

# GOLDMAN SACHS EQUITY FACTOR INDEX EMERGING MARKETS NET TOTAL RETURN USD

## METHODOLOGY SUMMARY

Dated: [ • ] 2018

### INDEX SUPPLEMENT

#### 1. Introduction

This "Index Supplement" section of the Goldman Sachs Equity Factor Index Emerging Markets Net Total Return USD Methodology Summary (the "**Methodology Summary**") constitutes the "Relevant Index Supplement" for the purposes of, and should be read in conjunction with (a) the "Equity Factor Index General Methodology" section of this Methodology Summary (the "**Equity Factor Index General Methodology**"), and (b) the "Base Methodology" section of this Methodology Summary (the "**Base Methodology**").

The following sections of this Methodology Summary should be read together:

- (i) this Index Supplement;
- (ii) the Equity Factor Index General Methodology; and
- (iii) the Base Methodology,

and in the event of any inconsistency between these sections, the provisions shall prevail according to the order given above (e.g., the provisions of this Index Supplement shall prevail over all other sections).

This Index Supplement is dated as indicated above. Upon each update to this Index Supplement, the most recent version shall be deemed to be in force from the date of such update and replace in its entirety the immediately preceding version such that, in the event of any conflict between the immediately preceding version and the most recent version, the most recent version shall prevail.

#### 2. Overview of the Goldman Sachs Equity Factor Index Emerging Markets Net Total Return USD

The Goldman Sachs Equity Factor Index Emerging Markets Net Total Return USD (the "**Index**") is a rules-based index which Goldman Sachs International or its successor(s) as Index Sponsor creates and sponsors. The Index is designed to provide synthetic exposure to a global basket of equity stocks reflecting the "momentum", "value", "quality", "size" and "low beta" investment factors (respectively the "**Momentum Factor**", the "**Value Factor**", the "**Quality Factor**", the "**Size Factor**" and the "**Low Beta Factor**"); and for the purpose of the Equity Factor Index General Methodology together the "**Relevant Target Factors**"), whilst taking into account various investment considerations, such as the market liquidity of stocks and the turnover of stocks.

As further described in the Equity Factor Index General Methodology, the Momentum Factor attempts to capture the potential future outperformance of stocks with high historical returns compared to stocks with low historical returns; the Value Factor attempts to capture potential outperformance of "inexpensive" companies compared to "expensive" companies, where such value measure is derived from various accounting ratios; the Quality Factor attempts to capture the potential outperformance of stocks with strong balance sheet metrics compared to stocks with weak balance sheet metrics; the Size Factor attempts to capture the potential outperformance of stocks with small market capitalizations compared to stocks with large market capitalizations; and the Low Beta Factor attempts to capture the potential future outperformance of stocks with low beta relative to the market compared to stocks with high beta to the market.

The Index aims to provide exposure to stocks reflecting the Relevant Target Factors, by assigning factor scores (the "**Factor Scores**") to each Eligible Stock. The Component Stocks included in the Basket in respect of the Index and the Weight assigned to each such Component Stock will then be determined by the "Weight Calculation Agent" and the "Index Calculation Agent" with respect to the Index, based on its Factor Scores and certain other constraints and parameters in accordance with the Equity Factor Index General Methodology and the parameters below. The Index will be calculated in accordance with the Base Methodology.

#### 3. Index Calculation Agent Methodology

The Index Calculation Agent will calculate the Index and make any determinations and/or adjustments under the rules and methodology in respect of the Index (the "**Index Rules**") in accordance with the policies and practices set out in the "Equity Indices Policies & Practices Methodology" of the Index Calculation Agent (such policies and

practices, the "**Index Calculation Agent Methodology**"). The Index Calculation Agent Methodology sets out how the Index Calculation Agent (a) determines adjustments to the Index for any dividends or corporate actions in respect of a Component Stock (b) applies notional dividend withholding tax (if any) to dividend amounts paid in respect of a Component Stock, and (c) determines the official closing price of any Component Stock on the relevant exchange. The Index Calculation Agent Methodology is similar to the methodology used by the Index Calculation Agent for the calculation of a large number of other equity indices, and is available on the website of the Index Calculation Agent at <http://www.spindices.com/documents/methodologies/methodology-sp-equity-indices-policies-practices.pdf>, or any successor page thereto. Information with respect to the determination of the official closing price for any Component Stock pursuant to the Index Calculation Agent Methodology is available at <https://us.spindices.com/documents/index-policies/spdji-global-equity-close-prices.pdf>, or any successor page thereto.

The Index Calculation Agent may change the Index Calculation Agent Methodology from time to time (including creating a methodology specifically in respect of a particular Index), and following the implementation of any such change it will be reflected in the future calculation of the Index Value for such Index.

#### **4. Definitions and Parameters**

Terms not otherwise defined in this Index Supplement in respect of the Index shall have the meanings given to them below.

##### **General Definitions**

<b>Index Name:</b>	Goldman Sachs Equity Factor Index Emerging Markets Net Total Return USD
<b>Bloomberg Ticker:</b>	GSISEMFN Index
<b>Index Currency:</b>	USD
<b>Return Type:</b>	Net Total Return
<b>Index Initial Value:</b>	1000
<b>Index Inception Date:</b>	2 May 2018
<b>Index Calculation Agent:</b>	S&P Dow Jones Indices LLC
<b>Index Value Publication Data Source:</b>	<a href="https://marquee.gs.com">https://marquee.gs.com</a> (or any successor page)
<b>Index Value Publication Precision:</b>	2 decimal places with +0.005 rounded upwards
<b>Index Value Floor:</b>	Applicable
<b>FX Rate Fixing:</b>	the WM Reuters London 4 p.m. closing spot rate fixing.
<b>Observation Day:</b>	Four days before a Rebalancing Day.
<b>Rebalancing Day:</b>	Index Inception Date and every three weeks thereafter.
<b>Transaction Cost Rate:</b>	0.25%

##### **Optimisation Constraints and Specific Parameters**

<b>Reference Universe</b>	MSCI Emerging Markets Index
<b>Benchmark Portfolio</b>	MSCI Emerging Markets Index
<b>Relevant Target Factors:</b>	For the purpose of this Index, the Relevant Target Factors are:

- the Momentum Factor;
- the Value Factor;
- the Quality Factor;
- the Low Beta Factor; and
- the Size Factor

**Score Standardization Classification:** Industry Group

**Country Constraint Level:** For each Eligible Country, the lesser of: (a) the sum of the weights of all component stocks in the Benchmark Portfolio associated with such Eligible Country, rounded up to the nearest third decimal; and (b) 3%.

**General Sector Constraint Classification:** "Industry Group"

**General Sector Constraint Level:** 3%

**Maximum Weight Constraint Level:** 1.5% or, for more liquid Eligible Stocks, 4%.

**Active Weight Constraint Level:** 1%

**Holding Liquidity Constraint Level:** 80%

**Holding Liquidity Constraint Volume:** 60 days

**Trading Liquidity Constraint Level:** 10%

**Trading Liquidity Constraint Volume:** 60 days

20%

**Turnover Constraint Level:**

**Risk Constraint Level:** 3%

**Issuer Exposure Constraint:** 4%

**Additional Optimisation Constraints:** Each of the following shall constitute an additional Optimisation Constraint in respect of the Index:

- (i) with effect from and including 1 June 2018, the Domestic China Constraint; and
- (ii) with effect from and including 27 July 2018, the Active India Weight Constraint.

**Domestic China Constraint:** The aggregate of the Optimal Weights of each Eligible Stock in the portfolio associated with "Domestic China", relative to the sum of the Optimal Weights for all Eligible Stocks, must be less than or equal to the Domestic China Constraint Level and greater than or equal to -1 times the Domestic China Constraint Level, as compared to the aggregate weight of all stocks associated with Domestic China in the Benchmark Portfolio.

For such purposes, "**Domestic China Constraint Level**" means the lesser of: (a) the sum of the weights of all component stocks in the Benchmark Portfolio associated with Domestic China, rounded up to the nearest third decimal; and (b) 3%.

**Active India Weight Constraint** For each Eligible Stock associated with “India” (each, an “**India Stock**”), the *absolute difference* between (i) the Optimal Weight of such India Stock and (ii) the weight of such stock in the Benchmark Portfolio, must be equal to 0%. If such India Stock is not part of the Benchmark Portfolio, then the weight of such stock in the Benchmark Portfolio will be deemed to be zero (0).

**Assumed Notional:** USD 1 billion

## 5. Cost Amendment Methodology

No additional conditions

## 6. Additional Risk Factors

*The following list of risk factors does not purport to be a complete list or explanation of all the risks associated with the Index and should be read together with the risk factors in the Equity Factor Index General Methodology, the Base Methodology and the General Risk Factors sections of this Methodology Summary. Risk factors in relation to a transaction or product which is linked to the performance of the Index may also be set out in the relevant documents in respect of such transaction or product.*

***The Index methodology does not target exposure to the Relevant Target Factors with respect to Eligible Stocks associated with “India”***

With effect from (and including) 27 July 2018, the Active Weight Constraint in respect of the Index restricts the weight of each India Stock, to the same weight as that of the corresponding such stock in the Benchmark Portfolio. Accordingly, while the Index is designed primarily to provide synthetic exposure to stocks reflecting each Relevant Target Factor, as a result of the application of such Active Weight Constraint, the Index methodology does not target exposure to the Relevant Target Factors with respect to any India Stock (notwithstanding any increase or decrease in the respective Factor Scores for any such India Stock). Such application of the Active Weight Constraint in respect of India Stocks may have an adverse impact upon the performance of the Index, perhaps materially so.

## 7. Disclaimers

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## EQUITY FACTOR INDEX GENERAL METHODOLOGY

### 1. Introduction

This “Equity Factor Index General Methodology” section of this Methodology Summary, constitutes the “Relevant General Index Methodology” for the purposes of, and should be read in conjunction with the “Base Methodology” section of this Methodology Summary.

### 2. Determination of the Eligible Stocks

On each Observation Day (as defined in the Relevant Index Supplement), the Component Stocks to be included in the Basket in respect of the Index will be selected from a potential reference universe, (the “Reference Universe”, as specified in the Relevant Index Supplement) of stocks as specified in the Relevant Index Supplement. Each stock comprised within this Reference Universe on such Observation Day will be deemed to be an “Eligible Stock” (and together the “Eligible Stocks”), and each country associated to such Eligible Stocks an “Eligible Country” (and together the “Eligible Countries”).

### 3. Selection of Component Stocks and determination of Weights

#### (i) Determination of Factor Scores and Objective Function

##### a. Factor Scores

In order to determine the Component Stocks included in the Basket and their respective Weights on an Observation Day, the Weight Calculation Agent will first assign a score (the “Factor Score”) for each investment factors listed below (each a “Factor”, together the “Factors”) to each Eligible Stock on such Observation Day. The Factor Score for each Factor in respect of the Index will be determined by the Weight Calculation Agent in accordance with the methodology described below:

- Quality Factor Score:** The Weight Calculation Agent will obtain the following seven metrics using data for each Eligible Stock: (i) return on assets, (ii) operating cash flow to total assets, (iii) accruals, (iv) liquidity, (v) gross margin, (vi) asset turnover and (vii) leverage. The Quality Factor Score for an Eligible Stock is calculated as the average of the seven metrics, whereby each metric has been standardised separately and subsequently winsorised to 2.5 standard deviations (i.e., by replacing extreme values for each metric with the relevant values based on the specified standard deviations). The average score is then standardised and subsequently winsorised to 2.5 standard deviations.
- Value Factor Score:** The Value Factor Score is calculated based on two descriptors: (a) the ratio of common equity of the Eligible Stock to the current market capitalization (i.e. Book-to-Price) and (b) the ratio of reported earnings of the Eligible Stock to current market capitalization (i.e. Earnings-to-Price) and is then standardised separately and subsequently winsorised to 2.5 standard deviations.
- Low Beta Factor Score:** The Low Beta Factor Score of an Eligible Stock is equal to one minus its “Beta” to the Benchmark Portfolio (as specified in the Relevant Index Supplement), where Beta is a measure of the sensitivity of an Eligible Stock’s returns to the returns of the Benchmark Portfolio. The vector  $\beta$  of the Betas for all Eligible Stocks is calculated using the vector of the Benchmark Stock Weights  $w_B$  (as defined below) and the covariance matrix  $C$  of the returns of each Eligible Stock:

$$\beta = \frac{C \cdot w_B}{w_B' \cdot C \cdot w_B}$$

- Momentum Factor Score:** For each Eligible Stock the Weight Calculation Agent will determine both (a) the total return cumulative performance and (b) the realised volatility, each over the 12 months preceding the relevant Observation Day (but excluding the most recent month preceding the relevant Observation Day). Both metrics are then standardised separately and subsequently winsorised to 2.5 standard deviations to generate a momentum score  $Z_M$  and a volatility score  $Z_V$  respectively. The Weight Calculation Agent will then run the cross-sectional regression  $Z_M = \gamma \mathbf{1} + Z_V \alpha + \varepsilon$  and the Momentum Factor Score is defined as the vector of residuals  $\varepsilon$ , standardised separately and subsequently winsorised to 2.5 standard deviations.
- Size Factor Score:** The Size Factor Score for an Eligible Stock is calculated as -1 (minus one) multiplied by the natural logarithm of an Eligible Stock’s market capitalisation and is standardised separately and subsequently winsorised to 2.5 standard deviations.

## b. Objective Function

In respect of a Basket Rebalancing, the Weight Calculation Agent will algorithmically maximize the value of an objective function (the “**Objective Function**”). Such Objective Function is defined as the *sum* across all Relevant Target Factors.

