

Global Investment Committee | March 31, 2022

Annual Update of GIC Capital Market Assumptions

In these pages, we present the annual update of our capital market assumptions. These forecasts estimate the returns and volatility of global asset classes over the strategic, or seven-year, horizon and the secular, or 20-year, horizon. The strategic estimates serve as the key inputs for the Global Investment Committee's (GIC) strategic asset allocations. Compared with 2021, modestly less elevated equity valuations have translated into moderately higher expected returns. For certain fixed income segments, expected returns remain historically low, driven by still-low yields and tight credit spreads. The potential for persistent inflation and below-average expected returns for traditional asset classes highlight the importance of portfolio diversifiers and inflation hedges in asset allocation over the seven-year investment horizon.

Alongside the annual update of our strategic assumptions, we provide a rebalancing of our GIC strategic asset allocation models. These models are optimized annually using our goals-based framework and targeted risk parameters. It's important to keep in mind that these strategic models, which are developed for a seven-year investment horizon, do not immediately impact our tactical models. The tactical models, updates to which are published separately, target an investment horizon of 12 to 18 months and are adjusted based on the GIC's collective deliberations.

Michael Wilson

Chief Investment Officer
Chief US Equity Strategist
Morgan Stanley & Co. LLC

Lisa Shalett

Chief Investment Officer
Head of the Global Investment Office
Morgan Stanley Wealth Management

Daniel Hunt, CFA

Senior Investment Strategist

Steve Edwards, CFA

Senior Investment Strategist

Spencer J. Cavallo, CFA

Investment Strategist

Lisha Ge

Investment Strategist

Jonah Silverman

Associate

Matt Armstrong

Associate



Executive Summary

Every year between December and March, the Global Investment Committee (GIC) convenes to update our strategic, or seven-year, and secular, or 20-year, capital market return assumptions. That process involves marking every asset class to current market conditions while weighing valuations against our historical frameworks and forecasting tools. We seek to balance a consistent process with dynamic and adaptive enhancements. These efforts seek to incorporate structural policy changes, such as those at the Federal Reserve and federal government or those related to global trade and geopolitics.

Two years removed from the COVID-19 pandemic’s onset, the global economy has sharply rebounded, bolstered by unprecedented fiscal and monetary stimulus. By mid-2021, global equities had more than recovered their pandemic-driven losses, while government bond yields remained below pre-pandemic levels, with deeply negative real yields. Echoing notes from the 2010s, US equities maintained their leadership position on surging earnings and high relative valuations.

Since that point, several potential regime shifts have emerged, however. This post-pandemic cycle has brought higher real GDP growth *and* inflationary pressures, breaking the previous cycle’s pattern of tepid real GDP growth and near-deflationary conditions. After more than a decade of healing, solid consumer and corporate balance sheets appear poised to support stronger demand amid demographic and labor market shifts, deglobalization and decarbonization. The global banking system, particularly in the US, has avoided the credit excesses of the mid-2000s, and improved labor productivity points to the potential reversion of real yields to positive levels.

Initially sparked by pandemic-related supply chain disruptions, inflation has leapt materially higher, beyond a transitory blip, in the Americas and Europe, causing central banks to begin normalizing their monetary policy and tightening financial conditions. For the Federal Reserve, normalization involves increasing short-term rates from near-zero levels and reducing its largest-ever balance sheet, all as US fiscal policy has retrenched sharply. Reacting to 7.9% annualized Consumer Price Index (CPI) inflation, the Fed started raising

its policy rate, with the potential for 150 basis points or more in increases in 2022, alongside balance sheet reductions that would act like rate hikes.

In addition to the macro and market backdrop, the post-Cold War geopolitical order, under which financial markets enjoyed a “peace dividend,” may have given way to a more complicated, multipolar setup. Under Pax Americana, the US benefited from the US dollar’s reserve currency status, while US financial assets attracted premium valuations due to their perceived safety and quality.

Amid these potential regime shifts, we refresh our capital market assumptions and strategic asset allocation models. Equities’ historically elevated valuations and the potential secular weakness of government bonds point to lower risk-adjusted returns and more limited diversification in traditional assets. As such, the environment will likely require thoughtful portfolio construction, maximizing the benefits of active-passive decisions, manager selection, risk management and tax mitigation.

Exhibit 1: Return Estimates for Equities and Fixed Income

	2022		2021	
	Annualized Return	Annualized Volatility	Annualized Return	Annualized Volatility
Global Equities	5.2	13.1	4.9	13.2
US Equities	4.1	14.1	4.0	14.2
International Equities	5.6	14.7	4.7	14.8
Emerging & Frontier Mkt. Equities	8.3	17.5	7.8	17.5
Ultrashort Fixed Income	1.6	0.7	1.0	0.7
US Taxable Fixed Income	2.0	4.9	1.1	4.9
High Yield Fixed Income	3.6	7.5	1.2	8.3
Real Assets	4.6	10.3	5.6	10.1
Absolute Return Assets	3.5	4.7	2.1	4.6
Equity Hedge Assets	5.2	6.8	4.6	7.2
Equity Return Assets	4.8	8.3	3.7	8.4

Note: Ultrashort fixed income is represented by 90-day T-bills; US taxable fixed income by the Bloomberg US Aggregate Index; and high yield fixed income by the Bloomberg Global High Yield Corporate Index.

Source: Bloomberg, FactSet, Moody’s, Haver Analytics, Morgan Stanley & Co., Morgan Stanley Wealth Management GIC as of Feb. 28, 2022

Regime Change Now a Triple Threat

The Importance of Starting Points

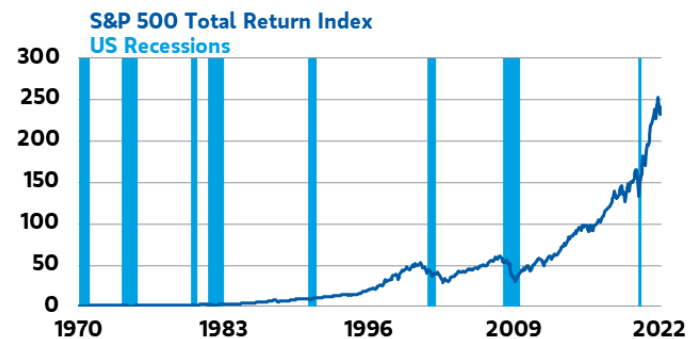
One of the most important things about measuring and assessing investment returns, not to mention forecasting them, is that starting points matter. On that score, one might come to our annual exercise of estimating capital market returns in a constructive mood. After all, 2022 has gotten off to a sour start for investors. As we go to press, the S&P 500 is down nearly 3% for the year, having declined, at the most tenuous moments, as much as 13% from January’s all-time high. The Nasdaq Composite, meanwhile, is attempting to recover from a full-blown bear market (down 20% or more) that began last November.

Damage below the surface has been broad: The highest beta and most speculative market segments have been hardest hit, and more than a third of the Russell 1000 is down more than 10% on the year. Adding insult to injury, bonds have done little to protect from the risk-off mood. With the two-year US Treasury yield up more than threefold—from 0.73% to 2.35%—and the 10-year yield up approximately 90 basis points and reaching our year-end target of 2.4%, three- and six-month bond market total returns are among the worst in history. Complicating the picture for investors seeking real (after inflation) returns have been the increasingly concerning dynamics around inflation, which was recently at its highest level in 40 years.

But in a world of historic relatives, the damage has been remarkably modest. Consider that, despite the recent pullback, the S&P 500 is still up twofold since the March 2020 bottom and more than sevenfold since the Great Financial Crisis trough of March 2009 (see Exhibit 2). US equity compound annual returns, at more than 15% over the last 12 years, have massively bested economic fundamentals such as growth in GDP, personal income and corporate profits, as interest rates have declined and multiples have expanded. At the current 19.7x forward price/earnings (P/E) ratio, the S&P 500 is still in the top decile of valuation regimes, and the equity risk premium (calculated using the 10-year Treasury yield), at approximately 270 basis points, remains solidly below its 15-year average (see Exhibit 3).

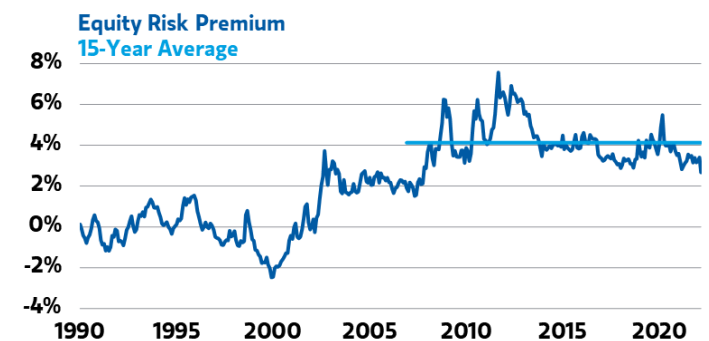
Equally important, corporate profitability remains at an all-time high, with operating profit margins running 2% above the prior cycle high in 2019. Peak multiples on peak business cycle earnings is a vulnerable combination, however. Treasuries, for their part, also remain richly priced, with real yields still deeply negative across the 30-year issuance curve. So while our forecasts for US stocks and bonds have improved slightly since a year ago, absolute value is far from compelling, and with volatility likely to normalize with policy, we forecast that Sharpe ratios—or risk-adjusted returns—will likely remain below long-run averages in aggregate.

