

Global Investment Committee | March 27, 2024

# Annual Update of GIC Capital Market Assumptions

In these pages, we present the annual update of our capital market assumptions, forecasting the returns and volatility of global asset classes over the strategic (seven-year) and secular (20-year) horizons. Not only are these estimates key inputs for the Global Investment Committee's (GIC) strategic asset allocations, but for most investors, strategic allocations serve as the "north star," anchoring intermediate- and long-term plans. With that in mind, we recently published reports on our philosophy ("[Your Global Investment Committee: A User's Guide](#)") and methods ("[Understanding the GIC Allocation Models](#)"). Here, we provide the GIC strategic asset allocation models, rebalanced for updated assumptions and asset prices, and optimized using our goals-based framework and targeted risk parameters.

The bottom line for 2024 is that the efficient frontier for US assets remains historically flat. Even so, it reflects annualized nominal returns roughly 50 to 125 basis points above last year, with a 60% equity/40% bond benchmark likely to generate around 6%. While the end of the secular bond bull market colors our forecasts, we have high conviction in a new theme: that we are entering a period we call the Great Normalization. In this environment, government and household sector re-leveraging returns markets to a pre-Great Financial Crisis (GFC) framework of higher neutral policy rates, real rates and inflation.

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## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Extending a theme from last year, positively correlated stocks and bonds in a reflationary setting place a premium on portfolio diversification. Happily, given the historical outperformance of US assets, opportunities to own non-US assets, real assets and alternatives while improving risk-adjusted returns remain decent. Notably, after several disappointing years, private equity, in particular, may see mean reversion work in investors' favor.

Given our broader thematic work, this year's models incorporate several innovations and adjustments (detailed descriptions of changes are included in the March 27 report, "[Innovations in Capital Market Assumptions](#)"). Not only do the model enhancements embrace the shifting inflation regime and its implications for long-run bond returns and stock and bond correlations, but they acknowledge our conviction in a higher-growth/higher-productivity era. We believe this new era will be driven by a material pickup in capital spending, powered by diffusion of generative artificial intelligence (AI) and comprehensive infrastructure investment. The latter is likely to include allocations across strategic supply chains, energy and power generation, and the electrical grid.

Furthermore, revisiting the stable long-term relationship between nominal GDP growth and nominal profit growth has enhanced our expectations for corporate earnings. Our assumptions regarding the sustained high level of US government debt and deficits, however, offset some of these return amplifiers, as does our commitment to valuation frameworks acknowledging long-run mean reversion to trailing 20-year price/earnings (P/E) and cyclically adjusted price/earnings (CAPE) ratios. These dynamics are quite meaningful given the extraordinary relative performance of US equities over the past 18 months, which has left several major indexes excessively concentrated and very expensive.

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 (seven-year) and secular (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 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.

### Exhibit 1: Asset Class Return and Volatility Forecasts

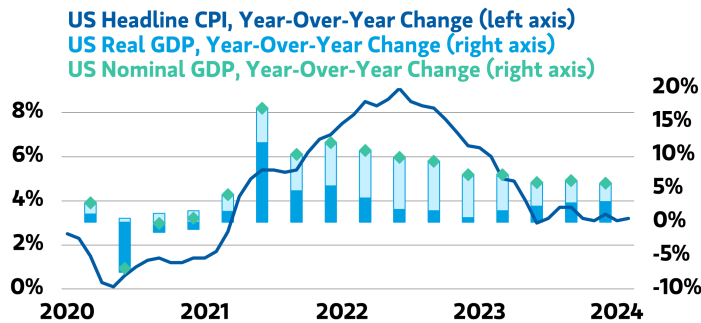
	2024		2023	
	Annualized Return	Annualized Volatility	Annualized Return	Annualized Volatility
Global Equities	6.0	13.5	5.2	13.4
US Equities	5.1	14.9	4.4	14.9
International Equities	6.6	15.4	5.5	15.4
Emerging Market Equities	8.1	19.3	7.8	19.3
Ultrashort Fixed Income	3.9	0.7	3.7	0.8
US Taxable Fixed Income	5.0	5.3	4.8	5.2
High Yield Fixed Income	5.9	8.4	7.1	8.3
Real Assets	6.5	12.3	5.5	12.3
Absolute Return Assets	5.6	5.0	6.0	5.1
Equity Hedge Assets	6.7	9.2	6.6	9.0
Equity Return Assets	6.4	8.8	6.3	8.8

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, Morgan Stanley & Co. Research, Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

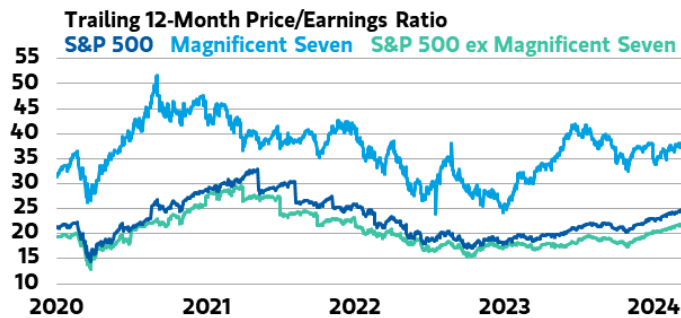
For our exercise, starting points matter. That said, 2023 delivered one of the most extraordinary outcomes in recent capital markets history, defying expectations and breaking traditional forecasting models based on the role of monetary policy tightening. To wit, real growth reaccelerated amid falling inflation as the economy benefited from a virtual perfect storm of surging government spending, still-ample excess liquidity in the wake of COVID stimulus checks, strong labor markets and falling prices for manufactured goods and commodities, especially those linked to energy (see Exhibit 2). Rather than the consensus forecast of an economic and profits recession, the result was material upside surprise. Equities, as measured by the S&P 500 Index, emerged from the 2022 bear market with a 25% gain, as valuations expanded and the generative AI theme took off (see Exhibit 3). Interest rate insensitivity—especially among the largest corporations and the richest 40% of households—was unprecedented, as deleveraged balance sheets with termed-out obligations were aided by constructive financial conditions and housing market resilience that padded consumer net worths.

### Exhibit 2: 2023 Exhibited Strong Real Growth Alongside Moderating Inflation



Note: CPI data as of Feb. 29, 2024 and GDP data as of Dec. 31, 2023.  
Source: Bloomberg

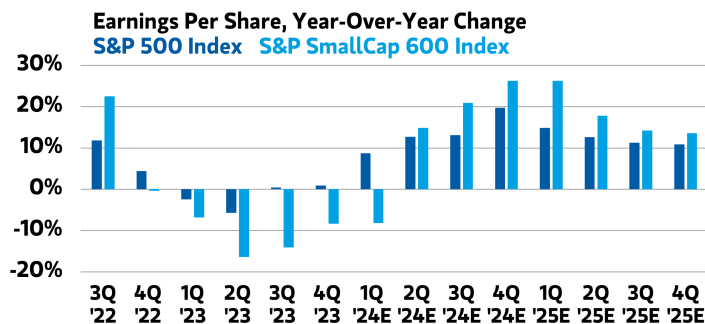
### Exhibit 3: S&P 500 Valuations Expanded in 2023, Especially for the Magnificent Seven



Source: Bloomberg as of March 20, 2024

As we approach the end of 2024's first quarter, US equities are up another 10%, embracing the contention that a rare soft landing has arrived and that strong economic growth coupled with benign inflation will deliver a profit rebound of roughly 26% over the next two years, justifying valuation multiples (see Exhibit 4). This comes despite a decline in expectations for Fed rate cuts over the next six to nine months from seven to three. Such near-term ebullience elicits caution on our part, as we consider US markets fully valued and susceptible to inevitable disappointment.

