



Description of the DB Enhanced US Equity Long Volatility Index™

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In the event of any inconsistency between the English language version of the text below and that which may be translated into any other language, the English language version shall prevail. Terms used herein have the meaning given to them in Section 3 (*Definitions*).

As at the date of this Description, Deutsche Bank AG acts as the Index Administrator and is not obliged to enter into, or promote, transactions or investments that are linked to the Index, the Underlying Index or any constituents thereof.

Subject as provided by law and as provided in the Overview, the Index Administrator is under no obligation to maintain or calculate the Index and may cancel or cease to calculate the Index at any time.

The Index is a proprietary index of Deutsche Bank AG. It is not sponsored, endorsed, sold, or promoted by the Underlying Index Administrator and the Underlying Index Administrator makes no representation whatsoever, whether express or implied, either as to the results to be obtained from the use of the Index or the levels at which the Index stands at any particular time on any particular date or otherwise.

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LIMITING ANY OF THE FOREGOING, IN NO EVENT WHATSOEVER SHALL S&P DOW JONES INDICES BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES INCLUDING BUT NOT LIMITED TO, LOSS OF PROFITS, TRADING LOSSES, LOST TIME OR GOODWILL, EVEN IF THEY HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, WHETHER IN CONTRACT, TORT, STRICT LIABILITY, OR OTHERWISE. THERE ARE NO THIRD PARTY BENEFICIARIES OF ANY AGREEMENTS OR ARRANGEMENTS BETWEEN S&P DOW JONES INDICES AND DEUTSCHE BANK AG, OTHER THAN THE LICENSORS OF S&P DOW JONES INDICES.

Neither the Index Owner nor the Index Administrator assumes any obligation or duty to any party and under no circumstances does the Index Owner or the Index Administrator assume any relationship of agency or trust or of a fiduciary nature for or with any party. Any calculations or determinations in respect of the Index or any part thereof shall be made by the Index Administrator and shall (save in the case of manifest error) be final, conclusive and binding, save as provided in the Overview. The term "manifest error" as used herein shall mean an error that is plain and obvious and can be identified from the results of the calculation or determination itself without: (i) recourse to any underlying data; or (ii) any application or re-application of any formulae.

The Index Administrator may delegate and/or transfer any of its obligations and/or functions to one or more third parties as it deems appropriate from time to time, but shall (a) ensure that appropriate legal documentation in relation to such delegation and/or transfer is put in place and (b) remain responsible for the actions and omissions of its delegates and transferees as if such actions and omissions were its own.

The Index Administrator does not endorse, sell or promote any transactions relating to the Index. Neither the Index Owner nor the Index Administrator makes any express or implied representations or warranties as to (a) the advisability of purchasing or assuming any risk in connection with any transaction which references or is otherwise linked to this Index, (b) the levels at which the Index stands at any particular time on any particular date, (c) the results to be obtained by any party from the use of the Index or any data included in it for the purposes of issuing securities or carrying out any financial transaction or (d) any other matter. Calculations may be based on information obtained from various publicly available sources. The Index Owner and the Index Administrator have relied on these sources and have not independently verified the information extracted from these sources and accept no responsibility or liability in respect thereof. If there is a calculation error the Index Administrator may restate the Index Closing Level.

Without prejudice to the Index Owner or the Index Administrator's obligations under any regulatory system, and without limiting any of the foregoing, in no event shall the Index Owner or the Index Administrator have any liability (whether in negligence 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 herein shall be taken to exclude any liability for fraud on the part of the Index Administrator.

Conflicts of Interest

Conflicts of interest may exist or arise between the Index Administrator and Deutsche Bank entities acting in other capacities, including as administrator for the Index or as counterparty to a transaction. Each relevant Deutsche Bank entity will pursue actions and take steps that it deems appropriate to protect its own interests without regard to the consequences for investors in respect of any investment or instrument linked or relating to the Index or otherwise.

Deutsche Bank entities shall be entitled to receive fees or other payments pursuant to investments or instruments linked or relating to the Index or otherwise and to exercise

all rights, including rights of termination or resignations, which they may have, even though doing so may have a detrimental effect on investors in any investment or instrument linked or relating to the Index.

Trading and other transactions by Deutsche Bank AG or its affiliates

Deutsche Bank AG and/or its affiliates may hedge its obligations under any relevant instruments or financial products linked to the Index by purchasing or selling securities and other assets, or listed or over-the-counter options, futures, swaps or other derivative financial instruments underlying or linked to the Index. Although they are not expected to, any of these hedging activities may adversely affect the value of such assets, and therefore the Index Closing Level or the value of any relevant instruments or financial products linked to the returns from these hedging activities while the level of the Index and/or relevant instruments or financial products linked to the Index declines.

Deutsche Bank AG and/or its affiliates may also engage in trading in securities and other assets, or listed or over-the-counter options, futures, swaps or other derivative financial instruments underlying or linked to the Index on a regular basis as part of their general broker-dealer and other businesses, for proprietary accounts, for other accounts under management or to facilitate transactions for customers. Any of these activities could adversely affect the value of such assets, and therefore the Index Closing Level or the value of any relevant instruments or financial products linked to the Index. With respect to any of these activities, neither Deutsche Bank AG nor any of its affiliates has any obligation to take the level of the Index into consideration at any time.

This document is referred to as the "**Description**" and consists of the following Sections:

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The DB Enhanced US Equity Long Volatility Index™ (Bloomberg Code: DBEEDR03 <Index>) (the "**Index**") is a Deutsche Bank AG proprietary index.

The Description constitutes the rules (the "**Index Description**") applicable to the Index.

The Index is the intellectual property of Deutsche Bank AG ("**Deutsche Bank AG**" or the "**Index Owner**", which expression shall include any successor in such capacity). The Index Owner owns the copyright and all other intellectual property rights in the Index and the Index Description. Any use of these intellectual property rights must be with the prior written consent of the Index Owner.

The Index will be governed by the Index Administrator (as defined below). The initial Index Administrator shall be Deutsche Bank AG operating through Deutsche Bank Index Quant ("**DBIQ**"), an independent research unit within Deutsche Bank AG via its internal processes and the "**Index Administrator**" shall mean Deutsche Bank AG acting in such capacity or any successor thereto. The Index Administrator controls the creation and operation of the Index administrative process, including all stages and processes involved in the production and dissemination of the Index. Notwithstanding that the Index relies on information from third party

sources, the Index Administrator has primary responsibility for all aspects of the Index administration and determination process.

The initial Index Administrator has implemented and maintains the DBIQ User Guidance and Administrator Handbook Overview (the "**Overview**"), which sets out a summary of the policies, procedures and controls implemented by the management of the Index Administrator to promote sound business practices for the lifecycle management of the Index Owner's proprietary benchmarks by the Index Administrator. The Overview also includes the Index Administrator's policy related to quality of benchmarks and input data management. Additional issues related to governance, controls, benchmark classification and risk controls, restatement and calculation error management, periodic reviews and conflicts of interest are also addressed. Subject as expressly provided or referenced in the Index Description, the Overview does not form part of the Index Description or of any document into which the Index Description may be incorporated.

The Overview is available on <http://index.db.com> (the "**DBIQ Website**").

This Index Description does not pursue any environmental, social and governance ("**ESG**") objectives or take into account any ESG factors.

1. INTRODUCTION TO THE INDEX

This section summarises a number of features of the Index. This section should be read as a summary introduction to the Index Description but is no substitute for reviewing the Index Description in full. Capitalised terms not otherwise defined shall have the meanings given in Section 3 (Definitions).

The Index to which the Index Description relates is owned by the Index Owner and is administered by the Index Administrator. Certain key features of the Index are as follows:

- The Index represents a rule-based strategy which tracks the return of holding delta notional linked to the delta of a portfolio of call options in respect of the Underlying Index.
- On any given Index Business day, the Index will be notionally invested in a fixed-weighted, daily rebalanced basket of the two (2) notional sub-indices (each a "**Sub-Index**" and together the "**Sub-Indices**").
- On any given Index Business day, each Sub-Index will be notionally invested in a basket of Futures (the "**Constant Maturity Future**" or "**CMF**"), equivalent to the delta of a specified number of call options in respect of the Underlying Index, each of which will have a specified tenor and will respectively be assumed to be traded on a different specified period immediately preceding such Index Business Day (the Sub-Index Hypothetical Portfolio in respect of such Sub-Index). The strike in respect of each such notional call option is a specified percentage of the closing level of the Underlying Index on the trade date in respect of such relevant call option.
- In respect of each Index Business Day and a particular Sub-Index, the delta in respect of each notional call option is calculated (the "**Call Delta**"). The notional holding in respect of the Constant Maturity Future will be determined based upon the average Call Delta(s) across the respective Sub-Index Hypothetical Portfolio(s) during the day as adjusted by the Participation Factor (the "**Sub-Index Average Adjusted Call Delta**"). On a daily basis if the Sub-Index Average Adjusted Delta changes in absolute terms as compared with when the Sub-Index was last rebalanced (or, if no such rebalancing has occurred, an initial specified amount), the notional holding in respect of the Constant Maturity Future will be revised and the Sub-Index will rebalance.
- The Sub-Index Closing Level in respect of each Index Business Day will be reduced by a Holding Cost and a Rebalancing Cost. Further, the Index Closing Level in respect of each Index Business Day will be reduced by a Running Cost. The incorporation of such costs means that the Index Closing Level will be lower than would be the case if no such costs were deducted.

