



Deutsche Bank AG

## Warrants, Notes or Securities Linked to an Index

Deutsche Bank AG may from time to time offer and sell certain warrants, notes or securities linked to an index (collectively, the “**securities**”). This underlying supplement describes several potential indices to which the securities may be linked, as well as related matters concerning the relationship, if any, between Deutsche Bank AG and the sponsor or publisher of the indices. Additional specific terms of any securities that we offer, including any additions or changes to the terms specified in the product supplement relating to your securities or the descriptions of the indices contained in this underlying supplement, will be described in a separate free writing prospectus, term sheet or pricing supplement, which we refer to generally as a “**pricing supplement**.” Any relevant pricing supplement, including any free writing prospectus, should be read in connection with this underlying supplement, the relevant product supplement and the accompanying prospectus and notes prospectus supplement or warrants prospectus supplement, as applicable. If there is any inconsistency between the terms described in the relevant pricing supplement and those described in this underlying supplement or in the accompanying prospectus, prospectus supplement or warrants prospectus supplement, as applicable, or product supplement, the terms described in the relevant pricing supplement will be controlling.

**Underlying Indices:** The Deutsche Bank US Volatility Harvest Excess Return Index, The Deutsche Bank US Volatility Harvest Total Return Index, The Deutsche Bank US Volatility Harvest Total Return Net Index (collectively, the “**Deutsche Bank US Volatility Harvest Indices**”), The Deutsche Bank ImpAct Dollar Equity Volatility Bid Index, The Deutsche Bank Equity MEan Reversion ALpha inDex, The Deutsche Bank Equity MEan Reversion ALpha inDex Emerging Markets and The Deutsche Bank Equity Long Volatility Investment Strategy II Index

Investing in the securities involves risks not associated with an investment in conventional securities. See “**Risk Factors**” in the relevant product supplement and “**Selected Risk Considerations**” in the relevant pricing supplement for risks related to an investment in the securities.

Neither the Securities and Exchange Commission nor any other regulatory body has approved or disapproved of the securities or passed upon the adequacy or accuracy of this underlying supplement or the accompanying prospectus, prospectus supplement or warrants prospectus supplement, as applicable, or product supplement. Any representation to the contrary is a criminal offense.

The securities are not bank deposits and are not insured or guaranteed by the Federal Deposit Insurance Corporation or any other governmental agency.

Deutsche Bank AG

September 28, 2012

## ADDITIONAL INFORMATION ABOUT THE SECURITIES

You should read this underlying supplement together with the prospectus dated September 28, 2012, as supplemented by the prospectus supplement dated September 28, 2012, relating to our Series A global notes, of which these securities are a part, and any relevant product supplement and pricing supplement that we may file with the Securities and Exchange Commission (the “**SEC**”) from time to time, which contains a description of the terms of particular categories of securities or the specific terms of your securities.

Our Central Index Key, or CIK, on the SEC website is 0001159508. As used in this underlying supplement, “**we**,” “**us**” or “**our**” refers to Deutsche Bank AG, including, as the context requires, acting through one of its branches.

You should carefully consider, among other things, the risk considerations set forth in the relevant product supplement and pricing supplement, as the securities involve risks not associated with conventional debt securities. We urge you to consult your investment, legal, tax, accounting and other advisers before deciding to invest in the securities.

This underlying supplement describes potential indices to which the securities may be linked and the relationship, if any, between Deutsche Bank AG and the sponsor or publisher of the indices. If there is any inconsistency between the terms described in the relevant pricing supplement and those described in this underlying supplement, the terms described in the relevant pricing supplement will be controlling. Any relevant pricing supplement should also be read in connection with this underlying supplement, the relevant product supplement, if any, and the accompanying prospectus and prospectus supplement.

