

### Index Key Facts

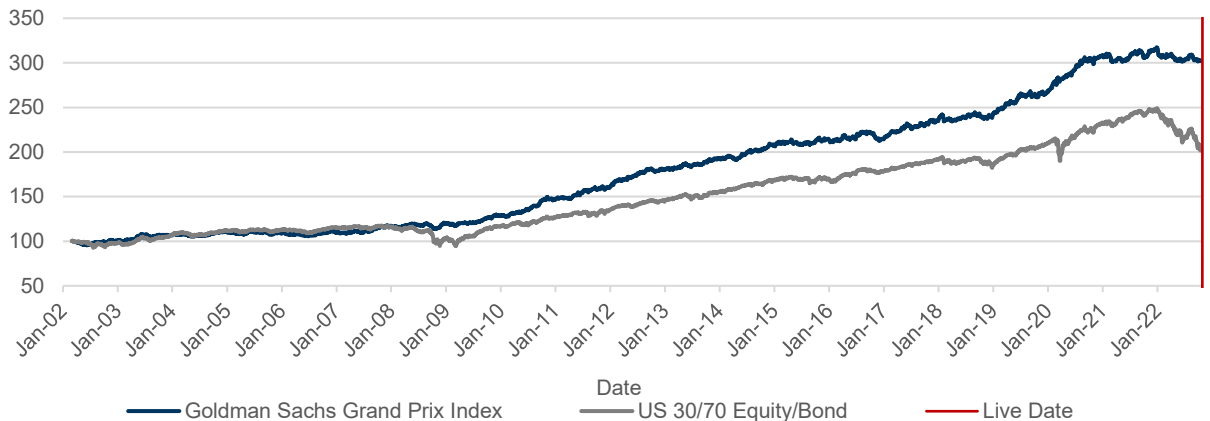
Bloomberg Ticker	GSGRNDPX
Live Date	October 28, 2022
Index Sponsor	Goldman Sachs International
Index Calculator	Goldman Sachs International
Currency	USD
Max Underliers	2
Volatility Target	4.50%
Return Type	Excess Return
Index Deduction Rate <sup>2</sup>	0.50% p.a.
Rebal/Service Cost <sup>1,2</sup>	Backtested high of 0.62% p.a., backtested average of 0.44% p.a.

### Overview

#### The Goldman Sachs Grand Prix Index (the "Index"):

- aims to provide an **equity and bond portfolio** and seeks to capitalize on **calendar based signals and price patterns**.
- seeks to dynamically allocate between **US Technology Equity futures** for equity exposure and **10-year U.S. Treasury futures** for bond exposure while **targeting 4.5% volatility**.
- utilizes **truVol® Risk Control Engine**, which aims to increase accuracy and responsiveness by utilizing intraday data and proprietary mechanism.<sup>3</sup>

### Hypothetical Backtested and Historical Performance (March 1, 2002 – December 31, 2022)<sup>1,2</sup>



### Hypothetical Backtested and Historical Performance Statistics (March 1, 2002– December 31, 2022)<sup>1,2</sup>

	1M Return	YTD Return	3Y Return (ann.)	5Y Return (ann.)	Full History Return (ann.)	Ann. Volatility	Sharpe	Max Drawdown
GS Grand Prix Index	-0.62%	-4.68%	4.13%	5.15%	5.44%	4.35%	1.25	-5.91%
US 30/70 Equity/Bond	-2.41%	-15.82%	-0.04%	1.77%	3.61%	5.83%	0.62	-19.57%

<sup>1</sup>Source: Goldman Sachs Global Markets Division, as of December 31, 2022. Backtested data from March 1, 2002 to October 28, 2022 and live data thereafter. 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 above backtesting analysis. Performance figures are net of 0.50% per annum deduction rate and applicable servicing and rebalancing costs. Backtested performance is simulated performance data created by applying the Goldman Sachs Grand Prix Index's calculation methodology and strategy to historical prices of the assets underlying the Index. You should not take historical index performance data or hypothetical index performance data as an indication of the future performance of the Index.

<sup>2</sup>The Goldman Sachs Grand Prix 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) that are applied at rates that vary according to the index component. Further, a deduction rate of 0.50% per annum (accruing daily) is applied to the Index. For more information about the costs and deductions, see [goldmansachsindices.com/products/GSGRNDPX](http://goldmansachsindices.com/products/GSGRNDPX).

