THE DEUTSCHE BANK TAIL OPTION RATIO CARRY BIAS INDEX

The Deutsche Bank Tail Option Ratio Carry Bias Index (the "**Option Ratio Index**") reflects the economic performance over time, less costs, of a strategy designed to monetize the high volatility experienced during significant downtowns of the U.S. equities market by, on each Index Calculation Date (as defined below), notionally purchasing and holding to expiration a number of out-of-the-money six-month put options on the S&P® 500 Index (the "**Underlying Index**") with a delta that is closest to –0.05 (the "**Long Options**"), while offsetting the negative carry costs of the Long Options using the premium generated by notionally selling and holding to expiration half the number (compared to the number of Long Options notionally purchased on such Index Calculation Date) of near-the-money six-month put options on the Underlying Index with a delta that is closest to –0.5 (the "**Short Options**," and together with the Long Options, the "**Options**"). Because the out-of-the-money Long Options are typically priced lower than the near-the-money Short Options, only half the number of Short Options is necessary to offset the negative carry costs of the Long Options. This 2:1 ratio of Long Options and Short Options with the above delta combination tends to result in slightly positive carry on a net basis from time to time, which we refer to herein as "carry bias." To reduce the price risk of the portfolio of Long Options and Short Options (the "**Option Portfolio**"), the Option Ratio Index also delta hedges the Option Portfolio through E-mini futures contracts on the Underlying Index (the "**Futures**") on a daily basis. This strategy of notionally buying a number of lower-priced far out-of-the-money Options, notionally selling half the number of higher-priced near-the-money Options and daily delta hedging the Option Portfolio seeks to provide tail risk protection by generating returns from increasing volatility during significant market downturns. It is expected that the Option Ratio Index will tend to perform well during volatile market downturns, stay flat during periods of low volatility, and suffer losses during volatile but flat or bull markets.

Tail Risk Protection

The risk of severe market downturns is often labeled as the "tail risk" in reference to events that have a small probability of occurring and occur at the ends (or "tails") of a normal return distribution curve. Traditional portfolio strategies typically assume that market returns follow a normal distribution. However, this assumption does not properly reflect market returns during periods of severe market distress. Tail events, despite their low probability of occurrence, may have a significant impact on a portfolio's performance due to their large negative returns. One way of providing tail risk protection is by purchasing out-of-money put options. Put options, by design, will pay off during severe market downturns because the value of put options tends to increase when the level of the underlying is declining or when the volatility of the underlying is high. In a declining or volatile market, it is more likely that put options will expire in-the-money, resulting in a settlement value greater than zero. However, when the underlying is flat or increasing or when the volatility of the underlying is low, the value of put options is expected to decline, reflecting the declining probability that such put options will expire in-the-money. There is a high carry cost with respect to purchasing put options that expire worthless in a flat or increasing market or during periods of low volatility. To help offset such carry cost, the Option Ratio Index also notionally sells higher-priced near-the-money Options, which generates positive returns through the premium income from selling such Short Options. The Option Ratio Index notionally purchases Long Options and sells Short Options on a daily basis. The Long Options and Short Options notionally purchased and sold over time form the Option Portfolio.

The Option Portfolio

The Option Portfolio consists of a number of Long Options with a delta that is closest to –0.05 at the time of purchase and half the number of Short Options with a delta that is closest to –0.5 at the time of their sale to offset the negative carry cost of Long Options. Delta measures the expected change in the option premium in response to the change in price of the underlying. A call option has a positive delta between 1.0 and 0, while a put option has a negative delta between 0 to –1.0 (because the value of a put option always moves in the opposite direction of the change in the price of the underlying). For example, a delta of –0.5 means that for every $1 increase in the price of the underlying, the put option premium will decrease by $0.50. Generally speaking, a short-term put option with a delta lower than –0.5 tends to be in-the-money and a short-term put option with a delta higher than –0.5 tends to be out-of-the-money.

Everything else being equal, a put option with a delta of –0.5 is near-the-money and commands a higher premium than a put option with a delta of –0.05, which is far out-of-the-money. Because the Options listed in strike level intervals of 25 points are more liquid, only those Options are included in the Option Ratio Index. Therefore, it may not be possible to notionally purchase Options with an exact delta of –0.05 or notionally sell Options with an exact delta of –0.5. Thus, the Option Ratio Index will notionally purchase the Long Options so long as its delta is between –0.01 and –0.1 and notionally sell the Short Options so long as its delta is between –0.4 and –0.6.

The Option Ratio Index is expected to notionally purchase out-of-the-money six-month put options on the Underlying Index (the "**S&P put options**") and notionally sell near-the-money six-month S&P put options on each Index Calculation Date. Because six-month S&P put options are not listed on the options exchange every calendar month, if there is no six-month S&P put options available, the Option Ratio Index will notionally purchase and sell the S&P put options with an expiration date that is closest to six months, but not less than five months, from the relevant Index Calculation Date. Therefore, according to the option exchange's current listing frequency and schedule, the S&P put options notionally purchased and sold on an Index Calculation Date may have an expiration date ranging from five to nine months from the relevant Index Calculation Date. After six-months of purchases and sales in that pattern, the Option Portfolio would be expected to reach a "steady state" that may include long positions in S&P put options expiring in one to nine-month and short positions in S&P put options expiring in one to nine-month, with the notional size of the long positions being approximately twice the notional size of the corresponding short positions.

For example, if the Option Portfolio in a "steady state" includes S&P put options expiring in one months, four months and five months, when the one-month S&P put options in the Option Portfolio expire, the four-month S&P put options will become three-month S&P put options and the five-month S&P put options will become four-month S&P put options. To maintain the "steady state," the Option Ratio Index will re-establish the long and short positions in new six-month S&P put options (or options with an expiration date that is close to six months but not less than five months) by notionally buying and selling such options in a ratio of two-to-one.

Delta Hedging

Delta hedging is a trading strategy that seeks to reduce, or hedge, the risk associated with price movements in an underlying asset by taking offsetting long and short positions. As the price and the volatility of the underlying asset changes, so does its delta. The goal of delta hedging is for the combined deltas of the underlying asset and the offsetting hedge positions to be as close as possible to zero when added together so that the combined portfolio is "neutral" in terms of any price movement of the underlying asset. Because the delta of an underlying asset changes over time, it is important to make adjustments to the hedge positions at regular intervals in order to remain delta neutral.

The delta of the Option Portfolio is equal to (i) the sum of the deltas of the Long Options minus (ii) the sum of the deltas of Short Options (after taking into account the number of Long Options and Short Options notionally held by the Option Ratio Index). While the Long Options have an original delta of –0.05 and the Short Options have an original delta of –0.5, the delta of each Option will change over time due to changes in factors such as level and volatility of the Underlying Index, interest rates and time remaining to expiration. The Option Portfolio can be delta hedged by taking an opposite position in the Futures. To delta hedge the Option Portfolio, the Futures with the nearest expiration date will be sold shortly before the scheduled market close to hedge the new Options that are notionally bought and sold on such day. Because a futures contract has a delta of 1.0, the notional amount of the Futures to be sold needs to be equal to the aggregate delta of the new Options in order to stay delta natural. For example, if the Option Ratio Index purchases twenty Long Options with a delta of –0.05 (resulting in an aggregate delta of –1.0) and sells ten Short Option with a delta of –0.5 (resulting in an aggregate delta of 5.0), the new Options will have a combined delta of 4.0. Therefore, 4 Futures will be sold to hedge the new Options notionally bought and sold on such day. Similarly, a portion of the Futures used to hedge the Options that are going to expire on the next day will be unwound shortly before the market close, and the notional amount of the Futures to be unwound is equal to the aggregate delta of the expiring Options. With respect to the remaining Options in the Option Portfolio, if their aggregate delta increases on such day, more Futures

will be sold to hedge the Option Portfolio in response to such increase, and if their aggregate delta decreases, more Futures will be bought in response to such decrease. As the Futures used to hedge the Option Portfolio near expiration, they will be "rolled" into the Futures for the next delivery month on the day immediately preceding the expiration date. Therefore, the Option Ratio Index will hold both the expiring Futures and the Futures for the next delivery month on the roll date.