### (ii) Determination of the Eligible Component Stocks and their Optimal Weights

The Weight Calculation Agent will then create a notional long only portfolio of Eligible Stocks by assigning an optimal weight to each Eligible Stock (the “**Optimal Weight**” in respect of such Eligible Stock) using a rules-based non-discretionary mathematical portfolio optimisation algorithm as described below. The algorithm will assign Optimal Weights to Eligible Stocks in order to maximise the Objective Function subject to the following set of optimisation constraints (the “**Optimisation Constraints**”):

- (a) **Long Only Constraint:** The Optimal Weight of each Eligible Stock cannot be less than zero.
- (b) **Country Constraint:** The aggregate of the Optimal Weights of each Eligible Stock in the portfolio associated with a particular Eligible Country, relative to the sum of the Optimal Weights for all Eligible Stocks, must be less than or equal to the Country Constraint Level (as specified in the Relevant Index Supplement) and greater than or equal to -1 times such Country Constraint Level, as compared to the aggregate weight of all stocks associated with such country in the Benchmark Portfolio.
- (c) **General Sector Constraint:** The aggregate of the Optimal Weights of each Eligible Stock in the portfolio associated with a General Sector Constraint Classification, relative to the sum of the Optimal Weights for all Eligible Stocks, must be less than or equal to the General Sector Constraint Level (as specified in the Relevant Index Supplement) and greater than or equal to -1 times such General Sector Constraint Level, as compared to the aggregate weight of all stocks associated with such General Sector Constraint Classification in the Benchmark Portfolio. In respect of an Index, the “**General Sector Constraint Classification**” is a grouping or category of stocks, by sector, as more particularly specified in the Relevant Index Supplement.
- (d) **Maximum Weight Constraint:** The Optimal Weight of each Eligible Stock in the portfolio must not exceed the Maximum Weight Constraint Level specified in the Relevant Index Supplement for such Eligible Stock.
- (e) **Active Weight Constraint:** For each Eligible Stock, the *absolute difference* between (i) the Optimal Weight of such Eligible Stock and (ii) the weight of such stock in the Benchmark Portfolio must not exceed the Active Weight Constraint Level (as specified in the Relevant Index Supplement). If an Eligible Stock is not part of the Benchmark Portfolio, then the weight of such stock in the Benchmark Portfolio will be deemed to be zero (0).
- (f) **Holding Liquidity Constraint:** For each Eligible Stock in the portfolio, the absolute value of the *product* of (i) the Optimal Weight, *multiplied* by (ii) the Assumed Notional (as specified in the Relevant Index Supplement), must not exceed the *product* of (A) the Holding Liquidity Constraint Level (as specified in the Relevant Index Supplement) *multiplied* by (B) the median daily trading volume of such Eligible Stock over the period specified as the “**Holding Liquidity Constraint Volume**” in the Relevant Index Supplement, as determined by the Weight Calculation Agent.
- (g) **Trading Liquidity Constraint:** For each Eligible Stock in the portfolio, the absolute value of the *product* of (i) the difference between (a) the Optimal Weight, and (b) the initial weight of such Eligible Stock (the “**Initial Weight**”), *multiplied* by (ii) the Assumed Notional, must not exceed the *product* of (A) the Trading Liquidity Constraint Level (as specified in the Relevant Index Supplement) *multiplied* by (B) the median daily trading volume of such Eligible Stock over the period specified as the “**Trading Liquidity Constraint Volume**” in the Relevant Index Supplement, as determined by the Weight Calculation Agent.
- (h) **Beta Constraint:** The aggregate of the Betas (as defined above) of each Eligible Stocks weighted by its respective Optimal Weight must be less than or equal to 1.001 and greater than or equal to 0.999.
- (i) **Turnover Constraint:** The sum, across all Eligible Stocks in the portfolio, of the absolute value of the difference between (a) the Optimal Weight, and (b) the Initial Weight (as defined below), must not exceed the Turnover Constraint Level (as specified in the Relevant Index Supplement).
- (j) **Risk Constraint:** The expected tracking error of the basket of Eligible Stocks with Optimal Weights to the Benchmark Portfolio (as defined below) must not exceed the Risk Constraint Level specified in the Relevant Index Supplement. The tracking error of the basket of Eligible Stocks with a vector of weights

$w_{Basket}$  is calculated using the vector of the Benchmark Stock Weights  $w_{BM}$  in the Benchmark Portfolio (each as defined below) and the covariance matrix  $C$  of the returns of each Eligible Stock:

$$\sqrt{(w_{Basket} - w_{BM})' \cdot C \cdot (w_{Basket} - w_{BM})}$$

- (k) **Issuer Exposure Constraint:** The sum of the respective Optimal Weights of Eligible Stocks in the portfolio which are issued by the same issuer must not exceed the Issuer-level Exposure Limit (as specified in the Relevant Index Supplement).

**(iii) Optimisation fallback provisions and rescaling; determination of Weights**

If no portfolio which satisfies all Optimisation Constraints can be established in accordance with the section "Determination of the Eligible Component Stocks and their Optimal Weights" above, then a constraint hierarchy is used pursuant to an optimisation software package (including the data contained therein, the "Optimiser") to minimally relax a set of the above optimisation constraints.

All Eligible Stocks to which the Optimiser assigns an Optimal Weight with an absolute value of less than 0.01 per cent will be removed from the portfolio. Each Eligible Stock which has not been removed from the portfolio will be deemed to be an "Eligible Component Stock" in respect of the relevant Basket Rebalancing.

The Optimal Weight assigned to each Eligible Component Stock will be rounded to the nearest 0.001 per cent. (with 0.0005 per cent. being rounded upwards) and will be rescaled to ensure that the *sum* of all the Optimal Weights of the Eligible Component Stocks included in the Basket is equal to 100 per cent. The resulting weight will then be deemed to be the "Post Processing Weight" in respect of the relevant Eligible Component Stock.

**4. Risk Factors**

*The following list of risk factors does not purport to be a complete list or explanation of all the risks associated with the Index and should be read together with the risk factors in the Index Supplement, Base Methodology and the General Risk Factors sections of this Methodology Summary. Risk factors in relation to a transaction or product which is linked to the performance of the Index may also be set out in the relevant documents in respect of such transaction or product.*

***No assurance can be given that the Index will be successful in capturing the Relevant Target Factor***

There is no guarantee that the Index will be successful at providing a positive exposure to the Relevant Target Factor, in particular as a result of the Optimisation Constraints, or that the Relevant Target Factor will persist in any particular market over time.

***The Relevant Target Factor can change, cease to exist, and/or lead to negative expected returns***

As a result of changes in market structure and/or due to increased investment in products attempting to capture the Relevant Target Factor or other similar investment themes, the Relevant Target Factor may change, cease to exist, and/or lead to negative expected returns over any time period. The Index will not be adjusted to account for any such changes.

***The Weights assigned to the Component Stocks may not be the optimal set of weights***

The Index uses an optimisation software package and the data contained therein in order to calculate the Weights of the Component Stocks included in the Basket. The Optimiser uses a pre-defined set of optimisation routines. If the Index employed a different optimiser, the final set of weights selected might be different and possibly materially so. As such, the performance of the Index could be materially different if the Index Sponsor or the Weight Calculation Agent replaces the Optimiser at any time. There is no guarantee that the Optimiser will determine the optimal set of weights and it is possible that there may exist alternative sets of weights that satisfy the relevant constraints.

As the potential weights to be assigned to the Component Stocks are a continuous function, there is no simple function to test the various combinations of exposures and achieve the optimal set of weights. As a result, it is necessary to use approximations contained in computation routines. Different optimisers may be more or less likely to determine the optimal set of weights for the Index, and using them could lead to a different performance of the Index.



### ***There can be no assurance that the rebalancing algorithm will optimise the performance of the Basket***

The algorithm used to determine the composition of the Basket operates to vary the exposure of the Basket to Component Stocks according to their Factor Scores and the other investment, trading and execution constraints described above. There can be no assurance that the algorithm will have the effect of positioning the Basket optimally with respect to the performance of each Component Stock over any period. In particular, the algorithm is capable of holding a long position in a Component Stock during periods in which the value of that Component Stock is declining. In such circumstances, there could be a material negative impact on the performance of the Index.

### ***Constraint satisfaction, post-processing and Assumed Notional***

Certain constraints may be relaxed if no portfolio which satisfies all Optimisation Constraints can be established. In that case, depending on the number of Optimisation Constraints that are relaxed to obtain a solution, the portfolio may have a higher trading liquidity, holding liquidity, maximum weight and/or turnover than would otherwise be the case, potentially leading to higher transaction costs, potential market impact from hedging activity, more concentrated positions and/or lower overall performance. In addition, between rebalancings, it is possible that the Weights of the Component Stocks will change and may no longer satisfy the Optimisation Constraints due to changes in risk, volume, relative weight of each Component Stock, and other market conditions.

In addition, the final Component Stocks included in the Basket are the result of certain post-processing. This Basket may have worse performance than a Basket without any post-processing.

At any point in time, it is possible that the actual notional amount of products linked to the Index will be lower or higher than the Assumed Notional used in the trading liquidity and holding liquidity constraints. This could potentially mean that the Index would have reduced performance when compared to a portfolio which has an actual notional equal to the Assumed Notional.

### ***Missing data***

If Eligible Stocks are removed because data is missing, such stocks will not be considered for inclusion in the optimisation procedure. This may have a material impact on the performance of the Index.

### ***Reliance on MSCI***

The Index can potentially rely on MSCI Indexes. If the Index uses an MSCI Index as Reference Universe and/or the Benchmark Portfolio, the performance of the Index can be different, potentially materially so from the performance of the Index if it were to use another Reference Universe and/or Benchmark Portfolio. Data errors or inaccuracies in the MSCI Index may impact the performance of the Index. Additionally, the MSCI Index methodology may be amended from time to time, potentially materially so, and this may impact the performance of the Index.

### ***The Index does not allow short exposure to stocks***

The Index provides exposure to the Component Stocks only through long positions. Therefore, while the Index allows the weight of a Component Stock to be zero, such weight may not be negative (thus preventing short positions).

### ***Disclaimers***

The Index is rules-based and none of the Index Sponsor, the Weight Calculation Agent or the Index Calculation Agent exercise any discretion or independent judgment as regards the application of the Index methodology as to the selection of Component Stocks, weighting and on-going rebalancing of the Basket other than in certain limited cases following the occurrence of an Extraordinary Event or a Disruption Event.

**The Index is not an actively managed index and none of the Index Sponsor, the Weight Calculation Agent or the Index Calculation Agent are providing any investment advice or performing a discretionary asset management role. None of the Index Sponsor, the Weight Calculation Agent or the Index Calculation Agent will owe any person any fiduciary duties in respect of the Index and are not required to take the interests of any person into account in making any determination with respect thereto.**

Please also refer to the sections entitled "Disclaimers" in the Base Methodology.

None of the Index Sponsor, the Weight Calculation Agent, the Index Calculation Agent or any market data providers, either together or alone, endorses, promotes or guarantees the quality, accuracy, completeness and/or uninterrupted calculation of the Index or any component thereof or product linked to the Index, and none of the Index Sponsor, the Weight Calculation Agent, the Index Calculation Agent or any market data providers shall have any liability in relation to the Index or any product linked to the Index.

None of the Index Sponsor, the Weight Calculation Agent, the Index Calculation Agent or any market data providers makes any warranty, express or implied, as to results to be obtained from the use of the Index or any data included therein, or any other express or implied warranties, and expressly disclaim all warranties of merchantability or fitness for a particular purpose or use with respect to the Index or any data included therein. Without limiting any of the foregoing, in no event shall any of the Index Sponsor, the Weight Calculation Agent, the Index Calculation Agent or any market data providers have any liability for any lost profits or special, incidental, punitive, indirect, or consequential damages, even if notified of the possibility of such damages.

## BASE METHODOLOGY

### 1. The Index

The Index provides synthetic exposure to a basket of equity stocks (the "**Basket**"). The methodology for determining the stocks to be included in the Basket on any day (each, a "**Component Stock**") and the weight assigned to each such Component Stock (the "**Weight**") is as specified or described in the preceding sections of this Methodology Summary..

The Index may have a long or short exposure (or no exposure), from time to time, to each of the Component Stocks. The Index may be calculated on a price return, a net total return or a gross total return basis as specified in the Relevant General Index Methodology and/or other sections of this Methodology Summary.

The Index is calculated so as to include deductions that are intended to synthetically reflect the transaction costs that a hypothetical investor would incur if such hypothetical investor were to enter into and maintain a series of direct investment positions to provide the same exposure to the Component Stocks as the Index. As a result, the Index Value is reduced from time to time by these deductions and the effect of these deductions could be to benefit an issuer of products linked to such Index where such issuer is the Index Sponsor and/or its affiliates. Investors should note that the actual costs of hedging the exposure to the Index may be lower or higher and, if they were lower, this may result in investors being in a worse position than if they were to maintain direct investment positions in the Component Stocks (see the sections entitled "Deduction of transaction costs" and "Risk factors" below). The Index Value will be reduced by the deduction of notional Transaction Costs, which are linked to the magnitude and frequency of changes to the number of shares of the Component Stocks included in the Basket, and may be greater than actual transaction costs incurred in hedging transactions of the Issuer and its affiliates.

### 2. Basket Rebalancing on a Rebalancing Day

The Basket will be rebalanced on a regular basis on each Rebalancing Day (each, a "**Basket Rebalancing**"). Each Basket Rebalancing will comprise the following steps:

- (i) on each Observation Day the Weight Calculation Agent will:
  - (a) identify the eligible stocks (each, an "**Eligible Stock**");
  - (b) determine the Component Stocks from the Eligible Stocks; and
  - (c) determine the Weight for each Component Stock,in each case, in accordance with the methodology specified or described in the Relevant General Index Methodology and/or other sections of this Methodology Summary; and
- (ii) on each Rebalancing Day related to such Observation Day, the Index Calculation Agent will determine the New Number of Shares in respect of a Component Stock to reflect the relevant Weight for each Component Stock in respect of such Rebalancing Day as determined on such Observation Day, in accordance with the process set out in the paragraph "Determination of the New Number of Shares in respect of a Rebalancing Day and a Component Stock" under the section "Calculation and publication of the Index Value" below.

For such purposes, each of "Observation Day", "Rebalancing Day" and "Weight" shall have the meaning given to such term in the Relevant General Index Methodology and/or other sections of this Methodology Summary.

The Component Stocks included in the Basket will remain unchanged from, but excluding, a Rebalancing Day to, and including, the immediately following Rebalancing Day, provided that the Index Calculation Agent may make certain adjustments and/or modifications to the Basket following the occurrence of any Extraordinary Events or Disruption Events as set out in the section "Extraordinary Events and Disruption Events" below.

### 3. Calculation and publication of the Index Value

#### 3.1. Calculation of the Index Value

**Index Value:** The value of the Index (the "**Index Value**") on the Index Inception Date is equal to the Initial Index Value (each as specified in the Relevant General Index Methodology

and/or other sections of this Methodology Summary).

Subject to the occurrence of an Extraordinary Event or a Disruption Event (as described in the section "Extraordinary Events and Disruption Events" below), on each "Index Business Day"  $t$  following the Index Inception Date, the Index Value will be expressed in the Index Currency, published by the Index Calculation Agent on the Index Value Publication Data Source and calculated in accordance with the following formula:

$$I_t = I_{t-1} \times \frac{BCV_t + BDiv_t}{BOV_t} \times (1 - Cost_t)$$

Where:

Subscript  $t$  represents the relevant Index Business Day;

Subscript  $t-1$  represents the Index Business Day immediately preceding, but excluding, Index Business Day  $t$ ;

$I_{date}$  means the Index Value on the relevant date;

$BCV_{date}$  means the Basket Closing Value on the relevant date;

$BOV_{date}$  means the Basket Opening Value on the relevant date;

$BDiv_{date}$  means the Basket Dividend on the relevant date; and

$Cost_{date}$  means the Basket Rebalancing Cost on the relevant date.

If "Index Value Floor" is specified to be applicable in the Relevant General Index Methodology and/or other sections of this Methodology Summary and the Index Value in respect of an Index Business Day would be less than or equal to zero, then the Index Value in respect of such Index Business Day and all subsequent Index Business Days shall be zero. If "Index Value Floor" is specified to be not applicable in the Relevant General Index Methodology and/or other sections of this Methodology Summary, then the Index Value may be a negative value.

**Basket Closing Value:**

On each Index Business Day  $t$  the Basket Closing Value will be calculated in accordance with the following formula:

$$BCV_t = \sum_i (NS_{i,t} \times Price_{i,t} \times FX_{i,t})$$

Where:

Subscript  $i$  represents the relevant Component Stock;

Subscript  $t$  represents the relevant Index Business Day;

$NS_{i,date}$  means the Number of Shares of Component Stock  $i$  on the opening of the relevant date;

$Price_{i,date}$  means the official closing price of Component Stock  $i$  published by the primary exchange on which such Component Stock is traded on the relevant date (such price and exchange as determined in accordance with the Index Calculation Agent Methodology, including if such day is a scheduled holiday for such primary exchange); and

$FX_{i,date}$  means, (I) if Component Stock  $i$  is denominated in a currency other than the Index Currency, the FX Rate Fixing on the relevant date, or (II) if Component Stock  $i$  is denominated in the Index Currency, one (1).

