correlation to average equity returns over the long term.<sup>1</sup>



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The theory behind this relationship is that more expensive CAPE ratios imply lower average future returns.

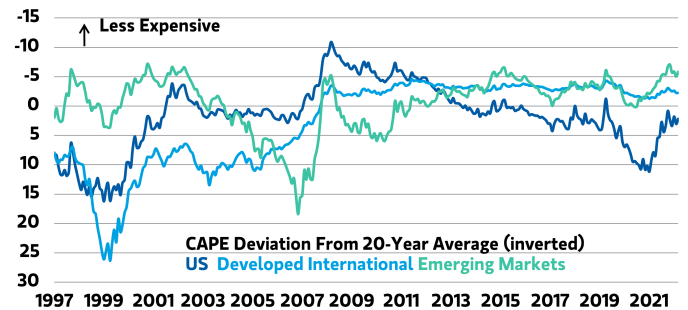
We use this observation as a baseline for our methodology. Because the recent rate of earnings growth does not necessarily reflect our expectations for the next seven years, we believe it is more appropriate to utilize the CAPE ratio to estimate how much of the return may come from changes in valuation alone. Our work suggests that equity multiples demonstrate some level of mean reversion over the seven-year strategic horizon. Historically, expansion and contraction in multiples have been associated with initial valuations: When equities are purchased at unusually cheap or expensive levels—as measured by a CAPE ratio with a trailing seven-year cyclical adjustment—they tend to rise or fall over the next seven years. As in previous years, we use a trailing 10-year cyclical adjustment for emerging markets and European equities, which we believe appropriately normalizes for their earnings potential.

We also adjust our methodology for Japanese equities. In the late 1980s, speculative activity in Japan drove valuations to extremes, only to be followed by decades of deflationary concerns and economic stagnation. Our analysis suggests that trailing price/earnings (P/E) ratios provide a better estimate of mean reversion than forward multiples and better correspond to our view that Japan's changes in corporate governance and shareholder-positive corporate management have ushered in a new reality, distinct from historical context.

As of our forecast date of Feb. 28, 2023, and for the seven-year horizon, CAPE ratios suggest that US equity returns are likely to shrink modestly due to contraction of multiples, while developed international and emerging markets are likely to rise slightly due to multiples expansion (see Exhibit 17).

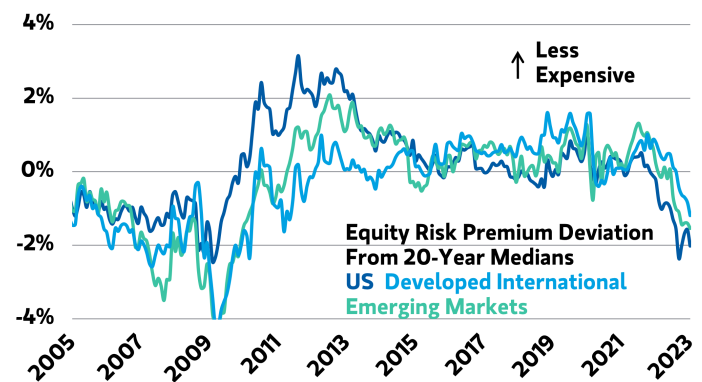
The equity risk premium component of our valuation analysis measures the incremental compensation investors require to hold stocks. We measure this premium by comparing the earnings yield generated by an equity position to the yield of corporate bonds, which is driven by similar fundamentals but offers additional levels of security in the form of fixed payments and a superior standing in the capital structure. A higher equity risk premium suggests that equities are inexpensive relative to bonds, as they offer a relatively high degree of compensation for bearing equity risk. Equity risk premiums decreased sharply in the US due to rising yields. Equity risk premiums also decreased among international developed and emerging markets (see Exhibit 18). The equity risk premium suggests that US equities multiples will face significant contraction, while developed international and emerging markets multiples may face more modest contraction.

**Exhibit 17: Based on CAPE, Developed International and Emerging Markets Appear Less Expensive Than US**



Note: CAPE uses a trailing seven-year time period, except in the case of EM and Europe. We show the trailing seven-year CAPE for Japan for comparability purposes, although we use trailing P/E for calculating our return estimates. Source: Robert J. Shiller of Yale University, Bloomberg, FactSet, Haver Analytics, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

**Exhibit 18: Equity Risk Premiums Have Narrowed Significantly**



Source: Bloomberg, FactSet, Haver Analytics, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

Over the seven-year strategic horizon, we expect global interest rates will continue to rise modestly from current levels. We also expect global inflation to remain at higher average levels over the strategic horizon than it did during the preceding decade. During the next seven years, we expect modestly higher rates, at levels consistent with our estimates of growth and inflation. Accordingly, we forecast that the 10-year government yield will rise to 4.2% in the US, 3.2% in Germany, 4.5% in the UK, 3.4% in Canada and 1.0% in Japan.

Assuming we realize these yield targets, investment grade corporate spreads return to historical medians and equity risk premiums revert to their historical medians from current elevated levels, we then calculate the implied future earnings yields associated with each equity region. This methodology allows us to estimate the impact of changing valuations on the return for each region. Similar to last year, we include an adjustment for our anticipated emerging market spreads, using a weighted average between median emerging market

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spreads and median international spreads rather than solely the historical median for emerging markets. This change reflects the continuing structural improvements made in these markets.

Consistent with last year, we apply a 50% haircut to the impact of changing valuations on returns from both CAPE and the equity risk premium for all equity asset classes. We apply this reduction based on the possibility that the natural interest rate will remain lower than the decades preceding the Global Financial Crisis. The natural interest rate has historically provided a guide to the maximum policy rate in late cycles and coincided with top-of-cycle levels for longer-term yields. As part of its Summary of Economic Projections from its March 22 meeting, the Fed reported a median long-term policy rate of 2.50%, with expectations ranging from 2.25% to 3.625%. Despite an increase since 2022, this level falls below the pre-2008 historical implied rate of approximately 5.0%. This movement suggests that equity valuations could stay above long-term historical levels.

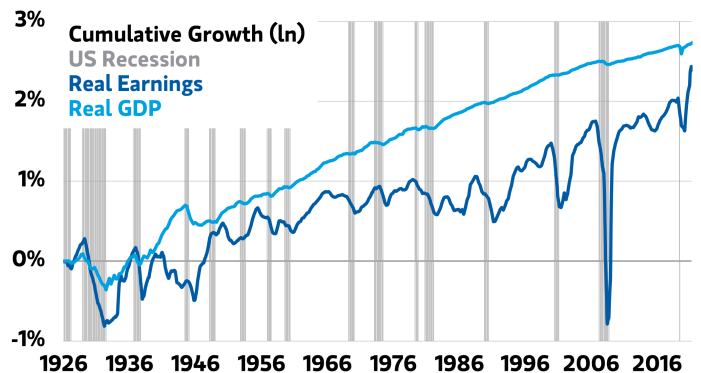
### What Is the Likely Economic Path?

The final component to equity return projections is the likely path of the economy, as it has a strong impact on the ability of companies to grow their earnings. We begin with Organization for Economic Cooperation and Development (OECD) estimates of real GDP growth for the next seven years. We believe real GDP growth provides a good baseline for the rate of index-level real earnings growth, as consumption and production, which constitute the lion's share of GDP growth, are closely related to index-level revenue values.

We include several refinements for smaller companies and for growth and value equities. We adjust our growth estimates for US mid- and small-cap equities relative to their large-cap counterparts according to their realized seven-year earnings growth premiums. We also incorporate a similar adjustment to account for the differences in US growth and value equities.

Nearly three years removed from the official end of the COVID-induced recession, the possibility of a recession occurring over the strategic horizon has risen significantly in response to the delayed economic impact of tighter global monetary policy. Consistent with the historical median level for all periods since 1970, we apply a multiplier to GDP growth of 1.1x when computing corporate earnings growth (See Exhibit 19).

### Exhibit 19: Earnings Growth Tends to Exceed GDP Growth Following Recessions



Source: FactSet, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

### How May We Account for Inflation Expectations?

The level of inflation serves as an important determinant of nominal equity returns. Inflation expectations are embedded in our shareholder yield component, which we have expressed in nominal terms. When necessary to convert between nominal and real forecast values, we consider market-based inflation breakeven rates. Inflation breakevens compare yields on nominal government bonds to liquid inflation-linked government securities, which pay investors a fixed rate of interest on a par value that increases in line with headline inflation. By subtracting the real yield of the inflation-linked bond from the nominal bond, we find the implied inflation rate for the time period associated with the maturity of the underlying bonds. To match the seven-year strategic forecast horizon, we focus on inflation breakevens for bonds set to mature in seven years, based on data availability.<sup>2</sup> These implied inflation rates suggest that levels of inflation expectations for the strategic horizon have increased moderately from last year's levels.