Delta hedging is not perfect, therefore profit or loss can be generated due to the changes in delta accumulated between hedging adjustments. Generally speaking, the profit or loss of the delta-hedged Option Portfolio and, as a result, the profit or loss of the Option Ratio Index, is affected by changes in both implied volatility and realized volatility of the Underlying Index. Implied volatility of the Underlying Index is a forward looking estimate of the volatility implied from Option prices. Changes in implied volatility tend to have a greater impact on the value of the Option Portfolio. In typical quiet markets, the Option Portfolio tends to have a negative correlation to changes in implied volatility, meaning that the value of the Option Portfolio will increase as the implied volatility of the Underlying Index decreases and will decrease as the implied volatility of the Underlying Index increases. Such negative correlation becomes positive during volatile market downturns. As a result, the Option Portfolio will benefit from the increased implied volatility and generate significant positive returns during sustained or extreme market downturns. Conversely, the Option Portfolio will suffer losses during volatile but flat or increasing markets. On the other hand, changes in realized volatility of the Underlying Index tend to have a greater impact on the profit or loss generated by delta hedging the Option Portfolio. In volatile and declining markets, the delta hedge tends to see its hedging profits accelerate and hedging losses decelerate, while in volatile but flat or increasing markets, the delta hedge tends to see its hedging profits decelerate and hedging losses accelerate. This is because the delta of the Option Portfolio tends to increase in volatile and declining markets, resulting in more Futures being sold to hedge the Option Portfolio. When the market recovers, the Option Ratio Index will buy back the Futures at a lower price, generating profits due to the price differential. In volatile but flat or increasing markets, such profits will turn into losses because the Option Ratio Index will adjust its hedge by selling more Futures at a lower price and buying them back at a higher price. The overall profit or loss of the Option Ratio Index will depend on the cumulative effect of the implied volatility and realized volatility of the Underlying Index and the premium spreads generated by buying Long Options and selling Short Options. Taking these three factors into account, the Option Ratio Index is generally expected to perform well during volatile and declining markets, stay flat during periods of low volatility, and suffer losses during volatile but flat or increasing markets.

By delta hedging the Option Portfolio using Futures, the Option Ratio Index is also able to profit over time from the difference between the implied volatility and the realized volatility of the Underlying Index. This delta hedging strategy will be profitable if the realized volatility of the Underlying Index is eventually proved to be lower than the implied volatility reflected in the Option prices. It has been observed in the market that the implied volatility tends to be greater than the realized volatility. This is because buyers of options cannot lose more than the premium they pay, so they need to compensate option sellers for taking the additional downside risk. The market takes this additional risk into account and prices the implied volatility higher. However, if the realized volatility of the Underlying Index is eventually proved to be higher than the implied volatility reflected in the Option prices, this delta hedging strategy will suffer losses. As a result, the Option Ratio Index may also perform well during periods of low volatility when the realized volatility of the Underlying Index tends to be lower than the implied volatility.

Calculation of the Option Ratio Index

The closing level of the Option Ratio Index (the "**Index Closing Level**") will be calculated on each Index Calculation Date equal to the sum of (i) 100, which is the Index Closing Level on August 31, 2016 (the "**Index Commencement Date**"), (ii) the mark-to-market value of all Options currently constituting the Option Portfolio on such Index Calculation Date, (iii) the premiums (after taking into account the addition or subtraction of the applicable Premium Spreads as described below) and expiration values notionally received or paid for all Options notionally traded since the Index Commencement Date, (iv) the hedging profit or loss notionally incurred by delta hedging the Option Portfolio since the Index Commencement Date (after deducting the applicable Delta Hedge Costs as described below) and (v) the interest notionally accrued at the federal funds effective rate, as measured by the Fed Funds Index, on the net premiums,

expiration values and hedging profit or loss accumulated since the last Option Expiration Date falling in the calendar quarter immediately preceding such Index Calculation Date.

Each Option premium is subject to a deduction (in the case of Option premiums received) or an addition (in the case of Option premiums paid) by a premium spread (the "**Premium Spread**"), which will be calculated based on such Option's vega and implied volatility on the relevant Index Calculation Date in accordance with a formula described below that is designed to approximate the "bid" or "ask" spread of such Option. Vega is a measure of the impact of changes in the underlying's implied volatility on the option price. Specifically, the vega of an Option represents the change in the price of such option for every 1% change in the Underlying Index's implied volatility. Generally speaking, the Premium Spread will increase as the option's vega or the implied volatility goes up. In addition, the hedging profit or loss notionally incurred by delta hedging the Option Portfolio on each Index Calculation Date is subject to the deduction of a 0.02% transaction cost (the "**Delta Hedge Cost**") in connection with (i) establishing the Futures positions to hedge the new Options sold or bought on such Index Calculation Date, (ii) unwinding the Futures positions to hedge the expiring Options and (iii) adjusting the Futures positions to hedge the remaining Options (including the cost of rolling the expiring Futures to the Futures for the next delivery month on the roll date). As a result of the deduction of Premium Spreads from the put premiums received and the addition of Premium Spreads to the put premiums paid and the deduction of the Delta Hedge Costs, the level of the Option Ratio Index will be lower than would otherwise be the case if such Premium Spreads and Delta Hedge Costs were not included, and the level of the Option Ratio Index will decrease if the index strategy does not generate sufficient returns to offset the effect of the Premium Spreads and Delta Hedge Costs. From the Index Commencement Date to and including 2017, the annual aggregate Premium Spreads and Delta Hedge Costs for the Option Ratio Index, expressed as a percentage of the retrospectively calculated index level, would have ranged from 1.52% to 1.95%. Because the calculation of the Option Ratio Index began on February 5, 2018 (the "**Live Date**"), the annual Premium Spreads and Delta Hedge Costs from the Index Commencement Date to the Live Date were retroactively calculated. The annual Premium Spreads and Delta Hedge Costs after the Live Date could be higher and have a greater negative impact on the performance of the Option Ratio Index.

Deutsche Bank AG, London Branch is the sponsor of the Option Ratio Index (the "**Index Sponsor**"). Solactive AG, or another entity selected by the Index Sponsor, will administer, calculate and publish the Index Closing Level on each Index Calculation Date (as administrator, the "**Index Administrator**" and, as calculation agent, the "**Index Calculation Agent**").

The Option Ratio Index was created by the Index Sponsor on the Live Date and has been retrospectively calculated using historical data and the same methodology as described herein since the Index Commencement Date. Therefore, the Option Ratio Index has very limited performance history and no actual investment linked to the performance of the Option Ratio Index was possible before the Live Date. Furthermore, the index methodology of the Option Ratio Index was designed, constructed and tested using historical market data and based on knowledge of factors that may have affected its performance. Any returns prior to the Live Date were achieved by means of a retroactive application of the back-tested index methodology designed with the benefit of hindsight. The actual performance of the Option Ratio Index may bear little relation to the retrospectively calculated performance of the Option Ratio Index if the market behaves differently than it has in the past.

An "**Index Calculation Date**" means (i) each day on which the Index Calculation Agent determines that (a) the Options are scheduled to be traded on the Options Exchange, (b) the Futures are scheduled to be traded on the Futures Exchange, (c) the sponsor of the Underlying Index is scheduled to publish the level of the Underlying Index and the S&P 500® Total Return Index and (d) the Relevant Exchange is scheduled to be open for trading and (ii) each Option Expiration Date.

The "**Options Exchange**" means the Chicago Board Options Exchange, or any successor to such exchange or quotation system or any substitute exchange or quotation system to which trading in options contracts on the Underlying Index has temporarily relocated; *provided* that the Index Administrator has determined that there is comparable liquidity relative to the options contracts on the Underlying Index on such temporary substitute exchange or quotation system as on the original Options Exchange.

The "**Futures Exchange**" means the Chicago Mercantile Exchange, 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 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.

The "**Relevant Exchange**" means the New York Stock Exchange, or any successor thereto, as determined by the Index Calculation Agent.

The "**Option Expiration Date**" means the expiration date of a S&P put option, which is the third Friday of each calendar month (or if that Friday is not a business day on the Options Exchange, the alternative day designated by the Options Exchange).