**Basket Opening Value:**

On each Index Business Day  $t$  the Basket Opening Value will be calculated as follows:

$$BOV_t = \sum_i (NS_{i,t} \times Price_{i,t-1} \times FX_{i,t-1} \times AF_{i,t})$$

Where:

Subscript  $i$  represents the relevant Component Stock;

Subscript  $t$  represents the relevant Index Business Day;

Subscript  $t-1$  represents the Index Business Day immediately preceding, but excluding, Index Business Day  $t$ ;

$NS_{i,date}$  means the Number of Shares of Component Stock  $i$  on the opening of the relevant date;

$Price_{i,date}$  means the official closing price of Component Stock  $i$  published by the primary exchange on which such Component Stock is traded on the relevant date (such price and exchange as determined in accordance with the Index Calculation Agent Methodology, including if such day is a scheduled holiday for such primary exchange);

$FX_{i,date}$  means, (I) if Component Stock  $i$  is denominated in a currency other than the Index Currency, the FX Rate Fixing on the relevant date, or (II) if Component Stock  $i$  is denominated in the Index Currency, one (1); and

$AF_{i,date}$  means the price adjustment factor in respect of the relevant date for any corporate actions that have occurred in respect of Component Stock  $i$ , as determined by the Index Calculation Agent in accordance with the section "

Adjustments for dividends, corporate actions and tax **rates**" below.

**Basket Dividend:**

On each Index Business Day  $t$  the Basket Dividend will be calculated in accordance with (i), (ii) or (iii) below:

- (a) if the "Return Type" of the Index is specified to be "Price Return" in the Relevant General Index Methodology and/or other sections of this Methodology Summary, zero;
- (b) if the "Return Type" of the Index is specified to be "Net Total Return" in the Relevant General Index Methodology and/or other sections of this Methodology Summary, an amount calculated in accordance with the following formula:

$$BDiv_t = \sum_i [NS_{i,t} \times Dividend_{i,t} \times FX_{i,t} \times (1 - WTR_{i,t})]$$

- (c) if the "Return Type" of the Index is specified to be "Gross Total Return" in the Relevant General Index Methodology and/or other sections of this Methodology Summary, an amount calculated in accordance with the following formula:

$$BDiv_t = \sum_i (NS_{i,t} \times Dividend_{i,t} \times FX_{i,t})$$

Where:

Subscript  $i$  represents the relevant Component Stock;

Subscript  $t$  represents the relevant Index Business Day;

Subscript  $t-1$  represents the Index Business Day immediately preceding, but excluding, Index Business Day  $t$ ;

$NS_{i,date}$  means the Number of Shares of Component Stock  $i$  on the opening of the relevant date;

$FX_{i,date}$  means, (I) if Component Stock  $i$  is denominated in a currency other than the Index Currency, the FX Rate Fixing on the relevant date, or (II) if Component Stock  $i$  is denominated in the Index Currency, one (1);

$Dividend_{i,date}$  means the dividend amount in respect of Component Stock  $i$  on the relevant date, as determined by the Index Calculation Agent in accordance with the section "

Adjustments for dividends, corporate actions **and tax rates**" below; and

.2  $WTR_{i,date}$  means the notional dividend withholding tax rate in respect of Component Stock  $i$  and the relevant date, as determined by the Index Calculation Agent in accordance with the section "

Adjustments for dividends, corporate actions **and tax rates**" below.

**Basket Rebalancing Cost:**

On each Index Business Day  $t$  the Basket Rebalancing Cost will be calculated in accordance with (i) or (ii) below:

- (a) if Index Business Day  $t$  is not a Rebalancing Day, zero; or
- (b) if Index Business Day  $t$  is a Rebalancing Day, the Basket Rebalancing Cost resulting from the Basket Rebalancing is calculated in accordance with the following formula:

$$Cost_t = \sum_i [TC Rate_{i,t} \times |OWE_{i,t+1} - CWE_{i,t}|]$$

Where:

Subscript  $i$  represents the relevant Component Stock;

Subscript  $t$  represents the relevant Index Business Day;

Subscript  $t+1$  represents the Index Business Day immediately following, but excluding, Index Business Day  $t$ ;

$TC Rate_{i,date}$  means the Transaction Cost Rate in respect of Component Stock  $i$  and the relevant date as specified in the Relevant General Index Methodology and/or other sections of this Methodology Summary;

$OWE_{i,date}$  means the Open Weight Equivalent in respect of Component Stock  $i$  and the relevant date; and

$CWE_{i,date}$  means the Close Weight Equivalent in respect of Component Stock  $i$  and the relevant date.

**Close Weight Equivalent:**

On each Index Business Day  $t$  the Close Weight Equivalent will be calculated in accordance with the following formula:

$$CWE_{i,t} = \frac{NS_{i,t} \times Price_{i,t} \times FX_{i,t}}{BCV_t}$$

Where:

Subscript  $i$  represents the relevant Component Stock;

Subscript  $t$  represents the relevant Index Business Day;

$BCV_{date}$  means the Basket Closing Value on the relevant date;

$NS_{i,date}$  means the Number of Shares of Component Stock  $i$  on the opening of the relevant date;

$Price_{i,date}$  means the official closing price of Component Stock  $i$  published by the primary exchange on which such Component Stock is traded on the relevant date (such price and exchange as determined in accordance with the Index Calculation Agent Methodology, including if such day is a scheduled holiday for such primary exchange); and

$FX_{i,date}$  means, (I) if Component Stock  $i$  is denominated in a currency other than the Index Currency, the FX Rate Fixing on the relevant date, or (II) if Component Stock  $i$  is denominated in the Index Currency, one (1).

**Open Weight Equivalent:**

On each Index Business Day  $t$  the Open Weight Equivalent will be calculated in accordance with the following formula:

$$OWE_{i,t} = \frac{NS_{i,t} \times Price_{i,t-1} \times FX_{i,t-1} \times AF_{i,t}}{BOV_t}$$

Where:

Subscript  $i$  represents the relevant Component Stock;

Subscript  $t$  represents the relevant Index Business Day;

Subscript  $t-1$  represents the Index Business Day immediately preceding, but excluding, Index Business Day  $t$ ;

$BOV_{date}$  means the Basket Opening Value on the relevant date;

$NS_{i,date}$  means the Number of Shares of Component Stock  $i$  on the opening of the relevant date;

$Price_{i,date}$  means the official closing price of Component Stock  $i$  published by the primary exchange on which such Component Stock is traded on the relevant date (such price and exchange as determined in accordance with the Index Calculation Agent Methodology, including if such day is a scheduled holiday for such primary exchange);

$FX_{i,date}$  means, (I) if Component Stock  $i$  is denominated in a currency other than the Index Currency, the FX Rate Fixing on the relevant date, or (II) if Component Stock  $i$  is denominated in the Index Currency, one (1); and

$AF_{i,date}$  means the price adjustment factor in respect of the relevant date for any corporate actions that have occurred in respect of Component Stock  $i$ , as determined by the Index Calculation Agent in accordance with the section "

Adjustments for dividends, corporate actions **and tax rates**" below.

**Number of Shares**

On each Index Business Day  $t$  and in respect of each Component Stock  $i$ , the Number of Shares will be determined as follows:

- (i) if Index Business Day  $t$  is immediately following a Rebalancing Day, the number of shares of such Component Stock is determined by the Index Calculation Agent in accordance with the section "Determination of the New Number of Shares in respect of a Rebalancing Day and a Component Stock" below and is effective on the opening of such Index Business Day; and

- (ii) on each Index Business Day other than those specified in paragraph (i) above, the number of shares of such Component Stock on the opening of such Index Business Day is determined by the Index Calculation Agent by reference to the Number of Shares on the opening of the immediately preceding Index Business Day and adjusted for any dividends and/or corporate actions that have occurred in respect of such Component Stock as described in the section "

Adjustments for dividends, corporate actions **and tax rates**" below.

### 3.2. Determination of the New Number of Shares in respect of a Rebalancing Day and a Component Stock

In respect of each Rebalancing Day and a Component Stock, the Index Calculation Agent will determine the New Number of Shares in respect of such Rebalancing Day and such Component Stock in accordance with paragraph (i) and (ii) below:

- (i) Following the determination of the Component Stocks to be included in the Basket in respect of a Basket Rebalancing, the Weight of each Component Stock will be converted by the Index Calculation Agent on the opening of such Rebalancing Day into a new number of shares of such Component Stock (the "**New Number of Shares**") in accordance with the formula below:

$$New\ NS_{i,RD} = \frac{BCV_{OD} \times Weight_{i,OD}}{Price_{i,OD} \times FX_{i,OD}}$$

Where:

Subscript *i* represents the relevant Component Stock;

Subscript *OD* represents the relevant Observation Day;

Subscript *RD* represents the relevant Rebalancing Day;

$BCV_{date}$  means the Basket Closing Value on the relevant date, as calculated in accordance with the section "Calculation and publication of the Index Value" above;

$FX_{i,date}$  means, (I) if Component Stock *i* is denominated in a currency other than the Index Currency, the FX Rate Fixing on the relevant date, or (II) if Component Stock *i* is denominated in the Index Currency, one (1);

$Price_{i,date}$  means the official closing price of Component Stock *i* published by the primary exchange on which such Component Stock is traded on the relevant date (such price and exchange as determined in accordance with the Index Calculation Agent Methodology, including if such day is a scheduled holiday for such primary exchange); and

$Weight_{i,date}$  means the Weight of Component Stock *i* on the relevant date, as determined by the Weight Calculation Agent in the Relevant General Index Methodology and/or other sections of this Methodology Summary.

- (c) (ii) The New Number of Shares in respect of such Component Stock is further adjusted by the Index Calculation Agent for any corporate actions that have taken effect, or are scheduled to take effect, in respect of such Component Stock during the period commencing from, but excluding, the Observation Day related to such Rebalancing Day and ending on, and including, the Index Business Day immediately following such Rebalancing Day (as described in the section "

Adjustments for dividends, corporate actions and tax **rates**" below). The New Number of Shares will become effective on the Index Business Day immediately following the relevant Rebalancing Day and will be



deemed to be the "Number of Shares" in respect of such Component Stock on the opening of such Index Business Day.

### **3.3. Foreign exchange conversion**

Any amounts or values (including the prices of the Component Stocks in the Basket) that are denominated in a currency other than the Index Currency will be converted by the Index Calculation Agent into the Index Currency by using the FX Rate Fixing, as specified in the Relevant General Index Methodology and/or other sections of this Methodology Summary.

### **3.4. Deduction of transaction costs**

On each Rebalancing Day on which the exposure of the Index to one or more Component Stocks increases and/or decreases, the Index Value of such Index will be reduced by deductions which are intended to reflect the transaction costs (including, but not limited to, any applicable stamp duty payments, financial transaction taxes, brokerage costs, and/or other fees and expenses) (the "**Transaction Costs**") that would be incurred by a hypothetical investor if it were to enter into actual transactions representing such notional rebalancing of the Basket.

The Transaction Costs associated with each Component Stock for which the Index's exposure has increased and/or decreased in respect of a Basket Rebalancing will be calculated by reference to the Transaction Cost Rate in respect of the Index and the value of such Component Stock. The Transaction Cost Rate in respect of the Index will be specified in the Relevant General Index Methodology and/or other sections of this Methodology Summary.

The Index Sponsor, acting in good faith and in a commercially reasonable manner (and subject to the "Cost Amendment Methodology" (if any) specified in the Relevant General Index Methodology and/or other sections of this Methodology Summary), reserves the right to amend the Transaction Cost Rate in respect of any Component Stock if the Index Sponsor determines that the costs that a hypothetical investor would incur (determined by reference to amounts charged by an independent broker in the relevant market) when replicating the exposure to any Component Stock by trading in such Component Stock have increased. The Index Sponsor will give at least 30 calendar days' notice of any changes to the Transaction Cost Rate in respect of the Index.

The notional Transaction Costs reflected in the calculation of the Index are calculated by reference to pre-determined rates and do not necessarily reflect the actual or realised transaction costs that would be incurred by an investor in the relevant Component Stocks, which could be larger or smaller from time to time. The Index Sponsor and/or any affiliate in its capacity as issuer of or counterparty to products linked to the Index (a "**Hedging Party**") that has hedged its exposure to the Component Stocks will benefit if the actual costs that it incurs in carrying out its hedging activity are less than the notional Transaction Costs in respect of the Index. Any such benefit will not be passed on to investors in products linked to such Index.

### **3.5. Adjustments for dividends, corporate actions and tax rates**

On each Index Business Day the Index Calculation Agent will adjust the Number of Shares in respect of each Component Stock included in the Basket (and consequently the Index Value) for any dividends and/or corporate actions that have occurred in respect of such Component Stock. Any such adjustments to the Number of Shares of a Component Stock, the Index Value and/or the Component Stocks included in the Basket will be determined by the Index Calculation Agent in accordance with the Index Calculation Agent Methodology (as defined below). Corporate actions resulting in stock removals due to de-listings, long-term stock suspensions, bankruptcies or acquisitions, each as specified in the Index Calculation Agent Methodology (as defined below), will be applied no earlier than one Index Business Day after the corresponding announcement by the Index Calculation Agent.

Where the "Return Type" of the Index is specified to be "Net Total Return" in the Relevant General Index Methodology and/or other sections of this Methodology Summary, the Index will deduct a notional dividend withholding tax from any dividend amounts in respect of a Component Stock, in accordance with the Index Calculation Agent Methodology. The notional tax rates applied to dividend amounts may vary according to a company's country of incorporation and are determined by the Index Calculation Agent in accordance with the Index Calculation Agent Methodology, and will be available on the website of the Index Calculation Agent or any successor website.

A Hedging Party that has hedged its exposure to the Component Stocks will benefit if the effective rate of withholding tax that it incurs in carrying out its hedging activity is less than the notional deduction for tax withholding applied in respect of the Index. Any such benefit will not be passed on to investors in products linked to such Index.

#### 4. Disruption Events

The following will be deemed to be an "**Other Disruption**": if, on any day, the Index Sponsor determines that, for any reason the Weight Calculation Agent is unable to and/or does not fulfil its obligations at the required time in respect of a Basket Rebalancing, or where the Weight Calculation Agent ceases to be the Weight Calculation Agent.

#### 5. Index Calculation Agent Methodology

The Index Calculation Agent will calculate the Index and make any determinations and/or adjustments in accordance with both the Index Rules and with its relevant policies and practices (the "**Index Calculation Agent Methodology**"). More details on the Index Calculation Agent Methodology are set out in the Relevant General Index Methodology and/or other sections of this Methodology Summary.

#### 6. Availability and publication of the Index Value, and termination of the Index

##### 6.1. Corrections

In the event that the value of any Component Stock or foreign exchange rate which is utilised for any calculation or determination in respect of the Index is subsequently corrected, the Index Calculation Agent may, if practicable, use such corrected value for the purpose of such calculation or determination, and, to the extent necessary and practicable, as determined by the Index Calculation Agent, may adjust any prior calculation or determination.

In the event that the value of any Component Stocks included in the Basket or their corresponding Weights, in each case, as determined by the Weight Calculation Agent in respect of a Basket Rebalancing are subsequently corrected, the Index Calculation Agent will not use any corrected values in respect of such Basket Rebalancing and will use the Component Stocks and their Weights in the Basket notified to it prior to the occurrence of such Basket Rebalancing.

##### 6.2. Index Publication

The Index Sponsor intends to make the Index Value available on each Index Business Day, subject to the right of the Index Sponsor to suspend or discontinue publication at any time and for any reason in its sole and absolute discretion.

The Index Value will be published on the Index Value Publication Data Source on each Index Business Day under the ticker as specified in the Relevant General Index Methodology and/or other sections of this Methodology Summary and on such other information sources as the Index Sponsor may select from time to time in its sole and absolute discretion. The Index Sponsor may, at any time, for any reason, and without notice, change the Index Value Publication Data Source, in its sole and absolute discretion.

The Index Value published on the Index Value Publication Data Source will be rounded according to the Index Value Publication Precision (as specified in the Relevant General Index Methodology and/or other sections of this Methodology Summary).

#### 7. The Weight Calculation Agent and the Index Calculation Agent

The Index Sponsor may appoint one or more replacement Weight Calculation Agents and/or one or more replacement Index Calculation Agents from time to time, including itself.

