

GS FINANCE CORP.

FORM 424B2

(Prospectus filed pursuant to Rule 424(b)(2))

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GS Finance Corp.
\$70,000
Leveraged S&P 500® Daily Risk Control 5% USD Excess Return Index-Linked Notes due 2026
guaranteed by
The Goldman Sachs Group, Inc.

The notes do not bear interest. In addition to the contingent CPI amount described below, the amount that you will be paid on your notes on the stated maturity date (February 5, 2026) is based on the performance of the S&P 500® Daily Risk Control 5% USD Excess Return Index (Excess Return index) as measured from the trade date (January 31, 2023) to and including the determination date (February 2, 2026).

At maturity, for each \$1,000 face amount of your notes, you will receive an amount in cash equal to:

- if the final index level on the determination date is *greater than* the initial index level of 159.43, the *sum* of (i) \$1,000 *plus* (ii) the *product* of (a) \$1,000 *times* (b) 1.35 *times* (c) the index return (the percentage increase or decrease in the final index level from the initial index level) *plus* (iii) the contingent CPI amount, if any; or
- if the final index level is *equal to or less than* the initial index level, the *sum* of (i) \$1,000 *plus* (ii) the contingent CPI amount, if any.

The contingent CPI amount is based on the non-seasonally adjusted U.S. City Average All Items Consumer Price Index for All Urban Consumers (the "CPI"). If the level of the CPI for November 2025 (the final CPI level) is *greater than* the level of the CPI for November 2022 (the initial CPI level), you will receive on the stated maturity date a contingent CPI amount equal to the *product* of (i) \$1,000 *times* (ii) the CPI return (the percentage increase or decrease in the final CPI level from the initial CPI level). **If the final CPI level is equal to or less than the initial CPI level, you will not receive a contingent CPI amount on the stated maturity date.**

The Excess Return index measures the return on a hypothetical investment in the S&P 500® Daily Risk Control 5% USD Total Return Index (Risk Control index or the index) borrowed at the Secured Overnight Financing Rate (SOFR) *plus* 0.02963%. **Any percentage increase in the Risk Control index will be offset by SOFR *plus* 0.02963%.**

The Risk Control index provides exposure to the S&P 500® Total Return Index (Total Return index), subject to a daily risk control strategy that increases or decreases exposure to the Total Return index to target 5% volatility of the Risk Control index, based on the greater of short-term realized volatility and long-term realized volatility of the Total Return index. The methodology used measures variations in the historical daily returns of the Total Return index and places greater significance on the returns of days that are closer to the calculation date such that days closer to the calculation date have the majority of the impact on the volatility calculation. See page S-18.

If realized volatility is less than 5%, the Risk Control index's exposure to the Total Return index will be greater than 100% (up to 150%) by hypothetically borrowing cash at SOFR *plus* 0.02963%. If realized volatility is greater than 5%, the Risk Control index's exposure to the Total Return index will be less than 100% (and could be 0%) by reallocating exposure from the Total Return index to a hypothetical cash position that accrues interest at SOFR *plus* 0.02963%. **Typically, a portion of the Risk Control index's exposure has been to the hypothetical cash position.**

The Risk Control index may decrease significantly more or increase significantly less than the Total Return index and there is no guarantee that the Risk Control index will achieve the 5% volatility target.

Prior to December 20, 2021, the Excess Return index measured the return on a hypothetical investment in the Risk Control index borrowed at the overnight U.S. dollar LIBOR rate (LIBOR). Any percentage increase in the Risk Control index was offset by LIBOR. Further, prior to such date, with respect to the Risk Control index, if realized volatility was less than 5%, the Risk Control index's exposure to the Total Return index would have been greater than 100% (up to 150%) by hypothetically borrowing cash at LIBOR. If realized volatility was greater than 5%, the Risk Control index's exposure to the Total Return index would have been less than 100% (and could have been 0%) by reallocating exposure from the Total Return index to a hypothetical cash position that accrued interest at LIBOR. As a result, extremely limited historical information regarding the performance of the Excess Return index and the Risk Control index subsequent to their discontinued use of LIBOR is available, which may make it difficult for you to make an informed decision with respect to an investment in the notes.

You should read the disclosure herein to better understand the terms and risks of your investment, including the credit risk of GS Finance Corp. and The Goldman Sachs Group, Inc. See page PS-10.

The estimated value of your notes at the time the terms of your notes are set on the trade date is equal to approximately \$984 per \$1,000 face amount. For a discussion of the estimated value and the price at which Goldman Sachs & Co. LLC would initially buy or sell your notes, if it makes a market in the notes, see the following page.

Original issue date:	February 3, 2023	Original issue price:	100% of the face amount
Underwriting discount:	1.04% of the face amount	Net proceeds to the issuer:	98.96% of the face amount

Neither the Securities and Exchange Commission nor any other regulatory body has approved or disapproved of these securities or passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense. The notes are not bank deposits and are not insured by the Federal Deposit Insurance Corporation or any other governmental agency, nor are they obligations of, or guaranteed by, a bank.

Goldman Sachs & Co. LLC
Pricing Supplement No. 8,707 dated January 31, 2023.

The issue price, underwriting discount and net proceeds listed above relate to the notes we sell initially. We may decide to sell additional notes after the date of this pricing supplement, at issue prices and with underwriting discounts and net proceeds that differ from the amounts set forth above. The return (whether positive or negative) on your investment in notes will depend in part on the issue price you pay for such notes.

GS Finance Corp. may use this prospectus in the initial sale of the notes. In addition, Goldman Sachs & Co. LLC or any other affiliate of GS Finance Corp. may use this prospectus in a market-making transaction in a note after its initial sale. ***Unless GS Finance Corp. or its agent informs the purchaser otherwise in the confirmation of sale, this prospectus is being used in a market-making transaction.***

Estimated Value of Your Notes

The estimated value of your notes at the time the terms of your notes are set on the trade date (as determined by reference to pricing models used by Goldman Sachs & Co. LLC (GS&Co.) and taking into account our credit spreads) is equal to approximately \$984 per \$1,000 face amount, which is less than the original issue price. The value of your notes at any time will reflect many factors and cannot be predicted; however, the price (not including GS&Co.'s customary bid and ask spreads) at which GS&Co. would initially buy or sell notes (if it makes a market, which it is not obligated to do) and the value that GS&Co. will initially use for account statements and otherwise is equal to approximately the estimated value of your notes at the time of pricing, plus an additional amount (initially equal to \$16 per \$1,000 face amount).

Prior to April 30, 2023, the price (not including GS&Co.'s customary bid and ask spreads) at which GS&Co. would buy or sell your notes (if it makes a market, which it is not obligated to do) will equal approximately the sum of (a) the then-current estimated value of your notes (as determined by reference to GS&Co.'s pricing models) plus (b) any remaining additional amount (the additional amount will decline to zero on a straight-line basis from the time of pricing through April 29, 2023). On and after April 30, 2023, the price (not including GS&Co.'s customary bid and ask spreads) at which GS&Co. would buy or sell your notes (if it makes a market) will equal approximately the then-current estimated value of your notes determined by reference to such pricing models.

About Your Prospectus

The notes are part of the Medium-Term Notes, Series F program of GS Finance Corp. and are fully and unconditionally guaranteed by The Goldman Sachs Group, Inc. This prospectus includes this pricing supplement and the accompanying documents listed below. This pricing supplement constitutes a supplement to the documents listed below, does not set forth all of the terms of your notes and therefore should be read in conjunction with such documents:

- General terms supplement no. 2,913 dated June 17, 2021
- Prospectus supplement dated March 22, 2021
- Prospectus dated March 22, 2021

The information in this pricing supplement supersedes any conflicting information in the documents listed above. In addition, some of the terms or features described in the listed documents may not apply to your notes.

We refer to the notes we are offering by this pricing supplement as the “offered notes” or the “notes”. Each of the offered notes has the terms described below. Please note that in this pricing supplement, references to “GS Finance Corp.”, “we”, “our” and “us” mean only GS Finance Corp. and do not include its subsidiaries or affiliates, references to “The Goldman Sachs Group, Inc.”, our parent company, mean only The Goldman Sachs Group, Inc. and do not include its subsidiaries or affiliates and references to “Goldman Sachs” mean The Goldman Sachs Group, Inc. together with its consolidated subsidiaries and affiliates, including us. The notes will be issued under the senior debt indenture, dated as of October 10, 2008, as supplemented by the First Supplemental Indenture, dated as of February 20, 2015, each among us, as issuer, The Goldman Sachs Group, Inc., as guarantor, and The Bank of New York Mellon, as trustee. This indenture, as so supplemented and as further supplemented thereafter, is referred to as the “GSFC 2008 indenture” in the accompanying prospectus supplement.

The notes will be issued in book-entry form and represented by master note no. 3, dated March 22, 2021.

TERMS AND CONDITIONS

CUSIP / ISIN: 40057PEZ1 / US40057PEZ18

Company (Issuer): GS Finance Corp.

Guarantor: The Goldman Sachs Group, Inc.

Underlier: the S&P 500® Daily Risk Control 5% USD Excess Return Index (current Bloomberg symbol: "SPXT5UE Index"), or any successor underlier, as it may be modified, replaced or adjusted from time to time as provided herein

CPI: the non-seasonally adjusted U.S. City Average All Items Consumer Price Index for All Urban Consumers (with the 1982-1984 average as the base reference period), reported monthly by the Bureau of Labor Statistics (the "BLS") of the U.S. Department of Labor and published on Bloomberg page "CPURNSA" or any successor or replacement service or page, as it may be modified, replaced or adjusted from time to time as provided herein

Face amount: \$70,000 in the aggregate on the original issue date; the aggregate face amount may be increased if the company, at its sole option, decides to sell an additional amount on a date subsequent to the trade date.

Authorized denominations: \$1,000 or any integral multiple of \$1,000 in excess thereof

Principal amount: On the stated maturity date, the company will pay, for each \$1,000 of the outstanding face amount, an amount in cash equal to the cash settlement amount.

Cash settlement amount:

- if the final underlier level is *greater than* the initial underlier level, the *sum* of (i) \$1,000 *plus* (ii) the *product* of (a) \$1,000 *times* (b) the upside participation rate *times* (c) the underlier return *plus* (iii) the contingent CPI amount; or
- if the final underlier level is *equal to* or *less than* the initial underlier level, the *sum* of (i) \$1,000 *plus* (ii) the contingent CPI amount

Initial underlier level: 159.43

Final underlier level: the closing level of the underlier on the determination date, subject to adjustment as provided in "— Consequences of a market disruption event or non-trading day" and "— Discontinuance or modification of the underlier" below

Upside participation rate: 135%

Underlier return: the *quotient* of (i) the final underlier level *minus* the initial underlier level *divided by* (ii) the initial underlier level, expressed as a percentage

Initial CPI level: 297.711, the CPI level for November 2022

Final CPI level: the CPI level for November 2025, subject to adjustment as provided in "— Discontinuance or modification of the CPI" below

CPI return: the *quotient* of (i) the final CPI level *minus* the initial CPI level *divided by* (ii) the initial CPI level, expressed as a percentage

Contingent CPI amount:

- if the final CPI level is *greater than* the initial CPI level, the *product* of (a) \$1,000 *times* (b) the CPI return; or
- if the final CPI level is *equal to* or *less than* the initial CPI level, \$0

Trade date: January 31, 2023

Original issue date: February 3, 2023

Determination date: February 2, 2026, unless the calculation agent determines that a market disruption event occurs or is continuing on such day or such day is not a trading day. In that event, the determination date will be the first following trading day on which the calculation agent determines that a market disruption event does not occur and is not continuing. However, the determination date will not be postponed to a date later than the originally scheduled stated maturity date or, if the originally scheduled stated maturity date is not a business day, later than the first business day after the originally scheduled stated maturity date. If a market disruption event occurs or is continuing on the day that is the last possible determination date or such last possible day is not a trading day, that day will nevertheless be the determination date.

Stated maturity date: February 5, 2026, unless that day is not a business day, in which case the stated maturity date will be postponed to the next following business day. The stated maturity date will also be postponed if the determination date is postponed as described under “— Determination date” above. In such a case, the stated maturity date will be postponed by the same number of business day(s) from but excluding the originally scheduled determination date to and including the actual determination date.

Closing level: for any given trading day, the official closing level of the underlier or any successor underlier published by the underlier sponsor on such trading day

CPI level: for any month, the level of the CPI published by the BLS for that month

Trading day: a day on which the respective principal securities markets for all of the underlier stocks are open for trading, the underlier sponsor is open for business and the underlier is calculated and published by the underlier sponsor

Successor underlier: any substitute underlier approved by the calculation agent as a successor underlier as provided under “— Discontinuance or modification of the underlier” below

Underlier sponsor: at any time, the person or entity, including any successor sponsor, that determines and publishes the underlier as then in effect. The notes are not sponsored, endorsed, sold or promoted by the underlier sponsor or any of its affiliates and the underlier sponsor and its affiliates make no representation regarding the advisability of investing in the notes.

Underlier stocks: at any time, the stocks that comprise the underlier as then in effect, after giving effect to any additions, deletions or substitutions

Market disruption event: With respect to any given trading day, any of the following will be a market disruption event with respect to the underlier:

- a suspension, absence or material limitation of trading in underlier stocks constituting 20% or more, by weight, of the underlier on their respective primary markets, in each case for more than two consecutive hours of trading or during the one-half hour before the close of trading in that market, as determined by the calculation agent in its sole discretion,
- a suspension, absence or material limitation of trading in option or futures contracts relating to the underlier or to underlier stocks constituting 20% or more, by weight, of the underlier in the respective primary markets for those contracts, in each case for more than two consecutive hours of trading or during the one-half hour before the close of trading in that market, as determined by the calculation agent in its sole discretion, or
- underlier stocks constituting 20% or more, by weight, of the underlier, or option or futures contracts, if available, relating to the underlier or to underlier stocks constituting 20% or more, by weight, of the underlier do not trade on what were the respective primary markets for those underlier stocks or contracts, as determined by the calculation agent in its sole discretion,

and, in the case of any of these events, the calculation agent determines in its sole discretion that such event could materially interfere with the ability of the company or any of its affiliates or a similarly situated person to unwind all or a material portion of a hedge that could be effected with respect to this note.

The following events will not be market disruption events:

- a limitation on the hours or numbers of days of trading, but only if the limitation results from an announced change in the regular business hours of the relevant market, and
- a decision to permanently discontinue trading in option or futures contracts relating to the underlier or to any underlier stock.

For this purpose, an “absence of trading” in the primary securities market on which an underlier stock is traded, or on which option or futures contracts relating to the underlier or an underlier stock are traded, will not include any time when that market is itself closed for trading under ordinary circumstances. In contrast, a suspension or limitation of trading in an underlier stock or in option or futures contracts, if available, relating to the underlier or an underlier stock in the primary market for that stock or those contracts, by reason of:

- a price change exceeding limits set by that market,
- an imbalance of orders relating to that underlier stock or those contracts, or
- a disparity in bid and ask quotes relating to that underlier stock or those contracts,

will constitute a suspension or material limitation of trading in that stock or those contracts in that market.

Consequences of a market disruption event or a non-trading day: If a market disruption event occurs or is continuing on a day that would otherwise be the determination date or such day is not a trading day, then the determination date will be postponed as described under “— Determination date” above.

If the calculation agent determines that the closing level of the underlier that must be used to determine the cash settlement amount is not available on the last possible determination date because of a market disruption event, a non-trading day or for any other reason (other than as described under “— Discontinuance or modification of the underlier” below), the calculation agent will nevertheless determine the closing level of the underlier based on its assessment, made in its sole discretion, of the level of the underlier on that day.