The "**Fed Funds Index**" means the Deutsche Bank Fed Funds Effective Rate Total Return Index (Bloomberg code: DBMMFED1 Index). The Fed Funds Index is a proprietary index of Deutsche Bank AG, London Branch and is intended to measure the accrual of a daily rolled deposit invested at the federal funds effective rate. The Fed Funds Index is calculated on a total return basis, meaning the deposit is compounded (reinvested) daily with a 360-day year-convention. The Fed Funds Index is described in more detail under "Deutsche Bank Fed Funds Effective Rate Total Return Index" below.

The following section provides more information about volatility, S&P put options and E-mini futures. The method of selecting the S&P put options and calculating the Index Closing Level are described in greater details following these sections under "Methodology of the Option Ratio Index — Establishment of the Option Portfolio" and "— Calculation of the Option Ratio Index."

Background Information

Realized Volatility and Implied Volatility

Volatility is a statistical measure of how much an asset's return varies from the mean of such returns; the more variable the asset's returns, the higher its volatility, and the higher the perceived risk of such asset (all other things being equal). Volatility is one of the market standards for assessing risk. Volatility is generally calculated based on the natural logarithm return of an asset between each observation. Realized volatility is a calculation of this amount of movement historically from prices or levels of the asset observed periodically in the market over a set period. Realized volatility is characterized by the frequency of the observations of the asset price used in the calculation and the period over which observations are made. For example, six-month daily realized volatility denotes realized volatility calculated from daily closing asset prices over a six-month period. Implied volatility is a market estimate of the volatility an asset will realize over a future period of time. Implied volatility is determined from the market prices of listed options on the asset. For example, one-month implied volatility denotes volatility implicit in the prices of the relevant options with one month to expiration.

The S&P Put Options

S&P put options were first launched for trading by the Options Exchange in April 1987. Investors that believe the Underlying Index will decrease may buy S&P put options, expecting that the decreasing Underlying Index will result in the S&P put option expiring in-the-money. Conversely, investors that believe the Underlying Index will increase may sell S&P put options, expecting that the increasing Underlying Index will result in the S&P put option expiring out-of-the-money. The settlement value for S&P put options is calculated using the closing level of the Underlying Index on the relevant expiration date. S&P put options are European style options, meaning that S&P put options may be exercised only on the set expiration date. The expiration date for a S&P put option will be third Friday of its expiring month.

The E-Mini Futures

The Futures are the E-Mini futures contracts on the Underlying Index, which are listed and traded on the Futures Exchange. The Futures are quoted in terms of the closing level of the Underlying Index in index points and are valued using a multiplier of $50. The minimum price change (or tick size) of the Futures is $12.50, which corresponds to 0.25 index points.

Prior to their settlement date, the Futures are not expected to trade at a level that is the same as the spot level of the Underlying Index. The difference between the spot level of the Underlying Index and the price the Futures are traded at is referred to as the "**Basis**." The Basis is a reflection of the expected "cost of carry" associated with buying the stock underlying the Underlying Index and holding them until the relevant settlement date. Such costs reflect the borrowing costs for financing the purchase of such stocks, the payout represented by the dividends that are expected to accrue on such stocks and the time remaining to settlement. The Basis may be positive or negative, which is expected to decrease to zero as settlement approaches. The Futures settle on the third Friday of each of March, June, September and December. At settlement, the Futures are cash settled in the morning using a final settlement price that is marked to a "special opening quotation" that is intended to facilitate arbitrage activity to drive Basis to zero and converge the trading price of the Futures to the spot level of the Underlying Index.

An exchange-traded futures contract provides for the purchase and sale of a specified type and quantity of an underlying asset or financial instrument at a stated delivery time for a fixed price. Because the Underlying Index is not a tangible item that can be purchased and sold directly, a Futures provides for the payment and receipt of cash based on the level of the Underlying Index at settlement or upon liquidation of the contract.

Unlike equity securities, futures contracts, by their terms, have stated expirations and, at a specified point in time prior to expiration, trading in a futures contract for the current delivery month will cease. As a result, a market participant wishing to maintain its exposure to a futures contract on a particular asset or financial instrument with the nearest expiration must close out its position in the expiring contract and establish a new position in the contract for the next delivery month, a process referred to as "rolling." For example, a market participant with a long position in Futures expiring in March that wishes to maintain a long position in the nearest quarterly delivery month will, as the March contracts near expiration, sell such Futures to close out the existing long position and buy new Futures expiring in June. This will "roll" the March position into a June position and, when the March contracts expire, the market participant will still have a long position in the nearest quarterly delivery month.

Methodology of the Option Ratio Index

Establishment of the Option Portfolio

On each Index Calculation Date after the Index Commencement Date, the Option Ratio Index will:

(i) notionally purchase a number of Long Options expiring on an Option Expiration Date that is closest to six months, but not less than five month, following such Index Calculation Date with a strike price and delta that satisfy the criteria set forth below for such Long Options; and

(ii) notionally sell half the number of Short Options (compared to the number of Long Options notionally purchased on such Index Calculation Date) expiring on an Option Expiration Date that is closest to six months, but not less than five month, following such Index Calculation Date with a strike price and delta that satisfy the criteria set forth below for such Short Options.

Therefore, for each Index Calculation Date, the Option Ratio Index will have an Option Portfolio consisting of the unexpired Options that have been notionally bought or sold on or prior to such Index Calculation Date.

On each Index Calculation Date, the Long Options and the Short Options will be selected from the currently listed six-month S&P put options (or, if there is no six-month S&P put options available on the

Options Exchange, the S&P put options with an Option Expiration Date that is closest to six months, but not less than five months, following such Index Calculation Date) that:

- have a strike price that is a multiple of 25 (e.g., options with a strike price of 2,510 would be excluded because they are not a multiple of 25, while options with a strike price of 2,600 would be included in the selection pool); and

- for the Long Options, have a delta that is (i) closest to the target delta of –0.05 and (ii) not less than –0.10 or greater than –0.01; or

- for the Short Options, have a delta that is (i) closest to the target delta of –0.5 and (ii) not less than –0.6 or greater than –0.4.

If the Option Expiration Dates of two S&P put options are at equal distance to six months following such Index Calculation Date, the S&P put options with a later Option Expiration Date will be used for the purpose of the above selection.

The delta of each eligible S&P put option will be calculated 15 minutes prior to the start of the TWAP Period as defined below under "— The TWAP Process" (the "**Delta Observation Time**") on such Index Calculation Date. The delta calculation with respect to the Option Ratio Index will be made in accordance with a formula that conforms to the market standard delta calculation for the Options. If none of the S&P put options satisfy the selection criteria above for the Long Options or the Short Options at the Delta Observation Time, the Option Ratio Index will not purchase any Long Option or sell any Short Option on such Index Calculation Date.

The number of Long Options notionally purchased on each Index Calculation Date will be equal to:

(i) the Index Closing Level on the Index Calculation Date immediately prior to the Option Expiration Date immediately preceding such Index Calculation Date (or if the Option Expiration Date falls on such Index Calculation Date, the Index Closing Level on the immediately preceding Index Calculation Date); *divided by*

(ii) the product of the Underlying Snap in respect of such Index Calculation Date, a scaling factor of 10 and the contract size of 100.

The number of Short Options notionally sold on each Index Calculation Date will be equal to half the number of Long Options notionally sold on such Index Calculation Date.

The "**Underlying Snap**" means the level of the Underlying Index published at the Delta Observation Time on an Index Calculation Date, or, if no level of the Underlying Index is published at such time on such Index Calculation Date, the first level of the Underlying Index published after such time in respect of such Index Calculation Date, in each case as determined by the Index Calculation Agent.

Calculation of the Index Closing Level

The Option Ratio Index measures the return from notionally buying the Long Options and notionally selling the Short Options as well as delta hedging the Option Portfolio in accordance with the index methodology over the life of the Option Ratio Index, less applicable Premium Spreads and Delta Hedge Costs. The Index Closing Level on the Index Commencement Date is 100. The Index Closing Level on each Index Calculation Date after the Index Commencement Date will be equal to the sum of (i) 100, which is the Index Closing Level on the Commencement Date, (ii) the mark-to-market value of all Options currently constituting the Option Portfolio (the "**Portfolio MtM**") on such Index Calculation Date and (iii) the value of the cash profit or loss accumulated by the Option Ratio Index (the "**Cash PnL**") since the Index Commencement Date.

