

GOLDMAN SACHS INTERNATIONAL – BENCHMARK STATEMENT

Publication Date: 12 July 2019
Last Update: 15 December 2023

This document applies to all the Benchmark Families specified in Annex 2. With respect to each Benchmark Family, this document, read in conjunction with the specification of the relevant Benchmark Family in Annex 2 shall constitute a “**Benchmark Statement**” (as defined in in the UKBMR) for such Benchmark Family.

More information on the methodology of each GSI Benchmark can be found in the Investor Disclosures which are available to GSI Benchmark Investors. Please reach out to your Goldman Sachs representative if you have any questions.

A. Definitions

- **Adjustment Events:** Business, market, legal, regulatory, judicial, financial, fiscal or other circumstances that may arise that could necessitate or make desirable a modification or change to a GSI Benchmark’s methodology.
- **Administrator:** GSI acting as the “administrator” as defined in Article 3.1(6) of the UKBMR.
- **Benchmark:** A benchmark pursuant to Article 3.1(3) of the UKBMR.
- **Index Committee:** Oversight function of GSI pursuant Article 5.1 of the UKBMR.
- **Calculation Agent:** GSI or a third party, when tasked with the determination of a GSI Benchmark.
- **Control Framework:** GSI’s policy and control framework, governing its benchmark administration activities.
- **EUBMR:** Regulation 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds and amending Directives 2008/48/EC and 2014/17/EU and Regulation (EU) No 596/2014. This regulation forms part of “retained EU law” in the United Kingdom as defined in the European Union (Withdrawal) Act 2018 (as amended from time to time).
- **ESG:** Environmental, Social and Governance.
- **Expert Judgment:** The exercise of discretion by GSI, including, but not limited to, extrapolating values from prior or related transactions, and adjusting values for factors that might influence the quality of data.
- **External Input Data:** Third Party Transactional Data and / or Third Party Non-Transactional Data.
- **GSI:** Goldman Sachs International.

- **GSI Benchmark:** A GSI administered Benchmark administered pursuant to Article 3.1(6) of the UKBMR.
- **GSI Benchmark Investors:** Counterparties to, or investors in, financial instruments referencing GSI Benchmarks.
- **Incidents:** Input data or calculation errors or anomalies affecting the published level of the GSI Benchmarks.
- **Internal Input Data:** Data already available in the Goldman Sachs Group prior to the provision of the GSI Benchmarks, which was created for purposes other than the determination of GSI Benchmarks.
- **Investor Disclosures:** Documentation outlining the methodology for each GSI Benchmark that is made available to GSI Benchmark Investors.
- **Input Data:** The data in respect of the value of one or more underliers used by GSI to determine a Benchmark.
- **Non-significant benchmark:** A Benchmark categorised as a non-significant benchmark following the provisions of Article 3.1(27) of the UKBMR.
- **Published Level:** The official level of a GSI Benchmark as defined the relevant Investor Disclosures.
- **Restatement Event:** An incident that results in the restatement of the published level of a Benchmark
- **Statement:** This benchmark statement published by GSI pursuant Article 27 of UKBMR.
- **Strategy Allocator:** A third party not affiliated with and not an agent of GSI which has the right (but not the obligation to) periodically determine and rebalance the relevant components and their assigned weights, and / or certain other parameters of a GSI Benchmark or of one of its components, in accordance with the terms separately agreed between the Strategy Allocator and GSI (each such determination by the Strategy Allocator, once so implemented by GSI, being a “**Parameter Adjustment**”). A Benchmark (for the purpose of this designation only, including one or more of its direct or indirect components) with a Strategy Allocator is designated as a “**Managed Benchmark**” in Annex 2.
- **Third Party Calculation Agent:** A third party to GSI involved in certain determinations and calculations in respect of a GSI Benchmark.
- **Third Party Non-Transactional Data:** Input data consisting of estimated prices, actual or estimated rates, quotes and committed quotes, or other values or surveys provided by third parties to GSI.