Exhibit 2: Large-Cap US Equities Have Risen More Than Sevenfold Since 2009



Source: Bloomberg, Morgan Stanley Wealth Management GIC as of March 24, 2022

Exhibit 3: The S&P 500’s Equity Risk Premium Is Below Its 15-Year Average

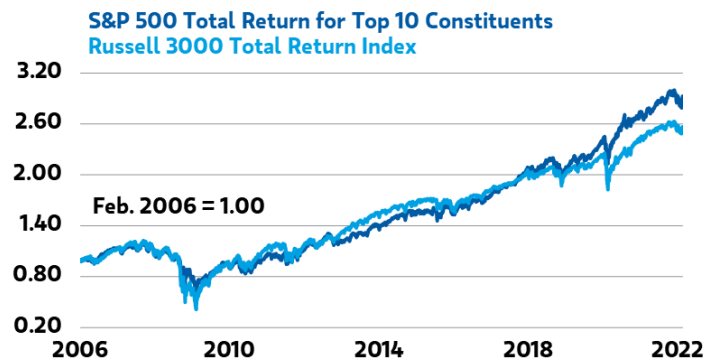


Source: Bloomberg, Morgan Stanley Wealth Management GIC as of March 24, 2022

Beyond starting points, relative cross-asset opportunity is just as vital to our forecasting exercise, as optimization aims to factor in both returns and risk. Here, too, US-centric investors need to appreciate their prior good fortune. The secular stagnation of the past decade (see the September 2016 GIC special report, “[Beyond Secular Stagnation](#)”), along with Federal Reserve actions that repressed the cost of capital and increased liquidity via nearly \$9 trillion of balance sheet expansion, fostered large skews in domestic indexes and among regional constituents of global ones. As mega-cap growth stocks have swamped small- and mid-cap value stocks, US indexes have outperformed non-US counterparts by historic degrees, suggesting unsustainable imbalances in a world of suddenly divergent central bank policies (see Exhibits 4, 5 and 6). In essence, US risk premiums remain low on a relative basis, despite a growing list of intermediate- and long-term concerns, suggesting that the best opportunities may lie outside last cycle’s winners.

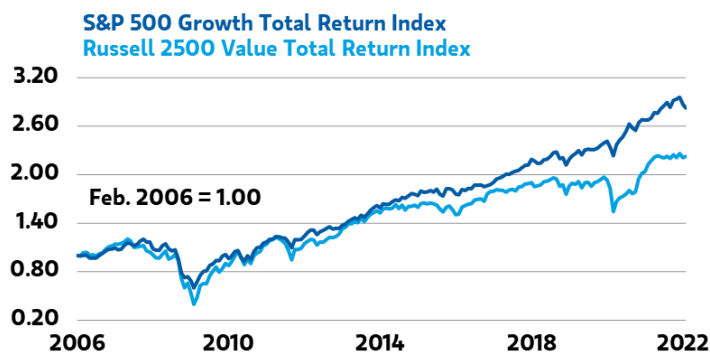
ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Exhibit 4: Equity Returns Have Been Skewed Toward the Largest Index Components



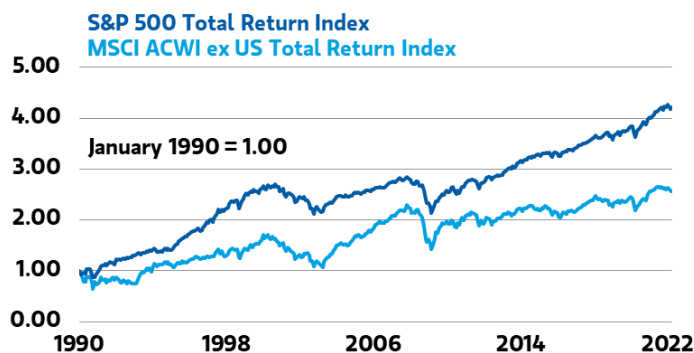
Note: Series displayed using natural logarithmic scale.
Source: FactSet, Morgan Stanley Wealth Management GIC as of March 25, 2022

Exhibit 5: US Growth Has Meaningfully Outpaced Value in Recent Years



Note: Series displayed using natural logarithmic scale.
Source: Bloomberg, Morgan Stanley Wealth Management GIC as of Feb. 28, 2022

Exhibit 6: US Equities Have Outperformed International Counterparts



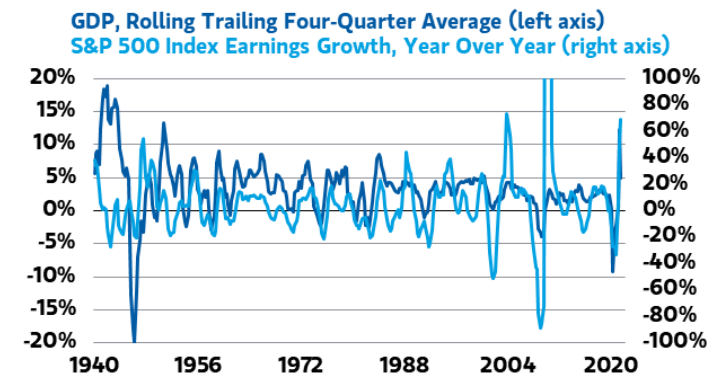
Note: Series displayed using natural logarithmic scale.
Source: Bloomberg, Morgan Stanley Wealth Management GIC as of March 24, 2022

Final considerations around starting points include the progression of the business cycle and the nature of the policy backdrop. On these fronts, we recognize as many as three major developments suggestive of both a new business cycle and investment regime. Specifically, we believe we have entered a fundamentally different backdrop—one that may harken back in part to the post-WWII period of 1946 to 1950. Navigating any one of them on its own would be difficult. Facing all three concurrently will likely prove even more challenging.

Regime Shift One: Post-Pandemic Reflation

As we wrote in our November 2020 report, "[Policymakers and the Pandemic: Defining a New Business Cycle](#)," the current business cycle is being powered not only by post-COVID behavioral dynamics but one of the most aggressive fiscal and monetary policy episodes in history. The result, not unlike the 1946 cycle, is that high excess consumer savings and pent-up demand are combining with profound social changes (e.g., de-urbanization, remote work and the metaverse) to impact economic growth trends (see Exhibit 7). Unlike the prior cycle of low growth, which saw a handful of players exploit innovation in the smart phone-centric ecosystem of e-commerce and social media, this one is apt to be much broader and deeper and to be driven by new themes and leadership.

Exhibit 7: Aggressive Fiscal and Monetary Policies Have Powered the Current Business Cycle



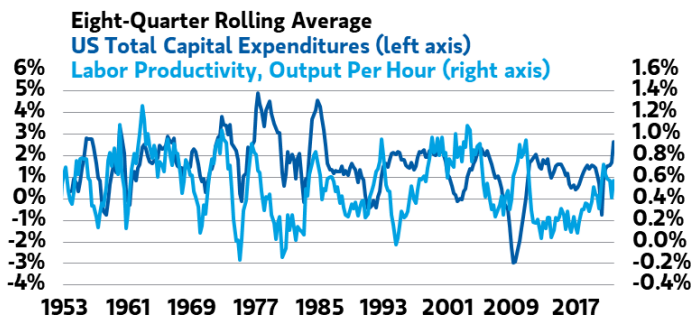
Source: Bloomberg, FactSet, Morgan Stanley Wealth Management GIC as of Dec. 31, 2021

We see these developments driving lasting structural change, with the "Six Ds"—demographics, deglobalization, decarbonization, dollar debasement, no deleveraging and detachment from the labor force—contributing to above average growth. Far from being transitory and driven by mere supply chain disruptions, we see healthy inflation of around 2.0% to 2.5%. Strong liquidity and balance sheets in the US banking system, in particular, suggest supreme conditions for

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

spending, lending and credit. Notably, deposits relative to liabilities are near all-time highs, household debt obligations to total net worth are at 40-year lows and corporations are awash in cash. The pandemic and evolving technology adoption by service business (from “tech makers” to “tech takers”), including those in financials, health care, education and government, are also driving higher levels of digitization, with both capital investment and productivity entering a renaissance (see Exhibit 8). Two things, especially, are helping to keep inflation looking more like the 1940s version than that of the 1970s: labor productivity and the absence of multiyear collective bargaining agreements featuring cemented cost of living adjustments leading to wage/price spirals.

Exhibit 8: Capital Investment and Productivity Have Been on an Upswing



Source: Federal Reserve Bank of St. Louis, Morgan Stanley Wealth Management GIC as of Oct. 1, 2021

Beyond the lack of last cycle’s deflationary deleveraging headwinds, demographics have also shifted constructively. The workforce productivity drag of aging baby boomers is being reversed by highly mobile and tech-savvy millennials and Gen Zers who are creating a labor force that is apt to continue to get younger and hungrier over the next 23 years, echoing the returning GIs of WWII. Housing, having begun a strong recovery from a decade of post-Great Financial Crisis restructuring, is an immediate beneficiary of that generational turnover. Contributing to this trend is the post-pandemic transformation of work itself, which is leading not only to more hybrid and remote models but to higher levels of overall detachment, with “gig work” and entrepreneurship playing bigger roles. This labor dynamism is both a growth accelerant and a driver of wage inflation.

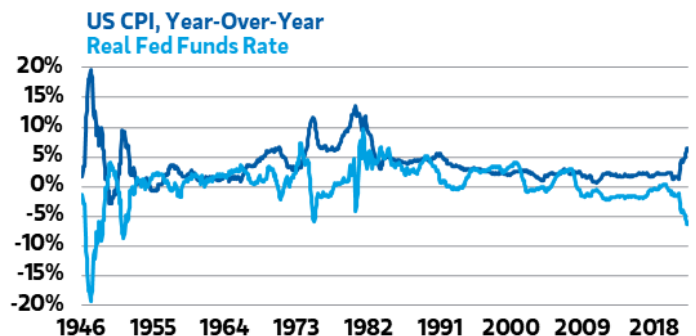
The reopening of the economy, with its attendant supply chain disruptions, also echoes the post-WWII period. This time, however, structural inflationary forces like deglobalization and decarbonization are at once driving not only higher costs but higher investment spending. Together, this amounts to a business cycle with higher real growth and inflation—one for which normalization of policy is increasingly possible and likely necessary.