The Index Closing Level on each Index Calculation Date after the Index Commencement Date is calculated as follows:

$$IL_t = 100 + \text{Portfolio MtM}_t + \text{Cash PnL}_t$$

Where,

Il_t = the Index Closing Level on such Index Calculation Date

$Portfolio\,MtM_t$ = the Portfolio MtM on such Index Calculation Date equal to (i) the sum of, for each Long Option that has not expired, the product of (a) its Option Close (which is calculated based on the Option TWAP as described below) on such Index Calculation Date, (b) the number of such options notionally underlying the Option Ratio Index and (c) the contract size of 100, minus (ii) the sum of, for each Short Option that has not expired or been unwound, the product of (a) its Option Close on such Index Calculation Date, (b) the number of such options notionally underlying the Option Ratio Index and (c) the contract size of 100;

$Cash\,PnL_t$ = The Cash PnL on such Index Calculation Date

The TWAP Process

The "**Option TWAP**" of an Option on each Index Calculation Date is equal to the time-weighted average "bid" and "ask" prices for such Option published by the Price Source at 15-second intervals during the period commencing at (and including) 25 minutes before the scheduled closing time of the Relevant Exchange and ending at (and including) 5 minutes before the scheduled closing time of the Relevant Exchange on such Index Calculation Date (the "**TWAP Period**"). A time-weighted average price is the arithmetic average of the trading prices as observed at specified times during a period of trading, and we refer to the process of obtaining a time-weighted average price as the "**TWAP Process**."

Using the Option TWAP, the Index Calculation Agent will calculate a hypothetical "closing" price for the relevant Option, which we refer to as the "**Option Close**," which is equal to the sum of (i) the Option TWAP and (ii) the product of (a) the delta of such Option calculated at the Delta Observation Time (the "**Intraday Delta**") and (b) the closing level of the Underlying Index (the "**Underlying Close**") *minus* the time-weighted average level of the Underlying Index during the TWAP Period calculated using the same TWAP Process described above (the "**Underlying TWAP**"). Because delta reflects the expected change in the option price in response to the change in level of the underlying, multiplying the Intraday Delta of an Option with the change in the Underlying Index from the Underlying TWAP to the Underlying Close produces the expected change in the price of such Option from the Option TWAP to the Option Close on such Index Calculation Date.

When a price or level, as applicable, is needed for the calculation of a time-weighted average price or level with respect to the Option Ratio Index, such price or level will be the price or level published by the Price Source or the Relevant Exchange exactly at the end of each 15 second interval. However, if a price or level, as applicable, is not published by the Price Source or the Relevant Exchange exactly at the end of each 15 second interval, the Option Ratio Index will be calculated using the most recent price or level, as applicable, published by the Price Source or the Relevant Exchange during the period starting from 300 minutes prior to the beginning of the TWAP Period and ending at the relevant 15 second interval (the "**Lookback Period**") on the applicable Index Calculation Date. If no such price or level exists during the Lookback Period on the applicable Index Calculation Date, then no price or level will be recorded for such 15 second interval.

The "**Price Source**" means Reuters (or any successor thereto, as determined by the Index Administrator).

Determination of Cash PnL

The Cash PnL on the Index Commencement Date is zero. The Cash PnL in respect of each Index Calculation Date after the Index Commencement Date is equal to the sum of:

(i)   the premiums (after taking into account the addition or subtraction of the applicable Premium Spreads) and expiration values notionally received or paid for all Options notionally traded during the period (the "**Index Period**") from, and including, the Index Commencement Date to, and including, such Index Calculation Date (the "**Option PnL**");

(ii) the hedging profit or loss notionally incurred by delta hedging the Option Portfolio during the Index Period (after deducting the applicable Delta Hedge Costs) (the "**Delta Hedge PnL**"); and

(iii) the interest notionally accrued at the federal funds effective rate, as measured by the Fed Funds Index, on (a) the Cash PnL on such Index Calculation Date *minus* (b) the amount of the Index Closing Level on the Notional Index Settlement Date immediately preceding such Index Calculation Date subtracted by 100 (the "**Accrued Interest**").

The Cash PnL on each Index Calculation Date after the Index Commencement Date is calculated as follows:

$$\text{Cash PnL}_t = \text{Option PnL}_t + \text{Delta Hedge PnL}_t + \text{Accrued Interest}_t$$

Where,

$Cash\ PnL_t$	=	the Cash PnL on such Index Calculation Date
$Option\ PnL_t$	=	(i) the Option PnL on the immediately preceding Index Calculation Date; *plus*

(ii) (a) the *sum* of, for each Short Option notionally sold on such Index Calculation Date, the product of (x) its Option TWAP on the Index Calculation Date minus the Premium Spread, (y) the number of such Options notionally sold on such Index Calculation Date and (z) the contract size of 100, minus (b) the sum of, for each Long Option notionally bought on such Index Calculation Date, the product of (x) its Option TWAP on the Index Calculation Date plus the Premium Spread, (y) the number of such Options notional bought on such Index Calculation Date and (z) the contract size of 100; *plus*

(iii) (a) the *sum* of, for each Long Option that is expiring on such Index Calculation Date, the product of (x) its Settlement Value, (y) the number of such Options notionally underlying the Option Ratio Index that are expiring and (z) the contract size of 100, minus (b) the sum of, for each Short Option that are expiring on such Index Calculation Date, the product of (x) its Settlement Value, (y) the number of such Options notionally underlying the Option Ratio Index that are expiring and (z) the contract size of 100

$Delta\ Hedge\ PnL_t$	=	(i) the Delta Hedge PnL on the immediately preceding Index Calculation Date; plus (ii) the Delta Hedge Return on such Index Calculation Date; plus (iii) the Delta Hedge MtM on such Index Calculation Date minus (vi) the Delta Hedge Cost on such Index Calculation Date
$Accrued\ Interest_t$	=	(i) the Accrued Interest on the immediately preceding Index Calculation Date; plus (ii) the product of:

(a) the Cash PnL on the immediately preceding Index Calculation Date *minus* the amount of the Index Closing Level on the Notional Index Settlement Date immediately preceding such Index Calculation Date *subtracted by* 100, which is the Index Closing Level on the Commencement Date; and

(b) the percentage return of the Fed Funds Index from the immediately preceding Index Calculation Date to such Index Calculation Date

The "**Notional Index Settlement Date**" means (i) the Index Commencement Date, and (ii) thereafter, each Option Expiration Date falling in March, June, September and December of each calendar year.

The "**Settlement Value**" for each Option will be equal to the greater of (i) zero and (ii) the strike price of such Option *minus* the Underlying Settlement Level on the relevant Option Expiration Date.

The "**Underlying Settlement Level**" means, in respect of any Index Calculation Date, the level of the Underlying Index that is used to calculate the official settlement price of an Option as published by the Price Source; *provided* that if such level is not published or available, then the Underlying Settlement Level will be determined by the Index Administrator.

Determination of the Premium Spread

The Option PnL on each Index Calculation Date is reduced by the Premium Spread for each Option notionally bought or sold on such Index Calculation Date. In respect of an Option, the Premium Spread on each Index Calculation Date will be calculated based on such Option's vega and implied volatility on such Index Calculation Date, subject to a minimum floor of 0.20. The Premium Spread is designed to approximate the "bid" or "ask" spread of such Option.