- **Third Party Transactional Data:** Input data in the form of observable prices, rates, indices or values representing transactions in third party trading venues or other marketplaces where GSI may or may not participate.
- **UKBMR:** The EUBMR as it forms part of “retained EU law” in the United Kingdom as defined in the European Union (Withdrawal) Act 2018 (as amended from time to time).
- **Underliers:** The underliers for the relevant Benchmark Family, as defined in Annex 2.

B. Statement Overview

The Goldman Sachs FICC and Equities business units of GSI create and sponsor a number of Benchmarks that it considers to be within the scope of the UKBMR.

This Statement is being published in accordance with Article 27 of the UKBMR. GSI classifies the GSI Benchmarks it administers into Benchmark Families for the purposes of the publication of the Statement.

This Statement intends to define the economic reality measured by the various Benchmark Families defined in Annex 2 and the circumstances in which such measurement may become unreliable. The Statement also highlights, where applicable, any elements of the calculation of the GSI Benchmarks where GSI may apply discretion or Expert Judgment. The statement also provides an overview of those internal or external factors which may require changes to the methodology of the GSI Benchmarks and the potential impact on the value of financial instruments referencing such GSI Benchmarks.

Information about the GSI Benchmarks’ methodologies is available to GSI Benchmark Investors via the Investor Disclosures. Counterparties and investors should carefully read the relevant Investor Disclosures prior to making any investment decision on the GSI Benchmarks.

C. GSI Benchmarks ISINs

The GSI Benchmarks do not have ISIN codes allocated to them at the time of publication of this Statement.

D. Contributions

The GSI Benchmarks are not determined using “contributions of input data”, as defined in Article 3.1(8) of the UKBMR.

E. Category of GSI Benchmarks

The GSI Benchmarks are non-significant benchmarks as set out in Article 3.1(27) of the UKBMR.

F. Market or economic reality measured by the GSI Benchmark

Other than the Managed Benchmarks as separately described in the paragraph immediately below, the GSI Benchmarks are synthetic rules based GSI proprietary systematic strategies (“**Systematic Benchmarks**”) which aim to notionally replicate the realised performance of a systematic investment process, periodically selecting and adjusting the weights of various underliers. The Underliers of the Systematic Benchmarks may be selected from one or more designated regions (e.g. "World", "Emerging Markets", "Europe"), and / or be based on a set of criteria defined by the methodology for the GSI Benchmark as set out in the relevant Investor Disclosure.

Each Managed Benchmark as specified in Annex 2 has a Strategy Allocator, which may select and adjust the Underliers and/or rebalance their weights, and / or adjust certain other parameters, from time to time at its own discretion, provided that the selection and adjustment satisfies the constraints specified in the Investor Disclosures. The Strategy Allocator’s decisions may have a material impact (including any potential adverse impact) on the Managed Benchmark pursuing its Economic Intention (as specified in Annex 2) and therefore may largely drive the performance of such Managed Benchmark. GSI has no discretion or influence on the decision made by the Strategy Allocator to adjust (or not adjust) the Managed Benchmarks, and GSI does not assess whether any proposed Parameter Adjustment is in the best interests of investors in the Managed Benchmarks and GSI is not responsible for the action taken or decision made by the Strategy Allocator.

The GSI Benchmarks (including both Systematic Benchmarks and Managed Benchmarks) may also include various types of computation steps which reference market data which in some cases falls outside of the universe of Underliers, including, but not limited to, an internal simulated currency hedge, a volatility target mechanism, a synthetic interest rate return or a mechanism to combine various components into a basket. Such computation steps are not expected to be the primary driver of the performance of the GSI Benchmarks and are included for technical reasons including, but not limited to, to hedge foreign exchange exposure of the Underliers of a GSI Benchmark, to target a particular volatility level for a GSI Benchmark or to combine various components into a basket.

Please refer to Annex 2 for more details in respect of the Economic Intention of each Benchmark Family.

