Deutsche Bank

DB US Variance Risk Premium Tactical Index

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Part 1
Summary of the Index and Index Calculation

1. INTRODUCTION

This description (the "**Index Description**") sets out the rules (the "**Index Rules**") applicable to the DB US Variance Risk Premium Tactical Index (the "**Index**") and the basis on which the Index will be calculated.

The Index Rules may be amended from time to time as provided in Part 2 (*Disruptions and Change in Methodology*). The Index Rules described in this document are subject to change at any time and will be superseded by any subsequent Index Rules. A copy of the current version of the Index Rules can be obtained as further described in Part 2 (*Disruptions and Change in Methodology*).

Terms used in this Index Description will have the meanings given to them in Section 4 (*Calculation of Index Levels*) below.

2. SUMMARY DESCRIPTION

Index Sponsor:	Deutsche Bank AG, London Branch, or any successor in such capacity.
Index Calculation Agent and Index Administrator:	Solactive AG.
Brief description:	The Index is a proprietary index of Deutsche Bank AG intended to track the performance of a rules-based variance swap strategy. The strategy aims to capture the spread between the implied volatility and the subsequently realized volatility in the S&P 500 Index by utilizing a Variance Risk Premium (VRP) Signal which indicates the direction and magnitude of the daily variance swap position. The VRP Signal is created by first examining the Percentage VRP, which is a measure of the implied to realized volatility spread. This is calculated as the implied volatility of the S&P 500 (as measured by the business day and bid adjusted VIX) minus the 3 day intraday realized volatility of the S&P 500, all divided by the implied

volatility. The Percentage VRP is then divided by the 3 day intraday realized variance of VIX to establish the VRP Signal.

Each day the Index notionally buys or sells 1 month S&P 500 variance swaps in a size proportional to the VRP Signal and holds them to maturity. Effective December 16th 2017 the signal is subject to a cap. They are sold when the signal is positive and above its 252 day moving average and bought when the signal is negative. All other things being equal, the magnitude of the signal is increased when the percentage difference between implied and realized variance increase and it is decreased in times when the VIX itself is more volatile.

The Signal is determined at 1pm EPT (and 11am EPT on half days) each day, and the variance swap is subsequently notionally traded. The strike of the variance swap is determined using a TWAP process of the VIX level between 3:25pm EPT to 3:55pm EPT (and 12:25pm EPT to 12:55pm EPT on half days). The VIX level, which is based on calendar days, is adjusted to account for a 252 business day schedule. If the Index is notionally selling variance swaps, it will be sold at 95% multiplied by the Business Day Adjusted VIX Level (i.e. the strike) as the corresponding bid level. If the Index is notionally buying variance swaps, it will be bought at 103% multiplied by the Business Day Adjusted VIX Level (i.e. the strike) as the corresponding ask level.

The settlement value of a variance swap is determined by the subsequent 1 month realized volatility of the S&P 500 and the strike. Before its settlement, a variance swap's mark-to-market is determined by a time weighted average of its already realized variance and the implied volatility for the remaining period. The value of that implied volatility component is not readily available on exchanges and must be determined through other market instruments. To determine the implied volatility of the remaining period, the

Index looks at the near-term and far-term VIX subindices (indices by which the VIX is determined), as well as the near-term and far-term VXST subindices (where VXST is the CBOE 9-day volatility index). The implied volatility is determined through an interpolation amongst these 4 business-day adjusted subindices, and the mark-to-market is the time weighted average of this implied volatility and the already realized volatility. The mark-to-market is determined each day at 4pm EPT (and 1pm EPT on half days) for all outstanding variance swaps.

Index Calculation and Publication

The Index Level is calculated for each Index Business Day following the Retrospective Index Commencement Date (subject to Part 2 (*Disruptions and Change in Methodology*) and published as soon as reasonably practicable thereafter in accordance with Section 111 (*Availability and Publication of Index Levels and Adjustments*) of Part 2 (*Disruptions and Change in Methodology*) below. On the Live Index Commencement Date the Index Level was 5268.40.

Prior to (and excluding) the Index TWAP Date, the Observation Time for all relevant data will be set to the scheduled closing time of the CBOE. The TWAP Observation Period will also be set to the scheduled closing time of the CBOE, whereby the TWAP Process will establish the level to be that as observed at the TWAP Observation Period.

The Index TWAP Date is October 6, 2014

Retrospective Index Commencement Date:

The Index has been calculated on a retrospective basis from and including April, 18 2008 (the "**Retrospective Index Commencement Date**") to, but excluding the Live Index Commencement Date.

Live Index Commencement Date:

The Index has been calculated on a live basis from and including November 28, 2016 (the "**Live Index Commencement Date**").

Further Information:	See the remainder of this document, which qualifies and expands on this Section 2 (*Summary Description*).
Bloomberg® code:	DBGVRPUS <Index>
Fee Information – Embedded Transaction Costs	Transaction costs are embedded in the Index. As described above, when the Index notionally sells variance swaps, it will sell at 95% multiplied by the Business Day Adjusted VIX Level (i.e. the strike) as the corresponding bid level, and when the Index notionally buys variance swaps, it will buy at 103% multiplied by the Business Day Adjusted VIX Level (i.e. the strike) as the corresponding ask level. The difference between 95% and 100% of VIX on sales and between 103% and 100% of VIX on purchases represents the transaction costs embedded in the Index. The impact of the embedded transaction cost on the Index on any given day will depend on the absolute level of VIX and the notional amount of variance swaps traded. The amount of these embedded transaction costs can be highly variable due to the potentially large fluctuations in both the VIX and the amount of trading in any given period. For more information on these embedded transaction costs as well as historical information, please see Section 5 below.

3. BACKGROUND INFORMATION

The background information in this Section 3 is based on information obtained from various publicly available sources and is provided for information purposes only. The Index Sponsor has relied on these sources and has not independently verified the information extracted from these sources and accepts no responsibility or liability in respect thereof. Information on the VIX

Indices and the VIX Sub-Indices can be obtained from the website of the Chicago Board Options Exchange ("**CBOE**"), and information on the S&P 500 can be obtained from the website of S&P Dow Jones Indices ("**SPDJI**").

3.1 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.

3.2 The VIX Index

The VIX Index is a benchmark index that measures the market's expectation of the S&P 500's volatility (also referred to as implied volatility) over the next 30 days, calculated based on the prices of certain put and call options on the S&P 500. The S&P 500 is intended to provide a broad performance benchmark for the U.S. equity markets. The VIX Index is a volatility index comprised of options rather than stocks, with the price of each option reflecting the market's expectation of future volatility. Thus, when the market's expectation of volatility over the next 30 days increases, the level of the VIX Index is expected to increase as well and, when the market's expectation of volatility over the next 30 days decreases, the level of the VIX Index is expected to decrease.

The VIX Index was developed by the CBOE and is calculated, maintained and published by the CBOE. The CBOE has no obligation to continue to publish, and may discontinue the publication of, the VIX Index. The VIX Index is reported by Thomson Reuters under the RIC symbol ".VIX"

From (but excluding) October 3, 2014, the VIX Index measures the 30-day volatility of the S&P 500 implied by the out-of-the-money put and call options on the level of the S&P 500 ("**SPX Options**") using both "standard" monthly SPX Options that expire on the third Friday of each month as well as "weekly" SPX Options that expire every Friday other than the third Friday of each month. To arrive at the VIX Index level, a broad range of out-of-the-money SPX Options that (i) have non-zero bid prices and (ii) have expiration dates more than 23 days and less than 37 calendar days are selected in order to derive a measure of 30-day market implied volatility. The SPX Options expiring 24 days to 30 days later are "**Near Term Options**" and the SPX Options expiring 31 days to 37 days later are "**Next Term Options**". As volatility rises and falls, the number of SPX Options that are used in the calculation of the VIX Index will fluctuate from month-to-month, day-to-day and possibly even minute-to-minute. The VIX Index is calculated independently of any particular option pricing model and in doing so seeks to eliminate any biases which may otherwise be included in using options pricing methodology based on certain assumptions. The model-free implied volatility for both the Near Term Options and the Next Term Options is then calculated using a strike-weighted sum of the mid-quote prices of the Near Term Options and the Next Term Options. The 30-day implied volatility is then interpolated from the implied volatilities of the Near Term Options and Next Term Options.

3.3 CBOE Short Term Volatility Index

On October 1, 2013, CBOE introduced the CBOE Short-Term Volatility Index (VXST), the first volatility index to incorporate weekly options. Whereas the VIX calculation is a measure of thirty-day expected volatility, the VXST calculation uses shorter-dated S&P 500 Index options than those used in the VIX calculation to reflect that the VXST calculation is a measure of nine-day expected volatility. The universe of S&P 500 Index options used in the VXST calculation includes SPX options with "standard" 3rd Friday expiration dates and "weekly" SPX options that expire every Friday, except on the 3rd Friday of each month. VXST futures began trading on CFE in February 2014; CBOE began trading VXST options in April 2014. More information on VXST may be found on the CBOE website at www.cboe.com/VXST.