For each Option, the Premium Spread on each Index Calculation Date after the Index Commencement Date is calculated as follows:

$$\text{Premium Spread}_{i,t} = \text{Vega}_{i,t} \times \text{Max}\left(\text{Floor}; \text{Spread} \times \frac{\sigma_{i,t}}{\text{Base}}\right)$$

Where,

$Premium\ Spread_{i,t}$	=	the Premium Spread of the relevant Option on such Index Calculation Date
$Vega_{i,t}$	=	the vega of the relevant Option on such Index Calculation Date
$\sigma_{i,t}$	=	the implied volatility of the relevant Option on such Index Calculation Date
$Floor$	=	0.20
$Spread$	=	0.20
$Base$	=	0.25

Determination of the Delta Hedge Return and Delta Hedge MtM

The Delta Hedge Return and Delta Hedge MtM together reflect the hedging profit or loss notionally incurred by delta hedging the Option Portfolio on each Index Calculation Date. To delta hedge the Option Portfolio, the Futures with the nearest expiration date will be sold during the TWAP Period on each Index

Calculation Date to hedge the new Options that are notionally bought or sold on such Index Calculation Date (the "**New Options**"), and the notional amount of the Futures to be sold is equal to the aggregate Intraday Delta of the New Options on such Index Calculation Date (the "**New Delta**"). Similarly, a portion of the Futures used to hedge the Options that are going to expire on the next Index Calculation Date (the "**Expiring Options**") will be unwound during the TWAP Period on such Index Calculation Date, and the notional amount of the Futures to be unwound is equal to the aggregate Intraday Delta of the Expiring Options on such Index Calculation Date (the "**Expiring Delta**"). With respect to the remaining Options in the Option Portfolio (including the New Options sold or bought on the immediately preceding Index Calculation Date) (the "**Continuing Options**"), if their aggregate Intraday Delta increases on such Index Calculation Date from their aggregate Intraday Delta on the immediately preceding Index Calculation Date (the "**Continuing Delta**"), more Futures will be sold to hedge the Option Portfolio in response to such increase, and if their aggregate Intraday Delta decreases on such Index Calculation Date, more Futures will be bought in response to such decrease. For each group of Options, its aggregate Intraday Delta on an Index Calculation Date is calculated as the sum of, in respect of each Option in such group, the product of the Intraday Delta of such Option on such Index Calculation Date, the number of such Option and the contract size of 100.

As the Futures used to hedge the Option Portfolio near expiration, they will be "rolled" into the Futures for the next delivery month on the Index Calculation Date immediately preceding the expiration date (the "**Futures Roll Date**"). We refer to the expiration date of a Futures contract, which is typically the third Friday of the delivery month, as the "**Futures Expiration Date**." Such "rolling" is done during the TWAP Period on the Futures Roll Date by unwinding the expiring Futures (the "**Front Futures**") and at the same time establishing new positions in the Futures for the next delivery month (the "**Back Futures**"). If the Option Portfolio has Options that will expire on the same day as the Front Futures, the portion of the Front Futures corresponding to the aggregate Intraday Delta of the Options expiring on the relevant Futures Expiration Date (the "**Intraday Delta Front**") will not be rolled into the Back Futures. No rolling of such Front Futures is necessary because they will expire on the same day as the expiring Options. The notional amount of the Back Futures established after "rolling" on the Futures Roll Date is equal to the aggregate Intraday Delta of the Options expiring after the relevant Futures Expiration Date (the "**Intraday Delta Back**"). On the Futures Expiration Date, the Front Futures will expire at 9:30 a.m., and the Back Futures will turn into Front Futures until the next Futures Expiration Date. Therefore, the Option Ratio Index will hold both the Front Futures and Back Futures only on a Futures Roll Date. On an Index Calculation Date that is not a Futures Roll Date, the Option Ratio Index will hold only the Front Futures, which is the Futures that will expire on the first Futures Expiration Date after such Index Calculation Date.

The Delta Hedge Return reflects the hedging profit or loss from the immediately preceding Index Calculation Date to the beginning of the TWAP Period on such Index Calculation Date, which is equal to the sum of:

(i)   the profit or loss incurred by hedging the Expiring Options on such Index Calculation Date, which is equal to the product of the Expiring Delta and the change in the price of the Front Futures from the Futures Close on the immediately preceding Index Calculation Date to the Futures Settlement Price (or if such Index Calculation Date is a Futures Expiration Date, the Underlying Settlement Level) on such Index Calculation Date; and

(ii)   the profit or loss incurred by hedging the Continuing Options on such Index Calculation Date, which is equal to the product of the Continuing Delta and the change in the price of the Front Futures (including the Back Futures that turn into Front Futures on a Futures Expiration Date) from the Futures Close on the immediately preceding Index Calculation Date to the Futures TWAP on such Index Calculation Date.

The Delta Hedge Return on each Index Calculation Date after the Index Commencement Date is calculated as follows:

$$\text{Delta Hedge Return}_t = \text{Expiring Delta}_{t-1} \times (\text{Expring Level}_t - \text{Front Futures Close}_{t-1})$$

$$+ \text{Continuing Delta}_{t-1} \times (\text{Front Futures TWAP}_t - \text{Front Futures Close}_{t-1})$$

Where,

$Delta\ Hedge\ Return_t$	=	the Delta Hedge Return on such Index Calculation Date
$Expiring\ Delta_{t-1}$	=	the Expiring Delta on the immediately preceding Index Calculation Date
$Continuing\ Delta_{t-1}$	=	the Continuing Delta on the immediately preceding Index Calculation Date
$Expiring\ Level_t$	=	if such Index Calculation Date is NOT a Futures Expiration Date, the Futures Settlement Price on such Index Calculation Date; or if such Index Calculation Date is a Futures Expiration Date, the Underlying Settlement Level on such Index Calculation Date
$Front\ Futures\ Close_{t-1}$	=	the Futures Close of the Front Futures on the immediately preceding Index Calculation Date
$Front\ Futures\ TWAP_t$	=	the Futures TWAP of the Front Futures on such Index Calculation Date

The "**Futures Close**" means, in respect of a Futures and an Index Calculation Date, the sum of (i) the Underlying Close on such Index Calculation Date and (ii) the Basis TWAP in respect of such Futures and such Index Calculation Date. The Futures Close is the hypothetical "closing" price for the relevant Futures.

The "**Futures Settlement Price**" means, in respect of a Futures and an Index Calculation Date, the sum of (a) the Underlying Settlement Level on such Index Calculation Date and (b) the Basis TWAP on the immediately preceding Index Calculation Date *minus* any decrease in the level of the Underlying Index due to dividends paid on the component stocks of the Underlying Index. Because the Basis reflects the borrowing costs, the dividend payout and the time remaining to settlement, the calculation in part (b) is designed to approximate the Basis on an Index Calculation Date prior to the start of the TWAP Period by deducting any dividend payout on such Index Calculation Date from the Basis TWAP on the immediately preceding Index Calculation Date.

The "**Basis TWAP**" means, in respect of a Futures and an Index Calculation Date, the amount that is equal to the Futures TWAP of the relevant Futures on such Index Calculation Date *minus* the Underlying TWAP on such Index Calculation Date.

The "**Futures TWAP**" means, in respect of a Futures and an Index Calculation Date, the time-weighted average "bid" and "ask" prices for such Futures published by the Price Source calculated using the same TWAP Process as described above.

The Delta Hedge MtM reflects the profit or loss incurred during the TWAP Period on each Index Calculation Date. Because no profit or loss is yet to be generated with respect to the Options newly sold or bought during the TWAP Period, the Delta Hedge MtM only reflects the profit or loss incurred during the TWAP Period with respect to the Options that will expire after such Index Calculation Date (excluding the New Options sold or bought on such Index Calculation Date) (the "**Intraday Options**"). If such Index Calculation Date is not a Futures Roll Date (on which the Option Ratio Index only holds the Front Futures), the Delta Hedge MtM is equal to the product of (i) the aggregate Intraday Delta of the Intraday Options (the "**Intraday Delta Total**") and (ii) the change in the price of the Front Futures from the Futures TWAP to the Futures Close on such Index Calculation Date. If such Index Calculation Date is a Futures Roll Date (on which a portion of the expiring Front Futures will be rolled into the Back Futures), the Delta Hedge MtM is equal to the sum of (i) the product of the Intraday Delta Front and the change in the price of

the Front Futures from the Futures TWAP to the Futures Close on such Index Calculation Date and (ii) the product of the Intraday Delta Back and the change in the price of the Back Futures from the Futures TWAP to the Futures Close on such Index Calculation Date.

