

Goldman  
Sachs



Goldman  
Sachs Equity  
TimeX Index

# Key Facts

<b>Bloomberg Ticker</b>	GSEQTMX
<b>Index Launch Date</b>	July 28, 2023
<b>Index Sponsor</b>	Goldman Sachs International
<b>Index Calculator</b>	Goldman Sachs International
<b>Currency</b>	USD
<b>Max Underliers</b>	1
<b>Volatility Target</b>	10%
<b>Leverage Cap</b>	150%
<b>Return Type</b>	Excess Return
<b>Index Deduction Rate<sup>2</sup></b>	0.50% per annum
<b>Rebal/Servicing Cost<sup>1,2</sup></b>	Backtested high of 0.92% p.a. Backtested average of 0.61%

<sup>1</sup> Goldman Sachs Global FICC and Equities, as of July 28, 2023. Data from January 3, 2000 to July 28, 2023. Backtested performance for the Goldman Sachs Equity TimeX Index up to July 28, 2023 and live performance thereafter. Performance figures are net of 0.50% index fee, transaction and servicing costs. Backtesting analysis/simulated results are for illustrative purposes only. GS provides no assurance or guarantee that the index will operate or would have operated in the past in a manner consistent with the backtesting analysis. Backtested performance may use slightly different data sources, approximation and limited differences in methodology to those prescribed in the index disclosure document.

<sup>2</sup> The Goldman Sachs Equity TimeX Index is calculated on an excess return basis, and is subject to servicing costs (accruing daily) and rebalancing costs (applied to the volume of daily turnover). Further, a deduction rate of 0.50% per annum (accruing daily) is applied to the Goldman Sachs Equity TimeX Index. For more information about the costs and deductions, see [goldmansachsindices.com/products/GSEQTMX](https://goldmansachsindices.com/products/GSEQTMX).

# Who is Goldman Sachs?

The Goldman Sachs Group, Inc. is a leading global investment banking, securities and investment management firm that provides a wide range of financial services to a substantial and diversified client base that includes corporations, financial institutions, governments and individuals. Founded in 1869, the firm is headquartered in New York and maintains offices in all major financial centers around the world.

2021



Future Iconic Leader Begi Goldman Sachs Launches *One Million Black Women*, Committing over US\$10 Billion towards Transformative Investments, Partnerships, and Grants

2019



New Bengaluru Campus Opens During the Office's 15th Anniversary Year

2009

Launch of 10,000 *Small Businesses* Helps Fuel the Engines of Job Creation and Spark Innovation



Landmark Partnership Preserves Pristine Wilderness in Tierra del Fuego



2004

1995



Goldman Sachs Adds Iconic NYC Property to Its Real Estate Portfolio



New Partners, including the First Woman Partner and First Black Partner, Reflect the Firm's Evolving Partnership

1986

Goldman Sachs Takes First Step to Becoming a Global Firm with London Office Opening



1970

Goldman Sachs Trading Corporation, Founded in 1928, Bears Full Brunt of 1929 Crash



1928



Future Iconic Leader Begins Work as a Janitor's Assistant



1907



Entrepreneurialism and Grit Inspire Marcus Goldman to Launch his Business

1869

# Goldman Sachs Equity TimeX Index

## OBJECTIVE

The Goldman Sachs Equity TimeX Index provides equity exposure while aiming to provide greater option cost stability through volatility control and excess return structure.

## APPROACH

The Index uses calendar based signals and price patterns to dynamically adjust exposure to equities at a targeted volatility level of 10%

## INDEX COMPONENT

The SPDR® S&P 500® ETF Trust

### TURN OF THE MONTH

Equity markets have historically<sup>1</sup>, on average, tended to return to prior averages towards the end of the month, and outperform during the first few days of the monthh