3.4 S&P 500 Index

The S&P 500® Index is intended to provide a performance benchmark for the U.S. equity markets. The calculation of the level of the S&P 500® Index (discussed below in further detail) is based on the relative value of the aggregate market value of the common stocks of 500 companies as of a particular time as compared to the aggregate average market value of the common stocks of 500 similar companies during the base period of the years 1941 through 1943. The "market value" of any S&P 500 component stock is the product of the market price per share and the number of the then outstanding shares of such S&P 500 component stock.

The 500 companies are not the 500 largest companies listed on the New York Stock Exchange and not all 500 companies are listed on such exchange. S&P chooses companies for inclusion in the S&P 500® Index with an aim of achieving a distribution by broad industry groupings that approximates the distribution of these groupings in the common stock population of the U.S. equity market. S&P may from time to time, in its sole discretion, add companies to, or delete companies from, the S&P 500® Index to achieve the objectives stated above. Relevant criteria employed by S&P include the viability of the particular company, the extent to which that company represents the industry group to which it is assigned, the extent to which the company's common stock is widely-held and the market value and trading activity of the common stock of that company.

To be eligible for inclusion in the S&P 500® Index, a company must be a U.S. company with a market capitalization in excess of $5.3 billion. Moreover, the company must have positive as-reported earnings over the most recent quarter, as well as over the most recent four quarters (summed together), and maintain a public float of at least 50%. In addition, the ratio of annual dollar value traded to float adjusted market capitalization for the company should be 1.0 or greater and the company should trade a minimum of 250,000 shares in each of the six months leading up to the evaluation date.

4. CALCULATION OF INDEX LEVELS

4.1 Definitions of underlying indices and underlying sub-indices

"**VIX Index**" means the CBOE Volatility Index (Reuters RIC: .VIX).

"**VIX Near-Term Index**" means the CBOE SPX Near-Term VIX Index (Reuters RIC: .VIN).

"**VIX Far-Term Index**" means the CBOE SPX Far-Term VIX Index (Reuters RIC: .VIF).

"**VIX Sub-Index**" means each of the VIX Near-Term Index and the VIX Far-Term Index, as applicable, and collectively, the "**VIX Sub-Indices**".

"**VXST Index**" means the CBOE Short Term Volatility Index (Reuters RIC: .VXST).

"**VXST Near-Term Index**" means the CBOE SPX Near-Term VXST Index (Reuters RIC: .VSTN).

"**VXST Far-Term Index**" means the CBOE SPX Far-Term VXST Index (Reuters RIC: .VSTF).

"**VXST Sub-Index**" means each of the VXST Near-Term Index and the VXST Far-Term Index, as applicable, and collectively, the "**VXST Sub-Indices**".

4.2 Data requirements

In order to calculate the Index Level, on each Index Business Day, the Index Calculation Agent will observe the intraday market data specified in Section 4.2(i) (*Data required for the calculation of the VRP Signal*) below from the relevant Price Source, subject to the provisions set out in Part 2 (*Disruptions and Change in Methodology*).

"**Price Source**" means either (as selected by the Index Calculation Agent in its sole discretion) (i) Reuters or (ii) any other market price information source selected by the Index Calculation Agent in its sole discretion.

"**RIC**" means Reuters Instrument Code.

(i) Data required for the calculation of the VRP Signal

"*Lookback Period Start Time*" means, for any relevant day, the time falling 300 minutes prior to the start of the *TWAP Observation Period* for such day.

"*Observation Time*" means 15 minutes prior to the scheduled closing time of the Chicago Board Option Exchange ("CBOE").

"*Signal Observation Time*" means 13:00 EPT (and 11:00 EPT on half-days of the CBOE)

"*Spot Far-Term Monthly VIX Level*" or **"*VIFMO(t)*"** means, in respect of any date t, the level of the VIX Far-Term Index, as published on Reuters (under RIC .VIF) before but excluding October 6, 2014 and under RIC .VIFMO on and after October 6, 2014, at the *Observation Time*. Prior to (and including) August 25, 2008, the *Spot Far-Term Monthly VIX Level* is reconstructed by the Index Sponsor from the *Spot Near-Term Monthly VIX Level* and the VIX Level.

"*Spot Far-Term Monthly VIX Signal Level*" or **"*Signal_VIFMO(t)*"** means, in respect of any date t, the level of the VIX Far-Term Index, as published on Reuters (under RIC .VIF) before but excluding October 6, 2014 and under RIC .VIFMO on and after October 6, 2014, as observed at the *Signal Observation Time*. Prior to (and including) August 25, 2008, the *Spot Far-Term Monthly VIX Signal Level* is reconstructed by the Index Sponsor from the *Spot Near-Term Monthly VIX Signal Level* and the *VIX Signal Level*.

"*Spot Far-Term* Monthly *VIX TWAP Level*" or **"*TWAP_VIFMO(t)*"** means, in respect of any date t, the level of the VIX Far-Term Index, as published on Reuters (under RIC .VIF) before but excluding October 6, 2014 and under RIC. VIFMO on and after October 6, 2014, as observed using the *TWAP Process* during the *TWAP Observation Period*. Prior to (and including) August 25, 2008, the *Spot Far-Term Monthly VIX TWAP Level* is reconstructed by the Index Sponsor from the *Spot Near-Term Monthly VIX TWAP Level* and the *VIX TWAP Level*.

"*Spot Far-Term Weekly VIX Level*" or **"*VIFWE(t)*"** means, in respect of any date t, the level of the VIX Far-Term Index as published on Reuters (under RIC .VIF) at the *Observation Time*, on and after October 6, 2014.

"*Spot Far-Term Weekly VIX Signal Level*" or **"*Signal_VIFWE(t)*"** means, in respect of any date t, the level of the VIX Far-Term Index as published on Reuters (under RIC .VIF) as observed at the *Signal Observation Time*, on and after October 6, 2014.

"*Spot Far-Term Weekly VIX TWAP Level*" or **"*TWAP_VIFWE(t)*"** means, in respect of any date t, the level of the VIX Far-Term Index as published on Reuters (under RIC .VIF) as observed using the *TWAP Process* during the *TWAP Observation Period*, on and after October 6, 2014.

"*Spot Near-Term Monthly VIX Level*" or **"*VINMO(t)*"** means, in respect of any date t, the level of the VIX Near-Term Index as published on Reuters (under RIC .VIN) before but excluding October 6, 2014 and under RIC .VINMO on and after October 6, 2014, at the *Observation Time*.

"*Spot Near-Term Monthly VIX Signal Level*" or **"*Signal_VINMO(t)*"** means, in respect of any date t, the level of the VIX Near-Term Index as published on Reuters (under RIC .VIN) before but excluding October 6, 2014 and under RIC .VINMO on and after October 6, 2014, as observed at the *Signal Observation Time*.

"*Spot Near-Term Monthly VIX TWAP Level*" or **"*TWAP_VINMO(t)*"** means, in respect of any date t, the level of the VIX Near-Term Index, as published on Reuters (under RIC .VIN) before but excluding October 6, 2014 and under RIC .VINMO on and after October 6, 2014, as observed using the *TWAP Process* during the *TWAP Observation Period*.

"*Spot Near-Term Weekly VIX Level*" or **"*VINWE(t)*"** means, in respect of any date t, the level of the VIX Near-Term Index, as published on Reuters (under RIC .VIN) on and after October 6, 2014, at the *Observation Time*.

"*Spot Near-Term Weekly VIX Signal Level*" or **"*Signal_VINWE(t)*"** means, in respect of any date t, the level of the VIX Near-Term Index, as published on Reuters (under RIC .VIN) on and after October 6, 2014, as observed at the *Signal Observation Time*.

"*Spot Near-Term Weekly VIX TWAP Level*" or **"*TWAP_VINWE(t)*"** means, in respect of any date t, the level of the VIX Near-Term Index, as published on Reuters (under RIC

.VIN) on and after October 6, 2014, as observed using the *TWAP Process* during the *TWAP Observation Period*.

"*Spot Near-Term VXST Level*" or **"*VSTN(t)*"** means, in respect of any date t, the level of the VXST Near-Term Index, as published on Reuters (under RIC .VSTN) on and after October 6, 2014 at the *Observation Time*.

"*Spot Far-Term VXST Level*" or **"*VSTF(t)*"** means, in respect of any date t, the level of the VXST Far-Term Index, as published on Reuters (under RIC .VSTF) on and after October 6, 2014, at the *Observation Time*.

"*TWAP Observation Period*" means the 30 minute period starting from 35 minutes prior to the scheduled closing time of the CBOE to 5 minutes prior to the scheduled closing time of the CBOE.

"*TWAP Process*" means a process of establishing a time-weighted average level on any Index Business Day t. During the *TWAP Observation Period*, the relevant level will be recorded at every 15 second interval (each interval being a "***TWAP Observation Interval***"). In respect of each *TWAP Observation Interval*, the level will be the most recent level at exactly the same time as such *TWAP Observation Interval*, or, if one or more levels are not reported at exactly the same time, the most recent level reported on or after the *Lookback Period Start Time* but prior to such *TWAP Observation Interval*.