#### 8. Risk factors

*The following list of risk factors does not purport to be a complete list or explanation of all the risks associated with the Index and should be read together with the risk factors in the Index Supplement, Equity Factor Index General Methodology and the General Risk Factors sections of this Methodology Summary. Risk factors in relation to a transaction or product which is linked to the performance of the Index may also be set out in the relevant documents in respect of such transaction or product.*

**The notional investment exposure provided by the Index is purely synthetic and an investor in the Index will not have any legal or beneficial interest in any Component Stock**

A notional investment in the Index does not constitute a direct or indirect purchase or other acquisition or assignment of any interest in any Component Stock. The notional investment exposure provided by the Index is

purely synthetic. As such, (i) the risks and returns of an investment linked to the Index may differ significantly from a cash investment in the relevant Component Stocks included in the Basket, and (ii) an investment linked to the Index will not make an investor a holder of, or give an investor a direct investment position in, or any right with respect to, any Component Stock or any other stock.

#### ***Reliance on the Weight Calculation Agent***

The Index relies on the Weight Calculation Agent to fulfil certain obligations in respect of each Basket Rebalancing, including determining the Component Stocks to be included in the Basket and their respective Weights. If the Weight Calculation Agent does not, and/or is unable to, perform its obligations in respect of the Index, the performance of the Index is likely to be materially affected. In such cases the Index Sponsor may postpone one or more Basket Rebalancings until the required data are available from the Weight Calculation Agent. If the appointment of the Weight Calculation Agent terminates for any reason it is likely that the performance of the Index will be impaired, possibly permanently.

#### ***Reliance on the Index Calculation Agent***

The Index relies on the Index Calculation Agent to determine the Index Value, amongst other obligations. If the Index Calculation Agent does not, and/or is unable to, perform its obligations in respect of the Index, the determination and publication of the Index Value of such Index is likely to be materially delayed. In such cases the Index Sponsor will aim to replace the Index Calculation Agent but there is no guarantee that this will be achieved in a reasonable timeframe and the determination and publication of the Index Value of such Index may be delayed for a material period of time. This is likely to have an adverse effect on products linked to such Index, including the possible termination of such products.

#### ***Reliance on the Index Calculation Agent Methodology***

The Index relies on the Index Calculation Agent Methodology to determine, amongst other things, how corporate actions are applied to the Component Stocks. Using a different methodology could lead to different outcomes and as such, any changes to the Index Calculation Agent Methodology could have a material impact on the Index. The Index Sponsor will not be able to influence changes to the Index Calculation Agent Methodology.

#### ***Exchanges closed on Observation Days and Rebalancing Days***

The universe of potential stocks is broad and covers multiple jurisdictions and stock exchanges. It is likely that on any Observation Day and/or Rebalancing Day the primary exchanges for a significant proportion of the Component Stocks included in the Basket will be closed. Where the relevant primary exchange for a Component Stock is closed, the Index will use the previous closing price for such Component Stock. As a result, previous closing prices may be used for a significant proportion of the universe of potential stocks when determining the Component Stocks and their Weights. This may impact the performance of the Index as compared to a methodology that required all exchanges to be open on an Observation Day and/or a Rebalancing Day.

#### ***The Index Value may be negative***

If “Index Value Floor” is specified to be not applicable in the Relevant General Index Methodology and/or other sections of this Methodology Summary and the Index Value in respect of an Index Business Day is less than zero, the Index Value in respect of such Index may be a negative value and this may have a negative effect on any investment linked to such Index.

#### ***Exact Rebalancing Days unavailable***

Given the universe of potential stocks is broad and covers multiple jurisdictions and stock exchanges, the business day calendar used to determine the frequency of Rebalancing Days is a sub-set of the entire holiday calendar for all possible jurisdictions and stock exchanges. The exact calendar used by the Index will not be made public.

#### ***The Weights assigned to the Component Stocks will be published on a delayed basis***

The Weights assigned to the Component Stocks will be published on a delayed basis following each Rebalancing Day. Investors in products linked to the Index may not be entitled to further information from the Index Sponsor regarding the Weights of the Component Stocks. The Index Sponsor may also have entered into non-exclusive licensing agreements with certain of its third party data suppliers in order to source the necessary data to calculate the Index. The formalities necessary to obtain access to such figures may deter potential investors from buying a product linked to the Index on the secondary market.

***The Index Sponsor, the Weight Calculation Agent and the Index Calculation Agent rely upon third party and other external and internal data sources which may be inaccessible and/or inaccurate, and the inputs used by them to run the Index calculations may affect the Index Value***

Each of the Index Sponsor, the Weight Calculation Agent and the Index Calculation Agent may rely upon third party brokers or external dealers and other external and internal sources to obtain certain inputs necessary to determine the Component Stocks to be included in the Basket, the Weights of the Component Stocks in the Basket and/or to compute the Index Value. The inability of the Index Sponsor, the Weight Calculation Agent and/or the Index Calculation Agent to source necessary data required for the relevant formulae of the Index may affect its Index Value. In addition, none of the Index Sponsor, the Weight Calculation Agent or the Index Calculation Agent makes any warranty as to the correctness or completeness of that information and takes no responsibility for the accuracy of such data or the impact of any inaccuracy of such data on the Index Value.

Products linked to the Index may be exposed to more or less risk, or perform better or worse, based upon the inputs received from the above suppliers or sources, than an actual investment in or linked to one or more of the Component Stocks.

***The Index Value will be reduced by the deduction of notional Transaction Costs, which are linked to the magnitude and frequency of changes to the number of shares of the Component Stocks included in the Basket, and may be greater than actual transaction costs incurred in hedging transactions of the Issuer and its affiliates***

The Index is calculated so as to include notional deductions which are intended to reflect the transaction costs (including, but not limited to, any applicable stamp duty payments, financial transaction taxes, brokerage costs, and/or other fees and expenses) that would be incurred by a hypothetical investor if it were to enter into actual transactions to provide the same exposure to the Component Stocks as the Index. The amounts of such deductions calculated in respect of any relevant day are linked to the absolute change in the Weights assigned to the Component Stocks on each Rebalancing Day. Deductions representing the Transaction Costs may therefore be significant if there is a high turnover of stocks in the Basket and the change in the Weights on a Rebalancing Day is large. The negative impact on the performance of the Index of deductions representing the Transaction Costs could be material.

Investors should also note that the Transaction Costs in respect of a Component Stock may be increased if the Index Sponsor determines, acting in good faith and in a commercially reasonable manner (and subject to the conditions described in the "Cost Amendment Methodology" (if any) specified in the Relevant General Index Methodology and/or other sections of this Methodology Summary), that the costs that a hypothetical investor would incur in respect of any amount charged by an independent broker in the relevant markets when replicating the exposure to any Component Stock have increased.

The notional Transaction Costs reflected in the calculation of the Index are calculated by reference to pre-determined rates and do not necessarily reflect the actual or realised transaction costs that would be incurred by an investor in the relevant Component Stocks, which could be larger or smaller from time to time. The Index Sponsor (or its affiliates) that has hedged its exposure to the Component Stocks will benefit if the actual costs that it incurs in carrying out its hedging activity are less than the notional Transaction Costs in respect of the Index. Any such benefit will not be passed on to investors in products linked to such Index.

***Dividends are subject to assumed tax rates which will have a negative impact on the Index***

Where the "Return Type" of the Index is specified to be "Net Total Return" in the Relevant General Index Methodology and/or other sections of this Methodology Summary, the Index will deduct a notional dividend withholding tax from any dividend amounts in respect of a Component Stock included in the Basket, which is intended to reflect the withholding tax rate levied, or the potential tax rate that may be levied, by the country of incorporation or residence of the issuer of such Component Stock. The assumed tax rate (which may be zero) will be determined by the Index Calculation Agent using the Index Calculation Agent Methodology based on its view of applicable law and/or regulations, observable sources and/or market practice. The assumed tax rates may be amended from time to time by the Index Calculation Agent. If the assumed tax rate in respect of one or more Component Stock is increased then the Index Value may be affected.

A Hedging Party that has hedged its exposure to the Component Stocks will benefit if the effective rate of withholding tax that it incurs in carrying out its hedging activity is less than the synthetic tax withholding applied in respect of the Index. Any such benefit will not be passed on to investors in products linked to such Index.

***Some of the Component Stocks are subject to currency exchange risk***

Some of the Component Stocks may be denominated in currencies other than the Index Currency. The Index will notionally convert the value of such Component Stocks into its Index Currency at prevailing exchange rates for purposes of determining the Index Value. The exposure of these Component Stocks to movements in currency exchange rates will depend on the extent to which such currencies strengthen or weaken against the Index Currency and the relative weighting of such Component Stocks. The Index does not seek to hedge any foreign currency exposure embedded in the Component Stocks included in the Basket and will not provide any hedge against any such foreign currency risk.

***A cancellation or failure to publish in respect of the Index may result in adjustment or termination of products linked to such Index***

The Index was created by the Index Sponsor, who has the right to permanently cancel the Index at any time. A permanent cancellation of the Index or a failure by the Index Sponsor to calculate or announce the Index Value may constitute a disruption event in respect of certain products linked to such Index. Upon the occurrence of such events, the calculation agent with respect to such products may have the discretion to determine the Index Value of such Index, which could materially affect the value of any such product linked to such Index. In certain circumstances, such calculation agent may have the discretion to terminate or redeem such product at its market price, as determined by such calculation agent.

***The Index Sponsor, the Index Calculation Agent and the Weight Calculation Agent have the discretion to make determinations that could materially affect the Index and create conflicts of interest***

None of the Index Sponsor, the Index Calculation Agent or the Weight Calculation Agent owe any fiduciary duties in respect of the Index or any product linked to the Index. The Index Sponsor has a certain amount of discretion in the event of Disruption Events in respect of the Index or a Component Stock. The Index Calculation Agent also has a certain amount of discretion in the event of Extraordinary Events in respect of the Index or a Component Stock.

Determinations made by the Index Sponsor and the Index Calculation Agent could adversely affect the Index Value or any product linked to such Index and the exercise by the Index Sponsor and the Index Calculation Agent of their discretion could present them with a conflict of interest. In making those determinations, the Index Sponsor and the Index Calculation Agent will not be required to, and will not, take the interests of any investor of any such product into account or consider the effect their determinations will have on the value of such a product. All determinations made by the Index Sponsor and the Index Calculation Agent shall be conclusive for all purposes and will bind all holders and counterparties in respect of any products linked to the Index. The Index Sponsor and the Index Calculation Agent shall not have any liability for such determinations.

Where Goldman Sachs is required or entitled to make a determination in any capacity in relation to the Index pursuant to the Index methodology and that determination involves the exercise of expert judgement or discretion (other than those that are purely mechanical and, where relevant, implemented in accordance with the Methodology), then that expert judgement or discretion will be exercised in good faith and in a commercially reasonable manner and will be subject to its policies and procedures in effect from time to time.

***Index Sponsor determination of the price of Component Stocks***

To the extent that a Disruption Event has occurred in respect of a Component Stock of the Index for any Index Business Day, the Index Sponsor may determine the price of the relevant Component Stock in its commercially reasonable judgment, and in making such determination, the Index Sponsor may, but shall not be obliged to, have reference to the most recently available price of the relevant Component Stock. If the Index Sponsor makes such a determination in respect of the price of an affected Component Stock, it is likely that such price would be different from what it would have been if a Disruption Event had not occurred and this may have an adverse effect on the Index Value of such Index.

***Index Calculation Agent determination of adjustments to Component Stocks***

To the extent that an Extraordinary Event has occurred in respect of a Component Stock of the Index for any Index Business Day, the Index Calculation Agent may determine adjustments to the Index Value of such Index and/or the price of a Component Stock of such Index in accordance with the Index Calculation Agent Methodology. The determinations will be made by the Index Calculation Agent in its capacity as a professional calculation agent with extensive experience of acting as calculation agent to other indices or products. Such determinations may however differ from determinations made in respect of other indices or products by other third parties, potentially materially so.

**9. Disclaimers**

THE INDEX SPONSOR DOES NOT GUARANTEE THE ACCURACY AND/OR COMPLETENESS OF THE RULES OF THE INDEX, THIS DOCUMENT, ANY DATA INCLUDED THEREIN, OR ANY DATA ON WHICH IT IS BASED, AND THE INDEX SPONSOR SHALL HAVE NO LIABILITY FOR ANY ERRORS, OMISSIONS OR INTERRUPTIONS HEREIN OR THEREIN.

NONE OF THE INDEX SPONSOR, THE INDEX CALCULATION AGENT, THE WEIGHT CALCULATION AGENT NOR ANY OF THEIR RESPECTIVE AFFILIATES OR SUBSIDIARIES OR ANY OF THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, REPRESENTATIVES, DELEGATES OR AGENTS SHALL HAVE ANY RESPONSIBILITY TO ANY PERSON (WHETHER AS A RESULT OF NEGLIGENCE OR OTHERWISE) FOR ANY DETERMINATION MADE OR ANYTHING DONE (OR OMITTED TO BE DETERMINED OR DONE) IN RESPECT OF THE INDEX OR PUBLICATION OF THE INDEX VALUE FOR THE INDEX (OR THE FAILURE TO PUBLISH SUCH INDEX VALUE) AND ANY USE TO WHICH ANY PERSON MAY PUT THE INDEX OR THE INDEX VALUE OF SUCH INDEX. EACH OF THE INDEX SPONSOR, THE WEIGHT CALCULATION AGENT AND THE INDEX CALCULATION AGENT ACTS AS PRINCIPAL AND NOT AS FIDUCIARY AND OWES NO FIDUCIARY DUTIES IN RESPECT OF THE INDEX.

IN MAKING CALCULATIONS AND DETERMINATIONS IN RESPECT OF THE INDEX, THE WEIGHT CALCULATION AGENT, THE INDEX CALCULATION AGENT AND THE INDEX SPONSOR MAY OBTAIN AND USE DATA AND INFORMATION FROM THIRD PARTY SOURCES. NONE OF THE WEIGHT CALCULATION AGENT, INDEX CALCULATION AGENT OR THE INDEX SPONSOR WILL INDEPENDENTLY VERIFY SUCH INFORMATION OR GUARANTEE THE ACCURACY AND/OR THE COMPLETENESS OF SUCH DATA OR INFORMATION AND CONSEQUENTLY NONE OF THE WEIGHT CALCULATION AGENT, INDEX CALCULATION AGENT OR THE INDEX SPONSOR (OR ANY OF THEIR RESPECTIVE AFFILIATES OR SUBSIDIARIES) GUARANTEES THE QUALITY, ACCURACY AND/OR COMPLETENESS OF THE INDEX OR ANY DATA INCLUDED THEREIN. NONE OF THE WEIGHT CALCULATION AGENT, THE INDEX CALCULATION AGENT OR THE INDEX SPONSOR (NOR ANY OF THEIR RESPECTIVE AFFILIATES OR SUBSIDIARIES OR ANY OF THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, REPRESENTATIVES, DELEGATES OR AGENTS) SHALL BE LIABLE (WHETHER IN CONTRACT, TORT OR OTHERWISE) TO ANY PERSON FOR ANY INACCURACY, OMISSION, MISTAKE OR ERROR IN THE COMPUTATION OR DISSEMINATION OF THE INDEX VALUE OR ANY WEIGHT OR ANY OTHER COMPONENT OR UNDERLYING CALCULATION OR DETERMINATION AND NONE OF THE WEIGHT CALCULATION AGENT, THE INDEX CALCULATION AGENT OR THE INDEX SPONSOR IS UNDER ANY OBLIGATION TO ADVISE ANY PERSON OF ANY INACCURACY, OMISSION, MISTAKE OR ERROR IT BECOMES AWARE OF.