<sup>3</sup>The weights of the index components are based in part upon the truVol Risk Control Engine "truVol®", which is determined and designed by Salt Financial Indices LLC (Salt Financial) (or any applicable successor thereto, which may include Goldman Sachs International or its affiliates), a third party vendor, who licenses truVol to Goldman Sachs for use in calculating the Goldman Sachs Grand Prix Index. Although Goldman Sachs International administers the Goldman Sachs Grand Prix Index on a day-to-day basis based on the Index Methodology, and calculates and publishes index levels in its role as calculation agent, neither Goldman Sachs International nor any of its affiliates was in any way involved in the design or determination of truVol nor offers any express or implicit guarantee, assurance or endorsement with regard to the quality or performance of such truVol tools in connection with the Index.

↗ Hypothetical Backtested and Historical Monthly Realized<sup>1,2</sup>

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
2002			-0.79%	-1.53%	-1.49%	0.41%	1.91%	-0.06%	0.92%	0.73%	0.88%	-0.21%	0.73%
2003	-0.45%	1.51%	-0.06%	1.10%	3.95%	-0.54%	-0.85%	0.29%	1.03%	0.00%	-0.40%	0.51%	6.16%
2004	0.20%	0.34%	0.62%	-2.60%	0.89%	0.91%	-0.45%	0.62%	0.70%	1.62%	-0.06%	0.94%	3.74%
2005	-0.85%	-1.35%	0.17%	-0.56%	2.72%	-0.71%	-0.22%	0.61%	-1.07%	-1.55%	1.01%	-0.61%	-2.46%
2006	0.25%	-0.64%	-0.11%	0.39%	-1.60%	0.85%	-0.25%	1.61%	0.31%	1.06%	1.13%	-1.79%	1.15%
2007	-0.11%	-0.08%	0.19%	1.60%	-0.30%	-0.63%	0.36%	2.27%	1.42%	1.06%	1.44%	-0.21%	7.19%
2008	-0.70%	-0.23%	0.78%	0.41%	1.29%	-0.99%	0.15%	1.13%	-2.53%	-1.69%	3.28%	1.38%	2.17%
2009	-1.16%	-0.92%	2.12%	0.48%	-0.03%	0.55%	1.05%	1.09%	1.96%	-0.26%	2.99%	-1.03%	6.95%
2010	-0.43%	1.38%	1.24%	1.62%	0.11%	1.45%	2.49%	0.59%	4.13%	1.29%	0.12%	-0.31%	14.48%
2011	1.07%	0.31%	-0.16%	1.88%	2.30%	-0.55%	2.22%	0.27%	0.12%	1.07%	-0.21%	1.10%	9.78%
2012	3.63%	1.03%	0.18%	1.81%	0.69%	0.87%	1.73%	1.67%	0.13%	-1.31%	1.53%	-0.50%	11.99%
2013	-0.07%	0.66%	0.83%	1.32%	-0.26%	-0.28%	1.02%	-0.44%	1.83%	1.23%	1.01%	0.13%	7.18%
2014	-0.20%	1.18%	-1.01%	-0.20%	2.50%	0.70%	0.06%	1.84%	-0.60%	1.31%	2.55%	-1.08%	7.17%
2015	1.81%	0.19%	-0.29%	0.04%	0.22%	-1.36%	1.18%	-0.55%	0.65%	1.41%	-0.16%	0.03%	3.17%
2016	-0.14%	-0.01%	1.79%	-0.92%	0.35%	1.04%	1.86%	-0.33%	0.22%	-1.88%	-1.81%	0.13%	0.21%
2017	1.96%	1.83%	0.23%	1.47%	1.53%	-1.40%	0.64%	2.05%	-1.18%	1.86%	-0.21%	0.35%	9.43%
2018	2.66%	-1.84%	-0.29%	0.17%	0.73%	0.27%	0.69%	1.96%	-0.59%	-2.13%	1.20%	0.87%	3.63%
2019	2.32%	-0.27%	2.26%	1.24%	-0.11%	2.53%	-0.18%	1.58%	-1.36%	0.98%	0.57%	-0.02%	9.87%
2020	2.98%	1.60%	0.94%	1.41%	0.92%	1.43%	2.47%	1.46%	0.02%	-1.90%	2.54%	0.92%	15.73%
2021	-0.84%	-1.34%	-0.16%	0.92%	-0.41%	1.28%	1.17%	0.88%	-2.42%	0.95%	1.91%	0.49%	2.36%
2022	-2.53%	0.32%	0.09%	-2.18%	0.41%	-0.39%	1.62%	-1.37%	-0.61%	0.26%	0.28%	-0.62%	-4.68%