Discontinuance or modification of the underlier: If the underlier sponsor discontinues publication of the underlier and the underlier sponsor or any other person or entity publishes a substitute underlier that the calculation agent determines is comparable to the underlier and approves as a successor underlier, or if the calculation agent designates a substitute underlier, then the calculation agent will determine the amount payable on the stated maturity date by reference to such successor underlier.

If the calculation agent determines that the publication of the underlier is discontinued and there is no successor underlier, the calculation agent will determine the amount payable on the stated maturity date by a computation methodology that the calculation agent determines will as closely as reasonably possible replicate the underlier.

If the calculation agent determines that (i) the underlier, the underlier stocks or the method of calculating the underlier is changed at any time in any respect — including any addition, deletion or substitution and any reweighting or rebalancing of the underlier or the underlier stocks and whether the change is made by the underlier sponsor under its existing policies or following a modification of those policies, is due to the publication of a successor underlier, is due to events affecting one or more of the underlier stocks or their issuers or is due to any other reason — and is not otherwise reflected in the level of the underlier by the underlier sponsor pursuant to the then-current underlier methodology of the underlier or (ii) there has been a split or reverse split of the underlier, then the calculation agent will be permitted (but not required) to make such adjustments in the underlier or the method of its calculation as it believes are appropriate to ensure that the final underlier level, used to determine the amount payable on the stated maturity date, is equitable.

All determinations and adjustments to be made by the calculation agent with respect to the underlier may be made by the calculation agent in its sole discretion. The calculation agent is not obligated to make any such adjustments.

Discontinuance or modification of the CPI: If the CPI is discontinued or substantially altered, as determined by the calculation agent in its sole discretion, the calculation agent will determine the contingent CPI amount by reference to (i) the substitute CPI that is chosen by the Secretary of the Treasury for the Department of The Treasury’s Inflation-Linked Treasuries as described at Appendix B, Section I, Paragraph B.4 of Part IV of 69 Federal Register, No. 144 (July 28, 2004), or (ii) if no such CPI is chosen, the substitute CPI determined by the calculation agent in accordance with general market practice at the time.

If the calculation agent in its sole discretion determines that the CPI is discontinued or substantially altered and there is no substitute CPI, or that the CPI level is not available because of any other reason, the calculation agent will determine the CPI level by a computation methodology that the calculation agent determines will as closely as reasonably possible replicate the CPI. For the avoidance of doubt, however, if the base reference period of the CPI is changed to a different year or period and the 1982-1984 base reference period is no longer used, the base reference period for the notes will continue to be the 1982-1984 base reference period as long as the CPI with the 1982-1984 base reference period continues to be published.

Calculation agent: Goldman Sachs & Co. LLC (“GS&Co.”)

Overdue principal rate: the effective Federal Funds rate

HYPOTHETICAL EXAMPLES

The following examples are provided for purposes of illustration only. They should not be taken as an indication or prediction of future investment results and merely are intended to illustrate the impact that the various hypothetical underlier levels on the determination date could have on the cash settlement amount at maturity assuming all other variables remain constant.

The examples below are based on a range of final underlier levels that are entirely hypothetical; the underlier level on any day throughout the life of the notes, including the final underlier level on the determination date, cannot be predicted. The underlier has been highly volatile in the past — meaning that the underlier level has changed considerably in relatively short periods — and its performance cannot be predicted for any future period.

The information in the following examples reflects hypothetical rates of return on the offered notes assuming that they are purchased on the original issue date at the face amount and held to the stated maturity date. If you sell your notes in a secondary market prior to the stated maturity date, your return will depend upon the market value of your notes at the time of sale, which may be affected by a number of factors that are not reflected in the examples below, such as interest rates, the volatility of the underlier, the creditworthiness of GS Finance Corp., as issuer, and the creditworthiness of The Goldman Sachs Group, Inc., as guarantor. In addition, the estimated value of your notes at the time the terms of your notes are set on the trade date (as determined by reference to pricing models used by GS&Co.) is less than the original issue price of your notes. For more information on the estimated value of your notes, see “Additional Risk Factors Specific to Your Notes — The Estimated Value of Your Notes At the Time the Terms of Your Notes Are Set On the Trade Date (as Determined By Reference to Pricing Models Used By GS&Co.) Is Less Than the Original Issue Price Of Your Notes” on page PS-10 of this pricing supplement. The information in the examples also reflects the key terms and assumptions in the box below.

Key Terms and Assumptions	
Face amount	\$1,000
Upside participation rate	135%
Neither a market disruption event nor a non-trading day occurs on the originally scheduled determination date	
No change in or affecting any of the underlier stocks or the method by which the underlier sponsor calculates the underlier	
Notes purchased on original issue date at the face amount and held to the stated maturity date	

For these reasons, the actual performances of the underlier and the CPI over the life of your notes, as well as the amount payable at maturity, may bear little relation to the hypothetical examples shown below or to the historical underlier levels or historical CPI levels shown elsewhere in this pricing supplement. For information about the historical levels of the underlier and historical CPI levels during recent periods, see “The Underlier — Historical Closing Levels of the Excess Return Index” on page PS-18 and “The CPI — Historical Levels of the CPI” on page PS-33. Before investing in the offered notes, you should consult publicly available information to determine the levels of the underlier and the CPI between the date of this pricing supplement and the date of your purchase of the offered notes.

Also, the hypothetical examples shown below do not take into account the effects of applicable taxes. Because of the U.S. tax treatment applicable to your notes, tax liabilities could affect the after-tax rate of return on your notes to a comparatively greater extent than the after-tax return on the underlier stocks.

Hypothetical Contingent CPI amount at Maturity

The examples below show the hypothetical contingent CPI amount, if any, that could be paid as part of the cash settlement amount for each \$1,000 face amount of the notes.

The levels in the left column of the table below represent hypothetical final CPI levels and are expressed as percentages of the initial CPI level. The amounts in the right column represent the hypothetical contingent CPI amounts, based on the corresponding hypothetical final CPI level, and are expressed as percentages of the face amount of a note (rounded to the nearest one-thousandth of a percent). Thus, a hypothetical contingent CPI amount of 1.000% means that the value of the contingent CPI amount that we would deliver for each \$1,000 of the outstanding face amount of the offered notes on the stated maturity date as part of the cash settlement amount would equal 1.000% of the face amount of a note, based on the corresponding hypothetical final CPI level and the assumptions noted above. You may not receive any contingent CPI amount as part of the cash settlement amount for each \$1,000 face amount of your notes.

Hypothetical Final CPI Level (as Percentage of Initial CPI Level)	Hypothetical Contingent CPI Amount (as Percentage of Face Amount)
115.000%	15.000%
110.000%	10.000%
105.000%	5.000%
101.000%	1.000%
100.000%	0.000%
75.000%	0.000%
50.000%	0.000%
25.000%	0.000%
0.000%	0.000%

If, for example, the final CPI level were determined to be 25.000% of the initial CPI level, you would not receive a contingent CPI amount on the stated maturity date, as shown in the table above. Therefore, your return on the notes would be based solely on the index return. For example, assuming the final CPI level was 25.000% of the initial CPI level, if the hypothetical final index level was 100.000% of the initial index level, the cash settlement amount that we would deliver on your notes at maturity would be 100.000% of the face amount of your notes.

Hypothetical Cash Settlement Amount at Maturity

The examples below reflect hypothetical cash settlement amounts that you could receive on the stated maturity date, excluding any contingent CPI amount.

The levels in the left column of the table below represent hypothetical final underlier levels and are expressed as percentages of the initial underlier level. The amounts in the right column represent the hypothetical cash settlement amounts, based on the corresponding hypothetical final underlier level, and are expressed as percentages of the face amount of a note (rounded to the nearest one-thousandth of a percent). Thus, a hypothetical cash settlement amount of 100.000% means that the value of the cash payment that we would deliver for each \$1,000 of the outstanding face amount of the offered notes on the stated maturity date would equal 100.000% of the face amount of a note, based on the corresponding hypothetical final underlier level and the assumptions noted above.

Hypothetical Final Underlier Level (as Percentage of Initial Underlier Level)	Hypothetical Cash Settlement Amount (as Percentage of Face Amount)*
200.000%	235.000%
175.000%	201.250%
150.000%	167.500%
125.000%	133.750%
100.000%	100.000%
75.000%	100.000%
50.000%	100.000%
25.000%	100.000%
0.000%	100.000%

*Does not include the contingent CPI amount, if any.

If, for example, the final underlier level were determined to be 25.000% of the initial underlier level, the cash settlement amount that we would deliver on your notes at maturity would be 100.000% of the face amount of your notes, as shown in the table above. As a result, if you purchased your notes on the original issue date at the face amount and held them to the stated maturity date, you would receive no return on your investment.

The cash settlement amounts shown above are entirely hypothetical; they are based on market prices for the underlier stocks that may not be achieved on the determination date and on assumptions that may prove to be erroneous. The actual market value of your notes on the stated maturity date or at any other time, including any time you may wish to sell your notes, may bear little relation to the hypothetical cash settlement amounts shown above, and these amounts should not be viewed as an indication of the financial return on an investment in the offered notes. The hypothetical cash settlement amounts on notes held to the stated maturity date in the examples above assume you purchased your notes at their face amount and have not been adjusted to reflect the actual issue price you pay for your notes. The return on your investment (whether positive or negative) in your notes will be affected by the amount you pay for your notes. If you purchase your notes for a price other than the face amount, the return on your investment will differ from, and may be significantly lower than, the hypothetical returns suggested by the above examples. Please read "Additional Risk Factors Specific to Your Notes — The Market Value of Your Notes May Be Influenced by Many Unpredictable Factors" on page PS-11.

Payments on the notes are economically equivalent to the amounts that would be paid on a combination of other instruments. For example, payments on the notes are economically equivalent to a combination of an interest-bearing bond bought by the holder and one or more options entered into between the holder and us (with one or more implicit option premiums paid over time). The discussion in this paragraph does not modify or affect the terms of the notes or the U.S. federal income tax treatment of the notes, as described elsewhere in this pricing supplement.

We cannot predict the actual final underlier level, the actual final CPI level or what the market value of your notes will be on any particular trading day, nor can we predict the relationship between the underlier level, the CPI level and the market value of your notes at any time prior to the stated maturity date. The actual amount that you will receive at maturity and the rate of return on the offered notes will depend on the actual final underlier level and the actual final CPI level as determined by the calculation agent as described above. Moreover, the assumptions on which the hypothetical returns are based may turn out to be inaccurate. Consequently, the amount of cash to be paid in respect of your notes on the stated maturity date may be very different from the information reflected in the examples above.

ADDITIONAL RISK FACTORS SPECIFIC TO YOUR NOTES

An investment in your notes is subject to the risks described below, as well as the risks and considerations described in the accompanying prospectus, in the accompanying prospectus supplement, and under "Additional Risk Factors Specific to the Notes" in the accompanying general terms supplement no. 2,913. You should carefully review these risks and considerations as well as the terms of the notes described herein and in the accompanying prospectus, the accompanying prospectus supplement and the accompanying general terms supplement no. 2,913. Your notes are a riskier investment than ordinary debt securities. Also, your notes are not equivalent to investing directly in the underlier stocks, i.e., the stocks comprising the underlier to which your notes are linked. You should carefully consider whether the offered notes are appropriate given your particular circumstances.

Risks Related to Structure, Valuation and Secondary Market Sales

The Estimated Value of Your Notes At the Time the Terms of Your Notes Are Set On the Trade Date (as Determined By Reference to Pricing Models Used By GS&Co.) Is Less Than the Original Issue Price Of Your Notes

The original issue price for your notes exceeds the estimated value of your notes as of the time the terms of your notes are set on the trade date, as determined by reference to GS&Co.'s pricing models and taking into account our credit spreads. Such estimated value on the trade date is set forth above under "Estimated Value of Your Notes"; after the trade date, the estimated value as determined by reference to these models will be affected by changes in market conditions, the creditworthiness of GS Finance Corp., as issuer, the creditworthiness of The Goldman Sachs Group, Inc., as guarantor, and other relevant factors. The price at which GS&Co. would initially buy or sell your notes (if GS&Co. makes a market, which it is not obligated to do), and the value that GS&Co. will initially use for account statements and otherwise, also exceeds the estimated value of your notes as determined by reference to these models. As agreed by GS&Co. and the distribution participants, this excess (i.e., the additional amount described under "Estimated Value of Your Notes") will decline to zero on a straight line basis over the period from the date hereof through the applicable date set forth above under "Estimated Value of Your Notes". Thereafter, if GS&Co. buys or sells your notes it will do so at prices that reflect the estimated value determined by reference to such pricing models at that time. The price at which GS&Co. will buy or sell your notes at any time also will reflect its then current bid and ask spread for similar sized trades of structured notes.

In estimating the value of your notes as of the time the terms of your notes are set on the trade date, as disclosed above under "Estimated Value of Your Notes", GS&Co.'s pricing models consider certain variables, including principally our credit spreads, interest rates (forecasted, current and historical rates), volatility, price-sensitivity analysis and the time to maturity of the notes. These pricing models are proprietary and rely in part on certain assumptions about future events, which may prove to be incorrect. As a result, the actual value you would receive if you sold your notes in the secondary market, if any, to others may differ, perhaps materially, from the estimated value of your notes determined by reference to our models due to, among other things, any differences in pricing models or assumptions used by others. See "—The Market Value of Your Notes May Be Influenced by Many Unpredictable Factors" below.

The difference between the estimated value of your notes as of the time the terms of your notes are set on the trade date and the original issue price is a result of certain factors, including principally the underwriting discount and commissions, the expenses incurred in creating, documenting and marketing the notes, and an estimate of the difference between the amounts we pay to GS&Co. and the amounts GS&Co. pays to us in connection with your notes. We pay to GS&Co. amounts based on what we would pay to holders of a non-structured note with a similar maturity. In return for such payment, GS&Co. pays to us the amounts we owe under your notes.

In addition to the factors discussed above, the value and quoted price of your notes at any time will reflect many factors and cannot be predicted. If GS&Co. makes a market in the notes, the price quoted by GS&Co. would reflect any changes in market conditions and other relevant factors, including any deterioration in our creditworthiness or perceived creditworthiness or the creditworthiness or perceived creditworthiness of The Goldman Sachs Group, Inc. These changes may adversely affect the value of your notes, including the price you may receive for your notes in any market making transaction. To the extent that GS&Co. makes a market in the notes, the quoted price will reflect the estimated value determined by reference to GS&Co.'s pricing models at that time, plus or minus its then current bid and ask spread for similar sized trades of structured notes (and subject to the declining excess amount described above).

Furthermore, if you sell your notes, you will likely be charged a commission for secondary market transactions, or the price will likely reflect a dealer discount. This commission or discount will further reduce the proceeds you would receive for your notes in a secondary market sale.

There is no assurance that GS&Co. or any other party will be willing to purchase your notes at any price and, in this regard, GS&Co. is not obligated to make a market in the notes. See "Additional Risk Factors Specific to the Notes

— Your Notes May Not Have an Active Trading Market” on page S-7 of the accompanying general terms supplement no. 2,913.

The Notes Are Subject to the Credit Risk of the Issuer and the Guarantor

Although the return on the notes will be based on the performance of the underlier and the CPI, the payment of any amount due on the notes is subject to the credit risk of GS Finance Corp., as issuer of the notes, and the credit risk of The Goldman Sachs Group, Inc. as guarantor of the notes. The notes are our unsecured obligations. Investors are dependent on our ability to pay all amounts due on the notes, and therefore investors are subject to our credit risk and to changes in the market's view of our creditworthiness. Similarly, investors are dependent on the ability of The Goldman Sachs Group, Inc., as guarantor of the notes, to pay all amounts due on the notes, and therefore are also subject to its credit risk and to changes in the market's view of its creditworthiness. See “Description of the Notes We May Offer — Information About Our Medium-Term Notes, Series F Program — How the Notes Rank Against Other Debt” on page S-5 of the accompanying prospectus supplement and “Description of Debt Securities We May Offer — Guarantee by The Goldman Sachs Group, Inc.” on page 67 of the accompanying prospectus.