"*VIX Level*" or **"*VIX(t)*"** means, in respect of any date t, the level of the VIX Index as observed at the Observation Time.

"*VIX Monthly Sub-Index Levels*" means each of the *Spot Near-Term Monthly VIX Level* and *Spot Far-Term Monthly VIX Level*.

"*VIX Open Level*" or **"*Open_VIX(t)*"** means, in respect of any date t, the opening level of the VIX Index.

"*VIX Signal Level*" or **"*Signal_VIX(t)*"** means, in respect of any date t, the level of the VIX Index as observed at the Signal Observation Time.

"*VIX Sub-Index Levels*" means each of the *Spot Near-Term Weekly VIX Level*, *Spot Far-Term Weekly VIX Level*, *Spot Near-Term Monthly VIX Level*, *Spot Far-Term Monthly VIX Level*, *Spot Near-Term VXST Level*, and *Spot Far-Term VXST Level*.

"*VIX Weekly Sub-Index Levels*" means each of the *Spot Near-Term Weekly VIX Level* and *Spot Far-Term Weekly VIX Level*.

"*VXST Sub-Index Levels*" means each of the *Spot Near-Term VXST Level* and *Spot Far-Term VXST Level*.

4.3 Definition of expiry dates

"*Far-Term Monthly VIX Expiry Date* means, in respect of a date t, the *Monthly* ***Expiry*** *Date* immediately following the Near-Term Monthly VIX Expiry Date relevant to such date t.

"*Far-Term Weekly VIX Expiry Date* means, in respect of a date t, the *Weekly Expiry Date* immediately following the Near-Term Weekly VIX Expiry Date relevant to such date t.

"*Far-Term VXST Expiry Date* means, in respect of a date t, the *Weekly Expiry Date* immediately following the Near-Term Weekly VIX Expiry Date relevant to such date t.

"*Monthly Expiry Date"* means the third Friday of each month, provided that if such day is not an Index Business Day, the Index Business Day immediately preceding that day.

"*Monthly VIX Expiry Date"* means, in respect of a date t, either the *Near-Term Monthly VIX Expiry Date* or the *Far-Term Monthly VIX Expiry Date.*

"*Near-Term Monthly VIX Expiry Date* means, in respect of a date t, the last day that is (i) a *Monthly Expiry Date*; and (ii) falls on or before the 30th calendar day following t, provided that such day (the "**Tentative Near-Term Monthly VIX Expiry Date**") does not fall in the same calendar week as t; otherwise, the *Monthly Expiry Date* immediately following the Tentative Near-Term Monthly VIX Expiry Date. If no such *Monthly Expiry Date* falls on or before the 30^{th} calendar day following t, the Near-Term Monthly VIX Expiry Date shall be the *Monthly Expiry Date* immediately following the 30^{th} calendar day following t.

"*Near-Term Weekly VIX Expiry Date"* means, in respect of a date t, the last day that is (i) a *Weekly Expiry Date*; and (ii) falls on or before the 30^{th} calendar day (inclusive) following t.

"*Near-Term VXST Expiry Date"* means, in respect of a date t, the last day that is (i) a *Weekly Expiry Date*; and (ii) falls before the 9^{th} calendar day (exclusive) following t.

"*Weekly Expiry Date"* means the Friday of each week, provided that if such day is not an Index Business Day, the Index Business Day immediately preceding that day.

"*Weekly VIX Expiry Date"* means, in respect of a date t, either the *Near-Term Weekly VIX Expiry Date* or the *Far-Term Weekly VIX Expiry Date.*

"***VIX Interpolation Expiry Date"*** means, in respect of a date t, either a *Weekly VIX Expiry Date* or a *Monthly VIX Expiry Date* or a *VXST Expiry Date* which has at least one VIX Sub-Index Levels or VXST Sub-Index Levels associated to the expiry date.

"***VXST Expiry Date"*** means, in respect of a date t, either the *Near-Term VXST Expiry Date* or the *Far-Term VXST Expiry Date.*

4.4 Miscellaneous Definitions

"**EUR**" means Euro.

"**Index Business Day**" means a day other than Saturday or Sunday on which the New York Stock Exchange ("**NYSE**") is scheduled to be open and listed options are deemed to be tradeable on the CBOE.

"**VIX Business Day**" means a day other than Saturday or Sunday on which listed options are deemed to be tradeable on the CBOE.

"**USD**" means U.S. Dollar.

4.5 Calculation of Business Day Adjusted Levels

(i) Business day adjustment for VIX Level

The VIX index is calculated assuming a theoretical time to maturity based on calendar days and that do not account for holidays. However, the option prices used in the VIX Index level calculation accounts for holidays. A business day adjustment is therefore required in order to make the theoretical time to maturity consistent with the expiries of the underlying options.

A business day adjusted VIX Level ("**Business Day Adjusted VIX Level**") will be calculated on a daily basis, as follows:

$$\mathrm{VIX_B}(t)=\sqrt{\frac{1}{\Delta_B(t,T_{30,B})}\times\left[\mathrm{VIN_B^2}(t)\times\Delta_B(t,T_{VIN})\times\frac{\Delta_B(T_{30,B},T_{VIF})}{\Delta_B(T_{VIN},T_{VIF})}+\mathrm{VIF_B^2}(t)\times\Delta_B(t,T_{VIF})\times\frac{\Delta_B(T_{VIN},T_{30,B})}{\Delta_B(T_{VIN},T_{VIF})}\right]}$$

$$\mathrm{VIN_B}(t)=\mathrm{VIN}(t)\times\sqrt{\frac{252}{365}\times\frac{\Delta(t,T_{VIN})}{\Delta_B(t,T_{VIN})}}$$

$$\mathrm{VIF_B}(t)=\mathrm{VIF}(t)\times\sqrt{\frac{252}{365}\times\frac{\Delta(t,T_{VIF})}{\Delta_B(t,T_{VIF})}}$$

Where :

$T_{30,B}$ means, in respect of a VIX Business Day t, the 30th calendar day immediately following t, or if such day is not an Index Business Day, the immediately preceding Index Business Day

$\Delta(t_1,t_2)$: means the number of calendar days from and including t1, to but excluding t2

$\Delta_B(t_1,t_2)$: means the number of Index Business Days from and including t1, to but excluding t2

VIN(t) : means, in respect of an Index Business Day t on or after October 6, 2014, VINWE(t) as defined in the “Data Requirements” section; in respect of an Index Business Day t before but excluding October 6, 2014, VINMO(t) as defined in “Data Requirements” section.

VIF(t) : means, in respect of an Index Business Day t on or after October 6, 2014, VIFWE(t) as defined in the “Data Requirements” section; in respect of an Index Business Day t before but excluding October 6, 2014, VIFMO(t) as defined in “Data Requirements” section.

T_{VIN} : means, in respect of an Index Business Day t on or after October 6, 2014, the Near-Term Weekly VIX Expiry Date relevant to the CBOE SPX near-term Weekly VIX Index published on the relevant Index Business Day t; in respect of an Index Business Day t before but excluding October 6, 2014, means the Near-Term Monthly VIX Expiry Date relevant to the CBOE SPX near-term Monthly VIX Index published on the relevant Index Business Day t

T_{VIF} : means, in respect of an Index Business Day t on or after October 6, 2014, the Far-Term Weekly VIX Expiry Date relevant to the CBOE SPX far-term Weekly VIX Index published on the relevant Index Business Day t; in respect of an Index Business Day t before but excluding October 6, 2014, means the Far-Term Monthly VIX Expiry Date relevant to the CBOE SPX far-term Monthly VIX Index published on the relevant Index Business Day t

$VIN_B(t)$: means, in respect of a VIX Business Day t, the business day adjusted level for VIX Near-Term Index

$VIF_B(t)$: means, in respect of a VIX Business Day t, the business day adjusted level for VIX Far-Term Index

$VIX_B(t)$: means, in respect of a VIX Business Day t, the business day adjusted level for the VIX Index

VIX Business Day: as defined in Section 4.4 above, means a day other than Saturday or Sunday on which listed options are tradeable on the CBOE.

For February 12, 2008, due to unavailable data, the Business Day Adjusted VIX Level will be calculated as follows:

$$\mathrm{VIX_B(t)} = \mathrm{VIX(t)} \times \sqrt{\frac{252}{365} \times \frac{30}{\Delta_B(t, T_{30,B})}}$$

Where :

VIX(t) : means, in respect of an Index Business Day t, the level of the VIX Index as observed at the Observation Time

(ii) Business day adjustment for VIX TWAP Level

A Business Day adjusted VIX TWAP level will also be calculated on a daily basis, as follows:

$$\mathrm{TWAP\_VIX_B(t)} = \sqrt{\frac{1}{\Delta_B(t, T_{30,B})} \times \left[\mathrm{TWAP\_VIN_B^2(t)} \times \Delta_B(t, T_{VIN}) \times \frac{\Delta_B(T_{30,B}, T_{VIF})}{\Delta_B(T_{VIN}, T_{VIF})} + \mathrm{TWAP\_VIF_B^2(t)} \times \Delta_B(t, T_{VIF}) \times \frac{\Delta_B(T_{VIN}, T_{30,B})}{\Delta_B(T_{VIN}, T_{VIF})}\right]}$$

$$\mathrm{TWAP\_VIN_B(t)} = \mathrm{TWAP\_VIN(t)} \times \sqrt{\frac{252}{365} \times \frac{\Delta(t, T_{VIN})}{\Delta_B(t, T_{VIN})}}$$

$$\mathrm{TWAP\_VIF_B(t)} = \mathrm{TWAP\_VIF(t)} \times \sqrt{\frac{252}{365} \times \frac{\Delta(t, T_{VIF})}{\Delta_B(t, T_{VIF})}}$$

Where :

TWAP_VIN(t) : means, in respect of an Index Business Day t on or after October 6, 2014, TWAP_VINWE(t) as defined in the “Data Requirements” section; in respect of an Index Business Day t before but excluding October 6, 2014, TWAP_VINMO(t) as defined in “Data Requirements” section.

