Goldman Sachs | Asset Management

GS Retirement & Investment Solutions

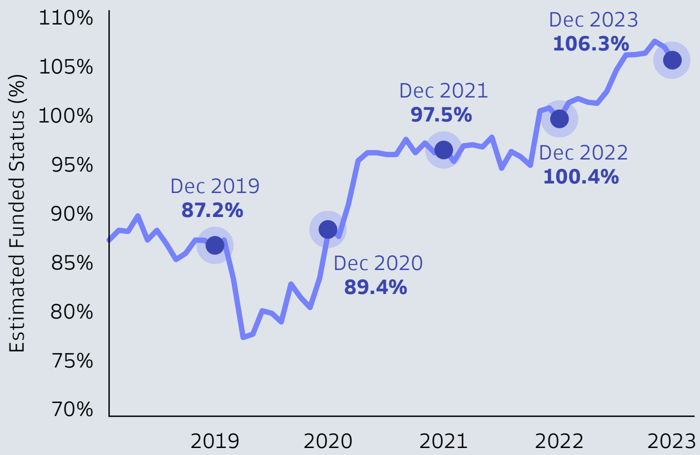
Corporate Pension Quarterly | 4Q 2023

DECODING A DEFINED BENEFIT COMEBACK

WHAT'S INSIDE

1. QUARTERLY SNAPSHOT

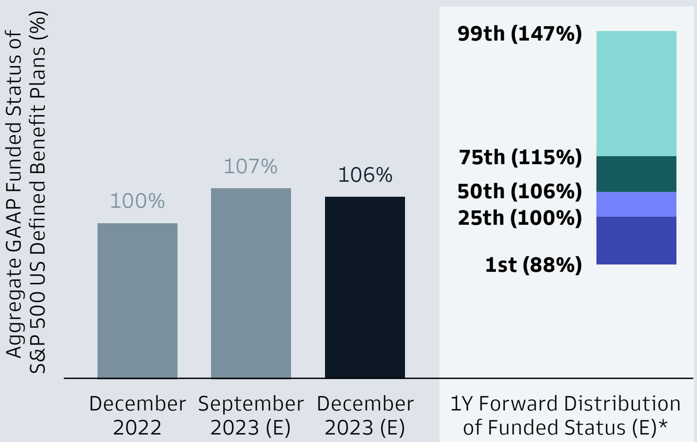
Historical Aggregate S&P 500 Funded Status[1]



Source: Goldman Sachs Asset Management. As of December 31, 2023. Funded status reflects monthly estimates. Exceptions apply to year-end data, which are actual, excluding December 2023.

- Our estimate of the funded status for the US corporate pension system decreased in 4Q to 106.3% from 107.2%, largely driven by a decrease in discount rates and a subsequent increase in pension liabilities.
- Global equity markets trended higher as many investors forecasted cooling inflation and the potential for rate cuts by the Fed to begin earlier than previously expected. In 2023, US equities were up 26%, a stark difference from losses in 2022.
- As for interest rates, the Moody's Aa corporate bond yield, a rate often referenced as the proxy for pension discount rates, dropped by -84 bps in 4Q, increasing the value of aggregate pension liabilities by an estimated 10.1%.
- On the macro front, the US outlook has continued to improve as inflation has eased. Our Global Investment Research team updated its forecast for the Fed to now expecting five rate cuts in 2024, beginning in March.

Distribution of Funded Status[1]



Source: Goldman Sachs Asset Management. As of December 31, 2023.

E = Estimated by Goldman Sachs Asset Management.

*1 year GS Asset Management projected funded status range using estimates of asset/liability returns and volatility.

Market Performance

Asset Class	4Q Change	2023 Change	2022 Change
Asset Returns[2]	**11.5%**	**14.1%**	**-20.7%**
US Equity	11.7%	26.3%	-18.1%
International Equity[3]	10.1%	17.3%	-15.0%
Fixed Income[4]	12.5%	8.9%	-24.6%
Moody's Aa Corp. Rate	-84 bps	-16 bps	+226 bps
Est. Change in Plan Liabilities Due to Discount Rate[5]	10.1%	1.9%	-24.6%

Source: Goldman Sachs Asset Management and Bloomberg. As of December 31, 2023. Percentage changes represent total returns.