You May Receive Only the Face Amount of Your Notes at Maturity

If the underlier return is zero or negative on the determination date, the return on your notes will be limited to the face amount unless a contingent CPI amount is paid. Even if the amount paid on your notes at maturity exceeds the face amount of your notes, the overall return you earn on your notes, including any contingent CPI amount, may be less than you would have earned by investing in a note with the same stated maturity that bears interest at the prevailing market rate.

The Amount Payable on Your Notes Is Not Linked to the Level of the Underlier at Any Time Other Than the Determination Date

The final underlier level will be based on the closing level of the underlier on the determination date (subject to adjustment as described elsewhere in this pricing supplement). Therefore, if the closing level of the underlier dropped precipitously on the determination date, the cash settlement amount for your notes may be significantly less than it would have been had the cash settlement amount been linked to the closing level of the underlier prior to such drop in the level of the underlier. Although the actual level of the underlier on the stated maturity date or at other times during the life of your notes may be higher than the final underlier level, you will not benefit from the closing level of the underlier at any time other than on the determination date.

Also, the market price of your notes prior to the stated maturity date may be significantly lower than the purchase price you pay for your notes. Consequently, if you sell your notes before the stated maturity date, you may receive far less than the amount of your investment in the notes.

The Contingent CPI Amount Payable on Your Notes Is Not Linked to Any Level of the CPI Other Than the Level of the CPI For November 2025

The final CPI level will be based on the level of the CPI for November 2025 (subject to adjustment as described elsewhere in this pricing supplement). Therefore, if the level of the CPI dropped precipitously for November 2025, the contingent CPI amount for your notes may be significantly less than it would have been had the contingent CPI amount been linked to the level of the CPI prior to such drop in the level of the CPI. Although the actual level of the CPI at maturity or at other times during the life of your notes may be higher than the final CPI level, you will not benefit from any level of the CPI other than the level of the CPI for November 2025.

Additionally, by including the contingent CPI amount feature in the notes, other economic terms of the notes will likely differ from, and be less favorable than, those of similar investments trading at or around the same time that are linked solely to the performance of the underlier. Also, the market price of your notes prior to the stated maturity date may be significantly lower than the purchase price you pay for your notes. Consequently, if you sell your notes before the stated maturity date, you may receive far less than the amount of your investment in the notes.

The Market Value of Your Notes May Be Influenced by Many Unpredictable Factors

When we refer to the market value of your notes, we mean the value that you could receive for your notes if you chose to sell them in the open market before the stated maturity date. A number of factors, many of which are beyond our control, will influence the market value of your notes, including:

- the levels of the underlier and the CPI, including the initial underlier level and the initial CPI level;
- consumer confidence in the United States economy;
- real or perceived scarcity of consumer goods, global trade imbalances, scarcity of energy resources, availability of raw materials, and other supply chain factors;

- the volatility – i.e., the frequency and magnitude of changes – in the closing level of the underlier and the level of the CPI;
- the dividend rates of the underlier stocks;
- economic, financial, regulatory, political, military, public health and other events that affect stock markets generally and the underlier stocks, and which may affect the closing levels of the underlier and the CPI;
- interest rates and yield rates in the market;
- the time remaining until your notes mature; and
- our creditworthiness and the creditworthiness of The Goldman Sachs Group, Inc., whether actual or perceived, and including actual or anticipated upgrades or downgrades in our credit ratings or the credit ratings of The Goldman Sachs Group, Inc. or changes in other credit measures.

Without limiting the foregoing, the market value of your notes may be negatively impacted by increasing interest rates. Such adverse impact of increasing interest rates could be significantly enhanced in notes with longer-dated maturities, the market values of which are generally more sensitive to increasing interest rates.

These factors may influence the market value of your notes if you sell your notes before maturity, including the price you may receive for your notes in any market making transaction. If you sell your notes prior to maturity, you may receive less than the face amount of your notes. You cannot predict the future performance of the underlier or the CPI based on its historical performance.

Your Notes Do Not Bear Interest

You will not receive any interest payments on your notes. As a result, even if the cash settlement amount payable for your notes on the stated maturity date exceeds the face amount of your notes, the overall return you earn on your notes may be less than you would have earned by investing in a non-indexed debt security of comparable maturity that bears interest at a prevailing market rate.

You Have No Shareholder Rights or Rights to Receive Any Underlier Stock

Investing in your notes will not make you a holder of any of the underlier stocks. Neither you nor any other holder or owner of your notes will have any rights with respect to the underlier stocks, including any voting rights, any right to receive dividends or other distributions, any rights to make a claim against the underlier stocks or any other rights of a holder of the underlier stocks. Your notes will be paid in cash and you will have no right to receive delivery of any underlier stocks.

We May Sell an Additional Aggregate Face Amount of the Notes at a Different Issue Price

At our sole option, we may decide to sell an additional aggregate face amount of the notes subsequent to the date of this pricing supplement. The issue price of the notes in the subsequent sale may differ substantially (higher or lower) from the original issue price you paid as provided on the cover of this pricing supplement.

If You Purchase Your Notes at a Premium to Face Amount, the Return on Your Investment Will Be Lower Than the Return on Notes Purchased at Face Amount and the Impact of Certain Key Terms of the Notes Will Be Negatively Affected

The cash settlement amount will not be adjusted based on the issue price you pay for the notes. If you purchase notes at a price that differs from the face amount of the notes, then the return on your investment in such notes held to the stated maturity date will differ from, and may be substantially less than, the return on notes purchased at face amount. If you purchase your notes at a premium to face amount and hold them to the stated maturity date, the return on your investment in the notes will be lower than it would have been had you purchased the notes at face amount or a discount to face amount.

Additional Risks Related to the Underlier

Notwithstanding That the Title of the Index Includes the Phrase “Risk Control,” the Underlier May Decrease Significantly More or Increase Significantly Less Than the Total Return Index

The underlier, through the Risk Control index, is intended to provide investors with exposure to the Total Return index subject to a risk control strategy that dynamically increases or decreases the exposure to the Total Return index in an attempt to achieve a 5% volatility target. The Risk Control index's exposure to the Total Return index can be greater than, less than or equal to 100%. The performance of the underlier is not taken into account when implementing the risk control strategy and could result in leveraged exposure to the Total Return index in a falling stock market or deleveraged exposure to the Total Return index in a rising stock market. Additionally, the underlier is the excess return version of the Risk Control index. As an excess return underlier, the underlier is designed to measure the return on a hypothetical investment in the Risk Control index that is made with hypothetically borrowed

funds. Borrowing costs for these funds are assessed at a rate of SOFR *plus* 0.02963%. Any positive performance of the Risk Control index will be offset by such hypothetical borrowing costs. Therefore, although the title of the underlier includes the phrase “Risk Control,” the underlier may decrease significantly more or increase significantly less than the Total Return index and your notes are not necessarily less risky than, and will not necessarily have better returns than, notes linked to the Total Return index. See “Comparative Performance of the Excess Return Index, the Risk Control Index and the Total Return Index” below for a comparison of the historical performance of the underlier relative to the Risk Control index and the Total Return index.

The Return on Your Notes is Based on an Underlier That Reflects Excess Return; There Are Borrowing Costs at the Underlier Level

The underlier is the excess return version of the Risk Control index, meaning that it is designed to measure the return on a hypothetical investment in the Risk Control index that is made with hypothetically borrowed funds. Borrowing costs for these funds are assessed at a rate of SOFR plus 0.02963%. Such costs will reduce any positive performance of the Risk Control index (and, thereby, the underlier) and will increase any negative performance of the Risk Control index (and, thereby, the underlier). In order to receive a positive return on your notes, the return of the index must exceed the borrowing costs at the index level. Because the return of the underlier is equal to the return of the Risk Control index minus borrowing costs, the return of the underlier will always be less than the return of the Risk Control index. See “Comparative Performance of the Excess Return Index, the Risk Control Index and the Total Return Index” below for a comparison of the historical performance of the underlier relative to the Risk Control index and the Total Return index.

There Is No Assurance that Calculating Realized Volatility as the Greater of Short-Term Volatility and Long-Term Volatility Is the Best Way to Measure Realized Volatility

With regard to the Risk Control index, “realized volatility” is a measurement of variations in the historical daily returns of the Total Return index from the day that is two Risk Control index calculation days before the inception date (September 10, 2009) of the Risk Control index to the day that is two Risk Control index calculation days before the current Risk Control index calculation day. As a result, the measurement period for realized volatility will always have the same start date and will continue to get longer with each new Risk Control Index calculation day. Realized volatility is calculated as the greater of short-term volatility and long-term volatility. When the volatility of the Total Return index increases (or decreases), short-term volatility will increase (or decrease) more quickly than long-term volatility. Because realized volatility is the greater of short-term volatility and long-term volatility, realized volatility will increase quickly when volatility increases, which will quickly reduce exposure to the Total Return index. Conversely, because realized volatility is the greater of short-term volatility and long-term volatility, realized volatility will decrease slowly when volatility decreases, which in turn will gradually increase exposure to the Total Return index. There is no assurance that calculating realized volatility as the greater of short-term volatility and long-term volatility or using a measurement period with a set start date that continues to get longer with each new Risk Control index calculation day is the best way to measure realized volatility. It is possible that exclusively relying on short-term volatility or long-term volatility or on the lesser of short-term volatility and long-term volatility is a more reliable way to measure realized volatility.

The Underlier Will Not Reflect the Most Current Volatility of the Total Return Index

The Risk Control index is rebalanced using a leverage factor at the close of each Risk Control index calculation day in order to adjust its exposure to the Total Return index based on the applicable realized volatility. Although the Risk Control index is rebalanced at the close of each Risk Control index calculation day, because of how the leverage factor is calculated, there is a lag of two Risk Control index calculation days between the calculation of the leverage factor and the rebalancing of the Risk Control index in accordance with that leverage factor. Therefore, on any given Risk Control index calculation day, the leverage factor that determines the Risk Control index’s exposure to the Total Return index for such Risk Control index calculation day will be based on the realized volatility of the Total Return index from two Risk Control index calculation days prior. Due to this two-day lag and the fact that realized volatility can fluctuate significantly during this period, and even during a single day, the Risk Control index will not be rebalanced to reflect (and therefore the underlier will not reflect) the realized volatility of the Total Return index as of the rebalancing day and will not have an actual volatility of 5%. As a result, if there is a rapid and severe decline in the level of the Total Return index, due to the two-day lag, the Risk Control index may not rebalance into the hypothetical cash position until the underlier has declined by a substantial amount.

There Is No Guarantee that the Underlier Will Achieve the 5% Volatility Target

The exposure of the Risk Control index (and therefore the underlier) to the Total Return index is subject to a maximum leverage factor of 150%, which may limit the ability of the Risk Control index (and therefore the underlier) to fully achieve a volatility target of 5% if achieving such volatility target would require a leverage factor in excess of 150%. Therefore, there is no guarantee that the Risk Control index (and therefore the underlier) will achieve the 5% volatility target.

You May be Exposed to Borrowing Costs at the Risk Control Underlier Level

The exposure of the Risk Control index to the Total Return index can be greater than, less than or equal to 100%. Exposure in excess of 100% (i.e., leverage) is achieved by hypothetically borrowing cash at a rate of SOFR *plus* 0.02963% for the exposure above 100%. As leverage increases, borrowing costs increase.

The cost of borrowing is ignored when determining leverage above 100% (subject to a maximum leverage factor of 150%), even if a prudent investor would choose not to borrow money to invest in the Total Return index at such time. The cost of borrowing may exceed the returns from the Total Return index if the return of the Total Return index decreases or if the rate of the SOFR *plus* 0.02963% increases (or both).

Controlled Volatility Does Not Mean the Underlier Will Have Lower Volatility than the Total Return Index

The underlier, through the Risk Control index, employs a risk-control strategy that uses mathematical equations to target 5% volatility. The strategy does not have a goal of achieving lower volatility than the Total Return index. In fact, if the realized volatility of the Total Return index is less than the volatility target of 5%, the exposure to the Total Return index will be increased in an attempt to raise the volatility of the Risk Control index to 5%. Any time the exposure to the Total Return index is greater than 100%, the Risk Control index would be more volatile than the Total Return index.

Low Volatility Does Not Necessarily Mean the Risk Control Index Will Outperform the Total Return Index or that the Underlier Will Have Positive Performance

The underlier, through the Risk Control index, employs a risk-control strategy that uses mathematical equations to target 5% volatility. Even if the Risk Control index achieves its 5% volatility target, there is no guarantee that the Risk Control index will outperform the Total Return index or that the underlier return will be positive. For example, if the performance of the Total Return index remains stable or steadily decreases over time, the 5% volatility target will not cause the Risk Control index to outperform the Total Return index or result in a positive Risk Control index return. Moreover, the underlier return will be less than the Risk Control index return due to its excess return feature and the borrowing costs thereof. See "Comparative Performance of the Excess Return Index, the Risk Control Index and the Total Return index" below for a comparison of the historical performance of the underlier relative to the Risk Control index and the Total Return index.

There May Be Overexposure to the Total Return Index in Falling Stock Markets or Underexposure in Rising Stock Markets

The underlier, through the Risk Control index, is designed to achieve a volatility target of 5% regardless of the direction of price movements in the market. Therefore, in rising stock markets if realized volatility is higher than the volatility target, some of the Risk Control index's exposure (and therefore the underlier's exposure) will be moved from the Total Return index to the hypothetical cash position, and the Risk Control index (and therefore the underlier) will experience lower returns than if the full exposure was maintained in the Total Return index. In contrast, if realized volatility is less than the volatility target in a falling stock market, the Risk Control index (and therefore the underlier) will be exposed to more than 100% of the losses in the Total Return index and the Risk Control index (and therefore the underlier) will experience lower returns than the Total Return index. The hypothetical cash position has represented a very significant portion of the Risk Control index in the past. Any rebalancing into a hypothetical cash position will limit your return on the notes.

The Exposure to the Total Return Underlier May Be Rebalanced into a Hypothetical Cash Position on Any or All Days During the Term of the Notes

The underlier, through the Risk Control index, has a daily rebalancing feature which can result in a rebalancing between the exposure to the Total Return index and the hypothetical cash position. This could have the effect of reducing the exposure of the Total Return index to less than 100% in an attempt to reduce the volatility to 5%. The minimum leverage factor is 0%. Therefore, there is no guarantee that the Risk Control index will not be rebalanced

so that the hypothetical cash position represents a significant portion of the Risk Control index (up to 100% of the underlier). Any rebalancing into a hypothetical cash position will limit your return on the notes.

Typically, a portion of the Risk Control index's exposure has been to the hypothetical cash position.

On December 20, 2021, Each of the Underlier and the Risk Control Index Discontinued Its Use of Overnight U.S. Dollar LIBOR For All Purposes and Replaced Such Rate

On December 20, 2021, the underlier discontinued use of overnight U.S. dollar LIBOR for all purposes and replaced such rate with SOFR *plus* 0.02963%. Therefore, beginning on such date, the Underlier measures the return on a hypothetical investment in the Risk Control index that is made with hypothetically borrowed funds at costs assessed at a rate of SOFR *plus* 0.02963%. Further, from such date, if the Risk Control index increases its exposure to the Total Return index to more than 100% to achieve the 5% volatility target, such exposure will be achieved by hypothetically borrowing cash at a rate of SOFR *plus* 0.02963%. If the Risk Control index decreases its exposure to the Total Return index to less than 100% to achieve the 5% volatility target, such exposure will be achieved by hypothetically selling some of the exposure to the Total Return index, which results in a hypothetical cash position that accrues interest at SOFR *plus* 0.02963%.