Regime Shift Two: Fed Policy Pivots Toward Normalization of Rates and Balance Sheet

A second, and hopefully obvious, implication is that the 40-year bull market in bonds has finally ended, with the real 10-year Treasury yield bottoming in August 2021. But our journey through the multidecade trough in rates is likely to be volatile. What many investors may be underestimating—and something Fed Chair Jerome Powell himself has admitted—is that this cycle is unlike any other, and analogies to prior tightening episodes may not apply. For one, the central bank has never waited this long to commence tightening relative to economic growth, inflation and unemployment, with GDP recently at 6.9% annualized, consumer prices up 7.9% year over year and unemployment down to 3.8% (see Exhibit 9). In addition, the Fed’s balance sheet has never been this big, at 38% of annual GDP. Furthermore, the Fed has never attempted to manage its policy choices against such a huge fiscal cliff, with government stimulus concurrently rolling off. As the market struggles to price a suddenly hawkish Fed, the current turbulence is a case in point.

That is not to say that a Fed-induced recession is a foregone conclusion, as some pundits and bond market bulls posit. To the contrary, many dynamics suggest a strong economic cycle is still possible and that we are simply making a midcycle transition to more normal conditions including a bit more inflation and interest rates that produce positive real returns.

Exhibit 9: Anticipated Tightening Is Lagging Gains in Inflation



Source: Bloomberg, Morgan Stanley Wealth Management GIC as of Feb. 28, 2022

A secular bear market in bonds does not suggest that rates will cease going up and down with the business cycle; rather, it indicates that the long-run trend and the persistently negative term premium that has dominated the recent backdrop and supported ever-higher risk-asset multiples is structurally reversing. The issue is not simply acknowledging a Fed that is behind the curve *this* cycle, but one that needs to increasingly address the unwind of a swollen balance sheet, growing fiscal and trade deficits, and record debt as a percent of GDP. Here, too, we recall the negative interest rate

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

regime of 1946 to 1950, the inflation chasing and the increased volatility and higher rates that ultimately resulted. But what is the correct neutral rate for the US economy as we normalize? Certainly, it's not the 4% to 5% of the 1940s, but is it the sub-2% of the 2010s?

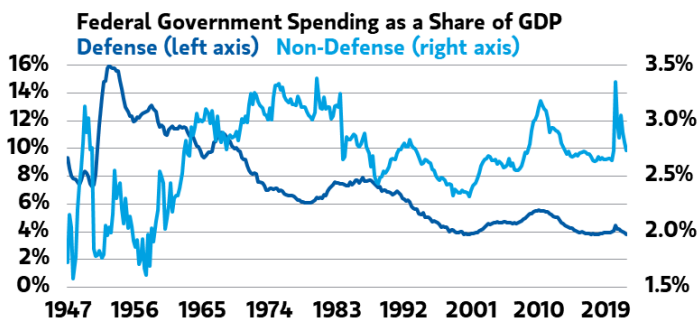
Finally, in light of capital misallocation and asset bubble risk, central bank navigation at the zero bound is not a sustainable long-term policy stance. This is a complicating challenge that we didn't face in the 1940's given more modest equity valuations and lower income and wealth inequality—factors currently driving political instability and divisiveness. While these rate considerations contribute to uncertainty, undermine stock multiples and expand credit spreads, the most important challenge posed by the repricing of the risk-free rate is to portfolio construction, where the efficacy of bonds as diversifying assets is temporarily impaired.

Regime Shift Three: New World Order and End of the Peace Dividend

A third element of the new investment regime—one that recently emerged and is still evolving—is what appears to be a new world order following the Russian invasion of Ukraine.

It seems clear to us that at least two things with lasting investment implications have changed. First, the 40-year peace dividend that came with the fall of the Berlin Wall and the dissolution of the Soviet Union appears to be over. In the face of new international tensions, public spending could increase on everything from cybersecurity, to defense, to alternative energy, to space exploration and weaponry (see Exhibit 10).

Exhibit 10: Defense Spending Relative to GDP Appears Poised to Rebound



Source: Haver Analytics, Morgan Stanley Wealth Management GIC as of Dec. 31, 2021

Second, the potential repercussions of imposing economic sanctions raise new questions. Not the least of these is whether the US can continue to command the benefits that accrue to the issuer of the world's reserve currency while the US government seizes or freezes central bank foreign exchange reserves, as it has done with Russia. What are the

implications for the US dollar and, in turn, for American global purchasing power, especially with countries like China eager to see their currencies used more prominently in international trade? Here, too, the consequences may be positive for growth—as they were amid post-WWII global rebuilding—but negative for the US dollar. Notably, a weaker dollar creates tailwinds for American investors investing overseas.

Rebalancing Our Strategic Models

As we detail below, changes in underlying financial market variables have shifted our strategic (seven-year) capital market assumptions, summarized in Exhibits 11 and 12. As such, we are updating and rebalancing our strategic models, as shown in Exhibits 20 and 21. We continue to show preference for US value-style and non-US equities. We increase allocations to Japanese and Asia Pacific ex Japan equities, offsetting slight decreases in European equities. Among alternatives, we increase allocations to energy infrastructure and equity hedge assets and decrease allocations to real estate investment trusts (REITs).

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

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

Within fixed income, we maintain our underweight allocation relative to the benchmark, and we further reduce duration risk by increasing allocations to short-term fixed income and decreasing allocations to US taxable fixed income. Further, we slightly increase allocations to emerging market fixed income, given an improved risk-return profile for the strategic horizon.

Within equities, our allocations to the US are little changed, as our preference for international equities remains intact. We modestly increase our exposure to Japan and Asia Pacific ex Japan, offsetting a slight decrease in our European allocation.

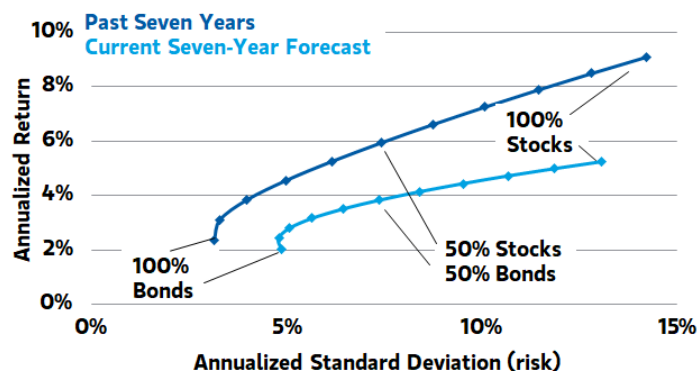
Within alternatives, we adjust our exposure to real assets and hedged strategy asset classes where we deem appropriate. These investment strategies attempt to reduce exposure to broad equity movements; hedge the portfolio during major market drawdowns; and generate higher returns than high-quality fixed income, a traditional portfolio diversifier. Within real assets, which may provide some portfolio diversification in case of rising inflation, we slightly increase our allocations to energy infrastructure and reduce allocations to REITs and commodities in some models. Among hedged strategies, we increase our allocation to equity hedge assets, based on a

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

favorable risk-reward profile for the strategic horizon.

For clients with more than \$25 million in investable assets, we slightly increase our allocations to private investments, increasing weights to both private equity and private debt, offsetting a modest reduction in private real estate.

Exhibit 11: Next Seven-Year Outlook Calls for Lower Returns and Higher Volatility



Note: Stocks are represented by the MSCI All Country World Index and bonds by the Bloomberg US Aggregate Index.
Source: FactSet, Morgan Stanley Wealth Management GIC as of Feb. 28, 2022

Exhibit 12: The GIC's New Strategic Return, Volatility and Correlation Forecasts

	Annualized Return	Annualized Volatility	Correlation to Equities
Equities	5.2	13.1	1.00
REITs	4.4	13.7	0.68
Energy Infrastructure/MLPs	6.4	14.3	0.58
Commodities	3.0	15.0	0.19
Private Real Estate	5.4	7.4	0.40
Equity Hedge Assets	5.2	6.8	0.27
US Taxable Fixed Income	2.0	4.9	0.19

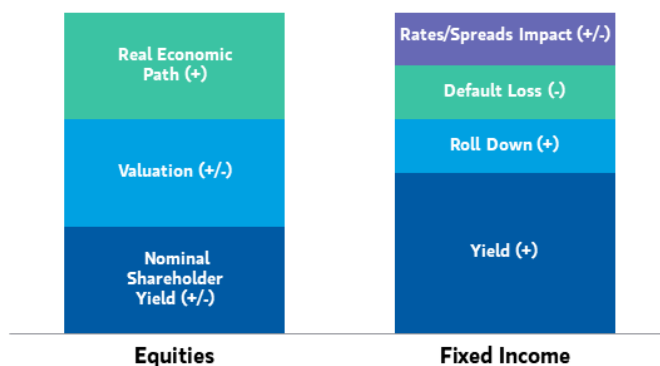
Note: Seven-year annualized forecast
Source: Robert J. Shiller of Yale University, Bloomberg, FactSet, Moody's, Haver Analytics, Datastream/IBES, Morgan Stanley & Co., Morgan Stanley Wealth Management GIC as of Feb. 28, 2022

Building Our Forecasts

We forecast strategic equity and fixed income returns by maintaining a largely similar methodology to last year's but have included refinements to certain calculation parameters as we continue to improve the methodology. For equities, we build return estimates by combining the nominal return to shareholders (including share repurchases and dividends), the impact of changes in valuation and the likely inflation-adjusted economic path over the next seven years. For fixed

income, we construct estimates starting with current yields, add the return due to expected "roll down"—the price appreciation that comes as bonds near maturity, given a positively sloping yield curve—and make adjustments for potential losses from defaults, changing interest rates and credit spreads (see Exhibit 13). 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 13: Building Blocks of Our Return Estimates



Source: Morgan Stanley Wealth Management GIC, Morgan Stanley & Co.

Equities: Our Strategic Methodology

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

What Yields Will Companies Deliver to Investors?

