

**GOLDMAN SACHS MOMENTUM BUILDER  
MULTI-ASSET 5 ER INDEX**

**METHODOLOGY**

**JULY 3, 2023**

## GS MOMENTUM BUILDER MULTI-ASSET 5 ER INDEX

### Overview

*The following overview of the GS Momentum Builder Multi-Asset 5 ER Index is a summary and, as such, is necessarily incomplete. This overview should be read in conjunction with, and is qualified in its entirety by, the more detailed description of the GS Momentum Builder Multi-Asset 5 ER Index and its operation that follows in this document.*

The GS Momentum Builder Multi-Asset 5 ER Index (the “**Index**”) is comprised of shares of exchange-traded funds and other exchange traded products (each an “**Underlying ETF**” and together the “**Underlying ETFs**”) and a hypothetical overnight cash investment (the “**Money Market Position**”), which constitute the underlying assets (each an “**Underlying Asset**” and together the “**Underlying Assets**”).

The Underlying Assets provide exposure to several asset classes (each an “**Asset Class**” and together the “**Asset Classes**”) as described below:

- *Equities* including U.S. and international developed equity markets
- *Fixed Income* including U.S. Treasuries, and investment grade and high yield corporate and government bonds
- *Emerging Markets* including emerging market equities and emerging market fixed income
- *Commodities* including exposure to 14 commodity contracts and physical gold
- *Alternatives* including real estate securities, master limited partnerships focused on energy, and a senior leveraged loan portfolio
- *Inflation* with U.S. Government inflation-linked securities
- *Cash Equivalent* with the Money Market Position

The Index is calculated on an excess return basis and the value of the Index (the “**Index Value**”) is calculated on each Index Business Day (as defined in the attached annex) in U.S. dollars.

The Index Value is calculated by reference to the *excess* of the Total Return Index Value (as more specifically described under “Calculation of the Index” below) *over* the sum of the return on the “**Notional Interest Rate**” (which is SOFR *plus* 0.26161%, which is determined as specified in the Annex) *plus* the “**Daily Index Maintenance Fee**” of 0.50% per annum.

On any given Index Business Day following the Index Inception Date (any such day, a “**Total Return Index Rebalancing Day**”), the Total Return Index may be partially rebalanced from the Base Index into the Deleverage Position as a result of the volatility control feature. The value of the Total Return Index (the “**Total Return Index Value**”) is calculated on each Index Business Day by reference to the weighted performance (after rebalancing) of:

- (i) the Base Index (as more specifically described below) and
- (ii) the Deleverage Position.

The “**Deleverage Position**” means a hypothetical investment in the Money Market Position.

The initial composition of the Base Index is described in the Annex and the value of the Base Index (the “**Base Index Value**”) is calculated on each Index Business Day. The Base Index seeks

to provide exposure to price momentum of the Underlying Assets by seeking to reflect the combination of Underlying Asset weightings that would have provided the highest historical return (determined as described under “*Calculation of the Underlying Assets Target Weights*” below) on the first Index Business Day of each calendar month (the “**Base Index Observation Day**”), subject to constraints on maximum and minimum weights for each Underlying Asset and Asset Class along with volatility controls further described below. The Base Index is rebalanced monthly over the first five Index Business Days of each calendar month (the “**Base Index Rebalancing Period**”). Each Index Business Day in a Base Index Rebalancing Period will be deemed a “**Base Index Rebalancing Day**”.

Goldman Sachs & Co (the “**Index Sponsor**”) has retained Solactive AG to serve as Calculation Agent for the Index. In the event the Index Sponsor appoints a replacement Calculation Agent a public announcement will be made via press release.

Unless otherwise indicated, any public announcement contemplated by this Methodology shall be made on the website of the Calculation Agent.

## **The Methodology**

### *Overview*

At any given time, the Base Index tracks the weighted return of the Underlying Assets. The respective weights of the Underlying Assets, which can be as low as zero, are rebalanced monthly over the relevant Base Index Rebalancing Period within a set of pre-determined investment and volatility constraints by applying the Methodology algorithm. On any Total Return Index Rebalancing Day, the Base Index may also be ratably rebalanced into the Deleverage Position as a result of the volatility control feature of the Methodology. Under certain limited circumstances described under “*Delayed Rebalancing*”, the Calculation Agent may delay any Base Index Rebalancing Day or Total Return Index Rebalancing Day in its sole discretion. In addition, the Index Committee intends to review the Methodology at least once a year, and may make changes to the Methodology from time to time (including after any such annual review) if it determines, in its sole discretion, that such changes are necessary or desirable in light of the goals of the Index. Any such changes to the Methodology will be publicly announced at least 60 Index Business Days prior to their effective date. The Index is designed to be an investable index.

### *Base Index Rebalancing*

On each Base Index Observation Day, the Calculation Agent, pursuant to the Methodology and subject to the applicable constraints, seeks to select the combination of permitted Underlying Asset weights with the highest historical total return (as described under “*Calculation of the Underlying Assets Target Weights*” below). The Base Index will then be reweighted over the Base Index Rebalancing Period from the previous Underlying Asset Weights to the newly determined Underlying Asset Weights.

### *Total Return Index Rebalancing and Volatility Control Feature*

The Methodology has a volatility control feature applied on any Total Return Index Rebalancing Day. This has the effect of reducing the exposure of the Total Return Index to the performance of

the Base Index (and subsequently the Underlying Assets) by rebalancing a portion of the Base Index into the Deleverage Position if the realized volatility of the Base Index exceeds the Volatility Cap (as defined under “*Total Return Index Rebalancing and Volatility Control*” below) on any Total Return Index Rebalancing Day.

### *Notional Interest Rate*

The Index is calculated on an excess return basis over the sum of the Daily Index Maintenance Fee and the return that could be earned on a notional cash deposit at the Notional Interest Rate, compounded quarterly. The Notional Interest Rate will be reset quarterly, on each January 2, April 2, July 2, and October 2 or, if one of those dates is not an Index Business Day, on the Index Business Day immediately following such date, starting from and including the Index Inception Date. Each such date is referred to herein as a “**Notional Interest Rate Reset Date**”.

### **Publication of the Index**

Solactive AG (the “**Calculation Agent**”) calculates and publishes the value of the Index every 15 seconds on each Index Business Day and publishes it on both Bloomberg and Reuters. The relevant tickers are specified in the Annex.

### **Publication of Changes to the Index and to the Methodology**

Changes to the components of the Index made by the Index Committee will be publicly announced as promptly as is reasonably practicable and normally at least five Index Business Days prior to the effective date of the changes. Changes to the Methodology made by the Index Committee will be publicly announced at least 60 Index Business Days prior to their effective date. Adjustments made by the Calculation Agent in response to market adjustment events and potential adjustment events will be publicly announced as promptly as is reasonably practicable.

### **Index Committee**

An Index Committee is responsible for overseeing the Index and the Methodology, while the Calculation Agent is responsible for the day to day implementation of the Methodology and for the calculation of the Index, including responding to Market Disruption Events (as defined under “*Market Disruption Events*” below) and potential adjustment events. The Index Committee is committed to maintaining the Index as a liquid, tradable index. The Index Committee will initially be comprised of three full-time employees of The Goldman Sachs Group, Inc. or one or more of its affiliates.

The Index Committee may exercise limited discretion with respect to the Index, as contemplated by the Methodology, including in the situations described under “*Changes to the Index Components*”. Any such changes or actions are publicly announced as promptly as is reasonably practicable and normally at least five Index Business Days prior to their effective date. The Calculation Agent may from time to time consult the Index Committee on matters of interpretation with respect to the Methodology.

Because the Index Committee considers information about changes to the Index and related matters may be potentially market moving and material, all Index Committee discussions,

including those with the Calculation Agent, are confidential. The Index Committee will determine the successor of any of its members.