Source: MSCI, Bloomberg, and Goldman Sachs Asset Management. As of December 31, 2023. The economic and market forecasts presented herein have been generated by Goldman Sachs Asset Management for informational purposes as of the date of this document. They are based on proprietary models and there can be no assurance that the forecasts will be achieved. Please see additional disclosures at the end of this document. **Past performance does not guarantee future results, which may vary.**

1. GAAP funded status estimates are based on US plans (where specified) of defined pension plans within the S&P 500 (i.e., 246 companies with pension data per GS Asset Management research). 2. Average asset-weighted return of S&P 500 companies' US defined benefit plans. 3. Mix of MSCI EAFE and MSCI ACWI ex-US. 4. Mix of Corporates (Bloomberg US Aggregate Bond Index), High Yield (iShares US High Yield Index), Treasuries, and Long Credit (iShares Long US Credit Index). 5. Estimated Change in Plan Liabilities based on increase in estimated discount rate and duration of 12.

2. IN THE NEWS

Recent Matters of Note

IBM Reportedly Reopens Defined Benefit Plan

- In November, it was reported that **International Business Machines (IBM)** announced a reopening of its previously frozen US DB plan in the form of "Retirement Benefits Account (RBA)," starting in January 2024. The firm's defined contribution plan remains open for qualified employees, but IBM will stop employee matching and automatic contributions.
- As part of the change, it appears that IBM employees will receive 5% monthly credits in the DB plan based on their compensation, with the balance growing monthly with applied interest. The RBA guarantees a 6% interest return through 2026 and thereafter ties interest to the 10-Year US Treasury yield with a 3% floor through 2033.
- As of FY 2022, its frozen qualified DB plan was overfunded at 125% with a pension surplus of $5bn. Reopening the DB plan may allow IBM to fund contributions from the pension surplus, which may reduce the burden on the firm's balance sheet.

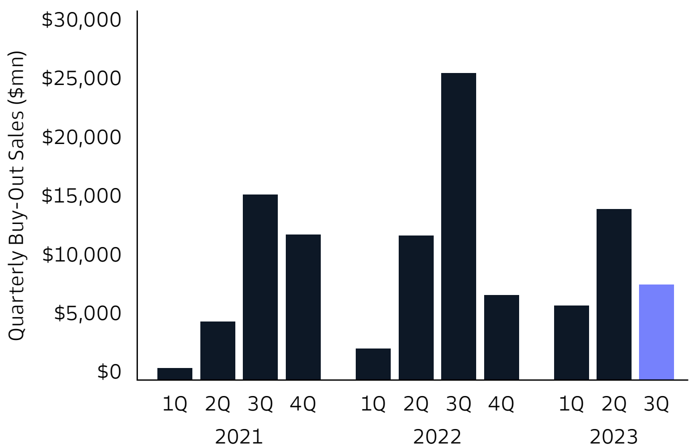
News Regarding the PBGC

- In October, the **Pension Benefit Guaranty Corporation (PBGC)** published its premium rate schedule for 2024. As part of the update, flat-rate premiums for single-employer plans will rise to $101 from $96 per participant, while variable-rate premiums will stay flat at 5.2%.
- Also in 4Q, the PBGC published its 2023 annual report, detailing that, overall, financial health of the US pension system has improved. Key highlights include the PBGC's single-employer program is now $44.6bn overfunded, and its multiemployer program reported a $1.5bn surplus, up from a deficit position in 2020.
- Additionally, the **American Benefits Council** shared a series of policy proposals to reform the US single-employer DB pension system in November. One recommendation is related to adjusting PBGC premiums given the higher funded status of the system.

Source: Goldman Sachs Asset Management and news releases. As of 4Q 2023.

Elevated Annuitization Volume in 3Q 2023

The **Life Insurance Marketing and Research Association ("LIMRA")** reported that single premium buy-out sales for 3Q 2023 were $8.1bn, down 69% YoY, though the decline was likely mostly attributable to an abnormally high total the year before.