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

We measure shareholder yield by examining what companies in each region have paid out in both forms over the previous 10 years, tracking a market cycle. We compute nominal shareholder yields by analyzing historical index-level shareholder payout ratios and forward-looking earnings yield estimates. This calculation avoids the attempt to differentiate between dividends and share repurchases and instead groups

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

the two sources of returns under a single metric. Consistent with last year, we chose to consider a 10-year period because this longer-term horizon mitigates the observed cyclicalities in payout ratios. Compared to last year, shareholder yields have risen across different equity segments, driven by increased forward-looking earnings yield estimates. These estimates of nominal shareholder yield (see Exhibit 14) form the base of our return forecasts, to which we add effects from changes in valuation and real earnings growth.

Exhibit 14: International Equities to Outperform US Large-Cap

	Nominal Shareholder Yield	Valuation	Real Economic Path	Total
US Large-Cap Equities	3.7	-1.6	1.8	4.0
US Small/Mid-Cap Equities	2.3	0.0	2.8	5.1
European Equities	3.5	0.4	1.5	5.4
Japan Equities	3.7	1.2	0.7	5.7
Asia Pacific ex Japan Equities	3.9	0.2	2.9	7.0
Developed International Equities	3.5	0.5	1.6	5.6
Emerging Markets Equities	2.9	0.5	4.8	8.3
Global Equities	3.5	-0.5	2.3	5.2

Source: Robert J. Shiller of Yale University, Bloomberg, FactSet, Haver Analytics, Datastream/IBES, Morgan Stanley & Co., Morgan Stanley Wealth Management GIC as of Feb. 28, 2022

Are Valuations Likely to Boost or Drag Down Returns?

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

First, we estimate valuation-driven returns based on the CAPE ratio. This metric attempts to smooth volatile swings in company earnings that can occur over the course of a business cycle and adjusts for inflation in order to gain a better picture of the true earnings potential of the equity market, in aggregate, and how much investors are paying for it. Popularized by Yale University professor Robert Shiller, a version of the CAPE ratio that employs a 10-year average to smooth earnings has shown a historical correlation to average equity returns over the long term.¹ The theory behind this relationship suggests that more expensive CAPE ratios imply lower average future returns.

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

Similarly to previous years, we use a trailing 10-year cyclical adjustment for emerging markets (EM) and European equities, which we believe appropriately normalizes for their earnings potential by effectively reducing the weights of the idiosyncratic data points that have been a feature of the exceptional postcrisis cycle.

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

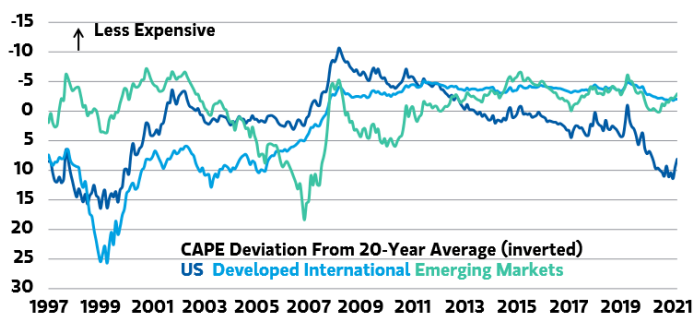
As of our forecast date of Feb. 28, 2022, and for the seven-year horizon, CAPE ratios suggest that US equity returns are likely to shrink modestly due to multiple contraction, while developed international and emerging markets are likely to rise slightly due to multiple expansion (see Exhibit 15).

The equity risk premium component of our valuation analysis measures the incremental compensation investors require to hold stocks. We measure this premium by comparing the earnings yield generated by an equity position to the yield of corporate bonds, which is driven by similar fundamentals but

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

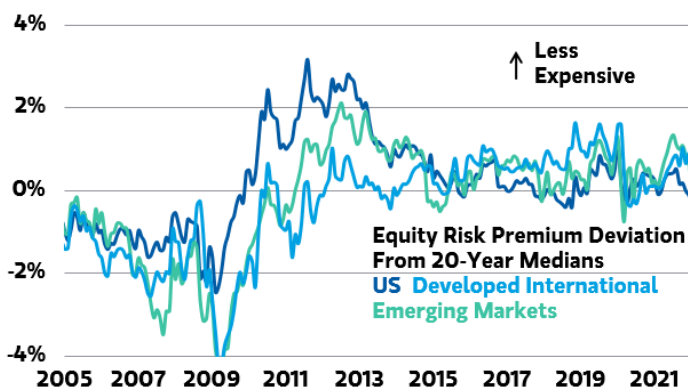
offers additional levels of security in the form of fixed payments and a superior standing in the capital structure. A higher equity risk premium suggests that equities are inexpensive relative to bonds, as they offer a relatively high degree of compensation for bearing equity risk. Despite strong earnings growth since the 2020 recession and recent market weakness in the first quarter of 2022, equity risk premiums decreased modestly in the US due to rising yields. In contrast, equity risk premiums increased among international developed markets (see Exhibit 16).

Exhibit 15: Based on CAPE, Developed International and Emerging Markets Appear Less Expensive Than US



Note: CAPE uses a trailing seven-year time period, except in the case of EM and Europe. We show the trailing seven-year CAPE for Japan for comparability purposes, although we use trailing P/E for calculating our return estimates. Source: Robert J. Shiller of Yale University, Bloomberg, FactSet, Haver Analytics, Morgan Stanley Wealth Management GIC as of March 25, 2022

Exhibit 16: Equity Risk Premiums Remain Close to or Above 20-Year Medians



Source: Bloomberg, FactSet, Haver Analytics, Morgan Stanley Wealth Management GIC as of March 25, 2022

Over the seven-year strategic horizon, we expect interest rates will continue to rise globally as the accommodative global monetary policy in place today normalizes. We also expect global inflation to sustain at higher average levels over the strategic horizon than it did during the preceding decade.

During the next seven years, we expect modestly higher rates, at levels consistent with our estimates of growth and inflation. Accordingly, we forecast that 10-year government yields will rise to 2.7% in the US, 1.3% in Germany, 3.3% in the UK, 2.3% in Canada and 1.1% in Japan.

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

Consistent with last year, we apply a 50% haircut to the impact of changing valuations on returns from both CAPE and the equity risk premium for all equity asset classes. We base this assumption on the possibility that the natural rate of interest has declined. We attribute this change to material adjustments to monetary policy after the Global Financial Crisis along with further crystallization following the policy response to COVID-19. The natural interest rate has historically provided a guide to the maximum policy rates in late cycles and coincided with the top-of-cycle level for longer-term yields. As part of its Summary of Economic Projections from its March 17 meeting, the Fed reported a median long-term policy rate of 2.375%, with expectations ranging from 2.0 to 3.0%. This level falls well below the pre-2008 historical implied rate of approximately 5.0%. This movement suggests that equity valuations could stay above historical levels for years to come.

What Is the Likely Economic Path?

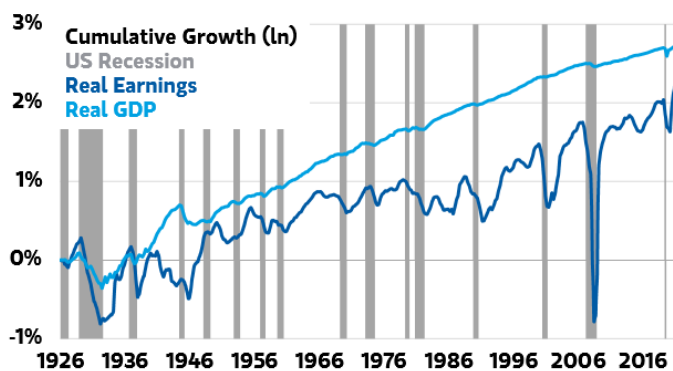
The final component to equity returns is the likely path of the economy, as it has a strong impact on the ability of companies to grow their earnings. We begin with Organization for Economic Cooperation and Development (OECD) estimates of real GDP growth for the next seven years. We believe real GDP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

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

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Last year, in light of the global economy's ongoing recovery from the COVID-19 lockdown recession, we applied a 1.4x multiplier to GDP growth to account for operating leverage, reflecting the historical median level in nonrecessionary periods since 1953 (See Exhibit 17). History suggests that, during economic recoveries, earnings growth has tended to exceed GDP growth, owing to companies' operating leverage. Now nearly two years removed from the official end of the COVID-induced recession, the possibility of a recession occurring over the strategic horizon has risen to a more typical level. We therefore adjust the multiplier to GDP growth to 1.1x, which reflects the historical median level for all periods since 1970.

Exhibit 17: Earnings Growth Tends to Exceed GDP Growth Following Recessions



Source: Bloomberg, FactSet, Morgan Stanley Wealth Management GIC as of March 25, 2022

How May We Account for Inflation Expectations?

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

These implied inflation rates suggest that levels of global inflation have recovered somewhat from last year's subdued levels. We continue to be slightly more optimistic than the market concerning inflation in Japan, where we assume it will reach 1.0%. This increase is driven by our more optimistic view of the country's economic path and is also intended to

offset the potential bias from a constrained supply of Japanese inflation-linked securities.

Fixed Income: Our Strategic Methodology

To compute our forecasts for fixed income returns at the strategic horizon, we first estimate returns based on current yields and the "roll down"—the price appreciation due to the anticipated change in bond yields, given a typically upward-sloping yield curve, as bonds approach maturity. 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 18). Our methodology leverages the work of Andrew Sheets, Morgan Stanley & Co.'s chief cross-asset strategist and a member of the GIC.³

Exhibit 18: We Adjust Fixed Income Returns by Considering Their Marginal Drivers

	Starting Yield	Return From Roll Down	Default Loss	Impact of Yields/Spreads Changed	Total
US 10-20 Year Treasury	2.2	0.6	0.0	-2.1	0.7
US Aggregate	2.3	0.6	0.0	-0.8	2.0
Global High Yield	5.7	0.7	-2.0	-0.9	3.6
International Agg.	1.3	0.5	0.0	-0.9	0.8
Emg. Mkt. Credit*	7.5	0.6	-0.9	-0.4	6.8
Global Aggregate	1.8	0.5	-0.1	-0.8	1.3

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

Source: Bloomberg, Moody's, Morgan Stanley Wealth Management GIC as of Feb. 28, 2022

Initial Yield and Roll Down

Our approach uses the current yield on each index to set a baseline for fixed income returns. Historically, the yield at which investors have purchased fixed income instruments has been a strong predictor, explaining more than 90% of variability in forward returns over a multiyear horizon.³ 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

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

form our estimates of the strategic returns.