The Delta Hedge MtM on each Index Calculation Date after the Index Commencement Date is calculated as follows:

(i) if such Index Calculation Date is NOT a Futures Roll Date:

$$\text{Delta Hedge MtM}_t = \\ \text{Intraday Delta Total}_t \times (\text{Front Futures Close}_t - \text{Front Futures TWAP}_t)$$

(ii) if such Index Calculation Date is a Futures Roll Date:

$$\text{Delta Hedge MtM}_t = \\ \text{Intraday Delta Front}_t \times (\text{Front Futures Close}_t - \text{Front Futures TWAP}_t) \\ + \text{Intraday Delta Back}_t \times (\text{Back Futures Close}_t - \text{Back Futures TWAP}_t)$$

Where,

$Delta\ Hedge\ MtM_t$	=	the Delta Hedge MtM on such Index Calculation Date
$Intraday\ Delta\ Total_t$	=	the Intraday Delta Total on such Index Calculation Date
$Intraday\ Delta\ Front_t$	=	the Intraday Delta Front on such Index Calculation Date
$Intraday\ Delta\ Back_t$	=	the Intraday Delta Back on such Index Calculation Date
$Front\ Futures\ Close_t$	=	in respect of the Front Futures, the Futures Close on such Index Calculation Date
$Front\ Futures\ TWAP_t$	=	in respect of the Front Futures, the Futures TWAP on such Index Calculation Date
$Back\ Futures\ Close_t$	=	in respect of the Back Futures, the Futures Close on such Index Calculation Date
$Back\ Futures\ TWAP_t$	=	in respect of the Back Futures, the Futures TWAP on such Index Calculation Date

Determination of Delta Hedge Cost

On each Index Calculation Date, the Delta Hedge PnL is reduced by a Delta Hedge Cost that approximates the transaction cost associated with delta hedging the Option Portfolio on such Index Calculation Date. The Delta Hedge Cost on each Index Calculation Date consists of:

(i) the transaction cost for establishing the Futures positions to hedge the New Options sold or bought on such Index Calculation Date, equal to the product of (a) the absolute value of the New Delta on such Index Calculation Date, (b) the Front Futures Close (or if such Index Calculation Date is a Futures Roll Date, the Back Futures Close) on such Index Calculation Date, and (c) 0.02% (the "**Transaction Cost**");

(ii) the transaction cost for unwinding the Futures positions to hedge the Expiring Options on such Index Calculation Date, equal to the product of (a) the absolute value of the Expiring Delta in the immediately preceding Index Calculation Date, (b) the Futures Settlement Price on such Index

Calculation Date, and (c) the Transaction Cost; *provided* that no transactions cost will be imposed with respect to the Expiring Delta if such Index Calculation Date is a Futures Expiration Date; and

(iii) the transaction cost for adjusting the Futures positions to hedge the Continuing Options (including the cost of rolling the Front Futures into the Bank Futures if such Index Calculation Date is a Futures Roll Date), equal to the product of (x) the absolute value of the Continuing Delta Change on such Index Calculation Date, (y) the Front Futures TWAP (or if such Index Calculation Date is a Futures Roll Date, the Back Futures TWAP) on such Index Calculation Date, and (c) the Transaction Cost.

The "**Continuing Delta Change**" means:

(i) in respect of an Index Calculation Date that is NOT a Futures Roll Date, the absolute value of the change in the aggregate Intraday Delta of the Continuing Options from the immediately preceding Index Calculation Date to the beginning of the TWAP Period on such Index Calculation Date; and

(ii) in respect of an Index Calculation Date that is a Futures Roll Date, the sum of (a) the absolute value of the change in the aggregate Intraday Delta of the Options expiring on the next Futures Expiration Date from the immediately preceding Index Calculation Date to the beginning of the TWAP Period on such Futures Roll Date, and (b) the greater of (x) the absolute value of the Intraday Delta Back on such Futures Roll Date, (y) in respect of the immediately preceding Index Calculation Date, the absolute value of the aggregate Intraday Delta of the Options expiring after the next Futures Expiration Date (the "**Delta Back**"), and (z) the absolute value of the Intraday Delta Back on such Futures Roll Date minus the Delta Back on the immediately preceding Index Calculation Date.

As a result, on a Futures Roll Date, the Delta Hedge Cost will reflect not only the cost of adjusting the hedge positions in the Front Futures corresponding to the Options expiring on the next Futures Expiration Date, but also the cost of rolling a portion of the Front Futures into the Back Futures. If such rolling involves selling the Front Futures and buying the Back Futures (or buying the Front Futures and selling short the Back Futures), the rolling cost will be equal to the greater of the cost of unwinding the Front Futures and the cost of establishing the Back Futures. If such rolling involves selling both the Front Futures and the Back Futures (or buying both the Front Futures and the Back Futures), the rolling cost will be equal to the sum of the cost of unwinding the Front Futures and the cost of establishing the Back Futures. As a result of the deduction of the Delta Hedge Cost from the Delta PnL, the levels of the Option Ratio Index will be lower than would otherwise be the case if such Delta Hedge Cost were not included, and the level of the Option Ratio Index will decrease if the index strategy does not generate sufficient returns to offset the effect of the Delta Hedge Cost.

Consequences of Disruptions

Consequences of a Disruption Event

If a Disruption Event (as defined below) occurs or is continuing on any Index Calculation Date, the Index Administrator will determine whether the occurrence or existence of such event is material. In the event that the Index Administrator determines that the occurrence or existence of a Disruption Event is material, the Index Administrator may:

(i) determine any relevant price, value, amount, rate or level required in order to calculate the Index Closing Level in respect of such Index Calculation Date;

(ii) suspend the notional buying and/or selling of Options and/or defer the determination and publication of the Index Closing level until the next Index Calculation Date on which the Index Administrator determines that no Disruption Event exist; *provided* that where any such suspension of the notional buying and/or selling of Options and/or deferral of determination and publication continues for a period of 10 consecutive Index Calculation Dates, then the Index Administrator will:

(a) determine and, if applicable, publish the Index Closing Level in respect of each Index Calculation Date falling in such period in its sole discretion taking into consideration the then-prevailing market conditions, the last reported price, value, rate, spread or level and such other factor(s) and condition(s) as the Index Administrator considers relevant for the purpose of determining such Index Closing Level; and/or

(b) permanently cease determining and publishing the Option Ratio Index as of the later of (x) the date when such Disruption Event commenced or (y) the Index Calculation Date immediately following the last Index Calculation Date for which the Index Administrator calculated and, if applicable, published the relevant Index Closing Level in accordance with sub-clause (a) above (if any);

(iii) make such determinations and/or adjustments in relation to the methodology of the Option Ratio Index as it considers reasonably appropriate with regard to preserving the economic intention of the methodology of the Option Ratio Index;

(iv) in the case of a Disruption Event due to an Underlying Index Event (as define below), select a successor exchange to replace any Related Exchange and/or a Successor Underlying Index (as defined below), with such successor exchange and/or Successor Underlying Index to be selected by the Index Administrator with regard to preserving the economic intention of the methodology of the Option Ratio Index as set out herein and, in each case, make such adjustments to the Option Ratio Index to reflect such selection as it determines reasonably appropriate; and/or

(v) permanently cease to determine, calculate and make available the Index Closing Level and cancel the Option Ratio Index.

Consequences of an Option TWAP Disruption Event

If an Option TWAP Disruption Event (as defined below) occurs or is continuing on any Index Calculation Date, the Index Administrator will determine whether the occurrence or existence of such event is material. In the event that the Index Administrator determines that the occurrence or existence of an Option TWAP Disruption Event is material, it will determine the relevant Option TWAP using the black-scholes formula and an implied volatility equal to (i) if the implied volatility for such affected Option can be calculated using the same formula used by the Option Ratio Index to determine the implied volatility in connection with determining the Intraday Delta of an Option, such implied volatility, or (ii) a linear interpolation (or extrapolation) across the strike price of implied volatilities that can be calculated using the same formula used by the Option Ratio Index to determine the implied volatility in connection with determining the Intraday Delta of an Option.

Index Administrator and Index Calculation Agent

Unless otherwise provided and subject to "Change in Methodology," all determinations made by the Index Administrator or the Index Calculation Agent will be made by it in good faith and in a commercially reasonable manner by reference to such factors as it deems appropriate and will be final, conclusive and binding in the absence of manifest error.

Definitions

For the purposes of this description of the Option Ratio Index:

"**Disruption Event**" means a Market Disruption Event, a Force Majeure Event, an Option Market Disruption Event, an Underlying Index Event, a TWAP Disruption Event which is not an Option TWAP Disruption Event, an Unresolved Option TWAP Disruption Event or a Fed Funds Index Event.