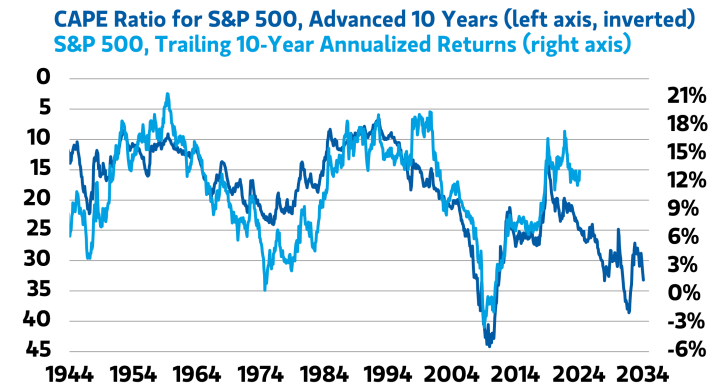
### Exhibit 4: US Equities Have Priced in a Major Earnings Rebound Over the Next Two Years



Source: Strategas as of March 18, 2024

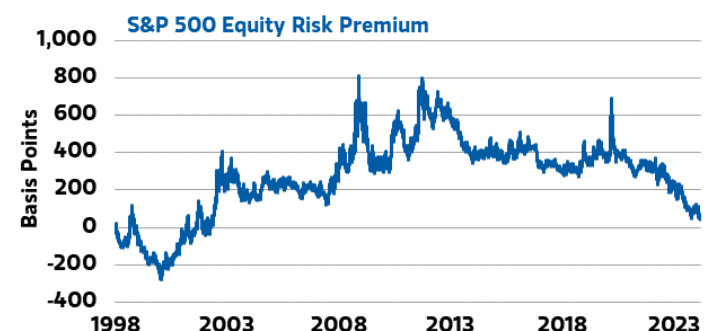
In the intermediate term, our models contemplate a continuation of the secular bull market in US equities—but one characterized by regime change through cycles. Notably, “bull market” is a relative term suggesting a directional move higher for stocks and their outperformance of cash, gold and bonds on a nominal basis. We continue to make this distinction because investors have become spoiled by recency bias when establishing a baseline for setting expectations. Over the very long run, stocks have tended to return approximately 7% to 8% per year, while bonds have compounded at roughly 3%. Fueled by multiples expansion and central bank and fiscal spending largesse, the past 15 years have delivered returns nearly twice that. As a result, stock valuations have run well ahead of earnings fundamentals, and frameworks like the Shiller CAPE ratio, based on normalized earnings, predict below average total returns in the coming decade (see Exhibits 5 and 6). We acknowledge this reality in our modelling. Something else to acknowledge is that valuation ratios have decoupled from real rates, another long-term anchor (see Exhibit 7).

### Exhibit 5: Cyclically Adjusted P/E Ratios Point to Below-Average Returns for US Stocks Over the Next Decade



Source: FactSet, Morgan Stanley Wealth Management GIC

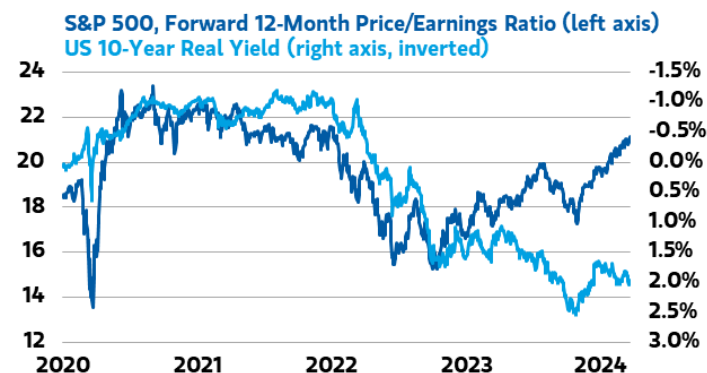
### Exhibit 6: The S&P 500's Equity Risk Premium Has Fallen Close to a 22-Year Low



Source: Bloomberg as of March 20, 2024



## Exhibit 7: Equity Valuation Ratios Have Decoupled From Real Rates



Source: Bloomberg as of March 20, 2024

One dimension of regime change pertains to inflation, which we believe will mean-revert following 15 years of persistent, post-GFC disinflation. In our view, the disinflationary period was disproportionately impacted by structural deleveraging and narrow technology diffusion that limited capital deepening and economic growth. In the post-COVID business cycle, we believe a variety of factors are resetting inflation and the natural economic growth rate higher. Along with structural changes to the labor market (what work we want to do as well as how and where) and demographic changes around home ownership, these include a step change in government deficit- and debt-financed spending on deglobalization, decarbonization, digitization and defense. A capital spending boom is not just embracing the realities of generative AI but acknowledging once-in-a-generation geopolitical shifts and the likelihood of new dynamics between the US and China in order to drive productivity gains. Some of these will not be competed away, resulting in higher profit growth rates over the next decade. Regime change of this nature has implications for market leadership, active management, stock selection and cross-asset valuations—forces we have tried to capture using our inflation-regime conditioning framework (see our Jan. 26, 2023 Special Report, [“What if the Future Is Inflation? Correcting Disinflationary Bias in Market Forecasts”](#)).

Another aspect of regime change relates to policy normalization, whereby we assume a departure from the persistent financial repression of the post-GFC timeframe. A return to central bank policies that follow the business cycle has implications for volatility, uncertainty and term premiums—factors that are likely to shift the correlation between equities and fixed income. If we go back to the positive correlations that persisted from 1970 to 2000, the challenges to achieving easy diversification will likely increase, producing more volatile portfolio return patterns and increasing the attractiveness of alternative and uncorrelated asset classes like hedge funds and private investments.

Given these multivariate shifts, we have revised our 2024 seven-year annual forecast for global stocks higher to 6.0%, with projected US equity returns improving modestly to 5.1%, which is still below the historical average. Our seven-year US bond forecast has also improved modestly, moving up from last year’s 4.8% per year to this year’s 5.0%. Meanwhile, our forecast returns for hedged strategies and commodities are similar to last year, at 5.5%-7.0% and 5.0%, respectively. Private assets remain among our higher-returning asset classes, with prospects for private equity and real estate increasing materially, while anticipated private credit returns have dimmed slightly. All our illiquid return forecasts, however, are below last decade’s double-digit returns. With the exception of private credit, we see returns for most private asset classes improving from last year, with expectations for high single-digit average annualized gains.

Amid these potential shifts, in addition to refreshing our capital market assumptions, we have re-optimized the GIC strategic asset allocation models (see Exhibits 19, 20 and 21). Historically elevated equity valuations and the potential secular weakness of government bonds point to lower risk-adjusted returns and more limited diversification of traditional assets. As such, the environment will likely require thoughtful portfolio construction, maximizing the benefits of active/passive decisions, manager selection, risk management and tax mitigation.

## 2024 and Beyond: The Great Normalization

Successful strategic asset allocation requires grasping the major themes and understanding the factors that could lead to inflection points. In fact, the big decisions—choosing relative allocations to cash, bonds, stocks and alternatives—determine about 80% of risk-based outcomes. While we certainly analyze the obvious inputs for those decisions—including economic growth, inflation, interest rates and earnings—sometimes it is the tectonic forces that characterize an investment era.

Technology-linked themes are part of that calculus, and we have applied our study of the history of technology diffusion to forecasting generative AI’s impact on capital markets, with a focus over the next seven years on the “AI adopters.” In addition, we have pointed to the importance of capital-spending-linked themes in the coming decade, especially those driven by forces such as digitization, deglobalization, decarbonization, demographics and changes to power infrastructure. That’s not to mention geopolitics, with its implications for cybersecurity, defense and space travel. At the highest level, this makes us want to directionally overweight equities and real assets that benefit from growth, productivity and somewhat higher inflation.

In some ways, however, that’s too simple. Understanding whether we are in a period of secular stagnation and rampant expansion of private capital, as in 2010-2019, or in a period of

great globalization, as in 2000-2009, or in that of a great bond bull market, as in 1982-2000, is critical to asset allocation. Today, we look forward amid another US bull market, albeit one that has been transformed by COVID and a once-in-a-generation \$9 trillion shot of stimulus that is still burning off. What has changed is that inflation and growth are normalizing to pre-GFC levels. Federal Reserve and US government policy are both at critical junctures. With the central bank potentially risking its long-term credibility on inflation in order to preserve the “Fed put,” fiscal spending is being funded by increasingly unsustainable levels of debt and deficits, built up during times of economic prosperity. Market concentration is very high among the largest stocks, and valuations are extremely rich. Meanwhile, many are being left behind, including small caps and those deemed “value” stocks. So, too, are many in need of financing, like regional banks, as well as start-ups and commercial real estate.