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

Allowances for Rising Rates and Wider Credit Spreads

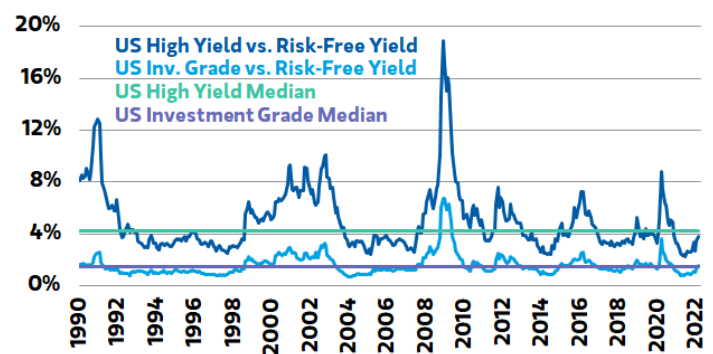
Fixed income instruments have benefitted from a nearly 40-year secular bull market, culminating in rates falling to historical lows during the COVID-19 lockdown in March 2020. We believe, however, that during the next seven years, rates are likely to reach higher levels as growth and inflation normalize. To maintain consistency, we must account for the drop in price that these higher rates would imply, offsetting a portion of the returns from the initial yield and the roll down.

As in recent years, we utilize a broader range of interest rate forecasts to incorporate region-specific factors into our estimates. Given the likelihood of a multiyear upturn in interest rates, we generate seven-year forecasts based on our long-run estimates for fair-value interest rates across various regions. Historically, secular trends in interest rates have occurred over a multicycle horizon. Accordingly, we expect only partial progress toward our long-run target over a seven-year strategic horizon. We forecast that 10-year government yields will rise to 2.7% in the US, 1.3% in Germany, 3.3% in the UK, 2.3% in Canada and 1.1% in Japan. These forecasts also feed into our expected equity risk premium methodology.

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

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

Exhibit 19: Credit Spreads Have Risen to Median Levels



Source: Morgan Stanley Wealth Management GIC, Bloomberg as of Feb. 28, 2022

Allowances for Default Loss

Fixed income securities may also be subject to losses associated with default risk. 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 a lower risk of default losses 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 time to maturity.

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Ultrashort Fixed Income

We base our strategic ultrashort fixed income return forecast on the market-implied expected return of the three-month US Treasury bill for the next seven years. We derive this figure from the prices of a set of instruments, including the on-the-run three-month T-bill and a selection of longer-term swaps (T-bill vs. three-month interbank rates), up to a maturity of seven years. Due to the normalization of Fed policy, short-term rates are expected to rise through 2024, increasing this year's return forecast to 1.6%, from 1.0% for 2021.

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.⁴ We expect a return of 1.7% this year, as global inflation expectations have risen significantly, offsetting real rates that remain negative in the major developed regions.

Alternatives: Our Strategic Methodology

Global REITs

We estimate the return on global REITs using a similar methodology as that for equities. For the earnings payout contribution to return, we examine what these securities have paid out via dividends and share repurchases in the past 10 years. We take into account their current valuations by using the CAPE ratio to project forward multiple expansion and acknowledge the impact of our forecast for higher interest rates and mean-reverting credit spreads via the equity risk premium. We use the same earnings growth forecast as for global equities. By our estimates, we expect global REITs to deliver an annualized 4.4% return over the seven-year horizon.

Energy Infrastructure/MLPs

Our strategic forecast for energy infrastructure/master limited partnerships (MLPs) also uses a methodology similar to that used for equities. For the earnings payout contribution to return, we balance the high yield associated with these securities against their historical reliance on equity issuance as a form of funding, computing the implied nominal shareholder yield over a 10-year window. Their valuations remain low relative to history both on a CAPE ratio and equity risk premium basis. This leads to our projection for modest valuation multiple expansion over the strategic horizon. The expected valuation multiple expansion is lower than in 2021, however, due to the relatively strong trailing 12-month performance. We also assume a partial 50% reversion

to historical medians. We maintain this adjustment based on our expectation that the asset class will not fully return to the high valuations achieved in previous decades.

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 6.4%.

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 3.0% over this period.

Hedged Strategies and Managed Futures

Hedged strategies do not themselves represent asset classes. Instead, they are investment strategies that have historically shown an ability to deliver returns in a manner that diversifies stock and bond holdings within portfolios by leveraging exposure to traditional asset classes.

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

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

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Private Equity, Private Debt and Private Real Estate

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

To forecast returns for these illiquid asset classes, we add an expected illiquidity premium to our forecast returns for a corresponding liquid asset class: for private equity, US mid- and small-cap equities; for private debt, US high yield bonds; and for private real estate, REITs. We determined this expected illiquidity premium from studying the historical spreads between the illiquid asset classes and their corresponding liquid asset classes. This year, we sourced longer-term and more granular private investment returns data from Cambridge Associates. Additionally, we obtained public market equivalent (PME) returns, which we believe enables a more appropriate comparison of private and public investment performance for the purpose of estimating the illiquidity premium. 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.

Today's historically elevated valuations and significant "dry powder" may dampen return prospects over the strategic horizon. We forecast these illiquidity premiums as follows: 1.0% for private real estate; 3.1% for private equity; and 2.5% for private debt. Overall, we expect an annualized return of 5.4% for private real estate, 8.2% for private equity and 6.3% for private debt.

Secular Returns

In addition to our strategic return estimates, we also project returns over the secular horizon, which we consider to be 20-years or longer. As a primary guide for potential long-term returns, we use the real geometric average returns over a long history of market data for both global equities and bonds. We then add back a forward-looking forecast of inflation to estimate the long-term sustainable level. This year, we base our inflation forecast on an average of the market-implied US 20-year breakeven inflation rate (derived from yield differentials between nominal Treasuries and TIPS) and the Federal Reserve Bank of Cleveland's 20-year inflation expectations. This leads to an expected annualized inflation rate of 2.26% over the secular horizon.

In order to resolve limitations on data history for certain

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

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

For US, international and emerging markets equities, we found that relative historical returns may not represent a reasonable picture of forward-looking returns. We therefore dampened the historical spread by 50% and 75% for US and international equities, respectively, to account for each region's significant outperformance or underperformance indicated by the common-period return history. US equities have produced gains that have outpaced all other developed markets since the 1970s, which represents 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 returns, but their return profile has since converged somewhat toward developed markets as the underlying economies have matured.

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

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

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

Volatility

Volatility measures the variability of returns around their average value and serves as one indicator of the risk associated with an investment. We compute average

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

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

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

We first classified historical periods into one of four mutually exclusive regimes, based on long-term trends in GDP and inflation. We then calculated volatility 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 exclude the period from 1946 to 1955 since we believe the exceptional returns variability experienced during this period is not representative of prospective volatility for the asset class. For other asset classes for which data is not available to January 1946, we applied a statistical machine learning technique to impute the missing returns, based on relationships with available return series and other relevant macroeconomic data, such as bond yields, commodity prices, corporate earnings and inflation rates.

Correlation

A critical factor in asset allocation is correlation, or the degree to which asset class returns move together. Correlations can vary considerably over different historical periods due to changes in macro regimes, market structure, stages of the business cycle and multiple other factors. Consistent with our approach described above for estimating volatilities, we estimated correlations, using a regime-weighted approach based on the GIC’s expectations for future macro regimes and historical return series from January 1946. Please refer to Exhibit 23, starting on page 18.

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Exhibit 20: New Strategic Weights for GIC Asset Allocation Models, Level 1

	WEALTH CONSERVATION	INCOME	BALANCED GROWTH	MARKET GROWTH	OPPORTUNISTIC GROWTH
ULTRASHORT FIXED INCOME	12	10	5	2	1
EQUITIES					
US Equities	10	14	19	25	30
US Large-Cap Growth	3	4	5	8	10
US Large-Cap Value	4	6	9	10	13
US Mid-Cap Growth	0	0	0	1	1
US Mid-Cap Value	1	1	2	2	2
US Small-Cap Growth	1	1	1	2	2
US Small-Cap Value	1	2	2	2	2
International Equities	8	12	15	22	25
European Equities	4	6	7	11	12
Japan Equities	3	5	6	9	10
Asia Pacific ex Japan Equities	1	1	2	2	3
Emerging & Frontier Market Equities	3	4	6	6	8
TOTAL EQUITIES	21	30	40	53	63
Total US Equities	10	14	19	25	30
Total International Equities	8	12	15	22	25
Total Emerging & Frontier Market Equities	3	4	6	6	8
FIXED INCOME & PREFERRED					
Short-Term Fixed Income	18	15	11	6	2
US Taxable Fixed Income	28	20	15	10	5
International Fixed Income	0	0	0	0	0
Inflation-Linked Securities	1	1	1	1	1
High Yield Fixed Income	1	1	2	2	1
Emerging Market Fixed Income	1	2	2	1	1
TOTAL FIXED INCOME	49	39	31	20	10
ALTERNATIVES					
Real Assets	5	5	7	7	8
Real Estate/REITS	1	1	2	2	2
Commodities	2	2	2	2	3
Energy Infrastructure/MLPs	2	2	3	3	3
Absolute Return Assets	3	5	4	4	4
Equity Hedge Assets	8	8	9	9	8
Equity Return Assets	2	3	4	5	6
Private Investments	0	0	0	0	0
Private Real Estate	0	0	0	0	0
Private Equity	0	0	0	0	0
Private Credit	0	0	0	0	0
TOTAL ALTERNATIVE INVESTMENTS	18	21	24	25	26

Source: Morgan Stanley Wealth Management GIC as of Feb. 28, 2022

Note: Strategic allocations effective Apr. 1, 2022, for investors with less than \$25 million in investable assets.

