

Global Investment Committee | September 21, 2021

GIC Special Report Summary

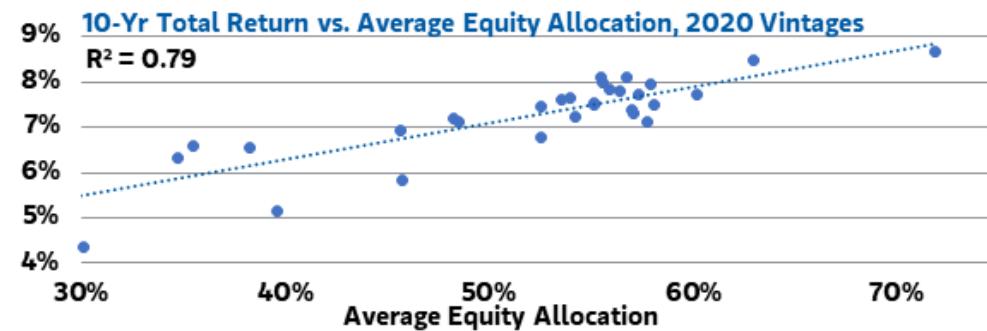
Elevating the Investment Process: A New Standard for Defined Contribution Plan Fiduciaries

The following is a summary of the recently published Special Report, "[Elevating the Investment Process: A New Standard for Defined Contribution Plan Fiduciaries](#)," published on September 21, 2021. To obtain a copy of the full report, please contact your Morgan Stanley Financial Advisor.

A basic requirement of fiduciaries is that they use a prudent and well-documented process to make investment decisions. While that standard isn't controversial, industry practitioners often disagree on what it means in practice, making life difficult for fiduciaries. A quintessential example of unclear standards in real-world investment decision-making are those applicable to the selection and monitoring of target date funds (TDFs) and other multiasset class products that function as qualified default investment alternatives (QDIAs) within the fund lineups of defined contribution (DC) pension plans.

In seeking to identify best practices for selecting and monitoring such products, we observed a large disconnect between common practice in the space and standards applicable to defined benefit (DB) pension plans. DB plans support their investment decisions with deep actuarial analyses of projected contributions and liabilities, and they leverage analytical tools to evaluate the impact of candidate investment strategies and conduct manager evaluations. DC plans generally do not apply the same approach, especially in terms of their process for assessing what constitutes appropriate asset allocation strategy, which is the most important determinant of investment results. Indeed, some studies indicate up to 90% of differentiation in returns can be explained by differences in asset allocation,¹ a level corroborated by the tight relationship between the 10-year track record of vintage 2020 TDF returns and their average equity allocations (see Exhibit 1).

Exhibit 1: Differences in Return Mostly Reflect Differences in Asset Allocation



Source: Morningstar as of Dec. 31, 2020

Note: See endnotes for details of the assumptions used in this analysis

Lisa Shalett

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

Daniel Hunt, CFA

Investment Strategist

Zi Ye, CFA

Investment Strategist

Vibhor Dave, CFA

Investment Strategist

Target Date Retirement Funds – Tips for ERISA Plan Fiduciaries

"In general, plan fiduciaries should engage in an objective process to obtain information that will enable them to evaluate the prudence of any investment option made available under the plan... It also may be helpful for plan fiduciaries to discuss with their prospective TDF providers the possible significance of other characteristics of the participant population, such as participation in a traditional defined benefit pension plan offered by the employer, salary levels, turnover rates, contribution rates and withdrawal patterns."

– The US Department of Labor

In lieu of a deeper evaluation of participant data, such as projected funding status, demographic information and risk preferences, as called for in the Department of Labor's guidelines for selecting and monitoring TDFs, (see Target Date Retirement Funds—Tips for ERISA Plan Fiduciaries callout), DC plans have historically employed heuristics such as the distinction between "to" and "through" glidepath methodologies, to make this critical decision. Such standards are often arbitrary. For example, there is no evidence that a "to" approach is more appropriate for investors who redeem at retirement or that a "through" approach is more appropriate for those who don't, resulting in significant latitude for incongruent recommendations from one advisor to the next. In our view, this doesn't meet a best practices standard.