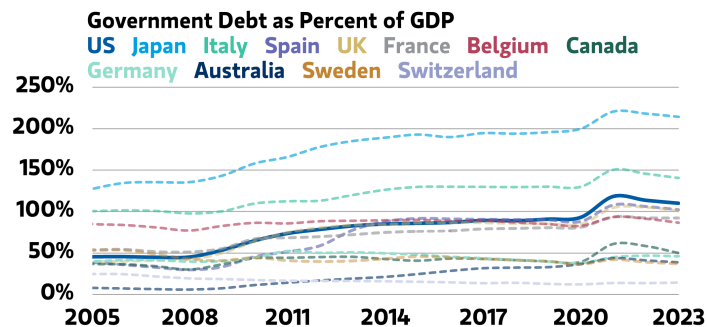
Could our current boom, aided by easy financial conditions and liquidity, end in a bust, especially given historically high valuations and unsustainably high government debt? The answer is not an unequivocal no. Without careful consideration, the US model may be walking headlong into a permanent state of debt monetization, which inevitably ends in deflation—a scenario in which bonds thrive for the most part. This argues for some portfolio balance over the seven-year horizon, even if the power of the traditional 60/40 portfolio is diluted.

Outside of disappointing fundamentals or a black swan, what could catalyze such a bust? One theme with potentially profound investment implications is the end of what we have referred to as American Policy Exceptionalism. After 15 years of extreme US stock and bond outperformance, US assets are vastly over-owned by global investors relative to the US’ share of global GDP growth and corporate profits. In fact, the US accounts for roughly 62% of global equity market capitalization, an all-time high. Such skews have kept the US dollar strong despite historically wide trade and fiscal deficits. This is occurring against a backdrop of growing geopolitical instability and increasing distance between the US and its traditional allies, as well as rising tensions with Russia and China.

While it remains the consensus that US currency and market hegemony are unchallenged, we continue to risk-manage for a world that could radically rebalance toward global assets, especially if de-dollarization or other countries’ better growth and demographics are rewarded. A policy mistake from the Fed on inflation would be negative too, as would forced austerity measures for US citizens. Consider that few developed countries are running total-debt-to-GDP ratios as high as that of the US (see Exhibit 8). The nonzero probability that this unstable asset-valuation mix in favor of US firms could unravel is only exacerbated by the potential for domestic instability, which could be unleashed by further

political and governance dysfunction. This supports the case to strategically own non-US equities.

### Exhibit 8: Fiscal Stimulus and Monetary Policy Have Pressured the US Debt-to-GDP Ratio



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

The post-GFC/post-COVID era, ultimately, has been one of great imbalances. If policy is forced to normalize amid the normalization of growth, inflation and debt fundamentals, portfolios that currently reign supreme will lag. Valuation multiples do not grow to the stars.

## Rebalancing Our Strategic Models

As we detail below, changes in underlying financial market variables have shifted our strategic capital market assumptions, summarized in Exhibits 9 and 10. As such, we are updating and rebalancing our strategic allocation models, as shown in Exhibits 19, 20 and 21. Broadly, we increased allocations to US large-cap equities relative to international and US small- and mid-cap equities, but maintain a moderate underweight to the former. Within fixed income, we increased allocations to core fixed income relative to short-term but remain slightly underweight duration relative to the benchmark.

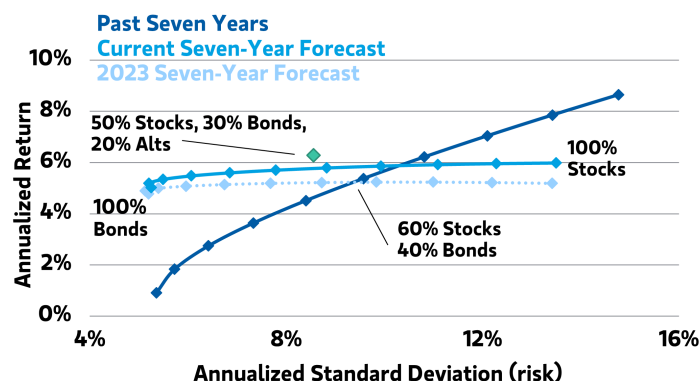
Investors should keep in mind that our strategic allocation models are based on an investment horizon of at least seven years and are designed to maximize risk-adjusted returns and minimize turnover. Investors who are seeking to take advantage of short-term market opportunities and are comfortable with 12-to-18-month holding periods should consider the GIC’s tactical allocation models, which can make opportunistic or defensive short-term adjustments as the GIC deems appropriate.

Overall, we remain moderately underweight equities in light of historically elevated valuations, which serve as a key determinant of strategic-horizon investment returns. We remain slightly overweight fixed income to benefit from relatively attractive current yields and move toward a neutral-duration position, as we near the expected start of the Fed’s rate-cutting cycle. We remain moderately

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overweight alternatives, as we seek to maximize portfolio diversification and exposure to differentiated sources of attractive risk-adjusted returns.

### Exhibit 9: Next-Seven-Year Outlook Steepens Modestly but Remains Historically Flat



Note: Stocks are represented by the MSCI All Country World Index, bonds by the Bloomberg US Aggregate Index and alternatives by the HFRI Fund-Weighted Composite.

Source: Bloomberg, FactSet, Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

### Exhibit 10: The GIC's New Strategic Return, Volatility and Correlation Forecasts

	Annualized Return	Annualized Volatility	Correlation to Equities
Cash	3.9	0.7	0.0
Global Equities	6.0	13.5	1.0
US Fixed Income	5.0	5.3	0.2
Real Assets	6.5	12.3	0.7
Hedged Strategies	6.3	8.0	0.8
Private Investments	8.1	15.4	0.5

Note: Seven-year annualized forecast

Source: Robert J. Shiller of Yale University, Bloomberg, FactSet, Moody's, Morgan Stanley & Co. Research, Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

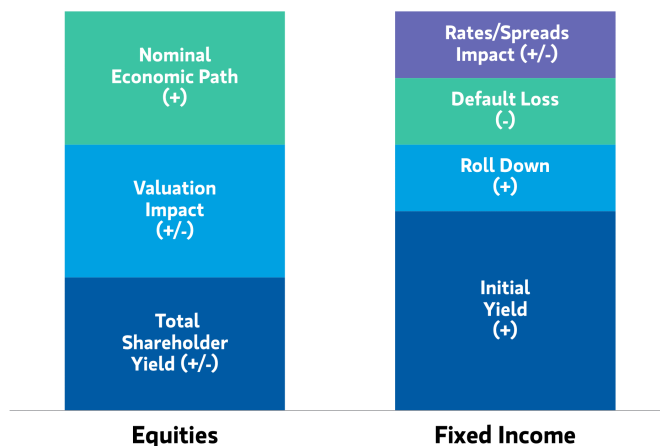
Starting in 2024, the GIC will begin publishing strategic allocations across three level types: Level 0, including traditional assets only; Level 1, including traditional assets, real assets and hedged strategies; and Level 2, including both traditional assets and alternative investments including private investments. Further, the GIC has reduced the recommended asset threshold for the Level 2 models to \$10 million, from \$25 million previously. This significant change is motivated by the GIC's belief that the democratization of alternative investment strategies has lowered the threshold for effectively implementing the Level 2 models. All three levels of the updated 2024 GIC Strategic Allocations are presented in Exhibits 19, 20 and 21. The GIC will maintain alignment to the strategic allocations by also publishing

tactical allocations corresponding to all three levels. On March 6, the GIC published a primer, "[Understanding the GIC Allocation Models](#)," which provides further details on the current conceptual design of the different allocation models.

## Building Our Forecasts

While we forecast strategic equity and fixed income returns by maintaining a methodology 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 total return to shareholders, including both share repurchases and dividends; the impact of changes in valuation; and the expected 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 11). 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 11: 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 estimate the total earnings that companies are likely to pay out to investors, either through dividends or share repurchases, net of new share issuance. 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 estimate the growth in corporate earnings due to forecast economic

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growth over the seven-year horizon. Relative to the previous cycle, we expect a durably higher average level of inflation and average level for the natural rate of interest. As a result, we pay special attention to the expected flow-through of economic growth to corporate earnings growth in nominal terms. By decomposing our return forecasts into these three components, we can better 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 investors. 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 total 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 previous years, we chose to consider a 10-year period because this longer-term horizon mitigates the observed cyclicity in payout ratios. These estimates of total shareholder yield (see Exhibit 12) form the base of our return forecasts, to which we add effects from changes in valuation and earnings growth.