### OPTIONS EXPIRY WEEK

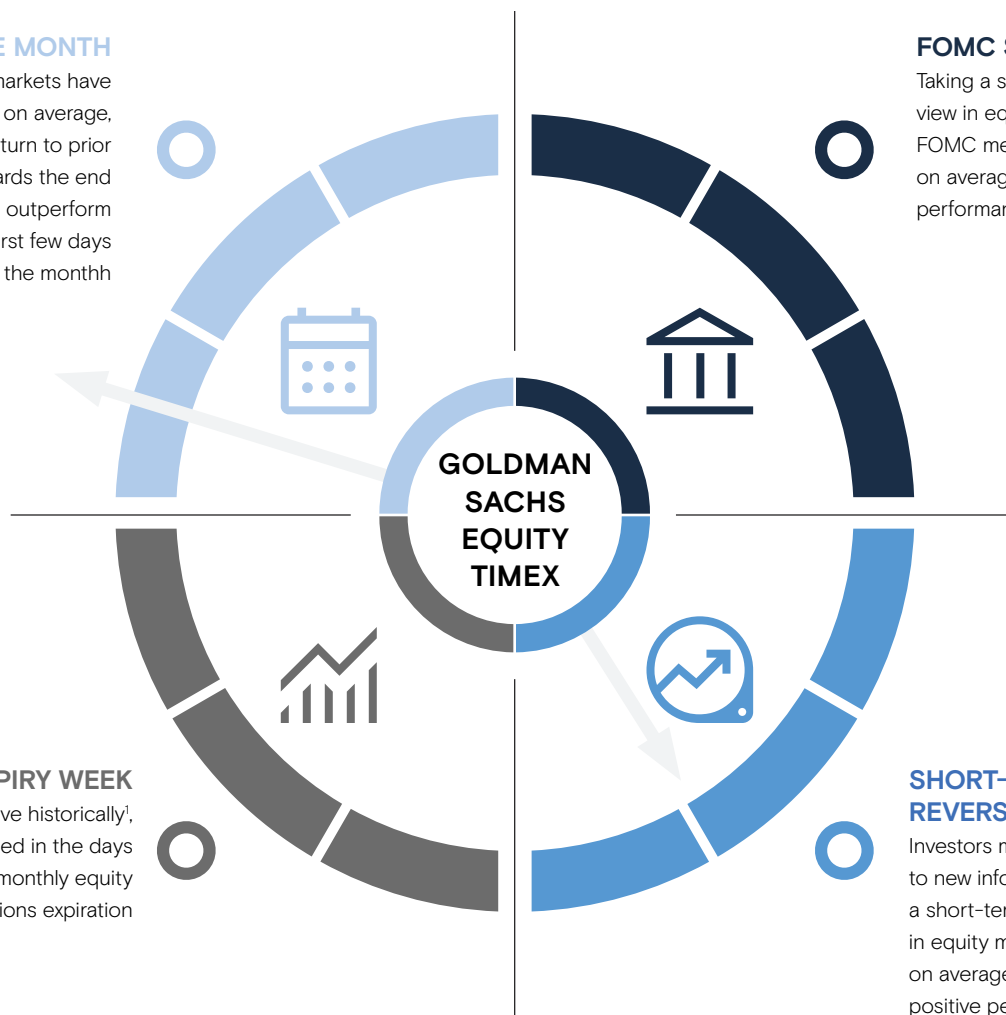
Equity markets have historically<sup>1</sup>, on average, trended in the days prior to monthly equity options expiration

### FOMC SIGNAL

Taking a short-term bullish view in equity markets during FOMC meetings has historically<sup>1</sup>, on average, provided positive performance

### SHORT-TERM MEAN REVERSION

Investors may overreact to new information, and taking a short-term contrarian view in equity markets has historically<sup>1</sup>, on average, provided strong positive performance



*This index dynamically adjusts the weights of the index components based on certain calendar based signals and price patterns ("Market Signals"). Past performance or hypothetical past performance on the basis of Market Signals is no guide to future performance and historical trends may not hold.*

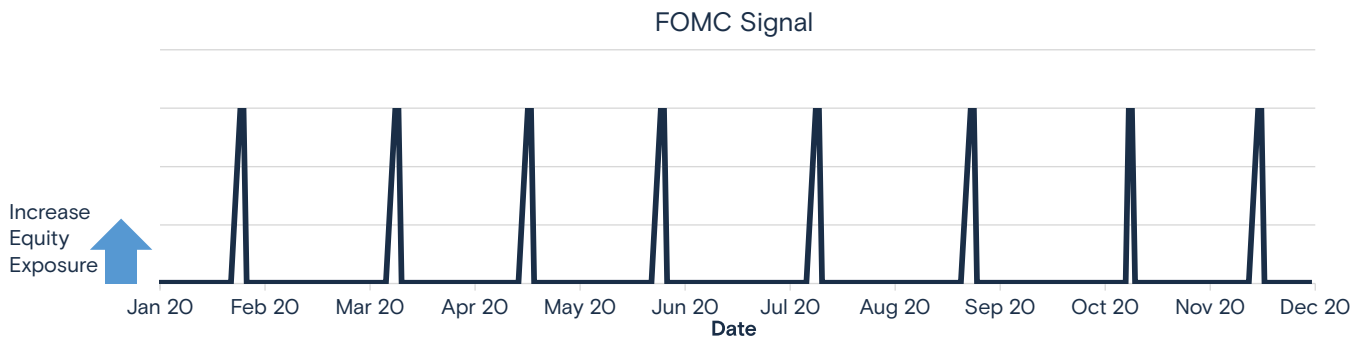
<sup>1</sup>As observed in the analyzed sample between January 3, 2000 and July 31, 2023. Past performance of the index is no guide to future performance.