### **Changes to the Index Components**

The components of the Index are not expected to change. However, if, for any reason any of the following events occur:

- an Underlying ETF ceases to exist, is delisted, terminated, wound up, liquidated or files for bankruptcy, is combined with another ETF that has a different investment objective, or changes its currency of denomination,
- an Underlying ETF suspends creations or redemptions for five consecutive Index Business Days or announces a suspension of unlimited duration for such creations or redemptions,
- the net asset value of an Underlying ETF is not calculated or is not announced by either the Underlying ETF or its sponsor for five consecutive Index Business Days, or a Market Disruption Event occurs and is continuing for five consecutive Index Business Days,
- the average daily trading volume in the preceding three calendar months of an Underlying ETF is less than \$1 million (where average daily trading volume is measured by summing the value of all reported transactions in such Underlying ETF for each trading day during the preceding three full calendar months, and dividing this sum by the total number of such trading days) or the net asset value of such Underlying ETF is below \$250 million (where net asset value is measured as the value of an entity's assets less the value of its liabilities as publicly disclosed by the Underlying ETF or its sponsor),
- the sponsor or investment adviser of an Underlying ETF files for bankruptcy and there is no solvent immediate successor,
- limitations on ownership are imposed on an Underlying ETF due to a change in law or regulation, loss of regulatory exemptive relief or otherwise, and the Index Committee, in its sole discretion, determines that such limitations materially adversely affect the ability of holders of such Underlying ETF to hold, acquire or dispose of shares of such Underlying ETF,
- the tax treatment of an Underlying ETF changes in a way that would have an adverse effect on holders of shares of such Underlying ETF,
- the Index Committee, in its sole discretion, determines that an Underlying ETF has changed the index underlying or otherwise referenced by such Underlying ETF (the "**Reference Index**" for such Underlying ETF) to an index that is materially different, or the methodology for the Reference Index is materially modified (other than a modification in the ordinary course of administration of the Reference Index),

- the Reference Index of an Underlying ETF is no longer compiled, or the closing level of such Reference Index is not calculated or published for five consecutive Index Business Days, or
- the Index Sponsor determines in its sole discretion that it is not practicable for an Underlying ETF to continue to be included in the Index for any reason, including due to
  - a) a dispute as to whether a license is required to use the Underlying ETF or the related Reference Index, or
  - b) to the extent there is an agreement in place governing such use, changes in the terms upon which an Underlying ETF or related Reference Index is made available to the Index Sponsor for inclusion in the Index that the Index Sponsor, in its sole discretion, determines to be materially adverse to it,

then the Index Committee may discontinue representation of the affected Underlying ETF and/or designate a successor ETF. Any such successor ETF shall be the ETF that most closely replicates the affected Underlying ETF without triggering any of the events listed above.

Such deletions and additions may be undertaken during a rebalancing or in between rebalancing dates. Any such changes or actions taken with respect to the Index by the Index Committee are publicly announced as promptly as is reasonably practicable and normally at least five Index Business Days prior to the effective date of the changes or actions.

## **Underlying Assets Weights, Base Index Rebalancing and Total Return Index Rebalancing**

### *Overview*

The respective target weights of the Underlying Assets (each an “**Underlying Asset Target Weight**” and together the “**Underlying Asset Target Weights**”), which can be as low as zero, are determined on each Base Index Observation Day, within the investment and volatility maximum constraints described in the attached Constraints Schedule and below, by applying the Methodology algorithm. The weights of the Underlying Assets (each an “**Underlying Asset Weight**” and together the “**Underlying Assets Weights**”) in the Base Index will then be adjusted gradually over the Base Index Rebalancing Period to meet the Underlying Assets Target Weights. The Calculation Agent is required to delay a Base Index Rebalancing Day under certain circumstances described below under “Delayed Rebalancing”.

### *Calculation of the Underlying Assets Target Weights*

The target weight attributed to each Underlying Asset pursuant to the Methodology on each Base Index Observation Day (regardless of whether a Market Disruption Event occurs or is occurring on that day) is intended to optimize the total return performance of the Underlying Assets based on an analysis of the historical returns of the Underlying Assets, subject to the constraints included in the Methodology.

For each Return Look-Back Period (as specified below) and Volatility Look-Back Period (as specified below) pair, the Methodology algorithm seeks to select — out of all the combinations of

admissible Underlying Assets Target Weights within a set of investment constraints and volatility constraints described below — the combination with the highest Annualized Assets Combination Return (for the avoidance of doubt, the number of *{Return Look-Back Period , Volatility Look-Back Period}* pairs considered on any Base Index Observation Day will be equal to the product of the number of Return Look-Back Periods and the number of Volatility Look-Back Periods). Among other things, this requires the Calculation Agent to calculate the Annualized Assets Combination Return for the relevant Return Look-Back Period and the Annualized Assets Combination Realized Volatility for each relevant Volatility Look-Back Period.

Note that there is one Return Look-Back Period and three Volatility Look-Back Periods, which results in three *{Return Look-Back Period , Volatility Look-Back Period}* pairs per asset. The Underlying Asset Target Weight for an Underlying Asset will be equal to the average of the target weights for that Underlying Asset determined in respect of each of the *{Return Look-Back Period , Volatility Look-Back Period}* pairs (with rounding effects treated as described below under “Rounding Convention”). For the avoidance of doubt, rounding will be applied only when calculating the average of the target weights but not at the level of each individual *{Return Look-Back Period , Volatility Look-Back Period}* pair.

If on an Base Index Observation Day, for any *{Return Look-Back Period , Volatility Look-Back Period}* pair, no combination of Underlying Assets Target Weights complies with the pre-defined investment and volatility constraints, then the Methodology algorithm will select from all combinations of Underlying Assets Target Weights that comply with the investment constraints, the combination with the lowest Annualized Assets Combination Realized Volatility, regardless of that combination’s Annualized Assets Combination Return. The particular combination so selected will therefore exceed the volatility constraint.

The “**Return Look-Back Period**” on any given Base Index Observation Day is the period from (and including) the day which is six (6) calendar months (or, if any such date is not an Index Business Day, the preceding Index Business Day) before the third Index Business Day prior to the given Base Index Observation Day to (but excluding) the third Index Business Day prior to the given Base Index Day.

The “**Volatility Look-Back Period**” on any given Index Business Day is the period from (and including) the day which is respectively six (6), three (3) or one (1) calendar months before the third Index Business Day prior to the given Index Business Day (or, if any such date is not an Index Business Day, the preceding Index Business Day) to (but excluding) the third Index Business Day prior to the given Index Business Day.

- Investment Constraints: Investment constraints set a minimum weight of 0% and maximum weight for each Underlying Asset as well as a minimum weight of 0% and maximum weight for each Asset Class (for the avoidance of doubt the sum of the weights for each Underlying Asset within an Asset Class has to be greater than or equal to 0% for that Asset Class and less than or equal to the maximum weight for that Asset Class). Negative weights (that is, short positions) are not permitted by the Methodology, but weights can be as low as zero so that the performance of zero-

weighted Underlying Assets would not be reflected in the performance of the Base Index for the relevant periods. The sum of the weights of all Underlying Assets in the Base Index is always equal to 1.0 (with rounding effects treated as described below under “Rounding Convention”).

Where, among other situations described under “Changes to the Index Components”, an Underlying ETF ceases to exist, is delisted or is no longer tradable and is not replaced by the Index Committee in the manner described above, it will be deemed to have been assigned a zero weight in the Base Index and will be replaced with a hypothetical position in the Money Market Position. At the next Base Index Observation Day, the target weights of the remaining Underlying Assets will be calculated pursuant to the Methodology except that any Underlying ETF that ceases to exist, is delisted or is no longer tradable will be assigned a zero weight.

The maximum weight per Underlying ETF and Asset Class investment constraints applicable to the Index are set out in the attached Constraints Schedule.