**Exhibit 12: International and US SMID-Cap Equities Should Outperform US Large-Cap**

	Total Shareholder Yield	Valuation Impact	Nominal Economic Path	Total (%)
US Large-Cap Equities	4.1	-2.9	3.7	4.9
US SMID-Cap Equities	2.1	-0.5	4.8	6.4
European Equities	3.8	-0.3	3.2	6.8
Japan Equities	3.3	0.2	2.3	5.8
Asia Pacific ex Japan Equities	4.0	-0.2	3.9	7.7
Canadian Equities	3.4	-0.5	3.5	6.4
Developed International Equities	3.7	-0.2	3.1	6.6
Emerging Market Equities	2.5	-0.2	5.8	8.1
Global Equities	3.6	-1.6	4.0	6.0

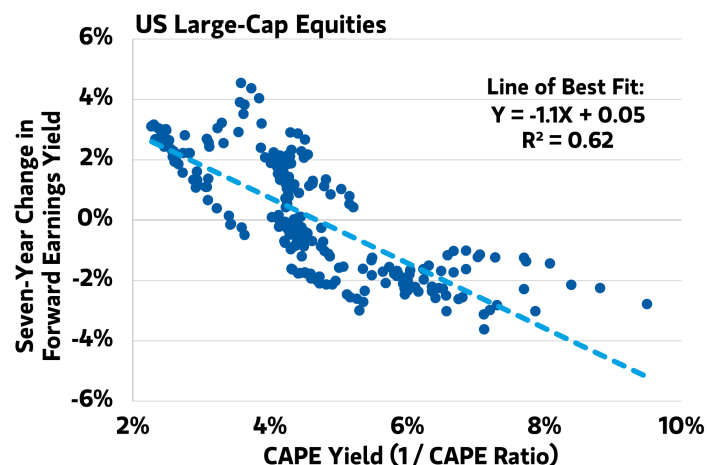
Source: Robert J. Shiller of Yale University, Bloomberg, FactSet, Morgan Stanley & Co., Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

### 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 reasonableness 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> The theory behind this relationship is that more expensive CAPE ratios imply lower average future returns (see Exhibit 13).

**Exhibit 13: The CAPE Ratio Is a Statistically Significant Predictor of Seven-Year Changes in the P/E Ratio**



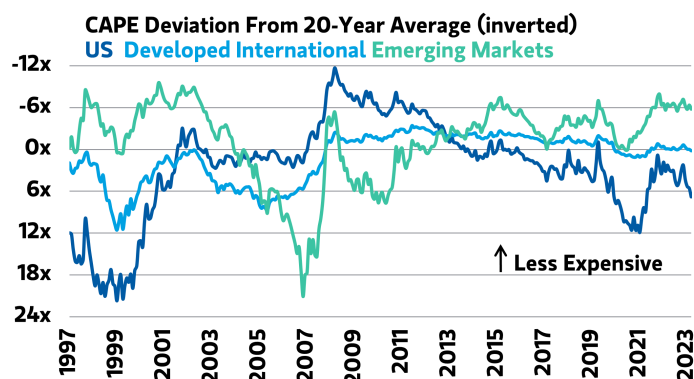
Source: Robert J. Shiller of Yale University, Bloomberg, FactSet, Morgan Stanley Wealth Management GIC as of Feb. 29, 2024



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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. It is both intuitive and empirically supported that equity multiples demonstrate some level of mean reversion over the seven-year strategic horizon. Historically, future expansion and contraction in multiples have been related to 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 experience higher or lower returns over the next seven years, compared to their long-term averages. The CAPE ratio for the US stands out among the major regions as the most significantly expensive relative to its own history (see Exhibit 14).

### Exhibit 14: Based on CAPE, Developed International and Emerging Markets Appear Significantly Less Expensive Than US



Note: CAPE uses a trailing seven-year time period  
Source: Robert J. Shiller of Yale University, Bloomberg, FactSet, Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

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.

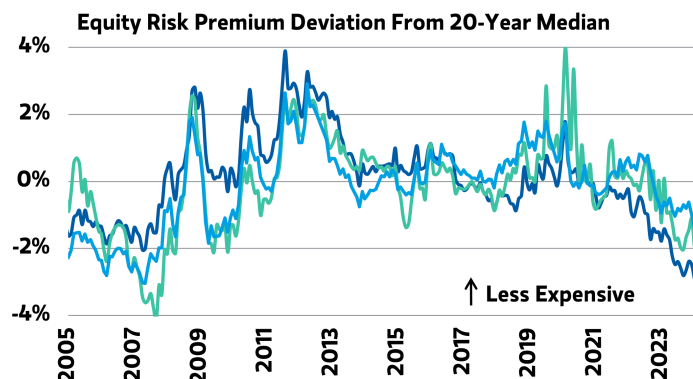
The equity risk premium component of our valuation analysis measures the incremental compensation investors require to hold stocks. We measure this premium by comparing the earnings yield generated by an equity position to the yield from holding corresponding government bonds. A higher equity risk premium 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 across most regions as a result of rising yields and increasing equity valuations, led by the sharpest decrease in the US (see Exhibit 15). The equity risk premium suggests that US equity multiples will likely face significant contraction, while developed international and emerging market multiples may face modest contraction.

The changes in valuation implied by the CAPE ratio and the equity risk premium will ordinarily align with one another, but in some cases the two methods may differ in magnitude or even direction. Therefore, this combination of two different approaches helps to effectively size the valuation component according to the relative "conviction" that the valuation reversion will occur over the strategic horizon. In other words, in markets where both methods imply significant valuation compression, such as US large-cap core and growth equities, our combined approach assigns the largest valuation impacts. For a majority of other markets, however, the approach assigns smaller valuation adjustments commensurate with relatively lower conviction in how valuations will evolve.

As of our forecast date of Feb. 29, 2024, our analysis suggests that the returns of US large-cap core and growth style equities may be most impacted by multiples compression over the seven-year horizon. Meanwhile, US large-cap value, US mid- and small-cap equities, and international equities may face slight-to-moderate multiples compression. Few equity markets are likely to face significant valuation expansion over the strategic horizon, which is partially attributable to the above-trend increase in global equity prices over the previous 12 months, during which time the MSCI All Country World Index gained more than 25% on a total-return basis.

Furthermore, we assume equity valuations will only partially revert to the levels implied by the CAPE and equity risk premium methods. We assume that the extent of reversion to occur over the seven-year horizon will vary according to the conviction that the equity market is significantly overvalued or undervalued. We assume only a partial reversion to historically derived average valuation levels, acknowledging that the true equilibrium level of valuations is not necessarily stationary through time.



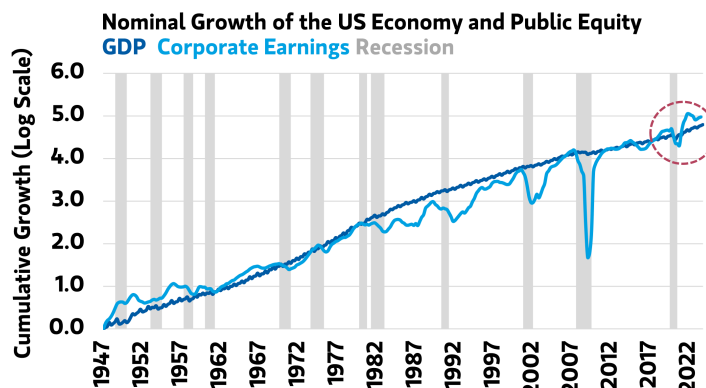
**Exhibit 15: Equity Risk Premiums Have Narrowed Significantly**

Note: CAPE uses a trailing seven-year time period

Source: Bloomberg, FactSet, Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

### 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. While GDP growth is highly representative of the underlying trend in corporate earnings growth broadly, we adjust our earnings growth estimates for US mid- and small-cap equities relative to their large-cap counterparts according to their historical earnings growth premiums. We similarly adjust the earnings growth estimates for US growth and value equities according to the historical basis in earnings growth between each style and US core equities. We then add forward inflation expectations to derive nominal GDP growth forecasts. Finally, we scale the nominal GDP growth estimates based on the long-term empirical relationship between nominal economic growth and corporate earnings growth. We assume that, on average, 90% of nominal GDP growth will flow through to nominal earnings growth, based on the long-term ratio since the 1940s, which encompasses multiple market cycles and macro regimes (see Exhibit 16). As the GIC expects that inflation and the natural rate of interest may sustain at higher average levels relative to the previous decade, we believe it is essential to capture the relationship between economic growth and corporate earnings growth in nominal terms.