Source: LIMRA Group Annuity Risk Transfer Survey. As of 3Q 2023.

Select Transactions Announced in 4Q

- In October, **ATI Inc**. announced that it entered an agreement with **Athene** to transfer all its remaining US pension plan liabilities totaling $1.77bn as of FY 2022. The transaction, covering 8,200 participants, is a part of the company's de-risking strategy.
- In its third quarter earnings report, **Kemper Corporation** announced termination of its frozen DB plan after a lump-sum payment of $90mn to certain qualified participants and purchase of an annuity contract to transfer the remaining obligations of $205.7mn to **Banner Life**.
- In November, **Unisys** transferred about $250mn of its US pension plan liabilities to **F&G Annuities & Life, Inc**. The transaction is the firm's 4th announced annuitization since 2021. Prior to this series of transactions, Unisys contributed about $600mn to the plan in preparation for its risk transfer activities.

Source: Company reports. As of 4Q 2023. The transactions shown above are not intended to be an exhaustive list. They are based on press releases and company reports observed during the quarter and are selected based on salience in the press.

Source: Goldman Sachs Asset Management. As of December 31, 2023. Any reference to a specific company or security does not constitute a recommendation to buy, sell, hold or directly invest in the company or its securities. Goldman Sachs does not provide accounting, tax or legal advice. Please see additional disclosures at the end of this document. Company names and logos, excluding those of Goldman Sachs and any of its affiliates, are trademarks or registered trademarks of their respective holders. Use by Goldman Sachs does not imply or suggest a sponsorship, endorsement or affiliation.

3. PORTFOLIO MANAGER PERSPECTIVES

Over the next few weeks, many companies will be filing 10-K annual reports with the Securities and Exchange Commission and consequently disclosing the 2023 results of their defined benefit pension programs. As we do every year, we will compile those actual results and analyze how the system stands on factors like funded levels, asset allocation, and actuarial assumptions. Below, we discuss some of our expectations for these annual results.

Michael Moran

CFA, Senior Pension Strategist

Goldman Sachs Asset Management

In the recent US corporate pension review / preview publication, GS Asset Management estimated that funded levels rose in 2023. What do you believe were the drivers of that improvement?

Last year was all about asset returns. US equities, led by the Magnificent Seven[1], returned over 25% in 2023. While equity returns outside the US were not as strong, many of those markets still posted double-digit gains. Fixed income also generally saw positive returns of mid- to upper-single digits across strategies of varying duration and credit quality. We expect a number of corporate plans to report actual asset returns for 2023 in the low- to mid-teens. Individual results will obviously vary, but asset returns like these, with smaller increases in liabilities due to interest rate fluctuations, will likely result in a year-over-year increase in funded levels for many organizations.

What may cause some divergence among plans with respect to year-over-year changes in funded status?

Plans that have been focused on minimizing funded status volatility, and therefore have higher allocations to fixed income, may see lower actual returns. For those sponsors, they may not see the year-over-year increase in funded levels that some other plans may report, given their goals and objectives may be more centered around preserving funded levels as opposed to reducing deficits or growing surplus. In addition, sponsors that made large contributions to their plans may see larger year-over-year increases than their peers. However, with contribution activity generally muted, we don't expect to see many of those individual situations in their 2023 results.

A big component related to financial reporting for these plans are actuarial assumptions. How do you expect to see plans adjusting these for 2023 year-end reporting?

The Moody's Aa corporate bond yield, a common proxy for pension accounting discount rates, ended 2023 down around 15 basis points. Consequently, we would expect accounting discount rates for calendar-year companies to decline by a similar amount. The equal-weighted average accounting discount rate for calendar year-end companies in 2022 was 5.34%. As a result, we would expect the average for 2023 to fall to around 5.20%.

Expected return on asset (EROA) assumptions have been on the rise. A number of companies disclosed increases to the EROA assumptions they were using for 2023 financial reporting. After coming in at an average rate of 5.7% in 2022, the 2023 average EROA will likely be north of 6.0%. Some off calendar-year companies such as Deere, Emerson Electric, and WestRock recently disclosed modest increases to their EROAs for fiscal-year 2024, so the trend of EROAs being upwardly adjusted seems to be on track to continue.