### Fixed Income: Our Strategic Methodology

To compute our forecasts for fixed income returns over the strategic horizon, we first estimate returns based on current yields and effect of the anticipated yield "roll down". We then adjust these preliminary returns downward to account for the likelihood of rising rates and mean-reverting credit spreads, along with potential credit losses (see Exhibit 20). Our methodology leverages the work of Andrew Sheets, Morgan Stanley & Co.'s chief cross-asset strategist and a member of the GIC.<sup>3</sup>

**Exhibit 20: We Adjust Fixed Income Returns by Considering Their Marginal Drivers**

	Starting Yield	Return From Roll Down	Default Loss	Impact of Yields/Spreads Changed	Total (%)
10-Yr. US Treasury	4.1	0.2	0.0	-0.6	3.7
US Aggregate	4.8	0.1	0.0	-0.1	4.8
Global High Yield	8.6	0.0	-2.0	0.5	7.1
International Agg.	3.0	0.2	0.0	-0.2	2.9
Emg. Mkt. Credit*	7.9	0.1	-0.9	0.6	7.8
Global Aggregate	3.8	0.2	-0.1	-0.1	3.8

Note: The Asset classes are represented by the following indexes in order of appearance: Bloomberg US Treasury: 10-20 Year Index; Bloomberg US Aggregate Index; Bloomberg Global Corporate High Yield Index; Bloomberg Global Aggregate Non-USD (Hedged) Index; JPMorgan EMBI Global; and Bloomberg Global Aggregate Index. \*Emerging Market Credit is US dollar-denominated.

Source: Bloomberg, Moody's, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

**Initial Yield and Roll Down**

Our approach uses the current yield on each index to set a baseline for fixed income returns. Historically, the yield at which investors have purchased fixed income instruments has been a strong predictor, explaining more than 90% of variability in forward returns over a multiyear horizon.<sup>3</sup> Given its strong relationship to returns, we use current yield as the first component, to which we add effects from roll down, default loss and impact of changes in yields and spreads to form our estimates of the strategic returns.

In addition to the yield, changes in a fixed income security's market value account for the rest of the return to investors. A bond's roll down is one relatively predictable component of expected changes in market value. Generally, yield curves are upward sloping—a phenomenon associated with additional compensation for the higher uncertainty associated with longer time horizons. As time passes, longer-maturity bonds roll down the curve, growing closer to their maturity date and effectively becoming shorter-maturity bonds. As dictated by the typically upward-sloping yield curve, this roll down entails price appreciation as yields decline. The magnitude of

appreciation differs according to different indexes' specific yield curves. We interpolate the return from roll down for each index using its average maturity and the current shape of its yield curve.

**Allowances for Rising Rates and Wider Credit Spreads**

Fixed income instruments benefitted from a nearly 40-year secular bull market, culminating in rates falling to historical lows during the COVID-19 lockdown in March 2020. As we have seen in 2022, rates are conversely subject to significant upward pressure as growth and inflation normalize. We must account for the change in price that the expected change in rates over the strategic horizon would imply. Last year, we forecasted that rates would rise across most fixed income markets over the strategic horizon. However, given the significant increase in rates since last year, our expectations for rates to rise or fall from current levels now varies across different fixed income categories.

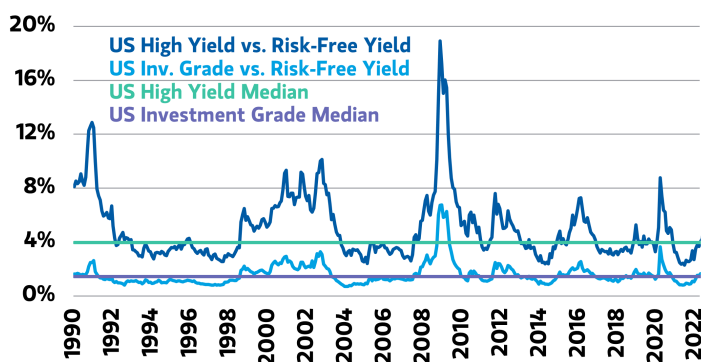
As in recent years, we utilize a broader range of interest rate forecasts to incorporate region-specific factors into our estimates. Given the likelihood of a multiyear upturn in interest rates, we generate seven-year forecasts based on our long-run estimates for fair-value interest rates across various regions. Historically, secular trends in interest rates have occurred over a multicycle horizon. Accordingly, we expect only partial progress toward our long-run target over a seven-year strategic horizon. We forecast that the 10-year government yield will rise to 4.2% in the US, 3.2% in Germany, 4.5% in the UK, 3.4% in Canada and 1.0% in Japan. These forecasts also feed into our expected equity risk premium methodology.

Given our seven-year horizon, which equates to the average length of a business cycle, we make no assumptions about changes in the shape of the yield curve because they tend to average out over the course of a cycle. Instead, we assume a parallel upward shift in the curve for all fixed income instruments and adjust for duration, or interest rate sensitivity, to estimate the impact on returns for each fixed income asset class. As such, our analysis shows that long-duration bonds are most affected.

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We also incorporate the impact of potentially changing credit spreads on credit-sensitive fixed income asset classes. In line with our equity risk premium methodology, we assume corporate bond spreads will revert to their 20-year medians in each region relative to their government benchmark (see Exhibit 19). Similar to last year, we incorporate an adjustment for anticipated spreads in emerging markets using a weighted average between median emerging market spreads and median international spreads in order to account for structural improvements in these markets and the strength of the underlying issuers. Bonds of lower credit quality, especially those with longer duration, are the most affected.

### Exhibit 21: Credit Spreads Have Risen to Median Levels



Source: Morgan Stanley Wealth Management GIC, Bloomberg as of Feb. 28, 2023

### Allowances for Default Loss

Fixed income securities may also be subject to losses associated with default. This risk is especially important for bonds with lower credit ratings, such as high yield bonds or debt issued by emerging market countries.

The relationship between default losses and the time to maturity varies depending on the credit rating of the bond. Investment grade bonds generally face higher risk of default loss as the maturity of the bond grows closer, as the issuers are likely to grow larger and take on greater risks as time passes from their bond issuance.

High yield bonds, on the other hand, generally face lower risk of default loss as time goes on. These riskier, generally newer companies face the highest default risk in the first few years, suggesting that those companies that succeed in making it past the first few years are likely able to sustain or even improve their credit quality.

Accordingly, we adjust our forecasts based on the historical default losses associated with bonds of similar credit ratings and times to maturity.

### Ultrashort Fixed Income

We base our strategic ultrashort fixed income return forecast on the market-implied expected return of the three-month US Treasury bill for the next seven years. We derive this figure from the prices of a set of instruments, including the on-the-run three-month T-bill and a selection of longer-term swaps (T-bill versus three-month interbank rates) up to a maturity of seven years. Due to tightening Fed policy, short-term rates have risen significantly, increasing this year's return forecast to 3.7%, from 1.6% for 2022.

### Inflation-Linked Securities

We forecast strategic returns for inflation-linked securities by adding the real yield associated with global inflation-linked securities to the same inflation breakeven measures used in our equity forecasts, weighting each country's breakeven according to the country's respective weight in the Bloomberg Global Inflation-Linked Index.<sup>4</sup> We expect a return of 3.7% this year, as global inflation expectations have risen significantly, alongside higher real rates in the major developed regions.

## Alternatives: Our Strategic Methodology

### Global REITs

We estimate the return on global real estate investment trusts (REITs) using a similar methodology as that for equities. For the earnings payout contribution to return, we examine what these securities have paid out via dividends and share repurchases in the past 10 years. We take into account their current valuations by using the CAPE ratio to project forward multiples expansion and acknowledge the impact of our forecast for higher interest rates and mean-reverting credit spreads via the equity risk premium. We use the same earnings growth forecast as for global equities. By our estimates, we expect global REITs to deliver an annualized 4.0% return over the seven-year horizon.

### Energy Infrastructure/MLPs

Our strategic forecast for energy infrastructure/master limited partnerships (MLPs) also uses a methodology similar to that used for equities. For the earnings payout contribution to return, we balance the high yield associated with these securities against their historical reliance on equity issuance as a form of funding, computing the implied nominal shareholder yield over a 10-year window. Their valuations remain low relative to history both on a CAPE ratio and equity risk premium basis. This leads to our projection for modest expansion of valuation multiples over the strategic horizon.

## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Our earnings growth forecast, however, differs from our equity methodology. For energy infrastructure/MLPs, volume growth acts as the fundamental driver of earnings growth; therefore, we base our estimates on the projected seven-year production growth for crude and natural gas from the US Energy Information Administration. Overall, this approach leads to a forecast return of 7.5%.