- An Index Closing Level is calculated on each Index Business Day by the Index Administrator and may be used in connection with one or more financial products (each a "**Financial Product**") relating to the Index. The Financial Products may be issued or entered into by Deutsche Bank AG or other financial product providers. Each investor in relation to Financial Products is referred to as a "**Financial Product Investor**".
- The Index Closing Level will be published by the Index Administrator as soon as practicable following its calculation in accordance with Section 5 (*Index Publication*).
- All determinations referred to below will be made by the Index Administrator by reference to such factors as it deems appropriate and such determinations will, save for manifest error and subject as provided in the Overview, be binding on all parties.
- The Index will be expressed in the Index Currency.
- The Index is "notional" in nature. This means that the Index Administrator is not obliged to enter into transactions in respect of any derivative in order to calculate the Index.
- The Index contains Disruption Event provisions which apply when events (including, without limitation, a "Force Majeure Event") require the Index Administrator to calculate the Index on an alternative basis were such event to occur or exist on such day, as described in Section 6 (*Disruption Events*) below. If a Disruption Event occurs, the Index Administrator may make such adjustments and/or determinations in relation to the Index as it may determine, in its sole and absolute discretion, appropriate to facilitate the calculation and publication of the Index Closing Level or, if such adjustment or calculation cannot be made, defer calculation and publication of the Index Closing Level and, in some cases, permanently cease to calculate the Index. These events may have an adverse effect on Financial Product Investors. Index Closing Levels which are calculated following any such delay may give different economic results in relation to the Financial Products than the Index Closing Levels which would have prevailed but for such delay. If the Index is cancelled or adjusted, this may lead to the calculation agent in respect of a Financial Product taking action under provisions of the Financial Product which may have an adverse effect on Financial Product Investors.
- The Index contains Adjustment Event provisions which entitle the Index Administrator to make such modifications and/or changes as it in its sole and absolute discretion deems appropriate, as described in Section 7 (*Adjustment Provisions*) below. If market, regulatory, judicial, financial, fiscal or other circumstances arise that would, in the determination of the Index Administrator, necessitate or make desirable a modification or change to the Index Description in order for the Index to continue to be calculated and determined notwithstanding the relevant circumstances, the Index Administrator may make such modifications or changes.
- The Overview sets out the process for making changes to its benchmarks as a general matter and the internal oversight and approval process that DBIQ will go through. It also sets out DBIQ's procedures for consulting on and notifying changes. Any such modification or change in methodology described in this Description in accordance with the below shall be made in accordance with Section 9 (*Changes to and Retiring a Benchmark*) of the Overview.
- This Section 1 (*Introduction to the Index*) is subject to and qualified by the remainder of the Index Description.

2. INDEX RISK FACTORS

The risk factors set out in this Section 2 (*Index Risk Factors*) are not a comprehensive list of all risks that might have an adverse effect on the value of the Index. When considering an investment in a Financial Product, prospective Financial Product Investors should review carefully the whole of the Index Description and form their own decisions as to risks associated with the Index Administrator and the Index.

Risks relating to the Index

Estimated Return: The realised return in a given period might be less than the expected return that would be realised over that time period if the interest rate term structure remained unchanged.

Running Cost, Holding Cost and Rebalancing Cost: The Sub-Index Closing Level in respect of each Index Business Day will be reduced by a Holding Cost and a Rebalancing Cost. Further, the Index Closing Level in respect of each Index Business Day will be reduced by a Running Cost. The incorporation of such costs means that the Index Closing Level will be lower than would be the case if no such costs were deducted

Index Administrator's Powers: The Index Administrator has a number of discretions in relation to the Index, which always have to be exercised in good faith and in a commercially reasonable manner. Nevertheless the exercise of these discretions may have a significant effect on Financial Products. In particular:

- If a Disruption Event, or a Force Majeure Event occurs, the Index Administrator may make such adjustments and/or determinations in relation to the Index as it may determine, in its sole and absolute discretion, appropriate to facilitate the calculation and publication of the Index Closing Level or postpone or cancel and permanently cease to calculate the Index. A Disruption Event may occur, amongst other things, as a result of the failure of trading to commence, or the permanent discontinuation of trading in any relevant futures contract.
- If market, regulatory, judicial, financial, fiscal or other circumstances arise that would necessitate or make desirable a modification or change to the Index Description, the Index Administrator may make such modifications or changes.

Future Regulatory Change in respect of indices: Legal and regulatory changes could adversely affect indices including the Index. The effect of any future legal or regulatory change on indices may not be possible to predict, but could be substantial and adverse.

Risks relating to futures contracts: The value of futures contracts may change even at times when the price of the underlying referenced by such futures contracts stays the same or the value of the futures contracts may change in a different way than the price of the underlying referenced by such futures contracts. Prospective investors should be aware that this might result in the Index suffering falls in value at a time when a direct investment in the underlying referenced by such futures contracts would not.

Any costs associated with the replacement of the futures contracts when the futures contracts approach expiry may cause the value of the futures contracts to be different from the price of the underlying referenced by such futures contracts. Prospective investors should be aware that this might result in the Index suffering falls in value at a time when a direct investment in the underlying referenced by such futures contracts would not.

A time weighted average methodology is applied in the Index. The application of a time weighted average methodology will mean the level of the Index shall be different from the closing price of the futures contracts referenced by the Index. Prospective investors should be aware that this might result in a different value for the Index than the value of the underlying futures contracts referenced by the Index.

General risks

Multiple roles of Deutsche Bank Entities: Conflicts of interest may exist between the Index Owner, initial Index Administrator and Deutsche Bank AG and its affiliates (each a "**Deutsche Bank Entity**").

A Deutsche Bank Entity may also act as the issuer of, or an obligor under, a Financial Product and as a dealer, calculation agent or hedge provider in relation to a Financial Product. Various conflicts of interest might exist or arise as a result of these different roles as well as from the overall activities of Deutsche Bank Entities. Deutsche Bank AG has a regulatory obligation to take reasonable steps to manage such conflicts fairly. Such reasonable steps include information walls being maintained between the personnel of Deutsche Bank Entities involved

in different roles. However, as with any set of systems and controls there is a risk that such information walls might not be effective in all cases.

No disclosure of information: Deutsche Bank Entities may be in possession at any time of information in relation to the Index which may not be available to Financial Product Investors. There is no obligation on any Deutsche Bank Entity to disclose to Financial Product Investors any such information.

Fees: Deutsche Bank Entities shall be entitled to receive fees or other payments and exercise all rights, including rights of termination or resignation, which they may have, even though this may have a detrimental effect on the Index and Financial Products.

Hedging Arrangements: The Index is calculated as a "notional" index. This means that the Index reflects the performance of notional options contracts, but there is no requirement for the Index Administrator to enter into any option contracts in order to calculate the Index. Deutsche Bank Entities may enter into option contracts in order to meet obligations in respect of Financial Products or for any other purpose, but Deutsche Bank Entities are not required to do this. If they do, Deutsche Bank Entities will have certain rights pursuant to such option contracts and will pursue actions and take steps that they deem appropriate to protect their own interests.

Political and Economic Factors: The level of the Underlying Index, may be influenced by a number of circumstances, including but not limited to political events, general economic conditions, government intervention, changes in balances of payments and trade, domestic and international interest rates and rates of inflation, international trade restrictions and currency devaluations. Any such circumstance (or a combination of them) may cause unexpected volatility or illiquidity in the interest rates markets. This may have an adverse effect on the Underlying Closing Level in respect of the Underlying Index which may in turn have an adverse effect on the performance of Financial Products.

Future Regulatory Change: Legal and regulatory changes could adversely affect the market for option contracts. In addition, many governmental agencies and regulatory organisations are authorised to take extraordinary actions in the event of market emergencies. The effect of any future legal or regulatory change on the market for option contracts is not possible to predict, but could be substantial and adverse.

3. DEFINITIONS

The following words and expressions shall have the following meanings:

"Affiliate" means in relation to any entity (the **"First Entity"**), any entity controlled, directly or indirectly, by the First Entity, any entity that controls, directly or indirectly, the First Entity or any entity directly or indirectly under common control with **the** First Entity. For these purposes, **"control"** means ownership of a majority of the voting power of an entity.

"Average GSI Sentiment Indicator" means, in respect of an Index Business Day, an amount calculated by the Index Administrator equal to the quotient of:

- (i) the aggregate of the Relevant DBIQ Global Sentiment Indicator II Index Closing Level in respect of each of the ten (10) Index Business Days falling immediately prior to such Index Business Day (as numerator); and
- (i) 10 (as denominator).