**Exhibit 16: The Pace of Nominal Corporate Earnings Growth Exceeded GDP Growth Since 2020**

Source: Robert J. Shiller of Yale University, Bloomberg, Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

### How May We Account for Inflation Expectations?

The level of inflation is an important determinant of nominal equity returns. We primarily incorporate forward-looking inflation expectations from 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 yield, we find the implied inflation rate for the time period associated with the maturity of the underlying bonds. We select bonds that are closest in term to the strategic seven-year horizon depending on data availability by region. For the US, we blend this market-based measure of inflation with the seven-year expected inflation rate published by the Federal Reserve Bank of Cleveland to produce a more stable forward-looking estimate.

### 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 17). Our methodology leverages the work of Andrew Sheets, a member of the GIC and formerly Morgan Stanley & Co.'s chief cross-asset strategist.<sup>3</sup>

**Exhibit 17: We Adjust Fixed Income Returns by Considering Their Marginal Drivers**

	Starting Yield	Return From Roll Down	Default Loss	Impact of Yield or Spread Changes	Total (%)
US 10-Year Treasury	4.5	0.4	0.0	-0.7	4.2
US Aggregate Fixed Income	4.9	0.5	0.0	-0.4	5.0
Global High Yield Credit	7.7	0.3	-2.0	-0.1	5.9
International Aggregate Fixed Income	2.9	0.7	0.0	-0.5	3.0
Emerging Market Credit (USD)	7.5	0.4	-2.2	0.1	5.8
Global Aggregate Fixed Income	3.8	0.7	-0.1	-0.4	4.0

Note: We represent these asset classes 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 (USD-Denominated); and Bloomberg Global Aggregate Index.

Source: Bloomberg, Moody's, Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

**Initial Yield and Roll Down**

Our approach uses the current yield of 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. Across most markets, current yield curves are notably flat or inverted relative to long-term history. Based on current yield curves, the expected roll down return is historically low or even negative. To account for the GIC's

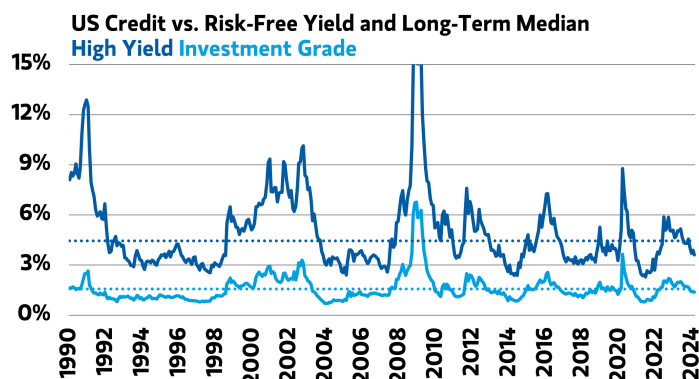
view that yield curves will normalize over the seven-year horizon, we compute the roll-down return based on an average of the bond's roll down implied from the current yield curve and the average long-term roll down. We calculate the roll-down return using a yield curve that is most applicable for each fixed income category, depending on data availability.

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

Fixed income instruments benefited from a nearly 40-year secular bull market, culminating in rates falling to historic lows during the COVID-19 lockdown in March 2020. We have since witnessed how rates are conversely subject to significant upward pressure, given the normalization in both growth and inflation. We must account for the change in price that the expected change in rates over the strategic horizon would imply. We forecast that rates will be modestly higher than current levels at the end of the strategic horizon.

As in recent years, we utilize a broader range of interest rate forecasts to incorporate region-specific factors into our estimates. We generate seven-year forecasts based on our long-run estimates for fair-value interest rates across various regions, which incorporate forward-looking estimates of inflation, the natural real rate of interest and the term premium. We forecast that the 10-year government yield may rise toward 4.6% in the US, 3.1% in Germany, 4.8% in the UK, 3.8% in Canada and 1.2% in Japan. 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 when computing this component 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.

We also incorporate the impact of potentially changing credit spreads on credit-sensitive fixed income asset classes. We assume that corporate bond spreads will revert toward their 20-year medians in each region relative to their government benchmark (see Exhibit 18). As in prior years, we incorporate an adjustment for anticipated spreads in emerging markets using a weighted average of median emerging market spreads and median international developed market spreads in order to account for structural improvements in these markets. Bonds of lower credit quality, especially those with longer duration, are the most affected by this adjustment. Specifically, high yield credit spreads tightened further over the previous 12 months, suggesting that moderate spread normalization will be a net headwind for high yield over the seven-year horizon.

**Exhibit 18: Credit Spreads Have Tightened, Led by High Yield**

Source: Bloomberg, FactSet, Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

**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-bills versus three-month interbank rates) up to a maturity of seven years. Due to restrictive Fed policy, short-term rates have risen to 3.9%, up from 3.7% in 2023 and 1.6% in 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. We expect the return may average 3.9% per year, as global inflation expectations have risen 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 other 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. We estimate that global REITs will deliver an annualized 5.5% return over the seven-year horizon.

**Energy Infrastructure/Master Limited Partnerships (MLPs)**

Our strategic forecast for energy infrastructure/MLPs also uses a methodology similar to that 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.

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 9.0% annualized over the strategic horizon.

**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. Overall, this approach leads to forecast returns similar to last year in the range of 5.5%-7.0% annualized over the strategic horizon.

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 and private investment funds often hold less liquid securities; as such, reported returns appear excessively smoothed due to lagging price discovery. We use well-established statistical methods to mitigate these effects and establish return characteristics that are 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 small- and mid-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; 3.4% for private equity; and 2.6% for private debt. Overall, we expect an annualized return of 6.5% for private real estate, 9.7% for private equity and 8.4% 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 sustainable long-term returns. As in previous years, 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 2.4% 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 calculation of 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 reduced 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 current 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. Historically, we computed average annualized volatility using historical monthly returns. 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 post-GFC 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 return 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 machine-learning-driven statistical 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 return 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 is 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 (see Exhibit 23).

## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

### Exhibit 19: GIC Strategic Asset Allocation Models, Level 0: Traditional Assets Only

	WEALTH CONSERVATION	INCOME	BALANCED GROWTH	MARKET GROWTH	OPPORTUNISTIC GROWTH
ULTRASHORT FIXED INCOME	13	10	5	3	1
<b>EQUITIES</b>					
US Equities	14	19	26	34	41
US Large-Cap Growth	6	8	11	14	17
US Large-Cap Value	6	8	10	13	16
US Mid-Cap Growth			1	1	2
US Mid-Cap Value		1	1	2	2
US Small-Cap Growth	1	1	1	2	2
US Small-Cap Value	1	1	2	2	2
International Equities	7	11	15	20	25
International Equities	7	9	13	18	23
Japan Equities		2	2	2	2
Emerging Market Equities	3	4	5	7	9
<b>TOTAL EQUITIES</b>	<b>24</b>	<b>34</b>	<b>46</b>	<b>61</b>	<b>75</b>
Total US Equities	14	19	26	34	41
Total International Equities	7	11	15	20	25
Total Emerging Market Equities	3	4	5	7	9
<b>FIXED INCOME AND PREFERRED</b>					
Short-Term Fixed Income	19	18	15	11	6
US Taxable Fixed Income	39	33	29	20	14
International Fixed Income	1	1	1	1	
Inflation-Linked Securities	1	1	1	1	1
High Yield Fixed Income	2	2	2	2	2
Emerging Market Fixed Income	1	1	1	1	1
<b>TOTAL FIXED INCOME AND PREFERRED</b>	<b>63</b>	<b>56</b>	<b>49</b>	<b>36</b>	<b>24</b>

Note: Strategic allocations effective April 1, 2024. In contrast to Level 1 and Level 2, the GIC has chosen, for practical reasons, to implement the Level 0 asset allocation models through a broad allocation to International Equities, supplemented by a region-specific allocation to Japan Equities in cases where the GIC currently recommends a strategic overweight relative to the benchmark.