NONE OF THE WEIGHT CALCULATION AGENT, THE INDEX CALCULATION AGENT OR THE INDEX SPONSOR MAKES ANY EXPRESS OR IMPLIED REPRESENTATIONS OR WARRANTIES AS TO (I) THE ADVISABILITY OF PURCHASING OR ASSUMING ANY RISK IN CONNECTION WITH ANY TRANSACTION LINKED TO THE INDEX, (II) THE INDEX VALUE AT ANY PARTICULAR TIME ON ANY PARTICULAR DATE, (III) THE RESULTS TO BE OBTAINED BY ANY INVESTOR IN A PRODUCT LINKED TO THE PERFORMANCE OF THE INDEX OR ANY COMPONENT STOCK OR TO ANY OTHER PERSON OR ENTITY RELATING TO THE USE OF THE INDEX OR DATA INCLUDED THEREIN FOR ANY USE, OR (IV) ANY OTHER MATTER. NONE OF THE WEIGHT CALCULATION AGENT, THE INDEX CALCULATION AGENT OR THE INDEX SPONSOR MAKES ANY EXPRESS OR IMPLIED REPRESENTATIONS OR WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE WITH RESPECT TO THE INDEX OR ANY DATA OR INFORMATION INCLUDED THEREIN.

THE INDEX HAS BEEN STRUCTURED, THE INDEX VALUE IS CALCULATED AND DETERMINATIONS RELATING TO THE INDEX ARE MADE, WITHOUT REGARD TO ANY TRANSACTION LINKED TO SUCH INDEX. THE INDEX SPONSOR, THE WEIGHT CALCULATION AGENT, AND THE INDEX CALCULATION AGENT HAVE NO OBLIGATION TO TAKE THE INTERESTS OF ANY PERSON INTO CONSIDERATION IN STRUCTURING THE INDEX, CALCULATING THE INDEX VALUE, EXERCISING ANY DISCRETION IN RELATION TO THE INDEX OR MAKING DETERMINATIONS RELATING TO THE INDEX, AS THE CASE MAY BE. NONE OF THE INDEX SPONSOR, THE WEIGHT CALCULATION AGENT, OR THE INDEX CALCULATION AGENT SHALL BE LIABLE FOR ANY LOSS SUFFERED BY ANY PERSON (INCLUDING ANY INVESTOR IN, OR ANY ISSUER, ARRANGER OR OTHER PERSON OF, A PRODUCT LINKED TO THE INDEX OR ANY COMPONENT STOCK) AS A RESULT OF EXERCISING, OR REFRAINING FROM EXERCISING, ITS DISCRETION IN RESPECT OF THE INDEX.

WITHOUT LIMITING ANY OF THE FOREGOING, IN NO EVENT SHALL THE WEIGHT CALCULATION AGENT, THE INDEX CALCULATION AGENT OR THE INDEX SPONSOR HAVE ANY LIABILITY (WHETHER IN CONTRACT, TORT OR OTHERWISE) TO ANY PERSON FOR ANY DIRECT, INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL OR ANY OTHER DAMAGES (INCLUDING LOST PROFITS) EVEN IF NOTIFIED OF THE POSSIBILITY OF SUCH DAMAGES.

NOTHING IN THIS DISCLAIMER SHALL EXCLUDE OR LIMIT LIABILITY TO THE EXTENT SUCH EXCLUSION OR LIMITATION IS NOT PERMITTED BY LAW.

## EXTRAORDINARY EVENTS AND DISRUPTION EVENTS

### 1. Extraordinary Events

In respect of an Index that is calculated in accordance with the policies and practices of a third party Index Calculation Agent Methodology, following the determination by the Index Calculation Agent that an Extraordinary Event has occurred in respect of a Component Stock, the Index Calculation Agent will adjust the Index Value in accordance with the Index Calculation Agent Methodology.

**"Extraordinary Event"** means, in respect of a Component Stock, each of a Delisting, an Insolvency, a Merger Event, a Nationalisation and a Tender Offer, or any analogous circumstances, as determined by the Index Sponsor or Index Calculation Agent (as applicable) in its sole and absolute discretion;

**"Delisting"** means, in respect of a Component Stock, the reference exchange (as determined by the Index Sponsor or Index Calculation Agent (as applicable)) announces that pursuant to the rules of such reference exchange, such Component Stock ceases (or will cease) to be listed, traded, or publicly quoted on such reference exchange for any reason (other than a Merger Event or Tender Offer) and are not immediately re-listed, re-traded, or re-quoted on an exchange or quotation system located in the same country as such reference exchange (or, where such reference exchange is within the European Union, in a member state of the European Union);

**"Insolvency"** means that by reason of the voluntary or involuntary liquidation, bankruptcy, insolvency, dissolution, or winding-up of or any analogous proceeding affecting the issuer of a Component Stock, (I) all such Component Stock is required to be transferred to a trustee, liquidator, or other similar official, or (II) holders of such Component Stock become legally prohibited from transferring them;

**"Merger Date"** means the closing date of a Merger Event or, where a closing date cannot be determined under the local law applicable to such Merger Event, such other date as determined by the Index Sponsor or Index Calculation Agent (as applicable);

**"Merger Event"** means, in respect of a Component Stock, any of the following:

- (I) a reclassification or change of such Component Stock that results in a transfer of, or an irrevocable commitment to transfer all such Component Stock outstanding to another entity or person;
- (II) a consolidation, amalgamation, merger, or binding share exchange of the issuer of such Component Stock with or into another entity or person (other than a consolidation, amalgamation, merger, or binding share exchange in which such issuer is the continuing entity and which does not result in a reclassification or change of all of such Component Stock outstanding);
- (III) a takeover offer, tender offer, exchange offer, solicitation, proposal, or other event by any entity or person to purchase or otherwise obtain 100 per cent. (100%) of the outstanding Component Stock that results in a transfer of, or an irrevocable commitment to transfer, all such Component Stock (other than such Component Stock owned or controlled by such other entity or person); or
- (IV) a consolidation, amalgamation, merger, or binding share exchange of the issuer of such Component Stock or its subsidiaries with or into another entity in which such issuer is the continuing entity and which does not result in a reclassification or change of all such Component Stock outstanding but results in the outstanding Component Stock (other than such Component Stock owned or controlled by such other entity) immediately prior to such event collectively representing less than 50 per cent. (50%) of the outstanding Component Stock immediately following such event;

**"Nationalisation"** means that all the Component Stock or all or substantially all the assets of the issuer of such Component Stock are nationalised, expropriated, or are otherwise required to be transferred to any governmental agency, authority, entity, or instrumentality thereof;

**"Tender Offer"** means a takeover offer, tender offer, exchange offer, solicitation, proposal, or other event by any entity or person that results in such entity or person purchasing, or otherwise obtaining, or having the right to obtain, by conversion or other means, greater than 10 per cent. (10%) and less than 100 per cent. (100%) of the outstanding voting shares of the issuer of a Component Stock, as determined by the Index Sponsor or Index Calculation Agent (as applicable), based upon the making of filings with governmental or self-regulatory agencies or such other information as the Index Sponsor or Index Calculation Agent (as applicable) determines to be relevant; and



**"Tender Offer Date"** means, in respect of a Tender Offer, or, the date on which voting shares of the issuer of a Component Stock in the amount of the applicable percentage threshold are actually purchased or otherwise obtained, as determined by the Index Sponsor or Index Calculation Agent (as applicable).

## 2. Disruption Events

If, in respect of the Index or any underlying component thereof (an **"Index Component"**), any one or more of the following events (each, a **"Disruption Event"**) occur:

- (a) the Index Sponsor becomes aware of (i) the adoption of, or change in, any applicable law or (ii) the promulgation of, or any change in, the interpretation of any applicable law by a court, tribunal or regulatory authority with competent jurisdiction, which has the effect that (x) the performance by the Index Sponsor or Index Calculation Agent of their respective roles in respect of the Index has become unlawful, impracticable or would result in materially increased costs to them in whole or in part for any reason, or (y) any relevant entity would be prevented from entering into transactions in respect of the Index or Index Component (including any Index Component where the Index Sponsor and/or any of its affiliates is sponsor) by any applicable law or regulation;
- (b) (i) the Index Sponsor determines that a market participant, as a result of a market-wide condition relating to the Index and/or Index Component would (x) 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 such Index Component, or (y) incur a materially increased cost in doing so, including due to any capital requirements or other law or regulation, or (ii) any other event described in this Methodology Supplement as an **"Additional Market Disruption Event"** occurs (in each case, a **"Hedging Disruption"**);
- (c) the occurrence of a systems failure, natural or man-made disaster, act of God, armed conflict, act of terrorism, riot or labour disruption or any similar intervening circumstance that is beyond the reasonable control of the Index Sponsor, Index Calculation Agent or any of their respective affiliates that the Index Sponsor determines is likely to have a material effect on a Index Component, or on its ability to perform its role in respect of the Index (a **"Force Majeure Event"**);
- (d) (I) the official price, level, rate or other measure of any Index Component is unavailable on any relevant day on which such measure is scheduled to be published (including cases where a member of the Goldman Sachs Group is the sponsor or calculation agent of such Index Component);  
  
(II) the relevant reference exchange is not open for trading during its regular trading session, or closes prior to its scheduled closing time, on any relevant day;  
  
(III) a trading disruption occurs in respect of the relevant reference exchange or any other event or circumstance occurs which, in the reasonable judgement of the Index Sponsor, (A) affects the ability of market participants in general to enter into transactions in respect of such Index Component in a notional size required in relation to any product or transaction linked to the Index, (B) impairs the liquidity of any transactions in relation to such Index Component and/or (C) affects the value of such Index Component;  
  
(IV) a **"Currency Exchange Rate Disruption Event"** has occurred, or  
  
(V) the value of the Index and/or Index Component is, in the reasonable judgement of the Index Sponsor or Index Calculation Agent, manifestly incorrect,  
  
(each of (I) - (V) being an **"Other Disruption"**);
- (e) where required, the Index Sponsor (after using commercially reasonable efforts) ceases to have the relevant data license in respect of such Index Component,

then the Index Sponsor (or the Index Sponsor may instruct the Index Calculation Agent to), acting in good faith and in a commercially reasonable manner, determine in its sole discretion to take one or more of the following actions (or take no such actions), with reference to preserving the intended commercial purpose of the Index (the **"Index Purpose"**):

- (I) make such determinations or adjustments to the terms of the Index, including to the methodology and relevant data sources, as it deems appropriate to account for such Disruption Event and, as applicable, to the extent necessary to calculate an Index Value in respect of such day (for which purpose it may use its own internal models and other market data sources as it reasonably determines is necessary);

- (II) postpone any applicable rebalancing in whole or in part in respect of the Index or an Index Component (a "**Relevant Rebalancing**") to the immediately following applicable business day (a "**Relevant Business Day**") on which no Disruption Event is continuing, and make any relevant adjustments to the methodology for calculating the Index that it deems appropriate to account for such postponement of the Relevant Rebalancing;
- (III) suspend the publication of the Index Value to the immediately following Relevant Business Day on which no Disruption Event is continuing;
- (IV) publish an indicative value of the Index in respect of each business day on which a Disruption Event is continuing (and no official Index Value in respect of the Index will be published); or
- (V) remove and/or replace any affected Index Component with an alternative asset where it considers in its sole discretion that a similar alternative is available.

## CHANGE IN INDEX METHODOLOGY

**Change in Methodology:** Except as provided in this part entitled "*Change in Index Methodology*", the Index Calculation Agent and, if applicable, the Weight Calculation Agent for the Index will, subject as provided below, employ the methodology described in the Index Rules with respect to calculating and determining the Index Value and the determining weights of any Index Components respectively, and its application of such methodologies shall (in the absence of manifest error) be conclusive and binding. While the Index Calculation Agent and, if applicable, the Weight Calculation Agent, expects to employ the methodology described in the Index Rules (the "**Index Methodology**") at all times to calculate and determine the Index Value and determining the weights of any Index Components respectively, it is possible that market, legal, regulatory, judicial, financial, fiscal or other circumstances (including, but not limited to, any changes to or any suspension or termination of or any other events affecting the Index and/or any Index Component, as the case may be, or any other events affecting the ability of a third party data source to supply the necessary data for purposes of calculating the Index Value) will arise that would, in the view of the Index Sponsor, necessitate or make desirable a modification or change of such Index Methodology in order to preserve the Index Purpose. The Index Sponsor reserves the right to make any other changes to the composition of the Index or to the Index Methodology or to any third party data source used to calculate the value of the Index as the Index Sponsor may, in its sole discretion, determine to be necessary as a result of market, legal, regulatory, judicial, financial, fiscal or other circumstances.

Accordingly, the Index Sponsor shall be entitled to make modifications and/or changes to the Index Methodology, the composition of the Index or to any data obtained from a third party data source which is used to calculate the Index Value without notice as it in its sole and absolute discretion deems appropriate, necessary or desirable, including (without limitation):

- (i) to correct any manifest error or proven error contained in the Index Rules;
- (ii) to cure, correct or supplement any ambiguity or contradictory or defective provision contained in the Index Rules;
- (iii) to change the frequency of calculation of the Index Value and to make such adjustment to the Index Methodology as it determines, in good faith and in a commercially reasonable manner, to be necessary to take account of the amended frequency of calculation;
- (iv) to permit the Index Calculation Agent and, if applicable, the Weight Calculation Agent to continue calculating and determining the Index Value and determining the weights of any Index Component respectively if market, legal, regulatory, judicial, financial, fiscal or other circumstances arise which were not reasonably foreseeable by the Index Sponsor as of the date of the relevant Index Rules and which have not been deliberately caused by the Index Sponsor and such circumstances would prevent the Index Calculation Agent and, if applicable, the Weight Calculation Agent from calculating and determining the Index Value and determining the weights of any Index Components respectively, and would necessitate a modification or change of the methodology described in the Index Rules in order for the Index Value to continue to be calculated and determined notwithstanding the relevant circumstances; and/or
- (v) to preserve the Index Purpose where such modification and/or change is of a formal, minor or technical nature.

In making any such modifications described above, the Index Sponsor and/or Index Committee, as applicable, will ensure that such modifications or changes will result in a methodology that is consistent with the Index Purpose. However, the Index Sponsor and the Index Calculation Agent or Weight Calculation Agent (each, a "**Calculation Agent**") does not owe any person any fiduciary duties in respect of the Index and are not required to take the interests of any person into account in making any such modifications with respect thereto.

**Index Committee:** In respect of the Index, the Index Sponsor may, but is not required to, establish an index committee (the "**Index Committee**"). The Index Committee, if established, will comprise employees of the Index Sponsor and at least an equal number of external members with a relevant academic or professional background, as selected by the Index Sponsor in its sole and absolute discretion. The Index Sponsor may propose any modifications and/or changes to the Index Methodology of the kind described in paragraphs (i) to (v) above, without limitation, to the Index Committee for its consideration.

If an Index Committee is established, a meeting of the Index Committee will be considered quorate if (a) a majority of the Index Committee is in attendance, and (b) at least half of those in attendance are external members. For any decision of the Index Committee to be approved, the Index Committee must vote by a simple majority, including at least one external member, to approve such decision.

The role, responsibilities and powers of the Index Committee, if established, will be pre-defined by the Index Sponsor and will be limited to approving changes to the Index Methodology or to any data obtained from a third

party data source which is used to calculate the Index Value, in each case where the Index Sponsor has made a proposal as permitted to do so by and as contemplated by the above. In addition, the Index Committee, if established, may be given the power to make proposals to cure, correct or supplement ambiguities, defective provisions, errors, omissions and inconsistencies and to make administrative changes that are not economically significant. The Calculation Agent(s) may from time to time consult with the Index Committee on matters of interpretation with respect to the methodology of the Index. For the avoidance of doubt, the Index Committee, if established, will not have greater powers than the Index Sponsor at any time.