↗ Hypothetical Backtested and Historical Average Final Lookthrough Weight Per Month (2022)<sup>1</sup>

Asset Class	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Equity	8.3%	11.9%	8.9%	5.3%	4.0%	8.5%
Bond	7.6%	4.3%	3.1%	6.2%	7.1%	6.3%

<sup>1</sup>Source: Goldman Sachs Global Markets Division, as of December 31, 2022. Backtested data from March 1, 2002 to October 28, 2022 and live data thereafter. 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 above backtesting analysis. Performance figures are net of 0.50% per annum deduction rate and applicable servicing and rebalancing costs. Backtested performance is simulated performance data created by applying the Goldman Sachs Grand Prix Index's calculation methodology and strategy to historical prices of the assets underlying the Index. You should not take historical index performance data or hypothetical index performance data as an indication of the future performance of the Index.

<sup>2</sup>The Goldman Sachs Grand Prix 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) that are applied at rates that vary according to the index component. Further, a deduction rate of 0.50% per annum (accruing daily) is applied to the Index. For more information about the costs and deductions, see [goldmansachsindices.com/products/GSGRNDPX](https://goldmansachsindices.com/products/GSGRNDPX).

## ➤ Selected Risk Factors

These “Selected Key Risks” are intended to summarize certain risks associated with the Goldman Sachs Grand Prix Index, but are not exhaustive, and should be read in conjunction with the “Certain Risk Factors and Additional Information about the Index” section at the end of the Goldman Sachs Grand Prix Index Methodology. The “Selected Key Risks” should not be regarded as offering advice on the advisability of investing in products that may be linked to the Index or the investment strategy underlying the Index. You should also read any relevant documentation which may highlight further risks particular to any product linked to the Index, or arising from the relationship between the terms of such product and the features of the Index.

The value of the Index depends on the values of the Index Components, each of which may increase or decrease in value over time. Neither the Index nor any of the Index Components includes any element of downside protection or guaranteed return. The value of an Index Component, or the Index itself, may fall substantially below its value at the Live 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 Live 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 Component Servicing Cost Rate and Component Rebalancing Cost Rate applicable to each 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 Components.

The Index employs truVol created by Salt Financial, a third party vendor. Goldman Sachs does not calculate the risk scalars, nor does Goldman Sachs guarantee the quality or accuracy of truVol or its output or its effectiveness in measuring volatility for the purpose of the weighting of the Index. If truVol fails to perform as expected, the Equity Asset may be over-weighted during a period when equity markets are underperforming or under-weighted during a period when equity markets are overperforming and the performance of the Index may suffer.

Depending on the application of the factors that impact the weights of the Index Components, the Index may have a leverage as high as 200%. Leverage means that the Index will have increased exposure to changes, which may be positive or negative, in the levels of the Index Components, magnifying the volatility and risk that the performance of the Index will be adversely affected should the value of the Index Components decrease. In other conditions the Index may have no exposure to either of the Index Components, or all of its exposure to only one Index Component.

No assurance can be given that the Index will achieve its volatility target of 4.5%, 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 Index Components 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 one or more Index Components.

The Market Signals, volatility control mechanisms, and risk parity allocation mechanism 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.

The performance of futures contracts may not correspond to the performance of their related Index Components, and are subject to certain risks that are not associated with their underlying assets. It is possible for the value of an Index Component composed of futures contracts to decrease significantly over time even when the relevant securities indices or near-term or spot prices of underlying commodities are stable or increasing. It is also possible, when the relevant securities indices or the near-term or spot prices of the underlying assets are decreasing, for the value of such Index Component to decrease significantly over time.