TWAP_VIF(t) : means, in respect of an Index Business Day t on or after October 6, 2014, TWAP_VIFWE(t) as defined in the “Data Requirements” section; in respect of an Index Business Day t before but excluding October 6, 2014, TWAP_VIFMO(t) as defined in “Data Requirements” section.

$\mathbf{TWAP\_VIN_B(t)}$: means, in respect of a VIX Business Day t, the business day adjusted TWAP level for the VIX Near-Term Index

$\mathbf{TWAP\_VIF_B(t)}$: means, in respect of a VIX Business Day t, the business day adjusted TWAP level for the VIX Far-Term Index

$\mathbf{TWAP\_VIX_B(t)}$: means, in respect of a VIX Business Day t, the business day adjusted TWAP level for the VIX Index

(iii) Business day adjustment for VIX Signal Level

Business Day adjusted VIX Signal level will also be calculated on a daily basis, as follows:

$$\text{Signal\_VIX}_B(t) = \sqrt{\frac{1}{\Delta_B(t,\ T_{30,B})} \times \left[\text{Signal\_VIN}_B^2(t) \times \Delta_B(t, T_{VIN}) \times \frac{\Delta_B(T_{30,B}, T_{VIF})}{\Delta_B(T_{VIN}, T_{VIF})} + \text{Signal\_VIF}_B^2(t) \times \Delta_B(t, T_{VIF}) \times \frac{\Delta_B(T_{VIN}, T_{30,B})}{\Delta_B(T_{VIN}, T_{VIF})}\right]}$$

$$\text{Signal\_VIN}_B(t) = \text{Signal\_VIN}(t) \times \sqrt{\frac{252}{365} \times \frac{\Delta(t, T_{VIN})}{\Delta_B(t, T_{VIN})}}$$

$$\text{Signal\_VIF}_B(t) = \text{Signal\_VIF}(t) \times \sqrt{\frac{252}{365} \times \frac{\Delta(t, T_{VIF})}{\Delta_B(t, T_{VIF})}}$$

Where :

Signal_VIN(t) : means, in respect of an Index Business Day t on or after October 6, 2014, Signal_VINWE(t) as defined in the "Data Requirements" section; in respect of an Index Business Day t before but excluding October 6, 2014, Signal_VINMO(t) as defined in "Data Requirements" section.

Signal_VIF(t) : means, in respect of an Index Business Day t on or after October 6, 2014, Signal_VIFWE(t) as defined in the "Data Requirements" section; in respect of an Index Business Day t before but excluding October 6, 2014, Signal_VIFMO(t) as defined in "Data Requirements" section.

Signal_VIN_B(t) : means, in respect of a VIX Business Day t, the business day adjusted Signal level for CBOE SPX near-term VIX Index

Signal_VIF_B(t) : means, in respect of a VIX Business Day t, the business day adjusted Signal level for CBOE SPX far-term VIX Index

Signal_VIX_B(t) : means, in respect of a VIX Business Day t, the business day adjusted Signal level for CBOE SPX Volatility Index

Prior to, but excluding August 18, 2011, due to unavailable data, the Business Day adjusted VIX Signal level will be calculated as follows:

$$\text{Signal\_VIX}_B(t) = \text{Signal\_VIX}(t) \times \sqrt{\frac{252}{365} \times \frac{30}{\Delta_B(t,\ T_{30,B})}}$$

Where :

Signal_VIX(t) : means, in respect of an Index Business Day t, the level of the CBOE SPX Volatility Index as observed at the Signal Observation Time

Prior to, but excluding March 30, 2009, due to unavailable data, the Business Day adjusted VIX Signal level will be calculated as follows:

$$\text{Signal\_VIX}_B(t) = \text{Open\_VIX}(t) \times \sqrt{\frac{252}{365} \times \frac{30}{\Delta_B(t, T_{30,B})}}$$

Where :

Open_VIX(t) : means, in respect of an Index Business Day t, the opening level of the CBOE SPX Volatility Index

(iv) Mark-to-Market Variance Swap Strikes for expiry date T and valuation date t

For a Variance Swap contract with expiry date T, the Mark-to-Market Variance Swap Strike is calculated, in respect of valuation date t, using VIX and VXST Sub-Indices.

The Mark-to-Market Variance Swap Strike is calculated based on the business day adjusted levels of two of the VIX and VXST Sub-Index Levels (the “Left Sub-Index Level” and the “Right Sub-Index Level”).The Left Sub-Index Level and the Right Sub-Index Level together with the Left Expiry Date and the Right Expiry Date, in respect of an Index Business Day t, are determined as follows.

Left Expiry Date means, in respect of expiry date T,

i) The smallest of the VIX Interpolation Expiry Dates, if the smallest of the VIX Interpolation Expiry Dates is larger than the expiry date T;

ii) Otherwise, the greatest of the VIX Interpolation Expiry Dates which is smaller than or equal to the expiry date T.

Right Expiry means, in respect of expiry date T,

i) Left Expiry Date, if Left Expiry Date is greater than the expiry date T or Left Expiry Date is the greatest of the VIX Interpolation Expiry Dates;

ii) Otherwise, the smallest of the VIX Interpolation Expiry Dates that is greater than the Left Expiry Date.

Left Sub-Index Level means,

i) The relevant VXST Sub-Index Level associated with the Left Expiry Date, if the Left Expiry Date is a VXST Expiry Date

ii) Otherwise, the relevant VIX Weekly Sub-Index Level associated with the Left Expiry Date, if the Left Expiry Date is a Weekly VIX Expiry Date

iii) Otherwise, the relevant VIX Monthly Sub-Index Level associated with the Left Expiry Date.

Right Sub-Index Level means,

i) The relevant VXST Sub-Index Level associated with the Right Expiry Date, if the Right Expiry Date is a VXST Expiry Date

ii) Otherwise, the relevant VIX Weekly Sub-Index Level associated with the Right Expiry Date, if the Right Expiry Date is a Weekly VIX Expiry Date

iii) Otherwise, the relevant VIX Monthly Sub-Index Level associated with the Right Expiry Date.

The Mark-to-Market Variance Swap Strike is calculated as follows:

$$\mathrm{Vol}(t,T)=\begin{cases} \mathrm{VLT_B}(t); & \text{if } T_{VLT}=T_{VRT} \\ \sqrt{\dfrac{1}{\Delta_B(t,\,T)}\times\left[\mathrm{VLT_B^2}(t)\times\Delta_B(t,T_{VLT})\times\dfrac{\Delta_B(T,T_{VRT})}{\Delta_B(T_{VLT},T_{VRT})}+\mathrm{VRT_B^2}(t)\times\Delta_B(t,T_{VRT})\times\dfrac{\Delta_B(T_{VLT},T)}{\Delta_B(T_{VLT},T_{VRT})}\right]}\ ; & \text{otherwise} \end{cases}$$

$$\mathrm{VLT_B}(t)=\mathrm{VLT}(t)\times\sqrt{\frac{252}{365}\times\frac{\Delta(t,T_{VLT})}{\Delta_B(t,T_{VLT})}}$$

$$\mathrm{VRT_B}(t)=\mathrm{VRT}(t)\times\sqrt{\frac{252}{365}\times\frac{\Delta(t,T_{VRT})}{\Delta_B(t,T_{VRT})}}$$

Where :

T : means the expiry date of the valuated Variance Swap contract

VLT(t) : means, in respect of valuation date t, the Left Sub-Index Level

VRT(t) : means, in respect of valuation date t, the Right Sub-Index Level

T_{VLT} : means, in respect of expiry date T, the Left Expiry Date

T_{VRT} : means, in respect of expiry date T, the Right Expiry Date

$VLT_B(t)$: means, in respect of valuation date t, the business day adjusted level for the Left Sub-Index Level

$VRT_B(t)$: means, in respect of valuation date t, the business day adjusted level for the Right Sub-Index Level

(v) Mark-to-Market Realized Volatility for Variance Swap contracts with trade date t_0 and valuation date t

For a Variance Swap contract with trade date t_0 the Mark-to-Market Realized Volatility is calculated, in respect of valuation date t, as follows:

$$\mathrm{RV}(t_0,t)=\begin{cases} 0\ ; & \text{if } t=t_0 \\ 100\times\sqrt{\dfrac{252}{\Delta_B(t_0,t)}\times\displaystyle\sum_{i=t_0+1}^{t}\ln^2\left(\frac{\mathrm{SPX(i)}}{\mathrm{SPX(i\text{-}1)}}\right)}\ ; & \text{otherwise} \end{cases}$$

For the avoidance of doubt, the Mark-to-Market Realized Volatility shall be calculated for each Index Business Day even if such date is a Disrupted Day, and, pursuant to Section 6(iii) below, if the closing level of the S&P 500 is unavailable, the Index Calculation Agent shall perform the calculation required by this Section 4.5(v) using the next closing level of the S&P 500 that is available on a day that is not a Disrupted Day.