In this underlying supplement, when we refer to the “**securities**,” we mean certain securities, notes or warrants that may be offered by Deutsche Bank AG from time to time linked to one or more indices or other underlying assets. Also, references to the “**accompanying prospectus**” and “**prospectus supplement**” mean, respectively, the accompanying prospectus, dated September 28, 2012, of Deutsche Bank AG and the prospectus supplement, dated September 28, 2012, of Deutsche Bank AG, and references to “**relevant product supplement**” refer to the relevant product supplement that we may file from time to time relating to the particular category of your securities. References to the “**relevant pricing supplement**” mean the pricing supplement and any free writing prospectus that describe the specific terms of your securities.

### **Specific Terms Will Be Described in Relevant Pricing Supplements**

The specific terms of your securities will be described in the relevant pricing supplement, including any additions or changes to the terms specified in the relevant product supplement or the description of the indices set forth in this underlying supplement.

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## THE DEUTSCHE BANK US VOLATILITY HARVEST INDICES

### General Description

The Deutsche Bank US Volatility Harvest Excess Return Index (the "**Excess Return Index**") is intended to reflect a volatility arbitrage strategy (the "**Strategy**") which aims to generate consistent returns from implied volatility, realized volatility and mean reversion in the S&P 500<sup>®</sup> Index.

The Deutsche Bank US Volatility Harvest Total Return Index (the "**Total Return Index**") is intended to reflect the performance of the Excess Return Index plus a funding element in the form of the US Federal Funds effective rate.

The Deutsche Bank US Volatility Harvest Total Return Index (the "**Total Return Net Index**") is intended to reflect the performance of the Total Return Index less a 1% (100 basis points) per annum fee.

## THE DEUTSCHE BANK US VOLATILITY HARVEST EXCESS RETURN INDEX

### General Description

The Deutsche Bank US Volatility Harvest Excess Return Index (the "**Excess Return Index**") is intended to reflect a volatility arbitrage strategy which aims to generate consistent returns from implied volatility, realized volatility and mean reversion in the S&P 500<sup>®</sup> Index. The Excess Return Index was created by Deutsche Bank AG, the Index Sponsor, on August 25, 2010 and is calculated, maintained and published by the Index Sponsor. The closing level of the Excess Return Index was set to 100 on December 17, 1999 (the "**Excess Return Index Base Date**"). The Excess Return Index is denominated in U.S. dollars.

The Excess Return Index is comprised of a fixed weight combination of the following three Deutsche Bank AG proprietary indices:

- a) the **Deutsche Bank ImpAct Dollar Equity Volatility BID Index ("ImpAct")**, which tracks the performance of a strategy of selling volatility with respect to the S&P 500<sup>®</sup> Index;
- b) the **Deutsche Bank Equity MEan Reversion ALpha inDex ("EMERALD")**, which tracks the performance of a strategy of buying daily volatility and selling weekly volatility with respect to the S&P 500<sup>®</sup> Index on a weekly rolling basis; and
- c) the **Deutsche Bank Equity Long Volatility Investment Strategy II ("ELVIS II")**, which tracks the performance of a strategy of buying forward volatility with respect to the S&P 500<sup>®</sup> Index;

(each of ImpAct, EMERALD and ELVIS II, a "**Strategy Index**" and together the "**Strategy Indices**"). Further information on each of the Strategy Indices is set out in "The Deutsche Bank ImpAct Dollar Equity Volatility Bid Index", "The Deutsche Bank Equity MEan Reversion ALpha inDex" and "The Deutsche Bank Equity Long Volatility Investment Strategy II Index" below.

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 of the 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. The 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.

Variance is the square of volatility and is used in certain products in the over-the-counter derivatives market in place of volatility due to mathematical properties that make it simpler for financial institutions to value and hedge those products. Each Strategy Index primarily uses variance in its calculations for this reason, but uses and refers to volatility as a standard measure of reference, which is consistent with market practice.

### Excess Return Index Calculation

The Excess Return Index seeks to achieve its aim via a fixed weight combination of notional investments in the three Strategy Indices: (i) 67.5% for ImpAct, (ii) 52.5% for EMERALD and (iii) 30% for ELVIS II (each a "**fixed weight**"). The fixed weights are intended to allow the Excess Return Index to be "volatility neutral" and "non-directional" such that it aims to achieve performance regardless of whether volatility (implied or realized) increases or decreases in respect of the S&P 500<sup>®</sup> Index.