"Average Sub-Index Call Delta Weight" or "AvgDeltaWt(i,t)" means, in respect of a Sub-Index (i) and:

- (i) the Index Commencement Date, the Initial Sub-Index Delta Weight in respect of such Sub-Index; and
- (ii) each Index Business Day from (but excluding) the Index Commencement Date, an amount calculated by the Index Administrator as the quotient of:
 - (a) the aggregate of, in respect of each Call Option in the Sub-Index Hypothetical Portfolio in respect of such Sub-Index and such Index Business Day, the Call Delta in respect of such Call Option and such Index Business Day (as numerator); and

(b) m (as denominator).

Expressed as a formula:

$$\text{AvgDeltaWt}(i, t) = \frac{\sum_{j=1}^m \Delta \text{call}(j, i, t)}{m}$$

Where:

AvgDeltaWt(i,t)	means, in respect of an Index Business Day and a Sub-Index (i), the Average Sub-Index Call Delta Weight in respect of such Sub-Index (i) and such Index Business Day;
j	means, in respect of a Sub-Index (i) and an Index Business Day, a number between one and m (inclusive) representing a Call Option in the Sub-Index Hypothetical Portfolio in respect of such Sub-Index (i) in respect of such Index Business Day;
Δcall (j,i,t)	means, in respect of a Sub-Index (i), an Index Business Day and a Call Option in the Sub-Index Hypothetical Portfolio in respect of such Sub-Index (i) in respect of such Index Business Day, the Call Delta in respect of such Call Option and such Index Business Day; and
m	means, in respect of a Sub-Index (i) and an Index Business Day, the Number of Call Options included in the Sub-Index Hypothetical Portfolio of Sub-Index (i) in respect of such Index Business Day

"**Bloomberg**" means Bloomberg L.P. or any successor thereto.

"**Call Delta**" means, in respect of an Index Business Day and each Call Option in each of the Sub-Index Hypothetical Portfolios in respect of such Index Business Day, an amount calculated by the Index Administrator as the standard lognormal cumulative distribution function in respect of the d1 in respect of such Call Option and such Index Business Day

Expressed as a formula:

$$\Delta \text{call}(j, i, t) = \Phi(d1c[t, T(j, t), S(t), K(jc), \sigma(t-1)])$$

Where:

Δcall (j,i,t)	means, in respect of an Index Business Day and a Call Option in each of the Sub-Index Hypothetical Portfolios in respect of such Index Business Day, the Call Delta in respect of such Call Option and such Index Business Day;
t	means an Index Business Day;
j	means, in respect of an Index Business Day, a number between one and K (inclusive) representing a Call Option in each of the Sub-Index Hypothetical Portfolios in respect of such Index Business Day;
i	means, each of the Sub-Indices in respect of such Index Business Day;
K(jc)	means, in respect of an Index Business Day, the Strike in respect of such Call Option;
Φ	means the standard lognormal cumulative distribution function; and
d1c[t,T(j,t),S(t),K(jc),σ(t-1)]	means, in respect of an Index Business Day and a Call Option in respect of such Index Business Day, the d1c in respect of such Call Option and such Index Business Day.

"Call Option" means, in respect of an Index Business Day and a Sub-Index, each of five notional Call Options (which together constitute the **"Sub-Index Hypothetical Portfolio"** in respect of such Sub-Index and such Index Business Day) each referencing the Underlying Index, each having a tenor equal to the Tenor, a strike equal to the Call Strike in respect of such Call Option and, respectively, a trade date falling on the Index Business Day falling each of:

- (i) five (5) Index Business Days immediately prior to such Index Business Day;
 - (ii) ten (10) Index Business Days immediately prior to such Index Business Day;
 - (iii) fifteen (15) Index Business Days immediately prior to such Index Business Day;
 - (iv) twenty (20) Index Business Days immediately prior to such Index Business Day; and
 - (v) twenty Five (25) Index Business Days immediately prior to such Index Business Day,
- (each such trade date shall be the **"Trade Date"** in respect of such Call Option).

"Call Strike" means, in respect of an Index Business Day and a Call Option in respect of such Index Business Day, an amount calculated by the Index Administrator equal to the product of (1) the Call Strike Percentage and (2) the Underlying Closing Level of the Underlying Index in respect of the Trade Date in respect of such Call Option.

"Call Strike Percentage" means 150% (expressed as 1.50).

"Constant Maturity Future TWAP" or **"CMFTWAP(i,t)"** in respect of an Index Business Day and a Sub-Index (i), an amount calculated by the Index Administrator according to the following equation:

$$\text{CMFTWAP}(i, t) = \sum_{n=1}^2 \text{FuturesTWAP}_n(i, t) \times \text{CRW}_n(t-1)$$

Where:

- n** means in respect of an Index Business Day, an integer counter from (and including) one, to (and including) two, each representing a Future in respect of such Index Business Day;
- FuturesTWAP_n(i,t)** means, in respect of a Sub-Index (i), an Index Business Day and a Future in respect of such Index Business Day, the Future TWAP in respect of such Sub-Index (i), Future and Index Business Day; and
- CRW_n(t-1)** means, in respect of an Index Business Day and a Future in respect of such Index Business Day, the Contract Roll Weight in respect of such Future and the Index Business Day falling immediately prior to such Index Business Day.

"Constant Maturity Future Close" or **"CMFClose(t)"** means, in respect of an Index Business Day, an amount calculated by the Index Administrator according to the following equation:

$$\text{CMFClose}(t) = \sum_{n=1}^2 \text{FuturesClose}_n(i, t) \times \text{CRW}_n(t)$$

Where:

- n** means in respect of an Index Business Day, an integer counter from (and including) one, to (and including) two, each representing a Future in respect of such Index Business Day;
- FuturesClose_n(i,t)** means, in respect of an Index Business Day and a Future in respect of such Index Business Day, the

Futures Close in respect of such Future and such Index Business Day; and

CRW_n(t)

means, in respect of an Index Business Day and a Future in respect of such Index Business Day, the Contract Roll Weight in respect of such Future and such Index Business Day.

"**Contract Roll Weights**" or "**CRW_n(t)**" means, in respect of an Index Business Day and a Future in respect of such Index Business Day, an amount calculated by the Index Administrator according to the following equation:

(a) in respect of the Current Future in respect of such Index Business Day:

$$CRW_1(t) = \frac{dr}{dt}$$

(b) in respect of the Next Future in respect of such Index Business Day:

$$CRW_2(t) = 1 - \frac{dr}{dt}$$

Where:

dt

means, in respect of an Index Business Day, the total number of Index Business Days in the Future Roll Period in respect of such Index Business Day; and

dr

means, in respect of an Index Business Day and the Future Roll Period in respect of such Index Business Day, the total number of Index Business Days falling in such Future Roll Period in the period from (and including) the immediately succeeding Index Business Day to (but excluding) the immediately succeeding Future Roll Date. The determination of such number of Index Business Days shall be adjusted to reflect any new holiday introduced intra-month up to the Index Business Day preceding such a holiday.

"**d1c**" means, in respect of an Index Business Day and each Call Option in the Sub-Index Hypothetical Portfolio of a Sub-Index (i) in respect of such Index Business Day, an amount calculated by the Index Administrator as

$$d_{1c}(t, T_i, S_t, K_{tc}, \sigma_{t-1}) = \frac{\ln\left(\frac{S_t}{K_{tc}}\right) + \frac{1}{2}(\sigma_{t-1})^2(\text{Time_to_expiry}(i))}{\sigma_{t-1}\sqrt{\text{Time_to_expiry}(i)}}$$

Where:

d_{1c}(t, T_i, S_t, K_{tc}, σ_{t-1})

means, in respect of an Index Business Day, a Sub-Index (i) and a Call Option in the Sub-Index Hypothetical Portfolio of a Sub-Index (i) in respect of such Index Business Day, the d1 in respect of such Call Option and such Index Business Day;

t

means an Index Business Day

ln

means the natural logarithm;

S_t

means, in respect of a Sub-Index (i) and an Index Business Day, the Constant Maturity Future TWAP in respect of such Sub-Index (i) and such Index Business Day;

K_{tc}

means, in respect of an Index Business Day, a Sub-Index (i) and a Call Option in the Sub-Index Hypothetical Portfolio of a Sub-Index (i)

in respect of such Index Business Day, the Strike in respect of such Call Option;

σ_{t-1} means, in respect of a Sub-Index (i) and an Index Business Day, the N-Business Day Sub-Index Realised Volatility in respect of such Sub-Index (i) in respect of the Index Business Day immediately preceding such Index Business Day; and

Time_to_expiry(i) or T_i means, in respect of an Index Business Day, a Sub-Index (i) and a Call Option in the Sub-Index Hypothetical Portfolio of a Sub-Index (i) in respect of such Index Business Day, the Time to Expiry in respect of such Call Option and the Index Business Day immediately preceding such Index Business Day.

"DBIQ Global Sentiment Indicator II Index Closing Level" means the Index Level (as defined in the Description of the Deutsche Bank DBIQ Global Sentiment Indicator II Index) in respect of the DBIQ Global Sentiment Indicator II Index.

"DBIQ Website" means <http://index.db.com>.

"Description of the Deutsche Bank DBIQ Global Sentiment Indicator II Index" means the Description of the Deutsche Bank DBIQ Global Sentiment Indicator II Index, as amended and/or restated from time to time, a copy of which can be found on the DBIQ Website.