- Volatility Constraint: The volatility constraint of the Methodology sets a limit of 5% on the Annualized Assets Combination Realized Volatility within a Volatility Look-Back Period of any selected combination of Underlying Asset Target Weights.

Realized volatility is a historical calculation of the degree of movement based on prices or values of an asset observed periodically in the market over a specified period. The realized volatility of an asset is characterized by the frequency of the observations of the asset price used in the calculation and the period over which observations are made.

Rounding Convention: The target weight of each Underlying Asset computed at each Base Index Observation Day is rounded to the nearest three decimal places with 0.05% (0.0005) being rounded upward. For example, if the optimal weight is 12.36% (0.1236), it would be rounded up to 12.4% (0.124). The effect of rounding is that the sum of the rounded weights may not add up to 100%. For this reason, at each Base Index Observation Day, the sum of the rounded target weights is deducted from 1. If the resulting excess weight is positive, it is added to the Underlying Asset with the highest historical return in respect of the Return Look-Back Period regardless of whether this might cause the target weight of that Underlying Asset to exceed any of the constraints specified above. If the resulting excess weight is negative, its absolute value is subtracted from the target weight of the Underlying Asset that had the lowest historical return in respect of the Return Look-Back Period and a target weight higher than the absolute value of the excess amount being deducted regardless of whether this might cause the target weight of the Underlying Asset to exceed any of the constraints specified above.

#### *Calculation of the Underlying Assets Weights*

On each Base Index Rebalancing Day<sub>(t)</sub>, the Underlying Asset Weight<sub>(i)</sub> of an Underlying Asset<sub>(i)</sub> is calculated according to the following formula:



$$w_{i,t} = w_{i,BRt} + \frac{w_{i,BOt}^{Target} - w_{i,BRt}}{p}$$

Where:

*Subscript (t)* refers to the relevant Base Index Rebalancing Day;

*Subscript (BRt)* refers to the Base Index Rebalancing Day immediately preceding Base Index Rebalancing Day<sub>(t)</sub>;

$w_{i,t}$  is the Underlying Asset Weight<sub>(i)</sub> on calendar date<sub>(t)</sub>;

$w_{i,BOt}^{Target}$  is the Underlying Asset Target Weight<sub>(i)</sub> that was determined on the Base Index Observation Day on or immediately preceding Base Index Rebalancing Day<sub>(t)</sub>;

$p$  is the number of remaining Base Index Rebalancing Days (and including such Base Index Rebalancing Day<sub>(t)</sub>) in the related Base Index Rebalancing Period;

#### *Calculation of the Annualized Assets Combination Return*

The Annualized Assets Combination Return, during the relevant Return Look-Back Period, of each admissible combination of Underlying Assets Target Weights, with respect to any given Base Index Observation Day, is calculated according to the following formula:

$$AAC\_Return_{BOt} = \sum_{i=1}^n a_i \times AssetReturn_{i,BOt}$$

Where:

$AAC\_Return_{BOt}$  is the Annualized Assets Combination Return, during the relevant Return Look-Back Period, of the given combination of Underlying Assets Target Weights;

$n$  is the number of Underlying Assets (15);

$a_i$  is the Underlying Asset Target Weight<sub>(i)</sub> in the given combination of Underlying Assets Target Weights;

*Subscript BOt* refers to the relevant Base Index Observation Day; and

$AssetReturn_{i,BOt}$  is the Annualized Asset Return of the Underlying Asset<sub>(i)</sub> as of the Base Index Observation Day<sub>(BOt)</sub>, and is calculated according to the following formula:

$$AssetReturn_{i,BOt} = \frac{252}{N_{BOt}} \times \sum_s \ln \left( \frac{A_{i,s+1}}{A_{i,s}} \right)$$

Where:

$AssetReturn_{i,BOt}$  is the Annualized Asset Return, during the relevant Return Look-Back Period, of the Underlying Asset<sub>(i)</sub>;

$N_{BOt}$  is the actual number of Index Business Days within the relevant Return Look-Back Period;

*Subscript*  $(BO_t)$  refers to the relevant Base Index Observation Day;  
*Subscript*  $(s)$  refers to each Index Business Day within the relevant Return Look-Back Period;  
 $A_{i,s}$  is the Underlying Asset Value $_{(i)}$  on Index Business Day $_{(s)}$ ; and  
 $A_{i,s+1}$  is the Underlying Asset Value $_{(i)}$  on the Index Business Day immediately following Index Business Day $_{(s)}$ .

*Calculation of the Annualized Assets Combination Realized Volatility*

The Annualized Assets Combination Realized Volatility, during the relevant Volatility Look-Back Period, of each admissible combination of Underlying Assets Target Weights, with respect to any Base Index Observation Day, is calculated according to the following formula:

$$AAC\_Realized\_Volatility_{BO_t} = \sqrt{\sum_{i,j=1}^n a_i \times a_j \times AssetCovariance_{i,j,BO_t}}$$

Where:

$AAC\_Realized\_Volatility_{BO_t}$  is the Annualized Assets Combination Realized Volatility, during the relevant Volatility Look-Back Period, of the given combination of Underlying Assets Target Weights;

$n$  is the number of Underlying Assets (15);

$a_i$  is the Underlying Asset Target Weight $_{(i)}$  in the given combination of Underlying Assets Target Weights;

$a_j$  is the Underlying Asset Target Weight $_{(j)}$  in the given combination of Underlying Assets Target Weights;

*Subscript*  $BO_t$  refers to the relevant Base Index Observation Day; and

$AssetCovariance_{i,j,BO_t}$  is the Annualized Asset Co-Variance between Underlying Asset $_i$  and Underlying Asset $_j$  during the relevant Volatility Look-Back Period, and is calculated according to the following formula:

$$AssetCovariance_{i,j,BO_t} = \frac{252}{N_{BO_t}} \times \sum_s \left[ \ln \left( \frac{A_{i,s+1}}{A_{i,s}} \right) \times \ln \left( \frac{A_{j,s+1}}{A_{j,s}} \right) \right]$$

Where:

$N_{BO_t}$  is the actual number of Index Business Days within the relevant Volatility Look-Back Period;

*Subscript*  $(s)$  refers to each Index Business Day within the relevant Volatility Look-Back Period;

$A_{i,s}$  is the Underlying Asset Value $_{(i)}$  on Index Business Day $_{(s)}$ ;

$A_{i,s+1}$  is the Underlying Asset Value $_{(i)}$  on the Index Business Day immediately following Index Business Day $_{(s)}$ ;

$A_{j,s}$  is the Underlying Asset Value $_{(j)}$  on Index Business Day $_{(s)}$ ;

$A_{j,s+1}$  is the Underlying Asset Value<sub>(j)</sub> on the Index Business Day immediately following Index Business Day<sub>s</sub>; and

*Subscript*  $BOI$  refers to the relevant Base Index Observation Day.