In making or proposing any such modifications described above, the Index Committee will ensure that such modifications or changes will result in a methodology that is consistent with the Index Purpose.

The Index Committee, if established, will keep a record of any approved amendments. Such record, and the agenda and minutes of each and any meeting of the Index Committee, will be made available to investors upon their request.

In addition, if the aggregate notional amount of products or transactions linked to the Index (or any other index which is sponsored by the same sponsor and which uses a similar methodology as the Index) exceeds a certain threshold (as determined by the Index Sponsor by reference to the ability and capacity of the Index Sponsor and/or any affiliate to be able to effectively hedge its exposure to the Index and the liquidity impact of such hedging on the relevant markets), then the Index Sponsor may (a) change the Index Methodology so that the rebalancing of the Index is executed over one or more additional business days or that the rebalancing of the Index occurs more frequently, (b) replace the Index with a replacement index which will be identical in all material respects other than the day or days on which the Index is rebalanced and/or (c) make such other adjustments to the Index, in each case, in order to enable the Index Sponsor and/or any affiliate to effectively hedge its exposure to the Index and/or reduce the expected liquidity impact of such hedging transactions in relevant markets. No modifications, replacement or changes proposed as a result of this paragraph shall result in an index that is inconsistent with the Index Purpose. Any such changes or actions will be announced as promptly as is reasonably practicable and normally prior to their effective date on the Index Value Publication Data Source.

In addition and in respect of the Index, the Index Sponsor will have policies and procedures in place governing the frequency with which it conducts internal reviews with respect to such Index and the frequency with which it consults with investors in products linked to the Index.

Please see <http://www.goldmansachs.com/what-we-do/securities/business-groups/sts-folder/index.html> (or any successor page) for Goldman Sachs' IOSCO Principles for Financial Benchmarks Compliance Statement and the Summary of Index Control Framework.

## CONFLICTS OF INTEREST

*This section relates to conflicts of interest in connection with certain notional rules-based proprietary strategies which Goldman Sachs International or its successor(s) (as sponsor) may create from time to time (each, a "Strategy" and together, the "Strategies"), including the Index. This section does not purport to be a complete list or explanation of all existing or potential conflicts of interests associated with the Strategies.*

*References in this section to the "Strategy Sponsor" or "Strategy Calculation Agent" include the Index Sponsor and Index Calculation Agent with respect to the Index (respectively), and references to any "Strategy Value" include the Index Value with respect to the Index.*

### Overview of the Roles of the Goldman Sachs Group

The Goldman Sachs Group has multiple roles in connection with the Strategies:

- (i) If Goldman Sachs International is a Calculation Agent of a Strategy, Goldman Sachs International is responsible for calculating and publishing the Strategy Value in its capacity as Strategy Calculation Agent and for making certain determinations in respect of such Strategy from time to time in its capacity as Strategy Sponsor.
- (ii) The Strategies are designed by, and are operated in accordance with, an algorithm developed by Goldman Sachs International. Among other things, Goldman Sachs International created the parameters within which each Strategy operates. The Strategy Sponsor does not have any obligation to ensure that the Strategy Calculation Agent continues to calculate and publish the Strategy Value. Except in the limited circumstances set out in the relevant Strategy description, Goldman Sachs International does not generally exercise any discretion in relation to the operation of each Strategy. Goldman Sachs International owes no fiduciary duties in respect of such Strategy.
- (iii) The Goldman Sachs Group is a full service financial services group and, consequently, is engaged in a range of activities that could affect the value of a Strategy, as the case may be, and any underlying component of a (each, a "Strategy Component") positively or negatively as further described below.
- (iv) The Goldman Sachs Group members may be sponsors and/or calculation agents of one or more Strategy Components and in that capacity have the power to make determinations that could materially affect the Strategy Value of such Strategy.
- (v) The Goldman Sachs Group may from time to time have a direct or indirect ownership interest in any Calculation Agent (or any other calculation agent with respect to a Strategy or Strategy Component) and any third party data providers with respect to a Strategy or any Strategy Component.

### Potential Conflicts of Interest

Potential conflicts of interest may arise in relation to Goldman Sachs' multiple roles in connection with the Strategy. Although the Goldman Sachs Group will perform its obligations in a manner that it considers commercially reasonable, it may face conflicts between the roles it performs in respect of a Strategy and its own interests. In particular, the Goldman Sachs Group may have, or enter into transactions to create, a physical, economic or other interest (including an adverse and/or short interest, as the case may be) in a Strategy, products linked thereto, any Strategy Component and/or investments referenced by or linked to any Strategy Component and may exercise remedies or take other action with respect to its interests as it deems appropriate. These actions could adversely affect the Strategy Value and may include the following:

- (i) The Goldman Sachs Group actively trades products linked to a Strategy, any Strategy Component, investments referenced by or linked to a Strategy Component and numerous related investments. These activities could adversely affect the Strategy Value, which could in turn affect the return on, and the value of, any products linked to such Strategy.
- (ii) The Goldman Sachs Group may have access to information relating to a Strategy, products linked thereto, a Strategy Component or investments referenced by or linked to a Strategy Component. The Goldman Sachs Group is not obliged to use that information for the benefit of any person acquiring or entering into any products linked to such Strategy.
- (iii) Certain activities conducted by the Goldman Sachs Group may conflict with the interests of those acquiring products linked to a Strategy. It is possible that the Goldman Sachs Group could receive substantial returns in respect of these activities while the value of any investment referenced to such Strategy may decline. For example:

- (a) The Goldman Sachs Group and other parties may issue or underwrite additional securities or trade other financial or derivative instruments or investments referenced to a Strategy or other similar strategies or any Strategy Component. An increased level of investment and trading in these securities, instruments or investments may negatively affect the performance of a Strategy and could affect the Strategy Value of such Strategy and, therefore, the amount payable at maturity (or on any other payment date) on any products linked to such Strategy and the value before maturity of any such products. Such securities, instruments or investments may also compete with any products linked to a Strategy. By introducing competing products into the marketplace in this manner, the Goldman Sachs Group could adversely affect the market value of any products linked to a Strategy and the amount paid by it on such products at maturity (or on any other payment date). To the extent that the Goldman Sachs Group serves as issuer, agent, underwriter or counterparty in respect of those securities or other similar instruments or investments, its interests in respect of those securities, instruments or investments may be adverse to the interests of a holder or counterparty in respect of any products linked to a Strategy.
- (b) Although the Goldman Sachs Group is not obliged to do so, it may elect to hedge its exposure to a Strategy, any products linked thereto, a Strategy Component or any investment referenced by or linked to a Strategy Component with an affiliate or a third party. That affiliate or third party, in turn, is likely to directly or indirectly hedge some or all of its exposure, including through transactions taking place on the futures and options markets. Where the Goldman Sachs Group chooses to hedge its exposure, it may adjust or unwind such hedges by purchasing or selling products linked to a Strategy, a Strategy Component, any investments referenced by or linked to a Strategy Component or any other product on or before the date such Strategy is valued for purposes of any investments referenced to such Strategy. The Goldman Sachs Group may also enter into, adjust or unwind hedging transactions relating to other instruments linked to a Strategy or a Strategy Component including at times and/or levels which are different from those used to determine the Strategy Value. Any of this hedging activity may adversely affect the Strategy Value of a Strategy and the value of any products linked to such Strategy. In addition, and without limitation:
- (I) The Goldman Sachs Group could receive substantial returns with respect to these hedging activities while the Strategy Value of a Strategy and/or the value of any product linked to a Strategy may decline.
  - (II) If the Goldman Sachs Group has hedged its exposure to a Strategy Component and incurs an effective rate of withholding tax that is less than the synthetic tax withholding applied in respect of a Strategy, the Goldman Sachs Group could receive substantial returns.
  - (III) The Goldman Sachs Group could receive substantial returns if it trades in a Strategy Component on or before the rebalancing of a Strategy and/or at levels which are different from the levels specified in the methodology for determining the Strategy Value of a Strategy. Such trading may have an adverse impact on the level at which a rebalancing occurs, which may result in an adverse impact on the performance of a Strategy. In addition, such trading could generate significant returns to the Goldman Sachs Group that will not be passed on to the investors in products linked to a Strategy.
- (c) Certain activities conducted by the Goldman Sachs Group may conflict with the interests of those acquiring products linked to a Strategy. For example, as described above, the Goldman Sachs Group may elect to hedge its obligations, if any, with an affiliate or a third party. It is possible that the Goldman Sachs Group could receive substantial returns with respect to these activities irrespective of the performance of such Strategy and including while the value of any investment referenced to a Strategy may decline.
- (d) The Goldman Sachs Group may also engage in trading for its proprietary accounts, for other accounts under its management or to facilitate transactions, including block transactions, on behalf of customers relating to one or more products linked to a Strategy, a Strategy Component or any constituent thereof and/or any investment referenced by or linked to a Strategy Component or any constituent thereof. In the course of these transactions, the Goldman Sachs Group's customers may receive information about a Strategy before it is made available to other investors. Any of these activities could also adversely affect the Strategy Value of such Strategy directly or indirectly by affecting the level of a Strategy Component or any constituent thereof or the investments referenced by or linked to a Strategy Component or any constituent thereof and, therefore, the market value of any products linked to such Strategy and the amount paid on any such product at maturity.

- (iv) As operator or sponsor of a Strategy, under certain circumstances Goldman Sachs International will have discretion in making various determinations that affect a Strategy and products linked to it including, but not limited to, those situations described in the relevant Strategy Description. Goldman Sachs International may use these determinations to calculate how much cash it must pay at maturity, or, as the case may be, upon any early redemption or on any other payment date, of any product linked to a Strategy, including products issued by the Goldman Sachs Group members. The exercise by Goldman Sachs International of this discretion could adversely affect the Strategy Value of such Strategy and the value of any such product linked to it. It is possible that the exercise by the Strategy Sponsor of its discretion to change the relevant Strategy Methodology may result in substantial returns in respect of the Goldman Sachs Group's trading activities for its proprietary accounts, for other accounts under its management or to facilitate transactions on behalf of customers relating to one or more products linked to a Strategy, and/or the Strategy Components thereof or any investment referenced by or linked to such Strategy Components.
- (v) As operator or sponsor of one or more Strategy Components, the Goldman Sachs Group members may be entitled to exercise discretion over decisions that would have an adverse impact on the Strategy Value of a Strategy, including, without limitation, discontinuing publication of the level of one or more Strategy Components. The Goldman Sachs Group members will exercise any such discretion without regard to any Strategy or investors in any products linked thereto.
- (vi) The Goldman Sachs Group may in the future create and publish other indices or strategies, the concepts of which are similar, or identical, to that of a Strategy or one or more of the Strategy Components. The Strategy Components as specified in the Strategy Description for such Strategy, however, are the only components that will be used for the calculation of the Strategy. Accordingly, no other published indices should be treated by any investor as the level of any Strategy Component (except as the Strategy Sponsor or any Calculation Agent may so determine, as described above).
- (vii) The Goldman Sachs Group may publish research, express opinions or provide recommendations (for example, with respect to a Strategy Component) that are inconsistent with investing in products linked to such Strategy, and which may be revised at any time. Any such research, opinions or recommendations may or may not recommend that investors buy or hold the relevant Strategy Component and could affect the value and or performance of such Strategy or of products linked to such Strategy.
- (viii) The Goldman Sachs Group may have ownership interests in sponsors of Strategy Components and as such may be able to influence the methodology and other features of such Strategy Components. In addition, members of the Goldman Sachs Group may provide pricing or other data that is directly used in the calculation of the level, coupon and/or components of Strategy Components (or the components thereof). The activities of the Goldman Sachs Group members as contributor to any Strategy Components may be adverse to the interests of investors and/or counterparties to products linked to any such Strategy Components and may have an impact on the performance of such Strategy Components.
- (ix) The Goldman Sachs Group may have ownership interests in any Calculation Agent (or any other calculation agent with respect to a Strategy or Strategy Component) and any third party data providers with respect to a Strategy or any Strategy Component and as such may be able to influence the determinations of such a Calculation Agent or other calculation agent. In addition, members of the Goldman Sachs Group may provide pricing or other data that is directly used in the calculation of the level, coupon and/or components of the Strategy. The activities of the Goldman Sachs Group members as contributor to any Strategy may be adverse to the interests of investors and/or counterparties to products linked to any such Strategy and may have an impact on the performance of such Strategy.

## GENERAL RISK FACTORS

*Risk factors relating to a synthetic investment in any Strategies, including the Index, are set out below. This section does not purport to describe all of the risks associated with a synthetic investment in any Strategy. Risk factors in relation to a transaction or product which is linked to the performance of a Strategy may also be set out in the relevant documents in respect of such transaction or product. In addition, potential investors should refer to all relevant strategy documentation elements in respect of each Strategy and the Strategy Components for specific risk factors relating to such Strategy and such Strategy Components.*

*References in this section to the "Strategy Sponsor" or "Strategy Calculation Agent" include the Index Sponsor and Index Calculation Agent with respect to the Index (respectively), and references to any "Strategy Value" include the Index Value with respect to the Index.*

### ***Investors in a Strategy could lose their entire investment***

The value of a Strategy depends on the performance of the Strategy Components, each of which may increase or decrease in value. Neither a Strategy nor any of the Strategy Components includes any element of capital protection or guaranteed return. The value of any Strategy Component, or a Strategy itself, may fall below its initial value.

If a floor is not specified to be applicable in respect of a Strategy or Strategy Component then the value of that Strategy or Strategy Component may fall below zero and have a negative value. In this case an investment linked to a Strategy may incur losses which exceed the notional value of such investment.

If a floor is specified to be applicable in respect of a Strategy or Strategy Component then the value of that Strategy or Strategy Component may fall to zero. In such a case, the value will remain at zero and any investment linked solely to such Strategy may have lost all of its value, in which case there will be no chance of such investment thereafter recovering.

### ***Changes in market structure and/or increased investment in similar products may negatively affect the value of a Strategy***

As a result of changes in market structure and/or due to increased investment in products using the same or similar investment rationale to that of a Strategy or a Strategy Component, the underlying market or economic characteristics that such Strategy or Strategy Component attempts to capture, measure or replicate may change, cease to exist, and/or lead to negative expected returns over any time period. This may have a negative impact on the value of a Strategy and a Strategy will not be adjusted to take account of any such changes.

### ***A Strategy is not actively managed***

The weight or quantity assigned to a Strategy Component on each relevant rebalancing day is determined by applying an algorithm operating within pre-determined rules. There will be no active management of a Strategy so as to enhance returns beyond those embedded in a Strategy.

Market participants are often able to adjust their investments promptly in view of market, political, financial or other factors, and an actively managed product could potentially respond more directly and appropriately to immediate market, political, financial or other factors than a non-actively managed strategy. In contrast, the algorithm for a Strategy will rebalance the weights or quantities to their specified values on each relevant rebalancing day.

### ***The weights of the Strategy Components may total more or less than 100%***

A Strategy's absolute overall exposure to the Strategy Components may be greater or less than 100%.

If the sum of the absolute weights of the Strategy Components is greater than 100% the Strategy will employ leverage. In the current instance, leverage means that a Strategy will have increased exposure to changes, which may be positive or negative, in the levels of the Strategy Components, magnifying the volatility and risk the performance of the Strategy will be adversely affected should the level of long Strategy Components decrease and/or the value of short Strategy Components increase.

If the sum of the absolute weights of the Strategy Components is less than 100% the Strategy will have a reduced participation to the Strategy Components and may underperform as compared to a Strategy where the exposure was greater.