### Commodities

We estimate the return to commodities based on the three sources of returns of commodity futures: changes in the spot price of commodities, the yield from collateral set aside by investors and the appreciation or depreciation from rolling along the futures curve. We assume that the spot price will appreciate with expected inflation and expect collateral set aside for commodities futures trading to deliver a return in line with our ultrashort fixed income estimate. Finally, we estimate the roll yield from the historical return from the Bloomberg Roll Select Commodities Index.

We believe this framework is appropriate for a seven-year horizon, which leads to an estimated annualized return of 5.0% over this period.

### Hedged Strategies and Managed Futures

In some important ways, Hedged strategies themselves do not represent distinct asset classes. More precisely, they are investment strategies that have historically shown an ability to deliver returns in a manner that provides diversification relative to stock and bond holdings within portfolios by leveraging exposure to traditional asset classes.

To develop return assumptions, we deconstruct historical returns into their fundamental sources. We use betas to stock and bond markets to determine return forecasts consistent with our estimates of these traditional asset classes and then add the alpha component to reflect these strategies' security selection skill, in proportions consistent with recent history.

When we consider the performance of alternative investment strategies broadly, we face difficulties that are not present with traditional asset classes. Private indexes designed to track the performance of funds following these strategies rely on independent investment managers to report their own performance, which can impart selection and survivorship bias from selective disclosures of existing and now-extinct funds. Furthermore, managers of hedged strategies often hold less liquid securities; as such, reported returns appear excessively smoothed due to lagging price discovery. We use statistical methods to mitigate these effects and establish estimated returns as closely aligned with the underlying economics as possible.

### Private Equity, Private Debt and Private Real Estate

Private equity, private debt and private real estate have also earned a reputation for delivering strong returns in a manner uncorrelated with traditional asset classes. Due to their illiquidity and the lack of published high-frequency return data, however, their performance can also be difficult to measure at an index level.

To forecast returns for these illiquid asset classes, we add an expected illiquidity premium to our forecast returns for a corresponding liquid asset class: for private equity, US mid- and small-cap equities; for private debt, US high yield bonds; and for private real estate, REITs. We determined the expected illiquidity premiums by studying the historical spreads between the illiquid asset classes and their corresponding liquid asset classes. We source long-term private investment returns data from Cambridge Associates. Additionally, we obtained public market equivalent (PME) returns specific to each private investment category. The use of PME returns allows for more consistent comparisons between private and public investment performance when estimating illiquidity premiums. Based on this historical data, we calculated the long-term historical illiquidity premium for each private investment category. We then scaled the historical long-run illiquidity premium for private equity and private debt to be 75% of the long-term average. This adjustment reflects our analysis whereby we determined that illiquidity premiums have moved widely over time but have exhibited sensitivity to market valuation levels, the stage of the market cycle and other macroeconomic variables. We estimate these illiquidity premiums as follows: 1.0% for private real estate; 3.2% for private equity; and 2.5% for private debt. Overall, we expect an annualized return of 5.0% for private real estate, 8.1% for private equity and 9.3% for private debt.

### Secular Returns

In addition to our strategic return estimates, we also project returns over the secular horizon, which we consider to be 20-years or longer. As a primary guide for potential long-term returns, we use the real geometric average returns over a long history of market data for both global equities and bonds. We then add back a forward-looking forecast of inflation to estimate the long-term sustainable level. This year, we base our inflation forecast on an average of the market-implied US 20-year breakeven inflation rate (derived from yield differentials between nominal Treasuries and TIPS) and the Federal Reserve Bank of Cleveland's 20-year inflation expectations. This leads to an expected annualized inflation rate of 2.40% over the secular horizon.

In order to resolve limitations of data history for certain assets, we extend their return time series to the early 1970s with monthly index data by using appropriate proxies. These proxies facilitate calculating secular returns by extending the existing return series, providing a richer history of multiple interest rate and inflation regimes.

For equities, energy infrastructure/MLPs and REITs, we computed each asset class's returns by adding a long-term average real return for global equities, the asset class's historical return differential versus global equities over a common period and the 20-year expected inflation estimate.

For US, international and emerging market equities, we found that relative historical returns may not represent a reasonable picture of forward-looking returns. We therefore dampened the historical spread by 50% and 75% for US and international equities, respectively, to account for each region's significant outperformance or underperformance indicated by the common-period return history. US equities have produced gains that have outpaced all other developed markets since the 1970s, the start of our common-period sample for size-style combinations. Due to a stretch of deflation from the late 1990s through the 2010s, the Japanese economy and equity markets languished, making the common-period sample potentially unrepresentative of the secular horizon. Finally, emerging market equities demonstrated sizable outperformance at the outset of their common-period history, but their return profile has since converged somewhat toward developed markets as the underlying economies have matured.

For energy infrastructure/MLPs, the earliest return history showed remarkably positive spreads versus global equities, boosting the overall relative return value. Given changing dynamics with energy infrastructure/MLPs—particularly the propensity of management to finance growth from retained earnings—we believe that this asset class will perform in line with global equities over the secular horizon.

For fixed income asset classes, we followed a similar pattern as with US equities, substituting US government bonds for global equities.

Among commodities, hedged strategies and private investments, we employ similar methodologies to those used in our strategic estimates over the longest available horizon to provide secular return estimates for alternatives. For private equity, we anticipate the illiquidity premium returning to the long-term average, reasoning that today's environmental factors will exercise less influence over the 20-year horizon than the seven-year horizon.

## Volatility

Volatility measures the variability of returns around their average value and serves as one indicator of the risk associated with an investment. We compute average annualized volatility using historical monthly returns to estimate volatility for liquid asset classes. In 2020, we enhanced our calculation process by extending the return time series to the early 1970s for all asset classes in our taxonomy. We achieved this goal by using reasonable proxies for certain asset classes with data limitations where appropriate. Using long-term data mitigates the impact of specific regimes and business cycle stages that could skew our results. Moreover, longer return series provide a richer history of multiple interest rate and inflation regimes for the calculation of volatility, as well as for secular returns and correlations.

In 2021, we began to apply a “regime-weighted” approach to forecasting volatility that incorporates the GIC's forward-looking expectations for various macro regimes. We were motivated by the observation that the prevailing macro regime has exerted significant impact on the volatility and correlations of asset class returns, which may meaningfully impact asset allocation decisions. For instance, during periods of rising economic growth and inflation, fixed income's volatility and correlation to US equities have historically been significantly higher than in low-growth, low-inflation environments, as in the postcrisis period.

We first classified historical periods into one of four mutually exclusive regimes, based on long-term trends in GDP and inflation. We then calculated volatilities and correlations under each regime separately and computed a weighted average of these estimates based on probabilistic expectations of each regime occurring over the forecast horizon. To ensure sufficient representation of each regime state in our historical returns, we further extended the return time series for each asset class from the early 1970s to January 1946. For Japanese equities, we excluded the period from 1946 to 1955 since we believe the exceptional returns variability experienced during this period is not representative of prospective volatility for the asset class. For other asset classes for which data is not available to January 1946, we applied a statistical machine learning technique to impute the missing returns, based on relationships with available return series and other relevant macroeconomic data, such as bond yields, commodity prices, corporate earnings and inflation rates. In 2023, we enhanced both the input data and calibration of the machine learning technique used to impute missing returns, resulting in what we believe to be more realistic returns sequences for the 1946 to 1970 period. The enhancements resulted in moderately higher dispersion of returns for the imputed periods. The impact of these changes are most notable for fixed income and alternatives asset classes.

## Correlation

A critical factor in asset allocation is correlation, or the degree to which asset class returns move together. Correlations can vary considerably over different historical periods due to changes in macro regimes, market structure,

stages of the business cycle and multiple other factors. Consistent with our approach described above for estimating volatilities, we estimated correlations using a regime-weighted approach based on the GIC's expectations for future macro regimes and historical return series from January 1946. Please refer to Exhibit 25, starting on page 19.

## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

### Exhibit 22: New Strategic Weights for GIC Asset Allocation Models, Level 1

	WEALTH CONSERVATION	INCOME	BALANCED GROWTH	MARKET GROWTH	OPPORTUNISTIC GROWTH
<b>ULTRASHORT FIXED INCOME</b>	<b>15</b>	<b>9</b>	<b>6</b>	<b>3</b>	<b>1</b>
<b>EQUITIES</b>					
<b>US Equities</b>	9	12	15	23	28
US Large-Cap Growth	3	4	4	8	9
US Large-Cap Value	4	5	7	9	12
US Mid-Cap Growth				1	1
US Mid-Cap Value	1	1	1	2	2
US Small-Cap Growth		1	1	1	2
US Small-Cap Value	1	1	2	2	2
<b>International Equities</b>	8	12	14	19	23
European Equities	4	6	7	10	11
Japan Equities	3	5	6	7	9
Asia Pacific ex Japan Equities	1	1	1	2	3
<b>Emerging &amp; Frontier Market Equities</b>	3	4	4	6	7
<b>TOTAL EQUITIES</b>	<b>20</b>	<b>28</b>	<b>33</b>	<b>48</b>	<b>58</b>
<b>Total US Equities</b>	9	12	15	23	28
<b>Total International Equities</b>	8	12	14	19	23
<b>Total Emerging &amp; Frontier Market Equities</b>	3	4	4	6	7
<b>FIXED INCOME &amp; PREFERRED</b>					
Short-Term Fixed Income	27	23	16	8	3
US Taxable Fixed Income	21	17	19	12	9
International Fixed Income					
Inflation-Linked Securities	1	1	1	1	1
High Yield Fixed Income	1	2	2	2	2
Emerging Market Fixed Income	1	1	1	1	1
<b>TOTAL FIXED INCOME</b>	<b>51</b>	<b>44</b>	<b>39</b>	<b>24</b>	<b>16</b>
<b>ALTERNATIVES</b>					
<b>Real Assets</b>	4	4	6	6	6
Real Estate/REITS	1	1	1	1	1
Commodities	2	2	3	3	3
Energy Infrastructure/MLPs	1	1	2	2	2
<b>Absolute Return Assets</b>	4	6	5	5	5
<b>Equity Hedge Assets</b>	5	6	8	8	8
<b>Equity Return Assets</b>	1	3	3	6	6
<b>Private Investments</b>					
Private Real Estate					
Private Equity					
Private Credit					
<b>TOTAL ALTERNATIVE INVESTMENTS</b>	<b>14</b>	<b>19</b>	<b>22</b>	<b>25</b>	<b>25</b>

Source: Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

Note: Strategic allocations effective Apr. 1, 2023, for investors with less than \$25 million in investable assets.



## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

### Exhibit 23: New Strategic Weights for GIC Asset Allocation Models, Level 2

	WEALTH CONSERVATION	INCOME	BALANCED GROWTH	MARKET GROWTH	OPPORTUNISTIC GROWTH
<b>ULTRASHORT FIXED INCOME</b>	<b>15</b>	<b>8</b>	<b>6</b>	<b>2</b>	<b>1</b>
<b>EQUITIES</b>					
<b>US Equities</b>	7	9	14	21	26
US Large-Cap Growth	2	3	4	6	8
US Large-Cap Value	3	4	6	10	11
US Mid-Cap Growth			1	1	1
US Mid-Cap Value	1	1	1	1	2
US Small-Cap Growth			1	1	2
US Small-Cap Value	1	1	1	2	2
<b>International Equities</b>	9	10	14	18	21
European Equities	5	5	7	9	11
Japan Equities	3	4	6	7	7
Asia Pacific ex Japan Equities	1	1	1	2	3
<b>Emerging &amp; Frontier Market Equities</b>	2	3	4	6	7
<b>TOTAL EQUITIES</b>	<b>18</b>	<b>22</b>	<b>32</b>	<b>45</b>	<b>54</b>
<b>Total US Equities</b>	7	9	14	21	26
<b>Total International Equities</b>	9	10	14	18	21
<b>Total Emerging &amp; Frontier Market Equities</b>	2	3	4	6	7
<b>FIXED INCOME &amp; PREFERRED</b>					
Short-Term Fixed Income	26	20	13	7	3
US Taxable Fixed Income	20	18	15	11	6
International Fixed Income					
Inflation-Linked Securities	1	1	1	1	1
High Yield Fixed Income	1	2	2	2	1
Emerging Market Fixed Income	1	1	1	1	1
<b>TOTAL FIXED INCOME</b>	<b>49</b>	<b>42</b>	<b>32</b>	<b>22</b>	<b>12</b>
<b>ALTERNATIVES</b>					
<b>Real Assets</b>	3	4	4	4	5
Real Estate/REITS	1	1	1	1	1
Commodities	1	2	2	2	2
Energy Infrastructure/MLPs	1	1	1	1	2
<b>Absolute Return Assets</b>	2	4	3	2	3
<b>Equity Hedge Assets</b>	4	6	7	8	6
<b>Equity Return Assets</b>	1	1	2	3	4
<b>Private Investments</b>	8	13	14	14	15
Private Real Estate	3	4	4	4	4
Private Equity	2	4	4	6	6
Private Credit	3	5	6	4	5
<b>TOTAL ALTERNATIVE INVESTMENTS</b>	<b>18</b>	<b>28</b>	<b>30</b>	<b>31</b>	<b>33</b>

Source: Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

Note: Strategic allocations effective Apr. 1, 2023, for investors with more than \$25 million in investable assets.

## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

### Exhibit 24: Strategic and Secular Return and Volatility Estimates

	STRATEGIC (SEVEN-YEAR) ESTIMATES FOR 2023		SECULAR (20-YEAR) ESTIMATES FOR 2023	
	Annualized Return	Annualized Volatility	Annualized Return	Annualized Volatility
<b>ULTRASHORT FIXED INCOME</b>	<b>3.7</b>	<b>0.8</b>	<b>3.1</b>	<b>0.8</b>
<b>EQUITIES</b>	<b>5.2</b>	<b>13.4</b>	<b>8.0</b>	<b>13.4</b>
<b>US Equities</b>	4.4	14.9	8.3	14.9
US Large-Cap Growth	4.2	16.1	8.2	16.1
US Large-Cap Value	5.5	14.4	8.3	14.4
US Mid-Cap Growth	3.9	17.8	8.4	17.8
US Mid-Cap Value	5.7	15.6	8.7	15.6
US Small-Cap Growth	4.6	21.8	7.1	21.8
US Small-Cap Value	7.5	19.1	8.5	19.1
<b>International Equities</b>	5.2	15.4	7.2	15.4
European Equities	4.9	15.7	7.1	15.7
Japan Equities	4.8	20.2	6.9	20.2
Asia Pacific ex Japan Equities	7.0	19.8	7.2	19.8
<b>Emerging &amp; Frontier Market Equities</b>	7.8	19.3	8.4	19.3
<b>FIXED INCOME &amp; PREFERRED</b>	<b>4.8</b>	<b>5.2</b>	<b>3.8</b>	<b>5.2</b>
Short-Term Fixed Income	4.8	2.2	3.5	2.2
US Taxable Fixed Income	4.8	5.2	3.8	5.2
International Fixed Income	2.9	5.1	3.6	5.1
Inflation-Linked Securities	3.7	9.7	4.6	9.7
High Yield Fixed Income	7.1	8.3	5.4	8.3
Emerging Market Fixed Income	7.8	9.2	6.7	9.2
<b>ALTERNATIVES</b>	<b>6.5</b>	<b>8.0</b>	<b>6.2</b>	<b>8.0</b>
<b>Real Assets</b>	5.5	12.3	6.1	12.3
Real Estate/REITS	4.0	16.0	6.4	16.0
Commodities	5.0	15.3	4.3	15.3
Energy Infrastructure/MLPs	7.5	17.6	7.5	17.6
<b>Absolute Return Assets</b>	6.0	5.1	5.2	5.1
<b>Equity Hedge Assets</b>	6.6	9.0	6.0	9.0
<b>Equity Return Assets</b>	6.3	8.8	7.2	8.8
<b>Private Investments</b>	6.5	15.5	10.1	15.5
Private Real Estate	5.0	16.7	7.4	16.7
Private Equity	8.1	16.2	12.9	16.2
Private Credit	9.3	10.4	8.8	10.4

Source: Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

Note: We represented ultrashort fixed income represented by 90-day T-bills, fixed income & preferreds by Bloomberg US Aggregate Index, short-term fixed income by Bloomberg Aggregate 1-3 Year Index, US taxable fixed income by Bloomberg US Aggregate Index, international fixed income by Barclays Global Aggregate Non-USD (Hedged) Index, inflation-linked securities by Bloomberg Global Inflation-Linked Index, high yield fixed income by Barclays Global High Yield Corporate Index and emerging market fixed income by JP Morgan EMBI Global Index. All other are based on proprietary models. Strategic annualized return and volatility estimates are based on a seven-year time horizon. Secular annualized return and volatility estimates are based on a 20-year time horizon. Annualized volatility estimates are based on data with longest available history through Feb. 28, 2023. Estimates are for illustrative purposes only, are based on proprietary models and are not indicative of the future performance of any specific investment, index or asset class. Actual performance may be more or less than the estimates shown in this table. Estimates of future performance are based on assumptions that may not be realized. Investor appropriateness: Morgan Stanley Wealth Management recommends that investors independently evaluate each asset class, investment style, issuer, security, instrument or strategy discussed. Legal, accounting and tax restrictions, transaction costs and changes to any assumptions may significantly affect the economics and results of any investment. Investors should consult their own tax, legal or other advisors to determine appropriateness for their specific circumstances. Investments in private funds (including hedge funds, managed futures funds and private equity funds) are speculative and include a high degree of risk.

## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

### Exhibit 25: Correlation Matrix

CORRELATION MATRIX	1	2	3	4	5	6	7	8	9	10	11
1 Ultrashort Fixed Income	1.00	-0.01	-0.01	-0.01	0.00	-0.01	-0.02	-0.02	-0.02	-0.01	0.00
2 Equities	-0.01	1.00	0.88	0.86	0.86	0.83	0.84	0.76	0.75	0.87	0.84
3 US Equities	-0.01	0.88	1.00	0.98	0.97	0.94	0.95	0.86	0.85	0.58	0.60
4 US Large-Cap Growth	-0.01	0.86	0.98	1.00	0.90	0.95	0.88	0.85	0.78	0.55	0.57
5 US Large-Cap Value	0.00	0.86	0.97	0.90	1.00	0.87	0.96	0.80	0.86	0.57	0.59
6 US Mid-Cap Growth	-0.01	0.83	0.94	0.95	0.87	1.00	0.90	0.92	0.84	0.55	0.57
7 US Mid-Cap Value	-0.02	0.84	0.95	0.88	0.96	0.90	1.00	0.86	0.91	0.56	0.58
8 US Small-Cap Growth	-0.02	0.76	0.86	0.85	0.80	0.92	0.86	1.00	0.93	0.51	0.52
9 US Small-Cap Value	-0.02	0.75	0.85	0.78	0.86	0.84	0.91	0.93	1.00	0.51	0.51
10 International Equities	-0.01	0.87	0.58	0.55	0.57	0.55	0.56	0.51	0.51	1.00	0.91
11 European Equities	0.00	0.84	0.60	0.57	0.59	0.57	0.58	0.52	0.51	0.91	1.00
12 Japan Equities	0.00	0.62	0.33	0.31	0.31	0.31	0.30	0.28	0.26	0.80	0.52
13 Asia Pacific ex Japan Equities	-0.03	0.75	0.62	0.59	0.61	0.61	0.62	0.57	0.56	0.73	0.70
14 Emerging & Frontier Market Equities	-0.05	0.69	0.54	0.52	0.53	0.56	0.53	0.53	0.51	0.67	0.64
15 Fixed Income & Preferreds	0.15	0.21	0.22	0.21	0.22	0.19	0.23	0.14	0.17	0.15	0.15
16 Short-Term Fixed Income	0.38	0.14	0.14	0.13	0.15	0.12	0.15	0.07	0.11	0.10	0.11
17 US Taxable Fixed Income	0.15	0.21	0.22	0.21	0.22	0.19	0.23	0.14	0.17	0.15	0.15
18 International Fixed Income	0.13	0.11	0.15	0.13	0.16	0.14	0.17	0.14	0.19	0.02	0.02
19 Inflation-Linked Securities	-0.01	0.12	0.14	0.14	0.13	0.12	0.14	0.08	0.08	0.07	0.07
20 High Yield Fixed Income	0.02	0.62	0.62	0.58	0.62	0.61	0.66	0.58	0.62	0.48	0.50
21 Emerging Market Fixed Income	0.04	0.47	0.46	0.44	0.46	0.46	0.47	0.42	0.43	0.33	0.33
22 Alternatives	0.06	0.80	0.89	0.87	0.85	0.88	0.85	0.84	0.80	0.54	0.55
23 Real Assets	-0.03	0.68	0.69	0.62	0.71	0.67	0.77	0.68	0.75	0.52	0.52
24 REITs	-0.01	0.71	0.74	0.68	0.77	0.72	0.82	0.73	0.81	0.52	0.53
25 Commodities	0.00	0.22	0.15	0.13	0.16	0.16	0.19	0.16	0.16	0.24	0.21
26 Energy Infrastructure/MLPs	-0.04	0.62	0.69	0.63	0.71	0.66	0.75	0.68	0.75	0.42	0.42
27 Absolute Return Assets	0.07	0.67	0.69	0.64	0.70	0.66	0.72	0.65	0.68	0.51	0.51
28 Equity Hedge Assets	0.04	0.40	0.48	0.46	0.49	0.46	0.49	0.43	0.45	0.22	0.21
29 Equity Return Assets	0.05	0.82	0.89	0.86	0.86	0.88	0.86	0.85	0.82	0.57	0.58
30 Private Investments	-0.03	0.51	0.60	0.57	0.60	0.58	0.63	0.63	0.66	0.30	0.30
31 Private Real Estate	-0.06	0.39	0.46	0.42	0.48	0.44	0.50	0.48	0.54	0.22	0.21
32 Private Equity	-0.03	0.56	0.67	0.64	0.66	0.65	0.68	0.68	0.69	0.34	0.34
33 Private Debt	-0.02	0.36	0.40	0.36	0.42	0.38	0.44	0.38	0.43	0.22	0.23

Source: Bloomberg, Datastream, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

Note: Above is based on returns from the mid-1940s through February 2023. Correlation is a statistical method of measuring the strength of a linear relationship between two variables. The correlation between two variables can assume any value from -1.00 to +1.00, inclusive. Past performance is not indicative of future results. We apply significant statistical adjustments to correct for distortions typically associated with index returns for hedge funds, private equity and private real estate. Correlation assumptions are the same for the strategic and secular horizons.

## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

### Exhibit 25: Correlation Matrix (continued)

CORRELATION MATRIX	12	13	14	15	16	17	18	19	20	21	22
1 Ultrashort Fixed Income	0.00	-0.03	-0.05	0.15	0.38	0.15	0.13	-0.01	0.02	0.04	0.06
2 Equities	0.62	0.75	0.69	0.21	0.14	0.21	0.11	0.12	0.62	0.47	0.80
3 US Equities	0.33	0.62	0.54	0.22	0.14	0.22	0.15	0.14	0.62	0.46	0.89
4 US Large-Cap Growth	0.31	0.59	0.52	0.21	0.13	0.21	0.13	0.14	0.58	0.44	0.87
5 US Large-Cap Value	0.31	0.61	0.53	0.22	0.15	0.22	0.16	0.13	0.62	0.46	0.85
6 US Mid-Cap Growth	0.31	0.61	0.56	0.19	0.12	0.19	0.14	0.12	0.61	0.46	0.88
7 US Mid-Cap Value	0.30	0.62	0.53	0.23	0.15	0.23	0.17	0.14	0.66	0.47	0.85
8 US Small-Cap Growth	0.28	0.57	0.53	0.14	0.07	0.14	0.14	0.08	0.58	0.42	0.84
9 US Small-Cap Value	0.26	0.56	0.51	0.17	0.11	0.17	0.19	0.08	0.62	0.43	0.80
10 International Equities	0.80	0.73	0.67	0.15	0.10	0.15	0.02	0.07	0.48	0.33	0.54
11 European Equities	0.52	0.70	0.64	0.15	0.11	0.15	0.02	0.07	0.50	0.33	0.55
12 Japan Equities	1.00	0.47	0.44	0.10	0.07	0.10	-0.01	0.04	0.25	0.19	0.31
13 Asia Pacific ex Japan Equities	0.47	1.00	0.72	0.10	0.04	0.10	0.02	0.03	0.49	0.39	0.61
14 Emerging & Frontier Market Equities	0.44	0.72	1.00	0.04	-0.02	0.04	0.02	0.00	0.45	0.46	0.58
15 Fixed Income & Preferreds	0.10	0.10	0.04	1.00	0.84	1.00	0.60	0.58	0.43	0.43	0.22
16 Short-Term Fixed Income	0.07	0.04	-0.02	0.84	1.00	0.84	0.41	0.52	0.39	0.28	0.16
17 US Taxable Fixed Income	0.10	0.10	0.04	1.00	0.84	1.00	0.60	0.58	0.43	0.43	0.22
18 International Fixed Income	-0.01	0.02	0.02	0.60	0.41	0.60	1.00	0.26	0.26	0.60	0.20
19 Inflation-Linked Securities	0.04	0.03	0.00	0.58	0.52	0.58	0.26	1.00	0.31	0.23	0.12
20 High Yield Fixed Income	0.25	0.49	0.45	0.43	0.39	0.43	0.26	0.31	1.00	0.54	0.62
21 Emerging Market Fixed Income	0.19	0.39	0.46	0.43	0.28	0.43	0.60	0.23	0.54	1.00	0.51
22 Alternatives	0.31	0.61	0.58	0.22	0.16	0.22	0.20	0.12	0.62	0.51	1.00
23 Real Assets	0.28	0.59	0.53	0.20	0.15	0.20	0.16	0.11	0.62	0.47	0.69
24 REITs	0.28	0.57	0.51	0.30	0.22	0.30	0.26	0.15	0.68	0.52	0.71
25 Commodities	0.14	0.26	0.23	-0.07	-0.04	-0.07	-0.10	0.01	0.15	0.12	0.20
26 Energy Infrastructure/MLPs	0.21	0.50	0.45	0.23	0.18	0.23	0.21	0.11	0.63	0.45	0.69
27 Absolute Return Assets	0.29	0.53	0.46	0.37	0.34	0.37	0.22	0.24	0.82	0.47	0.80
28 Equity Hedge Assets	0.10	0.31	0.24	0.23	0.21	0.23	0.25	0.15	0.37	0.31	0.57
29 Equity Return Assets	0.33	0.63	0.61	0.18	0.13	0.18	0.12	0.10	0.63	0.46	0.98
30 Private Investments	0.15	0.36	0.29	0.17	0.11	0.17	0.16	0.05	0.38	0.23	0.62
31 Private Real Estate	0.10	0.27	0.22	0.17	0.12	0.17	0.18	0.06	0.32	0.21	0.47
32 Private Equity	0.18	0.41	0.32	0.13	0.07	0.13	0.13	0.05	0.40	0.24	0.68
33 Private Debt	0.11	0.25	0.22	0.18	0.18	0.18	0.14	0.15	0.53	0.24	0.45