4.6 Calculation of Variance Swap Contract Specifications

(i) Expiry of Variance Swap traded on date t

The Expiry Date of Variance Swap traded on date t is the 30th calendar day immediately following t, or if such day is not a Business Day, the immediately preceding Business Day.

$$\mathrm{Expiry(t)} = \mathrm{T}_{30,\mathrm{B}}(\mathrm{t})$$

(ii) Vega Notional of Variance Swap traded on date t

On each day, the Vega Notional of the Variance Swap is determined, using the VRP Signal defined in "Calculation of VRP Signal" section.

$$\mathrm{VegaNotional(t)} = \mathrm{VarSwap(t)} \times \frac{\mathrm{Cash(t\text{-}1)}}{1500}$$

(iii) Strike of Variance Swap traded on date t

On each day, the strike of Variance Swap traded will be determined through the observation of business day adjusted TWAP level for the VIX Index. If Vega Notional is negative, we notionally sell the Variance Swap, otherwise we notionally buy the Variance Swap. If the Vega Notional is 0, no strike is calculated and no Variance Swap is traded on date t.

$$\mathrm{Strike(t)} = \begin{cases} 95\% \times \mathrm{TWAP\_VIX_B(t)}; & \text{if VegaNotional(t)} < 0 \\ 103\% \times \mathrm{TWAP\_VIX_B(t)}; & \text{otherwise} \end{cases}$$

(iv) Variance Notional of Variance Swap traded on date t

On each day, the Variance Notional will be determined as follows:

$$\mathrm{Notional(t)} = \frac{\mathrm{VegaNotional(t)}}{2 \times \mathrm{Strike(t)}}$$

(v) Mark-to-Market Value as of t, for a Variance Swap traded at t_0

Determined as follows:

$$VarMtM(t_0,t)=\begin{cases} 0; & \text{if } t > Expiry(t_0) \\ 0; & \text{if } t = t_0 \\ Notional(t_0)\times\left(\frac{\Delta_B(t_0,t)}{\Delta_B(t_0,Expiry(t_0))}\times(RV(t_0,t))^2+\frac{\Delta_B(t,Expiry(t_0))}{\Delta_B(t_0,Expiry(t_0))}\times\left(Vol(t,Expiry(t_0))\right)^2-(Strike(t_0))^2\right); & \text{otherwise} \end{cases}$$

(vi) Settlement Value as of t, for a Variance Swap traded at t_0

Determined as follows:

$$Settle(t_0,t)=\begin{cases} VarMtM(t_0,t); & \text{if } t=Expiry(t_0) \\ 0; & \text{otherwise} \end{cases}$$

4.7 Calculation of VRP Signal

(i) Percentage VRP

On each day, the Percentage VRP will be determined as the spread between the Business Day Adjusted VIX Level and the Intraday Realized Volatility.

$$VRP(t)=\frac{95\%\times Signal\_VIX_B(t)-\ iRV(t)}{95\%\times Signal\_VIX_B(t)}$$

(ii) VRP Signal

In respect of each Index Business Day t, the VRP Signal will be determined as follows:

$$VRPSignal(t)=\frac{VRP(t)}{iVIXRV(t)}$$

(iii) Intraday Realized Volatility

The "Intraday Realized Volatility" is measured as the 3-day intraday volatility of the S&P 500 using half hour price intervals during normally scheduled NYSE market hours, starting at 13:00 EPT (and 11:00 EPT on half-days) on 3 Index Business Days prior to t, through 13:00 EPT (and 11:00 EPT on half-days) on day t. The overnight change from the official closing time of the

NYSE of one Index Business Day to the scheduled opening time of the next Index Business Day will be deemed as one interval. For avoidance of doubt, the last observation of each Index Business Day will be taken at the official closing time of the NYSE (16:00 EPT and 13:00 EPT on half-days) and may not correspond to the official closing level of the S&P 500.

$$\mathrm{iRV(t)}=100\times\sqrt{\frac{252}{3}\times\sum_{h=h_0+\Delta h}^{h_t}\ln^2\left(\frac{\mathrm{SPX(h)}}{\mathrm{SPX(h-\Delta h)}}\right)}$$

Where :

SPX(h) : means the level of the S&P 500 at each interval (h)

$\mathbf{h_0}$: means 13:00 EPT (and 11:00 EPT on half-days) on 3 Index Business Days prior to t

$\mathbf{h_t}$: means 13:00 EPT (and 11:00 EPT on half-days) on t

$\Delta\mathbf{h}$: means 30 minutes, except the period between the official closing time of one Index Business Day to the scheduled opening time of the next Index Business Day, which will be deemed to be an interval

(iv) Intraday Realized VIX Variance

The Intraday Realized VIX Variance is measured as the 3-day intraday variance of the VIX Index using half hour price intervals during normally scheduled CBOE market hours, starting at 13:00 EPT (and 11:00 EPT on half-days) on 3 Index Business Days prior to t, through 13:00 EPT (and 11:00 EPT on half-days) on day t. The observation between 16:00 EPT (13:00 EPT on half-days) and the official closing time of CBOE (16:15 EPT and 13:15 EPT on half-days) will be deemed to be an interval. The overnight change from the official closing time of the CBOE of one Index Business Day to the scheduled opening time of the next Index Business Day will also be deemed as one interval.

$$\mathrm{iVIXRV(t)}=\frac{252}{3}\times\sum_{v=v_0+\Delta v}^{v_t}\ln^2\left(\frac{\mathrm{VIX(v)}}{\mathrm{VIX(v-\Delta v)}}\right)$$

Where :

VIX(v) : means the level of the CBOE Volatility Index at each interval (v)

$\mathbf{v_0}$: means 13:00 EPT (and 11:00 EPT on half-days) on 3 Index Business Days prior to t

$\mathbf{v_t}$: means 13:00 EPT (and 11:00 EPT on half-days) on t

$\Delta\mathbf{v}$: means 30 minutes, except the period between 16:00 EPT (13:00 EPT on half-days) and the official closing time of the VIX (16:15 EPT, and 13:15

EPT on half-days) will be deemed to be an interval. The period between the official closing time of one Index Business Day to the scheduled opening time of the next Index Business Day will also be deemed to be an interval.

Prior to (but excluding) April 2, 2009, Intraday Realized VIX Variance is approximated by using the official closing level of the CBOE VVIX Index, as published on Reuters under RIC .VVIX, divided by 100 and squared.

(v) Variance Swap Signal

The strategy will buy variance swaps if the VRP Signal is negative. Otherwise if the signal is positive, the strategy will sell variance swaps when the VRP Signal is greater than the average VRP Signal over a trailing 252 business day period.

$$\mathbf{VarSwap(t)} = \begin{cases} -1 \times \mathrm{VRPSignal(t)}; & \text{if } \mathrm{VRPSignal(t)} < 0 \\ -1 \times \mathrm{VRPSignal(t)}; & \text{if } \mathrm{VRPSignal(t)} > 0 \text{ and } \mathrm{VRPSignal(t)} > \mathrm{Average(t)} \\ 0; & \text{otherwise} \end{cases}$$

Where : $\mathrm{Average(t)} = \frac{1}{252}\sum_{n=0}^{251} \mathrm{VRPSignal}(t\text{-}n)$

Effective after December 16th 2017, the value of VarSwap(t) will be subject to a floor of negative six and a cap of six. Thus if the calculation of VarSwap(t) as above results in a value higher than six, then VarSwap(t) will equal six. And if the calculation above results in a negative value less than negative six, then VarSwap(t) will equal negative six.

4.8 Calculation of Index Level

The Index level is determined on each Index Business Day t as the sum of the mark-to-market of all non-expired Variance Swaps and the settlement amounts of all expired Variance Swaps (the "**Index Level**").

$$\mathrm{IL(t)} = \mathrm{Cash(t)} + \mathrm{MtM(t)}$$

$$\mathrm{MtM(t)} = \sum_{n=1}^{n_{\mathrm{act}}} \mathrm{VarMtM}(t\text{-}n+1,t)$$

$$\text{Cash}(t)=\text{Cash}(t\text{-}1)+\sum_{n=1}^{n_{act}}\text{Settle}(t\text{-}n,t\text{-}1)$$

Where :

$\mathbf{IL}(\mathbf{t})$: means the Index Level as of Index Business Day t

$\mathbf{n_{act}}$: means the number of Variance Swaps for which the Expiry Date falls on or after t

$\mathbf{Cash}(\mathbf{t})$: means the Cash Account on Index Business Day t, with its value equal to 1000 on the Index Start Date

The Index level is calculated starting on April 18, 2008. For the calculation, VIX business day adjusted levels is required from April 19, 2007, and Intraday Realized Volatility and Intraday Realized VIX Variance is required from April 16, 2007.