### *Calculation of the Underlying Asset Value*

The Underlying Asset Value<sub>(i)</sub> of an Underlying Asset<sub>(i)</sub> on the Asset Inception Date (as specified in the Annex) is equal to 100. On any Index Business Day<sub>(t)</sub> following the Asset Inception Date, the Underlying Asset Value<sub>(i)</sub> of an Underlying Asset<sub>(i)</sub> is calculated according to the following formula:

$$A_{i,t} = A_{i,t-1} \times \frac{RL_{i,t}}{RL_{i,t-1}}$$

Where:

*Subscript*  $(t)$  refers to the given Index Business Day;

*Subscript*  $(t-1)$  refers to the Index Business Day immediately preceding Index Business Day<sub>(t)</sub>;

$A_{i,t-1}$  means the Underlying Asset Value<sub>(i)</sub> as of the Index Business Day immediately preceding Index Business Day<sub>(t)</sub>;

$RL_{i,t}$  means the “**Reinvested Level**” of Underlying Asset<sub>(i)</sub> as of the given Index Business Day<sub>(t)</sub>, calculated according to the below:

The Reinvested Level of Underlying Asset<sub>(i)</sub> on the Asset Inception Date is equal to 100. On any Index Business Day<sub>(t)</sub> following the Asset Inception Date, the Reinvested Level of Underlying Asset<sub>(i)</sub> is calculated according to the following formula:

$$RL_{i,t} = RL_{i,t-1} \times \left( \frac{I_{i,t} + D_{i,t}}{I_{i,t-1}} \right)$$

Where:

*Subscript*  $(t)$  refers to the given Index Business Day;

*Subscript*  $(t-1)$  refers to the Index Business Day immediately preceding Index Business Day<sub>(t)</sub>;

$RL_{i,t-1}$  means the Reinvested Level of Underlying Asset<sub>(i)</sub> as of the Index Business Day immediately preceding Index Business Day<sub>(t)</sub>;

$I_{i,t}$  means the Reference Level of Underlying Asset<sub>(i)</sub> (determined as specified in the Annex) as of Index Business Day<sub>(t)</sub>;

$I_{i,t-1}$  means the Reference Level of Underlying Asset<sub>(i)</sub> as of the Index Business Day immediately preceding Index Business Day<sub>(t)</sub> and

$D_{i,t}$  means, for each Underlying Asset<sub>(i)</sub>, the aggregate amount of cash dividends with an ex-dividend date during the period from but excluding Index Business Day<sub>(t-1)</sub> to and including Index Business Day<sub>(t)</sub> ;

And where:

$RL_{i,t-1}$  means the Reinvested Level of Underlying Asset<sub>(i)</sub> as of the Index Business Day immediately preceding Index Business Day<sub>(t)</sub>.

#### *Total Return Index Rebalancing and Volatility Control*

The Methodology has a volatility control feature applied on any Total Return Index Rebalancing Day. This has the effect of reducing the exposure of the Total Return Index to the performance of the Base Index (and subsequently the Underlying Assets) by rebalancing a portion of the Base Index into the Deleverage Position if the realized volatility of the Base Index exceeds the Volatility Cap of 6% (the “**Volatility Cap**”) on any Total Return Index Rebalancing Day.

To operate the volatility control, the annualized historical realized volatility of the Base Index (the “**Annualized Base Index Realized Volatility**”) is calculated over the relevant Volatility Cap Period (as described below) on each Total Return Index Rebalancing Day. As long as on any given Total Return Index Rebalancing Day such calculated volatility is equal to or less than the Volatility Cap, the weight of the Base Index in the Total Return Index will be set to 100% on that Total Return Index Rebalancing Day. However, if on any given Total Return Index Rebalancing Day such calculated volatility exceeds the Volatility Cap, the exposure of the Total Return Index to the Base Index will be partially rebalanced into the Deleverage Position for that Total Return Index Rebalancing Day, effected through a reduction of the Base Index weight to the percentage that is equal to the Volatility Cap divided by such calculated volatility. As a result, the respective Underlying Assets weights within the Index will be ratably reduced.

With respect to any given Total Return Index Rebalancing Day, the “**Volatility Cap Period**” is the period from (and including) the day which is one (1) calendar month (or, if any such date is not an Index Business Day, the preceding Index Business Day) before the second Index Business Day prior to the given Total Return Index Rebalancing Day to (and including) the third Index Business Day prior to the given Total Return Index Rebalancing Day.

The Volatility Cap Period, with respect to any given Total Return Index Rebalancing Day will not be affected by any postponement of such Total Return Index Rebalancing Day by the Calculation Agent, and the Base Index Weight (determined as described under “*Calculation of the Total Return Index Value*”) will be calculated on the postponed Total Return Index Rebalancing Day as though such Total Return Index Rebalancing Day had not been postponed.

#### *Calculation of the Annualized Base Index Realized Volatility*

The Annualized Base Index Realized Volatility over the relevant Volatility Cap Period with respect to a given Total Return Index Rebalancing Day<sub>(t)</sub> is calculated as according to the following formula:

$$Base\_Index\_Realized\_Volatility_{TRRt} = \sqrt{\frac{252}{N_{TRRt}} \times \sum_s \left[ \ln \left( \frac{B_{S+1}}{B_s} \right) \right]^2}$$

Where:

*Subscript*  $(TRR_t)$  refers to the given Total Return Index Rebalancing Day;

*Base\_Index\_Realized\_Volatility* $_{TRR_t}$  is the Annualized Base Index Realized Volatility during the Volatility Cap Period as of the given Total Return Index Rebalancing Day;

*Subscript*  $(s)$  refers to each Index Business Day within the relevant Volatility Cap Period;

*Subscript*  $(s+1)$  refers to the Index Business Day immediately following each Index Business Day  $(s)$ ;

$N_{TRR_t}$  is the actual number of Index Business Days within the relevant Volatility Cap Period; and

$B_s$  is the Base Index Value on the date  $s$

$B_{s+1}$  is the Base Index Value on the date  $s+1$

### *Delayed Rebalancing*

If a Base Index Rebalancing Day or a Total Return Index Rebalancing Day must be effected on an Index Business Day on which a Market Disruption Event (as defined in “Market Disruption Events”) occurs and is continuing with respect to any Underlying Assets included in the Index, the Calculation Agent shall postpone such Base Index Rebalancing Day or Total Return Index Rebalancing Day, as applicable, to the next Index Business Day on which no Market Disruption Event occurs or is continuing with respect to any Underlying Asset. The Calculation Agent shall then rebalance the Index as if (i) for each Underlying Asset that had not been affected by such Market Disruption Event, the Base Index Rebalancing Day (if applicable) and Total Return Index Rebalancing Day, respectively, occurred on the first day on which such Market Disruption Event occurred and (ii) for each Underlying Asset that had been affected by such Market Disruption Event, the Base Index Rebalancing Day (if applicable) and Total Return Index Rebalancing Day, respectively, occurred on the first day on which there was no Market Disruption Event occurring or continuing.

On the sixth Index Business Day following the occurrence of a Market Disruption Event with respect to any Underlying ETFs included in the Index, if such Market Disruption Event is continuing, the Index Committee may determine in its sole discretion to instruct the Calculation Agent to rebalance the Index using a specified price. In the event the Index Committee determines on such sixth Business Day, in its sole discretion, that no such instructions should be given to the Calculation Agent, the Index Committee may revisit such determination on any Index Business Day thereafter on which the Market Disruption Event is continuing.

### **Calculation of the Index**

The Index Value on the Index Inception Date is equal to 100. On any given Index Business Day $(t)$  following the Index Inception Date, the Index Value is calculated according to the following formula:

$$Index_t = Index_{IRt} \times \left[ \frac{TRV_t}{TRV_{IRt}} - Interest\_Rate_{IRt} \times DCF_{IRt,t} \right] \times e^{(-Deduction\_Rate * DCF_{IRt,t})}$$

Where:

*Subscript<sub>(t)</sub>* refers to the given Index Business Day<sub>(t)</sub>;  
*Subscript<sub>(IR<sub>t</sub>)</sub>* refers to the Notional Interest Rate Reset Date immediately preceding (but not including) Index Business Day<sub>(t)</sub>;  
*Index<sub>t</sub>* means the Index Value as of the date *t*;  
*Index<sub>IR<sub>t</sub></sub>* means the Index Value as of the date *IR<sub>t</sub>*;  
*TRV<sub>t</sub>* means the Total Return Index Value as of the date *t*;  
*TRV<sub>IR<sub>t</sub></sub>* means the Total Return Index Value as of the date *IR<sub>t</sub>*;  
*Interest\_Rate<sub>IR<sub>t</sub></sub>* means the Notional Interest Rate as of date *IR<sub>t</sub>*;  
*Deduction\_Rate* means the Daily Index Maintenance Fee of 0.50% per annum  
*DCF<sub>IR<sub>t</sub>,t</sub>* is the day count fraction for the period from (but excluding) the date *IR<sub>t</sub>* to (and including) the given Index Business Day<sub>(t)</sub>, determined by using the Day Count Convention (as specified in the Annex)  
*e* means the exponential function