Replacement of overnight U.S. dollar LIBOR with SOFR *plus* 0.02963% could potentially result in higher borrowing costs being deducted from the return of the Risk Control Index. See "The Underlier" below. As discussed above under "— The Return on Your Notes is Based on an Underlier That Reflects Excess Return and Will Be Reduced By Borrowing Costs at the Underlier Level", increases in the borrowing costs will offset any positive performance of the Risk Control index (and, thereby, the underlier) and will increase any negative performance of the Risk Control index (and, thereby, the underlier). As a result, the use of SOFR *plus* 0.02963% may adversely affect the performance of the underlier and the Risk Control Index and could reduce the amount payable in respect of your Notes.

Historical information regarding the performance of the underlier and the Risk Control index as of any date, or for any period, prior to December 20, 2021 was during a period in which the underlier and the Risk Control index used overnight U.S. dollar LIBOR instead of SOFR *plus* 0.02963%. Extremely limited historical information regarding the performance of the underlier and the Risk Control index subsequent to their discontinued use of overnight U.S. dollar LIBOR is available, which may make it difficult for you to make an informed decision with respect to the notes.

The Historical Levels of SOFR Are Not an Indication of the Future Levels of SOFR

In the past, the level of SOFR has experienced significant fluctuations. You should note that historical levels, fluctuations and trends of SOFR are not necessarily indicative of future levels. Any historical upward or downward trend in SOFR is not an indication that SOFR is more or less likely to increase or decrease at any time, and you should not take the historical levels of SOFR as an indication of its future performance.

Certain Risks Related to SOFR

On June 22, 2017, the Alternative Reference Rates Committee ("ARRC") convened by the Board of Governors of the Federal Reserve System and the Federal Reserve Bank of New York identified SOFR, a broad U.S. treasuries repurchase financing rate to be published by the Federal Reserve Bank of New York, as the rate that, in the consensus view of the ARRC, represented best practice for use in certain new U.S. dollar derivatives and other financial contracts. SOFR is a broad measure of the cost of borrowing cash overnight collateralized by U.S. treasury securities and has been published by the Federal Reserve Bank of New York since April 2018. The Federal Reserve Bank of New York has also published historical indicative Secured Overnight Financing Rates going back to 2014. Investors should not rely on any historical changes or trends in SOFR as an indicator of future changes in SOFR.

Because SOFR is published by the Federal Reserve Bank of New York based on data received from other sources, we have no control over its determination, calculation or publication. The Federal Reserve Bank of New York notes on its publication page for SOFR that use of SOFR is subject to important limitations and disclaimers, including that the Federal Reserve Bank of New York may alter the methods of calculation, publication schedule, rate revision practices or availability of SOFR at any time without notice. There can be no guarantee, particularly given its relatively recent introduction, that SOFR will not be discontinued or fundamentally altered in a manner that is materially adverse to the interests of investors in the notes. If the manner in which SOFR is calculated is changed, that change may result in a reduction of the levels of the underlier and the Risk Control Index and, therefore, the amount payable on your notes and the trading prices of such notes. In addition, the Federal Reserve Bank of New York may withdraw, modify or amend published SOFR data in its sole discretion and without notice.

Additionally, daily changes in SOFR have, on occasion, been more volatile than daily changes in other benchmark or market rates. The return on and value of your notes may fluctuate more than if the underlier and the Risk Control Index used a less volatile rate. In addition, the volatility of SOFR has reflected the underlying volatility of the overnight U.S. Treasury repo market. The Federal Reserve Bank of New York has at times conducted operations in the overnight U.S. Treasury repo market in order to help maintain the federal funds rate within a target range. There can be no assurance that the Federal Reserve Bank of New York will continue to conduct such operations in the future, and the duration and extent of any such operations is inherently uncertain. The effect of any such operations, or of the cessation of such operations to the extent they are commenced, is uncertain and could be materially adverse to the levels of the underlier and the Risk Control Index and, therefore, the amount payable on your notes.

Except to the Extent The Goldman Sachs Group, Inc. Is One of the Companies Whose Common Stock Comprises the Underlier, There Is No Affiliation Between the Underlier Stock Issuers or the Underlier Sponsor and Us

The common stock of The Goldman Sachs Group, Inc. is one of the underlier stocks comprising the Underlier. We are not otherwise affiliated with the issuers of the underlier stocks or the underlier sponsor. As we have told you above, however, we or our affiliates may currently or from time to time in the future own securities of, or engage in business with the underlier sponsor or the underlier stock issuers. Neither we nor any of our affiliates have participated in the preparation of any publicly available information or made any “due diligence” investigation or inquiry with respect to the underlier or any of the other underlier stock issuers. You, as an investor in your notes, should make your own investigation into the underlier and the underlier stock issuers. See “The Underlier” below for additional information about the underlier.

Neither the underlier sponsor nor any of the other underlier stock issuers are involved in the offering of your notes in any way and none of them have any obligation of any sort with respect to your notes. Thus, neither the underlier sponsor nor any of the other underlier stock issuers have any obligation to take your interests into consideration for any reason, including in taking any corporate actions that might affect the market value of your notes.

The Policies of the Underlier Sponsor and Changes That Affect the Underlier or the Underlier Stocks Could Affect the Payment Amount on Your Notes and Their Market Value

The policies of the underlier sponsor concerning the calculation of the level of the underlier, additions, deletions or substitutions of underlier stocks and the manner in which changes affecting the underlier stocks or their issuers, such as stock dividends, reorganizations or mergers, are reflected in the level of the underlier could affect the level of the underlier and, therefore, the cash settlement amount on your notes on the stated maturity date and the market value of your notes before that date. The amount payable on your notes and their market value could also be affected if the underlier sponsor changes these policies, for example, by changing the manner in which it calculates the level of the underlier or if the underlier sponsor discontinues or suspends calculation or publication of the level of the underlier, in which case it may become difficult to determine the market value of your notes. If events such as these occur, or if the closing level of the underlier is not available on the determination date because of a market disruption event or for any other reason, the calculation agent - which initially will be GS&Co., our affiliate - may determine the closing level of the underlier - and thus the amount payable on your notes - in a manner it considers appropriate, in its sole discretion. We describe the discretion that the calculation agent will have in determining the closing level of the underlier on the determination date and the amount payable on your notes more fully under “Terms and Conditions - Discontinuance or modification of the underlier” above.

Risks Related to the CPI

The Historical Levels of the CPI Are Not an Indication of the Future Levels of the CPI

In the past, the levels of the CPI have experienced significant fluctuations. You should note that historical levels, fluctuations and trends of the CPI are not necessarily indicative of future levels. Any historical upward or downward trend in the level of the CPI is not an indication that the level of the CPI is more or less likely to increase or decrease at any time, and you should not take the historical levels of the CPI as an indications of its future performance.

If the Level of the CPI Changes, the Market Value of Your Notes May Not Change in the Same Manner

The price of your notes may move differently than the level of the CPI. Changes in the level of the CPI may not result in a comparable change in the market value of your notes. We discuss some of the reasons for this disparity under “— The Market Value of Your Notes May Be Influenced by Many Unpredictable Factors” above.

The Policies of the BLS and Changes that Affect the CPI Could Affect the Cash Settlement Amount on Your Notes and Their Market Value

The policies of the BLS concerning the calculation of the level of the CPI could affect the level of the CPI and, therefore, the contingent CPI amount portion of the cash settlement amount on your notes at maturity and the market value of your notes prior to maturity. The cash settlement amount on your notes and their market value could also be affected if the BLS changes these policies, for example, by changing the manner in which it calculates the level of the CPI, or if the BLS discontinues or suspends calculation or publication of the CPI, in which case it may become difficult to determine the market value of your notes. If events such as these occur, or if the CPI level necessary to calculate the cash settlement amount is not available for any other reason, the calculation agent — which initially will be GS&Co., our affiliate — may determine the CPI level — and thus the cash settlement amount on the stated maturity date — in a manner it considers appropriate, in its sole discretion. We describe the discretion that the calculation agent will have in determining the CPI level more fully under “Terms and Conditions — Discontinuance or modification of the CPI” above.

There Is No Affiliation between the BLS and Us

The CPI is currently calculated and published by the Bureau of Labor Statistics of the U.S. Department of Labor, a division of the U.S. federal government. We have derived all information about the BLS in this pricing supplement from the publicly available information referred to in the “The CPI”. We have not participated in the preparation of any of those documents or made any “due diligence” investigation or inquiry with respect to the CPI or the BLS in connection with the offering of your note. You, as an investor in your notes, should make your own investigation into the CPI and the BLS. See “The CPI” below for additional information about the CPI.

The BLS is not involved in the offering of your notes in any way and has no obligation of any sort with respect to your notes. Thus, the BLS has no obligation to take your interests into consideration for any reason, including in taking any actions that might affect the market value of your notes.

Risks Related to Tax

Your Notes Will Be Treated as Debt Instruments Subject to Special Rules Governing Contingent Payment Debt Instruments for U.S. Federal Income Tax Purposes

The notes will be treated as debt instruments subject to special rules governing contingent payment debt instruments for U.S. federal income tax purposes. If you are a U.S. individual or taxable entity, you generally will be required to pay taxes on ordinary income from the notes over their term based on the comparable yield for the notes, even though you will not receive any payments from us until maturity. This comparable yield is determined solely to calculate the amount on which you will be taxed prior to maturity and is neither a prediction nor a guarantee of what the actual yield will be. In addition, any gain you may recognize on the sale, exchange or maturity of the notes will be taxed as ordinary interest income. If you are a secondary purchaser of the notes, the tax consequences to you may be different. Please see “Supplemental Discussion of U.S. Federal Income Tax Consequences” below for a more detailed discussion. Please also consult your tax advisor concerning the U.S. federal income tax and any other applicable tax consequences to you of owning your notes in your particular circumstances.

Foreign Account Tax Compliance Act (FATCA) Withholding May Apply to Payments on Your Notes, Including as a Result of the Failure of the Bank or Broker Through Which You Hold the Notes to Provide Information to Tax Authorities

Please see the discussion under “United States Taxation — Taxation of Debt Securities — Foreign Account Tax Compliance Act (FATCA) Withholding” in the accompanying prospectus for a description of the applicability of FATCA to payments made on your notes.

THE UNDERLIER

The S&P 500® Daily Risk Control 5% USD Excess Return Index (the “Excess Return index”):

- is an equity index, and therefore cannot be invested in directly;
- does not file reports with the SEC because it is not an issuer;
- has a launch date of September 10, 2009, with a base value of 100 as of its base date, February 5, 1990; and
- is sponsored by S&P Dow Jones Indices LLC (“S&P”).

The Excess Return index is the excess return version of the S&P 500® Daily Risk Control 5% USD Total Return Index (the “Risk Control index”), meaning that the Excess Return index is designed to measure the return on a hypothetical investment in the Risk Control index borrowed at a rate of the Secured Overnight Financing Rate (SOFR) *plus* 0.02963%. Any percentage increase in the Risk Control index will be offset by a rate of SOFR *plus* 0.02963%.

Prior to December 20, 2021, the Excess Return index measured the return on a hypothetical investment in the Risk Control index borrowed at the overnight U.S. dollar LIBOR rate.

The Risk Control index is intended to provide investors with exposure to the S&P 500® Total Return Index (the “Total Return index”) subject to a risk control strategy that dynamically increases or decreases the exposure to the Total Return index in an attempt to achieve a 5% volatility target. The Risk Control index’s exposure to the Total Return index can be greater than, less than or equal to 100%. Exposure in excess of 100% is achieved by hypothetically borrowing cash at a rate of SOFR *plus* 0.02963%. Exposure of less than 100% is achieved by hypothetically selling some of the exposure to the Total Return index, which results in a hypothetical cash position that accrues interest at the rate of SOFR *plus* 0.02963%. Notwithstanding that the title of each of the Excess Return index and the Risk Control index includes the phrase “Risk Control”, the Excess Return index and the Risk Control index may decrease significantly more or increase significantly less than the Total Return index.

Prior to December 20, 2021, the Risk Control index’s exposure in excess of 100% was achieved by hypothetically borrowing cash at a rate of overnight U.S. dollar LIBOR. Exposure of less than 100% was achieved by hypothetically selling some of the exposure to the Total Return index, which resulted in a hypothetical cash position that accrued interest at the overnight U.S. dollar LIBOR rate.

As a result, extremely limited historical information regarding the performance of the Excess Return Index and the Risk Control index subsequent to their discontinued use of overnight U.S. dollar LIBOR is available, which may make it difficult for you to make an informed decision with respect to an investment in the notes.

The Total Return index is a total return-based calculation of the S&P 500® Index. The S&P 500® Index includes a representative sample of 500 leading companies in leading industries of the U.S. economy.

The Excess Return index, the Risk Control index, the Total Return index and the S&P 500® Index are calculated, maintained and published by S&P Dow Jones Indices LLC (“S&P”). Additional information about the Excess Return index, the Risk Control index, the Total Return index, and the S&P 500® Index (including sector weights) is available on the following websites: spglobal.com/spdji/en/indices/strategy/sp-500-daily-risk-control-5-index, spglobal.com/spdji/en/indices/equity/sp-500 and spglobal.com. We are not incorporating by reference the websites or any material they include in this pricing supplement.

S&P 500® Daily Risk Control 5% USD Excess Return Index

The Excess Return index is the excess return version of the Risk Control index. The Excess Return index is designed to measure the return on a hypothetical investment in the Risk Control index that is made with borrowed funds. Borrowing costs are assessed at a rate of SOFR *plus* 0.02963%. Such costs will reduce any positive index return and will increase any negative index return. The level of the Excess Return index on an index calculation day (“T”) is equal to the *product* of (a) the level of the Excess Return index on the previous index calculation day (“T – 1”) *multiplied by* (b) (i) the return of the Risk Control index on the Excess Return index calculation day (“T”) *minus* (ii) the borrowing costs.

S&P 500® Daily Risk Control 5% USD Total Return Index

The Risk Control index is designed to measure the return on a hypothetical investment in the Total Return index that dynamically increases or decreases its exposure to the Total Return index in an attempt to achieve a 5%

volatility target (the “volatility target”). While the Risk Control index is designed to achieve a stable level of volatility, there can be no assurance that the Risk Control index will achieve this goal.

The return on the Risk Control index consists of two components: (1) the exposure to the Total Return index, which may be greater than (but not greater than 150%), less than (as low as zero) or equal to 100% of the daily return of the Total Return index, and (2) an interest cost or gain. An exposure greater than 100% of the daily return of the Total Return index is a leveraged position where the exposure to the Total Return index is increased by hypothetically borrowing cash (and paying interest on such cash as described below) and investing such cash in the Total Return index. An exposure less than 100% of the daily return of the Total Return index is a deleveraged position where the exposure to the Total Return index is decreased by hypothetically selling some of the exposure, which results in a hypothetical cash position that accrues interest. An exposure equal to 100% of the daily return of the Total Return index has the same daily return as the Total Return index. Interest cost accrues on the amount of any hypothetical borrowed cash and interest gain accrues on the amount of any hypothetical cash position. The rate of SOFR *plus* 0.02963% is used to calculate the interest cost or gain. The Excess Return index sponsor may use other successor interest rates if SOFR is unavailable, and a 360-day year is assumed for the interest calculations in accordance with U.S. banking practices.

Each Risk Control index calculation day (“T”), the Excess Return index sponsor calculates the “leverage factor”, which determines whether the exposure to the Total Return index should be greater than, less than or equal to 100% of the daily return of the Total Return index for the following Risk Control index calculation day (“T + 1”). The leverage factor is a ratio of the target volatility level (of 5%) to the “realized volatility” (as defined below) for the second preceding Risk Control index calculation day (“T - 2”), subject to a maximum leverage factor of 150% and a minimum leverage factor of 0%. For example, if on the second preceding Risk Control index calculation day the realized volatility were equal to 4%, on the Risk Control index calculation day the leverage factor would be equal to 125% (5% divided by 4%) and on the following Risk Control index calculation day the Risk Control index would be exposed to 125% of the daily return of the Total Return index.