G. GSI Benchmarks’ Methodology

(a) Methodologies of the GSI Benchmarks

The methodologies of the GSI Benchmarks are developed by GSI to establish a set of rules, aiming to achieve a defined objective through replicating the performance of a basket of Underliers. Detailed information related to the methodologies of the GSI Benchmarks, including a detailed description of the calculation arrangements and parameters applied and input data used, can be found in the Investor Disclosures which are available to GSI Benchmark Investors.

GSI Benchmarks are determined using the values of the Underliers, based on their relative weight or quantity which are rebalanced periodically as per the defined methodology:

- (i) As more particularly specified for the relevant Benchmark Family in Annex 2, the determination of the values of Underliers of a GSI Benchmark relies on:
 - a. External Input Data; or

- b. A combination of External Input Data and Internal Input Data.
- (ii) Other than the Managed Benchmarks as separately described in the paragraph immediately below, the determination of the weights or quantities of the Underliers of a GSI Benchmark is fully systematic and may use various metrics relating to the Underliers such as the performance, the realised volatility, or other metrics measured during a defined observation period.
- (iii) With respect to each Managed Benchmark as specified in Annex 2, the relevant components are selected by and the weights, quantities or certain other parameters of such components are determined and adjusted by the Strategy Allocator at its own discretion from time to time, within the constraints specified in the Investor Disclosures of the Managed Benchmark.

Changes in the value of the Underliers may impact their weighting in a GSI Benchmark and the value of such GSI Benchmark. The value of a GSI Benchmark may be reduced by the deduction of rebalancing costs, asset servicing costs and/or other types of deductions, each as specified in the Investor Disclosures.

(b) Procedures for approving the GSI Benchmarks

Prior to being launched, new GSI Benchmarks are subject to a defined approval process including but not limited to approval by the Index Committee. The Index Committee:

- Reviews and approves new GSI Benchmarks;
- Provides challenges on key aspects of the provision of GSI Benchmarks, including the GSI Benchmarks' methodologies, the expected or known usage of the GSI Benchmarks and the materiality of existing or potential conflicts of interests identified in respect of the GSI Benchmarks; and
- Oversees the implementation and control infrastructure as well as the continuous operation of GSI Benchmarks.

(c) Changes to the GSI Benchmarks

GSI is entitled to make modification or changes to the methodologies of the Benchmarks, under circumstances defined in the Investor Disclosures, and subject to the oversight of the Index Committee. The changes may only result in methodologies that are consistent with the Investor Disclosures.

Such circumstances may include correction of manifest or proven error, correction of contradictory or defective provisions, necessary changes to the calculation frequency, changes to allow the calculation and determination of weights and value following the occurrence of an Adjustment Event.

Changes to a GSI Benchmark' methodology may have an impact on financial instruments that reference the GSI Benchmark or the measurement of the performance of investment funds directly or indirectly linked to the GSI Benchmark. Specific processes related to review of and changes to the methodologies of the GSI Benchmarks and cessation of GSI Benchmarks are defined in the Investor Disclosures.

H. Input Data

Input data for the GSI Benchmarks consists of External Input Data and, in some cases and as specified in Annex 2, Internal Input Data.

Input Data is subject to quality controls prior to being used in the determination of the GSI Benchmarks. Multiple different data sources may be used, where readily available to GSI or its appointed Third Party Calculation Agent, depending on the type of Input Data. GSI has controls in place to ensure completeness and accuracy of the Input Data used.

GSI may use multiple sources of Input Data for the determination of GSI Benchmarks. In the event of a discrepancy between the data obtained from the different sources, GSI aims to find alternative sources of data to corroborate the previously available Input Data.

GSI may change the Input Data on which the GSI Benchmarks are determined and/or change the frequency of publication of the GSI Benchmarks as set out in the Investor Disclosures.

I. Discretion and Expert Judgment

GSI may apply discretion and/or Expert Judgment in limited circumstances, for example where GSI is required or entitled to make a determination in relation to a GSI Benchmark and that determination involves the exercise of Expert Judgment or discretion. This includes but is not limited to when a restatement of the GSI Benchmark may be required, when dealing with errors in input data, or the occurrence of any disruption events (including but not limited to market disruption events and asset substitution events) or Adjustment Events.