"Expiry Date" means, in respect of an Index Business Day and a Call Option in respect of such Index Business Day, the Index Business Day that is a number of Index Business Days immediately following the Trade Date in respect of such Call Option equal to the Tenor.

"First Future Expiry Date" means, in respect of an Index Business Day, the first Future Expiry Date in respect of a VIX Future immediately following such Index Business Day, provided that, if such Index Business Day falls on a Future Roll Date, or on the Index Business Day immediately following a Future Roll Date, the First Future Expiry Date shall mean the second Future Expiry Date in respect of a VIX Future immediately following such Index Business Day.

"Force Majeure Event" means, in respect of the Index, an event or circumstance (including, without limitation, a systems failure, fire, building evacuation, natural or man-made disaster, act of God, armed conflict, act of terrorism, riot or labour disruption or any similar intervening circumstance) that affects the ability of the Index Administrator to calculate or determine the Index and which is beyond the reasonable control of the Index Administrator.

"Future" means, in respect of an Index Business Day, each of:

- (i) the VIX Futures expiring on the First Future Expiry Date (the **"Current Future"** in respect of such Index Business Day); and
- (ii) the VIX Futures expiring on the Second Future Expiry Date (the **"Next Future"** in respect of such Index Business Day),

in each case, in respect of such Index Business Day (together the **"Futures"**).

"Future Close" means, in respect of a Future and an Index Business Day, the official final settlement price in respect of such Future on such day (however defined in the contract specifications of such Futures) on the Futures Exchange, as determined by the Index Administrator.

"Futures Exchange" means the Chicago Mercantile Exchange (the **"CME"**), or any successor to such exchange or quotation system or any substitute exchange or quotation system to which trading in futures contracts on the Underlying Index has temporarily or permanently relocated (provided that the Index Administrator has determined that there is comparable liquidity relative to futures contracts on the Underlying Index on such temporary substitute exchange or quotation system as on the original Futures Exchange).

"Future Expiry Date" means, in respect of a VIX Future, the expiry date of such VIX Future on which the Futures Exchange sponsor announces, and the Futures Exchange publishes, the "final settlement price" of such VIX Future, as determined by the Index Administrator.

"Future Roll Date" means, in respect of a Future, the second Index Business Day preceding the Future Expiry Date in respect of such Future.

"Future Roll Period" means in respect of each Index Business Day, each Index Business Day in the period commencing on, and including, the Future Roll Date falling on such Index Business Day (or, if none, then the immediately preceding Future Roll Date) and ending on, but excluding, the Future Roll Date immediately following such Index Business Day. For the avoidance of doubt, the number of Index Business Days in a Future Roll Period shall remain constant in the event of a new holiday introduced intra-month or an unscheduled market closure in respect of the Futures Exchange.

"Future TWAP" means, in respect of a Future, a Sub-Index (i) and an Index Business Day, an amount calculated by the Index Administrator equal to the arithmetic mean of the results returned by the Future TWAP Observation (i) in respect of such Sub-Index, in respect of the TWAP Process (as defined in Section 4(d)) run on such Index Business Day using (1) the bid prices quoted for a size of one or more contracts of such Future, and (2) the ask prices quoted for a size of one or more contracts of such Future, in each case as published on the Underlying Price Source.

"Future TWAP Observation" or **"Future TWAP Observation (i)"** means, in respect of a Future, a Sub-Index (i) and an Index Business Day, a TWAP Process parametrised as follows

Sub-Index (i=)	TWAP Process Start Time	TWAP Process End Time
1	10:00 a.m. New York Time	5 minutes after the TWAP Process Start Time
2	15:55 p.m. New York Time	5 minutes after the TWAP Process Start Time

"Index" has the meaning given to such term on page 3 of this Description.

"Index Administrator" has the meaning given to such term on page 3 of this Description.

"Index Business Day" means each day on which the VIX Futures are scheduled to be traded during a regular trading session on the Futures Exchange, as determined by the Index Administrator, which for the avoidance of doubt, does not include days on which the Futures Exchange is scheduled to close prior to its regular weekday closing time.

"Index Closing Level" means, in respect of an Index Business Day, an amount, expressed in the Index Currency, being the closing level of the Index in respect of such Index Business Day, as determined by the Index Administrator in accordance with Section 4(b) (*Index Calculation*).

"Index Commencement Date" means 29th November 2012.

"Index Currency" means U.S. Dollars (**"USD"**).

"Index Description" has the meaning given to such term on page 3 of this Description.

"Index Live Date" means 15th October 2021

"Index Valuation Time" means in respect of an Index Business Day, on or about 15:00 p.m. (London time) on the Index Business Day falling immediately after such Index Business Day.

"Indicator Index Publication Date" means each day in respect of which the DBIQ Global Sentiment Indicator II Index is published by the index administrator in respect of such index.

"Initial Index Closing Level" means 100.

"Initial Sub-Index Closing Level" means:

- (i) in respect of Sub-Index (i=1), 100; and
- (ii) in respect of Sub-Index (i=2), 100.

"Initial Sub-Index Delta Weight" means:

- (i) in respect of Sub-Index (i=1), 0.0454029%; and
- (ii) in respect of Sub-Index (i=2), 0.0869888%.

"Initial Sub-Index Unit Holding" means:

- (i) in respect of Sub-Index (i=1), 0.5; and
- (ii) in respect of Sub-Index (i=2), 0.5.

"Initial Sub-Index Delta Unit Holding" means, in respect of a Sub-Index:

- (i) in respect of Sub-Index (i=1), 0.00287271; and
- (ii) in respect of Sub-Index (i=2), 0.00548566.

"Number of Call Options" means five (5).

"N-Business Day Sub-Index Realised Volatility" means, in respect of an Index Business Day and a Sub-Index (i), an amount calculated by the Index Administrator equal to the square root of the product of:

- (i) 252; and
- (ii) the quotient of:
 - (a) the aggregate, in respect of each Index Business Day in the period from (and including) the Index Business Day that is N Index Business Days immediately preceding such Index Business Day to (but excluding) such Index Business Day (such period, the "**Volatility Period**" in respect of such Index Business Day), of the square of:
 - (1) the RD in respect of such Index Business Day; *minus*
 - (2) the RD Mean in respect of such Index Business Day and such Volatility Period,
 (as numerator); and
 - (b) N (as denominator).

Expressed as a formula:

$$\text{Vol}(i, t) = \sqrt{252 \times \frac{\sum_{t=t}^{t-N} (\text{RD}(i, t) - \overline{\text{RD}(i, t)})^2}{N}}$$

Where:

Vol(i,t)	means, in respect of a Sub-Index (i) and an Index Business Day, the N-Business Day Sub-Index Realised Volatility in respect of such Sub-Index (i) and such Index Business Day;
RD(i,t)	means, in respect of a Sub-Index (i) and an Index Business Day, the RD in respect of such Sub-Index (i) and such Index Business Day;
$\overline{\text{RD}(i, t)}$	means, in respect of a Sub-Index (i), an Index Business Day and the Volatility Period in respect of such Index Business Day, the RD Mean in respect of such Sub-Index (i), Index Business Day and Volatility Period; and
N	means 252.

"Participation Factor" means, in respect of an Index Business Day, an amount calculated by the Index Administrator as:

- (i) 50%, if the Average GSI Sentiment Indicator in respect of such Index Business Day is less than 33; or
- (ii) 37.5%, if the Average GSI Sentiment Indicator in respect of such Index Business Day is greater than or equal to 33 and less than 66; or

- (iii) 25%, if the Average GSI Sentiment Indicator in respect of such Index Business Day is greater than or equal to 66 and less than 75; or
- (iv) 5%, if the Average GSI Sentiment Indicator in respect of such Index Business Day is greater than or equal to 75 and less than 90; or
- (v) 0%, if the Average GSI Sentiment Indicator in respect of such Index Business Day is greater than or equal to 90.

"Percentage Rebalancing Cost" means zero point three per cent. (0.30%).

"Price Source" means any data required by the Index Administrator to calculate the level of the Index including, without limitation any information service or source including but not limited to (i) Refinitiv, Bloomberg and any other such provider, and/or (ii) any published proprietary information of the administrator of the Underlying Index relevant to determining the level of the Underlying Index, as determined by the Index Administrator.

"Processes" means the processes and controls set out in Section 8 (*Input Data Management*) of the Overview dated July 2020 (or any successor publication and/or section of such publication that addresses the input data management policy of the Index Administrator).

"RD" means in respect of an Index Business Day and a Sub-Index (i), an amount calculated by the Index Administrator equal to:

- (i) the quotient of:
 - (a) the Constant Maturity Future TWAP in respect of such Sub-Index (i) and such Index Business Day (as numerator); and
 - (b) the Constant Maturity Future TWAP in respect of such Sub-Index (i) in respect of the Index Business Day immediately preceding such Index Business Day (as denominator); *minus*
- (ii) one.