Although the Risk Control index is rebalanced at the close of each Risk Control index calculation day, because of how the leverage factor is calculated, there is a lag of two Risk Control index calculation days between the calculation of the leverage factor and the rebalancing of the Risk Control index in accordance with that leverage factor. Therefore, on any given Risk Control index calculation day, the leverage factor that determined the Risk Control index’s exposure to the Total Return index for such Risk Control index calculation day was based on the realized volatility of the Total Return index from two Risk Control index calculation days prior.

“Realized volatility” is a measurement of variations in the historical daily returns of the Total Return index. Realized volatility is calculated as the greater of short-term volatility and long-term volatility. Both short-term volatility and long-term volatility are calculated based on the historical daily returns over the same time period (from the day that is two Risk Control index calculation days before the inception date (September 10, 2009) of the Risk Control index to the day that is two Risk Control index calculation days before the current Risk Control index calculation day) and both apply and gradually increase a discount that gradually reduces the significance of a given historical daily return as it moves farther into the past. However, short-term volatility applies a larger discount than does long-term volatility. The discount for short-term volatility is slightly more than double the discount for long-term volatility. As a result, the 10 most recent Risk Control index calculation days account for approximately 50% of the weighting when determining short-term volatility, while the 23 most recent Risk Control index calculation days account for approximately 50% of the weighting when determining long-term volatility. **The short-term realized volatility calculation and the long-term realized volatility calculations differ only in that the long-term volatility calculation places 50% of the calculation weighting on an additional 13 days.**

When the volatility of the Total Return index increases (or decreases), short-term volatility will increase (or decrease) more quickly than long-term volatility. Because realized volatility is the greater of short-term volatility and long-term volatility, realized volatility will increase quickly when volatility increases, which will quickly reduce exposure to the Total Return index. Conversely, because realized volatility is the greater of short-term volatility and long-term volatility, realized volatility will decrease slowly when volatility decreases, which in turn will gradually increase exposure to the Total Return index.

If realized volatility is less than the volatility target, the leverage factor will be greater than one and the exposure to the daily return of the Total Return index will be greater than 100%. As a result, interest costs will be incurred for the exposure greater than 100% at the rate of SOFR *plus* 0.02963%. For example, if the realized volatility is 4%, the leverage factor will be 125% (i.e., 5 divided by 4 = 125%). In this case, the Risk Control index would be exposed to

125% of the daily return of the Total Return index, and interest cost will be assessed for the 25% exposure above 100%. If realized volatility is greater than the volatility target, the leverage factor will be less than one and the exposure to the daily return of the Total Return index will be less than 100%. As a result, exposure will be moved to the cash position, which will accrue interest at the rate of SOFR *plus* 0.02963%. For example, if the realized volatility is 6%, the leverage factor will be approximately 83% (i.e., 5 divided by 6 = approximately 83%). In this case, the Risk Control index would be exposed to approximately 83% of the daily return of the Total Return index, plus the interest gain on the 17% of exposure that is moved to the cash position. If realized volatility is equal to the volatility target, the leverage factor will be equal to one and exposure to the daily return of the Total Return index will be equal to 100% and there will be no interest cost or gain.

Typically, a portion of the Risk Control index's exposure has been to the hypothetical cash position.

Total Return Index

The Total Return index is a total return-based calculation of the S&P 500® Index. The total return construction reflects both movements in stock prices and the reinvestment of dividend income. The Total Return index represents the total return earned in a portfolio that tracks the S&P 500® Index and reinvests dividend income in the overall index, not in the specific stock paying the dividend.

The total return construction builds the Total Return index from the price return version of the S&P 500® Index but accounts for daily total dividend returns. The first step is to calculate the total dividend paid on a given day and convert that figure into price index points. A total daily dividend amount is calculated as the aggregate of (a) the number of shares of each stock in the S&P 500® Index *times* (b) the dividend per share paid for such stock. This calculation is performed for each trading day. The dividend per share for a stock is generally zero except for four times a year when it goes ex-dividend for the quarterly dividend payment. Some stocks included in the S&P 500® Index do not pay dividends and this amount always remains zero. Ordinary cash dividends are applied on the ex-dividend date in calculating the total return index. The Total Return index reflects both ordinary and special cash dividends. "Special dividends" are those dividends that are outside of the normal payment pattern established historically by the issuing company. These may be described by the company as "special," "extra," "year-end" or "return of capital." Whether a dividend is funded from operating earnings or from other sources of cash does not affect the determination of whether it is ordinary or special. S&P Dow Jones Indices will generally consider the third consecutive instance of a non-ordinary dividend (in terms of timing, not amount) to be ordinary for index calculation purposes as a third consecutive instance will now be considered to be part of the normal payment pattern established by the company. As discussed under "The S&P 500® Index" below, special dividends are treated as corporate actions with offsetting price and divisor adjustments.

The total daily dividend amount calculated above is converted to index points by dividing such amount by the divisor for the price return version of the S&P 500® Index. The daily total return for the Total Return index is then determined by calculating (a) the *sum* of (i) the level of the price return version of the S&P 500® Index on that day *plus* (ii) the index points reflecting the total daily dividend amount on such day *divided by* (b) the level of the price return version of the S&P 500® Index for the previous day *minus* (c) one. The daily total return is used to update the Total Return index level from one day to the next by calculating the *product* of (a) the level of the Total Return index from the previous day *times* (b) the *sum* of (i) one *plus* (ii) the daily total return for the given day.

S&P 500® Index

The S&P 500® Index:

- is an equity index, and therefore cannot be invested in directly;
- does not file reports with the SEC because it is not an issuer;
- was first launched on March 4, 1957 based on an initial value of 10 from 1941-1943; and
- is sponsored by S&P Dow Jones Indices LLC ("S&P").

The S&P 500® Index includes a representative sample of 500 companies in leading industries of the U.S. economy. The 500 companies are not the 500 largest companies listed on the NYSE and not all 500 companies are listed on the NYSE. S&P chooses companies for inclusion in the S&P 500® Index with an aim of achieving a distribution by broad industry groupings that approximates the distribution of these groupings in the common stock population of the U.S. domiciled equity market. Although the S&P 500® Index contains 500 constituent companies, at any one time it may contain greater than 500 constituent trading lines since some companies included in the S&P 500® Index prior to July 31, 2017 may be represented by multiple share class lines in the S&P 500® Index. The S&P 500® Index is calculated, maintained and published by S&P and is part of the S&P Dow Jones Indices family of indices.

S&P intends for the S&P 500® Index to provide a performance benchmark for the large-cap U.S. domiciled equity markets. Constituent changes are made on an as-needed basis and there is no schedule for constituent reviews. Index additions and deletions are announced with at least three business days advance notice. Less than three business days' notice may be given at the discretion of the S&P Index Committee. Relevant criteria for additions to the S&P 500® Index that are employed by S&P include: the company proposed for addition should have an unadjusted company market capitalization of \$12.7 billion or more and a security level float-adjusted market capitalization of at least 50% of such threshold (for spin-offs, eligibility is determined using when-issued prices, if available); the float-adjusted liquidity ratio of the stock (defined as the annual dollar value traded divided by the float-adjusted market capitalization) should be greater than or equal to 0.75 at the time of the addition to the S&P 500® Index and the stock should trade a minimum of 250,000 shares in each of the six months leading up to the evaluation date (current constituents have no minimum requirement), where the annual dollar value traded is calculated as the average closing price multiplied by the historical volume over the 365 calendar days prior to the evaluation date (reduced to the available trading period for IPOs, spin-offs or public companies considered to be U.S. domiciled for index purposes that do not have 365 calendar days of trading history on a U.S. exchange); the company must be a U.S. company (characterized as a Form 10-K filer with its U.S. portion of fixed assets and revenues constituting a plurality of the total and with a primary listing of the common stock on the NYSE, NYSE Arca, NYSE American (formerly NYSE MKT), Nasdaq Global Select Market, Nasdaq Select Market, Nasdaq Capital Market, Cboe BZX (formerly Bats BZX), Cboe BYX (formerly Bats BYX), Cboe EDGA (formerly Bats EDGA) or Cboe EDGX (formerly Bats EDGX) (each, an "eligible exchange")); the proposed constituent has an investable weight factor ("IWF") of 10% or more; the inclusion of the company will contribute to sector balance in the S&P 500® Index relative to sector balance in the market in the relevant market capitalization range; financial viability (the sum of the most recent four consecutive quarters' Generally Accepted Accounting Principles (GAAP) earnings (net income excluding discontinued operations) should be positive as should the most recent quarter); and, for IPOs, the company must be traded on an eligible exchange for at least twelve months (for former SPACs, S&P considers the de-SPAC transaction to be an event equivalent to an IPO, and 12 months of trading post the de-SPAC event are required before a former SPAC can be considered for inclusion in the S&P 500® Index; spin-offs or in-specie distributions from existing constituents do not need to be traded on an eligible exchange for twelve months prior to their inclusion in the S&P 500® Index). In addition, constituents of the S&P MidCap 400® Index and the S&P SmallCap 600® Index can be added to the S&P 500® Index provided they meet the unadjusted company level market capitalization eligibility criteria for the S&P 500® Index. Migrations from the S&P MidCap 400® Index or the S&P SmallCap 600® Index do not need to meet the financial viability, liquidity, or 50% of the S&P 500® Index's unadjusted company level minimum market capitalization threshold criteria. Further, constituents of the S&P Total Market Index Ex S&P Composite 1500 (which includes all eligible U.S. common equities except for those included in the S&P 500® Index, the S&P MidCap 400® Index and the S&P SmallCap 600® Index) that acquire a constituent of the S&P 500® Index, the S&P MidCap 400® Index or the S&P SmallCap 600® Index that do not fully meet all of the eligibility criteria may still be added to the S&P 500® Index at the discretion of the Index Committee if the merger consideration includes the acquiring company issuing stock to target company shareholders, and the Index Committee determines that the addition could minimize turnover and enhance the representativeness of the S&P 500® Index as a market benchmark. Certain types of organizational structures and securities are always excluded, including, but not limited to, business development companies (BDCs), limited partnerships, master limited partnerships, limited liability companies (LLCs), OTC bulletin board issues, closed-end funds, ETFs, ETNs, royalty trusts, tracking stocks, special purpose acquisition companies (SPACs), preferred stock and convertible preferred stock, unit trusts, equity warrants, convertible bonds, investment trusts, rights and American depositary receipts (ADRs). Stocks are deleted from the S&P 500® Index when they are involved in mergers, acquisitions or significant restructurings such that they no longer meet the inclusion criteria, and when they substantially violate one or more of the addition criteria. Stocks that are delisted or moved to the pink sheets or the bulletin board are removed, and those that experience a trading halt may be retained or removed in S&P's discretion. S&P evaluates additions and deletions with a view to maintaining S&P 500® Index continuity.

For constituents included in the S&P 500® Index prior to July 31, 2017, all publicly listed multiple share class lines are included separately in the S&P 500® Index, subject to, in the case of any such share class line, that share class line satisfying the liquidity and float criteria discussed above and subject to certain exceptions. It is possible that one listed share class line of a company may be included in the S&P 500® Index while a second listed share class line of the same company is excluded. For companies that issue a second publicly traded share class to index share class holders, the newly issued share class line is considered for inclusion if the event is mandatory and the market capitalization of the distributed class is not considered to be de minimis.

As of July 31, 2017, companies with multiple share class lines are no longer eligible for inclusion in the S&P 500® Index. Only common shares are considered when determining whether a company has a multiple share class structure. Constituents of the S&P 500® Index prior to July 31, 2017 with multiple share class lines will be grandfathered in and continue to be included in the S&P 500® Index. If an S&P 500® Index constituent reorganizes

into a multiple share class line structure, that company will be reviewed for continued inclusion in the S&P 500® Index at the discretion of the S&P Index Committee.

Calculation of the S&P 500® Index

The S&P 500® Index is calculated using a base-weighted aggregative methodology. The value of the S&P 500® Index on any day for which an index value is published is determined by a fraction, the numerator of which is the aggregate of the market price of each stock in the S&P 500® Index *times* the number of shares of such stock included in the S&P 500® Index, and the denominator of which is the divisor, which is described more fully below. The “market value” of any index stock is the *product* of the market price per share of that stock *times* the number of the then-outstanding shares of such index stock that are then included in the S&P 500® Index.

The S&P 500® Index is also sometimes called a “base-weighted aggregative index” because of its use of a divisor. The “divisor” is a value calculated by S&P that is intended to maintain conformity in index values over time and is adjusted for all changes in the index stocks’ share capital after the “base date” as described below. The level of the S&P 500® Index reflects the total market value of all index stocks relative to the S&P 500® Index’s base date of 1941-43.

In addition, the S&P 500® Index is float-adjusted, meaning that the share counts used in calculating the S&P 500® Index reflect only those shares available to investors rather than all of a company’s outstanding shares. S&P seeks to exclude shares held by long-term, strategic shareholders concerned with the control of a company, a group that generally includes the following: officers and directors and related individuals whose holdings are publicly disclosed, private equity, venture capital, special equity firms, asset managers and insurance companies with board of director representation, publicly traded companies that hold shares in another company, holders of restricted shares (except for shares held as part of a lock-up agreement), company-sponsored employee share plans/trusts, defined contribution plans/savings, investment plans, foundations or family trusts associated with the company, government entities at all levels (except government retirement or pension funds), sovereign wealth funds and any individual person listed as a 5% or greater stakeholder in a company as reported in regulatory filings (collectively, “strategic holders”). To this end, S&P excludes all share-holdings (other than depository banks, pension funds (including government pension and retirement funds), mutual funds, exchange traded fund providers, investment funds, asset managers that do not have direct board of director representation (including stakeholders who may have the right to appoint a board of director member but choose not to do so, stakeholders who have exercised a right to appoint a board of director “observer” even if that observer is employed by the stakeholder and stakeholders who have exercised a right to appoint an independent director who is not employed by the stakeholder), investment funds of insurance companies and independent foundations not associated with the company) with a position greater than 5% of the outstanding shares of a company from the float-adjusted share count to be used in S&P 500® Index calculations.

The exclusion is accomplished by calculating an IWF for each stock that is part of the numerator of the float-adjusted index fraction described above:

$$\text{IWF} = (\text{available float shares})/(\text{total shares outstanding})$$

where available float shares is defined as total shares outstanding less shares held by strategic holders. In most cases, an IWF is reported to the nearest one percentage point. For companies with multiple share class lines, a separate IWF is calculated for each share class line.

Maintenance of the S&P 500® Index

In order to keep the S&P 500® Index comparable over time S&P engages in an index maintenance process. The S&P 500® Index maintenance process involves changing the constituents as discussed above, and also involves maintaining quality assurance processes and procedures, adjusting the number of shares used to calculate the S&P 500® Index, monitoring and completing the adjustments for company additions and deletions, adjusting for stock splits and stock dividends and adjusting for other corporate actions. In addition to its daily governance of indices and maintenance of the S&P 500® Index methodology, at least once within any 12 month period, the S&P Index Committee reviews the S&P 500® Index methodology to ensure the S&P 500® Index continues to achieve the stated objective, and that the data and methodology remain effective. The S&P Index Committee may at times consult with investors, market participants, security issuers included in or potentially included in the S&P 500® Index, or investment and financial experts.

Divisor Adjustments

The two types of adjustments primarily used by S&P are divisor adjustments and adjustments to the number of shares (including float adjustments) used to calculate the S&P 500® Index. Set forth below under “Adjustments for Corporate Actions” is a table of certain corporate events and their resulting effect on the divisor and the share count. If a corporate event requires an adjustment to the divisor, that event has the effect of altering the market value of the affected index stock and consequently of altering the aggregate market value of the index stocks

following the event. In order that the level of the S&P 500® Index not be affected by the altered market value (which could be an increase or decrease) of the affected index stock, S&P generally derives a new divisor by dividing the post-event market value of the index stocks by the pre-event index value, which has the effect of reducing the S&P 500® Index's post-event value to the pre-event level.