Finally, and importantly, what does all of this mean for asset allocation?

This is always the most anticipated part of our annual analysis since it is the one time every year when plans disclose their actual and target asset allocations. Given the upward move in funded levels, many plans have likely moved down their glide paths and potentially increased their allocations to liability hedging fixed income (see Strategy in Focus on next page for an example). The aggregate allocation to fixed income in the US corporate pension universe was 51% at the end of 2022. We would suspect it moved higher at the end of 2023, but likely marginally so given the measured movements by plan sponsors as well as the reality that equities outperformed fixed income last year.Beyond this, many plans were overweight alternatives at the end of 2022 given the denominator effect. It will be interesting to see how those allocations may or may not have adjusted in 2023.

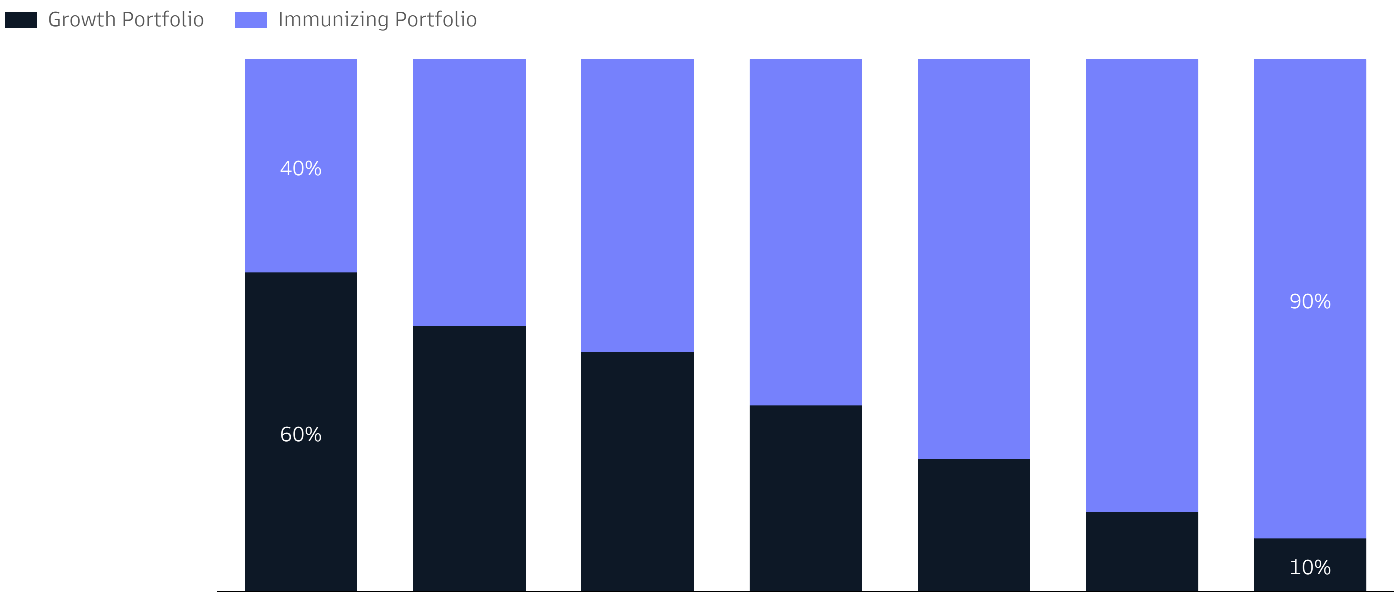
Source: Goldman Sachs Asset Management. As of December 31, 2023. For discussion purposes only. The portfolio risk management process includes an effort to monitor and manage risk, but does not imply low risk. Please see additional disclosures at the end of this document. Goldman Sachs Asset Management leverages the resources of Goldman Sachs & Co. LLC subject to legal, internal and regulatory restrictions. Any reference to a specific company or security does not constitute a recommendation to buy, sell, hold or directly invest in the company or its securities.