# Signals in Action



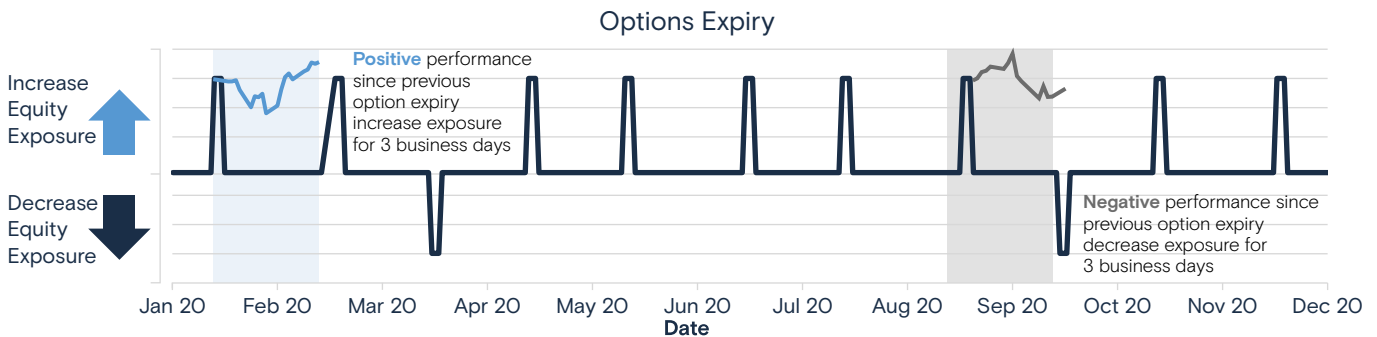
## FOMC SIGNAL

Taking a short-term bullish view in equity markets during FOMC meetings has historically<sup>1</sup>, on average, provided positive performance



## OPTIONS EXPIRATION SIGNAL

Equity markets have historically<sup>1</sup>, on average, trended in the days prior to monthly equity options expiration



<sup>1</sup>As observed in the analyzed sample between January 3, 2000 and July 31, 2023. Past performance of the index is no guide to future performance.

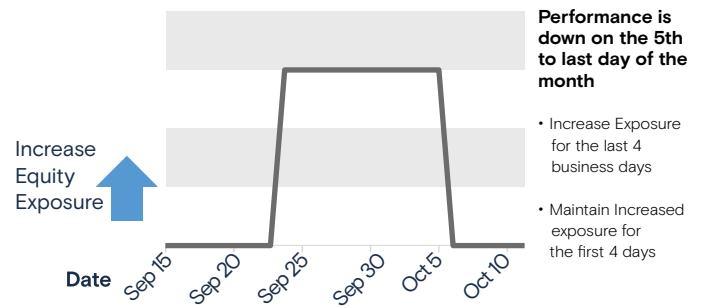
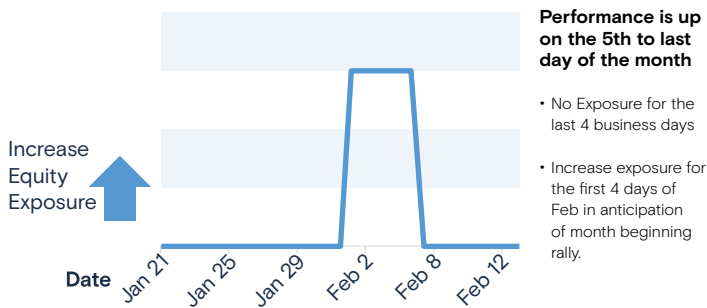
# Calendar Based Signals



## TURN OF MONTH SIGNALS

Equity markets have historically<sup>1</sup>, on average, tended to return to prior averages towards the end of the month, and outperform during the first few days of the month

### Turn of Month

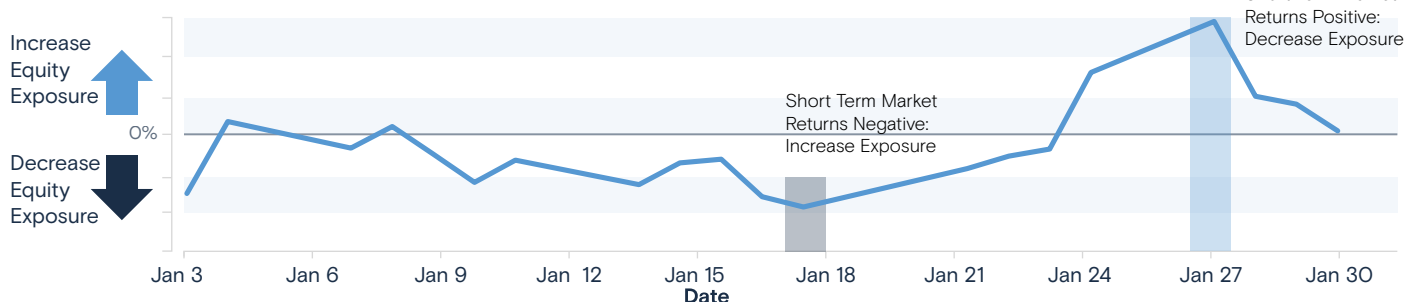


## SHORT-TERM MEAN REVERSION SIGNAL

Investors may overreact to new information, and taking a short-term contrarian view in equity markets has historically<sup>1</sup>, on average, provided strong positive performance