Index Start Date:	April 18, 2008
Index Live Date:	November 28, 2016
Index Sponsor:	Deutsche Bank AG, London

Prior to (and excluding) the Index TWAP Date, the *Observation Time* for all relevant data will be set to the scheduled closing time of the CBOE. The *TWAP Observation Period* will also be set to the scheduled closing time of the CBOE, whereby the *TWAP Process* will establish the level to be that as observed at the *TWAP Observation Period*.

Index TWAP Date: October 6, 2014

5. FEE INFORMATION – EMBEDDED TRANSACTION COSTS

Transaction costs of notionally buying and selling the variance swaps are embedded in the Index. As described above, when the Index notionally sells variance swaps, it will sell at 95% multiplied by the Business Day Adjusted VIX Level (i.e. the strike) as the corresponding bid level, and when the Index notionally buys variance swaps, it will buy at 103% multiplied by the Business Day Adjusted VIX Level (i.e. the strike) as the corresponding ask level. The difference between 95% and 100% of VIX on sales and between 103% and 100% of VIX on purchases represents the transaction costs embedded in the Index. The amount of the embedded transaction costs in the Index on any given day will depend on the absolute level of VIX and the notional of variance swaps traded and therefore can be highly variable due to the potentially large fluctuations in both the VIX and the amount of trading in any given period.

Based on hypothetical historical data from April 18, 2008 to November 1, 2016, the average annual transactional cost of the Index, as evaluated on January 1 of each year, is 5.77%. The transactional costs vary significantly between periods, ranging in the hypothetical historical period as high as 15.81% for the annual period ending January 1, 2010. The hypothetical historical performance and related transactional cost calculations are not based on actual transactional costs or actual performance of the Index as it did not then exist. There can be no assurance that the transactional costs of the Index will not substantially exceed the highest levels indicated in the hypothetical historical period.

Part 2
Disruptions and Change in Methodology

6. CONSEQUENCES OF DISRUPTIONS

If a Disruption Event occurs or is subsisting on any Index Business Day (a **"Disrupted Day"**):

(i) In the case of a Signal Disruption:

(a) in respect of any Variance Swaps to be notionally purchased or sold on such Disrupted Day, such notional transactions shall not take place and the notional for purposes of Section 4.6(iv) is set to zero.

(b) In respect of future Signal calculations, the Disrupted Day will be excluded from all future Signal calculations.

(ii) In the case of a Strike Disruption Event, the Index Calculation Agent will:

Subject to the proviso below, in respect of any Variance Swaps to be notionally purchased or sold on such Disrupted Day which are affected by such Strike Disruption Event (each a "Disrupted Variance Swap"), determine that the notional amount of such Disrupted Variance Swap to be purchased or sold (as applicable) on such Disrupted Day shall be multiplied by a fraction, the numerator of which is equal to 121 minus the number of TWAP Observation Intervals for which one or more of the relevant levels was unavailable and the denominator of which is 121; *provided, however*, if eight (8) or more TWAP Observation Periods are disrupted on an Index Observation Day, then the notional amount of the Disrupted Variance Swap shall be set to zero (including, without limitation, for the purposes of Section 4.6(iv)) and no amounts shall be allocated to such Disrupted Day; and

(iii) in the case of a Temporary Disruption Event:

(a) the Index Calculation Agent may defer the determination and publication of the Index Level until the next Index Business Day on which the Index Calculation Agent determines that no such Temporary Disruption Event exists (an "**Adjusted Index Business Day**"), provided that where any such deferral of determination and publication continues for a period of 8 consecutive Index Business Days, then the Index Calculation Agent will permanently cancel the Index and cease determining and publishing the Index Level as of the date on which such Temporary Disruption Event commenced;

(b) if the Index has not been cancelled pursuant to sub-paragraph (a) above, each Disrupted Day on which the determination and publication of the Index Level has been deferred shall be deemed not to be an Index Business Day for the purposes of any determination or calculation in respect of the Index (as set out in Section 4 (*Calculation of Index Levels*) of Part 1) made by the Index Calculation Agent on and after the Adjusted Index Business Day determined pursuant to sub-paragraph (a) above;

(c) for purposes of Section 4.6(iv), if the closing level of the S&P 500 is unavailable, the notional amount of the Variance Swap will be set to zero;

(d) for purposes of Sections 4.5(v) and 4.6(vi), if the closing level of the S&P 500 is unavailable, the Index Calculation Agent shall use the next closing level of the S&P 500 that is available on a day that is not a Disrupted Day;

(e) for purposes of Section 4.6(v), if the relevant levels of the VIX or VXST are unavailable, the Index Calculation Agent shall use the last values that were available for purposes of such calculations; and

(f) if the closing level of the S&P 500 is unavailable on any given Index Business Day, no Index Level will be published for such day.

(iv) in the case of a Permanent Disruption Event:

(a) the Index Calculation Agent may make such adjustments to the Index Rules as the Index Calculation Agent considers appropriate, including, but not limited to: in the case of a Permanent Underlying Index Event, selecting a successor index to replace the relevant Underlying Index, such successor index to be selected by the Index Calculation Agent with regard to preserving the economic intention of the methodology of the Index and in each case, the Index Calculation Agent may make such adjustments to the Index Rules to reflect such replacement as it determines appropriate; and/or

(b) if the Index Calculation Agent determines that it is not possible to make the adjustments in relation to the Index Rules described in sub-paragraph (a) above, it will permanently cease to determine, calculate and make available the Index Level and cancel the Index.

Notwithstanding the foregoing, if a Disrupted Day is also a the expiry date for any Variance Swap notionally purchased or sold by the Index and expiring on such Disrupted Day shall be deemed to have expired and settled on such day, and the Index Calculation Agent shall reflect the notional value of such settlement on the next following Index Business Day which is not a Disrupted Day.

7. DEFINITIONS

"**Disruption Event**" means a Signal Disruption, a Partial Disruption Event, a Temporary Disruption Event or a Permanent Disruption Event.

"**Force Majeure Event**" means an event or circumstance other than a Temporary Underlying Index Event, a Permanent Underlying Index 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 impairs the ability of the Index Calculation Agent to make determinations or calculations in respect of the Index.

"**Index Observation Day**" means the period from and excluding the Signal Observation Time on the preceding Index Business Day to and including the Signal Observation Time on the current Index Business Day.

“**Permanent Disruption Event**” means the occurrence of any of the following events as determined by the Index Sponsor:

(i) a Force Majeure Event, or

(ii) a Permanent Underlying Index Event,

that in each case, in the opinion of the Index Calculation Agent, impairs on a permanent basis the Index Calculation Agent’s ability to determine the Index Level and/or the notional amounts of any Variance Swaps to be notionally purchased or sold by the Index;

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

(i) an Underlying Index Sponsor:

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

(b) permanently cancels an Underlying Index and no Successor Underlying Index exists;

(c) makes or announces that it will make a change to the dates on which the level of an Underlying Index is scheduled to be published by the Underlying Index Sponsor.

"**Signal Disruption**" means there is no reported level of (a) the VIX in any one hour period during regular trading hours of the CBOE from and excluding the prior Signal Observation Time to and including the current Signal Observation Time or (b) the S&P 500 in any one hour period during regular trading hours of the NYSE from and excluding the prior Signal Observation Time to and including the current Signal Observation Time.

“**Strike Disruption Event**” means that, in respect of the VIX TWAP levels to be observed under Sections 4.5(ii) or 4.6(iii) on any Index Business Day, any of such levels are unavailable during the TWAP Observation Period, as determined by the Index Sponsor.

“**Temporary Disruption Event**” means the occurrence of any of the following events as determined by the Index Sponsor:

(i) a Force Majeure Event; or

(ii) a Temporary Underlying Index Event.

that in each case, in the opinion of the Index Calculation Agent, impairs on a temporary basis the Index Calculation Agent’s ability to determine the Index Level and/or the notional amounts of any Variance Swaps to be notionally purchased or sold by the Index.

"**Temporary Underlying Index Event**" means any the relevant Underlying Index Sponsor on any relevant day, fails to calculate and announce any relevant level of an Underlying Index.

"**TWAP Observation Period**" has the meaning given in Section 4.2(i) (*Data required for the calculation of the VRP Signal*).

"**TWAP Observation Interval**" has the meaning given in Section 4.2(i) (*Data required for the calculation of the VRP Signal*).

"**TWAP Process**" has the meaning given in Section 4.2(i) (*Data required for the calculation of the VRP Signal*).