### ***Excess Return Strategies will nearly always underperform Total Return Strategies***

A Strategy which is calculated on an excess return basis is the excess return version of one or more total return strategies. To determine the value of an excess return strategy, the performance of the total return strategy is reduced by the return that could be earned on a synthetic cash deposit at a notional interest rate. Thus, the performance of an excess return strategies will nearly always be less than the performance of the equivalent total return strategy.

### ***Total Return Strategies may exhibit excess return characteristics***

A Strategy which is calculated on a total return basis may include Strategy Components which are calculated on an excess return basis. In such case even though the Strategy is calculated on a total return basis it will exhibit characteristics of an excess return version.

### ***The reference level of Strategy Components which are shares, ETFs or funds may be adjusted to take account of net dividend payments and other potential adjustment events***

On the date on which a Strategy Component which is a share, ETF or fund commences trading without the rights to receive a dividend, the reference level of such asset will be adjusted by the Strategy Sponsor with the aim of increasing the level to a value as if the relevant dividend amount, net of tax, had not been declared. When making such adjustment, the Strategy Sponsor will assume a notional tax rate in respect of the dividend, which will reduce the increase in the reference level for such Strategy Component. Such tax rates may vary according to changes in tax laws and procedures.

Any announced dividend in respect of a Strategy Component will be reduced by an assumed tax rate (which may be zero), which is intended to reflect the withholding tax rate levied, or the potential tax rate that may be levied, by the country of incorporation or residence of the issuer of such Strategy Component. The assumed tax rate will be determined by the Strategy Sponsor using the relevant Strategy methodology based on its view of applicable law and/or regulations, observable sources and/or market practice. The assumed tax rates may be amended from time to time by the Strategy Sponsor. If the assumed tax rate in respect of one or more Strategy Components is increased then the Strategy Value of a Strategy may be affected.

The Strategy Sponsor and/or any affiliate that has hedged its exposure to any Strategy Component will benefit if the effective rate of withholding tax that it incurs through its hedging activity is less than the synthetic tax withholding applied in respect of the relevant Strategy and such benefit will not be passed on to the investors in products or transactions linked to a Strategy.

Following the determination by the Strategy Sponsor that an event has occurred that would have a diluting or concentrative effect in respect of a Strategy Component which is a share, an ETF or a fund or following any adjustment to the settlement terms of listed options or futures contracts on such Strategy Component traded on an options or futures exchange, the Strategy Sponsor may make an adjustment to account for such effect. The Strategy Sponsor may, but need not, determine the appropriate adjustment by reference (amongst other things) to the adjustment in respect of such event made by the other equity market dealers and/or exchanges (including but not limited to the reference exchange for such Strategy Component, and options and futures exchanges related to such Strategy Component) or quoting services. Such adjustment may have an adverse effect on the performance of the Strategy.

***No assurance can be given that the methodology underlying each Strategy will be successful in producing positive returns or that such Strategy will outperform any other alternative investment strategy.***

Furthermore, it should be noted that the results that may be obtained from investing in any product linked to a Strategy or otherwise participating in any transaction linked to a Strategy might well be significantly different from the results that could theoretically be obtained from a direct investment in the Strategy Components or any related derivatives.

### ***The actual weights of Strategy Components may vary following each rebalancing***

The actual weight of each of the Strategy Components may be different than the assigned weights, and therefore the relative contribution of each Strategy Component to the Strategy Value may vary from time to time, depending on the performance of each of the Strategy Components relative to the other Strategy Components since such immediately preceding rebalancing. The longer the period between each rebalancing, the greater the likelihood that there will be a significant variance between the absolute values of the weights of the Strategy Components, and the Strategy may therefore have an exposure to a Strategy Component further below or in greater excess of its assigned weight than it would if the period were shorter, which may result in a greater

skewing of the absolute nature of the investment positions with respect to the Strategy Components and increase the overall risk profile of the Strategy.

***Historical levels of a Strategy may not be indicative of future performance***

Past performance of a Strategy is no guide to future performance. It is impossible to predict whether the value of a Strategy will rise or fall. The actual performance of a Strategy in the future may bear little relation to the historical performance of a Strategy.

***An Investor in a Strategy will have no rights in respect of the Strategy Components or any Strategy Components***

The investment exposure provided by a Strategy is synthetic. An investment referenced to a Strategy will therefore not make an investor a holder of, or give an investor a direct investment position in, any Strategy or any Strategy Component (or any components thereof).

***A Strategy may provide short exposure to one or more of the Strategy Components***

A Strategy may specify that the weight of a Strategy Component may be less than zero, i.e. a short position in such Strategy Component. A short position in a Strategy Component means that a Strategy will have negative exposure to such Strategy Component and the Strategy Value of such Strategy will be negatively affected if the value of such Strategy Component should increase and positively affected if the value of such Strategy Component should decrease. Therefore, investors should be aware that an investment linked to a Strategy may decline in value in a period, even if the value of such Strategy Component increases during that timeframe. Further, given that short positions may create exposure to uncapped losses, increases in the value of such Strategy Component could result in a decrease in the Strategy Value that is greater than the weight in respect of such Strategy Component and may result in the Strategy Value falling to zero.

***If specified in the relevant Strategy Supplement, the level at which Strategy Components are rebalanced will depend on the execution by the Strategy Sponsor***

If so specified in the relevant Strategy Supplement in respect of one or more Strategy Components, then the level at which such rebalancing takes place will depend on the Strategy Sponsor's execution level. The Strategy Sponsor will not owe any fiduciary duties in respect of such execution (and in particular will not be under any obligations of "best execution" or similar) to any investor in a product linked to a Strategy or to any other person.

***An investment in a Strategy may be subject to dilution, which may limit the gains in such investment***

A Strategy may be subject to dilution, such that investors in products linked to such Strategy may not benefit fully from increases or decreases (depending on whether the exposure is long or short) in the value of a Strategy Component. Dilution means that the return or loss on an investment is subject to a multiplier decreasing exposure to such investment and reducing the volatility and risk of loss should the value of such investment decline, but reducing the potential gain should the value of such investment increase. Investors should be aware that if the value of a Strategy Component increases or decreases, an investment linked to a Strategy may not have the same magnitude of increased or decreased value as the Strategy Component.

***Correlation of performances among the Strategy Components may reduce the performance of a Strategy***

Performances of the Strategy Components of a Strategy may become highly correlated from time to time, including, but not limited to, periods in which there is a substantial decline in a particular sector or asset type represented by the Strategy Components. High correlation during periods of negative returns among the Strategy Components may have an adverse effect on the level of a Strategy.

***Volatility and Strategy risk***

A Strategy may have a daily volatility adjustment feature (if so specified in the Strategy description), which aims to provide a notional volatility-controlled exposure to the Strategy Components of such Strategy. This is achieved by periodically increasing or decreasing the exposure of such Strategy to the Strategy Components, based on the realized volatility of the Strategy Components over a certain period of time relative to a pre-determined volatility target. An increase in the realized volatility of a Strategy Component may decrease the exposure of such Strategy to such Strategy Component.

If the daily volatility adjustment feature is applicable, an underperformance of the Strategy compared to a similar Strategy without such feature could be observed in periods where the value of a Strategy Component in which a Strategy holds a synthetic long position is increasing and, at the same time, the realized volatility exceeds the

volatility target. The daily volatility adjustment feature, if applicable, is not designed for short term investments both in terms of improved participation for option-based payoffs linked to the Strategy and in terms of Strategy performance.

Potential investors should make their own investigations and form their own views as to the appropriateness or otherwise of such Strategy, taking into account their own circumstances. In particular, potential investors in products linked to such Strategy should note that such Strategy may not reflect the return that could be realized from a direct investment in the Strategy Components.

***As some Strategy Components may not be denominated in the Strategy Currency, a Strategy may be subject to currency exchange rate risks***

Each Strategy is calculated in a specified Currency (the “**Strategy Currency**”). While some of the Strategy Components may be denominated in the Strategy Currency, a Strategy may also comprise Strategy Components denominated in other currencies. A Strategy may therefore be exposed to currency exchange rate risks. The impact on the Strategy Value of a Strategy will depend on the extent to which these other currencies, if any, strengthen or weaken against the Strategy Currency, the relative weight of each such other currency. Currency exchange rates vary over time. Changes in a particular currency exchange rate result from the interaction of many factors directly or indirectly affecting economic or political conditions, including rates of inflation, interest rate levels, balances of payment among countries, the extent of governmental surpluses or deficits and other financial, economic, military and political factors, among others.

A Strategy may have an internal simulated currency hedge feature in respect of one or more of its Strategy Components denominated in another currency, if so specified in the Strategy description. Through a series of synthetic transactions, the internal simulated currency hedge feature, if applicable, seeks to offset a substantial portion of the positive or negative effects of currency exchange rate fluctuations in such other currency on the values of such Strategy Component. However, a Strategy's internal simulated currency hedge feature will prove ineffective if, and to the extent that, the performance of the relevant money markets and of such Strategy Component move in opposite directions or move in the same direction but to a different extent. As a result of such movements, investors in such Strategy will still be subject to the risk of currency fluctuations affecting the value of such Strategy. In addition, as the currency hedged levels of such Strategy Component are based on the performance of synthetic cash deposits, the internal simulated currency hedge Feature, if applicable, is unlikely to replicate a return exactly equal or similar to the return such Strategy Component that would be available to an investor whose investment currency is the same as that of such Strategy Component.

***A Strategy may have a limited operating history and may perform in unanticipated ways***

A Strategy may be a relatively new strategy. Where limited historical performance data exists with respect to the Strategy Components referenced by such Strategy and the Strategy itself, any investment in respect of which returns are linked to the performance of a Strategy or its Strategy Components may involve greater risk than an investment linked to returns generated by an investment strategy with a proven track record. While a longer history of actual performance could provide more reliable information on which to assess the validity of a Strategy and on which to base an investment decision, the fact that a Strategy and the Strategy Components are relatively new would not allow this. There can be no guarantee or assurance that a Strategy or its Strategy Components will operate in a manner consistent with the data available.

***Information about a Strategy is no guarantee of the performance of such Strategy***

Certain presentations and historical analysis (“**Back-testing**”) or other statistical analysis materials in respect of the operation and/or potential returns of a Strategy which may be provided are based on a number of assumptions, historical estimates, simulated analyses and hypothetical circumstances to estimate how such Strategy may have performed prior to its actual existence. The Strategy Sponsor may use historical data that is available to calculate the hypothetical level of a Strategy prior to its inception. If the Strategy Sponsor determines that such historical data is not available or is incomplete, the Strategy Sponsor may use alternate sources of data in place of such historical data as well as make certain modifications to the strategy methodology as it deems necessary to calculate the hypothetical level of a Strategy prior to its inception. The Strategy Sponsor provides no assurance or guarantee that a Strategy will operate or would have operated in the past in a manner consistent with those materials. As such, any historical returns projected in such materials or any hypothetical simulations based on these analyses, which are provided in relation to a Strategy may not reflect the performance of, and are no guarantee or assurance in respect of the performance or returns of, a Strategy over any time period. Furthermore, any Back-testing of a Strategy is based on information and data provided to the Strategy Sponsor by third parties. The Strategy Sponsor will not have independently verified or guaranteed the accuracy and/or the completeness of such information or data provided and is not responsible for any inaccuracy, omission, mistake or error in such information, data and/or Back-testing.

### ***Strategy Inception Date***

A Strategy will only have been calculated since a specified “inception date” (the “**Strategy Inception Date**”), being a date determined by the Strategy Sponsor as the date on which the value of the Strategy would have been equal to a specified “initial value” based on Back-testing (using simulated analyses and hypothetical circumstances, as described in more detail above). As such, any historical returns or any hypothetical simulations based on such back-tested data or analyses with respect to the period from the Strategy Inception Date to the date on which investment products linked to a Strategy are first implemented (which may be materially later than the Strategy Inception Date of such Strategy), may not reflect the performance of, and are no guarantee or assurance in respect of the performance or returns of, such Strategy over any time period.

### ***Some Strategy parameters are partially based on simulated data***

Some parameters of a Strategy may have been determined by reference to simulated time series data which start before the Strategy Inception Date for such Strategy. Such simulated data are based on various assumptions, do not reflect actual trading and are subject to various market data limitations. As a result, the performance of the simulated time series data may differ from the actual historical performance of a Strategy and this difference may be material. The future performance of a Strategy will depend, among other things, on the choice of the parameters as described in the supplement for the relevant Strategy. As such, the performance of such Strategy could be materially different if the relevant parameters were determined based on the actual performance of such Strategy rather than based on simulated time series data.

### ***A Strategy may be subject to a Disruption Event***

If a Disruption Event occurs or is continuing in respect of a Strategy, the Strategy Sponsor may make (or the Strategy Sponsor may instruct the Strategy Calculation Agent to make) certain adjustments in respect of such Strategy and which may include: any adjustments to the methodology and relevant data sources in order to calculate the Strategy Value, a postponement of any relevant rebalancing or the suspension the publication of the Strategy Value. If the Strategy Sponsor or Strategy Calculation Agent (as applicable) makes any adjustments to the methodology and relevant data sources or postpones any relevant rebalancing, it is likely that the Strategy Value will be different from what it would have been if such event had not occurred, and it may vary unpredictably and could be lower.

### ***Changes in the Strategy Components may affect the Strategy Value***

Where a Strategy Component ceases to exist or is no longer tradable, including as a result of a Goldman Sachs Group member discontinuing a Strategy Component of which it is a sponsor, or where the Strategy Sponsor would be prevented from entering into transactions in respect of an Strategy Component (including one for which a Goldman Sachs Group member is the sponsor) by any applicable law or regulation, the Strategy Sponsor may (but is not obliged to) substitute another Strategy Component for the original one where it considers in its sole discretion that a similar alternative is available. Any such substitution or assignment could alter the exposure provided by a Strategy and materially affect the performance and value of such Strategy.

### ***Gains from an investment linked to a Strategy will be adjusted by deductions included in the calculation of the value of such Strategy***

Notional embedded costs will be included within a Strategy and will reduce the level of such Strategy. Such amounts will be deducted from the performance of a Strategy with the intention of reflecting synthetically one or more of (i) the cost of maintaining exposure to, and replicating performance of, each Strategy Component (such costs are applicable on an ongoing basis for such time as the Strategy maintains exposure to the relevant Strategy Component and are often referred to as servicing costs) and (ii) the cost of entering into and/or unwinding transactions relating to a Strategy Component following each rebalancing of the Strategy Components in the Strategy (such costs are made only as a result of a rebalancing of a Strategy and are often referred to as transaction costs). The costs referred to in (i) and (ii) above will vary for each Strategy Component. These embedded costs will reduce the value of such Strategy. The value of a Strategy may also be reduced by an amount calculated at a fixed rate specified in the rules of the relevant Strategy. In addition, the value of a Strategy may be reduced by further deductions if so specified in the relevant strategy documentation.

### ***The value of each Strategy Component and of each underlying component may be adjusted by certain deductions***

Each Strategy Component and the underlying components thereof may also embed notional cost deductions, the effect of which is to reduce the level of the Strategy Component or component thereof, as applicable. Such notional costs deductions are intended to reflect, synthetically, certain costs incurred in respect of such Strategy Component (or component thereof, as applicable) as described in the rules of the relevant Strategy Component

or underlying component thereof (as applicable). Any such deductions from the level or value of a Strategy Component or underlying component thereof shall have the effect of reducing the level of the relevant Strategy.

***Notional servicing costs and transaction costs embedded in a Strategy may be greater than actual servicing cost and transaction costs incurred in hedging transactions of the Strategy Sponsor or its affiliates***

The Strategy costs (and the component amounts thereof) which are embedded and reflected in the calculation of a Strategy will be calculated by reference to pre-determined rates and will not necessarily reflect the actual or realised servicing costs and transaction costs that would be incurred by an investor in the relevant Strategy Components or their underlying constituents, which could be larger or smaller from time to time. The Strategy Sponsor (or its affiliates) may benefit if the Strategy costs (and the component amounts thereof) embedded in a Strategy exceed the actual servicing costs and/or transaction costs that are incurred by the Strategy Sponsor (or its affiliates) in hedging transactions that may be entered into in respect of such Strategy, each Strategy Component and/ or any underlying component thereof.