*Calculation of the Total Return Index Value*

The Total Return Index Value on the Total Return Index Inception Date 100. On any given Index Business Day<sub>(t)</sub> following the Total Return Index Inception Date, the Total Return Index Value is calculated according to the following formula:

$$TRV_t = TRV_{TRRt} * \left[ \frac{B_t}{B_{TRRt}} * w_{TRRt}^B + \frac{DP_t}{DP_{TRRt}} * (1 - w_{TRRt}^B) \right]$$

Where:

*Subscript<sub>(t)</sub>* refers to the given Index Business Day<sub>(t)</sub>;  
*Subscript<sub>(TRR<sub>t</sub>)</sub>* refers to the Total Return Index Rebalancing Day immediately preceding (but not including) Index Business Day<sub>(t)</sub>;  
*TRV<sub>t</sub>* means the Total Return Index Value as of the date *t*;  
*TRV<sub>TRR<sub>t</sub></sub>* means the Total Return Index Value as of the date *TRR<sub>t</sub>*;  
*B<sub>t</sub>* means the Base Index Value as of the date *t*;  
*B<sub>TRR<sub>t</sub></sub>* means the Base Index Value as of the date *TRR<sub>t</sub>*;  
*DP<sub>t</sub>* means the Deleverage Position Value as of the date *t*;  
*DP<sub>TRR<sub>t</sub></sub>* means the Deleverage Position Value as of the date *TRR<sub>t</sub>*;  
*w<sub>TRR<sub>t</sub></sub><sup>B</sup>* means the Base Index Weight as of date *TRR<sub>t</sub>* and calculated according to the following formula

$$w_{TRRt}^B = \min \left( 100\%, \frac{VolatilityCap}{Base\_Index\_Realized\_Volatility_{TRRt}} \right)$$

Where:

*VolatilityCap* means the Volatility Cap (as defined under “Total Return Index Rebalancing and Volatility Control” above); and

*Base\_Index\_Realized\_Volatility<sub>TRRt</sub>* means the Annualized Base Index Realized as of date *TRR<sub>t</sub>*.

### *Calculation of the Base Index Value*

The Base Index Value on the Base Index Inception Date 100. On any given Index Business Day<sub>(t)</sub> following the Base Index Inception Date, the Base Index Value is calculated according to the following formula:

$$B_t = B_{BRt} \times \left[ 1 + \sum_{i=1}^n w_{i,BRt} \times \left( \frac{A_{i,t}}{A_{i,BRt}} - 1 \right) \right]$$

Where:

*Subscript<sub>(t)</sub>* refers to the given Index Business Day<sub>(t)</sub>;

*Subscript<sub>(BRt)</sub>* refers to the Base Index Rebalancing Day immediately preceding (but not including) Index Business Day<sub>(t)</sub>;

$B_t$  means the Base Index Value as of the date  $t$ ;

$B_{BRt}$  means the Base Index Value as of the date  $BRt$ ;

$w_{i,BRt}$  is the Underlying Asset Weight<sub>(i)</sub> of Underlying Asset<sub>(i)</sub> as of the date  $BRt$

$A_{i,t}$  means the Underlying Asset Value<sub>(i)</sub> of Underlying Asset<sub>(i)</sub> as of the date  $t$ ; and

$A_{i,BRt}$  means the Underlying Asset Value<sub>(i)</sub> of Underlying Asset<sub>(i)</sub> as of the date  $BRt$

### *Calculation of the Deleverage Position Value*

On any Index Business Day<sub>(t)</sub> following the Total Return Index Inception Date the Deleverage Position Value is equal to the Money Market Position Value (defined below) on that Index Business Day<sub>(t)</sub>

### **Calculation of the Money Market Position**

#### *Overview*

The Money Market Position is intended to express the notional returns accruing to a hypothetical investor from an investment in a notional overnight money account denominated in U.S. dollars that accrues interest at a rate determined by reference to the Overnight Interest Rate (the Federal Funds Rate, determined as specified in the Annex). The Money Market Position will have a positive notional return if the Overnight Interest Rate is positive.

#### *Calculation of the Money Market Position Value*

The value of the Money Market Position (the “**Money Market Position Value**”) is equal to 100 on the Money Market Position’s Asset Inception Date. On any calendar date<sub>(t)</sub> following the Index Inception Date, the Money Market Position Value will be calculated according to the following formula:

$$MM_t = MM_{t-1} \times (1 + R_{t-1} \times DCF_{t-1,t})$$

Where:

*Subscript*  $(t)$  refers to the given calendar date;

*Subscript*  $(t-1)$  refers to the calendar date immediately preceding calendar date $(t)$ ;

$MM_t$  means the Money Market Position Value as of the date  $t$

$MM_{t-1}$  means the Money Market Position Value as of the date  $t-1$

$R_{t-1}$  means the Overnight Interest Rate as of the date  $t-1$

$DCF_{t-1,t}$  is the day count fraction for the period from (but excluding) the date  $t-1$  to (and including) the date  $t$ , determined by using the Day Count Convention

## **Historical Data**

The “**Launch Date**” for the Index, which is the date the Calculation Agent began calculating the Index, is specified in the Annex. Therefore, historical information provided for the period from the Index Inception Date until the Launch Date, is hypothetical and is provided as an illustration of how the Index would have performed during the period had the Calculation Agent begun calculating the Index on the Index Inception Date using the Methodology. This data does not reflect actual performance, nor was a contemporaneous investment model run of the Index. Historical information for the period from and after the Launch Date is based on the actual performance of the Index.

Historical levels of the Index are calculated with reference to the Reference Levels of the Underlying Assets determined based on the latest available data published by the relevant exchanges.

## **Market Disruption Events**

A “**Market Disruption Event**” with respect to an Underlying ETF will have occurred in any of the following situations: (i) upon the occurrence or existence of a Trading Disruption or an Exchange Disruption, in either case, for more than two hours of trading, or at any time during the one-hour period that ends at the scheduled closing time of the relevant Exchange, and which the Calculation Agent determines is material, (ii) upon the occurrence or existence of an Early Closure, (iii) the net asset value per share of such Underlying ETF is not calculated or is not announced by the Underlying ETF or the sponsor of such Underlying ETF, (iv) the ETF or the relevant sponsor of any Underlying ETF suspends creations or redemptions of shares of such Underlying ETF, (v) upon the occurrence or existence of an Index Dislocation or (vi) upon the occurrence or existence of a Force Majeure Event.

A “**Trading Disruption**” means any suspension of or limitation imposed on trading by the relevant Exchange or Related Exchange, and whether by reason of movements in price exceeding limits permitted by the relevant Exchange or otherwise, relating to the Underlying ETF shares, related Reference Index or futures or options on the Underlying ETF shares or Reference Index.

An “**Exchange Disruption**” means any event that disrupts or impairs (as determined by the Calculation Agent in its sole discretion) the ability of market participants in general to effect transactions in, or obtain market values for, the shares of the Underlying ETF on the relevant Exchange or futures or options on the Underlying ETF shares or Reference Index, in each case on the relevant Related Exchange.



“**Early Closure**” means the closure of the relevant Exchange or relevant Related Exchange on any business day of that exchange prior to its scheduled closing time unless such earlier closing time is announced by such exchange prior to the close of trading on the first Index Business Day immediately preceding such date.

“**Exchange**” means the primary exchange on which shares of an Underlying ETF are listed.