Source: Bloomberg, Datastream, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

Note: Above is based on returns from the mid-1940s through February 2023. Correlation is a statistical method of measuring the strength of a linear relationship between two variables. The correlation between two variables can assume any value from -1.00 to +1.00, inclusive. Past performance is not indicative of future results. We apply significant statistical adjustments to correct for distortions typically associated with index returns for hedge funds, private equity and private real estate. Correlation assumptions are the same for the strategic and secular horizons.

## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

### Exhibit 25: Correlation Matrix (continued)

CORRELATION MATRIX	23	24	25	26	27	28	29	30	31	32	33
1 Ultrashort Fixed Income	-0.03	-0.01	0.00	-0.04	0.07	0.04	0.05	-0.03	-0.06	-0.03	-0.02
2 Equities	0.68	0.71	0.22	0.62	0.67	0.40	0.82	0.51	0.39	0.56	0.36
3 US Equities	0.69	0.74	0.15	0.69	0.69	0.48	0.89	0.60	0.46	0.67	0.40
4 US Large-Cap Growth	0.62	0.68	0.13	0.63	0.64	0.46	0.86	0.57	0.42	0.64	0.36
5 US Large-Cap Value	0.71	0.77	0.16	0.71	0.70	0.49	0.86	0.60	0.48	0.66	0.42
6 US Mid-Cap Growth	0.67	0.72	0.16	0.66	0.66	0.46	0.88	0.58	0.44	0.65	0.38
7 US Mid-Cap Value	0.77	0.82	0.19	0.75	0.72	0.49	0.86	0.63	0.50	0.68	0.44
8 US Small-Cap Growth	0.68	0.73	0.16	0.68	0.65	0.43	0.85	0.63	0.48	0.68	0.38
9 US Small-Cap Value	0.75	0.81	0.16	0.75	0.68	0.45	0.82	0.66	0.54	0.69	0.43
10 International Equities	0.52	0.52	0.24	0.42	0.51	0.22	0.57	0.30	0.22	0.34	0.22
11 European Equities	0.52	0.53	0.21	0.42	0.51	0.21	0.58	0.30	0.21	0.34	0.23
12 Japan Equities	0.28	0.28	0.14	0.21	0.29	0.10	0.33	0.15	0.10	0.18	0.11
13 Asia Pacific ex Japan Equities	0.59	0.57	0.26	0.50	0.53	0.31	0.63	0.36	0.27	0.41	0.25
14 Emerging & Frontier Market Equities	0.53	0.51	0.23	0.45	0.46	0.24	0.61	0.29	0.22	0.32	0.22
15 Fixed Income & Preferreds	0.20	0.30	-0.07	0.23	0.37	0.23	0.18	0.17	0.17	0.13	0.18
16 Short-Term Fixed Income	0.15	0.22	-0.04	0.18	0.34	0.21	0.13	0.11	0.12	0.07	0.18
17 US Taxable Fixed Income	0.20	0.30	-0.07	0.23	0.37	0.23	0.18	0.17	0.17	0.13	0.18
18 International Fixed Income	0.16	0.26	-0.10	0.21	0.22	0.25	0.12	0.16	0.18	0.13	0.14
19 Inflation-Linked Securities	0.11	0.15	0.01	0.11	0.24	0.15	0.10	0.05	0.06	0.05	0.15
20 High Yield Fixed Income	0.62	0.68	0.15	0.63	0.82	0.37	0.63	0.38	0.32	0.40	0.53
21 Emerging Market Fixed Income	0.47	0.52	0.12	0.45	0.47	0.31	0.46	0.23	0.21	0.24	0.24
22 Alternatives	0.69	0.71	0.20	0.69	0.80	0.57	0.98	0.62	0.47	0.68	0.45
23 Real Assets	1.00	0.85	0.58	0.87	0.67	0.42	0.71	0.55	0.50	0.53	0.40
24 REITs	0.85	1.00	0.20	0.77	0.69	0.44	0.71	0.60	0.56	0.57	0.41
25 Commodities	0.58	0.20	1.00	0.22	0.19	0.11	0.21	0.08	0.07	0.08	0.09
26 Energy Infrastructure/MLPs	0.87	0.77	0.22	1.00	0.69	0.44	0.70	0.59	0.54	0.57	0.47
27 Absolute Return Assets	0.67	0.69	0.19	0.69	1.00	0.49	0.81	0.58	0.49	0.60	0.65
28 Equity Hedge Assets	0.42	0.44	0.11	0.44	0.49	1.00	0.51	0.44	0.39	0.43	0.35
29 Equity Return Assets	0.71	0.71	0.21	0.70	0.81	0.51	1.00	0.61	0.47	0.68	0.46
30 Private Investments	0.55	0.60	0.08	0.59	0.58	0.44	0.61	1.00	0.93	0.92	0.62
31 Private Real Estate	0.50	0.56	0.07	0.54	0.49	0.39	0.47	0.93	1.00	0.74	0.53
32 Private Equity	0.53	0.57	0.08	0.57	0.60	0.43	0.68	0.92	0.74	1.00	0.64
33 Private Debt	0.40	0.41	0.09	0.47	0.65	0.35	0.46	0.62	0.53	0.64	1.00

Source: Bloomberg, Datastream, Morgan Stanley Wealth Management GIC as of Feb. 28, 2023

Note: Above is based on returns from the mid-1940s through February 2023. Correlation is a statistical method of measuring the strength of a linear relationship between two variables. The correlation between two variables can assume any value from -1.00 to +1.00, inclusive. Past performance is not indicative of future results. We apply significant statistical adjustments to correct for distortions typically associated with index returns for hedge funds, private equity and private real estate. Correlation assumptions are the same for the strategic and secular horizons.

### Appendix

#### Hedge Fund Index Performance Biases

It should be noted that the majority of hedge fund indexes are composed of hedge fund manager returns. This is in contrast to traditional indexes, which comprise individual securities in the various market segments they represent and offer complete transparency as to membership and construction methodology. As such, some believe that hedge fund index returns have certain biases that are not present in traditional indexes. Some of these biases inflate index performance, while others may skew performance negatively. However, many studies indicate that overall hedge fund index performance has been biased to the upside. Some studies suggest performance has been inflated by up to 2.6% or more annually, depending on the types of biases included and the time period studied. Although there are numerous potential biases that could affect hedge fund returns, we identify some of the more common ones throughout this paper.

Self-selection bias results when certain manager returns are not included in the index returns and may result in performance being skewed up or down. Because hedge funds are private placements, hedge fund managers are able to decide which fund returns they want to report and are able to opt out of reporting to the various databases. Certain hedge fund managers may choose only to report returns for funds with strong returns and opt out of reporting returns for weak performers. Other hedge funds that close may decide to stop reporting in order to retain secrecy, which may cause a downward bias in returns.

Survivorship bias results when certain constituents are removed from an index. This often results from the closure of funds due to poor performance, “blow-ups” or other such events. As such, this bias typically results in performance being skewed higher. As noted, hedge fund index performance biases can result in positive or negative skew. Nonetheless, it would appear that the skew is more often positive. While it is difficult to quantify the effects precisely, investors should be aware that idiosyncratic factors may be giving hedge fund index returns an artificial “lift” or upwards bias.

### Endnotes

<sup>1</sup> Campbell, John and Robert Shiller, "Valuation Ratios and the Long-Run Stock Market Outlook," *The Journal of Portfolio Management*, July 1997.

<http://www.econ.yale.edu/~shiller/online/jpmalt.pdf>.

<sup>2</sup> In order to account for lack of available data, we employed the following proxies: UK: 60% weight in five-year UK breakeven and 40% weight in 10-year UK breakeven; Europe ex UK: 30% weight in Germany five-year breakeven, 20% weight in Germany 10-year breakeven, plus 50% weight in France seven-year breakeven; EM: seven-year US breakeven; Canada: 10-year Canada breakeven.