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Exhibit 21: New Strategic Weights for GIC Asset Allocation Models, Level 2

	WEALTH CONSERVATION	INCOME	BALANCED GROWTH	MARKET GROWTH	OPPORTUNISTIC GROWTH
ULTRASHORT FIXED INCOME	8	6	4	1	0
EQUITIES					
US Equities	9	13	17	23	28
US Large-Cap Growth	3	4	5	7	8
US Large-Cap Value	3	6	7	10	11
US Mid-Cap Growth	0	0	0	1	1
US Mid-Cap Value	1	1	2	2	3
US Small-Cap Growth	1	1	1	1	2
US Small-Cap Value	1	1	2	2	3
International Equities	8	13	15	20	24
European Equities	5	6	7	10	13
Japan Equities	2	5	6	7	8
Asia Pacific ex Japan Equities	1	2	2	3	3
Emerging & Frontier Market Equities	3	4	5	7	8
TOTAL EQUITIES	20	30	37	50	60
Total US Equities	9	13	17	23	28
Total International Equities	8	13	15	20	24
Total Emerging & Frontier Market Equities	3	4	5	7	8
FIXED INCOME & PREFERRED					
Short-Term Fixed Income	15	12	9	4	1
US Taxable Fixed Income	28	18	14	8	2
International Fixed Income	0	0	0	0	0
Inflation-Linked Securities	1	1	1	1	1
High Yield Fixed Income	1	1	1	1	1
Emerging Market Fixed Income	1	1	1	1	1
TOTAL FIXED INCOME	46	33	26	15	6
ALTERNATIVES					
Real Assets	5	5	5	6	7
Real Estate/REITS	1	1	1	2	2
Commodities	2	2	2	2	2
Energy Infrastructure/MLPs	2	2	2	2	3
Absolute Return Assets	3	3	3	2	2
Equity Hedge Assets	6	8	8	7	6
Equity Return Assets	2	2	2	3	3
Private Investments	10	13	15	16	16
Private Real Estate	4	5	5	4	4
Private Equity	4	5	6	9	9
Private Credit	2	3	4	3	3
TOTAL ALTERNATIVE INVESTMENTS	26	31	33	34	34

Source: Morgan Stanley Wealth Management GIC as of Feb. 28, 2022

Note: Strategic allocations effective Apr. 1, 2022, for investors with more than \$25 million in investable assets.

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Exhibit 22: Strategic and Secular Return and Volatility Estimates

	STRATEGIC (SEVEN-YEAR) ESTIMATES FOR 2022		SECULAR (20-YEAR) ESTIMATES FOR 2022	
	Annualized Return	Annualized Volatility	Annualized Return	Annualized Volatility
ULTRASHORT FIXED INCOME	1.6	0.7	3.0	0.7
EQUITIES	5.2	13.1	8.0	13.1
US Equities	4.1	14.1	8.4	14.1
US Large-Cap Growth	3.6	14.8	8.4	14.8
US Large-Cap Value	5.5	13.7	8.3	13.7
US Mid-Cap Growth	3.6	16.0	8.5	16.0
US Mid-Cap Value	6.2	14.5	8.7	14.5
US Small-Cap Growth	5.1	19.9	7.1	19.9
US Small-Cap Value	8.1	17.3	8.5	17.3
International Equities	5.6	14.7	7.2	14.7
European Equities	5.4	15.5	7.0	15.5
Japan Equities	5.7	20.1	6.9	20.1
Asia Pacific ex Japan Equities	7.0	18.4	7.1	18.4
Emerging & Frontier Market Equities	8.3	17.5	8.6	17.5
FIXED INCOME & PREFERRED	2.0	4.9	3.8	4.9
Short-Term Fixed Income	1.7	1.9	3.4	1.9
US Taxable Fixed Income	2.0	4.9	3.8	4.9
International Fixed Income	0.8	4.1	3.6	4.1
Inflation-Linked Securities	1.7	7.6	4.9	7.6
High Yield Fixed Income	3.6	7.5	5.4	7.5
Emerging Market Fixed Income	6.8	8.0	6.8	8.0
ALTERNATIVES	4.7	7.5	6.3	7.5
Real Assets	4.6	10.3	6.0	10.3
Real Estate/REITS	4.4	13.7	6.6	13.7
Commodities	3.0	15.0	3.9	15.0
Energy Infrastructure/MLPs	6.4	14.3	7.6	14.3
Absolute Return Assets	3.5	4.7	5.2	4.7
Equity Hedge Assets	5.2	6.8	6.6	6.8
Equity Return Assets	4.8	8.3	7.2	8.3
Private Investments	6.8	7.2	10.1	7.2
Private Real Estate	5.4	7.4	7.6	7.4
Private Equity	8.2	8.1	12.7	8.1
Private Credit	6.3	6.1	8.8	6.1

Source: Morgan Stanley Wealth Management GIC as of Feb. 28, 2022

Note: We represented ultrashort fixed income represented by 90-day T-bills, fixed income & preferreds by Bloomberg US Aggregate Index, short-term fixed income by Bloomberg Aggregate 1-3 Year Index, US taxable fixed income by Bloomberg US Aggregate Index, international fixed income by Barclays Global Aggregate Non-USD (Hedged) Index, inflation-linked securities by Bloomberg Global Inflation-Linked Index, high yield fixed income by Barclays Global High Yield Corporate Index and emerging market fixed income by JP Morgan EMBI Global Index. All other are based on proprietary models. Strategic annualized return and volatility estimates are based on a seven-year time horizon. Secular annualized return and volatility estimates are based on a 20-year time horizon. Annualized volatility estimates are based on data with longest available history through Feb. 28, 2022. Estimates are for illustrative purposes only, are based on proprietary models and are not indicative of the future performance of any specific investment, index or asset class. Actual performance may be more or less than the estimates shown in this table. Estimates of future performance are based on assumptions that may not be realized. Investor appropriateness: Morgan Stanley Wealth Management recommends that investors independently evaluate each asset class, investment style, issuer, security, instrument or strategy discussed. Legal, accounting and tax restrictions, transaction costs and changes to any assumptions may significantly affect the economics and results of any investment. Investors should consult their own tax, legal or other advisors to determine appropriateness for their specific circumstances. Investments in private funds (including hedge funds, managed futures funds and private equity funds) are speculative and include a high degree of risk.

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Exhibit 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	0.00	-0.02
2 Equities	0.01	1.00	0.88	0.86	0.86	0.83	0.84	0.76	0.74	0.88	0.79
3 US Equities	-0.01	0.88	1.00	0.97	0.97	0.92	0.94	0.84	0.82	0.61	0.60
4 US Large-Cap Growth	-0.01	0.86	0.97	1.00	0.89	0.94	0.87	0.84	0.76	0.59	0.58
5 US Large-Cap Value	0.00	0.86	0.97	0.89	1.00	0.85	0.96	0.78	0.83	0.60	0.59
6 US Mid-Cap Growth	-0.01	0.83	0.92	0.94	0.85	1.00	0.88	0.92	0.82	0.60	0.58
7 US Mid-Cap Value	-0.02	0.84	0.94	0.87	0.96	0.88	1.00	0.84	0.90	0.60	0.59
8 US Small-Cap Growth	-0.02	0.76	0.84	0.84	0.78	0.92	0.84	1.00	0.93	0.56	0.52
9 US Small-Cap Value	-0.02	0.74	0.82	0.76	0.83	0.82	0.90	0.93	1.00	0.56	0.52
10 International Equities	0.00	0.88	0.61	0.59	0.60	0.60	0.60	0.56	0.56	1.00	0.88
11 European Equities	-0.02	0.79	0.60	0.58	0.59	0.58	0.59	0.52	0.52	0.88	1.00
12 Japan Equities	-0.06	0.37	0.19	0.20	0.17	0.21	0.18	0.19	0.17	0.48	0.27
13 Asia Pacific ex Japan Equities	0.01	0.69	0.57	0.55	0.56	0.58	0.58	0.54	0.53	0.69	0.63
14 Emerging & Frontier Market Equities	0.00	0.61	0.49	0.47	0.48	0.52	0.49	0.50	0.48	0.60	0.55
15 Fixed Income & Preferreds	0.13	0.19	0.20	0.19	0.21	0.18	0.21	0.13	0.16	0.12	0.11
16 Short-Term Fixed Income	0.37	0.13	0.13	0.12	0.15	0.11	0.15	0.07	0.10	0.10	0.10
17 US Taxable Fixed Income	0.13	0.19	0.20	0.19	0.21	0.18	0.21	0.13	0.16	0.12	0.11
18 International Fixed Income	0.18	0.09	0.11	0.10	0.13	0.11	0.14	0.12	0.16	0.01	0.00
19 Inflation-Linked Securities	0.03	0.09	0.12	0.13	0.12	0.10	0.12	0.07	0.07	0.04	0.05
20 High Yield Fixed Income	0.01	0.61	0.60	0.55	0.60	0.60	0.64	0.55	0.59	0.50	0.50
21 Emerging Market Fixed Income	0.08	0.39	0.37	0.35	0.37	0.38	0.37	0.34	0.34	0.30	0.28
22 Alternatives	0.07	0.81	0.88	0.86	0.84	0.87	0.83	0.83	0.78	0.59	0.56
23 Real Assets	0.01	0.65	0.62	0.56	0.65	0.63	0.73	0.63	0.70	0.55	0.53
24 REITs	0.00	0.68	0.67	0.61	0.70	0.66	0.78	0.67	0.77	0.56	0.54
25 Commodities	0.01	0.19	0.13	0.11	0.14	0.16	0.17	0.15	0.14	0.22	0.21
26 Energy Infrastructure/MLPs	0.00	0.58	0.61	0.55	0.63	0.60	0.69	0.61	0.68	0.45	0.44
27 Absolute Return Assets	0.09	0.67	0.67	0.62	0.68	0.64	0.70	0.62	0.66	0.55	0.52
28 Equity Hedge Assets	0.12	0.27	0.29	0.28	0.29	0.27	0.30	0.26	0.30	0.19	0.16
29 Equity Return Assets	0.06	0.81	0.88	0.85	0.85	0.87	0.85	0.83	0.79	0.60	0.58
30 Private Investments	0.01	0.52	0.55	0.52	0.55	0.54	0.60	0.60	0.63	0.39	0.35
31 Private Real Estate	0.02	0.40	0.41	0.37	0.42	0.41	0.47	0.45	0.51	0.32	0.28
32 Private Equity	0.00	0.58	0.64	0.62	0.62	0.62	0.65	0.67	0.67	0.42	0.37
33 Private Debt	0.02	0.41	0.43	0.38	0.44	0.42	0.47	0.38	0.42	0.31	0.32