“**Related Exchange**” means, in respect of an Underlying ETF or Reference Index, as the case may be, the primary exchange (or exchanges) or quotation system (or quotation systems) on which futures or options contracts relating to such Underlying ETF or Reference Index, as the case may be, are traded, if any.

An “**Index Dislocation**” means the Calculation Agent determines that a market participant, as a result of a market-wide condition relating to the Index or any Underlying ETF would (i) be unable, after using commercially reasonable efforts, to acquire, establish, re-establish, substitute, maintain, unwind, or dispose of all or a material portion of any hedge position relating to the Index or an Underlying ETF, or (ii) incur a materially increased cost in doing so, including due to any capital requirements or other law or regulation.

A “**Force Majeure Event**” means the Calculation Agent determines that there has been the occurrence of a systems failure, natural or man-made disaster, act of God, armed conflict, act of terrorism, riot or labor disruption or any similar intervening circumstance that is beyond the reasonable control of the Index Sponsor, Calculation Agent or any of their respective affiliates that Calculation Agent determines is likely to have a material effect on an Index component, or on its ability to perform its role in respect of the Index.

On any Index Business Day on which a Market Disruption Event occurs or is continuing with respect to any non-zero weighted Underlying ETFs included in the Index, the Calculation Agent shall postpone calculation of the Index Value to the next Index Business Day on which no Market Disruption Event occurs or is continuing with respect to any Underlying ETFs, and an indicative level for the Index will be published. Such level will be identified as a “disrupted indicative level”. The Calculation Agent shall resume calculating the Index Value on the first Index Business Day on which no Market Disruption Event is occurring or continuing with respect to any Underlying ETF by using (i) for the weight of each Underlying Asset that had not been affected by such Market Disruption Event, the weight that would have been used as if the Base Index Rebalancing Day (if applicable) and Total Return Index Rebalancing Day, respectively, occurred on the first day on which such Market Disruption Event occurred and (ii) for the weight of each Underlying Asset that had been affected by such Market Disruption Event, the weight of the Index Business Day immediately preceding the first day of such Market Disruption Event.

On the sixth Index Business Day following the occurrence of a Market Disruption Event with respect to any Underlying ETFs included in the Index, if such Market Disruption Event is continuing and such Underlying ETFs have not been removed from the Index, the Index Committee may determine in its sole discretion to instruct the Calculation Agent to calculate the Index, using a price for such Underlying ETFs as determined by the Index Committee in its sole discretion. In the event the Index Committee determines on such sixth Business Day, in its sole discretion, that no such instructions should be given to the Calculation Agent, the Index Committee

may revisit such determination on any Index Business Day thereafter on which the Market Disruption Event is continuing.

Notwithstanding the foregoing, in the event of a Force Majeure Event in which all Underlying Assets are affected, the calculation and publication of the Index will be postponed until, in the determination of the Calculation Agent, such Force Majeure Event has been resolved.

### Potential Adjustment Events

In the event that an Underlying ETF is affected by a “**potential adjustment event**”, the Calculation Agent may make adjustments to the level of such Underlying ETF and/or the weighting of the Underlying ETF if it determines that the event could have a diluting or concentrative effect on the theoretical value of the Underlying ETF shares and would not otherwise be accounted for in the Index. Table 1 below describes the potential adjustment events for which adjustments may be made by the Calculation Agent.

**Table 1. Potential Adjustment Events.**

Potential Adjustment Event	Adjustment	Adjustment Description
Cash Dividends	Yes	The Dividend is reinvested in that Underlying ETF.
Special / Extraordinary Dividends	Yes	The Dividend is reinvested in that Underlying ETF.
Return on Capital	Yes	The Dividend is reinvested in that Underlying ETF.
Stock Dividend	Yes	Where shareholders receive “B” new shares for every “A” share held, the number of shares is adjusted by multiplying the original number of shares by the quotient of (a) the sum of A and B divided by (b) A.
Stock Split	Yes	Where shareholders receive “B” new shares for every “A” share held, the number of shares is adjusted by multiplying the original number of shares by the quotient of B divided by A.

For potential adjustment events not listed in the table above, the Calculation Agent may make adjustments if it determines that the event could have a diluting or concentrative effect on the theoretical value of the Underlying ETF shares and would not otherwise be accounted for in the Index. Any such adjustments are publicly announced in advance wherever practicable.

### **Revision to Index Values in the Event of Data Error**

If the Calculation Agent determines that the price made available for an Underlying ETF with a non-zero weighting in the Index by the relevant Exchange reflects a manifest error, the calculation of the Index shall be delayed until such time as a corrected price is made available. In the event a corrected price is not made available on a timely basis, the Calculation Agent may determine an appropriate price and disclose on its website its determination and the basis therefor. In the event an Exchange corrects prices previously provided, the Calculation Agent shall recalculate Index Values using the corrected information and disclose on its website that it has substituted updated versions of Index Values as a result. If such a correction occurs 30 days or fewer after such an error, the Calculation Agent will recalculate the Index Value for each Index Business Day after and including the day on which such error occurred, using the corrected information. If such a correction occurs more than 30 days after such error, the Calculation Agent will recalculate the Index Value for each Index Day after and including the day on which such correction occurs, using the corrected information.

On any Base Index Observation Day, or Total Return Index Rebalancing Day, respectively, during which the price for an Underlying ETF reflects such an error (and such error has not been corrected), the Underlying Asset Target Weights, or the Base Index Weight, respectively, will be calculated using the price made available by the relevant Exchange (notwithstanding any manifest error). If the relevant Exchange subsequently corrects such price, the Index Value will be calculated using such corrected price, but the Underlying Asset Target Weights, or the Base Index Weight, respectively, will not be adjusted.

### **Licensing Information**

Goldman, Sachs & Co. is the sole licensing agent for the Index. Questions about licensing the Index can be directed to the individuals listed under “Contact Information” below.

### **Contact Information**

#### *Equity STS Group*

Philip Coureau – 212 357 2861 – eq-esg-sts@gs.com

#### *Media Relations*

Michael Duvally – 212 902 2605 – Michael.Duvally@gs.com

### **Calculation Agent Website**

<http://www.solactive.com/>

## **Disclaimers**

Trademarks: The “GS Momentum Builder™ Multi-Asset 5 ER Index” is a trademark of Goldman, Sachs & Co.

No Advice or Recommendation: Neither Goldman, Sachs & Co. nor any of its affiliates makes any representation or warranty, express or implied, or accept any liability or responsibility (except in the case of fraud) to the owner of any products linked to the Index or any member of the public regarding (i) the advisability of investing in securities generally, in the Index or in the Underlying ETFs or (ii) the ability of the Index to generate positive results. If you consider acquiring any product linked to the Index you should consult your own accounting, tax, investment and legal advisors before doing so. Goldman, Sachs & Co. does not act as an advisor or fiduciary.

Calculation of the Underlying ETFs: The level of certain Underlying ETFs is calculated and published by third parties and not Goldman, Sachs & Co. or any of its affiliates. Goldman, Sachs & Co. and its affiliates disclaim all liability for any errors committed by, or omissions or delays on the part of, any third party in calculating or publishing the level of any Underlying ETF.

Strategies Not Designed by Reference to Individual Needs: The Index is structured by Goldman, Sachs & Co. and determined and calculated by the Calculation Agent without regard to any products linked to it. Goldman, Sachs & Co. does not have any obligation to take the needs of any person into consideration in structuring the Index or revising its methodology, and the Calculation Agent does not have any obligation to take the needs of any person into consideration in determining and calculating the Index.

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

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

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

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

Nothing in this document excludes any liability for, or remedy in respect of, fraudulent misrepresentation.

“iShares” is a registered trademark of BlackRock Institutional Trust Company, N.A. (“BITC”). The Index is not sponsored, endorsed, sold, or promoted by BITC. BITC makes no representations or warranties to the owners of the Index or any product linked to the Index or any member of the public regarding the advisability of investing in the Index or such product. BITC has no obligation or liability in connection with the operation, marketing, trading or sale of the Index.