Expressed as a formula:

$$RD(i, t) = \left(\frac{CMFTWAP(i, t)}{CMFTWAP(i, t - 1)} \right) - 1$$

Where:

RD(i,t)	means, in respect of an Index Business Day and a Sub-Index (i), the RD in respect of such Sub-Index (i) and such Index Business Day and such Sub-Index (i);
CMFTWAP(i,t)	means, in respect of an Index Business Day and a Sub-Index (i), the Constant Maturity Future TWAP in respect of such Index Business Day and such Sub-Index (i); and
CMFTWAP(i,t-1)	means, in respect of an Index Business Day and a Sub-Index (i), the Constant Maturity Future TWAP in respect of such Sub-Index (i) and the Index Business Day immediately preceding such Index Business Day.

"RD Mean" means in respect of an Index Business Day, a Sub-Index (i) and the Volatility Period in respect of such Index Business Day, an amount calculated by the Index Administrator equal to the quotient of:

- (i) the aggregate, in respect of each Index Business Day falling in such Volatility Period, of the RD in respect of such Sub-Index (i) and such Index Business Day (as numerator); and
- (i) N (as denominator).

Expressed as a formula:

$$\overline{RD(i,t)} = \frac{\sum_{t=t}^{t=N} RD(i,t)}{N}$$

Where:

$\overline{RD(i,t)}$	means in respect of an Index Business Day, a Sub-Index (i), and the Volatility Period in respect of such Index Business Day, the RD Mean in respect of such Index Business Day, Sub-Index (i) and Volatility Period;
$RD(i,t)$	means, in respect of an Index Business Day, a Sub-Index (i) and the Volatility Period in respect of such Index Business Day and an Index Business Day (t) falling in such Volatility Period, the RD in respect of such Index Business Day (t) and Sub-Index (i);
t	means, in respect of an Index Business Day and the Volatility Period in respect of such Index Business Day, an integer counter from (and including) one to (and including) N representing a Index Business Day falling in such Volatility Period; and
N	means 30.

"**Refinitiv**" means Refinitiv Ltd or any of its Affiliates and subsidiaries, or any successor market price information provider(s).

"**Relevant DBIQ Global Sentiment Indicator II Index Closing Level**" means, in respect of an Index Business Day, the DBIQ Global Sentiment Indicator II Index Closing Level in respect of such Index Business Day (or if such Index Business Day is not an Indicator Index Publication Date, the Indicator Index Publication Date immediately preceding such Index Business Day).

"**Running Cost**" means zero point five per cent. (0.50%).

"**Second Future Expiry Date**" means, in respect of an Index Business Day, the second Future Expiry Date in respect of any VIX Future immediately following such Index Business Day, provided that, if such Index Business Day falls on a Future Roll Date, or on the Index Business Day immediately following a Future Roll Date, the Second Future Expiry Date shall mean the third Future Expiry Date in respect of a VIX Future immediately following such Index Business Day.

"**Sub-Index Holding Cost**" or "**HoldCost(i,t)**" means in respect of an Index Business Day and a Sub-Index (i), an amount calculated by the Index Administrator equal to the product of:

- (1) 0.30%;
- (2) the Sub-Index Delta Unit Holding in respect of such Sub-Index (i) and Index Business Day;
- (3) the Constant Maturity Future TWAP in respect of such Sub-index (i) and Index Business Day; and
- (4) the quotient of:
 - (i) the actual number of calendar days in the period commencing on (and including) the Index Business Day falling immediately prior to such Index Business Day and ending on (but excluding) such Index Business Day (as numerator); and
 - (ii) 365 (as denominator).

"**Sub-Index Closing Level**" means, in respect of an Index Business Day and a Sub-Index (i), an amount calculated by the Index Administrator in accordance with Section 4(c) (*Sub-Index Calculation*).

"**Sub-Index Delta Unit Holding**" means, in respect of an Index Business Day and a Sub-Index (i), where such Index Business Day is:

- (i) the Index Commencement Date, the Initial Sub-Index Delta Unit Holding in respect of such Sub-Index (i); and
- (ii) a Sub-Index Rebalancing Day in respect of such Sub-Index (i), an amount calculated by the Index Administrator as the quotient of:
 - (a) the product of:
 - (1) the Target Weight in respect of such Sub-Index (i) in respect of such Sub-Index Rebalancing Day; and
 - (2) the Sub-Index Closing Level in respect of such Sub-Index (i) in respect of the Index Business Day immediately preceding such Sub-Index Rebalancing Day,
 (as numerator); and
 - (b) the Constant Maturity Future TWAP in respect of such Sub-Index Rebalancing Day and Sub-Index (i) (as denominator).

Expressed as a formula:

$$SIDU(i, t_R) = \frac{TW(i, t_R) \times SIL(i, t_R - 1)}{CMFTWAP(i, t_R)}$$

Where:

SIDU(i, t_R)	means, in respect of a Sub-Index (i) and a Sub-Index Rebalancing Day in respect of such Sub-Index (i), the Sub-Index Delta Unit Holding in respect of such Sub-Index Rebalancing Day and Sub-Index (i);
t_R	means, in respect of a Sub-Index (i), a Sub-Index Rebalancing Day in respect of such Sub-Index (i);
TW(i, t_R)	means, in respect of a Sub-Index (i) and a Sub-Index Rebalancing Day in respect of such Sub-Index (i), the Target Weight in respect of such Sub-Index Rebalancing Day and Sub-Index (i);
SIL(i, t_R - 1)	means, in respect of a Sub-Index (i) and a Sub-Index Rebalancing Day in respect of such Sub-Index (i), the Sub-Index Closing Level in respect of such Sub-Index (i) in respect of the Index Business Day immediately preceding such Sub-Index Rebalancing Day; and
CMFTWAP(i, t_R)	means, in respect of an Index Business Day and a Sub-Index (i), the Constant Maturity Future TWAP in respect of such Sub-Index (i) and such Index Business Day; and

- (iii) is not the Index Commencement Date or a Sub-Index Rebalancing Day in respect of such Sub-Index (i), an amount equal to the Sub-Index Delta Unit Holding in respect of the Sub-Index Rebalancing Day in respect of such Sub-Index (i) immediately preceding such Index Business Day (or, if no such Sub-Index Rebalancing Day exists, the Initial Sub-Index Delta Unit Holding) in respect of such Sub-Index (i).

Expressed as a formula:

$$SIDU(i, t) = SIDU(i, t_R)$$

Where:

SIDU(i, t)	means, in respect of an Index Business Day and a Sub-Index (i), the Sub-Index Delta Unit Holding in respect of such Sub-Index (i) and Index Business Day;
SIDU(i, t_R)	means, in respect of an Index Business Day and a Sub-Index (i), the Sub-Index Delta Unit Holding in respect of such Sub-Index (i) and the Sub-Index Rebalancing Day in respect of such Sub-Index (i) immediately preceding such Index Business Day

(or, if no such Sub-Index Rebalancing Day exists, then the Initial Sub-Index Delta Unit Holding in respect of such Sub-Index (i));

t means an Index Business Day; and

t_R means, in respect of a Sub-Index (i) and an Index Business Day, the Sub-Index Rebalancing Day in respect of such Sub-Index (i) immediately preceding such Index Business Day.

"**Sub-Index Hypothetical Portfolio**" has the meaning given to it in the definition of "Call Option".

"**Sub-Index Rebalancing Cost**" means, in respect of a Sub-Index (i) and a Sub-Index Rebalancing Day in respect of such Sub-Index (i):

- (i) where such Sub-Index Rebalancing Day falls on the Index Commencement Date, zero; and
- (ii) in respect of each Sub-Index Rebalancing Day in respect of such Sub-Index (i) from (but excluding) the Index Commencement Date, an amount calculated by the Index Administrator as the product of:
 - (a) the Constant Maturity Future TWAP in respect of such Sub-Index (i) and Sub-Index Rebalancing Day;
 - (b) the absolute value of:
 - (1) the Sub-Index Delta Unit Holding in respect of such Sub-Index (i) and Sub-Index Rebalancing Day; *minus*
 - (2) the Sub-Index Delta Unit Holding in respect of such Sub-Index (i) and the Sub-Index Rebalancing Day in respect of such Sub-Index (i) falling immediately prior to such Sub-Index Rebalancing Day (or, if none, in respect of the Index Commencement Date); and
 - (c) the Percentage Rebalancing Cost.

Expressed as a formula:

$$\text{RebalancingCost}(i, t_R) = \text{CMFTWAP}(i, t_R) \times \text{ABS}[\text{SIDU}(i, t_R) - \text{SIDU}(i, t_{R-1})] \times \text{PRC}$$

Where:

RebalancingCost(i, t_R) means, in respect of a Sub-Index (i) and a Sub-Index Rebalancing Day in respect of such Sub-Index (i), the Sub-Index Rebalancing Cost in respect of such Sub-Index (i) and Sub-Index Rebalancing Day;

t_R means, in respect of a Sub-Index (i), a Sub-Index Rebalancing Day in respect of such Sub-Index (i);

CMFTWAP(i, t_R) means, in respect of a Sub-Index (i) and a Sub-Index Rebalancing Day in respect of such Sub-Index (i), the Constant Maturity Future TWAP in respect of such Sub-Index (i) and Sub-Index Rebalancing Day;

ABS followed by an amount (or value) inside brackets, means the absolute value of the amount (or value) within such brackets;

SIDU(i, t_R) means, in respect of a Sub-Index (i) and a Sub-Index Rebalancing Day in respect of such Sub-Index (i), the Sub-Index Delta Unit Holding in respect of such Sub-Index (i) and Sub-Index Rebalancing Day;

SIDU(i, t_{R-1}) means, in respect of a Sub-Index (i) and a Sub-Index Rebalancing Day in respect of such Sub-Index (i), the

Sub-Index Delta Unit Holding in respect of such Sub-Index (i) and the Sub-Index Rebalancing Day in respect of such Sub-Index (i) falling immediately prior to such Sub-Index Rebalancing Day (or, if none, in respect of the Index Commencement Date); and

PRC means the Percentage Rebalancing Cost.