Source: Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

### Exhibit 20: GIC Strategic Asset Allocation Models, Level 1: Traditional Assets, Real Assets and Hedged Strategies

	WEALTH CONSERVATION	INCOME	BALANCED GROWTH	MARKET GROWTH	OPPORTUNISTIC GROWTH
ULTRASHORT FIXED INCOME	14	7	5	2	1
EQUITIES					
US Equities	8	15	20	29	34
US Large-Cap Growth	4	6	9	12	14
US Large-Cap Value	3	6	8	11	13
US Mid-Cap Growth				1	1
US Mid-Cap Value		1	1	2	2
US Small-Cap Growth		1	1	1	2
US Small-Cap Value	1	1	1	2	2
International Equities	5	9	11	15	19
European Equities	3	4	5	7	11
Japan Equities	2	3	4	5	5
Asia Pacific ex Japan Equities		2	2	3	3
Emerging Market Equities	2	3	5	6	7
TOTAL EQUITIES	15	27	36	50	60
Total US Equities	8	15	20	29	34
Total International Equities	5	9	11	15	19
Total Emerging Market Equities	2	3	5	6	7
FIXED INCOME AND PREFERRED					
Short-Term Fixed Income	20	16	12	8	3
US Taxable Fixed Income	36	32	26	13	8
International Fixed Income					
Inflation-Linked Securities	1	1	1	1	1
High Yield Fixed Income	1	1	1	2	2
Emerging Market Fixed Income	1	1	1	1	1
TOTAL FIXED INCOME AND PREFERRED	59	51	41	25	15
ALTERNATIVES					
Real Assets	3	4	5	6	6
Real Estate/REITS		1	1	2	2
Commodities	1	1	1	1	1
Energy Infrastructure/MLPs	2	2	3	3	3
Absolute Return Assets	3	4	4	4	4
Equity Hedge Assets	5	5	6	8	8
Equity Return Assets	1	2	3	5	6
TOTAL ALTERNATIVES	12	15	18	23	24

Note: Strategic allocations effective April 1, 2024

Source: Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

### Exhibit 21: GIC Strategic Asset Allocation Models, Level 2: Traditional Assets and Alternatives, Including Private Investments

	WEALTH CONSERVATION	INCOME	BALANCED GROWTH	MARKET GROWTH	OPPORTUNISTIC GROWTH
ULTRASHORT FIXED INCOME	13	5	3	1	
<b>EQUITIES</b>					
US Equities	8	14	19	27	34
US Large-Cap Growth	4	6	8	12	15
US Large-Cap Value	3	6	8	10	14
US Mid-Cap Growth			1	1	1
US Mid-Cap Value		1	1	2	2
US Small-Cap Growth				1	1
US Small-Cap Value	1	1	1	1	1
International Equities	4	8	11	16	20
European Equities	3	4	6	9	12
Japan Equities	1	3	4	5	6
Asia Pacific ex Japan Equities		1	1	2	2
Emerging Market Equities	2	3	4	5	7
<b>TOTAL EQUITIES</b>	<b>14</b>	<b>25</b>	<b>34</b>	<b>48</b>	<b>61</b>
Total US Equities	8	14	19	27	34
Total International Equities	4	8	11	16	20
Total Emerging Market Equities	2	3	4	5	7
<b>FIXED INCOME AND PREFERRED</b>					
Short-Term Fixed Income	19	15	11	8	2
US Taxable Fixed Income	34	28	22	13	6
International Fixed Income					
Inflation-Linked Securities	1	1	1		
High Yield Fixed Income	1	1	1	1	1
Emerging Market Fixed Income	1	1	1	1	1
<b>TOTAL FIXED INCOME AND PREFERRED</b>	<b>56</b>	<b>46</b>	<b>36</b>	<b>23</b>	<b>10</b>
<b>ALTERNATIVES</b>					
Real Assets	2	3	4	4	4
Real Estate/REITS		1	1	1	1
Commodities	1	1	1	1	1
Energy Infrastructure/MLPs	1	1	2	2	2
Absolute Return Assets	2	2	2	2	2
Equity Hedge Assets	4	6	6	7	6
Equity Return Assets	1	2	3	3	4
Private Investments	8	11	12	12	13
Private Real Estate	3	3	3	3	3
Private Equity	3	5	6	6	7
Private Credit	2	3	3	3	3
<b>TOTAL ALTERNATIVES</b>	<b>17</b>	<b>24</b>	<b>27</b>	<b>28</b>	<b>29</b>

Note: Strategic allocations effective April 1, 2024, for investors with more than \$10 million in investable assets.

Source: Morgan Stanley Wealth Management GIC as of Feb. 29, 2024



## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

### Exhibit 22: Strategic and Secular Return and Volatility Estimates

	STRATEGIC (SEVEN-YEAR) ESTIMATES FOR 2024		SECULAR (20-YEAR) ESTIMATES FOR 2024	
	Annualized Return (%)	Annualized Volatility (%)	Annualized Return (%)	Annualized Volatility (%)
<b>ULTRASHORT FIXED INCOME</b>	<b>3.9</b>	<b>0.7</b>	<b>3.1</b>	<b>0.7</b>
<b>EQUITIES</b>	<b>6.0</b>	<b>13.5</b>	<b>8.0</b>	<b>13.5</b>
<b>US Equities</b>	5.1	14.9	8.4	14.9
US Large-Cap Growth	4.8	16.2	8.5	16.2
US Large-Cap Value	7.1	14.4	8.2	14.4
US Mid-Cap Growth	6.0	17.9	8.5	17.9
US Mid-Cap Value	7.7	15.8	8.6	15.8
US Small-Cap Growth	6.6	21.8	7.1	21.8
US Small-Cap Value	7.9	19.1	8.4	19.1
<b>International Equities</b>	6.6	15.4	7.3	15.4
European Equities	6.8	15.8	7.0	15.8
Japan Equities	5.8	20.0	7.0	20.0
Asia Pacific ex Japan Equities	7.7	19.8	7.1	19.8
<b>Emerging Market Equities</b>	8.1	19.3	8.3	19.3
<b>FIXED INCOME AND PREFERRED</b>	<b>5.0</b>	<b>5.3</b>	<b>3.7</b>	<b>5.3</b>
Short-Term Fixed Income	4.9	2.2	3.4	2.2
US Taxable Fixed Income	5.0	5.3	3.7	5.3
International Fixed Income	3.0	5.0	3.6	5.0
Inflation-Linked Securities	3.9	9.7	4.5	9.7
High Yield Fixed Income	5.9	8.4	5.4	8.4
Emerging Market Fixed Income	5.8	9.2	6.7	9.2
<b>ALTERNATIVES</b>	<b>6.3</b>	<b>8.0</b>	<b>6.1</b>	<b>8.0</b>
<b>Real Assets</b>	6.5	12.3	5.9	12.3
Real Estate/REITS	5.5	16.1	6.0	16.1
Commodities	5.0	15.3	4.2	15.3
Energy Infrastructure/MLPs	9.0	17.4	7.6	17.4
<b>Absolute Return Assets</b>	5.6	5.0	5.2	5.0
<b>Equity Hedge Assets</b>	6.7	9.2	5.9	9.2
<b>Equity Return Assets</b>	6.4	8.8	7.1	8.8
<b>Private Investments</b>	8.1	15.4	10.0	15.4
Private Real Estate	6.5	16.7	7.0	16.7
Private Equity	9.7	16.2	13.0	16.2
Private Credit	8.4	10.5	9.0	10.5

Note: We represented ultrashort fixed income represented by 90-day T-bills, fixed income and 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. 29, 2024. 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.