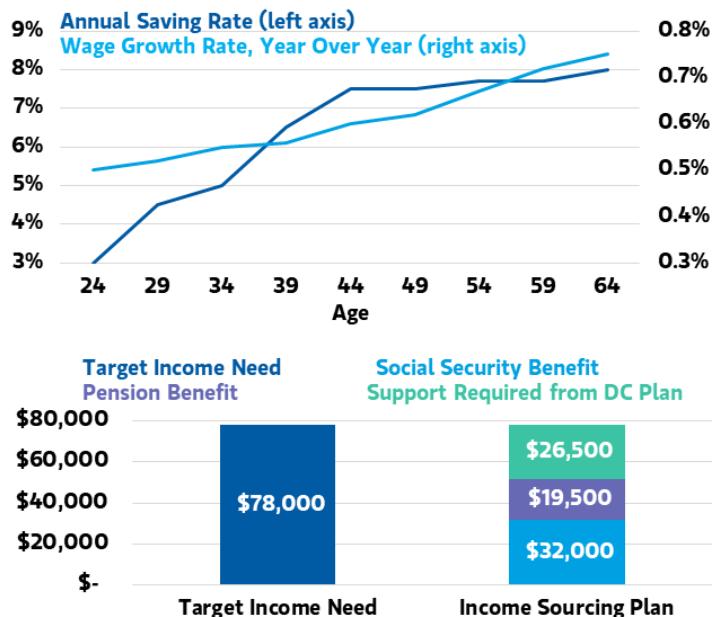
A more promising approach starts with the data highlighted in Exhibit 2, which can be used to make inferences about the means and needs of participants, on average. Analyzing that data within a quantitative simulation framework creates the picture in Exhibit 3, where multiple decision metrics have been calculated based on the policy asset allocations of each TDF family. These metrics fall into three categories: goal attainment, "lost decade" risk (the risk of long-term adverse events, like the near 0% market returns between 2000 and 2009) and drawdown risk (the risk of short-term adverse events, like the COVID-19 selloffs in February and March last year). While some asset allocation decisions can improve return without necessarily increasing risk or reduce risk without lessening return, to a large extent, the choice of policy asset allocation involves resolving inherent tradeoffs. For example, asset allocation strategies that score highest in goal attainment metrics are typically more aggressively postured, while those that score better in drawdown risk categories are typically more conservative. Choosing the most appropriate asset allocation requires a judgment about the relative importance of each metric, i.e., it requires identifying risk preferences. Once preferences are specified, it's possible to weight decision metrics to create an overall rank from

most to least appropriate policy allocation, as indicated in Exhibit 3 in the column farthest to the right.

While using a forward-looking analysis to determine the most appropriate asset allocation for plan participants is a crucial part of selecting a QDIA manager, it is not sufficient on its own. Plans must also qualify managers themselves, based on an assessment of their skillfulness in implementing a policy allocation. This means a backward-looking analysis of managers' historical track records is also needed, to evaluate whether, and to what extent, they've been able to add value after accounting for fees historically. The catch is that the policy allocation is not identical from one manager to another, and, as Exhibit 1 makes clear, those differences can bias the evaluation of which managers are adding the most value and which the least.

To unwind the influence of those differences on the track record and maximize the inferences that can be drawn from it, we utilize a two-step process. The first step is to construct a fund or fund-family specific benchmark for each product that is equivalent in risk orientation but otherwise neutral, i.e., one that consists of broad equity and bond market indexes with the same weights as the fund's respective allocations to risk assets and to cash and fixed income assets. The second step is to measure value-added net of the benchmark, and to attribute it to the part of the investment process from whence it came.