Such expert judgement or discretion is exercised in good faith and in a commercially reasonable manner (unless otherwise specified in the Investor Disclosures), and subject to GSI's Control Framework which includes review and approval by the Index Committee.

J. Cessation of GSI Benchmarks

GSI may discontinue or terminate the determination and publication of the GSI Benchmarks in accordance with the provisions of the Investor Disclosures. The Index Committee may, prior to the discontinuation or cessation of a GSI Benchmark, assess the potential impact of the cessation. GSI aims to inform stakeholders about a potential discontinuation and aims to offer alternative solutions to GSI Benchmark Investors to ensure an orderly transition out of the discontinued GSI Benchmark.

K. Incidents and Adjustment Events

From time to time Adjustment Events may arise that could necessitate or make desirable a modification or change to the GSI Benchmarks. Adjustment Events, for example, include (but are not limited to) (i) events that impair or are expected to impair the market liquidity of transactions relating to an Underlier, (ii) changes to, or suspensions or terminations of, or other events affecting, the GSI Benchmarks or an Underlier, or (iii) other events affecting the ability of an input data provider to supply the necessary Input Data for purposes of calculating the value of the GSI Benchmark or events affecting the availability of Input Data relating to an Underlier.

GSI maintains controls and processes to identify and correct Incidents. All Incidents, attributable to GSI or to a third-party are subject to internal policies and procedures for handling potential Restatement Events.

Unless otherwise specified in the Investor Disclosures, GSI may make adjustments to the GSI Benchmark as a result of Adjustment Events and Incidents. Such Adjustment Events and Incidents are subject to the oversight of the Index Committee and to the provisions of the Investor Disclosures. Any adjustments made to the GSI Benchmarks are subject to review and approval by the Index Committee, and are announced, where necessary, to GSI Benchmark Investors.

L. Limitations to the determination of GSI Benchmarks

GSI has identified the following situations as the main potential limitations to the determination of GSI Benchmarks:

- Compromise of Input Data

The Input Data used in the determination of GSI Benchmarks may be compromised in certain circumstances. For example, there may be insufficient data available or a material change in the formula for or method of calculating the Input Data by data providers.

In addition, GSI Benchmarks' External Input Data is generally available via third party data providers. GSI may have insufficient input data to determine the Benchmarks if such External Input Data becomes inaccessible or incomplete.

If the Input Data is compromised or unavailable, the Published Level could stop being a reliable representation of the market or economic reality the GSI Benchmarks intend to measure.

In those situations GSI may lack alternative input data to determine the GSI Benchmarks in accordance with their methodologies. The Investor Disclosures specify provisions for the use of alternative input data, including potentially using Internal Input Data in certain circumstances under the oversight of the Index Committee.

- Limitations in methodologies of the GSI Benchmarks

The GSI Benchmarks may be subject to constraints and limitations which, in certain events (for example in illiquid or fragmented markets or in the case of concentrated input data), may cause the GSI Benchmarks not to accurately capture the market or economic reality they intend to measure. These constraints and limitations could also be a result of assumptions used in the design of the methodology or implementation complexities.

- No discretion or influence on Strategy Allocator's decisions

The ability of GSI Benchmarks which are Managed Benchmarks to achieve their objective may be substantially affected by the abilities of, and determinations made by, the Strategy Allocator. There is no guarantee that the Strategy Allocator will act rationally and in accordance with current market trends in determining any Parameter Adjustment. There is no guarantee that the adjustments by the Strategy Allocator will enhance the performance of the Managed Benchmark and their decisions may also have a negative impact on the performance of the Managed Benchmark.

- Changes to market structure

Trading activity on the Underliers, carried out by GSI or other market participants, could affect the Published Level of the GSI Benchmarks as well as the fundamental assumptions of the GSI Benchmarks' methodologies.