Changes to the Number of Shares of a Constituent

The index maintenance process also involves tracking the changes in the number of shares included for each of the index companies. Changes as a result of mandatory events, such as mergers or acquisition driven share/IWF changes, stock splits and mandatory distributions are not subject to a minimum threshold for implementation and are implemented when the transaction occurs. At S&P's discretion, however, de minimis merger and acquisition changes may be accumulated and implemented with the updates made with the quarterly share updates as described below. Material share/IWF changes resulting from certain non-mandatory corporate actions follow the accelerated implementation rule. Non-material share/IWF changes are implemented quarterly.

Accelerated Implementation Rule

1. Public offerings. Public offerings of new company-issued shares and/or existing shares offered by selling shareholders, including block sales and spot secondaries, will be eligible for accelerated implementation treatment if the size of the event meets the materiality threshold criteria:

- (a) at least US \$150 million, and
- (b) at least 5% of the pre-event total shares.

In addition to the materiality threshold, public offerings must satisfy the following conditions:

- be underwritten.
- have a publicly available prospectus, offering document, or prospectus summary filed with the relevant authorities.
- have a publicly available confirmation from an official source that the offering has been completed.

For public offerings that involve a concurrent combination of new company shares and existing shares offered by selling shareholders, both events are implemented if either of the public offerings represent at least 5% of total shares and \$150 million. Any concurrent share repurchase by the affected company will also be included in the implementation.

2. Dutch Auctions, self-tender offer buybacks, and split-off exchange offers. These nonmandatory corporate action types will be eligible for accelerated implementation treatment regardless of size once the final results are publicly announced and verified by S&P.

Exception to the Accelerated Implementation Rule

For non-mandatory corporate actions subject to the accelerated implementation rule with a size of at least US \$1 billion, S&P will apply the share change, and any resulting IWF change, using the latest share and ownership information publicly available at the time of the announcement, even if the offering size is below the 5% threshold. This exception ensures that very large events are recognized in a timely manner using the latest available information.

All non-mandatory events not covered by the accelerated implementation rule (including but not limited to private placements, acquisition of private companies, and conversion of non-index share lines) will be implemented quarterly coinciding with the third Friday of the third month in each calendar quarter. In addition, events that were not implemented under the accelerated implementation rule but were found to have been eligible, (e.g. due to lack of publicly available information at the time of the event) are implemented as part of a quarterly rebalancing.

Announcement Policy

For accelerated implementation, S&P will generally provide two (2) business days' notice for all non-U.S. listed stocks and U.S. listed depositary receipts, and one (1) business days' notice for all non-depositary receipt U.S. listed stocks.

IWF Updates

Accelerated implementation for events less than \$1 billion will include an adjustment to the company's IWF only to the extent that such an IWF change helps the new float share total mimic the shares available in the offering. To minimize unnecessary turnover, these IWF changes do not need to meet any minimum threshold requirement for implementation. Any IWF change resulting in an IWF of 0.96 or greater is rounded up to 1.00 at the next annual IWF review.

IWF changes will only be made at the quarterly review if the change represents at least 5% of total current shares outstanding and is related to a single corporate action that did not qualify for the accelerated implementation rule, regardless of whether there is an associated share change.

Quarterly share change events resulting from the conversion of derivative securities, acquisitions of private companies, or acquisitions of non-index companies that do not trade on a major exchange are considered to be available to investors unless there is explicit information stating that the new owner is a strategic holder.

Other than the situations described above, please note that IWF changes are only made at the annual IWF review.

Share Updates

For companies with multiple share class lines, the criteria specified under the heading “Accelerated Implementation Rule” above apply to each individual multiple share class line rather than total company shares.

Exceptions:

Any non- fully paid or non-fully settled offering such as forward sales agreements are not eligible for accelerated implementation. Share updates resulting from completion of subscription receipts terms or the settlement of forward sale agreements are updated at a future quarterly share rebalance.

Rebalancing Guidelines – Share/IWF Reference Date & Freeze Period

A reference date, after the market close five weeks prior to the third Friday in March, June, September, and December, is the cutoff for publicly available information used for quarterly shares outstanding and IWF changes. All shares outstanding and ownership information contained in public filings and/or official sources dated on or before the reference date are included in that quarter's update. In addition, there is a freeze period on a quarterly basis for any changes that result from the accelerated implementation rules.

Pro-forma files for float-adjusted market capitalization indices are generally released after the market close on the first Friday, two weeks prior to the rebalancing effective date. Pro-forma files for capped and alternatively weighted indices are generally released after the market close on the second Friday, one week prior to the rebalancing effective date. For illustration purposes, if rebalancing pro-forma files are scheduled to be released on Friday, March 5, the share/IWF freeze period will begin after the close of trading on Tuesday, March 9 and will end after the close of trading the following Friday, March 19 (i.e. the third Friday of the rebalancing month).

During the share/IWF freeze period, shares and IWFs are not changed and the accelerated implementation rule is suspended, except for mandatory corporate action events (such as merger activity, stock splits, and rights offerings). The suspension includes all changes that qualify for accelerated implementation and would typically be announced or effective during the share/IWF freeze period. At the end of the freeze period all suspended changes will be announced on the third Friday of the rebalancing month and implemented five business days after the quarterly rebalancing effective date.

Adjustments for Corporate Actions

There is a large range of corporate actions that may affect companies included in the S&P 500® Index. Certain corporate actions require S&P to recalculate the share count or the float adjustment or to make an adjustment to the divisor to prevent the value of the S&P 500® Index from changing as a result of the corporate action. This helps ensure that the movement of the S&P 500® Index does not reflect the corporate actions of individual companies in the S&P 500® Index.

Spin-Offs

As a general policy, a spin-off security is added to the S&P 500® Index on the ex-date at a price of zero (with no divisor adjustment) and will remain in the S&P 500® Index for at least one trading day. The spin-off security will remain in the S&P 500® Index if it meets all eligibility criteria. If the spin-off security is determined ineligible to remain in the S&P 500® Index, it will generally be removed after at least one day of regular way trading (with a divisor adjustment). The weight of the spin-off being deleted is reinvested across all the index components proportionately such that the relative weights of all index components are unchanged. The net change in index market capitalization will cause a divisor change.

Companies that are spun off from a constituent of the S&P 500® Index do not need to meet the eligibility criteria for new constituents, but they should be considered U.S. domiciled for index purposes. At the discretion of the Index Committee, a spin-off company may be retained in the S&P 500® Index if the Index Committee determines it has a total market capitalization representative of the S&P 500® Index. If the spin-off company's estimated market capitalization is below the minimum unadjusted company market capitalization for the S&P 500® Index but there are

other constituent companies in the S&P 500® Index that have a significantly lower total market capitalization than the spin-off company, the Index Committee may decide to retain the spin-off company in the S&P 500® Index.

Several additional types of corporate actions, and their related treatment, are listed in the table below.

Corporate Action	Treatment
Company addition/deletion	<u>Addition</u> Companies are added at the float market capitalization weight. The net change to the index market capitalization causes a divisor adjustment. <u>Deletion</u> The weights of all stocks in the index will proportionally change. Relative weights will stay the same. The index divisor will change due to the net change in the index market capitalization
Change in shares outstanding	Increasing (decreasing) the shares outstanding increases (decreases) the market capitalization of the index. The change to the index market capitalization causes a divisor adjustment.
Split/reverse split	Shares outstanding are adjusted by split ratio. Stock price is adjusted by split ratio. There is no change to the index market capitalization and no divisor adjustment.
Change in IWF	Increasing (decreasing) the IWF increases (decreases) the market capitalization of the index. A net change to the index market capitalization causes a divisor adjustment.
Ordinary dividend	When a company pays an ordinary cash dividend, the index does not make any adjustments to the price or shares of the stock. As a result there are no divisor adjustments to the index.
Special dividend	The stock price is adjusted by the amount of the dividend. The net change to the index market capitalization causes a divisor adjustment
Rights offering	All rights offerings that are in the money on the ex-date are applied under the assumption the rights are fully subscribed. The stock price is adjusted by the value of the rights and the shares outstanding are increased by the rights ratio. The net change in market capitalization causes a divisor adjustment.

Any company that is removed from the S&P 500® Index, the S&P MidCap 400® Index or the S&P SmallCap 600® Index must wait a minimum of one year from its removal date before being reconsidered as a replacement candidate for the S&P 500® Index.

Recalculation Policy

S&P reserves the right to recalculate and republish the S&P 500® Index at its discretion in the event one of the following issues has occurred: (1) incorrect or revised closing price of one or more constituent securities; (2) missed or misapplied corporate action; (3) incorrect application of an index methodology; (4) late announcement of a corporate action; or (5) incorrect calculation or data entry error. The decision to recalculate the S&P 500® Index is made at the discretion of the index manager and/or index committee, as further discussed below. The potential market impact or disruption resulting from a recalculation is considered when making any such decision. In the event of an incorrect closing price, a missed or misapplied corporate action, a late announcement of a corporate action, or an incorrect calculation or data entry error that is discovered within two trading days of its occurrence, generally the S&P 500® Index is recalculated. In the event any such event is discovered beyond the two trading day period, the index committee shall decide whether the S&P 500® Index should be recalculated. In the event of an incorrect application of the methodology that results in the incorrect composition and/or weighting of index constituents, the index committee shall determine whether or not to recalculate the S&P 500® Index following specified guidelines. In the event that the S&P 500® Index is recalculated, it shall be done within a reasonable timeframe following the detection and review of the issue.

Calculations and Pricing Disruptions

Closing levels for the S&P 500® Index are calculated by S&P based on the closing price of the individual constituents of the S&P 500® Index as set by their primary exchange. Closing prices are received by S&P from one of its third party vendors and verified by comparing them with prices from an alternative vendor. The vendors

receive the closing price from the primary exchanges. Real-time intraday prices are calculated similarly without a second verification. Official end-of-day calculations are based on each stock's primary market closing price. Prices used for the calculation of real time index values are based on the "Consolidated Tape". The Consolidated Tape is an aggregation of trades for each constituent over all regional exchanges and trading venues and includes the primary exchange. If there is a failure or interruption on one or more exchanges, real-time calculations will continue as long as the "Consolidated Tape" is operational.

If an interruption is not resolved prior to the market close, official closing prices will be determined by following the hierarchy set out in NYSE Rule 123C. A notice is published on the S&P website at spglobal.com indicating any changes to the prices used in S&P 500® Index calculations. In extreme circumstances, S&P may decide to delay index adjustments or not publish the S&P 500® Index. Real-time indices are not restated.

Unexpected Exchange Closures

An unexpected market/exchange closure occurs when a market/exchange fully or partially fails to open or trading is temporarily halted. This can apply to a single exchange or to a market as a whole, when all of the primary exchanges are closed and/or not trading. Unexpected market/exchange closures are usually due to unforeseen circumstances, such as natural disasters, inclement weather, outages, or other events.

To a large degree, S&P is dependent on the exchanges to provide guidance in the event of an unexpected exchange closure. S&P's decision making is dependent on exchange guidance regarding pricing and mandatory corporate actions.

NYSE Rule 123C provides closing contingency procedures for determining an official closing price for listed securities if the exchange is unable to conduct a closing transaction in one or more securities due to a system or technical issue.

3:00 PM ET is the deadline for an exchange to determine its plan of action regarding an outage scenario. As such, S&P also uses 3:00 PM ET as the cutoff.

If all major exchanges fail to open or unexpectedly halt trading intraday due to unforeseen circumstances, S&P will take the following actions:

Market Disruption Prior to Open of Trading:

- (i) If all exchanges indicate that trading will not open for a given day, S&P will treat the day as an unscheduled market holiday. The decision will be communicated to clients as soon as possible through the normal channels. Indices containing multiple markets will be calculated as normal, provided that at least one market is open that day. Indices which only contain closed markets will not be calculated.
- (ii) If exchanges indicate that trading, although delayed, will open for a given day, S&P will begin index calculation when the exchanges open.

Market Disruption Intraday:

- (i) If exchanges indicate that trading will not resume for a given day, the S&P 500® Index level will be calculated using prices determined by the exchanges based on NYSE Rule 123C. Intraday S&P 500® Index values will continue to use the last traded composite price until the primary exchange publishes official closing prices.

License Agreement between S&P and GS Finance Corp.

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Historical Closing Levels of the Excess Return Index

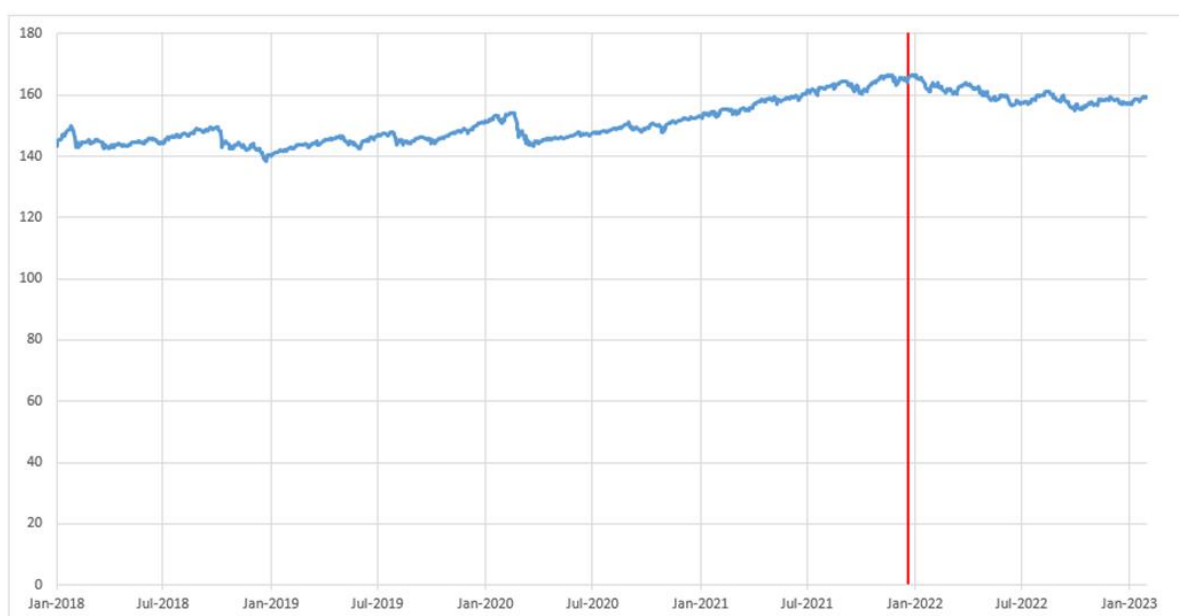
The closing level of the Excess Return index has fluctuated in the past and may, in the future, experience significant fluctuations. **In particular, the Excess Return index has recently experienced extreme and unusual volatility.** Any historical upward or downward trend in the closing level of the Excess Return index during the period shown below is not an indication that the Excess Return index is more or less likely to increase or decrease at any time during the life of your notes.

You should not take the historical levels of the Excess Return index as an indication of the future performance of the Excess Return index, including because of the recent volatility described above. We cannot give you any assurance that the future performance of the Excess Return index or the Excess Return index stocks will result in your receiving an amount greater than the outstanding face amount of your notes on the stated maturity date.

Neither we nor any of our affiliates make any representation to you as to the performance of the Excess Return index. Before investing in the offered notes, you should consult publicly available information to determine the levels of the Excess Return index between the date of this pricing supplement and the date of your purchase of the offered notes **and, given the recent volatility described above, you should pay particular attention to recent levels of the Excess Return index.** The actual performance of the Excess Return index over the life of the offered notes, as well as the cash settlement amount, may bear little relation to the historical closing levels shown below.