"Sub-Index Rebalancing Day" means in respect of a Sub-Index (i), each Index Business Day in respect of which the absolute difference between the Target Weight in respect of such Sub-Index (i) and such Index Business Day and the Target Weight in respect of such Sub-Index (i) and the Index Business Day falling immediately prior to such Index Business Day (or, if no such Index Business Day exists, the Initial Sub-Index Delta Weight) is not equal to zero, as determined by the Index Administrator.

"Sub-Index Unit Holding" means, in respect of a Sub-Index (i) and:

- (i) the Index Commencement Date, the Initial Sub-Index Unit Holding in respect of such Sub-Index (i); and
- (ii) any Index Business Day other than the Index Commencement Date, an amount calculated by the Index Administrator as the quotient of:
 - (a) the product of:
 - (1) 0.5; and
 - (2) the Index Closing Level in respect of such Index Business Day (as numerator); and
 - (b) the Sub-Index Closing Level in respect of such Sub-Index (i) on such Index Business Day (as denominator);

Expressed as a formula:

$$SIU(i, t) = \frac{0.5 \times IL(i, t)}{SIL(i, t)}$$

Where:

SIU(i,t) means, in respect of a Sub-Index (i) and an Index Business Day other than the Index Commencement Date, the Sub-Index Unit Holding in respect of such Sub-Index (i) and Index Business Day;

SIL(i,t) means, in respect of a Sub-Index (i) and an Index Business Day, the Sub-Index Closing Level in respect of such Sub-Index (i) in respect of such Index Business Day; and

IL(t) means, in respect of an Index Business Day, the Index Closing Level in respect of such Index Business Day.

"Successor Source" means, in relation to any display page, other published source, information vendor or provider:

- (i) the successor display page, other published source, information vendor or provider that has been officially designated by the administrator of the original page or source; or
- (ii) if the administrator of the original page or source has not officially designated a successor display page, other published source, service or provider (as the case may be), the successor display page, other published source, service or provider, if any, designated by the relevant information vendor or provider (if different from such administrator).

"Target Weight" or **"TW(i, t_R)"** means, in respect of an Index Business Day and a Sub-Index (i) and:

- (i) the Index Commencement Date, the Initial Sub-Index Delta Weight in respect of such Sub-Index (i); and
- (ii) each Index Business Day from (but excluding) the Index Commencement Date, an amount calculated by the Index Administrator as the product of:
 - (a) (i) in respect of Sub-Index (i=1):

$$\text{AvgDeltaWt}_{1,t}, \text{ if } \text{ABS}[\text{AvgDeltaWt}_{1,t} - \text{AvgDeltaWt}_{2,t-1}] > \text{Threshold}$$

$$\text{TW}_{1,t-1}, \text{ otherwise; and}$$
 - (ii) in respect of Sub-Index (i=2):

$$\text{AvgDeltaWt}_{2,t}, \text{ if } \text{ABS}[\text{AvgDeltaWt}_{2,t} - \text{AvgDeltaWt}_{1,t}] > \text{Threshold}$$

$$\text{TW}_{2,t-1}, \text{ otherwise; and}$$
- (b) the Participation Factor.

Where:

ABS followed by an amount (or value) inside brackets, means the absolute value of the amount (or value) within such brackets; and

AvgDeltaWt(i,t) means, in respect of an Index Business Day and a Sub-Index (i), the Average Sub-Index Call Delta Weight in respect of such Sub-Index (i) and Index Business Day.

"Tenor" means thirty (30).

"Threshold" means 20% (expressed as 0.20).

"Time to Expiry" means, in respect of an Index Business Day and a Call Option in a Sub-Index Hypothetical Portfolio of Sub-Index (i) in respect of such Index Business Day, an amount calculated by the Index Administrator as the quotient of:

- (i) the actual number of days in the period commencing on (and including) such Index Business Day and ending on (but excluding) the Expiry Date in respect of such Call Option (as numerator); and
- (ii) 365.25 (as denominator).

Expressed as a formula:

$$T = \frac{T_i - i}{365.25}$$

Where:

T means, in respect of an Index Business Day and a Call Option in respect of such Index Business Day, the Time to Expiry in respect of such Call Option and such Index Business Day; and

T_i - i means, in respect of an Index Business Day and a Call Option in respect of such Index Business Day, the actual number of days in the period commencing on (and including) such Index Business Day and ending on (but excluding) the Expiry Date in respect of such Call Option.

"TWAP Process" has the meaning given to it in Section 4 (d) (*Time-Weighted Average Price Process*).

"TWAP Process End Time" has the meaning given to it in Section 4(d) (*Time-Weighted Average Price Process*).

"TWAP Process Start Time" has the meaning given to it in Section 4(d) (*Time-Weighted Average Price Process*).

"Underlying Closing Level" means, in relation to any relevant day, the closing level of the Underlying Index in respect of that day as determined by the Index Administrator by reference to the Bloomberg page: *VIX <Index>* or any Successor Source thereto.

"Underlying Index Administrator" means, in respect of the Underlying Index, the sponsor, administrator or calculation agent, as applicable, responsible for calculating, publishing and making available such Underlying Index.

"Underlying Index" means the means the CBOE Volatility Index® published by Chicago Board Options Exchange® (CBOE®) or any successor thereto.

"Underlying Price Source" means Refinitiv, or any Successor Source thereto.

"Volatility Period" has the meaning given to such term in the definition of "N-Business Day Sub-Index Realised Volatility".

"VIX Futures" means CBOE Volatility Index® (VX) Futures on the Underlying Index which are listed and traded on the Futures Exchange.

4. INDEX CALCULATION

(a) Index Calculation on the Index Commencement Date

The Index is deemed to have been established on the Index Commencement Date.

The Index Closing Level in respect of the Index Commencement Date was equal to the Initial Index Closing Level.

The Index has been calculated back to the Index Commencement Date and has been published as of the Index Live Date.

(b) Index Calculation

The Index Closing Level in respect of each Index Business Day from (but excluding) the Index Commencement Date shall be an amount (expressed in the Index Currency) calculated by the Index Administrator in accordance with the following formula:

$$IL(t) = \left[IL(t-1) \times \left\{ 1 - RC \times \frac{d(t-1, t)}{365} \right\} \right] + \sum_{i=1}^2 [SIL(i, t) - SIL(i, t-1)] \times SIU(i, t-1)$$

Where:

IL(t)	means, in respect of an Index Business Day, the Index Closing Level in respect of such Index Business Day;
t	means an Index Business Day;
t-1	means, in respect of an Index Business Day, the Index Business Day immediately preceding such Index Business Day;
i	means, each of the Sub-Indices in respect of such Index Business Day;
RC	means the Running Cost;
d(t-1, t)	means, in respect of an Index Business Day, the number of calendar days in the period from (and including) the Index Business Day immediately preceding such Index Business Day to (but excluding) such Index Business Day;

SIL(i,t)	means, in respect of a Sub-Index (i) and an Index Business Day, the Sub-Index Closing Level in respect of such Sub-Index (i) and such Index Business Day;
SIL(i,t-1)	means, in respect of a Sub-Index (i) and an Index Business Day, the Sub-Index Closing Level in respect of such Sub-Index (i) in respect of Index Business Day (t-1); and
SIU(i,t)	means, in respect of a Sub-Index (i) and an Index Business Day, the Sub-Index Unit Holding in respect of such Sub-Index and such Index Business Day.

(c) Sub-Index Calculation

The Sub-Index Closing Level in respect of each Sub-Index in respect of the Index Commencement Date shall be equal to the Initial Sub-Index Closing Level in respect of such Sub-Index.