1. "Magnificent Seven" refers to the seven mega-cap tech companies consisting of Alphabet, Amazon, Apple, Meta Platforms, Microsoft, NVIDIA, and Tesla.

4. STRATEGY IN FOCUS: EXECUTING ON THE GLIDEPATH

- Many plans have seen increases in funded levels and consequently moved down their glidepaths
- As depicted in the exhibit, this will often call for shifting assets out of return-seeking assets like public equities into liability hedging fixed income
- History shows that increases in funded levels can sometimes be fleeting, emphasizing the importance of acting on glidepaths when triggers are met
- As an example, 30-Year US Treasury yields declined over 100 basis points between late October and the end of 2023, which increased pension liabilities and placed downward pressure on funded ratios

Illustrative Pension Plan Portfolio



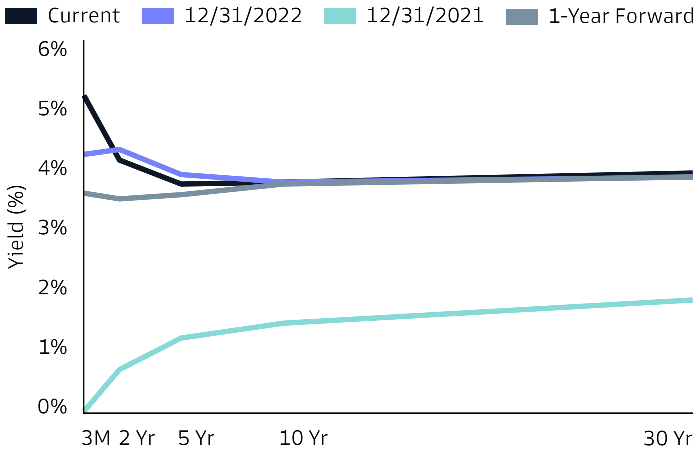
Funded Status	80%	85%	90%	95%	100%	105%	110+%
Growth Portfolio[1]	60%	50%	45%	35%	25%	15%	10%
Immunizing Portfolio[1]	40%	50%	55%	65%	75%	85%	90%
Rate Hedge Ratio	60%	70%	80%	90%	100%	100%	100%

Source: Goldman Sachs Asset Management. For illustrative purposes only. "Rate Hedge Ratio" represents how much risk that is attributed to changes in interest rate is being hedged by custom liability-driven investing (LDI) strategies. The illustrative pension plan portfolio provided herein has certain limitations. These results are based on simulated or hypothetical performance results that have certain inherent limitations. Unlike the results shown in an actual performance record, these results do not represent actual trading. Also, because these trades have not actually been executed, these results may have under-or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity. Simulated or hypothetical trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. No representation is being made that any account will or is likely to achieve profits or losses similar to these being shown. The illustrative pension plan shown on this page does not represent GS Asset Management portfolios.

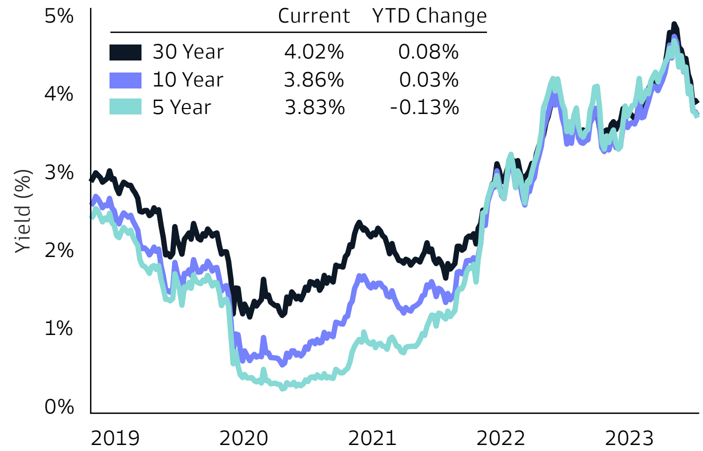
1. A growth portfolio is typically made up of assets expected to appreciate in value with some degree of volatility (e.g., equities, private assets, real estate, etc.), while immunizing portfolios are typically made up of fixed income and/or derivative positions intended to hedge interest rate risk.