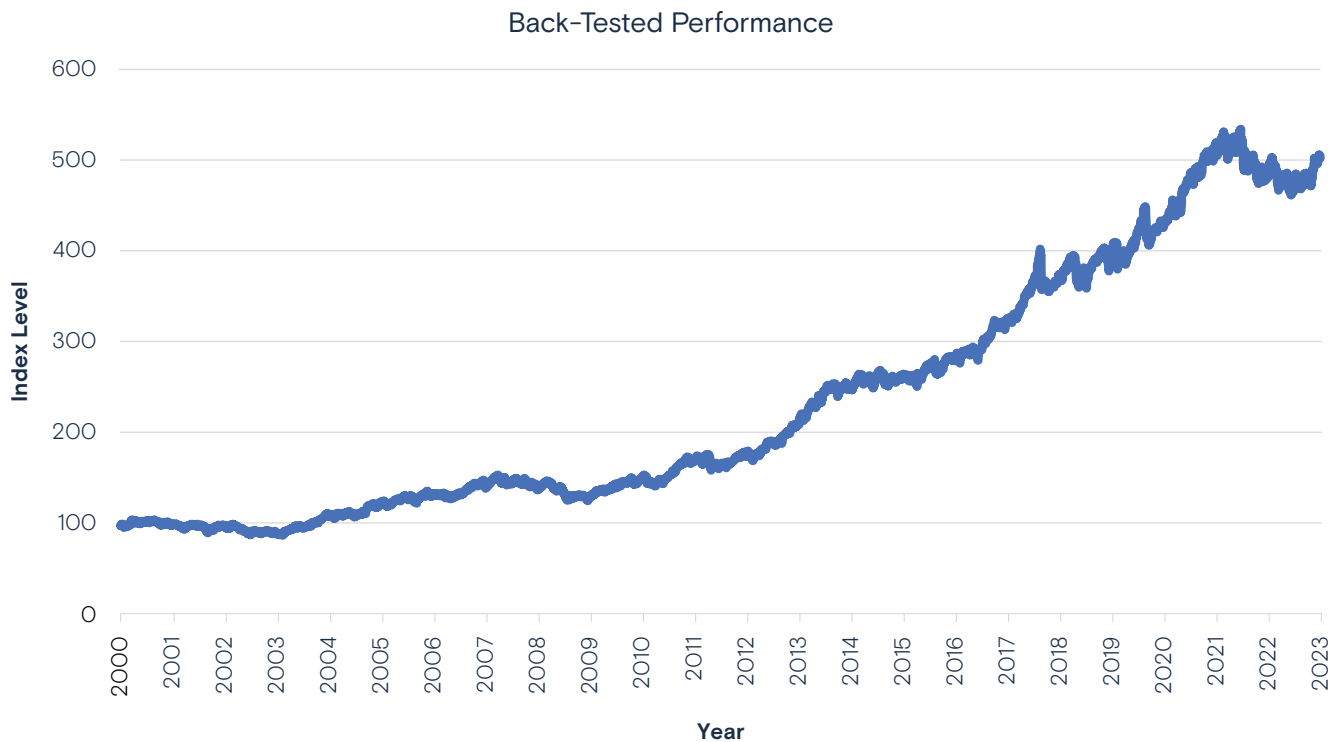
### Short Term Mean Reversion



<sup>1</sup>As observed in the analyzed sample between January 3, 2000 and July 31, 2023. Past performance of the index is no guide to future performance.

# Back-Tested Performance

Goldman Sachs Global FICC and Equities, as of July 28, 2023. Data from January 3, 2000 to July 28, 2023. Backtested performance for the Goldman Sachs Equity TimeX Index up to July 28, 2023 and live performance thereafter. Performance figures are net of 0.50% index fee, transaction and servicing costs. Backtesting analysis/simulated results are for illustrative purposes only. GS provides no assurance or guarantee that the index will operate or would have operated in the past in a manner consistent with the backtesting analysis. Backtested performance may use slightly different data sources, approximation and limited differences in methodology to those prescribed in the index disclosure document.



Index Backtested and Historical Performance (Jan 3, 2000 to July 28, 2023)

ANNUALIZED RETURN SINCE INCEPTION (1/3/2000)	7.24%
1 YEAR RETURN	2.15%
3 YEAR ANNUALIZED RETURN	5.32%
5 YEAR ANNUALIZED RETURN	6.02%

Annualized Return Since Inception: January 3, 2000 – July 28, 2023

1 Year Return: July 27, 2022 – July 28, 2023

3 Year Annualized Return: July 27, 2020 – July 28, 2023

5 Year Annualized Return: July 27, 2018 – July 28, 2023

# Selected Risk Factors

## Goldman Sachs Equity TimeX Index

These "Selected key risks" are intended to summarize certain risks associated with the Goldman Sachs Equity TimeX Index ("Index"), but are not exhaustive, and should be read in conjunction with the risk included in the Goldman Sachs Equity TimeX Index Methodology.