Exhibit 2: Using Plan Data to Model the Participant Retirement Challenge



Source: Morgan Stanley Wealth Management Global Investment Office
Note: For illustrative purposes only

Exhibit 3: Modeling Asset Allocation Tradeoffs for Participants

Rank	Fund	Glidepath Shape Parameters			Probability of Success	Income Replacement Ratio			Average Drawdown (1926-2020)			Score
		Equity	Slope	Curvature		50th Percentile (Median)	5th Percentile	1st Percentile	Early & Mid Career Vintages	Near-Retirement Vintages	In-Retirement Vintages	
1	TDF 1	65	6	6	78.3%	116.5%	35.0%	23.9%	34.4%	22.8%	18.0%	93
2	TDF 2	64	-3	0	77.8%	113.5%	34.9%	23.9%	33.2%	23.3%	18.5%	90
3	TDF 3	65	4	-10	77.4%	112.4%	34.6%	23.7%	34.0%	23.9%	17.3%	87
4	TDF 4	61	5	3	75.3%	104.3%	34.1%	23.9%	33.2%	21.0%	16.5%	86
5	TDF 5	61	5	3	75.1%	103.8%	34.0%	23.9%	33.0%	20.9%	16.5%	86
6	TDF 6	62	10	-10	75.3%	103.8%	34.1%	23.7%	33.2%	23.7%	14.6%	84
7	TDF 7	61	-7	-5	75.1%	104.0%	34.0%	23.7%	32.1%	21.4%	17.8%	82
8	TDF 8	61	13	-20	73.9%	97.8%	33.9%	23.6%	33.0%	23.1%	13.6%	81
9	TDF 9	56	-26	10	70.5%	91.3%	33.0%	23.9%	29.0%	20.0%	19.2%	72
10	TDF 10	56	8	3	69.6%	89.4%	32.5%	23.4%	31.9%	18.0%	14.2%	71

Glidepath Shape Parameters
Goal Attainment Metrics
"Lost Decade" Risk Metrics
Drawdown Risk Metrics

Source: Morgan Stanley Wealth Management Global Investment Office as of June 30, 2021

Note: For illustrative purposes only. See endnotes for details of the assumptions used in this analysis.

The relevant layers of the investment process are as follows: 1) asset class inclusion and weighting decisions (e.g., a policy allocation to commodities, a higher-than-average weight to non-US stocks, etc.), 2) glidepath decisions where applicable (e.g., the timing and degree of reductions in risk orientation as investors age), 3) tactical asset allocation decisions (short-term shifts in asset allocation) and, finally, 4) security selection decisions and the interaction between them and asset allocation decisions. Using this process, due diligence analysts can separate beta and alpha contributions to active return, and build up their overall convictions in a manager's competency based on assessments of each of the underlying parts of their investment process. An example analysis, again for the specific case of TDFs, is depicted in Exhibit 4.

After a decades-long transition between them, private sector DC pension plans have come to account for nearly triple the assets of the DB plans they supplanted. Notwithstanding their role as stewards of Americans' retirement security, advisors to DC plans have yet to apply the same rigorous standards used in the DB space to the core investment decisions faced by DC plans—most importantly the selection and monitoring of their QDIA, which can have an outsized impact on participant outcomes. The research framework outlined in this report highlights the opportunity to elevate the DC investment process by adopting the standards and analytical techniques used in the DB space, which we have thoughtfully adapted to suit DC plan circumstances. Talk to your advisor for more information about our innovative approach and how it might apply to your plan.

Exhibit 4: A New Picture of Manager Skill Emerges

TDF	Benchmark		Strategic		Glidepath		Tactical		Implementation & Interaction		Fees		Value added Net of Benchmark	
	Return	Sharpe	Return	Sharpe	Return	Sharpe	Return	Sharpe	Return	Sharpe	Return	Sharpe	Return	Sharpe
A	9.69%	0.86	0.30%	0.00	-0.14%	-0.01	0.14%	0.02	0.28%	0.11	-0.41%	-0.05	0.17%	0.08
B	9.62%	0.87	-0.07%	-0.01	0.02%	0.01	-0.03%	0.00	-0.01%	0.00	-0.07%	-0.01	-0.15%	0.00
C	8.95%	0.92	0.10%	-0.03	-0.11%	-0.01	0.03%	0.01	0.31%	0.00	-0.28%	-0.03	0.05%	-0.06

Note: See endnotes for details of the assumptions used in this analysis

Source: Morningstar, Bloomberg, Morgan Stanley Wealth Management Global Investment Office as of Dec. 31, 2020

Endnotes

¹Gary P. Brinson, Brian D. Singer & Gilbert L. Beebower (1991) Determinants of Portfolio Performance II: An Update, *Financial Analysts Journal*, 47:3, 40-48, DOI: 10.2469/faj.v47.n3.40