"**Fed Funds Index Event**" means (i) the failure of the relevant entity to publish the level of the Fed Funds Index for any day on which the level of the Fed Funds Index is scheduled to be published (without taking into account any right of the relevant entity to defer publication) or (ii) the relevant entity permanently ceases to calculate and make available the level of the Fed Funds Index.

"**Force Majeure Event**" means, in respect of the Option Ratio Index, an event or circumstance (including, without limitation, a systems failure, fire, building evacuation, natural or man-made disaster, act of God, act of state, armed conflict, act of terrorism, riot or labour disruption or any similar intervening circumstance), other than an Underlying Index Event, that impairs the ability of the Index Administrator to make calculations or determinations in respect of the Option Ratio Index.

"**Market Disruption Event**" means an event (other than a Force Majeure Event or an Underlying Index Event) that would require the Index Administrator to make any determination in respect of the Option Ratio Index on an alternative basis all as determined by the Index Administrator. Without limitation to the foregoing, each of the following events shall be a Market Disruption Event:

(i)   "**Trading Suspension**:" the suspension of trading in any relevant Underlying Contract on any Related Exchange or any relevant trading market;

(ii)   "**Disappearance of an Option or Futures Price**:" the failure of trading to commence, or the permanent discontinuation of trading in, a relevant Underlying Contract on any Related Exchange;

(iii)   "**Material Change in Formula or Determination**:" the occurrence since the Index Commencement Date of a material change in the formula for or the method of calculating the price of a relevant Underlying Contract by any Related Exchange or any other relevant party, or a material modification of any Related Exchange's method for dissemination of the price of any Underlying Contract;

(iv)   "**Material Change in Content**:" the occurrence since the Index Commencement Date of a material change in the content, composition or constitution of the Underlying Index to which a relevant Option or Futures relates;

(v)   "**Tax Disruption**:" 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 Underlying Contract 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 any Underlying Contract on any relevant day from what it would have been without that imposition, change or removal;

(vi)   "**Trading Limitation**:" a limitation is imposed on trading in any relevant Underlying Contract on any Related Exchange or any other relevant trading market;

(vii)   "**De Minimis Trading**:" the number of any relevant Underlying Contract traded on any Related Exchange on any relevant Index Calculation Date is materially reduced or the liquidity in any relevant Underlying Contract is otherwise reduced for any reason;

(viii) "**Change of Law or Rules**:" there is a change in, or amendment to, the laws, rules or regulations relating to any Underlying Contract, and/or a change in any application or interpretation of such laws, rules or regulations;

(ix)   "**Transaction Disruption**:" market participants in general would: (i) be unable, after using reasonable efforts, to acquire, establish, re-establish, substitute, maintain, unwind or dispose (in whole or in part) any Underlying Contract or any transaction(s) or asset(s) related to any Underlying Contract, or (ii) be unable, after using reasonable efforts, to realize, recover or remit the proceeds of any Underlying Contract or any transaction(s) or

asset(s) related to any Underlying Contract, or (iii) incur a materially increased cost (as compared with circumstances existing on the Index Commencement Date) due to the imposition, change 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 Underlying Contract or any constituents of the Underlying Index to (a) acquire, establish, re-establish, substitute, maintain, unwind or dispose (in whole or in part) any Underlying Contract or any transaction(s) or asset(s) related to any Underlying Contract or (b) realize, recover or remit the proceeds of any Underlying Contract or any transaction(s) or asset(s) related to any Underlying Contract;

(x)   "**Material Change in Circumstances**:" the occurrence of any event which would make it impossible, or not reasonably practicable, for market participants in general to enter into or maintain or fulfill its obligations under any relevant Underlying Contract on any Related Exchange or any other relevant trading market, as determined by the Index Administrator;

(xi)   "**Relevant Exchange Event**:" on any Index Calculation Date, the Relevant Exchange does not open on a day when it was scheduled to be open for trading for its regular full day trading session; or

"**Option Market Disruption Event**" means it is not possible or practicable to calculate any implied volatility using the formula contemplated in the terms of the Option Ratio Index as of the Index Commencement Date to determine the implied volatility of an Option in connection with determining the Intraday Delta of such Option.

"**Option TWAP Disruption Event**" means a TWAP Disruption Event with respect to the TWAP Process for an Option.

"**TWAP Disruption Event**" means, in respect of any relevant Index Calculation Date, an event or circumstance that makes it impossible or not practicable, in the determination of the Index Administrator, for any reason to carry out a TWAP Process for such Index Calculation Date, or the TWAP Process does not return a price for such Index Calculation Date including, without limitation, owing to the relevant bid or ask prices not being available or published.

"**Related Exchange**" means the Options Exchange or the Futures Exchange.

"**Relevant Exchange**" means the New York Stock Exchange, or any successor thereto, as determined by the Index Calculation Agent.

"**Underlying Contract**" means an Option, Futures or any other contract relating to the Underlying Index.

"**Underlying Index Event**" means any of the following:

(i)   The Underlying Index Sponsor:

a.   makes or announces that it will make a material change in the formula for or the method of calculating the Underlying Index or in any other way materially modifies the Underlying Index;

b.   permanently cancels the Underlying Index and no Successor Underlying Index (as defined below) exists; and/or

c.   on any relevant Index Calculation Date, fails to calculate and announce any relevant level of the Underlying Index;

(ii)   the failure of the Related Exchange to announce or publish any information necessary for determining the price of an Underlying Contract;

(iii)   any announcement or publication is made by any Related Exchange of information necessary for determining the price of an Underlying Contract that the Index Administrator and/or the Index Calculation Agent determines is erroneous or insufficient for the determination of the price of such Underlying Contract; or

(iv)   there is a temporary or permanent discontinuance or unavailability of any Related Exchange.

"**Underlying Index Sponsor**" means the entity, or the successor entity, that regularly calculates and publishes the Underlying Index.

"**Unresolved Option TWAP Disruption Event**" shall occur if an Option TWAP Disruption Event the Index Administrator determines is material occurs or is continuing and the Index Administrator is unable to determine the Option TWAP for an Option using the method described under "Consequences of an Option TWAP Disruption Event" above.

Successor Sponsor and Successor Underlying Index

If at any relevant time, the Underlying Index is:

(i)   not calculated or announced by the Underlying Index Sponsor but is calculated and announced by a successor sponsor (the "**Successor Sponsor**") acceptable to the Index Administrator; or

(ii)   is replaced by a successor index (a "**Successor Underlying Index**") which, in the determination of the Index Administrator, uses the same or substantially similar formula for and method of calculation as used in the calculation of the Underlying Index,

then the Underlying Index will be deemed to be (a) such Underlying Index so calculated and (as applicable) published by that Successor Sponsor or (b) that Successor Underlying Index, as the case may be, following adjustments (if any) to any requisite value or level, relating to the Successor Underlying Index, that the Index Administrator determines to be appropriate to preserve the economic intention of the methodology of the Option Ratio Index.

Change in Methodology

In calculating and determining the level of the Option Ratio Index, the Index Administrator will, subject to the provisions below, employ the methodology described above. The application of such methodology by the Index Administrator will be conclusive and binding. While the Index Administrator currently employs the above described methodology to calculate the Option Ratio Index, no assurance can be given that market, regulatory, juridical, financial, fiscal or other circumstances (including, but not limited to, any changes to or any suspension or termination of any constituent of the Option Ratio Index or any other events affecting transactions on the same or similar terms to any constituent of the Option Ratio Index) will not arise that would, in the view of the Index Administrator, necessitate or make desirable a modification of or change to such methodology (including, but without limitation, a change in the frequency of calculation of any Index Closing Level) in order for the Option Ratio Index to continue being calculated and determined notwithstanding the relevant circumstances and the Index Administrator shall be entitled to make any such modification or change in its sole discretion.

The Index Administrator shall be entitled to make such modifications and/or changes to the methodology of the Option Ratio Index as it in its sole discretion deems necessary or desirable, including (without limitation):

(i) to correct any manifest error or proven error or to cure, correct or supplement any ambiguity or

defective provision contained in this description;

(ii) to preserve the overall methodology and objective of the Option Ratio Index, where such modification and/or change is of a formal, minor or technical nature; and/or

(iii) to take into account any change in the terms (whether in relation to settlement mechanics or otherwise) on which any Underlying Contracts are traded.