Source: Bloomberg, Datastream, Morgan Stanley Wealth Management GIC as of Feb. 28, 2022

Note: Above is based on returns from the mid-1940s through February 2022. Correlation is a statistical method of measuring the strength of a linear relationship between two variables. The correlation between two variables can assume any value from -1.00 to +1.00, inclusive. Past performance is not indicative of future results. We apply significant statistical adjustments to correct for distortions typically associated with index returns for hedge funds, private equity and private real estate. Correlation assumptions are the same for the strategic and secular horizons.

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Exhibit 23: Correlation Matrix (continued)

CORRELATION MATRIX	12	13	14	15	16	17	18	19	20	21	22
1 Ultrashort Fixed Income	-0.06	0.01	0.00	0.13	0.37	0.13	0.18	0.03	0.01	0.08	0.07
2 Equities	0.37	0.69	0.61	0.19	0.13	0.19	0.09	0.09	0.61	0.39	0.81
3 US Equities	0.19	0.57	0.49	0.20	0.13	0.20	0.11	0.12	0.60	0.37	0.88
4 US Large-Cap Growth	0.20	0.55	0.47	0.19	0.12	0.19	0.10	0.13	0.55	0.35	0.86
5 US Large-Cap Value	0.17	0.56	0.48	0.21	0.15	0.21	0.13	0.12	0.60	0.37	0.84
6 US Mid-Cap Growth	0.21	0.58	0.52	0.18	0.11	0.18	0.11	0.10	0.60	0.38	0.87
7 US Mid-Cap Value	0.18	0.58	0.49	0.21	0.15	0.21	0.14	0.12	0.64	0.37	0.83
8 US Small-Cap Growth	0.19	0.54	0.50	0.13	0.07	0.13	0.12	0.07	0.55	0.34	0.83
9 US Small-Cap Value	0.17	0.53	0.48	0.16	0.10	0.16	0.16	0.07	0.59	0.34	0.78
10 International Equities	0.48	0.69	0.60	0.12	0.10	0.12	0.01	0.04	0.50	0.30	0.59
11 European Equities	0.27	0.63	0.55	0.11	0.10	0.11	0.00	0.05	0.50	0.28	0.56
12 Japan Equities	1.00	0.27	0.26	0.04	0.01	0.04	-0.03	0.00	0.14	0.10	0.19
13 Asia Pacific ex Japan Equities	0.27	1.00	0.67	0.09	0.05	0.09	0.01	0.01	0.47	0.34	0.58
14 Emerging & Frontier Market Equities	0.26	0.67	1.00	0.02	-0.03	0.02	0.01	-0.04	0.44	0.42	0.54
15 Fixed Income & Preferreds	0.04	0.09	0.02	1.00	0.79	1.00	0.51	0.51	0.41	0.37	0.23
16 Short-Term Fixed Income	0.01	0.05	-0.03	0.79	1.00	0.79	0.32	0.50	0.37	0.22	0.17
17 US Taxable Fixed Income	0.04	0.09	0.02	1.00	0.79	1.00	0.51	0.51	0.41	0.37	0.23
18 International Fixed Income	-0.03	0.01	0.01	0.51	0.32	0.51	1.00	0.13	0.19	0.58	0.20
19 Inflation-Linked Securities	0.00	0.01	-0.04	0.51	0.50	0.51	0.13	1.00	0.28	0.14	0.12
20 High Yield Fixed Income	0.14	0.47	0.44	0.41	0.37	0.41	0.19	0.28	1.00	0.45	0.61
21 Emerging Market Fixed Income	0.10	0.34	0.42	0.37	0.22	0.37	0.58	0.14	0.45	1.00	0.45
22 Alternatives	0.19	0.58	0.54	0.23	0.17	0.23	0.20	0.12	0.61	0.45	1.00
23 Real Assets	0.18	0.56	0.49	0.16	0.15	0.16	0.10	0.08	0.60	0.39	0.65
24 REITs	0.19	0.54	0.47	0.25	0.20	0.25	0.20	0.11	0.63	0.41	0.64
25 Commodities	-0.01	0.24	0.21	-0.08	-0.05	-0.08	-0.12	-0.01	0.14	0.10	0.19
26 Energy Infrastructure/MLPs	0.14	0.47	0.41	0.21	0.18	0.21	0.16	0.07	0.57	0.35	0.62
27 Absolute Return Assets	0.18	0.49	0.42	0.39	0.35	0.39	0.19	0.23	0.80	0.38	0.80
28 Equity Hedge Assets	0.05	0.19	0.11	0.29	0.27	0.29	0.27	0.15	0.29	0.12	0.39
29 Equity Return Assets	0.20	0.58	0.55	0.17	0.14	0.17	0.10	0.10	0.62	0.38	0.98
30 Private Investments	0.13	0.35	0.23	0.27	0.22	0.27	0.22	0.07	0.41	0.19	0.55
31 Private Real Estate	0.10	0.28	0.18	0.26	0.23	0.26	0.23	0.04	0.33	0.16	0.41
32 Private Equity	0.14	0.38	0.26	0.24	0.19	0.24	0.18	0.08	0.43	0.19	0.63
33 Private Debt	0.09	0.30	0.24	0.61	0.49	0.61	0.31	0.30	0.65	0.32	0.46

Source: Bloomberg, Datastream, Morgan Stanley Wealth Management GIC as of Feb. 28, 2022

Note: Above is based on returns from the mid-1940s through February 2022. Correlation is a statistical method of measuring the strength of a linear relationship between two variables. The correlation between two variables can assume any value from -1.00 to +1.00, inclusive. Past performance is not indicative of future results. We apply significant statistical adjustments to correct for distortions typically associated with index returns for hedge funds, private equity and private real estate. Correlation assumptions are the same for the strategic and secular horizons.

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Exhibit 23: Correlation Matrix (continued)

CORRELATION MATRIX	23	24	25	26	27	28	29	30	31	32	33
1 Ultrashort Fixed Income	0.01	0.00	0.01	0.00	0.09	0.12	0.06	0.01	0.02	0.00	0.02
2 Equities	0.65	0.68	0.19	0.58	0.67	0.27	0.81	0.52	0.40	0.58	0.41
3 US Equities	0.62	0.67	0.13	0.61	0.67	0.29	0.88	0.55	0.41	0.64	0.43
4 US Large-Cap Growth	0.56	0.61	0.11	0.55	0.62	0.28	0.85	0.52	0.37	0.62	0.38
5 US Large-Cap Value	0.65	0.70	0.14	0.63	0.68	0.29	0.85	0.55	0.42	0.62	0.44
6 US Mid-Cap Growth	0.63	0.66	0.16	0.60	0.64	0.27	0.87	0.54	0.41	0.62	0.42
7 US Mid-Cap Value	0.73	0.78	0.17	0.69	0.70	0.30	0.85	0.60	0.47	0.65	0.47
8 US Small-Cap Growth	0.63	0.67	0.15	0.61	0.62	0.26	0.83	0.60	0.45	0.67	0.38
9 US Small-Cap Value	0.70	0.77	0.14	0.68	0.66	0.30	0.79	0.63	0.51	0.67	0.42
10 International Equities	0.55	0.56	0.22	0.45	0.55	0.19	0.60	0.39	0.32	0.42	0.31
11 European Equities	0.53	0.54	0.21	0.44	0.52	0.16	0.58	0.35	0.28	0.37	0.32
12 Japan Equities	0.18	0.19	-0.01	0.14	0.18	0.05	0.20	0.13	0.10	0.14	0.09
13 Asia Pacific ex Japan Equities	0.56	0.54	0.24	0.47	0.49	0.19	0.58	0.35	0.28	0.38	0.30
14 Emerging & Frontier Market Equities	0.49	0.47	0.21	0.41	0.42	0.11	0.55	0.23	0.18	0.26	0.24
15 Fixed Income & Preferreds	0.16	0.25	-0.08	0.21	0.39	0.29	0.17	0.27	0.26	0.24	0.61
16 Short-Term Fixed Income	0.15	0.20	-0.05	0.18	0.35	0.27	0.14	0.22	0.23	0.19	0.49
17 US Taxable Fixed Income	0.16	0.25	-0.08	0.21	0.39	0.29	0.17	0.27	0.26	0.24	0.61
18 International Fixed Income	0.10	0.20	-0.12	0.16	0.19	0.27	0.10	0.22	0.23	0.18	0.31
19 Inflation-Linked Securities	0.08	0.11	-0.01	0.07	0.23	0.15	0.10	0.07	0.04	0.08	0.30
20 High Yield Fixed Income	0.60	0.63	0.14	0.57	0.80	0.29	0.62	0.41	0.33	0.43	0.65
21 Emerging Market Fixed Income	0.39	0.41	0.10	0.35	0.38	0.12	0.38	0.19	0.16	0.19	0.32
22 Alternatives	0.65	0.64	0.19	0.62	0.80	0.39	0.98	0.55	0.41	0.63	0.46
23 Real Assets	1.00	0.84	0.51	0.85	0.63	0.24	0.66	0.56	0.54	0.51	0.40
24 REITs	0.84	1.00	0.17	0.71	0.62	0.27	0.65	0.62	0.60	0.56	0.44
25 Commodities	0.51	0.17	1.00	0.19	0.17	0.04	0.20	0.09	0.07	0.09	0.04
26 Energy Infrastructure/MLPs	0.85	0.71	0.19	1.00	0.62	0.23	0.64	0.55	0.53	0.51	0.42
27 Absolute Return Assets	0.63	0.62	0.17	0.62	1.00	0.38	0.81	0.55	0.45	0.57	0.65
28 Equity Hedge Assets	0.24	0.27	0.04	0.23	0.38	1.00	0.34	0.38	0.33	0.38	0.25
29 Equity Return Assets	0.66	0.65	0.20	0.64	0.81	0.34	1.00	0.54	0.40	0.62	0.44
30 Private Investments	0.56	0.62	0.09	0.55	0.55	0.38	0.54	1.00	0.94	0.94	0.44
31 Private Real Estate	0.54	0.60	0.07	0.53	0.45	0.33	0.40	0.94	1.00	0.76	0.39
32 Private Equity	0.51	0.56	0.09	0.51	0.57	0.38	0.62	0.94	0.76	1.00	0.45
33 Private Debt	0.40	0.44	0.04	0.42	0.65	0.25	0.44	0.44	0.39	0.45	1.00