“**Underlying Index Sponsor**” means the corporation or other entity that (i) is responsible for setting and reviewing the rules and procedures and the methods of calculation and adjustments, if any, related to an Underlying Index, and (ii) announces (directly or through an agent) the level of an Underlying Index on a regular basis during each index calculation date for an Underlying Index. As of the Live Index Commencement Date, the Underlying Index Sponsor for the VIX Index, the VIX Sub-Indices, the VXST Index and the VXST Sub-Indices is the Chicago Board Options Exchange.

"**Underlying Indices**" means the VIX Index, the VIX Sub-Indices, the VXST Index and the VXST Sub-Indices (and each an "**Underlying Index**").

8. CORRECTIONS

In the event that any price or level published by the Underlying Index Sponsor for an Underlying Index on any date which is utilised for any calculation or determination in respect of the Index is subsequently corrected and the correction is published by an Underlying Index Sponsor, as the case may be, after the date of original publication, the Index Calculation Agent may, in its sole discretion adjust or correct any of the terms or levels of the Index to account for such correction(s) but is not obliged to do so. Details of any such adjustment or correction will be made available in the same manner as the Index Level is made available (as set out in Section 111 (*Availability and Publication of Index Levels and Adjustments*) of this Part 2 (*Disruptions and Change in Methodology*) below).

9. CHANGE IN METHODOLOGY OF THE INDEX

In calculating and determining the value of the Index, the Index Calculation Agent will, subject as provided below, employ the methodology described in this Index Description and its application of such methodology shall be conclusive and binding. While the Index Calculation Agent currently employs the above described methodology to calculate the 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 Index or any other events affecting transactions on the same or similar terms to any constituent of the Index) will not arise that would, in the view of the Index Calculation Agent, 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 Level) in order for the Index to continue being calculated and determined notwithstanding the relevant circumstances and the Index Calculation Agent shall be entitled to make any such modification or change in its sole discretion.

The Index Calculation Agent shall be entitled to make such modifications and/or changes to the Index Rules 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 Index Description; and/or

(ii) 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

(iii) to take into account any change in the terms on which options on the Underlying Index are traded.

In deciding what is necessary or desirable the Index Calculation Agent will consider and/or take into account what the Index Calculation Agent determines to be the intended commercial purposes of the Index.

In making any such modifications however the Index Calculation Agent will (x) ensure that such modifications or changes pursuant to this Section 9 (*Change in Methodology of the Index*) will result in a methodology that, in the Index Calculation Agent's sole determination, is consistent in its intended commercial purpose with the methodology described in this Index Description and (y) limit any such modification or change to the Index Rules and/or method of calculating any Index Level(s).

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

Subject to any applicable regulations, the Index Calculation Agent has no obligation to inform any person about such modification or change. The Index Calculation Agent will, however, following any such modification or change, make a new set of Index Rules (and the effective date thereof) available in the same manner as the Index Level is made available (as set out in Section 111 (*Availability and Publication of Index Levels and Adjustments*) of this Part 2 (*Disruptions and Change in Methodology*) below).

10. SUCCESSOR SPONSOR AND SUCCESSOR INDICES

10.1 Successor Underlying Index Sponsor and Successor Underlying Index

If at any relevant time, an Underlying Index is:

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

(ii) is replaced by a successor index (a "**Successor Underlying Index**") which, in the determination of the Index Calculation Agent, 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 (i) such Underlying Index so calculated and (as applicable) published by that Successor Underlying Index Sponsor or (ii) 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 Calculation Agent determines to be appropriate to preserve the economic intention of the methodology of the Index.

11. AVAILABILITY AND PUBLICATION OF INDEX LEVELS AND ADJUSTMENTS

11.1 General

For each Index Business Day, the Index Calculation Agent will make available the Index Level in respect of such day as soon as reasonably practicable on the next following Index Business Day (the "**Index Publication Time**"). Details of any adjustments made to the Index shall be made available by the Index Sponsor on application to the Index Sponsor's principal office in London for the time being at Winchester House, 1 Great Winchester Street, London EC2N 2DB ("**Principal Office**").

The Index is a Deutsche Bank AG proprietary index. No use or publication may be made of the Index without the prior written approval of Deutsche Bank AG.

11.2 Index Level

The Index Level shall be published at one or more of the following locations:

(i) on Bloomberg/Reuters under the following index ticker ("**Index Title**"): DBGVRPUS;

(ii) on such other information sources as the Index Calculation Agent may select from time to time at its sole discretion.

Part 3
RISK DISCLOSURE AND IMPORTANT INFORMATION

Prior to making an investment decision in respect of any financial product the return on which is linked in whole or in part to the performance of the Index (each a "**Financial Product**"), prospective investors should carefully consider all of the information set out in this document, including these risk factors. This Part 3 (*Risk Disclosure and Important Information*) is intended to describe various risk factors which the Index Sponsor believes represent the principal risks associated with a Financial Product. There may be other risks that a prospective investor should consider that are relevant to its particular circumstances or generally, whether arising from market factors or otherwise.

General

When considering any Financial Product, prospective investors should be aware that the Index Level can go down as well as up and that the performance of the Index in any future period may not mirror its past performance.

The Index is a rule based trading strategy which makes hypothetical investments in one-month variance swaps on the S&P 500® Index ("**Variance Swaps**") based on the difference between the implied volatility and the subsequently realized volatility in the S&P 500® Index, as described in Part 1 (*Summary of the Index and Index Calculation*). Investors have no proprietary interest in the underlying components of the S&P 500® Index, the VIX Index, the VIX Sub-Indices, the VXST Index, or the VXST Sub-Indices. Any investment linked or related to the Index will not be the same as an investment in any other derivatives (whether listed on an exchange or OTC) on the VIX Index, VIX Sub-Indices, the VXST Index, the VXST Sub-Indices, or the S&P 500® Index at any time.

Investors considering the performance of the Index must carefully consider the methodology for calculation of relevant values for the Variance Swaps and the calculation of the Index Level.

Without limiting any of the foregoing, in no event shall the Index Sponsor and/or the Index Calculation Agent, acting in such capacity, be liable (whether directly or indirectly, in contract, in tort or otherwise) for any loss incurred by any person that arises out of or in connection with the Index, including in relation to the performance by the Index Sponsor and/or the Index Calculation Agent, of any part of its role as Index Sponsor or Index Calculation Agent (as the case may be) under the Index Rules, provided that nothing shall relieve the Index Sponsor and/or the Index Calculation Agent from any liability arising by reason of fraud or acts or omissions constituting any breach of regulation (including the regulatory system) or other law.

Without limiting any of the foregoing, where use of the Index by a party is pursuant to a transaction between that party and Deutsche Bank AG, in no event shall the Index Sponsor and/or the Index Calculation Agent have any liability to any person except where such liability arises, respectively, from the Index Sponsor's or the Index Calculation Agent's wilful default, negligence resulting from a breach of material obligations only, or gross negligence in all other respects. Without prejudice to the foregoing, in no event shall the Index Sponsor and/or the Index Calculation Agent have any liability for any direct, special, punitive or consequential damages (provided that any such damage is not reasonably foreseeable) even if notified of the possibility of such damages.

The Index Sponsor owns the intellectual property rights in the Index and in this Index Description, which has been supplied by the Index Sponsor. Any use of any such intellectual property rights must be with the prior written consent of the Index Sponsor.

Calculations and Determinations

The Index will be calculated by the Index Calculation Agent.

Although the Index Calculation Agent will obtain information for inclusion in or for use in the calculation of the Index from sources which the Index Calculation Agent considers reliable, neither the Index Sponsor nor the Index Calculation Agent will independently verify such information and do not guarantee the accuracy and/or the completeness of the Index or any data included therein.

Unless otherwise stated, the Index Calculation Agent will make all determinations and calculations required pursuant to the Index Rules. Prospective investors in Financial Products should note that these calculations and determinations in relation to the Index will be final and binding on all parties in the absence of manifest error. The term "manifest error" as used herein shall mean an error that is plain and obvious and can be identified from results of the calculation or determination itself without (i) recourse to the underlying data, or (ii) any application or re-application of any formulae.

Transactions linked to the Index

The Index Sponsor is not obliged to enter into or promote transactions or investments that are linked to the Index and the Index Sponsor makes no express or implied representations or warranties as to: (a) the advisability of purchasing or assuming any risk in connection with any such transaction; (b) the levels at which the Index stands at any particular time on any particular date; (c) the results to be obtained by the issuer of any security or any counterparty or any such issuer's securityholders or customers or any such counterparty's counterparties or customers or any other person or entity from the use of the Index or any data used or published in connection with the Index in connection with any licensed rights or for any other use; or (d) any other matter. The Index Sponsor makes no express or implied representations or warranties of merchantability or fitness for a particular purpose with respect to the Index or any data used or published in connection with the Index.

Discretion

The terms of the Index confer on the Index Calculation Agent the right to make determinations, calculations, adjustments and modifications in relation to the Index and related matters, which involve, in certain circumstances as set out in this document, a degree of discretion in order to ensure that the Index can, where reasonably practicable, continue to be calculated and determined notwithstanding the relevant circumstances or, to allow a delay or a cancellation of the Index. The Index Calculation Agent will, as far as reasonably practicable, exercise any such discretion with the aim of preserving the overall methodology of the Index. The Index Calculation Agent, unless otherwise specified, is required to act in good faith and in a commercially reasonable manner in exercising its discretion, however, there can be no assurance that the exercise of any such discretion (or the absence of exercise, as the case may be) will not increase or decrease the Index Level and/or alter the volatility of the Index.