Source: Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

## Exhibit 23: 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	0.88	0.84
3	US Equities	-0.01	0.88	1.00	0.98	0.97	0.94	0.94	0.86	0.84	0.59	0.61
4	US Large-Cap Growth	-0.01	0.86	0.98	1.00	0.90	0.94	0.87	0.85	0.77	0.55	0.58
5	US Large-Cap Value	0.00	0.86	0.97	0.90	1.00	0.87	0.96	0.80	0.85	0.58	0.61
6	US Mid-Cap Growth	-0.01	0.83	0.94	0.94	0.87	1.00	0.90	0.93	0.84	0.56	0.58
7	US Mid-Cap Value	-0.02	0.84	0.94	0.87	0.96	0.90	1.00	0.86	0.91	0.57	0.60
8	US Small-Cap Growth	-0.02	0.76	0.86	0.85	0.80	0.93	0.86	1.00	0.93	0.52	0.53
9	US Small-Cap Value	-0.02	0.75	0.84	0.77	0.85	0.84	0.91	0.93	1.00	0.52	0.53
10	International Equities	-0.01	0.88	0.59	0.55	0.58	0.56	0.57	0.52	0.52	1.00	0.91
11	European Equities	0.00	0.84	0.61	0.58	0.61	0.58	0.60	0.53	0.53	0.91	1.00
12	Japan Equities	0.00	0.62	0.33	0.32	0.32	0.32	0.31	0.29	0.27	0.80	0.52
13	Asia Pacific ex-Japan Equities	-0.03	0.76	0.63	0.60	0.62	0.62	0.63	0.58	0.57	0.73	0.70
14	Emerging Market Equities	-0.05	0.69	0.55	0.52	0.54	0.56	0.54	0.54	0.52	0.67	0.65
15	Fixed Income and Preferreds	0.15	0.23	0.24	0.23	0.24	0.21	0.24	0.16	0.19	0.17	0.18
16	Short-Term Fixed Income	0.37	0.15	0.15	0.14	0.16	0.13	0.16	0.08	0.11	0.11	0.12
17	US Taxable Fixed Income	0.15	0.23	0.24	0.23	0.24	0.21	0.24	0.16	0.19	0.17	0.18
18	International Fixed Income	0.13	0.13	0.16	0.15	0.17	0.16	0.18	0.15	0.20	0.03	0.03
19	Inflation-Linked Securities	-0.01	0.13	0.15	0.15	0.14	0.13	0.15	0.09	0.09	0.09	0.09
20	High Yield Fixed Income	0.02	0.63	0.62	0.58	0.63	0.62	0.66	0.58	0.62	0.50	0.52
21	Emerging Market Fixed Income	0.04	0.48	0.47	0.44	0.47	0.47	0.47	0.42	0.43	0.35	0.35
22	Alternatives	0.06	0.78	0.86	0.83	0.82	0.85	0.82	0.82	0.78	0.52	0.54
23	Real Assets	-0.02	0.67	0.67	0.61	0.70	0.66	0.76	0.66	0.73	0.53	0.53
24	REITs	-0.01	0.72	0.74	0.68	0.77	0.72	0.83	0.73	0.81	0.54	0.55
25	Commodities	0.00	0.21	0.15	0.12	0.16	0.17	0.20	0.17	0.17	0.24	0.21
26	Energy Infrastructure/MLPs	-0.03	0.62	0.68	0.62	0.71	0.66	0.75	0.67	0.74	0.43	0.44
27	Absolute Return Assets	0.07	0.65	0.66	0.61	0.67	0.64	0.69	0.63	0.67	0.50	0.50
28	Equity Hedge Assets	0.04	0.35	0.41	0.37	0.43	0.39	0.43	0.37	0.41	0.20	0.19
29	Equity Return Assets	0.04	0.78	0.86	0.83	0.83	0.85	0.83	0.82	0.79	0.55	0.56
30	Private Investments	-0.03	0.49	0.58	0.54	0.58	0.56	0.61	0.61	0.64	0.30	0.30
31	Private Real Estate	-0.05	0.36	0.43	0.39	0.45	0.41	0.47	0.46	0.51	0.21	0.20
32	Private Equity	-0.03	0.55	0.65	0.63	0.64	0.64	0.67	0.67	0.67	0.34	0.34
33	Private Debt	-0.02	0.35	0.40	0.36	0.42	0.38	0.43	0.39	0.42	0.23	0.24

Note: Above is based on returns from the mid-1940s through February 2024. 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.

Source: Bloomberg, Datastream, Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

## ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Exhibit 24: Correlation Matrix (continued)

CORRELATION MATRIX		12	13	14	15	16	17	18	19	20	21	22
1	Ultrasort Fixed Income	0.00	-0.03	-0.05	0.15	0.37	0.15	0.13	-0.01	0.02	0.04	0.06
2	Equities	0.62	0.76	0.69	0.23	0.15	0.23	0.13	0.13	0.63	0.48	0.78
3	US Equities	0.33	0.63	0.55	0.24	0.15	0.24	0.16	0.15	0.62	0.47	0.86
4	US Large-Cap Growth	0.32	0.60	0.52	0.23	0.14	0.23	0.15	0.15	0.58	0.44	0.83
5	US Large-Cap Value	0.32	0.62	0.54	0.24	0.16	0.24	0.17	0.14	0.63	0.47	0.82
6	US Mid-Cap Growth	0.32	0.62	0.56	0.21	0.13	0.21	0.16	0.13	0.62	0.47	0.85
7	US Mid-Cap Value	0.31	0.63	0.54	0.24	0.16	0.24	0.18	0.15	0.66	0.47	0.82
8	US Small-Cap Growth	0.29	0.58	0.54	0.16	0.08	0.16	0.15	0.09	0.58	0.42	0.82
9	US Small-Cap Value	0.27	0.57	0.52	0.19	0.11	0.19	0.20	0.09	0.62	0.43	0.78
10	International Equities	0.80	0.73	0.67	0.17	0.11	0.17	0.03	0.09	0.50	0.35	0.52
11	European Equities	0.52	0.70	0.65	0.18	0.12	0.18	0.03	0.09	0.52	0.35	0.54
12	Japan Equities	1.00	0.47	0.44	0.12	0.08	0.12	0.01	0.06	0.27	0.20	0.30
13	Asia Pacific ex-Japan Equities	0.47	1.00	0.72	0.12	0.06	0.12	0.03	0.05	0.50	0.40	0.60
14	Emerging Market Equities	0.44	0.72	1.00	0.05	-0.01	0.05	0.03	0.01	0.46	0.46	0.56
15	Fixed Income and Preferreds	0.12	0.12	0.05	1.00	0.84	1.00	0.59	0.59	0.44	0.44	0.20
16	Short-Term Fixed Income	0.08	0.06	-0.01	0.84	1.00	0.84	0.41	0.53	0.39	0.28	0.15
17	US Taxable Fixed Income	0.12	0.12	0.05	1.00	0.84	1.00	0.59	0.59	0.44	0.44	0.20
18	International Fixed Income	0.01	0.03	0.03	0.59	0.41	0.59	1.00	0.26	0.27	0.60	0.20
19	Inflation-Linked Securities	0.06	0.05	0.01	0.59	0.53	0.59	0.26	1.00	0.31	0.24	0.11
20	High Yield Fixed Income	0.27	0.50	0.46	0.44	0.39	0.44	0.27	0.31	1.00	0.54	0.60
21	Emerging Market Fixed Income	0.20	0.40	0.46	0.44	0.28	0.44	0.60	0.24	0.54	1.00	0.49
22	Alternatives	0.30	0.60	0.56	0.20	0.15	0.20	0.20	0.11	0.60	0.49	1.00
23	Real Assets	0.29	0.60	0.53	0.21	0.16	0.21	0.15	0.12	0.62	0.46	0.66
24	REITs	0.29	0.59	0.52	0.32	0.23	0.32	0.27	0.17	0.69	0.52	0.68
25	Commodities	0.15	0.26	0.24	-0.07	-0.04	-0.07	-0.11	0.02	0.15	0.12	0.20
26	Energy Infrastructure/MLPs	0.22	0.51	0.45	0.23	0.19	0.23	0.22	0.12	0.64	0.45	0.67
27	Absolute Return Assets	0.29	0.52	0.46	0.30	0.29	0.30	0.18	0.20	0.79	0.43	0.81
28	Equity Hedge Assets	0.09	0.28	0.22	0.31	0.27	0.31	0.32	0.20	0.41	0.34	0.51
29	Equity Return Assets	0.32	0.62	0.60	0.16	0.12	0.16	0.11	0.09	0.61	0.44	0.97
30	Private Investments	0.15	0.36	0.28	0.16	0.10	0.16	0.15	0.03	0.36	0.22	0.59
31	Private Real Estate	0.10	0.27	0.21	0.16	0.11	0.16	0.17	0.04	0.29	0.19	0.44
32	Private Equity	0.18	0.41	0.33	0.14	0.08	0.14	0.13	0.04	0.40	0.24	0.66
33	Private Debt	0.11	0.25	0.22	0.18	0.18	0.18	0.13	0.15	0.52	0.24	0.45

Note: Above is based on returns from the mid-1940s through February 2024. 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.