In the event that a Market Disruption Event occurs with respect to the Equity Proxy Asset, the whole Index will be disrupted, even if a Market Disruption Event has not occurred with respect to either Index Component. The value of the Index will not be published on any day on which a Market Disruption Event occurs.

If the Calculation Agent does not receive certain information from Salt Financial in a timely manner, or the information materially differs from the Calculation Agent’s own determination, in its commercially reasonable discretion, then the Calculation Agent shall use information from the immediately preceding Equity Proxy Asset Business Day on which a Market Disruption Event did not occur. That information may not reflect current market conditions, and the performance of the Index may suffer as a result.

**➤ Goldman Sachs Grand Prix Index Disclaimers**

Financial products that are linked to or reference 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.**

truVol® and Salt Financial Indices™ are service marks of Salt Financial Indices LLC, and have been licensed for use by Goldman Sachs. The Goldman Sachs Grand Prix Index is not sponsored, endorsed, sold or promoted by Salt Financial Indices LLC. Nor does Salt Financial Indices LLC make any representation regarding the advisability of investing in any products tied to the performance of the Goldman Sachs Grand Prix Index.

Salt Financial Indices LLC determined and designed the methodology for the truVol Risk Control Engine, and is the owner of the intellectual property therein ("Salt IP"), which is licensed to Goldman Sachs for use in calculating the Index. SALT FINANCIAL INDICES LLC DOES NOT GUARANTEE THE ACCURACY AND/OR THE COMPLETENESS OF THE SALT IP OR ANY INDEX CALCULATED THEREFROM, AND EXPRESSLY DISCLAIMS AND SHALL NOT HAVE ANY LIABILITY FOR ANY ERRORS, OMISSIONS, OR INTERRUPTIONS THEREIN. SALT FINANCIAL LLC AND ITS AFFILIATES, EMPLOYEES, PARTNERS, AND VENDORS EXPRESSLY DISCLAIM AND SHALL NOT BE LIABLE TO ANY PARTY FOR ANY INDIRECT, INCIDENTAL, EXEMPLARY, COMPENSATORY, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES, COSTS, EXPENSES, LEGAL FEES, OR LOSSES (INCLUDING, WITHOUT LIMITATION, LOST INCOME OR LOST PROFITS AND OPPORTUNITY COSTS) IN CONNECTION WITH ANY USE OF THE SALT IP EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Brands referred to herein which are not owned by Goldman Sachs are brands of their respective owners.

## ➤ Goldman Sachs Grand Prix Index Disclaimers

---

Neither Goldman Sachs International nor any of its affiliates makes any representation or warranty, express or implied, or accepts any liability or responsibility to the owner of any products linked to the Index or any member of the public regarding (i) the advisability of investing in securities or other investments generally, in the Index or any Index Component or (ii) the ability of the Index to generate positive results. If you consider acquiring any product linked to the Index you should consult your own accounting, tax, investment and legal advisors before doing so. Goldman Sachs International does not act as an advisor or fiduciary.

The Index is structured and calculated by Goldman Sachs International, acting as the Calculation Agent, without regard to any other party. Goldman Sachs International does not have any obligation to take the needs of any person into consideration in structuring the Index or revising its methodology, and Goldman Sachs International does not have any obligation to take the needs of any person into consideration in determining and calculating the Index.

Neither Goldman Sachs International nor any of its affiliates guarantees the quality, accuracy and/or the completeness of the Index or any data included therein or on which the Index or any Index Component is based, and neither Goldman Sachs International nor any of its affiliates shall be liable to any third party for any loss or damage, direct, indirect or consequential, arising from (i) any inaccuracy or incompleteness in, or delays, interruptions, errors or omissions in the Index or any data included therein or on which the Index is based or (ii) any decision made or action taken by any third party in reliance upon the Index or any data included therein or on which the Index is based.

Neither Goldman Sachs International nor any of its affiliates makes any recommendation, representation or warranty, express or implied, as to the results to be obtained by the holders of any products linked to the Index or by any other person or entity from the use of the Index or any data on which it is based.

Neither Goldman Sachs International nor any of its affiliates makes any express or implied representation or warranty, and Goldman Sachs International and its affiliates hereby expressly disclaim all representations and warranties, of merchantability or fitness for a particular purpose or use with respect to the Index or any data included therein or on which the Index is based.