Annex 1

ESG Disclosures pursuant to REGULATION (EU) 2019/2089 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 November 2019 amending Regulation (EU) 2016/1011 as regards EU Climate Transition Benchmarks, EU Paris-aligned Benchmarks and sustainability-related disclosures for benchmarks as it forms part of “retained EU law” in the United Kingdom as defined in the European Union (Withdrawal) Act 2018 (as amended from time to time).

CLIMATE RELATED DISCLOSURES – CONSIDERATION OF ESG FACTORS		
Item 1	Name of the benchmark administrator.	Goldman Sachs International
Item 2	Type of benchmark	Non-significant benchmarks
Item 3	Name of the benchmark or family of benchmarks.	Each Benchmark Family as listed in Annex 2
Item 4	Does the benchmark pursue ESG objectives?	No
Item 5	Where the response to Item 4 is negative, is any EU Climate Transition Benchmark or EU Paris-aligned Benchmark available in the portfolio of the benchmark administrator or does the benchmark administrator have benchmarks that pursue ESG objectives or take into account ESG factors?	No

Annex 2

Overview of Benchmark Families

Name of the Benchmark Family	Underliers (*)	Geographical Regions (*)	Input Data (*)	Managed Benchmark (*)	Economic Intention
Equity Volatility Carry	Equity Options, Equity Futures	Specific to a determined geographic area (e.g., US, Europe)	External Input Data	No	<p>The strategies in this Benchmark Family aim to harvest the implied volatility premium (i.e. the tendency of implied volatility on average to exceed subsequently realised volatility) by selling volatility on the Underliers and employing a delta hedging mechanism. The strategies may also include other risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Equity Volatility Carry with Internal Input Data	Equity Options, Equity Futures	Specific to a determined geographic area (e.g., US, Europe, UK)	External Input Data and Internal Input Data	No	<p>The strategies in this Benchmark Family aim to harvest the implied volatility premium (i.e. the tendency of implied volatility on average to exceed subsequently realised volatility) by selling volatility on the Underliers and employing a delta hedging mechanism. The strategies may also include other risk control mechanisms.</p>

Name of the Benchmark Family	Underliers (*)	Geographical Regions (*)	Input Data (*)	Managed Benchmark (*)	Economic Intention
					<p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Equity Volatility Skew	Equity Options, Equity Futures	US	External Input Data External	No	<p>The strategies in this Benchmark Family aim to harvest the volatility skew premium which is driven by structural demand for put options and structural supply of call options. The strategies sell and buy options and employ a risk hedging mechanism. The strategies may also include other risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Equity Volatility Relative Value	Equity Options, Equity Futures	US	External Input Data	No	<p>The strategies in this Benchmark Family aim to capture a specific relative value opportunity embedded in the prices of certain Underliers. The strategies enter into long and short positions on a pair of Underliers. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor</p>

Name of the Benchmark Family	Underliers (*)	Geographical Regions (*)	Input Data (*)	Managed Benchmark (*)	Economic Intention
					Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.
Equity Volatility Relative Value with Internal Input Data	Equity Options, Equity Futures	US	External Input Data and Internal Input Data	No	<p>The strategies in this Benchmark Family aim to capture a specific relative value opportunity embedded in the prices of certain Underliers. The strategies enter into long and short positions on a pair of Underliers. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Single Stock Factors	Equities	Global or specific to a determined geographic area (e.g., US, Europe, Emerging Markets)	External Input Data	No	<p>The strategies in this Benchmark Family aim to capture one or several single stock equity factor premia across the value factor, quality factor, momentum factor, low beta factor and size factor as well as other systematic price discrepancies in single stocks. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in,</p>