The MSCI indexes are the exclusive property of MSCI Inc. (“MSCI”). MSCI and the MSCI index names are service mark(s) of MSCI or its affiliates. The financial securities referred to herein are not sponsored, endorsed, or promoted by MSCI, and MSCI bears no liability with respect to any such financial securities.

"SPDR®" is a registered trademark of Standard & Poor's Financial Services LLC ("S&P") and Dow Jones is a registered trademark of Dow Jones Trademark Holdings LLC (“Dow Jones”) and have been licensed for use by S&P Dow Jones Indices LLC. The Index is not sponsored, endorsed, sold or promoted by S&P Dow Jones Indices LLC, Dow Jones, S&P or their respective affiliates, and neither S&P Dow Jones Indices LLC, Dow Jones, S&P or their respective affiliates make any representation regarding the advisability of investing in the Index.

PowerShares® is a registered trademark of Invesco PowerShares Capital Management LLC (Invesco PowerShares). Invesco PowerShares Capital Management LLC and Invesco Distributors, Inc. are indirect, wholly owned subsidiaries of Invesco Ltd. PowerShares makes no representations or warranties to the owners of the Index or any product linked to the Index or any member of the public regarding the advisability of investing in the Index or such product. PowerShares has no obligation or liability in connection with the operation, marketing, trading or sale of the Index.

The Index is not issued, sponsored, endorsed, sold or promoted by Alerian.

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

## ANNEX

Index Inception Date	January 2 <sup>nd</sup> , 2013
Total Return Index Inception Date	January 2 <sup>nd</sup> , 2013
Base Index Inception Date	September 4 <sup>th</sup> , 2012
Launch Date	December 17 <sup>th</sup> , 2013
Index Bloomberg Ticker	GSMBMA5 Index
Index Reuters Ticker	.GSMBMA5
Asset Inception Date	See asset table below.
Index Business Day	Means a day on which the New York Stock Exchange is open for its regular trading session on such day
Notional Interest Rate	<p>With respect to Notional Interest Rate Reset Dates falling strictly before July 3, 2023, 3-Month USD LIBOR.</p> <p>With respect to Notional Interest Rate Reset Dates falling on or July 3, 2023, SOFR plus 0.26161%.</p> <p>SOFR will be the Secured Overnight Financing Rate published on the Federal Reserve Bank of New York’s Website at 3:00 p.m. (New York time), as observed two U.S. Government Securities Business Days prior to the relevant Notional Interest Rate Reset Date. A “<b>U.S. Government Securities Business Day</b>” means any day other than a Saturday, a Sunday or a day on which the Securities Industry and Financial Markets Association recommends that the fixed income departments of its members be closed for the entire day for purposes of trading in U.S. government securities.</p> <p>If the rate described above does not so appear, SOFR will be the Secured Overnight Financing Rate as published on the first preceding U.S. Government Securities Business Day on which the Secured Overnight Financing Rate was published on the Federal Reserve Bank of New York’s Website.</p> <p>Notwithstanding the foregoing, if the Calculation Agent determines that a Benchmark Transition Event and its related Benchmark Replacement Date have occurred prior to the</p>

Reference Time in respect of any determination of the Benchmark on any date, the Benchmark Replacement will replace the then-current Benchmark for all purposes in respect of such determination on such date and all determinations on all subsequent dates.

In connection with the implementation of a Benchmark Replacement, the Calculation Agent will have the right to make Benchmark Replacement Conforming Changes from time to time.

Any determination, decision or election that may be made by the Calculation Agent, including any determination with respect to a tenor, rate or adjustment or of the occurrence or non-occurrence of an event, circumstance or date and any decision to take or refrain from taking any action or any selection, will be conclusive and binding absent manifest error, may be made in the Calculation Agent's sole discretion, and, notwithstanding anything to the contrary in this Methodology, shall become effective without consent from any other party.

As used herein:

The term "**Benchmark**" means, initially, SOFR; provided that if a Benchmark Transition Event and its related Benchmark Replacement Date have occurred with respect to SOFR or the then-current Benchmark, then "Benchmark" means the applicable Benchmark Replacement.

The term "**Benchmark Replacement**" means the first alternative set forth in the order below that can be determined by the Calculation Agent as of the Benchmark Replacement Date:

- (1) the sum of: (a) the alternate rate of interest that has been selected or recommended by the Relevant Governmental Body as the replacement for the then-current Benchmark and (b) the Benchmark Replacement Adjustment;
- (2) the sum of: (a) the ISDA Fallback Rate and (b) the Benchmark Replacement Adjustment;
- (3) provided that if (i) the Benchmark Replacement cannot be determined in accordance with clause (3) or (4) above as of the Benchmark Replacement Date or (ii) the Calculation Agent shall have determined that the ISDA Fallback Rate determined in accordance with clause (4) above is not an industry-accepted rate of interest as a replacement for the then-current Benchmark for U.S. dollar denominated

floating rate debt securities at such time, then the Benchmark Replacement shall be the sum of: (a) the alternate rate of interest that has been selected by the Calculation Agent as the replacement for the then current Benchmark giving due consideration to any industry accepted rate of interest as a replacement for the then-current Benchmark for U.S. dollar denominated floating rate fixed income instruments at such time and (b) the Benchmark Replacement Adjustment.

The term “**Benchmark Replacement Adjustment**” means the first alternative set forth in the order below that can be determined by the Calculation Agent as of the Benchmark Replacement Date:

- (1) the spread adjustment (which may be a positive or negative value or zero), or method for calculating or determining such spread adjustment, that has been selected or recommended by the Relevant Governmental Body for the applicable Unadjusted Benchmark Replacement;
- (2) if the applicable Unadjusted Benchmark Replacement is equivalent to the ISDA Fallback Rate, then the ISDA Fallback Adjustment;
- (3) the spread adjustment (which may be a positive or negative value or zero) that has been selected by the Calculation Agent giving due consideration to any industry-accepted spread adjustment, or method for calculating or determining such spread adjustment, for the replacement of the then-current Benchmark with the applicable Unadjusted Benchmark Replacement for U.S. dollar denominated floating rate fixed income instruments at such time.

The term “**Benchmark Replacement Conforming Changes**” means, with respect to any Benchmark Replacement, any technical, administrative or operational changes (including changes to the definitions of “business day”, timing and frequency of determining rates and other administrative matters) that the Calculation Agent decides may be appropriate to reflect the adoption of such Benchmark Replacement in a manner substantially consistent with market practice (or, if the Calculation Agent decides that adoption of any portion of such market practice is not administratively feasible or if the Calculation Agent determines that no market practice for use of the Benchmark Replacement exists, in such other manner as the Calculation Agent determines is reasonably necessary).



The term “**Benchmark Replacement Date**” means the earliest to occur of the following events with respect to the then-current Benchmark:

- (1) in the case of clause (1) or (2) of the definition of “Benchmark Transition Event,” the later of (a) the date of the public statement or publication of information referenced therein and (b) the date on which the administrator of the Benchmark permanently or indefinitely ceases to provide the Benchmark; or
- (2) in the case of clause (3) of the definition of “Benchmark Transition Event,” the date of the public statement or publication of information referenced therein.

For the avoidance of doubt, if the event giving rise to the Benchmark Replacement Date occurs on the same day as, but earlier than, the Reference Time in respect of any determination, the Benchmark Replacement Date will be deemed to have occurred prior to the Reference Time for such determination.

For the avoidance of doubt, for purposes of the definitions of Benchmark Replacement Date and Benchmark Transition Event, references to “Benchmark” also include any reference rate underlying such Benchmark.