5. MARKET MONITOR

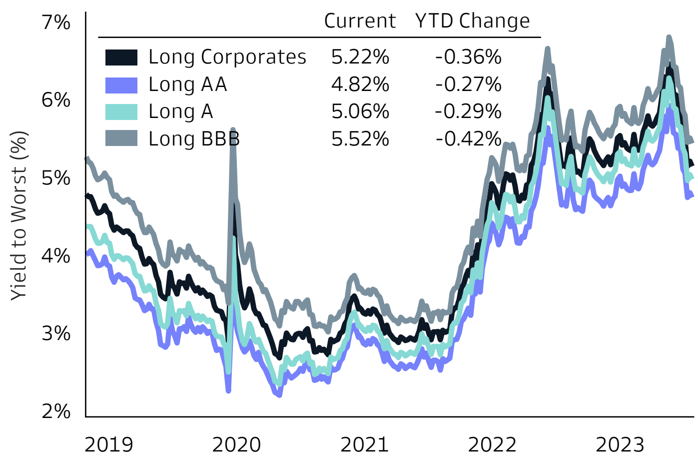
US Treasury Nominal Yield Curves



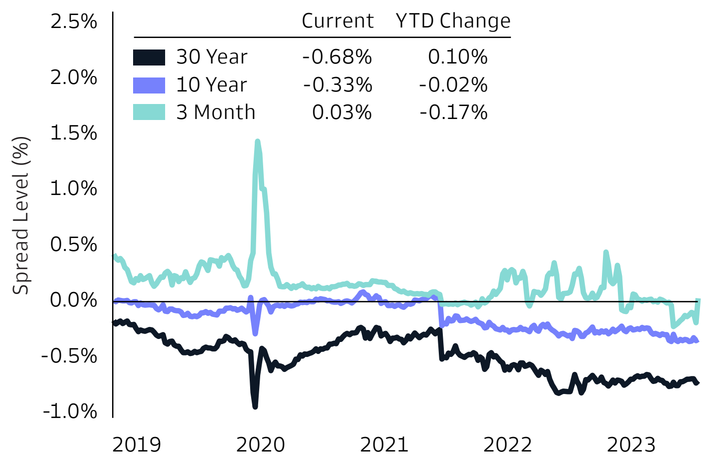
Constant Maturity US Treasury Rates



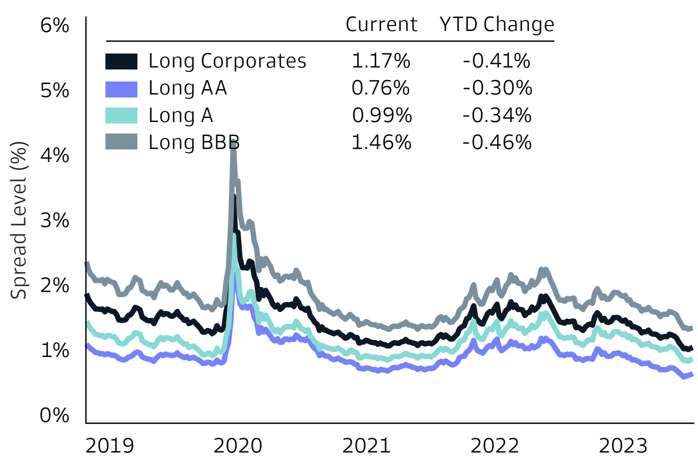
Investment Grade Corporate Bond Nominal Yields