- The value of the Index depends on the value of the underlying equity component ("Index Component"), which may increase or decrease in value over time. Neither the Index nor the Index Component includes any element of downside protection or guaranteed return. The value of the Index Component, or the Index itself, may fall substantially below its value as of the Launch Date or on any particular day and may fall to or below zero.
- The Index has a very limited performance history. The Index will only be calculated live from the Launch Date and as such, there will be no historical live performance data available in respect of it prior to that time.
- Past performance or hypothetical past performance of the Index is no guide to future performance. The actual performance of the Index in the future may bear little relation to the historical performance or hypothetical historical past performance of the Index.
- The Index deductions, including the servicing costs and rebalancing costs applicable to the Index Component, as well as the Index deduction rate, will have a negative impact on the Index performance. Such deductions may offset, in whole or in part, any increases in the return of the Index Component.
- Depending on the application of the factors that impact the weight of the Index Component, the Index may have a leverage as high as 150%. Leverage means that the Index will have increased exposure to changes, which may be positive or negative, in the levels of the Index Component, magnifying the volatility and risk that the performance of the Index will be adversely affected should the value of the Index Component decrease. In other conditions the Index may have no exposure to the Index Component.
- No assurance can be given that the Index will achieve its volatility target of 10%, as the Index's volatility control mechanisms either rely on backward-looking historical volatility (which may not be replicated) or estimations of future volatility (which may not reflect actual future volatility). In addition, the Index may be slow to rebalance allocations or reduce exposure to the Index Component following a sudden increase in volatility. All of these factors may cause the performance of the Index to be adversely and disproportionately affected by the poor performance of the Index Component.
- The Market Signals and volatility control mechanisms may each generate significant turnover within the Index which will impact performance due to the resulting embedded rebalancing costs and therefore negatively impact Index performance.
- The Index's Market Signals may not perform as expected should market environments change, and such signals' effectiveness may wane or disappear over time. If the effectiveness of the Market Signals wanes or disappears, the changes to the Index Component weights will no longer reflect the underlying assumptions of such signals and the performance of the Index may suffer.
- Goldman Sachs is a full service financial services firm engaged in a range of market activities. Goldman Sachs may issue, arrange for the issue of, or enter into financial instruments or derivatives linked to, the Index, other indices that are based on the Index Component and arrange for the distribution of these financial instruments or derivatives, including the payment of distribution fees and commissions to any intermediaries. These activities could adversely affect the Index Level and the Index Component.



# Goldman Sachs Treatment of Incidents

- The treatment of incidents affecting Benchmarks administered by Goldman Sachs is subject to a specific “Policy on Global Benchmark Incidents and Restatements” (the **Policy**) (1) in addition to the oversight of the Index Committee.
- Incidents include errors or anomalies with respect to the published level of a Benchmark which has resulted from various events including, but not limited to, a third party restating input data consumed by Goldman Sachs, a discrepancy between the documentation and the implementation of a Benchmark, a documentation error, a calculation error, a publication error or a third party error.
- After identification of such incidents, should Goldman Sachs determine it is required by the Policy, Goldman Sachs will recalculate and republish the Benchmark level for a period starting up to three weekdays prior to the incident being identified and until the day the Benchmark is corrected (the “**Restatement**”). This period is defined as the “**Restatement Period**”.
- This means that the benchmark levels prior to the Restatement Period will not be corrected, even if impacted by an incident.
- The Restatement is implemented in such a way that the daily returns of the Benchmark are corrected for each day in the Restatement Period. Investors will be notified of such Restatement via a notice posted on the Marquee website.
- A Restatement may alter the calculation of cash flows of instruments linked to the Benchmark within the Restatement Period. In such case, the relevant contractual provisions set out in the legal documentation of the instrument will apply. Please note that the Restatement can lead to different calculated cash flows (higher or lower) than if the Restatement had not occurred.
- For every incident resulting in incorrect rates of costs being deducted from the Benchmark level from the date of an incident and onwards (“**Additional Costs**” (2)) the relevant Goldman Sachs Group entity shall offer to reimburse any such Additional Costs, where due and payable as determined by Goldman Sachs, to investors in, or counterparties to, financial instruments linked to or referencing the Benchmark, in accordance with, and where permitted by, applicable laws and regulations and the contractual provisions and offering documents of the relevant instruments. Any reimbursement of Additional Costs shall be limited to the Additional Costs accrued during the three (3) years prior to the date on which the incident was identified.

(1) In the event of a discrepancy between the provisions of the Policy and the information set out in this document, the provisions of the Policy shall prevail. Please note that the policy can be changed at Goldman Sachs discretion

(2) Any increased cost which has occurred as a result of or derived from any incorrect asset weights or asset quantities arising from an incident does not constitute “Additional Costs”.