The term “**Benchmark Transition Event**” means the occurrence of one or more of the following events with respect to the then-current Benchmark:

- (1) a public statement or publication of information by or on behalf of the administrator of the Benchmark announcing that such administrator has ceased or will cease to provide the Benchmark, permanently or indefinitely, provided that, at the time of such statement or publication, there is no successor administrator that will continue to provide the Benchmark;
- (2) a public statement or publication of information by the regulatory supervisor for the administrator of the Benchmark, the central bank for the currency of the Benchmark, an insolvency official with jurisdiction over the administrator for the Benchmark, a resolution authority with jurisdiction over the administrator for the Benchmark or a court or an entity with similar insolvency or resolution authority over the administrator for the Benchmark, which states that the administrator of the Benchmark has ceased

or will cease to provide the Benchmark permanently or indefinitely, provided that, at the time of such statement or publication, there is no successor administrator that will continue to provide the Benchmark; or

- (3) a public statement or publication of information by the regulatory supervisor for the administrator of the Benchmark announcing that the Benchmark is no longer representative.

The term “**Federal Reserve Bank of New York’s Website**” means the website of the Federal Reserve Bank of New York at <http://www.newyorkfed.org>, or any successor source. We are not incorporating by reference the website or any material it includes in this prospectus.

The term “**ISDA Definitions**” means the 2006 ISDA definitions published by the International Swaps and Derivatives Association, Inc. or any successor thereto, as amended or supplemented from time to time, or any successor definitional booklet for interest rate derivatives published from time to time.

The term “**ISDA Fallback Adjustment**” means the spread adjustment (which may be a positive or negative value or zero) that would apply for derivatives transactions referencing the ISDA Definitions to be determined upon the occurrence of an index cessation event with respect to the Benchmark for the applicable tenor.

The term “**ISDA Fallback Rate**” means the rate that would apply for derivatives transactions referencing the ISDA Definitions to be effective upon the occurrence of an index cessation date with respect to the Benchmark for the applicable tenor excluding the applicable ISDA Fallback Adjustment.

The term “**Reference Time**” with respect to any determination of the Benchmark means (1) if the Benchmark is SOFR, 3:00 p.m. (New York time) on the day that is two U.S. Government Securities Business Days preceding the date of such determination, and (2) if the Benchmark is not SOFR, the time determined by the Calculation Agent in accordance with the Benchmark Replacement Conforming Changes.

The term “**Relevant Governmental Body**” means the Federal Reserve Board and/or the Federal Reserve Bank of New York, or a committee officially endorsed or convened by the Federal

	<p>Reserve Board and/or the Federal Reserve Bank of New York or any successor thereto.</p> <p>The term “<b>SOFR</b>” means the secured overnight financing rate published by the Federal Reserve Bank of New York, as the administrator of the Benchmark (or a successor administrator) on the Federal Reserve Bank of New York’s Website.</p> <p>The term “<b>Unadjusted Benchmark Replacement</b>” means the Benchmark Replacement excluding the Benchmark Replacement Adjustment.</p>
Day Count Convention	Actual/360, meaning the number of days in the relevant period divided by 360.
Overnight Interest Rate	<p>USD-FEDERAL-FUNDS-H15 (as provided by Reuters on RSF.REC.USONFFE=.NaE or by another recognized source used for the purpose of displaying such rate)</p> <p>For any given calendar day on which an Overnight Interest Rate is not available, the Calculation Agent will use for such day the latest available level of the Overnight Interest Rate.</p>

**OVERVIEW OF UNDERLYING ASSETS**

<b>Underlying Asset</b>	<b>Asset Inception Date</b>	<b>Bloomberg Ticker</b>	<b>Reference Level</b>
SPDR S&P 500 ETF Trust	February 1 <sup>st</sup> , 2012	SPY UP Equity	Closing price as reported on NYSE Arca, or its successor
iShares MSCI Japan ETF	February 1 <sup>st</sup> , 2012	EWJ UP Equity	Closing price as reported on NYSE Arca, or its successor
iShares MSCI EAFE ETF	February 1 <sup>st</sup> , 2012	EFA UP Equity	Closing price as reported on NYSE Arca, or its successor
iShares 20+ Year Treasury Bond ETF	February 1 <sup>st</sup> , 2012	TLT UQ Equity*	Closing price as reported on NASDAQ GM, or its successor*

<b>Underlying Asset</b>	<b>Asset Inception Date</b>	<b>Bloomberg Ticker</b>	<b>Reference Level</b>
iShares iBoxx \$ Investment Grade Corporate Bond ETF	February 1 <sup>st</sup> , 2012	LQD UP Equity	Closing price as reported on NYSE Arca, or its successor
iShares iBoxx \$ High Yield Corporate Bond ETF	February 1 <sup>st</sup> , 2012	HYG UP Equity	Closing price as reported on NYSE Arca, or its successor
iShares MSCI Emerging Markets ETF	February 1 <sup>st</sup> , 2012	EEM UP Equity	Closing price as reported on NYSE Arca, or its successor
iShares J.P. Morgan USD Emerging Markets Bond ETF	February 1 <sup>st</sup> , 2012	EMB UQ Equity	Closing price as reported on NASDAQ GM, or its successor**
Alerian MLP ETF	February 1 <sup>st</sup> , 2012	AMLG UP Equity	Closing price as reported on NYSE Arca, or its successor
iShares U.S. Real Estate ETF	February 1 <sup>st</sup> , 2012	IYR UP Equity	Closing price as reported on NYSE Arca, or its successor
PowerShares Senior Loan Portfolio	February 1 <sup>st</sup> , 2012	BKLN UP Equity	Closing price as reported on NYSE Arca, or its successor
PowerShares DB Commodity Index Tracking Fund	February 1 <sup>st</sup> , 2012	DBC UP Equity	Closing price as reported on NYSE Arca, or its successor
SPDR Gold Shares	February 1 <sup>st</sup> , 2012	GLD UP Equity	Closing price as reported on NYSE Arca, or its successor
iShares TIPS ETF	February 1 <sup>st</sup> , 2012	TIP UP Equity	Closing price as reported on NYSE Arca, or its successor
Money Market Position	January 3 <sup>rd</sup> , 2012	Not applicable	Determined as described in methodology

\* With respect to the iShares 20+ Year Treasury Bond ETF, prior to 03 February 2016, the Bloomberg Ticker was TLT UP Equity and the Reference Level was the Closing price as reported on NYSE Arca or its successor

\*\* With respect to the iShares J.P. Morgan USD Emerging Markets Bond ETF, prior to 02 August 2017, the Bloomberg Ticker was EMB UP Equity and the Reference Level was the Closing price as reported on NYSE Arca or its successor

## CONSTRAINTS SCHEDULE

### Investment Constraints\*

Asset Class	Asset Class Maximum Weight	Underlying Asset	Underlying Asset Maximum Weight
Equities	50%	SPDR S&P 500 ETF Trust	20%
		iShares MSCI Japan ETF	10%
		iShares MSCI EAFE ETF	20%
Fixed Income	50%	iShares 20+ Year Treasury Bond ETF	20%
		iShares iBoxx \$ Investment Grade Corporate Bond ETF	20%
		iShares iBoxx \$ High Yield Corporate Bond ETF	20%
Emerging Markets	25%	iShares MSCI Emerging Markets ETF	20%
		iShares J.P. Morgan USD Emerging Markets Bond ETF	20%
Alternatives	25%	Alerian MLP ETF	10%
		iShares U.S. Real Estate ETF	20%
		PowerShares Senior Loan Portfolio	10%
Commodities	25%	PowerShares DB Commodity Index Tracking Fund	20%
		SPDR Gold Shares	20%
Inflation	25%	iShares TIPS ETF	25%
Cash Equivalent	50%	Money Market Position**	50%

\*Minimum Asset Class Weight is 0%. Underlying Asset Minimum Weight is 0%.

\*\*As described in the Methodology.