Reliance on publicly available sources

For so long as the Index Calculation Agent calculates the Index Level, calculations and determinations by the Index Calculation Agent in connection with the Index will be made in reliance upon the information of various publicly available sources that neither the Index Calculation Agent nor the Index Sponsor have independently verified. Neither the Index Calculation Agent nor the Index Sponsor will accept any liability for loss or damage of any kind arising from the use of such information in any such calculation or determination.

Past Performance

Past performance is not indicative of future returns.

The Index has been retrospectively calculated by the Index Calculation Agent on a hypothetical basis, using the methodology described in Section 4 (*Calculation of Index Levels*) of Part 1 (*Summary of the Index and Index Calculation*) using data calculated by the Index Sponsor based on publicly available data. The Index has been calculated on a live basis from the Live Index Commencement Date. All prospective investors should be aware that a retrospective calculation means that no actual investment which allowed a tracking of the performance of the Index was possible at any time during the period of the retrospective calculation and that as a result any comparison is purely hypothetical. The methodology and the model used for the calculation and retrospective calculation of the Index were developed with the advantage of hindsight. In reality it is not possible to invest with the advantage of hindsight and therefore this performance comparison is purely theoretical.

Disruption Events, Changes to the Index and Index Cancellation

Investors should note carefully the provisions under Part 2 (*Disruptions and Change in Methodology*). If a Disruption Event occurs or is subsisting on an Index Business Day, the Index Calculation Agent, may pursuant to these provisions, acting in good faith and a commercially reasonable manner, (i) determine any relevant price, value, amount, rate or level required in order to be able to calculate the Index Level or (ii) defer the determination and publication of the Index Level for up to 8 Index Business Days and, if a Disruption Event exists on such eighth Index Business Day, terminate the calculation or publication of the Index.

Following a material amendment or modification of the terms of the VIX Index, VIX Sub-Indices, the VXST Index, the VXST Sub-Indices, or the S&P 500® Index the Index Calculation Agent may make such determinations, modifications, or adjustments in relation to the Index Rules as it considers appropriate and/or terminate the calculation and publication of the Index.

In certain circumstances, following a correction to the price or level published by the sponsors of the VIX Index, VIX Sub-Indices, the VXST Index, the VXST Sub-Indices, or the S&P 500® Index, which is used for any calculation or determination in respect of the Index, the Index Calculation Agent will, in case of manifest error, adjust or correct the terms or levels of the Index to account for such corrections, but is not obliged to do so.

In certain circumstances, the sponsors of any of the VIX Index, VIX Sub-Indices, the VXST Index, the VXST Sub-Indices, or the S&P 500® Index may be replaced by a successor sponsor and the VIX Index, VIX Sub-Indices, the VXST Index, the VXST Sub-Indices, or the S&P 500® Index may be replaced by a successor index and sub-indices.

Change in Methodology

If any market, regulatory, juridical, financial, fiscal or other circumstances arise that would, in the view of the Index Calculation Agent, necessitate a modification or change of the Index calculation methodology, the Index Calculation Agent shall be entitled to make such modification or change in its sole discretion. The Index Calculation Agent may also make modifications and/or changes to the terms of the Index as it in its sole discretion deems necessary or desirable including, without limitation, to correct any manifest error or proven error or to cure, correct or supplement any defective or ambiguous provision contained herein, to preserve the intended commercial purpose of the Index (where such modification or change is of a formal, minor or technical nature) and/or to take into account any change in the terms on which the relevant options are traded. The Index Sponsor will ensure that such modifications or changes will result in a methodology that, in the Index Calculation Agent's sole determination, is consistent in its intended commercial purposes with the methodology described under Section 4 (*Calculation of Index Levels*) of Part 1 (*Summary of the Index and Index Calculation*).

Fiduciary Duties

Subject always to the regulatory obligations of Deutsche Bank AG and any subsidiary or holding company of Deutsche Bank AG or a subsidiary of such holding company (as such terms are defined in section 1159 and Schedule 6 of the Companies Act 2006) (each a "**Deutsche Bank Entity**" and together "**Deutsche Bank Entities**") in performing each or any of the roles of issuer, obligor, dealer, sponsor of an index or calculation agent of a Financial Product, Deutsche Bank Entities do not act on behalf of, or accept any duty of care or any fiduciary duty to any investors in any Financial Product or any other person.

Conflicts of Interest

Deutsche Bank AG, London Branch acts as Index Sponsor. Conflicts of interest may exist or arise between the Index Sponsor and/or Deutsche Bank Entities acting in other capacities, including as counterparty to a transaction linked to any one or more of the VIX Index or VIX Sub-Indices, the VXST Index or VXST Sub-Indices, or S&P 500® Index. Subject always to its regulatory obligations, each relevant Deutsche Bank Entity will pursue actions and take steps that it deems appropriate to protect its interests without regard to the consequences for investors in any Financial Products. Deutsche Bank Entities may be in possession at any time of information in relation to the the VIX Index or VIX Sub-Indices, the VXST Index or VXST Sub-Indices, or S&P 500® Index which may not be available to investors in any Financial Product. There is no obligation on any Deutsche Bank Entity to disclose to any investor in any Financial Product any such information.

Deutsche Bank Entities may be entitled to receive fees or other payments pursuant to Financial Products or otherwise and to exercise all rights, including rights of termination or resignation, which they may have, even though so doing may have a detrimental effect on investors in any Financial Product.

The Index Sponsor and/or other Deutsche Bank Entities may, as an issuer of securitised products or otherwise, engage in hedging activities that may have an impact on the Index Level on an Index Business Day, meaning that it may be different from the level which it would otherwise have been. While the Index Sponsor believes that such activity will not have a material impact on the Index Level on any relevant day, no assurance can be given that market, financial or other circumstances will not arise with the result that the Index Level on any relevant day is negatively impacted.

Risks pertaining to the Underlying Indices

The VIX Index Sponsor can make methodological changes that could change the level of the VIX Index, VIX Sub-Indices, the VXST Index, or the VXST Sub-Indices. The VIX Index Sponsor can also alter, discontinue or suspend calculation or dissemination of the VIX Index, VIX Sub-Indices, the VXST Index or the VXST Sub-Indices. Such changes could impact the levels of these indices and also therefore the Index Level.

The S&P 500 Sponsor can make methodological changes that could change the level of S&P 500® Index. The S&P 500 Sponsor can also alter, discontinue or suspend calculation or dissemination of the S&P 500® Index. Such changes could impact the levels of the S&P 500® Index and also therefore the Index Level

Strategy Risk

The Index is intended to reflect the economic performance over time, less embedded transaction costs, of a strategy designed to track the notional performance returns from notionally buying and notionally selling one-month variance swaps on the S&P 500® Index as determined by a Variance Risk Premium signal that indicates the direction and magnitude of the daily variance swap position. No assurance or representation (express or implied) is given by the Index Sponsor or the Index Calculation Agent that the signal will accurately predict the direction and magnitude of the variance swap position, and therefore no assurance or representation can be given as to the performance of the Index.

Trading and other transactions by Deutsche Bank AG or Deutsche Bank Entities

Deutsche Bank Entities may hedge their obligations under any Financial Product by purchasing or selling equity securities underlying the VIX Index, equity securities underlying the VXST Index or, equity securities underlying the S&P 500® Index listed or over-the-counter options, futures, swaps or other derivative financial instruments linked to the Index, the VIX Index (including futures contracts on the VIX Index), the VXST Index (including futures contracts on the VXST Index) or the S&P 500® Index, and they may adjust these hedges by, *inter alia*, purchasing or selling any of the foregoing. Although they are not expected to, any of these hedging activities may adversely affect the market price of those items and, therefore, the level of the Index or the value of any Financial Product. It is possible that Deutsche Bank Entities could receive substantial returns from these hedging activities while the Index Level declines.

Deutsche Bank Entities may also engage in trading in equity securities underlying the VIX Index, equity securities underlying the VXST Index, equity securities underlying the S&P 500® index, or listed or over-the-counter options, futures, swaps or other derivative financial instruments linked to the Index, the VIX Index (including futures contracts on the VIX Index), the VXST Index (including futures contracts on the VXST Index), or the S&P 500® 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 market price of those items and, therefore, the level of the Index or the value of any Financial Products. Deutsche Bank Entities may also issue or underwrite other securities or financial or derivative instruments with returns linked or related to changes in the performance of any of the foregoing. By introducing competing products into the marketplace in this manner, Deutsche Bank Entities could adversely affect the level of the Index. With respect to any of the activities described above, Deutsche Bank Entities have no obligation to take the Index Level into consideration.

Each potential investor in any Financial Product should make their own investigations and form their own views as to the appropriateness or otherwise of the Index taking into account their own circumstances.