Without limiting any of the foregoing, in no event shall Goldman Sachs International or any of its affiliates have any liability for any special, punitive, indirect, or consequential damages (including lost profits), even if notified of the possibility of such damages.

'Goldman Sachs' and 'Goldman' are trademarks or service marks of Goldman Sachs & Co.

© 2022 Goldman Sachs. All rights reserved.

## ➤ Goldman Sachs Disclaimers

This message has been prepared by personnel in the Global Markets Division of one or more affiliates of The Goldman Sachs Group, Inc. ("Goldman Sachs") and is not the product of Global Investment Research. It is not a research report and is not intended as such.

**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.

---

**➤ Goldman Sachs Disclaimers**

---

**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, Cyprus, Denmark, Ireland, Italy, Liechtenstein, Luxembourg, Norway and Portugal by Goldman Sachs International ("GSI"); 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 other 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.

**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.

## ➤ Goldman Sachs Disclaimers

**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.

**Order Handling Practices for Listed and Over-the-Counter Derivatives:** While the firm is holding your derivative (e.g. options, convertible bonds, warrants or preferred shares) order, the firm or its clients may engage in trading activity in the same or related products, including transactions in the underlying securities. While such trading activity is unrelated to your order, it may coincidentally impact the price of the derivative that you are buying or selling.

### **OTC Derivatives Risk Disclosures:**

**Terms of the Transaction:** To understand clearly the terms and conditions of any OTC derivative transaction you may enter into, you should carefully review the Master Agreement, including any related schedules, credit support documents, addenda and exhibits. You should not enter into OTC derivative transactions unless you understand the terms of the transaction you are entering into as well as the nature and extent of your risk exposure. You should also be satisfied that the OTC derivative transaction is appropriate for you in light of your circumstances and financial condition. You may be requested to post margin or collateral to support written OTC derivatives at levels consistent with the internal policies of Goldman Sachs.

**Liquidity Risk:** There is no public market for OTC derivative transactions and, therefore, it may be difficult or impossible to liquidate an existing position on favorable terms. **Transfer Restrictions:** OTC derivative transactions entered into with one or more affiliates of The Goldman Sachs Group, Inc. (Goldman Sachs) cannot be assigned or otherwise transferred without its prior written consent and, therefore, it may be impossible for you to transfer any OTC derivative transaction to a third party.

**Conflict of Interests:** Goldman Sachs may from time to time be an active participant on both sides of the market for the underlying securities, commodities, futures, options or any other derivative or instrument identical or related to those mentioned herein (together, "the Product"). Goldman Sachs at any time may have long or short positions in, or buy and sell Products (on a principal basis or otherwise) identical or related to those mentioned herein. Goldman Sachs hedging and trading activities may affect the value of the Products.

**Counterparty Credit Risk:** Because Goldman Sachs, may be obligated to make substantial payments to you as a condition of an OTC derivative transaction, you must evaluate the credit risk of doing business with Goldman Sachs or its affiliates.

**Pricing and Valuation:** The price of each OTC derivative transaction is individually negotiated between Goldman Sachs and each counterparty and Goldman Sachs does not represent or warrant that the prices for which it offers OTC derivative transactions are the best prices available, possibly making it difficult for you to establish what is a fair price for a particular OTC derivative transaction; The value or quoted price of the Product at any time, however, will reflect many factors and cannot be predicted. If Goldman Sachs makes a market in the offered Product, the price quoted by Goldman Sachs would reflect any changes in market conditions and other relevant factors, and the quoted price (and the value of the Product that Goldman Sachs will use for account statements or otherwise) could be higher or lower than the original price, and may be higher or lower than the value of the Product as determined by reference to pricing models used by Goldman Sachs. If at any time a third party dealer quotes a price to purchase the Product or otherwise values the Product, that price may be significantly different (higher or lower) than any price quoted by Goldman Sachs. Furthermore, if you sell the Product, you will likely be charged a commission for secondary market transactions, or the price will likely reflect a dealer discount. Goldman Sachs may conduct market making activities in the Product. To the extent Goldman Sachs makes a market, any price quoted for the OTC derivative transactions, Goldman Sachs may differ significantly from (i) their value determined by reference to Goldman Sachs pricing models and (ii) any price quoted by a third party. The market price of the OTC derivative transaction may be influenced by many unpredictable factors, including economic conditions, the creditworthiness of Goldman Sachs, the value of any underlyers, and certain actions taken by Goldman Sachs.