The Sub-Index Closing Level in respect of each Sub-Index (i) and each Index Business Day from (but excluding) the Index Commencement Date shall be an amount (expressed in the Index Currency) calculated by the Index Administrator in accordance with (i) or (ii), as applicable:

(i) in respect of Sub-Index (i=1)

$$\text{SIL}(1, t) = \text{SIL}(1, t - 1) + \text{SIDU}(1, t - 1) \times [\text{CMFTWAP}(1, t) - \text{CMFClose}(t - 1)] + \text{SIDU}(1, t) \times [\text{CMFClose}(t) - \text{CMFTWAP}(1, t)] - \text{HoldCost}(1, t - 1) - \text{RebalancingCost}(1, t_{R-1}) ; \text{ and}$$

(ii) in respect of Sub-Index (i=2)

$$\begin{aligned} \text{SIL}(2, t) = & \text{SIL}(2, t - 1) + \text{SIDU}(2, t - 1) \times [\text{CMFTWAP}(2, t) - \text{CMFClose}(t - 1)] \\ & + \text{SIDU}(2, t) \times [\text{CMFClose}(t) - \text{CMFTWAP}(2, t)] - \text{HoldCost}(2, t - 1) \\ & - \text{RebalancingCost}(2, t_{R-1}) \end{aligned}$$

Where:

SIL(i,t)	means, in respect of an Index Business Day and a Sub-Index (i), the Sub-Index Closing Level in respect of such Index Business Day and Sub-Index (i);
t	means an Index Business Day;
t-1	means, in respect of an Index Business Day, the Index Business Day immediately preceding such Index Business Day;
HoldCost(i,t-1)	means, in respect of a Sub-Index (i) and an Index Business Day, the Holding Cost in respect of such Sub-Index (i) and the Index Business Day immediately preceding such Index Business Day;
CMFClose(t)	means, in respect of an Index Business Day, the Constant Maturity Future Close in respect of such Index Business Day;
CMFTWAP(i,t)	means, in respect of a Sub-Index (i) and an Index Business Day, the Constant Maturity Future TWAP in respect of such Sub-Index (i) and Index Business Day;
RebalancingCost(i,t_{R-1})	means, in respect of a Sub-Index (i) and an Index Business Day, the Sub-Index Rebalancing Cost in respect of such Sub-Index (i) and the Sub-Index Rebalancing Day in respect of such Sub-Index (i) falling immediately prior to such Index

	Business Day (or, if none, in respect of the Index Commencement Date);
SIDU(i,t)	means, in respect of an Index Business Day and a Sub-Index (i), the Sub-Index Delta Unit Holding in respect of such Sub-Index (i) and Index Business Day; and
r	means, in respect of a Sub-Index (i) and an Index Business Day, the Sub-Index Rebalancing Day in respect of such Sub-Index immediately preceding such Index Business Day.

(d) Time-Weighted Average Price Process

In order to establish relevant prices and inputs to calculate the Index Closing Level on any Index Business Day, a time-weighted average price observation process (the "**TWAP Process**") will be used by the Index Administrator.

For the purpose of determining any input using the TWAP Process in respect of an Index Business Day, the relevant price or level (each such price or level being a "**TWAP Observation Level**") will be recorded at the end of every 15 second interval (each such 15 second interval being a "**TWAP Observation Interval**") in the period commencing at, and including, the "**TWAP Process Start Time**" on such Index Business Day and ending at, and including, the "**TWAP Process End Time**" on such day.

In respect of each TWAP Observation Interval, the TWAP Observation Level to be recorded for such TWAP Observation Interval will be the most recent relevant price or level published by the relevant data source on or after the Lookback Period Start Time to, and including, the end of such TWAP Observation Interval. If no such price or level exists, then there will be no TWAP Observation Level recorded from such TWAP Observation Interval.

The "**Lookback Period Start Time**" means, for any relevant Index Business Day, the time falling [0] minutes prior to the TWAP Process Start Time on such day. For the avoidance of doubt, the first time at which a price or level will be recorded as a TWAP Observation Level (subject to there being a price or level to record) is the TWAP Process Start Time plus the TWAP Observation Interval.

The TWAP Process will return a price or level which is the arithmetic average of the recorded TWAP Observation Levels in respect of the period from (and including) the TWAP Process Start Time to (and including) the TWAP Process End Time. If there are no recorded TWAP Observation Levels, then the TWAP Process will not return a price or a level.

(e) Miscellaneous

The Index Closing Level in respect of each Index Business Day shall be calculated to six decimal places with 0.0000005 being rounded upwards (such level being the "**Calculated Index Level**" in respect of such Index Business Day) and published to two decimal places with 0.005 being rounded upwards, as set out in the section headed "Index Publication" below. The Index Administrator shall make available the Calculated Index Level in respect of each Index Business Day (including, for the avoidance of doubt, if requested, any historical Calculated Index Levels) on application to DBIQ at the Index Administrator's principal office in London for the time being at Winchester House, 1 Great Winchester Street, London EC2N 2DB (such address being, as of the date of this Description, the "**Principal Office**").

The methodology described in this Section 4 (*Index Calculation*) is subject to the provisions set out in Section 6 (*Disruption Events*) and Section 7 (*Adjustment Provisions*).

5. INDEX PUBLICATION

(a) Availability of Index Closing Levels and Adjustments

The Index Administrator will make available (a) the Index Closing Level in respect of the Index in respect of each Index Business Day as soon as reasonably practicable after the Index Valuation Time on such Index Business Day and (b) details of any adjustments made to the Index, in each case, on application to DBIQ at the Index Administrator's principal office in London for the time being at the Principal Office.

In addition, the Index Closing Level will be available:

- (i) at the Principal Office of the Index Administrator;
- (ii) on the DBIQ Website or any successor page thereto;
- (iii) subject to the availability of the Bloomberg system on any calendar day, on Bloomberg under the ticker *DBEEDR03 <Index>*; and
- (iv) on such other information sources as the Index Administrator may select from time to time at its sole and absolute discretion,

or on any Successor Sources that the Index Administrator shall elect from time to time.

(b) Corrections

In the event that any price or level published on any date which is utilised for any calculation or determination in respect of the Index is subsequently corrected, and/or recalculated in accordance with its terms or description (as the case may be), or the Index Administrator identifies an error or omission in any of its calculations or determinations in respect of the Index, the Index Administrator may, in its sole discretion adjust or correct any relevant terms, calculations or determinations in respect of the Index to take into account such correction(s), error(s) or omission(s) (as the case may be) but is not obliged to do so.

(c) Miscellaneous

Any publication described in this Section 5 (*Index Publication*) may be restricted by means determined as appropriate for such purpose by the Index Administrator in its sole and absolute discretion including, but not limited to, password protection on the DBIQ Website restricting access to a limited set of persons in accordance with arrangements agreed between the Index Administrator and such persons.

The Index Administrator may, at any time and without notice, change with respect to the Index the place of publication of the Index Closing Level.

The Index Administrator may, at any time and without notice, change the frequency of publication of the Index Closing Level.

Subject as provided by law, the Index Administrator accepts no legal liability to any person for publishing or not continuing to publish for any period of time any Index Closing Level at any particular place or any particular time.

In the event of any ambiguity in, or dispute about the meaning of, any of the provisions of the Index Description, the Index Administrator shall, in its sole and absolute discretion, construe the relevant provision(s) in order to determine the correct interpretation thereof, and the decision of the Index Administrator shall be final.

6. DISRUPTION EVENTS

(a) General

"**Disruption Event**", in respect of an Index Business Day and at any time, means an event (including a Force Majeure Event and a national holiday or a day of national mourning) that would require the Index Administrator to calculate the Index on an alternative basis were such event to occur or exist on such day, all as determined by the Index Administrator in its sole and absolute discretion.

Without limitation, each of the following may be a Disruption Event if so determined by the Index Administrator in its sole and absolute discretion:

- (i) **"Underlying Index Disruption Event"**: The Index Administrator determines that Underlying Closing Level in respect of the Underlying Index is not published within the scheduled or usual timeframe for publication in respect of an Index Business Day; and
- (ii) **"Price Source Disruption"**:
 - (a) any Price Source is temporarily or permanently discontinued, unavailable or not announced or published thereby preventing or restricting the availability of the information necessary for determining the Index; or
 - (b) following the application of the Processes in relation to any data obtained from a Price Source, the Index Administrator determines in good faith and a commercially reasonable manner that such data does not accurately and reliably represent the interest purported to be measured by that data.
- (iii) **"Index Cessation Event"**: In respect of the Underlying Index (the **"Relevant Benchmark"**), the Index Administrator determines that any authorisation, registration, recognition, endorsement, equivalence decision, approval or inclusion in any official register in respect of such Relevant Benchmark or the administrator or sponsor of such Relevant Benchmark has not been, or will not be, obtained or has been, or will be, rejected refused, suspended or withdrawn by the relevant competent authority or other relevant official body, with the effect that the Index Administrator is not, or will not be, permitted under any applicable law or regulation to use such Relevant Benchmark to perform its obligations in respect of determining the relevant Index Closing Level.
- (iv) **"Administrator/Benchmark Event"**: The occurrence of one or more of the following events in respect of a Relevant Benchmark:
 - (i) a public statement or publication of information by or on behalf of the administrator of such Relevant Benchmark announcing that it has ceased or will cease to provide such Relevant Benchmark permanently or indefinitely, provided that, at the time of the statement or publication, there is no successor administrator that will continue to provide such Relevant Benchmark;
 - (ii) a public statement or publication of information by the regulatory supervisor for the administrator of such Relevant Benchmark, the central bank for the currency of such Relevant Benchmark, an insolvency official with jurisdiction over the administrator for such Relevant Benchmark, a resolution authority with jurisdiction over the administrator for such Relevant Benchmark or a court or an entity with similar insolvency or resolution authority over the administrator for such Relevant Benchmark, which states that the administrator of such Relevant Benchmark has ceased or will cease to provide such Relevant Benchmark permanently or indefinitely, provided that, at the time of the statement or publication, there is no successor administrator that will continue to provide such Relevant Benchmark; or
 - (iii) any event which otherwise constitutes an 'index cessation event' in respect of such Relevant Benchmark (regardless of how it is actually defined or described in the definition of the Relevant Benchmark).
- (v) **"Change of Law or Rules"** means there is a change in, or amendment to, the laws, rules or regulations relating to any Future or any other futures contract relating to the Underlying Index, and/or a change in any application or interpretation of such laws, rules or regulations.
- (vi) **"De Minimis Trading"** means the number of any relevant Future or any other futures contract relating to the Underlying Index traded on the Futures Exchange on any relevant trading day is materially reduced or the liquidity in any relevant Future or any

other futures contract relating to the Underlying Index is otherwise reduced for any reason.