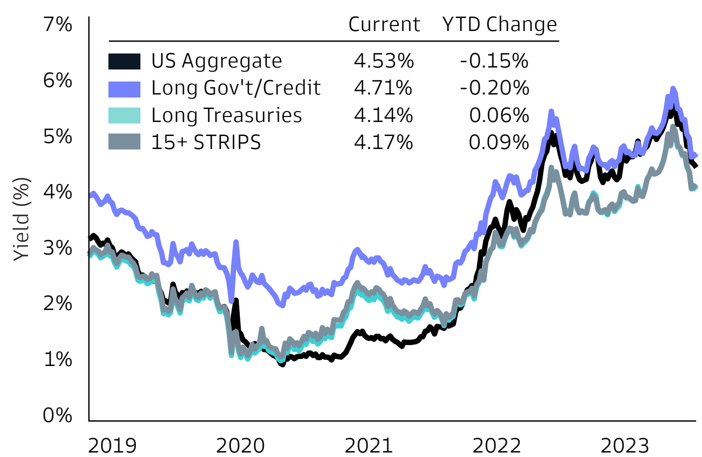
US Treasury Nominal Interest Rate Swap Spreads



Investment Grade Corporate Bond Nominal Spreads



Additional Investment Grade Bond Nominal Yields



Source: Bloomberg, Goldman Sachs Asset Management. Long AA, Long A, and Long BBB refer to S&P credit ratings, referring to investment grade quality fixed income. "Constant Maturity U.S. Treasury Rates" are yields computed by the Federal Reserve reflecting average yields across debt securities for the same maturity. "Yield to Worst" refers to the lowest possible yield that may be received on a fixed income instrument without default. "15+ STRIPS" refers to long duration government-backed securities. Any reference to a specific company or security does not constitute a recommendation to buy, sell, hold or directly invest in the company or its securities. **Past performance does not guarantee future results, which may vary.** Figures estimated/unaudited as of 12/31/2023, and subject to potentially significant revisions over time. Actual returns may vary significantly from the performance information presented. Economic and market forecasts presented herein are for informational purposes as of the date of this document. There can be no assurance that the forecasts will be achieved. Please see additional disclosures at the end of this document.

6. GOLDMAN SACHS ASSET MANAGEMENT PENSION SOLUTIONS

What We Do

We engage with institutional investors, combining our insight and analytics with investment products, to help clients solve complex asset and risk management challenges. Whether evaluating portfolio construction, broader plan design questions or investment strategies, Goldman Sachs Asset Management has the resources and capabilities to help you assess, develop or manage a defined benefit strategy.

Who We Are

We are tenured strategists, investors, former actuaries and counselors that offer unbiased advice and customized solutions for defined benefit plans and defined contribution programs.

Analytics

Investment analytics to help plans monitor and assess plan performance and risk position.

Asset Management

Growth Portfolio Optimization
Guidance on strategies to potentially enhance risk-adjusted returns in growth portfolios

Equity Risk Mitigation
Reshape the distribution of equities designed to provide downside preservation with upside participation

Liquidity Enhancement
Assist plans in maximizing return potential on free cash, as well as strategically managing for future cash flow needs

Partnership

Advisory and discretionary offering to help plans with strategic asset allocation, manager research and selection, portfolio monitoring and rebalancing and administrative support.

The Institutional Advisory Solutions team collaborates closely with our Fixed Income, Multi-Asset Solutions and Client Solutions Group teams which are distinct groups separated by informational barriers. The portfolio risk management process includes an effort to monitor and manage risk, but does not imply low risk. Reference to the term “partnership” is not intended to connote a type of organizational structure or any type of legal relationship with Goldman Sachs. Rather, the term “partnership” is intended to refer to a comprehensive relationship between Goldman Sachs and a client that incorporates a range of value-added services.

7. LIBRARY

GSAM Insights
January 4, 2024

US Corporate Pension Review and Preview: A Plan for All Seasons (2024)

View now

GSAM Insights
November 15, 2023

Asset Management Outlook 2024: Embracing New Realities

View now

GSAM Insights
November 14, 2023

Retirement Mindset Matters

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GSAM Insights
December 11, 2023

Private Equity's New Math: Value Creation in Today's Market

View now

Source: Goldman Sachs Asset Management. As of January 2024. Screenshots are for illustrative purposes only.

RISK CONSIDERATIONS

Equity securities are more volatile than bonds and subject to greater risks. Small and mid-sized company stocks involve greater risks than those customarily associated with larger companies.