<sup>3</sup> Tang, Serena W., Andrew Sheets, Phanikiran L. Naraparaju, Wanting Low, and Elizabeth Volynsky, "What Will Markets Return?," *Cross-Asset Dispatch*, Oct. 23, 2016, Morgan Stanley & Co. Research.

*For indexes referenced in this report please visit the following:* <https://www.morganstanley.com/wealth-investmentsolutions/wmir-definitions>

### Glossary

**ALPHA:** The excess return of an investment relative to the return of a benchmark index.

**BETA:** A measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole.

**DRAWDOWN:** Refers to the largest cumulative percentage decline in net asset value or the percentage decline from the highest value or net asset value (peak) to the lowest net asset value (trough) after the peak.

**EFFICIENT FRONTIER:** The efficient frontier is the set of optimal portfolios that offers the highest expected return for a defined level of risk or the lowest risk for a given level of expected return.

**EQUITY RISK PREMIUM:** The excess return that an individual stock or the overall stock market provides over a risk-free rate.

**EXCESS RETURN:** This term represents the average quarterly total return of the portfolio relative to its benchmark. A portfolio with a positive excess return has on average outperformed its benchmark on a quarterly basis. This statistic is obtained by subtracting the benchmark return from the portfolio's return.

**ILLIQUIDITY PREMIUM:** The extra yield investors expect to earn for giving up control to liquidate their capital for a certain period of time.

**MEAN REVERSION:** This theory suggests that prices and returns eventually move back toward the mean or average. This mean or average can be the historical average of the price or return or another relevant average, such as the growth in the economy or the average return of an industry.

**SHARPE RATIO:** This statistic measures a portfolio's rate of return based on the risk it assumed and is often referred to as its risk-adjusted performance. Using standard deviation and returns in excess of the returns of T-bills, it determines reward per unit of risk. This measurement can help determine if the portfolio is reaching its goal of increasing returns while managing risk.

**SHILLER PE RATIO** also known as the cyclically adjusted P/E ratio (CAPE), uses a 10-year average of inflation-adjusted earnings to value the stock market.

**STANDARD DEVIATION:** This statistic quantifies the volatility associated with a portfolio's returns by measuring the variation in returns around the mean return. Unlike beta, which measures volatility relative to the aggregate market, standard deviation measures the absolute volatility of a portfolio's return.

## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

### Disclosure Section

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### Risk Considerations

#### Master Limited Partnerships (MLPs)

Individual MLPs are publicly traded partnerships that have unique risks related to their structure. These include, but are not limited to, their reliance on the capital markets to fund growth, adverse ruling on the current tax treatment of distributions (typically mostly tax deferred), and commodity volume risk.

For tax purposes, MLP ETFs are taxed as C corporations and will be obligated to pay federal and state corporate income taxes on their taxable income, unlike traditional ETFs, which are structured as registered investment companies. These ETFs are likely to exhibit tracking error relative to their index as a result of accounting for deferred tax assets or liabilities (see funds' prospectuses).

The potential tax benefits from investing in MLPs depend on their being treated as partnerships for federal income tax purposes and, if the MLP is deemed to be a corporation, then its income would be subject to federal taxation at the entity level, reducing the amount of cash available for distribution to the fund which could result in a reduction of the fund's value.

MLPs carry interest rate risk and may underperform in a rising interest rate environment. MLP funds accrue deferred income taxes for future tax liabilities associated with the portion of MLP distributions considered to be a tax-deferred return of capital and for any net operating gains as well as capital appreciation of its investments; this deferred tax liability is reflected in the daily NAV; and, as a result, the MLP fund's after-tax performance could differ significantly from the underlying assets even if the pre-tax performance is closely tracked.

#### Duration

Duration, the most commonly used measure of bond risk, quantifies the effect of changes in interest rates on the price of a bond or bond portfolio. The longer the duration, the more sensitive the bond or portfolio would be to changes in interest rates. Generally, if interest rates rise, bond prices fall and vice versa. Longer-term bonds carry a longer or higher duration than shorter-term bonds; as such, they would be affected by changing interest rates for a greater period of time if interest rates were to increase. Consequently, the price of a long-term bond would drop significantly as compared to the price of a short-term bond.

### Hedged Strategy Definitions

**Absolute return** investing describes a category of investment strategies and mutual funds that seek to earn a positive return over time—regardless of whether markets are going up, down, or sideways—and to do so with less volatility than stocks.

**Equity Long/Short** This strategy consists of a core holding of long equities hedged at all times with varying degrees of short sales of stock and/or index options. Some managers maintain a substantial portion of assets within a hedge structure and commonly employ leverage.

**Equity Market Neutral** Equity market neutral strategies employ sophisticated quantitative techniques of analyzing price data to ascertain information about future price movement and relationships between securities, select securities for purchase and sale. These can include both factor-based and statistical arbitrage/trading strategies. Factor-based investment strategies include strategies in which the investment thesis is predicated on the systematic analysis of common relationships between securities. In many but not all cases, portfolios are constructed to be neutral to one or multiple variables, such as broader equity markets in dollar or beta terms, and leverage is frequently employed to enhance the return profile of the positions identified. Statistical arbitrage/trading strategies consist of strategies in which the investment thesis is predicated on exploiting pricing anomalies which may occur as a function of expected mean reversion inherent in security prices; high frequency techniques may be employed and trading strategies may also be employed on the basis of technical analysis or opportunistically to exploit new information the investment manager believes has not been fully, completely or accurately discounted into current security prices. Equity market neutral strategies typically maintain characteristic net equity market exposure no greater than 10% long or short.

**Alternative investments** often are speculative and include a high degree of risk. Investors could lose all or a substantial amount of their investment. Alternative investments are appropriate only for eligible, long-term investors who are willing to forgo liquidity and put capital at risk for an indefinite period of time. They may be highly illiquid and can engage in leverage and other speculative practices that may increase the volatility and risk of loss. Alternative Investments typically have higher fees than traditional investments. Investors should carefully review



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and consider potential risks before investing. Certain of these risks may include but are not limited to: Loss of all or a substantial portion of the investment due to leveraging, short-selling, or other speculative practices; Lack of liquidity in that there may be no secondary market for a fund; Volatility of returns; Restrictions on transferring interests in a fund; Potential lack of diversification and resulting higher risk due to concentration of trading authority when a single advisor is utilized; Absence of information regarding valuations and pricing; Complex tax structures and delays in tax reporting; Less regulation and higher fees than mutual funds; and Risks associated with the operations, personnel, and processes of the manager. Further, opinions regarding Alternative Investments expressed herein may differ from the opinions expressed by Morgan Stanley Wealth Management and/or other businesses/affiliates of Morgan Stanley Wealth Management.

Certain information contained herein may constitute forward-looking statements. Due to various risks and uncertainties, actual events, results or the performance of a fund may differ materially from those reflected or contemplated in such forward-looking statements. Clients should carefully consider the investment objectives, risks, charges, and expenses of a fund before investing.

Alternative investments involve complex tax structures, tax inefficient investing, and delays in distributing important tax information. Individual funds have specific risks related to their investment programs that will vary from fund to fund. Clients should consult their own tax and legal advisors as Morgan Stanley Wealth Management does not provide tax or legal advice.

Interests in alternative investment products are offered pursuant to the terms of the applicable offering memorandum, are distributed by Morgan Stanley Smith Barney LLC and certain of its affiliates, and (1) are not FDIC-insured, (2) are not deposits or other obligations of Morgan Stanley or any of its affiliates, (3) are not guaranteed by Morgan Stanley and its affiliates, and (4) involve investment risks, including possible loss of principal. Morgan Stanley Smith Barney LLC is a registered broker-dealer, not a bank.

**Managed futures investments** are speculative, involve a high degree of risk, use significant leverage, have limited liquidity and/or may be generally illiquid, may incur substantial charges, may subject investors to conflicts of interest, and are usually appropriate only for the risk capital portion of an investor's portfolio. Before investing in any partnership and in order to make an informed decision, investors should read the applicable prospectus and/or offering documents carefully for additional information, including charges, expenses, and risks. Managed futures investments are not intended to replace equities or fixed income securities but rather may act as a complement to these asset categories in a diversified portfolio.

Risks of **private real estate** include: illiquidity, a long-term investment horizon with a limited or nonexistent secondary market; lack of transparency; volatility (risk of loss); and leverage.

**Investing in commodities** entails significant risks. Commodity prices may be affected by a variety of factors at any time, including but not limited to, (i) changes in supply and demand relationships, (ii) governmental programs and policies, (iii) national and international political and economic events, war and terrorist events, (iv) changes in interest and exchange rates, (v) trading activities in commodities and related contracts, (vi) pestilence, technological change and weather, and (vii) the price volatility of a commodity. In addition, the commodities markets are subject to temporary distortions or other disruptions due to various factors, including lack of liquidity, participation of speculators and government intervention.