Source: Bloomberg, Datastream, Morgan Stanley Wealth Management GIC as of Feb. 29, 2024

## 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	Ultrasort Fixed Income	-0.02	-0.01	0.00	-0.03	0.07	0.04	0.04	-0.03	-0.05	-0.03	-0.02
2	Equities	0.67	0.72	0.21	0.62	0.65	0.35	0.78	0.49	0.36	0.55	0.35
3	US Equities	0.67	0.74	0.15	0.68	0.66	0.41	0.86	0.58	0.43	0.65	0.40
4	US Large-Cap Growth	0.61	0.68	0.12	0.62	0.61	0.37	0.83	0.54	0.39	0.63	0.36
5	US Large-Cap Value	0.70	0.77	0.16	0.71	0.67	0.43	0.83	0.58	0.45	0.64	0.42
6	US Mid-Cap Growth	0.66	0.72	0.17	0.66	0.64	0.39	0.85	0.56	0.41	0.64	0.38
7	US Mid-Cap Value	0.76	0.83	0.20	0.75	0.69	0.43	0.83	0.61	0.47	0.67	0.43
8	US Small-Cap Growth	0.66	0.73	0.17	0.67	0.63	0.37	0.82	0.61	0.46	0.67	0.39
9	US Small-Cap Value	0.73	0.81	0.17	0.74	0.67	0.41	0.79	0.64	0.51	0.67	0.42
10	International Equities	0.53	0.54	0.24	0.43	0.50	0.20	0.55	0.30	0.21	0.34	0.23
11	European Equities	0.53	0.55	0.21	0.44	0.50	0.19	0.56	0.30	0.20	0.34	0.24
12	Japan Equities	0.29	0.29	0.15	0.22	0.29	0.09	0.32	0.15	0.10	0.18	0.11
13	Asia Pacific ex-Japan Equities	0.60	0.59	0.26	0.51	0.52	0.28	0.62	0.36	0.27	0.41	0.25
14	Emerging Market Equities	0.53	0.52	0.24	0.45	0.46	0.22	0.60	0.28	0.21	0.33	0.22
15	Fixed Income and Preferreds	0.21	0.32	-0.07	0.23	0.30	0.31	0.16	0.16	0.16	0.14	0.18
16	Short-Term Fixed Income	0.16	0.23	-0.04	0.19	0.29	0.27	0.12	0.10	0.11	0.08	0.18
17	US Taxable Fixed Income	0.21	0.32	-0.07	0.23	0.30	0.31	0.16	0.16	0.16	0.14	0.18
18	International Fixed Income	0.15	0.27	-0.11	0.22	0.18	0.32	0.11	0.15	0.17	0.13	0.13
19	Inflation-Linked Securities	0.12	0.17	0.02	0.12	0.20	0.20	0.09	0.03	0.04	0.04	0.15
20	High Yield Fixed Income	0.62	0.69	0.15	0.64	0.79	0.41	0.61	0.36	0.29	0.40	0.52
21	Emerging Market Fixed Income	0.46	0.52	0.12	0.45	0.43	0.34	0.44	0.22	0.19	0.24	0.24
22	Alternatives	0.66	0.68	0.20	0.67	0.81	0.51	0.97	0.59	0.44	0.66	0.45
23	Real Assets	1.00	0.84	0.61	0.86	0.64	0.38	0.67	0.51	0.45	0.51	0.39
24	REITs	0.84	1.00	0.20	0.77	0.66	0.41	0.68	0.58	0.53	0.56	0.40
25	Commodities	0.61	0.20	1.00	0.24	0.19	0.10	0.21	0.06	0.04	0.07	0.08
26	Energy Infrastructure/MLPs	0.86	0.77	0.24	1.00	0.67	0.43	0.68	0.57	0.50	0.56	0.47
27	Absolute Return Assets	0.64	0.66	0.19	0.67	1.00	0.49	0.81	0.56	0.46	0.60	0.65
28	Equity Hedge Assets	0.38	0.41	0.10	0.43	0.49	1.00	0.44	0.39	0.36	0.38	0.37
29	Equity Return Assets	0.67	0.68	0.21	0.68	0.81	0.44	1.00	0.58	0.43	0.65	0.46
30	Private Investments	0.51	0.58	0.06	0.57	0.56	0.39	0.58	1.00	0.93	0.92	0.62
31	Private Real Estate	0.45	0.53	0.04	0.50	0.46	0.36	0.43	0.93	1.00	0.74	0.52
32	Private Equity	0.51	0.56	0.07	0.56	0.60	0.38	0.65	0.92	0.74	1.00	0.65
33	Private Debt	0.39	0.40	0.08	0.47	0.65	0.37	0.46	0.62	0.52	0.65	1.00

Note: Above is based on returns from the mid-1940s through February 2024. 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.

Source: Bloomberg, Datastream, Morgan Stanley Wealth Management GIC as of Feb. 29, 2024



## 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 upward 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.

### Disclosure Section

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### 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.

**Correlation:** This is a statistical measure of how two securities move in relation to each other. This measure is often converted into what is known as correlation coefficient, which ranges between -1 and +1. Perfect positive correlation (a correlation coefficient of +1) implies that as one security moves, either up or down, the other security will move in lockstep, in the same direction. Alternatively, perfect negative correlation means that if one security moves in either direction the security that is perfectly negatively correlated will move in the opposite direction. If the correlation is 0, the movements of the securities are said to have no correlation; they are completely random. A correlation greater than 0.8 is generally described as strong, whereas a correlation less than 0.5 is generally described as weak.

**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:** 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.

**R<sup>2</sup>:** The coefficient of determination, is a statistic used in the context of statistical models whose main purpose is either the prediction of future outcomes or the testing of hypotheses, on the basis of other related information. It provides a measure of how well observed outcomes are replicated by the model, based on the proportion of total variation of outcomes explained by the model.

**Roll down:** The amount that interest rates can rise over a specified time period before the current yield exceeds an investor's year-to-maturity.

**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 P/E Ratio:** A measurement of stock market valuation that uses a 10-year average of inflation-adjusted earnings. It is also known as the cyclically adjusted P/E ratio (CAPE).

**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.

**Term premium:** The excess yield that investors require to commit to holding a long-term bond instead of a series of shorter-term bonds.

**Volatility:** This is a statistical measure of the dispersion of returns for a given security or market index. Volatility can either be measured by

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using the standard deviation or variance between returns from that same security or market index. Commonly, the higher the volatility, the riskier the security.

### Hedged Strategy Definitions

**Absolute return:** This type of 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:** This strategy employs sophisticated quantitative techniques of analyzing price data to ascertain information about future price movement and relationships between securities, and 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.

### Asset Class 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.

**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 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

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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.

**Hedge funds** may involve a high degree of risk, often engage in leveraging and other speculative investment practices that may increase the risk of investment loss, can be highly illiquid, are not required to provide periodic pricing or valuation information to investors, may involve complex tax structures and delays in distributing important tax information, are not subject to the same regulatory requirements as mutual funds, often charge high fees which may offset any trading profits, and in many cases the underlying investments are not transparent and are known only to the investment manager.

**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.

**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.

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



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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.

**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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