Investments in fixed income securities are subject to the risks associated with debt securities generally, including credit, liquidity, interest rate, prepayment and extension risk. Bond prices fluctuate inversely to changes in interest rates. Therefore, a general rise in interest rates can result in the decline in the bond's price. The value of securities with variable and floating interest rates are generally less sensitive to interest rate changes than securities with fixed interest rates. Variable and floating rate securities may decline in value if interest rates do not move as expected. Conversely, variable and floating rate securities will not generally rise in value if market interest rates decline. Credit risk is the risk that an issuer will default on payments of interest and principal. Credit risk is higher when investing in high yield bonds, also known as junk bonds. Prepayment risk is the risk that the issuer of a security may pay off principal more quickly than originally anticipated. Extension risk is the risk that the issuer of a security may pay off principal more slowly than originally anticipated. All fixed income investments may be worth less than their original cost upon redemption or maturity.

Investments in foreign securities entail special risks such as currency, political, economic, and market risks. These risks are heightened in emerging markets.

An investment in real estate securities is subject to greater price volatility and the special risks associated with direct ownership of real estate.

Investments in commodities may be affected by changes in overall market movements, commodity index volatility, changes in interest rates or factors affecting a particular industry or commodity.

Alternative investments often are speculative, typically have higher fees than traditional investments, often include a high degree of risk and are suitable only for eligible, long-term investors who are willing to forgo liquidity and put capital at risk for an indefinite period. They may be highly illiquid and can engage in leverage and other speculative practices that may increase volatility and risk of loss.

Alternative Investments by their nature, involve a substantial degree of risk, including the risk of total loss of an investor's capital. Fund performance can be volatile. There may be conflicts of interest between the Alternative Investment Fund and other service providers, including the investment manager and sponsor of the Alternative Investment. Similarly, interests in an Alternative Investment are highly illiquid and generally are not transferable without the consent of the sponsor, and applicable securities and tax laws will limit transfers.

Volatility is a measure of variation of a financial instrument's price.

Yield to Worst (YTW) is the interest rate that makes the present value of a bond's cash flows equal to the bond's price or initial investment, calculated by making worst-case scenario assumptions (excluding issuer default) on the bond by calculating the returns that would be received if provisions, including prepayment, call, put, and sinking fund, are used by the issuer. The YTW on derivatives, Treasury futures, and interest rate swaps incorporate the impact of current funding rates (due to a change in data source, funding rates on Treasury futures were not incorporated on the YTW calculation from approximately early 2020 through 9-Nov-2022. Since November 9, 2022, funding rates on Treasury futures have been incorporated). On a portfolio level, the YTW is a characteristic of the portfolio based on its holdings as of a particular date and is considered a long-term bond yield expressed as an annualized rate of return, assuming the portfolio securities are called with the lowest yield after running to each potential call date. The YTW does not represent the performance yield for a portfolio and may increase or decrease depending on the present value of a bond's market price as well as the number and size of payments remaining. As of April 14, 2023, the YTW has been capped at 15% in order to provide a more prudent and conservative representation.

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Indices are unmanaged. The figures for the index reflect the reinvestment of all income or dividends, as applicable, but do not reflect the deduction of any fees or expenses which would reduce returns. Investors cannot invest directly in indices.The indices referenced herein have been selected because they are well known, easily recognized by investors, and reflect those indices that the Investment Manager believes, in part based on industry practice, provide a suitable benchmark against which to evaluate the investment or broader market described herein.

Standard & Poor's (S&P) 500 Index is Standard & Poor's Composite Stock Prices Index of 500 stocks, an unmanaged index of common stock prices.

Bloomberg US Aggregate Bond Index represents an unmanaged diversified portfolio of fixed income securities, including US Treasuries, investment grade corporate bonds, and mortgage backed and asset-backed securities.

Bloomberg US Corporate Investment Grade Index includes publicly issued US corporate and specified foreign debentures and secured notes.

US Treasury Bond is a debt obligation backed by the United States government and its interest payments are exempt from state and local taxes. However, interest payments are not exempt from federal taxes.

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Date of First Use: January 29, 2024. 352434-OTU-1950706..

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