The graph below shows the daily historical closing levels of the Excess Return index from January 1, 2018 through January 31, 2023. As a result, the following graph does not reflect the global financial crisis which began in 2008, which had a materially negative impact on the price of most equity securities and, as a result, the level of most equity indices. We obtained the closing levels in the graph below from Bloomberg Financial Services, without independent verification.

Historical Performance of the S&P 500® Daily Risk Control 5% USD Excess Return Index*

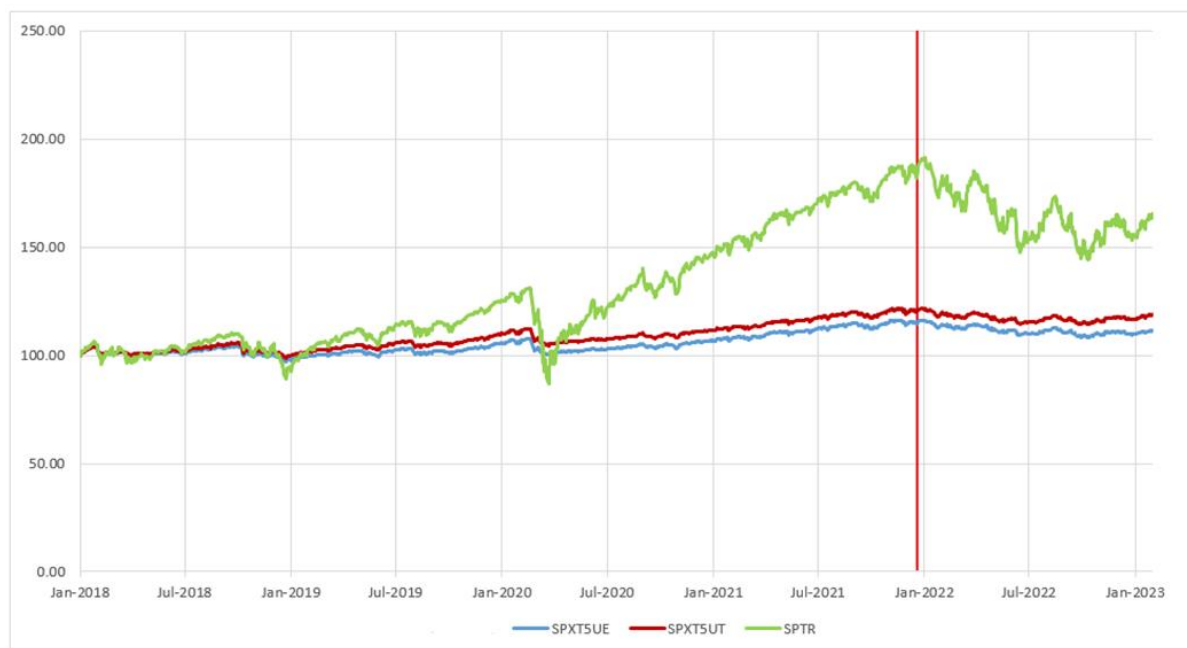


* Index data reflects the Excess Return index's use of overnight U.S. dollar LIBOR prior to December 20, 2021. The Excess Return index discontinued use of overnight U.S. dollar LIBOR for all purposes on December 20, 2021 and replaced such rate with SOFR *plus* 0.02963%. Therefore, extremely limited information regarding the performance of the Excess Return index subsequent to its discontinued use of overnight U.S. dollar LIBOR is available, which may make it difficult for you to make an informed decision with respect to an investment in the notes. In the graph, closing levels to the left of the vertical solid line marker reflect the historical closing levels of the underlier before the Excess Return index discontinued use of overnight U.S. dollar LIBOR on December 20, 2021. Closing levels to the right of the vertical solid line marker reflect the historical closing levels of the underlier after the Excess Return index discontinued use of overnight U.S. dollar LIBOR on December 20, 2021.

Comparative Performance of the Excess Return Index, the Risk Control Index and the Total Return Index

The graph below shows the performance of the Excess Return index, the Risk Control index and the Total Return index from January 1, 2018 through January 31, 2023. For comparative purposes, each of the Excess Return index, the Risk Control index and the Total Return index has been adjusted to have a closing level of 100.00 on January 1, 2018 by dividing the closing level of that underlier on each day by the closing level of that Risk Control index on January 1, 2018 and multiplying by 100.00. We obtained the closing levels used to determine the adjusted closing levels in the graph below from Bloomberg Financial Services, without independent verification. You should not take the historical performance of the Excess Return index, the Risk Control index or the Total Return index as an indication of the future performance of such underlier.

Historical Performance of the Excess Return Index (SPXT5UE Index), the Risk Control Index (SPXT5UT Index) and the Total Return Index (SPTR Index)*



* Underlier data reflects the Excess Return index and the Risk Control index's use of overnight U.S. dollar LIBOR prior to December 20, 2021. Each of the Excess Return index and the Risk Control index discontinued use of overnight U.S. dollar LIBOR for all purposes on December 20, 2021 and replaced such rate with SOFR *plus* 0.02963%. Therefore, extremely limited information regarding the performances of the Excess Return index and the Risk Control index subsequent to their discontinued use of overnight U.S. dollar LIBOR is available, which may make it difficult for you to make an informed decision with respect to an investment in the notes. In the graph, closing levels to the left of the vertical solid line marker reflect the historical closing levels of the underlier before the Excess Return index and the Risk Control index discontinued use of overnight U.S. dollar LIBOR on December 20, 2021. Closing levels to the right of the vertical solid line marker reflect the historical closing levels of the Excess Return index and the Risk Control index after the Excess Return index and the Risk Control index discontinued use of overnight U.S. dollar LIBOR on December 20, 2021.

The graph above illustrates the historical performance of the Excess Return index relative to the Risk Control index and the Total Return index over the time period shown and provides an indication of how the relative performance of the daily returns of the Excess Return index has historically been relative to the Risk Control index and the Total Return index. The Excess Return index will always underperform the Risk Control index.

THE CPI

The Consumer Price Index (CPI) is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services, including food, clothing, shelter, fuels, transportation, doctors' and dentists' services, drugs and other goods and services that people buy for day-to-day living. The CPI is reported monthly by the Bureau of Labor Statistics of the U.S. Department of Labor (which we refer to as the "BLS"). The BLS sets the average CPI level for the base reference period — the 36-month period covering 1982, 1983 and 1984 — equal to 100, and then measures changes in relation to that figure. The CPI for a particular month is published during the following month.

In calculating the CPI, price changes for the various items are averaged together with weights that represent their importance in the spending of urban households in the United States. The contents of the market basket of goods and services and the weights assigned to the various items are updated periodically by the BLS to take into account changes in consumer buying habits or shifts in population distribution or demographics.

Additional information about the CPI is available on the following website: [bls.gov/cpi/](https://www.bls.gov/cpi/). We are not incorporating by reference the website or any material it includes in this pricing supplement.

Whose buying habits does the CPI reflect?

The CPI reflects spending patterns for each of two population groups: all urban consumers and urban wage earners and clerical workers. The all urban consumer group represents about 93 percent of the total U.S. population. It is based on the expenditures of almost all residents of urban or metropolitan areas, including professionals, the self-employed, the unemployed, and retired people, as well as urban wage earners and clerical workers. Not included in the CPI are the spending patterns of people living in rural nonmetropolitan areas, those in farm households, people in the Armed Forces, and those in institutions, such as prisons and mental hospitals.

What goods and services are covered by the CPI?

The CPI represents all goods and services purchased for consumption by all urban consumers. The market basket of consumer goods and services is developed from detailed expenditure information provided by families and individuals on what they actually bought. The BLS classifies all expenditure items into more than 200 categories, arranged into eight major groups. Major groups and examples of categories in each are as follows:

- Food and beverages: breakfast cereal, milk, coffee, chicken, wine, full service meals and snacks;
- Housing: rent of primary residence, owners' equivalent rent, utilities and bedroom furniture;
- Apparel: men's shirts and sweaters, women's dresses, baby clothes, shoes and jewelry;
- Transportation: new vehicles, airline fares, gasoline and motor vehicle insurance;
- Medical care: prescription drugs, medical equipment and supplies, physicians' services, eyeglasses and eye care and hospital services;
- Recreation: televisions, toys, pets and pet products, sports equipment and park and museum admissions;
- Education and communication: college tuition, postage, telephone services, computer software and accessories; and
- Other goods and services: tobacco and smoking products, haircuts and other personal services and funeral expenses.

Also included within these major groups are various government-charged user fees, such as water and sewerage charges, auto registration fees, and vehicle tolls. In addition, the CPI includes taxes (such as sales and excise taxes) that are directly associated with the prices of specific goods and services. However, the CPI excludes taxes (such as income and Social Security taxes) not directly associated with the purchase of consumer goods and services. The CPI also does not include investment items, such as stocks, bonds, real estate, and life insurance because these items relate to savings, and not to day-to-day consumption expenses. For each of the item categories, using scientific statistical procedures, the BLS has chosen samples of several hundred specific items within selected business establishments frequented by consumers to represent the thousands of varieties available in the marketplace.

How is price data collected and reviewed?

Each month, BLS data collectors visit (in person or on the web) or call thousands of retail stores, service establishments, rental units, and doctors' offices, all over the United States, to obtain information on the prices of

the thousands of items used to track and measure price changes in the CPI. These data collectors record the prices of about 80,000 items each month, representing a scientifically selected sample of the prices paid by consumers for goods and services purchased. During each call or visit, the economic assistant collects price data on a specific good or service that was precisely defined during an earlier visit. If the selected item is available, the economic assistant records its price. If the selected item is no longer available, or if there have been changes in the quality or quantity of the good or service since the last time prices were collected, the data collector selects a new item or records the quality change in the current item. Data on prices for goods and services are collected each month in 75 urban areas across the country from about 6,000 housing units and approximately 24,000 retail establishments, which include department stores, supermarkets, hospitals, filling stations, and other types of stores and service establishments. All taxes directly associated with the purchase and use of items are included in the CPI. Data on rents are collected from about 50,000 landlords or tenants. Prices of fuels and a few other items are obtained every month in all 75 locations. Prices of most other commodities and services are collected every month in the three largest geographic areas and every other month in other areas.

The recorded information is sent to the national office of BLS, where specialists who have detailed knowledge about the particular goods or services priced review the data. These specialists check the data for accuracy and consistency, and make any necessary corrections or adjustments, which can range from an adjustment for a change in the size or quantity of a packaged item, to more complex adjustments based upon statistical analysis of the value of an item's features or quality. Thus, commodity specialists strive to prevent changes in the quality of items from affecting the CPI's measurement of price change.

How is the CPI calculated?

The CPI is a product of a series of interrelated samples. First, using data from the U.S. Census, the BLS selects the urban areas from which data on prices are collected. Next, a sample of data from the Consumer Expenditure Survey identifies the places where households purchase various types of goods and services, forming the basis for the CPI's outlet sample. Also using data from the Consumer Expenditure Survey, the BLS statisticians assign quotes in the CPI item categories to specific outlets. A specific item is then chosen for selection using a process which bases the probability of selection for an item on the share the item composes within the outlet's revenue in that item category.

Recorded price changes are weighted by the importance of the item in the spending patterns of the appropriate population group. The combination of carefully selected geographic areas, retail establishments, commodities and services, and associated weight, gives a weighted measurement of price change for all items in all outlets, in all areas priced for the CPI.

In calculating the CPI, price changes for the various items in each location are averaged together based on their weights, which represent their importance in the spending of the appropriate population group. Local data are then aggregated to obtain a U.S. city average and converted to a CPI to show price changes for the United States as a whole. The level of the CPI is considered final when released.

Will the CPI be updated or revised?

The CPI is subject to revision by the BLS. For example, the BLS revises the CPI to account for significant changes in consumer buying habits or shifts in population distribution or demographics. In addition, the census conducted every 10 years by the U.S. Census Bureau provides information that enables the BLS to reselect a new geographic sample that accurately reflects the current population distribution and other demographic factors. Also, as a matter of policy, the BLS researches statistical methods to apply to the calculation of the CPI. Thus, even between major revisions, further update or revisions to the CPI are made.

Is the CPI adjusted for seasonal changes?

The CPI is not adjusted to remove the effect of seasonal influences — those which occur at the same time and in about the same magnitude every year. Among these influences are price movements resulting from changing weather conditions, production cycles, changeovers of models, and holidays. Accordingly, it may be difficult to tell whether changes in the CPI between any two months reflect changing economic conditions or only normal seasonal patterns.

What are some of the limitations of the CPI?

The CPI may not be applicable to all population groups. For example, the CPI is designed to measure inflation for the U.S. urban population and thus may not accurately reflect the experience of people living in rural areas. Also, the CPI does not produce official estimates for the rate of inflation experienced by subgroups of the population, such as the elderly or the poor.

Another limitation is that the CPI cannot be used to measure differences in price levels or living costs between one area and another as it measures only time-to-time changes in each area. A higher index for one area does not necessarily mean that prices are higher there than in another area with a lower index. Instead, it means that prices have risen faster in the area with the higher index calculated from the two areas' common reference period. Additionally, the CPI is a conditional cost-of-living measure; it does not attempt to measure everything that affects living standards. Factors such as social and environmental changes and changes in income taxes are beyond the definitional scope of the CPI and are excluded.

The CPI is a measure of prices based on a sample of items, and therefore differs somewhat from what the results would be if the actual records of all retail purchases by everyone in the index population could be used to compile the CPI. These estimating or sampling errors are limitations in the accuracy of the CPI, not mistakes in calculating the CPI. The BLS calculates and publishes estimates of the 1-month, 2-month, 6-month and 12-month percent change standard errors annually for the CPI.

Furthermore, non-sampling errors occur from a variety of sources. Unlike sampling errors, they can cause persistent bias in measurements of the CPI. Non-sampling errors are caused by problems of price data collection, logistical lags in conducting surveys, difficulties in defining basic concepts and their operational implementation, and difficulties in handling the problems of quality change. Non-sampling errors can be far more hazardous to the accuracy of a price index than sampling errors.

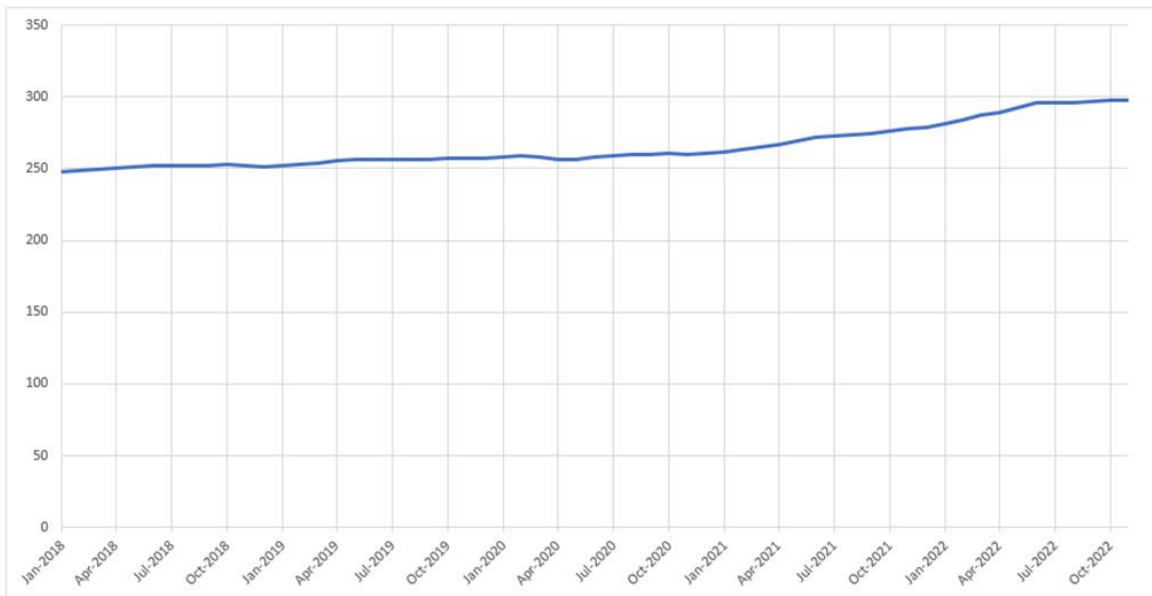
Historical Levels of the CPI

The level of the CPI has fluctuated in the past and may, in the future, experience significant fluctuations. **In particular, the CPI has recently experienced extreme and unusual volatility.** Any historical upward or downward trend in the level of the CPI during the period shown below is not an indication that the CPI is more or less likely to increase or decrease at any time during the life of your notes.