---

**➤ Goldman Sachs Disclaimers**

---

**Market Making, Investing and Lending:** Goldman Sachs engages in market making, investing and lending businesses for its own account and the accounts of its affiliates in the same or similar instruments underlying OTC derivative transactions (including such trading as Goldman Sachs deems appropriate in its sole discretion to hedge its market risk in any OTC derivative transaction whether between Goldman Sachs and you or with third parties) and such trading may affect the value of an OTC derivative transaction.

**Early Termination Payments:** The provisions of an OTC Derivative Transaction may allow for early termination and, in such cases, either you or Goldman Sachs may be required to make a potentially significant termination payment depending upon whether the OTC Derivative Transaction is in-the-money to Goldman Sachs or you at the time of termination. Indexes: Goldman Sachs does not warrant, and takes no responsibility for, the structure, method of computation or publication of any currency exchange rates, interest rates, indexes of such rates, or credit, equity or other indexes, unless Goldman Sachs specifically advises you otherwise.

**Risk Disclosure Regarding futures, options, equity swaps, and other derivatives as well as non-investment-grade securities and ADRs:** Please ensure that you have read and understood the current options, futures and security futures disclosure document before entering into any such transactions. Current United States listed options, futures and security futures disclosure documents are available from our sales representatives or at <http://www.theocc.com/components/docs/riskstoc.pdf>, <http://www.goldmansachs.com/disclosures/risk-disclosure-for-futures.pdf> and <https://www.nfa.futures.org/investors/investor-resources/files/security-futures-disclosure.pdf>, respectively. Certain transactions - including those involving futures, options, equity swaps, and other derivatives as well as non-investment-grade securities - give rise to substantial risk and are not available to nor suitable for all investors. If you have any questions about whether you are eligible to enter into these transactions with Goldman Sachs, please contact your sales representative. Foreign-currency-denominated securities are subject to fluctuations in exchange rates that could have an adverse effect on the value or price of, or income derived from, the investment. In addition, investors in securities such as ADRs, the values of which are influenced by foreign currencies, effectively assume currency risk.

**Options Risk Disclosures:** Options may trade at a value other than that which may be inferred from the current levels of interest rates, dividends (if applicable) and the underlier due to other factors including, but not limited to, expectations of future levels of interest rates, future levels of dividends and the volatility of the underlier at any time prior to maturity. Note: Options involve risk and are not suitable for all investors. Please ensure that you have read and understood the current options disclosure document before entering into any standardized options transactions. United States listed options disclosure documents are available from our sales representatives or at <http://theocc.com/publications/risks/riskstoc.pdf>. A secondary market may not be available for all options. Transaction costs may be a significant factor in option strategies calling for multiple purchases and sales of options, such as spreads. When purchasing long options an investor may lose their entire investment and when selling uncovered options the risk is potentially unlimited. Supporting documentation for any comparisons, recommendations, statistics, technical data, or other similar information will be supplied upon request.

This material is for the private information of the recipient only. This material is not sponsored, endorsed, sold or promoted by any sponsor or provider of an index referred herein (each, an "Index Provider"). GS does not have any affiliation with or control over the Index Providers or any control over the computation, composition or dissemination of the indices. While GS will obtain information from publicly available sources it believes reliable, it will not independently verify this information. Accordingly, GS shall have no liability, contingent or otherwise, to the user or to third parties, for the quality, accuracy, timeliness, continued availability or completeness of the data nor for any special, indirect, incidental or consequential damages which may be incurred or experienced because of the use of the data made available herein, even if GS has been advised of the possibility of such damages.

© 2022 Goldman Sachs. All rights reserved.

### ➤ Goldman Sachs Treatment of Incidents<sup>3</sup>

- The treatment of incidents affecting Benchmarks administered by Goldman Sachs is subject to a specific “Policy on Global Benchmark Incidents and Restatements” (the **Policy**)<sup>1</sup> 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**”<sup>2</sup>) 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.

<sup>1</sup>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.

<sup>2</sup>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”.

<sup>3</sup>For the avoidance of doubt, the Index is not an “Intraday Benchmark” for purposes of such Policy.