# Disclaimers

**Non-Reliance and Risk Disclosure:** This material is for the general information of our clients and is a solicitation of derivatives business generally, only for the purposes of, and to the extent it would otherwise be subject to, CFTC Regulations 1.71 and 23.605. This material should not be construed as an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. We are not soliciting any specific action based on this material. For the purposes of U.S. rules and regulations, it does not constitute a recommendation or take into account the particular investment objectives, financial conditions, or needs of individual clients. Before acting on this material, you should consider whether it is suitable for your particular circumstances and, if necessary, seek professional advice. The price and value of the investments referred to in this material and the income from them may go down as well as up, and investors may realize losses on any investments. Past performance is not a guide to future performance. Future returns are not guaranteed, and a loss of original capital may occur. We do not provide tax, accounting, or legal advice to our clients, and all investors are advised to consult with their tax, accounting, or legal advisers regarding any potential investment. The material is based on information that we consider reliable, but we do not represent that it is accurate, complete and/or up to date, and it should not be relied on as such. Opinions expressed are our current opinions as of the date appearing on this material only and only represent the views of the author and not those of Goldman Sachs, unless otherwise expressly noted.

**Conflict of Interest Disclosure:** We are a full-service, integrated investment banking, investment management, and brokerage firm. The professionals who prepared this material are paid in part based on the profitability of The Goldman Sachs Group, Inc., which includes earnings from the firm's trading, capital markets, investment banking and other business. They, along with other salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients that reflect opinions that are contrary to the opinions expressed herein or the opinions expressed in research reports issued by our Research Departments, and our market making, investing and lending businesses may make investment decisions that are inconsistent with the views expressed herein. In addition, the professionals who prepared this material may also produce material for, and from time to time, may advise or otherwise be part of our trading desks that trade as principal in the securities mentioned in this material. This material is therefore not independent from our interests, which may conflict with your interests. We and our affiliates, officers, directors, and employees, including persons involved in the preparation or issuance of this material, may from time to time have "long" or "short" positions in, act as principal in, and buy or sell the securities or derivatives (including options) thereof in, and act as market maker or specialist in, and serve as a director of, companies mentioned in this material. In addition, we may have served as manager or co manager of a public offering of securities by any such company within the past three years.

**Not a Fiduciary:** To the extent this material is provided to an employee benefit plan or account subject to the Employee Retirement Income Security Act of 1974, as amended ("ERISA") or Section 4975 of the Internal Revenue Code of 1986, as amended (the "Code") (each, a "Benefit Plan Investor"), by accepting this material such Benefit Plan Investor will be deemed to have represented, warranted and acknowledged that (1) the Benefit Plan Investor is represented by a fiduciary that is independent of Goldman Sachs and its affiliates (the "Independent Fiduciary"), (2) the Independent Fiduciary is a bank (as defined in section 202 of the Investment Advisers Act of 1940 (the "Advisers Act")) or a similar institution that is regulated and supervised and subject to periodic examination by a State or Federal agency; an insurance carrier which is qualified under the laws of more than one State to perform the services of managing, acquiring or disposing of assets of a plan; an investment adviser registered under the Advisers Act or, if not registered as an investment adviser under the Advisers Act by reason of paragraph (1) of section 203A, is registered as an investment adviser under the laws of the State in which it maintains its principal office and place of business; a broker-dealer registered under the Securities Exchange Act of 1934; or an Independent Fiduciary that holds or has under management or control total assets of at least \$50 Million; (3) the Independent Fiduciary is capable of evaluating investment risks independently, both in general and with regard to the information contained in this material; (4) the Independent Fiduciary is a fiduciary under ERISA and/or the Code with respect to, and is responsible for exercising independent judgment in evaluating, the information contained in this material; (5) neither Goldman Sachs nor its affiliates are undertaking to provide impartial investment advice, or to give advice in a fiduciary capacity, in connection with the information contained in this material or with respect to any Benefit Plan Investor's subsequent investment decisions; and (6) any financial interest of Goldman Sachs and its affiliates is or has been disclosed. To the extent this material is provided to any other recipient, this material is provided solely on the basis that the recipient has the capability to independently evaluate investment risk and is exercising independent judgment in evaluating investment decisions in that its investment decisions will be based on its own independent assessment of the opportunities and risks presented by a potential investment, market factors and other investment considerations.

**Not a Municipal Advisor:** Except in circumstances where Goldman Sachs expressly agrees otherwise in writing, Goldman Sachs is not acting as a municipal advisor and the opinions or views contained herein are not intended to be, and do not constitute, advice, including within the meaning of Section 15B of the Securities Exchange Act of 1934.