Name of the Benchmark Family	Underliers (*)	Geographical Regions (*)	Input Data (*)	Managed Benchmark (*)	Economic Intention
					financial instruments referencing the GSI Benchmarks.
Equity Long Gamma	Equity Options, Equity Futures	US	External Input Data	No	<p>The strategies in this Benchmark Family aim to provide systematic tail risk protection by buying and selling options. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to GSI Benchmark Investors.</p>
Equity Long Gamma with Internal Input Data	Equity Options, Equity Futures	US	External Input Data and Internal Input Data	No	<p>The strategies in this Benchmark Family aim to provide systematic tail risk protection by buying and selling options. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Equity Rolling Options	Equity Options, Equity Futures	Specific to a determined geographic area (e.g., US, Europe)	External Input Data	No	<p>The strategies in this Benchmark Family aim to roll a portfolio of options to provide systematic access to those options. Once the strategies reach a defined roll date (which may be before or at maturity of the options), the positions are rolled systematically. The strategies</p>

Name of the Benchmark Family	Underliers (*)	Geographical Regions (*)	Input Data (*)	Managed Benchmark (*)	Economic Intention
					<p>may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Equity Rolling Options Managed	Equity Options, Equity Futures	Specific to a determined geographic area (e.g., US, Europe)	External Input Data	Yes	<p>The strategies in this Benchmark Family aim to roll a portfolio of options to provide systematic access to those options. Once the strategies reach a defined roll date (which may be before or at maturity of the options), the positions are rolled systematically. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Equity Intraday Momentum	Equity Futures	US	External Input Data	No	<p>The strategies in this Benchmark Family aim to establish a long or short intraday position on equity futures based on observed market trends. The strategies may include risk control mechanisms.</p>

Name of the Benchmark Family	Underliers (*)	Geographical Regions (*)	Input Data (*)	Managed Benchmark (*)	Economic Intention
					<p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Dispersion	Equity Options, Equity Futures	US, Europe	External Input Data and Internal Input Data	No	<p>The strategies in this Benchmark Family aim to harvest the dispersion risk premium which is driven by the structural demand for index options and the structural supply of single stock options. The strategies sell options on an index and buy options on single stock constituents. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Dispersion Managed	Equity Options, Equity Futures	US, Europe	External Input Data	Yes	<p>The strategies in this Benchmark Family aim to harvest the dispersion risk premium which is driven by the structural demand for index options and the structural supply of single stock options. The strategies sell options on an index and buy options on single stock constituents. The strategies may</p>

Name of the Benchmark Family	Underliers (*)	Geographical Regions (*)	Input Data (*)	Managed Benchmark (*)	Economic Intention
					<p>also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Dispersion Managed with Internal Input Data	Equity Options, Equity Futures	US, Europe	External Input Data and Internal Input Data	Yes	<p>The strategies in this Benchmark Family aim to harvest the dispersion risk premium which is driven by the structural demand for index options and the structural supply of single stock options. The strategies sell options on an index and buy options on single stock constituents. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Variance	Equity Options, Equity Futures	US	External Input Data	No	<p>The strategies in this Benchmark Family aim to systematically provide a replicated exposure to the variance of the Underliers. The strategies may also include risk control mechanisms.</p>

Name of the Benchmark Family	Underliers (*)	Geographical Regions (*)	Input Data (*)	Managed Benchmark (*)	Economic Intention
					More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.
Variance with Internal Input Data	Equity Options, Equity Futures	US	External Input Data and Internal Input Data	No	<p>The strategies in this Benchmark Family aim to systematically provide a replicated exposure to the variance of the Underliers. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Option Selling Managed	Equity Options, Equity Futures	Europe, US	External Input Data	Yes	<p>The strategies in this Benchmark Family are market access strategies which systematically sell options and generate income from the premium of the sold options. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Multi Asset Trend	Futures across asset classes (e.g. equity,	Global	External Input Data	No	The strategies in this Benchmark Family aim to capture the

Name of the Benchmark Family	Underliers (*)	Geographical Regions (*)	Input Data (*)	Managed Benchmark (*)	Economic Intention
	rates), FX forwards, third party indices				<p>momentum premium across asset classes. The momentum premium stems from the tendency of prices in various financial markets to develop upward or downward trends from time to time. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Equity Rolling Futures	Equity Futures	Specific to a determined geographic area (e.g., US, Europe, UK, Japan)	External Input Data	No	<p>The strategies in this Benchmark Family aim to provide market access to equity markets, by investing in equity futures and rolling exposure from a nearby futures contract to a deferred futures contract.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Commodity Modified Strategies	Commodity Futures	Global	External Input Data	No	<p>The strategies in this Benchmark Family aim to outperform a third-party commodity index by making certain adjustments to its methodology such as, without limitation, modifying the date on which future contracts are rolled</p>