- (vii) **"Disappearance of a Future Price"** means the failure of trading to commence, or the permanent discontinuation of trading in, a relevant Future or any other futures contract relating to the Underlying Index on the Futures Exchange.
- (viii) **"Exchange Price Disruption Event"** means the latest available exchange published price at any relevant time for any component of any index underlying any Future is affected by a "limit move", which means that such exchange published price for such component has increased or decreased from the previous day's exchange published settlement price by the maximum amount permitted under applicable exchange rules.
- (ix) **"Material Change in Content"** means the occurrence of a material change in the content, composition or constitution of the Underlying Index to which a Future relates.
- (x) **"Material Change in Circumstance"** means the occurrence of any event which would make it impossible or not reasonably practicable, for a market counterparty to enter into or maintain or fulfil its obligations under any relevant Future or any other futures contract relating to the Underlying Index on the Futures Exchange or any other relevant trading market, as determined by the Index Administrator.
- (xi) **"Material Change in Formula or Determination"** means the occurrence of a material change in the formula for or the method of calculating the price of a relevant Future or a relevant price of any other futures contract relating to the Underlying Index by the Futures Exchange or any other relevant party, or a material modification of the Futures Exchange's method for dissemination of the price of any Future or any relevant price of any other futures contract relating to the Underlying Index.
- (xii) **"Future TWAP Disruption Event"** means (and a Future TWAP Disruption Event shall be deemed to have occurred if) it is not possible or practicable for any reason to carry out a TWAP Process, or the TWAP Process does not return a price or a level, including, without limitation, owing to (a) the relevant bid or ask prices of a Future not being available or published, or (b) an official level of the Underlying Index not being published at any time in the period commencing at the relevant Lookback Period Start Time and ending at the TWAP Process End Time.
- (xiii) **"Tax Disruption"** means the imposition of, change in or removal of any tax (including, without limitation, any excise, severance, sales, use, value-added, transfer, stamp, documentary, recording, financial transaction or similar tax) on, or in relation to, any relevant Future or any other futures contract relating to the Underlying Index or any constituents of the Underlying Index, by any government or taxation authority, if the direct effect of such imposition, change or removal is to raise or lower the price of a Future on any relevant day from what it would have been without that imposition, change or removal.
- (xiv) **"Futures Exchange Event"** means (and a Futures Exchange Event shall be deemed to have occurred if):
 - (a) on any Future Expiry Date the Futures Exchange is not scheduled to be open for trading for its regular full day trading session; or
 - (b) on any Index Business Day on which the Futures Exchange is scheduled to be open for trading for its regular full day trading session, such Futures Exchange does not so open.
- (xv) **"Trading Limitation"** means a limitation is imposed on trading in a relevant Future or on the Futures Exchange or in any other futures contract relating to the Underlying Index on any exchange, trading system or quotation system on which any such futures contracts are traded.

- (xvi) **"Trading Suspension"** means the suspension of trading in any Future on the Futures Exchange or in any other options contract relating to the Underlying Index on any exchange, trading system or quotation system on which any such options contracts are traded.
- (xvii) **"Underlying Event"** means any of the following:
 - (a) the failure of the Relevant Exchange to announce or publish any information necessary for determining the price of any Futures;
 - (c) any announcement or publication by the Relevant Exchange of information necessary for determining a price of a Future or the price of any other futures contract that the Strategy Calculation Agent determines is erroneous or insufficient for the determination of the price of such future; or
 - (d) the temporary or permanent discontinuance or unavailability of the Relevant Exchange.

(b) Consequences of Disruption Events

If a Disruption Event occurs or subsists at any time on any Index Business Day, that in the determination of the Index Administrator prevents or otherwise affects its determinations with respect to the Index Closing Level or any other relevant value that requires determination or calculation by the Index Administrator in relation to such Index Business Day, then:

- (i) first, the Index Administrator may make such adjustments and/or determinations in relation to the Index (including, but not limited to, the Index Description) and any relevant value as it may determine, in its sole and absolute discretion, appropriate to facilitate the calculation and publication of the Index Closing Level in respect of such Index Business Day;
- (ii) secondly, if the Index Administrator determines that any such adjustment or determination referred to in sub-section (i) above cannot be made on such Index Business Day, then the Index Administrator may defer calculation and publication of the Index Closing Level until the next Index Business Day on which the Index Administrator determines, in its sole and absolute discretion, that no Disruption Event exists provided that where any such deferral of calculation and publication continues for a period of ten consecutive Index Business Days, then the Index Administrator may:
 - (a) calculate and publish the Index Closing Level relating to each Index Business Day falling in or after such period having regard to the then prevailing market conditions, the last reported price, value, rate or level of any instrument relating to the Index or the Underlying Index and such other factor(s) and condition(s) that the Index Administrator considers relevant for the purpose of determining such Index Closing Levels including, but not limited to, any modifications that the Index Administrator determines to be appropriate in relation to reconstitution relating to the Index; and/or
 - (b) permanently cease to calculate and publish the Index Closing Level as of the later of the date when such Disruption Event commenced or the Index Business Day following the last Index Business Day for which the Index Administrator calculated and published the relevant Index Closing Level in accordance with sub-section (i) above (if any) and, in each case, as applicable, the Index shall terminate.

(c) Overview

Any such adjustments and/or determinations or decisions to permanently cease to calculate and publish an Index Closing Level in respect of the Index pursuant to sub-Sections 6(b) shall be made by the Index Administrator as far as reasonably practicable in accordance with Section 9 (*Changes to and Retiring a Benchmark*) of the Overview.

7. ADJUSTMENT PROVISIONS

Change in methodology

In calculating and determining the value of the Index, the Index Administrator will, subject as provided below, employ the methodology described herein and its application of such methodology shall be conclusive and binding. While the Index Administrator currently employs the above described methodology to calculate the Index, no assurance can be given that market, regulatory, judicial, financial, fiscal or other circumstances (including, but not limited to, any changes to or any suspension or termination of any constituent of the Index or any other events affecting transactions on the same or similar terms to any described herein) will not arise that would, in the view of the Index Administrator, necessitate or make desirable a modification of or change to such methodology.

Accordingly:

- (i) The Index Administrator shall be entitled to make such modifications and/or changes as it deems appropriate, including (without limitation):
 - (a) to correct any manifest error or proven error contained in the methodology described herein; and/or
 - (b) to cure, correct or supplement any defective provision contained in the methodology described herein; and/or
 - (c) if market, regulatory, juridical, financial, fiscal or other circumstances arise, and such circumstances would, in the determination of the Index Administrator, necessitate or make desirable such a modification or change of the methodology described herein (including, but without limitation, a change in the frequency of calculation of any Index Closing Level) in order for the Index to continue being calculated and determined notwithstanding the relevant circumstances. In deciding what is necessary the Index Administrator will consider and/or take into account what the Index Administrator determines to be the intended commercial purposes of the Index and/or any hedging transactions entered into by Deutsche Bank AG and/or any of its Affiliates in relation to any financial transaction linked to the Index; and
- (ii) Further, and without limitation to the above provisions, the Index Administrator shall be entitled to make such modifications and/or changes as it deems appropriate:
 - (a) to preserve the intended commercial purpose of the Index, where such modification and/or change is of a formal, minor or technical nature; and/or
 - (b) if market, regulatory, juridical, financial, fiscal or other circumstances arise, and in the determination of the Index Administrator, such modifications and/or changes would assist in maintaining the intended commercial purpose of the Index and/or would ensure that the Index can continue to be calculated and determined by the Index Administrator in light of such circumstances. In making such determination, the Index Administrator may consider and/or take into account any hedging transactions entered into by Deutsche Bank AG and/or any of its Affiliates in relation to any financial transaction linked to the Index.

In making such modifications however the Index Administrator will:

- (i) ensure that such modifications or changes pursuant to (i) or (ii) above will result in a methodology that is consistent in its intended commercial purpose with the methodology described in the Index Description; and
- (ii) limit any such modification or change to the terms of the Index and/or method of calculating the Index Closing Level.

The Index Administrator may, in its discretion, at any time, terminate the calculation and publication of the Index pursuant to Section 9.3 (*Benchmark Retirement*) of the Overview.

The Overview sets out the process for making changes to its benchmarks as a general matter and the internal oversight and approval process that DBIQ will go through. It also sets out

DBIQ's procedures for consulting on and notifying changes. Any such modification or change in methodology described in this Description shall be made in accordance with Section 9 (*Changes to and Retirement of a Benchmark*) of the Overview.