**Physical precious metals** are non-regulated products. Precious metals are speculative investments, which may experience short-term and long term price volatility. The value of precious metals investments may fluctuate and may appreciate or decline, depending on market conditions. If sold in a declining market, the price you receive may be less than your original investment. Unlike bonds and stocks, precious metals do not make interest or dividend payments. Therefore, precious metals may not be appropriate for investors who require current income. Precious metals are commodities that should be safely stored, which may impose additional costs on the investor. The Securities Investor Protection Corporation ("SIPC") provides certain protection for customers' cash and securities in the event of a brokerage firm's bankruptcy, other financial difficulties, or if customers' assets are missing. SIPC insurance does not apply to precious metals or other commodities.

**REITs investing** risks are similar to those associated with direct investments in real estate: property value fluctuations, lack of liquidity, limited diversification and sensitivity to economic factors such as interest rate changes and market recessions.

**Bonds** are subject to interest rate risk. When interest rates rise, bond prices fall; generally the longer a bond's maturity, the more sensitive it is to this risk. Bonds may also be subject to call risk, which is the risk that the issuer will redeem the debt at its option, fully or partially, before the scheduled maturity date. The market value of debt instruments may fluctuate, and proceeds from sales prior to maturity may be more or less than the amount originally invested or the maturity value due to changes in market conditions or changes in the credit quality of the issuer. Bonds are subject to the credit risk of the issuer. This is the risk that the issuer might be unable to make interest and/or principal payments on a timely basis. Bonds are also subject to reinvestment risk, which is the risk that principal and/or interest payments from a given investment may be reinvested at a lower interest rate.

**Bonds rated below investment grade** may have speculative characteristics and present significant risks beyond those of other securities, including greater credit risk and price volatility in the secondary market. Investors should be careful to consider these risks alongside their individual circumstances, objectives and risk tolerance before investing in high-yield bonds. High yield bonds should comprise only a limited portion of a balanced portfolio.

**Interest on municipal bonds** is generally exempt from federal income tax; however, some bonds may be subject to the alternative minimum tax (AMT). Typically, state tax-exemption applies if securities are issued within one's state of residence and, if applicable, local tax-exemption applies if securities are issued within one's city of residence.

**Treasury Inflation Protection Securities' (TIPS)** coupon payments and underlying principal are automatically increased to compensate for inflation by tracking the consumer price index (CPI). While the real rate of return is guaranteed, TIPS tend to offer a low return. Because the return of TIPS is linked to inflation, TIPS may significantly underperform versus conventional U.S. Treasuries in times of low inflation.

**Ultrashort-term fixed income** asset class is comprised of fixed income securities with high quality, very short maturities. They are therefore subject to the risks associated with debt securities such as credit and interest rate risk.

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The majority of \$25 and \$1000 par **preferred securities** are “callable” meaning that the issuer may retire the securities at specific prices and dates prior to maturity. Interest/dividend payments on certain preferred issues may be deferred by the issuer for periods of up to 5 to 10 years, depending on the particular issue. The investor would still have income tax liability even though payments would not have been received. Price quoted is per \$25 or \$1,000 share, unless otherwise specified. Current yield is calculated by multiplying the coupon by par value divided by the market price.

Some \$25 or \$1000 par **preferred securities** are QDI (Qualified Dividend Income) eligible. Information on QDI eligibility is obtained from third party sources. The dividend income on QDI eligible preferreds qualifies for a reduced tax rate. Many traditional ‘dividend paying’ perpetual preferred securities (traditional preferreds with no maturity date) are QDI eligible. In order to qualify for the preferential tax treatment all qualifying preferred securities must be held by investors for a minimum period – 91 days during a 180 day window period, beginning 90 days before the ex-dividend date.

The market value of **convertible bonds** and the underlying common stock(s) will fluctuate and after purchase may be worth more or less than original cost. If sold prior to maturity, investors may receive more or less than their original purchase price or maturity value, depending on market conditions. Callable bonds may be redeemed by the issuer prior to maturity. Additional call features may exist that could affect yield.

The initial interest rate on a **floating-rate security** may be lower than that of a fixed-rate security of the same maturity because investors expect to receive additional income due to future increases in the floating security’s underlying reference rate. The reference rate could be an index or an interest rate. However, there can be no assurance that the reference rate will increase. Some floating-rate securities may be subject to call risk.

Any type of **continuous or periodic investment plan** does not assure a profit and does not protect against loss in declining markets. Since such a plan involves continuous investment in securities regardless of fluctuating price levels of such securities, the investor should consider his financial ability to continue his purchases through periods of low price levels.

Active or frequent trading to effectuate a dynamic allocation strategy entails greater risk and is more speculative, but also entails the possibility for above-average returns, compared with a long-term investment strategy. It may also entail more costs and fees, as well as a larger and more immediate tax liability.

Principal is returned on a monthly basis over the life of a **mortgage-backed security**. Principal prepayment can significantly affect the monthly income stream and the maturity of any type of MBS, including standard MBS, CMOs and Lottery Bonds. Yields and average lives are estimated based on prepayment assumptions and are subject to change based on actual prepayment of the mortgages in the underlying pools. The level of predictability of an MBS/CMO’s average life, and its market price, depends on the type of MBS/CMO class purchased and interest rate movements. In general, as interest rates fall, prepayment speeds are likely to increase, thus shortening the MBS/CMO’s average life and likely causing its market price to rise. Conversely, as interest rates rise, prepayment speeds are likely to decrease, thus lengthening average life and likely causing the MBS/CMO’s market price to fall. Some MBS/CMOs may have “original issue discount” (OID). OID occurs if the MBS/CMO’s original issue price is below its stated redemption price at maturity, and results in “imputed interest” that must be reported annually for tax purposes, resulting in a tax liability even though interest was not received. Investors are urged to consult their tax advisors for more information.

**Equity securities** may fluctuate in response to news on companies, industries, market conditions and general economic environment.

Companies paying **dividends** can reduce or cut payouts at any time.

**Investing in smaller companies** involves greater risks not associated with investing in more established companies, such as business risk, significant stock price fluctuations and illiquidity.

**Stocks of medium-sized companies** entail special risks, such as limited product lines, markets, and financial resources, and greater market volatility than securities of larger, more-established companies.

**Asset allocation and diversification** do not assure a profit or protect against loss in declining financial markets.

Because of their narrow focus, **sector investments** tend to be more volatile than investments that diversify across many sectors and companies. **Technology stocks** may be especially volatile. Risks applicable to companies in the **energy and natural resources** sectors include commodity pricing risk, supply and demand risk, depletion risk and exploration risk. **Health care sector stocks** are subject to government regulation, as well as government approval of products and services, which can significantly impact price and availability, and which can also be significantly affected by rapid obsolescence and patent expirations.

**Investing in foreign markets** entails greater risks than those normally associated with domestic markets, such as political, currency, economic and market risks. These risks are magnified in **emerging and frontier markets**. **Investing in currency** involves additional special risks such as credit, interest rate fluctuations, derivative investment risk, and domestic and foreign inflation rates, which can be volatile and may be less liquid than other securities and more sensitive to the effect of varied economic conditions. In addition, international investing entails greater risk, as well as greater potential rewards compared to U.S. investing. These risks include political and economic uncertainties of foreign countries as well as the risk of currency fluctuations. These risks are magnified in countries with emerging markets, since these countries may have relatively unstable governments and less established markets and economies.

**Value investing** does not guarantee a profit or eliminate risk. Not all companies whose stocks are considered to be value stocks are able to turn their business around or successfully employ corrective strategies which would result in stock prices that do not rise as initially expected.

**Growth investing** does not guarantee a profit or eliminate risk. The stocks of these companies can have relatively high valuations. Because of these high valuations, an investment in a growth stock can be more risky than an investment in a company with more modest growth expectations.

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**Yields** are subject to change with economic conditions. Yield is only one factor that should be considered when making an investment decision.

**Credit ratings** are subject to change.

**Rebalancing** does not protect against a loss in declining financial markets. There may be a potential tax implication with a rebalancing strategy. Investors should consult with their tax advisor before implementing such a strategy.

The returns on a portfolio consisting primarily of **environmental, social, and governance-aware investments (ESG)** may be lower or higher than a portfolio that is more diversified or where decisions are based solely on investment considerations. Because ESG criteria exclude some investments, investors may not be able to take advantage of the same opportunities or market trends as investors that do not use such criteria. The companies identified and investment examples are for illustrative purposes only and should not be deemed a recommendation to purchase, hold or sell any securities or investment products. They are intended to demonstrate the approaches taken by managers who focus on ESG criteria in their investment strategy. There can be no guarantee that a client's account will be managed as described herein.

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