Name of the Benchmark Family	Underliers (*)	Geographical Regions (*)	Input Data (*)	Managed Benchmark (*)	Economic Intention
					<p>or applying certain dynamic timing rules or seasonal roll rules.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Multi Asset Risk Premia with Internal Input Data	GS administered indices	Global	External Input Data and Internal Input Data	No	<p>The strategies in this Benchmark Family aim to capture a combination of risk premia associated with various underlying strategies. Such risk premia (which include, but are not limited to, carry, value, curve and trend) may be based on the results of academic research or based on observed market dynamics. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Equity Multi Risk Premia	Equity Options, Equity Futures, single stocks	Global	External Input Data	No	<p>The strategies in this Benchmark Family aim to capture a combination of the risk premia associated with various underlying strategies on equity Underliers. Such risk premia (which include, but are not limited</p>

Name of the Benchmark Family	Underliers (*)	Geographical Regions (*)	Input Data (*)	Managed Benchmark (*)	Economic Intention
					<p>to, volatility carry) may be based on the results of academic research or based on observed market dynamics. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Equity Multi Risk Premia with Internal Input Data	Equity Options, Equity Futures, single stocks	Global	External Input Data and Internal Input Data	No	<p>The strategies in this Benchmark Family aim to capture a combination of the risk premia associated with various underlying strategies on equity Underliers. Such risk premia (which include, but are not limited to, Volatility Carry) may be based on the results of academic research or based on observed market dynamics. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Equity Multi Risk Premia Managed	Equity Options, Equity Futures, single stocks	Global	External Input Data	Yes	<p>The strategies in this Benchmark Family aim to capture a combination of the risk premia</p>

Name of the Benchmark Family	Underliers (*)	Geographical Regions (*)	Input Data (*)	Managed Benchmark (*)	Economic Intention
					<p>associated with various underlying strategies on equity Underliers. Such risk premia (which include, but are not limited to, volatility carry) may be based on the results of academic research or based on observed market dynamics. The strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Multi Asset Volatility Carry Managed	GS administered indices	Global	External Input Data and Internal Input Data	Yes	<p>The strategies in this Benchmark Family aim to capture the volatility carry risk premia across asset classes, via various GS administered indices which aim to harvest the implied volatility premium, (i.e. the tendency of implied volatility on average to exceed subsequently realized volatility) by selling volatility on the Underliers and employing a delta hedging mechanism. The strategies may also include other risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in,</p>

Name of the Benchmark Family	Underliers (*)	Geographical Regions (*)	Input Data (*)	Managed Benchmark (*)	Economic Intention
					financial instruments referencing the GSI Benchmarks.
Japanese Yen Rates	Japanese Rates Swaps	Japan	External Input Data and Internal Input Data	No	<p>The Strategies in this Benchmark Family combine various GSI administered indices which provide a rolling exposure to Japanese Yen Rates swaps. Those strategies may include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>
Industrial and precious metals	Industrial and precious metals Futures	Global	External Input Data	No	<p>The Strategies in this Benchmark Family provide equal weighted exposure to various industrial and precious metals futures on a rolling basis. Those Strategies may also include risk control mechanisms.</p> <p>More details on the methodology can be found in the Investor Disclosures which are available to counterparties to, or investors in, financial instruments referencing the GSI Benchmarks.</p>

GSI will monitor and update the Benchmark Families listed in the table above at least once per year. Between such periodic updates, the list of Benchmarks may vary and, from time to time, there may not be an active Benchmark within a specific Benchmark Family listed in the table above. Please reach out to your GSI representative for further information.

* As specified in the Investor Disclosures which are available to available to GSI Benchmark Investors. Please reach out to your GSI representative for further information.