**Phone recording:** Telephone conversations with Goldman Sachs personnel may be recorded and retained.

**Legal Entities Disseminating this Material:** This material is disseminated in Australia by Goldman Sachs Australia Pty Ltd (ABN 21 006 797 897); in Canada by either Goldman Sachs Canada Inc. or Goldman Sachs & Co. LLC; in Hong Kong by Goldman Sachs (Asia) L.L.C. or by Goldman Sachs Asia Bank Limited, a restricted licence bank; in Japan by Goldman Sachs Japan Co., Ltd.; in the Republic of Korea by Goldman Sachs (Asia) L.L.C., Seoul Branch; in New Zealand by Goldman Sachs New Zealand Limited; in Singapore by Goldman Sachs (Singapore) Pte. (Company Number: 198602165W), by Goldman Sachs Futures Pte. Ltd (Company Number: 199004153Z) or by J.Aron & Company (Singapore) Pte (Company Number: 198902119H); in India by Goldman Sachs (India) Securities Private Limited, Mumbai Branch; in the United Kingdom, Belgium, Denmark, Finland, Ireland, Italy, Liechtenstein and Luxembourg by Goldman Sachs International ("GSI"); in the United Kingdom, Belgium, France, Germany, Ireland, Luxembourg and the Netherlands by Goldman Sachs Bank USA, London Branch (Financial Services Register number 582328); in France by Goldman Sachs Paris Inc. et Cie or GSI Paris branch; in Spain by GSI Madrid branch; in Sweden by GSI Stockholm branch; in all European Economic Area jurisdictions by Goldman Sachs Bank Europe SE, including through its authorised branches ("GSBE"); in Switzerland by GSI; in the Cayman Islands by Goldman Sachs (Cayman) Trust, Limited; in Brazil by Goldman Sachs do Brasil Banco Múltiplo S.A.; and in the United States of America by Goldman Sachs & Co. LLC (which is a member of FINRA, NYSE and SIPC) and by Goldman Sachs Bank USA. You may obtain information about SIPC, including the SIPC brochure, by contacting SIPC (website: <http://www.sipc.org>; phone: 202-371-8300). GSI, which is authorised by the Prudential Regulation Authority ("PRA") and regulated by the Financial Conduct Authority ("FCA") and the PRA, has approved this material in connection with its distribution in the United Kingdom. GSI, whose registered office is at Plumtree Court, 25 Shoe Lane, London EC4A 4AU, appears in the FCA's Register (Registration No.: 142888). GSI is registered as a Private Unlimited Company in England and Wales (Company Number: 2263951) and its VAT registration number is GB 447 2649 28. GSI is subject to the FCA and PRA rules and guidance, details of which can be found on the websites of the FCA and PRA at [www.fca.org.uk](http://www.fca.org.uk) and [www.bankofengland.co.uk/pr](http://www.bankofengland.co.uk/pr). The FCA is located at 12 Endeavour Square, London E20 1JN, and the PRA is located at Bank of England, 20 Moorgate, London EC2R 6DA. GSBE is a credit institution incorporated in Germany and, within the Single Supervisory Mechanism established between those Member States of the European Union whose official currency is the Euro, subject to direct prudential supervision by the European Central Bank and in other respects supervised by German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin) and Deutsche Bundesbank. Unless governing law permits otherwise, you must contact a Goldman Sachs entity in your home jurisdiction if you want to use our services in effecting a transaction in the securities mentioned in this material. This material is not for distribution to retail clients, as that term is defined under The European Union Markets in Financial Instruments Directive (2014/65/EU) (including as implemented in the United Kingdom), and any investments, including derivatives, mentioned in this material will not be made available by us to any such retail client.

# Disclaimers

Financial products that are linked to or reference the Goldman Sachs Equity TimeX Index (the "Index") are not sponsored, endorsed, sold, guaranteed, underwritten, distributed or promoted by Goldman Sachs & Co. or any of its affiliates (including Goldman Sachs Asset Management, L.P.), with the exception of any endorsement, sales, distribution or promotion of a product that may occur through its affiliates that are licensed insurance agencies (excluding such affiliates, individually and collectively, "Goldman Sachs") or its third-party data providers. Goldman Sachs and its third-party data providers make no representation or warranty, express or implied, regarding the advisability of investing in financial products generally or in financial products that are linked to or reference the Index or in the investment strategy underlying any financial products that are linked to or reference the Index, particularly, the ability of the Index to perform as intended, the merit (if any) of obtaining exposure to the Index or the suitability of purchasing or holding interests in a financial product that is linked to or references the Index. Goldman Sachs and its third party data providers do not have any obligation to take the needs of the holders of a financial product that is linked to or references the Index into consideration in determining, composing or calculating the Index. GOLDMAN SACHS DOES NOT GUARANTEE THE ACCURACY AND/OR COMPLETENESS OF THE INDEX OR OF THE METHODOLOGY UNDERLYING THE INDEX, THE CALCULATION OF THE INDEX OR ANY DATA SUPPLIED BY IT FOR USE IN A FINANCIAL PRODUCT THAT IS LINKED TO OR REFERENCES THE INDEX. GOLDMAN SACHS HEREBY EXPRESSLY DISCLAIMS ANY AND ALL LIABILITY FOR ANY ERRORS, OMISSIONS OR INTERRUPTIONS THEREIN, OR IN THE CALCULATION THEREOF. GOLDMAN SACHS EXPRESSLY DISCLAIMS ALL LIABILITY FOR ANY SPECIAL, PUNITIVE, INDIRECT OR CONSEQUENTIAL DAMAGE EVEN IF NOTIFIED OF THE POSSIBILITY OF SUCH DAMAGES.