In deciding what is necessary or desirable, the Index Administrator will consider and/or take into account the overall methodology and objective of the Option Ratio Index as set out herein. In making any such modifications, however, the Index Administrator will (x) ensure that such modifications or changes will result in a methodology that, in the Index Administrator's determination, is consistent in its overall methodology and objective described herein and (y) limit any such modification or change to the methodology of the Option Ratio Index and/or the method of calculating any Index Closing Level.

The Index Administrator may, in its sole discretion, at any time and without notice, terminate the calculation and publication of the Option Ratio Index.

Availability and Publication of the Index Closing Level and Adjustments

The Index Closing Level will be published on Bloomberg under the title "Deutsche Bank Tail Option Ratio Carry Bias Index." The Bloomberg page relating to the Option Ratio Index is "DBPRFFUU," or any successors to such page or services as selected by the Index Administrator from time to time. Certain details as to levels of the Option Ratio Index and adjustments made in respect of the Option Ratio Index may be made available on such pages.

The "Deutsche Bank Tail Option Ratio Carry Bias Index" is a proprietary index of Deutsche Bank AG. Any use of such index or its name must be with the consent of Deutsche Bank AG.

DEUTSCHE BANK FED FUNDS EFFECTIVE RATE TOTAL RETURN INDEX

The Deutsche Bank Fed Funds Effective Rate Total Return Index (Bloomberg: DBMMFED1 <Index>) (the "**Fed Funds Index**") is intended to measure the accrual of a daily rolled deposit invested at the federal funds effective rate. The federal funds effective rate is the interest rate that is charged by depository institutions, with excess reserves at a United States Federal Reserve District Bank, to lend money to other depository institutions overnight. The federal funds effective rate is the average interest rate that was charged in relation to a given day. The Fed Funds Index is calculated on a total return basis, meaning the deposit is compounded (reinvested) daily with a 360-day year-convention.

The closing level of the Fed Funds Index (the "**Index Closing Level**") is calculated in U.S. dollars. The Fed Funds Index has been retrospectively calculated by Deutsche Bank AG, London Branch (the "**Index Sponsor**") on a hypothetical basis from July 31, 1995 (the "**Index Commencement Date**") and calculated on a live basis since October 8, 2007 (the "**Index Live Date**"). The Index Closing Level on the Index Commencement Date was set at 100.

Calculation of the Index Closing Level

The Index Sponsor will calculate the Index Closing Level on each Index Business Day, which will be equal to the Index Closing Level on the immediately preceding Index Business Day multiplied by the sum of (i) one *and* (ii) the product of (a) the Fed Funds Effective Rate on the immediately preceding calendar day on which a closing quote of the Fed Funds Effective Rate was available *multiplied by* (b) the quotient of the number of calendar days from, but excluding, the immediately preceding Index Business Day to, and including, such Index Business Day *divided by* 360.

Expressed as formula, the Index Closing Level on any Index Business Day is equal to:

$$ICL\ (t) = ICL\ (t-1) \times (1 + (R\ (t-1) \times D\ /\ 360))$$

where:

$ICL\ (t)$ is the Index Closing Level on the relevant Index Business Day;

$ICL\ (t-1)$ is the Index Closing Level on the immediately preceding Index Business Day;

$R\ (t-1)$ is the Fed Funds Effective Rate on the immediately preceding calendar day on which a closing quote of the Fed Funds Effective Rate was available; and

D is the number of calendar days from, but excluding, the immediately preceding Index Business Day to, and including, the relevant Index Business Day.

"**Fed Funds Effective Rate**" means, in respect of an Index Business Day, the federal funds effective rate (expressed as a per annum percentage rate) in respect of such Index Business Day as published on Bloomberg page "FEDL01," as determined by the Index Sponsor. If there is a subsequent correction to the Fed Funds Effective Rate, the Index Sponsor will determine in its sole and absolute discretion whether to subsequently correct the Index Closing Level to reflect such correction.

"**Index Business Day**" means a day (other than a Saturday or Sunday) on which (i) commercial banks are open for general business in London and (ii) the Fed Funds Effective Rate is calculated and published.

The Fed Funds Index has been calculated by the Index Sponsor on a live basis since the Index Live Date. The Index Sponsor will publish the Index Closing Level on Bloomberg page "DBMMFED1 <Index>" or on any successor to such page or service as selected by the Index Sponsor from time to time, and on the Index Sponsor's website under the heading "*Fed Funds Effective Rate Total Return Index.*"

Force Majeure, Market Disruption Events and Other Adjustments

Force Majeure

If a Force Majeure Event occurs or subsists on any calendar day that, in the determination of the Index Sponsor, prevents or otherwise affects its determinations in respect of the Fed Funds Index for any Index Business Day, the Index Sponsor may in its discretion:

(i)   make such determinations and/or adjustments to the terms of the Fed Funds Index as it considers appropriate to facilitate the determination of the Fed Funds Index or the calculation of the Index Closing level in respect of such Index Business Day and, if the Index Sponsor determines appropriate, in respect of any Index Business Day thereafter;

(ii)   defer making available the Index Closing Level until the next Index Business Day on which the Index Sponsor determines that no Force Majeure Event exists; and/or

(iii)   permanently cease to calculate and make available the Index Closing Level.

"**Force Majeure Event**" means an event or circumstance other than a Market Disruption Event (including, without limitation, a systems failure, fire, building evacuation, natural or man-made disaster, act of God, act of state, armed conflict, act of terrorism, riot or labour disruption or any similar intervening circumstance) that is beyond the reasonable control of the Index Sponsor.

Market Disruption Events

If a Market Disruption Event occurs in relation to any Index Business Day, the Index Closing Level or other relevant value for such Index Business Day or scheduled to be published on such Index Business Day may not be calculated or published and/or the Index Sponsor may make such adjustments and/or determinations in relation to the Fed Funds Index and the calculation of the relevant value as it may determine appropriate; *provided that* where the Index Sponsor determines to delay calculation of the Index Closing Level and the calculation of the Index Closing Level is delayed as a result of a Market Disruption Event continuing for a period of five Index Business Days, then the Index Sponsor will calculate the Index Closing Level having regard to then prevailing market conditions, the last reported Fed Funds Effective Rate and such other factor(s) and condition(s) that the Index Sponsor considers relevant.

"**Market Disruption Event**" means the occurrence or existence of a situation where it is not possible or it is not reasonably practicable for the Index Sponsor to determine the value (or an element of such value) of the federal funds effective rate or any security, asset or other reference basis used to determine the value (or an element of such value) of the federal funds effective rate, if, in the determination of the Index Sponsor, any of the foregoing is material and, in determining what is "material," the Index Sponsor considers such circumstances as it, acting in good faith and in a commercially reasonable manner, deems appropriate.

Fed Funds Effective Rate Unavailable

If the Index Sponsor determines that the Fed Funds Effective Rate cannot be determined on an Index Business Day and no Market Disruption Event has occurred on such Index Business Day, then no Index Closing Level for such Index Business Day may be determined and/or the Index Sponsor may make such adjustments and/or determinations in relation to the Fed Funds Index and the calculation of the Index Closing level as it may determine appropriate.

Index Sponsor

All determinations made by the Index Sponsor in respect of the Fed Funds Index will be made by it in good faith and in a commercially reasonable manner by reference to such factors as the Index Sponsor deems appropriate and will be final, conclusive and binding in the absence of manifest error.

Change in Methodology of the Fed Funds Index

The Index Sponsor will, subject as provided below, employ the methodology described herein to calculate the Fed Funds Index and its application of such methodology will be conclusive and binding. While the Index Sponsor currently employs the above described methodology to calculate the Fed Funds Index, no assurance can be given that fiscal, market, regulatory, juridical, financial or other circumstances will not arise that would, in the view of the Index Sponsor, necessitate or make desirable a modification of or change to such methodology and the Index Sponsor will be entitled to make any such modification or change. The Index Sponsor may also make modifications to the terms of the Fed Funds Index in any manner that it may deem necessary or desirable, including (without limitation) to correct any manifest or proven error or to cure, correct or supplement any defective provision contained in this description.