Exhibit 1: Each 2020 vintage TDF in the Morningstar Universe that has price history of at least 10 years is represented as a dot in the exhibit. Total return is calculated as the annualized geometric averages of the TDF's reported net return. Average equity allocation is calculated from equally-weighted monthly equity allocations for each product sourced from Morningstar. Since some products only report portfolio allocations on a quarterly basis, their monthly allocations are interpolated in between quarters. Thus the average equity allocation we calculate is subject to some approximation error due to intra-quarter and intra month trades. Such error is highly unlikely to materially affect the pictured relationship, however

Exhibit 3: Equity is represented by dollar-weighted equity allocation calculated using sample cash flows. Slope and Curvature are calculated using Principal Component Analysis on TDF allocations across different vintages. Probability of Success is defined as the probability of successfully meeting all retirement expenses. Income replacement ratio is defined as the hypothetical income replacement ratio calculated using simulated portfolio value and sample cashflows. Both Probability of Success and Income Replacement Ratios are calculated using Monte Carlo simulation with sample cashflows and hypothetical asset class return and risk assumptions. Drawdown is calculated using historical asset class returns and current TDF allocation. A weighted average z-score is calculated for each TDF using its performance across different metrics. This weighted average z-score is scaled to reflect the final score

Exhibit 4: The time-weighted return is calculated per stage by substituting overall TDF returns with intermediate portfolios representing different decision layers. Starting from left to right, the benchmark return is based on the return of a portfolio where the dollar-weighted average allocation to all bond and cash investments aggregate to Bloomberg Barclays US Aggregate Index and all other assets aggregate to a US-biased global equity index comprised of 70% Russell 3000 and 30% MSCI All Country World Index ex-US. The strategic return uses the fund's dollar-weighted average strategic asset allocation on a more granular basis, capturing differences in sub-asset class inclusion and weighting decisions; the tactical return uses the fund's monthly reported asset allocation with benchmark index return filled in for each asset class sleeve; the security selection and interaction return uses the fund's monthly reported gross returns; and the final stage uses the fund's monthly reported net returns. At each stage, the time-weighted return is calculated for each vintage and averaged across vintages. The incremental return between stages are then attributed to each step in the attribution process.

Return performance attribution is calculated as the incremental return difference between two stages.

Incremental return for Stage x = $(1 + \text{Return for Stage } x) / (1 + \text{Return for Stage } x-1) - 1$

Sharpe ratio performance attribution is calculated as the incremental

Sharpe ratio difference between two stages. Incremental Sharpe for Stage x = Sharpe for Stage x – Sharpe for Stage $x-1$

GIC SPECIAL REPORT SUMMARY

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, Zi Ye and Vibhor Dave are not members of the Global Investment Committee, and any implementation strategies suggested have not been reviewed or approved by the Global Investment Committee.

For other index, indicator and survey definitions referenced in this report please visit the following: <https://www.morganstanley.com/wealthinvestmentsolutions/wmir-definitions>

Glossary

Alpha is the excess return of an investment relative to the return of a benchmark index.

Beta is 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.

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.

Risk Considerations

Hypothetical Performance

General: Hypothetical performance should not be considered a guarantee of future performance or a guarantee of achieving overall financial objectives. Asset allocation and diversification do not assure a profit or protect against loss in declining financial markets.

Hypothetical performance results have inherent limitations. The performance shown here is simulated performance, not investment results from an actual portfolio or actual trading. There can be large differences between hypothetical and actual performance results achieved by a particular asset allocation.

Despite the limitations of hypothetical performance, these hypothetical performance results may allow clients and Financial Advisors to obtain a sense of the risk / return trade-off of different asset allocation constructs.

Investing in the market entails the risk of market volatility. The value of all types of securities may increase or decrease over varying time periods.

This analysis does not purport to recommend or implement an investment strategy. Financial forecasts, rates of return, risk, inflation, and other assumptions may be used as the basis for illustrations in this analysis. They should not be considered a guarantee of future performance or a guarantee of achieving overall financial objectives. No analysis has the ability to accurately predict the future, eliminate risk or guarantee investment results. As investment returns, inflation, taxes, and other economic conditions vary from the assumptions used in this analysis, your actual results will vary (perhaps significantly) from those presented in this analysis.