THIRD-PARTY DATA IS USED UNDER LICENSE AS A SOURCE OF INFORMATION FOR THE INDEX. THIRD-PARTY PROVIDER HAS NO OTHER CONNECTION TO GOLDMAN SACHS INDEXES AND SERVICES AND DOES NOT SPONSOR, ENDORSE, RECOMMEND OR PROMOTE ANY GOLDMAN SACHS INDEX OR SERVICES. A THIRD-PARTY PROVIDER HAS NO OBLIGATION OR LIABILITY IN CONNECTION WITH THE GOLDMAN SACHS INDEX AND SERVICES. THIRD-PARTY PROVIDER DOES NOT GUARANTEE THE ACCURACY AND/OR THE COMPLETENESS OF ANY MARKET DATA LICENSED TO GOLDMAN SACHS AND SHALL NOT HAVE ANY LIABILITY FOR ANY ERRORS, OMISSIONS OR INTERRUPTIONS THEREIN. THERE ARE NO THIRD-PARTY BENEFICIARIES OF ANY AGREEMENTS OR ARRANGEMENTS BETWEEN A THIRD-PARTY PROVIDER AND GOLDMAN SACHS.

"SPDR", "S&P" are registered trademarks of Standard & Poor's Financial Services LLC ("S&P") and SPDR® ETFs are distributed by State Street Global Advisors Funds Distributors, LLC (SSGA). The Index is not sponsored, endorsed, sold or promoted by SSGA, S&P or their affiliates, and they make no representation regarding the advisability of investing in the Index.

Goldman Sachs and its third party data providers make no representation or warranty, express or implied, regarding the ability of the Index to perform as intended or the merit (if any) of obtaining exposure to the Index. GOLDMAN SACHS DOES NOT GUARANTEE THE ACCURACY, TIMELINESS, ADEQUACY AND/OR COMPLETENESS OF THE INDEX, THE INDEX VALUES OR OF THE METHODOLOGY UNDERLYING THE INDEX OR THE CALCULATION OF THE INDEX. GOLDMAN SACHS EXPRESSLY DISCLAIMS ALL LIABILITY FOR ANY SPECIAL, PUNITIVE, INDIRECT OR CONSEQUENTIAL DAMAGE EVEN IF NOTIFIED OF THE POSSIBILITY OF SUCH DAMAGES.

Reproduction and Re-Distribution: Without our prior written consent, no part of this material may be (i) copied, photocopied or duplicated in any form by any means or (ii) redistributed. Notwithstanding anything herein to the contrary, and except as required to enable compliance with applicable securities law, you (and each of your employees, representatives and other agents) may disclose to any and all persons the U.S. federal income and state tax treatment and tax structure of the transaction and all materials of any kind (including tax opinions and other tax analyses) that are provided to you relating to such tax treatment and tax structure, without Goldman Sachs imposing any limitation of any kind.

Information Not for Further Dissemination: To the extent this communication contains Goldman Sachs' pricing information, such pricing information is proprietary and/or confidential and is provided solely for the internal use of the intended recipient(s). You are notified that any unauthorized use, dissemination, distribution or copying of this communication or its contents, including pricing information, in whole or in part, is strictly prohibited. Further, unless prohibited by local law, any use, review or acceptance of this information is subject to and manifests your agreement with Goldman Sachs to use such information only in accordance with the terms set forth above. Goldman Sachs has caused its proprietary information to be delivered to you in reliance upon such agreement.

Not a Valuation: Values herein are not customer valuations and should not be used in lieu of a customer valuation statement or account statement. These values may not reflect the value of the positions carried on the books and records of Goldman Sachs or its affiliates and should not be relied upon for the maintenance of your books and records or for any tax, accounting, legal or other purposes. The information provided herein does not supersede any customer statements, confirmations or other similar notifications.

Receipt of Orders: An order sent to Goldman Sachs by email or instant message is not deemed to be received by Goldman Sachs until a Goldman Sachs representative verifies the order details with a phone call to the client or acknowledges receipt of the order via email or instant message to the client.

Goldman Sachs does not accept client orders sent via fax or voicemail systems.

Indicative Terms/Pricing Levels: This material may contain indicative terms only, including but not limited to pricing levels. There is no representation that any transaction can or could have been effected at such terms or prices. Proposed terms and conditions are for discussion purposes only. Finalized terms and conditions are subject to further discussion and negotiation.

Backtesting, Simulated Results, Sensitivity/Scenario Analysis or Spreadsheet Calculator or Model: There may be data presented herein that is solely for illustrative purposes and which may include among other things back testing, simulated results and scenario analyses. The information is based upon certain factors, assumptions and historical information that Goldman Sachs may in its discretion have considered appropriate, however, Goldman Sachs provides no assurance or guarantee that this product will operate or would have operated in the past in a manner consistent with these assumptions. In the event any of the assumptions used do not prove to be true, results are likely to vary materially from the examples shown herein. Additionally, the results may not reflect material economic and market factors, such as liquidity, transaction costs and other expenses which could reduce potential return.

©2023 Goldman Sachs. All rights reserved