Source: Bloomberg, Datastream, Morgan Stanley Wealth Management GIC as of Feb. 28, 2022

Note: Above is based on returns from the mid-1940s through February 2022. Correlation is a statistical method of measuring the strength of a linear relationship between two variables. The correlation between two variables can assume any value from -1.00 to +1.00, inclusive. Past performance is not indicative of future results. We apply significant statistical adjustments to correct for distortions typically associated with index returns for hedge funds, private equity and private real estate. Correlation assumptions are the same for the strategic and secular horizons.

Appendix

Hedge Fund Index Performance Biases

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

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

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

Endnotes

¹ 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>.

² 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.

³ 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.

⁴ Including the adjustment for Japanese inflation to 1.0% from 0.6%.

For indexes referenced in this report please visit the following:

<https://www.morganstanley.com/wealth-investmentsolutions/wmir-definitions>

Glossary

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

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

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

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

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

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

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

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

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

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

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

Disclosure Section

The **Global Investment Committee (GIC)** is a group of seasoned investment professionals from Morgan Stanley & Co. and Morgan Stanley Wealth Management who meet regularly to discuss the global economy and markets. The committee determines the investment outlook that guides our advice to clients. They continually monitor developing economic and market conditions, review tactical outlooks and recommend asset allocation model weightings, as well as produce a suite of strategy, analysis, commentary, portfolio positioning suggestions and other reports and broadcasts.

Daniel Hunt, Steve Edwards, Spencer Cavallo, Lisha Ge, Jonah Silverman and Matt Armstrong are not members of the Global Investment Committee, and any implementation strategies suggested have not been reviewed or approved by the Global Investment Committee.

Important note regarding economic sanctions. This event may involve the discussion of country/ies which are generally the subject of selective sanctions programs administered or enforced by the U.S. Department of the Treasury's Office of Foreign Assets Control ("OFAC"), the European Union and/or by other countries or multi-national bodies. The content of this presentation is for informational purposes and does not represent Morgan Stanley's view as to whether or not any of the Persons, instruments or investments discussed are or may become subject to sanctions. Any references in this presentation to entities or instruments that may be covered by such sanctions should not be read as recommending or advising on any investment activities involving such entities or instruments. You are solely responsible for ensuring that your investment activities in relation to any sanctioned country/ies are carried out in compliance with applicable sanctions.

Risk Considerations

Master Limited Partnerships (MLPs)

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

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

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

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

Duration

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

Hedged Strategy Definitions

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

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

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

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

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

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 categories in a diversified portfolio.

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

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

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

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

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

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

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

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

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

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

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

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

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

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

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

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

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.

The **indices** are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment.

The **indices selected by Morgan Stanley Wealth Management** to measure performance are representative of broad asset classes. Morgan Stanley Smith Barney LLC retains the right to change representative indices at any time.

Disclosures

Morgan Stanley Wealth Management is the trade name of Morgan Stanley Smith Barney LLC, a registered broker-dealer in the United States. This material has been prepared for informational purposes only and is not an offer to buy or sell or a solicitation of any offer to buy or sell any security or other financial instrument or to participate in any trading strategy. Past performance is not necessarily a guide to future performance.

The author(s) (if any authors are noted) principally responsible for the preparation of this material receive compensation based upon various factors, including quality and accuracy of their work, firm revenues (including trading and capital markets revenues), client feedback and competitive factors. Morgan Stanley Wealth Management is involved in many businesses that may relate to companies, securities or instruments mentioned in this material.

This material has been prepared for informational purposes only and is not an offer to buy or sell or a solicitation of any offer to buy or sell any security/instrument, or to participate in any trading strategy. Any such offer would be made only after a prospective investor had completed its own independent investigation of the securities, instruments or transactions, and received all information it required to make its own investment decision, including, where applicable, a review of any offering circular or memorandum describing such security or instrument. That information would contain material information not contained herein and to which prospective participants are referred. This material is based on public information as of the specified date, and may be stale thereafter. We have no obligation to tell you when information herein may change. We make no representation or warranty with respect to the accuracy or completeness of this material. Morgan Stanley Wealth Management has no obligation to provide updated information on the securities/instruments mentioned herein.

The securities/instruments discussed in this material may not be appropriate for all investors. The appropriateness of a particular investment or strategy will depend on an investor's individual circumstances and objectives. Morgan Stanley Wealth Management recommends that investors independently evaluate specific investments and strategies, and encourages investors to seek the advice of a financial advisor. The value of and income from investments may vary because of changes in interest rates, foreign exchange rates, default rates, prepayment rates, securities/instruments prices, market indexes, operational or financial conditions of companies and other issuers or other factors. Estimates of future performance are based on assumptions that may not be realized. Actual events may differ from those assumed and changes to any assumptions may have a material impact on any projections or estimates. Other events not taken into account may occur and may significantly affect the projections or estimates. Certain assumptions may have been made for modeling purposes only to simplify the presentation and/or calculation of any projections or estimates, and Morgan Stanley Wealth Management does not represent that any such assumptions will reflect actual future events. Accordingly, there can be no assurance that estimated returns or projections will be realized or that actual returns or performance results will not materially differ from those estimated herein.

This material should not be viewed as advice or recommendations with respect to asset allocation or any particular investment. This information is not intended to, and should not, form a primary basis for any investment decisions that you may make. Morgan Stanley Wealth Management is not acting as a fiduciary under either the Employee Retirement Income Security Act of 1974, as amended or under section 4975 of the Internal Revenue Code of 1986 as amended in providing this material.

Morgan Stanley Smith Barney LLC, its affiliates and Morgan Stanley Financial Advisors do not provide legal or tax advice. Each client should always consult his/her personal tax and/or legal advisor for information concerning his/her individual situation and to learn about any potential tax or other implications that may result from acting on a particular recommendation.

This material is primarily authored by, and reflects the opinions of, Morgan Stanley Smith Barney LLC (Member SIPC), as well as identified guest authors. Articles contributed by employees of Morgan Stanley & Co. LLC (Member SIPC) or one of its affiliates are used under license from Morgan Stanley.

This material is disseminated in Australia to "retail clients" within the meaning of the Australian Corporations Act by Morgan Stanley Wealth Management Australia Pty Ltd (A.B.N. 19 009 145 555, holder of Australian financial services license No. 240813).

Morgan Stanley Wealth Management is not incorporated under the People's Republic of China ("PRC") law and the material in relation to this report is conducted outside the PRC. This report will be distributed only upon request of a specific recipient. This report does not constitute an offer to sell or the solicitation of an offer to buy any securities in the PRC. PRC investors must have the relevant qualifications to invest in such securities and must be responsible for obtaining all relevant approvals, licenses, verifications and or registrations from PRC's relevant governmental authorities.

If your financial adviser is based in Australia, Switzerland or the United Kingdom, then please be aware that this report is being distributed by the Morgan Stanley entity where your financial adviser is located, as follows: Australia: Morgan Stanley Wealth Management Australia Pty Ltd (ABN 19 009 145 555, AFSL No. 240813); Switzerland: Morgan Stanley (Switzerland) AG regulated by the Swiss Financial Market Supervisory Authority; or United Kingdom: Morgan Stanley Private Wealth Management Ltd, authorized and regulated by the Financial Conduct Authority, approves for the purposes of section 21 of the Financial Services and Markets Act 2000 this material for distribution in the United Kingdom.

ANNUAL UPDATE OF GIC CAPITAL MARKET ASSUMPTIONS

Morgan Stanley Wealth Management is not acting as a municipal advisor to any municipal entity or obligated person within the meaning of Section 15B of the Securities Exchange Act (the "Municipal Advisor Rule") and the opinions or views contained herein are not intended to be, and do not constitute, advice within the meaning of the Municipal Advisor Rule.

This material is disseminated in the United States of America by Morgan Stanley Wealth Management.

Third-party data providers make no warranties or representations of any kind relating to the accuracy, completeness, or timeliness of the data they provide and shall not have liability for any damages of any kind relating to such data.

This material, or any portion thereof, may not be reprinted, sold or redistributed without the written consent of Morgan Stanley Smith Barney LLC.

© 2022 Morgan Stanley Smith Barney LLC Member SIPC.

RS11648730223708 03/2022