***Under certain market conditions, the Strategy Sponsor could significantly increase the costs that are deducted from a Strategy***

Under certain market conditions, the Strategy Sponsor of a Strategy may determine to increase significantly the costs that are deducted from the Strategy, and there may be no fixed limits on the levels of these costs. Although this determination is constrained by the procedure described in the Strategy Description, it is possible that the increased cost may be significantly greater than the levels originally assigned to them. Further, although a period of such market conditions may last only a short time, the increased cost could be deducted from a Strategy for an extended period of time. This could materially adversely affect the performance and value of a Strategy.

***The Strategy Sponsor's hedging activity may affect the level of a Strategy***

By executing products linked to a Strategy ("**Linked Products**"), Goldman Sachs International and/or its affiliates ("**GS**") will have an exposure to such Strategy and its Strategy Components. GS will take risk positions to hedge this exposure in its sole discretion and in a principal capacity. Investors in any Linked Product will not have any rights in respect of any GS hedge positions, including any shares, futures, options, commodities or currencies. GS may execute its hedging activity by trading in the Strategy Components of a Strategy on or before the related rebalancing day. Such trading may have an adverse impact on the level at which a Strategy Component is rebalanced which will result in an adverse impact on the performance of a Strategy. GS's hedging activity, and hence the size of such impact, will be linked to the amount of new and outstanding Linked Products at the relevant time. Additionally, GS may generate revenues if it executes its hedging activity at different levels from those used to determine the value of a Strategy or on a rebalancing of such Strategy. Such hedging activity could generate significant returns to GS that will not be passed on to investors in Linked Products.

A Strategy and its components are calculated and rebalanced according to the methodology for such Strategy, which includes assumptions as to transaction and servicing costs and rates of dividend withholding tax. GS will generate revenues in relation to a Strategy if the cost or the tax rates that GS incurs through its hedging activities are less than the assumed costs or tax rates used in the methodology for a Strategy.

***Section 871(m) of the U.S. Internal Revenue Code***

The United States Treasury Department has issued regulations under which amounts paid or deemed paid on certain financial instruments ("**871(m) financial instruments**") that are treated as attributable to U.S.-source dividends could be treated, in whole or in part depending on the circumstances, as a "dividend equivalent" payment that are subject to tax at a rate of 30% (or a lower rate under an applicable treaty), which in the case of any amounts or returns which an investor in any Linked Products (which are 871(m) financial instruments) may receive under the terms of their investment, could be collected via withholding.

These regulations generally apply to any payment made on or after 1 January 2017 with respect to any 871(m) financial instrument issued, executed or substantially amended on or after 1 January 2017. Accordingly, the counterparty to, or issuer of, Linked Products (which are 871(m) financial instruments) issued, executed or substantially amended on or after such date, will likely be required to withhold such taxes if any U.S.-source dividends are paid on any Strategy Component during the term of such investment (regardless of whether a notional withholding tax is applied to such dividends pursuant to the Strategy Methodology or not). Any such withholding will reduce the performance of the Linked Product, possibly materially so.

Any investor in such Linked Products may be required to make certifications prior to the maturity of their investment in order to avoid or minimize withholding obligations, and the counterparty or issuer (as applicable) will likely withhold accordingly (subject to such investor's potential right to claim a refund from the United States Internal Revenue Service) if such certifications are not received or are not satisfactory.

Investors should note that, even where a Linked Product has been issued or executed prior to 1 January 2017, such product will likely constitute an 871(m) financial instrument as a result of any substantial amendment to the terms (including any increase in the notional amount) of such Linked Product made after that date. Investors in Linked Products should consult their tax advisors concerning these regulations or subsequent official guidance and regarding any other possible alternative characterisations of such products for United States federal income tax purposes.

***As Strategy Sponsor and Calculation Agent of a Strategy, Goldman Sachs International has the authority to make determinations that could materially affect a Strategy and create conflicts of interest***

As the Strategy Sponsor and, if applicable, a Calculation Agent of a Strategy, Goldman Sachs International does not generally exercise any discretion in relation to the operation of the Strategy. Goldman Sachs International owes no fiduciary duties in respect of such Strategy. Goldman Sachs International may, however, exercise discretion in certain limited situations including, but not limited to, those situations described in the Strategy Description. Determinations made by Goldman Sachs International as the Strategy Sponsor and, if applicable, a Calculation Agent of a Strategy could adversely affect the Strategy Value of such Strategy and the exercise by Goldman Sachs of its discretion could present it with a conflict of interest of the kind described in the part entitled "*Conflicts of Interest*". In making those determinations, the Strategy Sponsor and/or the Calculation Agent will not be required to, and will not, take the interests of any investor of any such product into account or consider the effect its determinations will have on the value of such a product. All determinations made by Strategy Sponsor and/or the Calculation Agent shall be at its sole discretion and shall be conclusive for all purposes and will bind all holders of any products linked to a Strategy. The Strategy Sponsor and/or the Calculation Agent shall not have any liability for such determinations.

***Potential amendment to the methodology of a Strategy or replacement of a Strategy to enable the Strategy Sponsor and/or any affiliate to be able to effectively hedge its exposure to the Strategy and to reduce the impact of such hedging transactions on the relevant markets***

If the Strategy Sponsor determines that the aggregate notional or principal amount of financial products linked to a Strategy is above a certain threshold it may (a) change the Methodology so that the rebalancing of the Strategy is executed over one or more additional business days or that the rebalancing of the Strategy occurs more frequently, (b) replace the Strategy with a replacement Strategy which will be identical in all material respects other than the day or days on which the Strategy is rebalanced and/or (c) make such other adjustments to the Strategy, in each case, in order to enable the Strategy Sponsor and/or any affiliate to be able to effectively hedge its exposure to such Strategy and/or to reduce the expected impact of such hedging transactions on the relevant markets. Although such amendments or such replacement would be designed to minimise potential market impact, the performance of the Strategy may be affected by such amendments or replacement, potentially materially so.

***As sponsors of Strategy Components, Goldman Sachs Group members have the authority to make determinations that could materially affect a Strategy and create conflicts of interest***

Goldman Sachs Group members may be the sponsors of Strategy Components of a Strategy. In that capacity, each of them has the power to make determinations that could materially affect the value of these Strategy Components and, in turn, the Strategy Value of such Strategy, and the exercise by such members of their discretion in their capacity as sponsors of such Strategy Components could present them with a conflict of interest of the kind described in described in the part entitled "*Conflicts of Interest*".

***Trading and other transactions by the Goldman Sachs Group could materially affect the value of any product linked to a Strategy***

The Goldman Sachs Group is a full service financial services firm engaged in a range of market activities. Goldman Sachs Group may issue, arrange for the issue of, or enter into financial instruments referenced to, a Strategy or any of the Strategy Components of such Strategy and arrange for the distribution of these financial instruments, including the payment of distribution fees and commissions to any intermediaries. These activities could adversely affect the Strategy Value of a Strategy and any of its Strategy Components and may present the Goldman Sachs Group with a conflict of interest of the kind described in the part entitled "*Conflicts of Interest*".

***Information provided by the Goldman Sachs Group about the value of any Strategy Component may not be indicative of future performance***

Any information about the performance of any Strategy Component provided by the Goldman Sachs Group will be or has been furnished as a matter of information only, and an investor in a product linked to Strategy should not regard the information as indicative of the range of, or trends in, fluctuations in the levels or values that may occur in the future. Such information will likely differ from the actual values and levels used under the relevant

Strategy Methodology.

***Information about a Strategy may only be available through the Goldman Sachs Group***

The Goldman Sachs Group may not provide holders of any product linked to a Strategy with further information in relation to such Strategy beyond what is provided in the Strategy description and further information may not be generally available. The Goldman Sachs Group has entered into non-exclusive licensing agreements with certain of its third party data suppliers in order to source the necessary data to calculate each Strategy. The formalities necessary to obtain access to such figures may deter potential investors from buying a product linked to a Strategy on the secondary market.

***The Strategy Sponsor and any Calculation Agent may rely upon third party and other external and internal data sources which may be inaccessible and/or inaccurate, and the inputs used by the Strategy Sponsor and any Calculation Agent may affect the value of a Strategy***

The Strategy Sponsor and any Calculation Agent may rely upon third party brokers or external dealers and other external and internal sources to obtain certain inputs necessary to compute the value of a Strategy and/or to determine the weights of the Strategy Components which may be inaccessible and/or inaccurate and the inputs used by them to compute the value of a Strategy may affect the value of such Strategy.

The inability of any Calculation Agent to source necessary data to calculate the relevant formulae of a Strategy may affect the value of such Strategy. In addition, the Strategy Sponsor and any Calculation Agent make no warranty as to the correctness or completeness of that information and take no responsibility for the accuracy of such data or the impact of any inaccuracy of such data on the value of a Strategy.

Products linked to a Strategy may be exposed to more or less risk, or perform better or worse, based upon the inputs received from the above suppliers or sources, than an actual investment in or linked to one or more of the Strategy Components.

***Sponsors of Strategy Components have authority to make determinations that could materially affect a Strategy***

Determinations that the sponsors of the Strategy Components of a Strategy, including Goldman Sachs Group members, may make in connection with the composition, calculation and maintenance of the Strategy Components may materially affect the value of the Strategy Components and could, in turn, adversely affect the Strategy Value of such Strategy. Those sponsors have no obligation to take the interests of the Strategy Sponsor or any holders of any investment referenced or linked to a Strategy into consideration for any reason in carrying out their functions and have generally disclaimed all liability to the extent permitted by law.

In addition, the sponsors of the Strategy Components have licensed, and may continue to license, such Strategy Components for use by other market participants, for publication in newspapers and periodicals, for distribution by information and data dissemination services and for various other purposes, any of which may contribute to an increased or decreased level of investment in such Strategy Components, which could adversely affect the Strategy Value of a Strategy.

***The policies of the Strategy Sponsor and changes that affect a Strategy could affect the value of such Strategy***

The policies of the Strategy Sponsor concerning the calculation of a Strategy could affect the value of such Strategy and, therefore, the amount payable on any financial instruments linked to such Strategy on the stated maturity date of such financial instruments (or on any other payment date) and the market value of such financial instruments before that date. The amount payable on any financial instruments linked to a Strategy and their market value could also be affected if the Strategy Sponsor changes these policies, for example, by changing the manner in which it calculates such Strategy, or if the Strategy Sponsor discontinues or suspends calculation or publication of such Strategy, in which case it may become difficult to determine the market value of such financial instruments. If such policy changes relating to a Strategy or the calculation or publication of a Strategy is discontinued or suspended, the calculation agent of any financial instrument linked to such Strategy (which may be Goldman Sachs International) may have discretion in determining the level of such Strategy on the relevant determination date and the amount payable on such financial instruments.

***The policies of a sponsor and changes affecting a Strategy Component could affect the Strategy and its value***

The policies of a sponsor concerning the calculation of the value of a Strategy Component, or additions, deletions or substitutions of Strategy Components and the manner in which changes affecting the Strategy Components

could affect the value of a Strategy Component and, therefore, the Strategy Value of such Strategy and any product linked to such Strategy. The Strategy Value could also be affected if the relevant sponsor changes these policies, for example, by changing the manner in which it calculates the value of the Strategy Component, or if the sponsor discontinues or suspends calculation or publication of the value of the Strategy Component, in which case it may become difficult to determine the Strategy Value.

***A Strategy relies on the use of third-party information***

With respect to any Strategy Component not sponsored by any member of the Goldman Sachs Group, a Strategy methodology relies on information from third-party sponsors of such Strategy Components and other external and internal sources to obtain certain inputs necessary to compute the value of a Strategy. The inability of the Strategy Sponsor and/or any Calculation Agent to source necessary data to calculate the relevant formulae of the Strategy may affect the value of such Strategy. Investors considering acquiring or making an investment in a product linked to such Strategy should carefully read and understand the information about such Strategy Components. Information about the Strategy Components can be found on the Bloomberg Pages specified in the Strategy description. However, the Goldman Sachs Group makes no warranty as to the correctness of that information and takes no responsibility for the accuracy of such data or the impact of any inaccuracy of such data on such Strategy.

Products linked to a Strategy may be exposed to more or less risk, or perform better or worse, based upon the inputs received from the above suppliers or sources, than an actual investment in or linked to one or more of the Strategy Components.

***A Strategy may use values determined using the Strategy Sponsor's own proprietary models***

The Strategy may use the Strategy Sponsor's own internal mark of the value of certain Strategy Components which may be derived from proprietary models (the "**Internal Data**"). Investors in products linked to a Strategy may not have access to the Internal Data and any associated models.

There is no guarantee that such Internal Data will correspond with market data if any exist, or that would be determined by other market participants. They do not represent tradable prices.

The Internal Data will depend on the specification of, and inputs used in, the relevant model used by the Strategy Sponsor. A model with a different specification and/or using different inputs would produce different results. The Internal Data may change if required by the Strategy Sponsor's internal policies or applicable law or regulation, or if the models used to calculate it change. The Strategy Sponsor will not be obliged to consider a Strategy when making any changes to the Internal Data or such models and will not have any liability for the effect of such changes on a Strategy.

As such, changes in the value of a Strategy on any day may be opaque and not solely be related to the change in the market value of any options and/or hedge instruments.

***A Strategy may be calculated without reference to corrected data***

In the event that the value of any component which is used for the calculation of the weight or quantity (as applicable) of any Strategy Component in relation to the Strategy is corrected after such time as it is used in the Strategy, the Calculation Agent(s) may not use such corrected value and may instead use the weight or quantity (as applicable) as calculated before such correction. As a result the performance of a Strategy may differ from the performance had such corrected values been used, and possibly materially so.

***A Strategy may be changed or become unavailable***

The Strategy Sponsor shall have the right to alter the methodology used to calculate a Strategy or to discontinue publication of the value of a Strategy and such event may result in a decrease in the value of or return on any product linked to such Strategy. The Strategy Sponsor reserves the right to form a Strategy Committee for the purposes of considering certain changes. Any changes may be made without regard to the interests of a holder of any product linked to such Strategy.

Furthermore, the decisions and policies of the Strategy Sponsor concerning the calculation of the value of a Strategy could affect its value and, therefore, the amount payable over the term of any product linked to such Strategy and the market value of such product. The amount payable on any product linked to a Strategy and its market value could also be affected if the Strategy Sponsor changes these policies.



***If a Strategy uses an optimisation computer software package then such package may not determine the mathematically optimal result***

As part of its pre-determined set of rules a Strategy may use a commercially available optimisation computer software package (an “**Optimiser**”) to solve a mathematical optimisation problem, which may be subject to certain optimisation constraints. For example, if specified in the rules of a Strategy such Strategy may use an Optimiser to calculate the weights of certain Strategy Components with the aim of maximising or minimising one or more variables.

As the possible results may be a continuous function, there may be no simple function to test the various combinations of results. Consequently, it is necessary to use approximations contained in computation routines. There is no guarantee that in respect of any optimisation problem an Optimiser will determine the optimal set of results and it is possible that there exist alternative results that satisfy the relevant constraints. Different Optimisers may be more or less likely to determine the optimal result for a Strategy, and using them could lead to a different performance of a Strategy. If such Strategy employed a different Optimiser, the results of rebalancing could be different and possibly materially so. As such, the performance of the Strategy may be dependent on the choice of Optimiser and could be materially different if the Strategy Sponsor replaces the Optimiser at any time.