You should not take the historical level of the CPI as an indication of the future performance of the CPI, including because of the recent volatility described above. We cannot give you any assurance that the future performance of the CPI will result in your receiving an amount greater than the outstanding face amount of your notes on the stated maturity date.

Neither we nor any of our affiliates make any representation to you as to the performance of the CPI. Before investing in the offered notes, you should consult publicly available information to determine the levels of the CPI between the date of this pricing supplement and the date of your purchase of the offered notes **and, given the recent volatility described above, you should pay particular attention to recent levels of the CPI.** The actual performance of the CPI over the life of the offered notes, as well as the cash settlement amount, may bear little relation to the historical levels shown below.

The graph below shows the published levels of the CPI for each month from January 2018 through November 2022. We obtained the levels in the graph below from Bloomberg Financial Services, without independent verification.



SUPPLEMENTAL DISCUSSION OF U.S. FEDERAL INCOME TAX CONSEQUENCES

The following section supplements the discussion of U.S. federal income taxation in the accompanying prospectus supplement.

The following section is the opinion of Sidley Austin LLP, counsel to GS Finance Corp. and The Goldman Sachs Group, Inc. It applies to you only if you hold your notes as a capital asset for tax purposes. This section does not apply to you if you are a member of a class of holders subject to special rules, such as:

- a dealer in securities or currencies;
- a trader in securities that elects to use a mark-to-market method of accounting for your securities holdings;
- a bank;
- a regulated investment company;
- a life insurance company;
- a tax-exempt organization;
- a partnership;
- an accrual method taxpayer subject to special tax accounting rules as a result of its use of financial statements;
- a person that owns the notes as a hedge or that is hedged against interest rate risks;
- a person that owns the notes as part of a straddle or conversion transaction for tax purposes; or
- a United States holder (as defined below) whose functional currency for tax purposes is not the U.S. dollar.

This section is based on the U.S. Internal Revenue Code of 1986, as amended, its legislative history, existing and proposed regulations under the Internal Revenue Code, published rulings and court decisions, all as currently in effect. These laws are subject to change, possibly on a retroactive basis.

You should consult your tax advisor concerning the U.S. federal income tax and other tax consequences of your investment in the notes, including the application of state, local or other tax laws and the possible effects of changes in federal or other tax laws.

United States Holders

This subsection describes the tax consequences to a United States holder. You are a United States holder if you are a beneficial owner of the notes and you are:

- a citizen or resident of the United States;
- a domestic corporation;
- an estate whose income is subject to U.S. federal income tax regardless of its source; or
- a trust if a United States court can exercise primary supervision over the trust's administration and one or more United States persons are authorized to control all substantial decisions of the trust.

If you are not a United States holder, this section does not apply to you and you should refer to “— Non-United States Holders” below.

Your notes will be treated as debt instruments subject to special rules governing contingent payment debt instruments for U.S. federal income tax purposes. Under those rules, the amount of interest you are required to take into account for each accrual period will be determined by constructing a projected payment schedule for your notes and applying rules similar to those for accruing original issue discount on a hypothetical noncontingent debt instrument with that projected payment schedule. This method is applied by first determining the yield at which we would issue a noncontingent fixed rate debt instrument with terms and conditions similar to your notes (the “comparable yield”) and then determining as of the issue date a payment schedule that would produce the comparable yield. These rules will generally have the effect of requiring you to include amounts in income in respect of your notes over their term based on the comparable yield for the notes, even though you will not receive any payments from us until maturity.

We have determined that the comparable yield for the notes is equal to 4.74% per annum, compounded semi-annually, with a projected payment at maturity of \$1,151.20 based on an investment of \$1,000.

Based on this comparable yield, if you are an initial holder that holds a note until maturity and you pay your taxes on a calendar year basis, we have determined that you would be required to report the following amounts as ordinary income, not taking into account any positive or negative adjustments you may be required to take into account based on the actual payments on the notes, from the note each year:

Accrual Period	Interest Deemed to Accrue During Accrual Period (per \$1,000 note)	Total Interest Deemed to Have Accrued from Original Issue Date (per \$1,000 note) as of End of Accrual Period
February 3, 2023 through December 31, 2023	\$43.52	\$43.52
January 1, 2024 through December 31, 2024	\$50.05	\$93.57
January 1, 2025 through December 31, 2025	\$52.45	\$146.02
January 1, 2026 through February 5, 2026	\$5.18	\$151.20

You are required to use the comparable yield and projected payment schedule that we compute in determining your interest accruals in respect of your notes, unless you timely disclose and justify on your U.S. federal income tax return the use of a different comparable yield and projected payment schedule.

The comparable yield and projected payment schedule are not provided to you for any purpose other than the determination of your interest accruals in respect of your notes, and we make no representation regarding the amount of contingent payments with respect to your notes.

If you purchase your notes at a price other than their adjusted issue price determined for tax purposes, you must determine the extent to which the difference between the price you paid for your notes and their adjusted issue price is attributable to a change in expectations as to the projected payment schedule, a change in interest rates, or both, and reasonably allocate the difference accordingly. The adjusted issue price of your notes will equal your notes' original issue price plus any interest deemed to be accrued on your notes (under the rules governing contingent payment debt instruments) as of the time you purchase your notes. The original issue price of your notes will be the first price at which a substantial amount of the notes is sold to persons other than bond houses, brokers or similar persons or organizations acting in the capacity of underwriters, placement agents or wholesalers. Therefore, you may be required to make the adjustments described above even if you purchase your notes in the initial offering if you purchase your notes at a price other than the issue price.

If the adjusted issue price of your notes is greater than the price you paid for your notes, you must make positive adjustments increasing (i) the amount of interest that you would otherwise accrue and include in income each year, and (ii) the amount of ordinary income (or decreasing the amount of ordinary loss) recognized upon maturity by the amounts allocated under the previous paragraph to each of interest and the projected payment schedule; if the adjusted issue price of your notes is less than the price you paid for your notes, you must make negative adjustments, decreasing (i) the amount of interest that you must include in income each year, and (ii) the amount of ordinary income (or increasing the amount of ordinary loss) recognized upon maturity by the amounts allocated under the previous paragraph to each of interest and the projected payment schedule. Adjustments allocated to the interest amount are not made until the date the daily portion of interest accrues.

Because any Form 1099-OID that you receive will not reflect the effects of positive or negative adjustments resulting from your purchase of notes at a price other than the adjusted issue price determined for tax purposes, you are urged to consult with your tax advisor as to whether and how adjustments should be made to the amounts reported on any Form 1099-OID.

You will recognize gain or loss upon the sale, exchange, or maturity of your notes in an amount equal to the difference, if any, between the cash amount you receive at such time and your adjusted basis in your notes. In general, your adjusted basis in your notes will equal the amount you paid for your notes, increased by the amount of interest you previously accrued with respect to your notes (in accordance with the comparable yield and the projected payment schedule for your notes) and increased or decreased by the amount of any positive or negative adjustment, respectively, that you are required to make if you purchase your notes at a price other than the adjusted issue price determined for tax purposes (as described in the accompanying prospectus supplement).

Any gain you recognize upon the sale, exchange, or maturity of your notes will be ordinary interest income. Any loss you recognize at such time will be ordinary loss to the extent of interest you included as income in the current or previous taxable years in respect of your notes, and thereafter, capital loss. If you are a noncorporate holder, you would generally be able to use such ordinary loss to offset your income only in the taxable year in which you

recognize the ordinary loss and would generally not be able to carry such ordinary loss forward or back to offset income in other taxable years.

Non-United States Holders

If you are a non-United States holder, please see the discussion under “United States Taxation — Taxation of Debt Securities — Non-United States Holders” in the accompanying prospectus for a description of the tax consequences relevant to you. You are a non-United States holder if you are the beneficial owner of the notes and are, for U.S. federal income tax purposes:

- a nonresident alien individual;
- a foreign corporation; or
- an estate or trust that in either case is not subject to U.S. federal income tax on a net income basis on income or gain from the notes.

The Treasury Department has issued regulations under which amounts paid or deemed paid on certain financial instruments (“871(m) financial instruments”) that are treated as attributable to U.S.-source dividends could be treated, in whole or in part depending on the circumstances, as a “dividend equivalent” payment that is subject to tax at a rate of 30% (or a lower rate under an applicable treaty), which in the case of amounts you receive upon the sale, exchange or maturity of your notes, could be collected via withholding. If these regulations were to apply to the notes, we may be required to withhold such taxes if any U.S.-source dividends are paid on the stocks included in the underlier during the term of the notes. We could also require you to make certifications (e.g., an applicable Internal Revenue Service Form W-8) prior to the maturity of the notes in order to avoid or minimize withholding obligations, and we could withhold accordingly (subject to your potential right to claim a refund from the Internal Revenue Service) if such certifications were not received or were not satisfactory. If withholding was required, we would not be required to pay any additional amounts with respect to amounts so withheld. These regulations generally will apply to 871(m) financial instruments (or a combination of financial instruments treated as having been entered into in connection with each other) issued (or significantly modified and treated as retired and reissued) on or after January 1, 2025, but will also apply to certain 871(m) financial instruments (or a combination of financial instruments treated as having been entered into in connection with each other) that have a delta (as defined in the applicable Treasury regulations) of one and are issued (or significantly modified and treated as retired and reissued) on or after January 1, 2017. In addition, these regulations will not apply to financial instruments that reference a “qualified index” (as defined in the regulations). We have determined that, as of the issue date of your notes, your notes will not be subject to withholding under these rules. In certain limited circumstances, however, you should be aware that it is possible for non-United States holders to be liable for tax under these rules with respect to a combination of transactions treated as having been entered into in connection with each other even when no withholding is required. You should consult your tax advisor concerning these regulations, subsequent official guidance and regarding any other possible alternative characterizations of your notes for U.S. federal income tax purposes.

Foreign Account Tax Compliance Act (FATCA) Withholding

Pursuant to Treasury regulations, Foreign Account Tax Compliance Act (FATCA) withholding (as described in “United States Taxation—Taxation of Debt Securities—Foreign Account Tax Compliance Act (FATCA) Withholding” in the accompanying prospectus) will generally apply to obligations that are issued on or after July 1, 2014; therefore, the notes will generally be subject to the FATCA withholding rules.

SUPPLEMENTAL PLAN OF DISTRIBUTION; CONFLICTS OF INTEREST

See “Supplemental Plan of Distribution” on page S-49 of the accompanying general terms supplement no. 2,913, and “Plan of Distribution — Conflicts of Interest” on page 129 of the accompanying prospectus. GS Finance Corp. estimates that its share of the total offering expenses, excluding underwriting discounts and commissions, will be approximately \$10,000.

GS Finance Corp. will sell to GS&Co., and GS&Co. will purchase from GS Finance Corp., the aggregate face amount of the offered notes specified on the front cover of this pricing supplement. GS&Co. proposes initially to offer the notes to the public at the original issue price set forth on the cover page of this pricing supplement, and to certain securities dealers at such price less a concession not in excess of 1.04% of the face amount. GS&Co. is an affiliate of GS Finance Corp. and The Goldman Sachs Group, Inc. and, as such, will have a “conflict of interest” in this offering of notes within the meaning of Financial Industry Regulatory Authority, Inc. (FINRA) Rule 5121. Consequently, this offering of notes will be conducted in compliance with the provisions of FINRA Rule 5121. GS&Co. will not be permitted to sell notes in this offering to an account over which it exercises discretionary authority without the prior specific written approval of the account holder. We have been advised that GS&Co. will also pay a fee in connection with the distribution of the notes to SIMON Markets LLC, a broker-dealer in which an affiliate of GS Finance Corp. holds an indirect minority equity interest.

We will deliver the notes against payment therefor in New York, New York on February 3, 2023. Under Rule 15c6-1 of the Securities Exchange Act of 1934, trades in the secondary market generally are required to settle in two business days, unless the parties to any such trade expressly agree otherwise. Accordingly, purchasers who wish to trade notes on any date prior to two business days before delivery will be required to specify alternative settlement arrangements to prevent a failed settlement.

We have been advised by GS&Co. that it intends to make a market in the notes. However, neither GS&Co. nor any of our other affiliates that makes a market is obligated to do so and any of them may stop doing so at any time without notice. No assurance can be given as to the liquidity or trading market for the notes.

The notes will not be listed on any securities exchange or interdealer quotation system.

VALIDITY OF THE NOTES AND GUARANTEE

In the opinion of Sidley Austin LLP, as counsel to GS Finance Corp. and The Goldman Sachs Group, Inc., when the notes offered by this pricing supplement have been executed and issued by GS Finance Corp., such notes have been authenticated by the trustee pursuant to the indenture, and such notes have been delivered against payment as contemplated herein, (a) such notes will be valid and binding obligations of GS Finance Corp., enforceable in accordance with their terms, subject to applicable bankruptcy, insolvency and similar laws affecting creditors' rights generally, concepts of reasonableness and equitable principles of general applicability (including, without limitation, concepts of good faith, fair dealing and the lack of bad faith), provided that such counsel expresses no opinion as to the effect of fraudulent conveyance, fraudulent transfer or similar provision of applicable law on the conclusions expressed above and (b) the guarantee with respect to such notes will be a valid and binding obligation of The Goldman Sachs Group, Inc., enforceable in accordance with its terms, subject to applicable bankruptcy, insolvency and similar laws affecting creditors' rights generally, concepts of reasonableness and equitable principles of general applicability (including, without limitation, concepts of good faith, fair dealing and the lack of bad faith), provided that such counsel expresses no opinion as to the effect of fraudulent conveyance, fraudulent transfer or similar provision of applicable law on the conclusions expressed above. This opinion is given as of the date hereof and is limited to the laws of the State of New York and the General Corporation Law of the State of Delaware as in effect on the date hereof. In addition, this opinion is subject to customary assumptions about the trustee's authorization, execution and delivery of the indenture and the genuineness of signatures and certain factual matters, all as stated in the letter of such counsel dated February 23, 2021, which has been filed as Exhibit 5.6 to the registration statement on Form S-3 filed with the Securities and Exchange Commission by GS Finance Corp. and The Goldman Sachs Group, Inc. on February 23, 2021.

We have not authorized anyone to provide any information or to make any representations other than those contained or incorporated by reference in this pricing supplement, the accompanying general terms supplement no. 2,913, the accompanying prospectus supplement or the accompanying prospectus. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. This pricing supplement, the accompanying general terms supplement no. 2,913, the accompanying prospectus supplement and the accompanying prospectus is an offer to sell only the notes offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. The information contained in this pricing supplement, the accompanying general terms supplement no. 2,913, the accompanying prospectus supplement and the accompanying prospectus is current only as of the respective dates of such documents.

\$70,000

GS Finance Corp.

S&P 500® Daily Risk Control 5% USD Excess Return Index-Linked Notes due 2026

guaranteed by

The Goldman Sachs Group, Inc.



Goldman Sachs & Co. LLC

The prospectus to which this Exhibit is attached is a final prospectus for the related offering. The maximum aggregate offering price for such offering is \$70,000.