The assumed return rates in this analysis are not reflective of any specific investment and do not include any fees or expenses that may be incurred by investing in specific products. The actual returns of a specific investment may be more or less than the returns used in this analysis. The return assumptions are based on hypothetical rates of return of securities indices, which serve as proxies for the asset classes. Moreover, different forecasts may choose different indices as a proxy for the same asset class, thus influencing the return of the asset class.

Monte Carlo Simulations

Monte Carlo Analysis Assumptions: As indicated above, the hypothetical (forward-looking) analysis uses a Monte Carlo simulation to generate randomized, correlated returns that overall have similar characteristics to the Global Investment Committee's 2020 strategic (seven-year) capital markets assumptions. The Monte Carlo simulation involves sampling from those monthly returns for the constituent asset classes. From those monthly returns, we can compute hypothetical monthly returns for portfolios constructed with a lump-sum investing or dollar-cost averaging approach as of any month in the simulated returns data.

IMPORTANT: The projections or other information generated by this Monte Carlo simulation analysis regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results and are not guarantees of future results. Results may vary with each use and over time.

Investments in **target-date funds** are subject to the risks associated with their underlying funds. The year in the fund name refers to the approximate year (the target date) when an investor in the fund would retire and leave the workforce. The fund will gradually shift its emphasis from more aggressive investments to more conservative ones based on its target date. An investment in a target date fund is not guaranteed at any time, including or after the target date. These funds are based on an estimated retirement age of approximately 65. Should you choose to retire significantly earlier or later, you may want to consider a fund with an asset allocation more appropriate to your particular situation.

Investments in **single premium immediate annuities** are subject to the following risks: loss of control over the funds invested; loss of purchasing

GIC SPECIAL REPORT SUMMARY

power if the annuity does not feature inflation protection, and in the case of variable annuities, market risk, as the payment stream could decline based on changes to the subaccounts that are invested in risk-based assets.

Mutual funds and annuities offered through a retirement plan are long-term investments designed for retirement purposes. If withdrawals are taken prior to age 59 1/2, a 10% federal penalty may apply. Money distributed will be taxed as ordinary income in the year the money is received. Account values fluctuate with market conditions, and when surrendered the principal may be worth more or less than its original amount invested. An annuity does not provide any additional tax deferral benefit, as tax deferral is provided by the plan. Annuities are subject to additional fees and expenses to which other tax-qualified funding vehicles may not be subject. However, an annuity does provide other features and benefits, such as lifetime income payments and death benefits, which may be valuable to you. Annuity contracts contain exclusions, limitations, reductions of benefits, and terms for keeping them in force. Your Financial Advisor can provide you with complete details.

Important: The projections or other information regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Results generated by a Monte Carlo analysis will vary with each use and over time because each portfolio simulation is randomly generated.

Since the future cannot be forecast, actual results will vary from the information shown for the future, including estimates and assumptions. The results may vary with each use and over time. It is possible that these variations may be material. The degree of uncertainty normally increases with the length of the future period covered. As a result, Morgan Stanley Smith Barney LLC cannot give any assurances that any estimates, assumptions or other aspects of the following analyses will prove correct. They are subject to actual known and unknown risks, uncertainties and other factors that could cause actual results to differ materially from those shown.

Blended index portfolio performance is shown for illustration purposes only. Hypothetical performance has inherent limitations and does not reflect actual performance, trading or decision making. The results vary and reflect material economic or market factors such as liquidity constraints or volatility, which have an important impact on decision making and actual performance.

Asset Class Risks

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 and frontier markets**, since these countries may have relatively unstable governments and less established markets and economies.

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

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.

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.

Yields are subject to change with economic conditions. Yield is only one factor that should be considered when making an investment decision. Equity securities may fluctuate in response to news on companies, industries, market conditions and general economic environment.

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.

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

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

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 **indices** are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent

GIC SPECIAL REPORT SUMMARY

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

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 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 research 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.

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.

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

© 2021 Morgan Stanley Smith Barney LLC. Member SIPC. Graystone Consulting is a business of Morgan Stanley.

RSI1631891228604 09/2021