The Excess Return Index closing level for any Trading Day (as defined below) is calculated by adding:

- i) the Excess Return Index closing level as of the third Friday in March, June, September or December immediately preceding such Trading Day commencing on, and including, the Excess Return Index Base Date, or if any such day is not a Trading Day, the previous Trading Day (each such day, a "**Relevant Rebalancing Day**"); and
- ii) the aggregate of the change in each Strategy Index closing level during the period from the Relevant Rebalancing Day until such Trading Day multiplied by the Notional allocated to each Strategy Index closing level for such Trading Day.

The notional in respect of a Strategy Index is reset quarterly on the Relevant Rebalancing Day in accordance with the fixed weights. Each Strategy Index's notional is calculated quarterly on the Trading Day immediately preceding the Relevant Rebalancing Day (each such day, a "**Determination Day**") and is equal to the product of:

- i) the Excess Return Index closing level on the Determination Date; and
- ii) the quotient of (a) the fixed weight for the applicable Strategy Index, as numerator and (b) the closing level of the applicable Strategy Index on the Determination Date, as denominator.

The Excess Return Index rebalances as of the close of trading on the Relevant Rebalancing Day immediately following such Determination Day, with each Strategy Index's new notional taking effect from but excluding such Relevant Rebalancing Day, to and including the immediately following Relevant Rebalancing Day.

The closing level for the Excess Return Index will be calculated by the Index Sponsor and rounded if necessary to the sixth decimal place, with 0.0000005 being rounded upwards. However, the closing level will be rounded for publication if necessary to two decimal places, with 0.005 being rounded upwards (see "Availability and Publication of the Excess Return Index Closing Level and Adjustments" below).

The methodology described herein is subject to the provision set out in "Consequences of Disruptions" and "Change in Methodology of the Excess Return Index" below.

### **Consequences of Disruptions**

If a Disruption Event (defined below), a Force Majeure Event (defined below) or Underlying Index Event (defined below) occurs on any Trading Day, the Index Sponsor will determine in its reasonable discretion whether the occurrence or existence of such event is material in respect of the calculation and/or rebalancing of the Excess Return Index. In the event that the Index Sponsor determines that the occurrence or existence of a Disruption Event, Force Majeure Event or Underlying Index Event is material, it will make such determinations and/or adjustments that in its reasonable discretion are required to take account of such event. In particular (and without limitation), the Index Sponsor in exercising its reasonable discretion, may:

- i) make such determinations and/or adjustments in relation to the terms of the Excess Return Index as it considers reasonably appropriate to determine any relevant price or level and/or to calculate the Excess Return Index closing level on such Trading Day; and/or
- ii) defer the determination and publication of the Excess Return Index closing level until the next Trading Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event which the Index Sponsor in its reasonable discretion determines to be material, ceases to exist; and/or
- iii) where such Trading Day would otherwise have been a Relevant Rebalancing Day, delay the Relevant Rebalancing Day until the next Trading Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event which the Index Sponsor in its reasonable discretion determines to be material, ceases to exist; and/or
- iv) select a successor exchange to replace the applicable Relevant Exchange and/or a successor index using the same or substantially similar formula for and method of calculation as used in the calculation of the S&P 500<sup>®</sup> Index or Strategy Index (a "**Successor Index**") to replace the S&P 500<sup>®</sup> Index or in the case of a Strategy Index, a Successor Index which is sponsored by the same index sponsor and whose methodology is substantially similar to the Strategy Index being replaced (as reasonably determined by the Index Sponsor) and, in each case, make such adjustments to the Excess Return Index to reflect such selection as it determines reasonably appropriate; and/or
- v) permanently cease to determine, calculate and make available the Excess Return Index closing level and cancel the Excess Return Index.

### **Index Sponsor**

Unless otherwise provided and subject to "Change in Methodology of the Excess Return Index" all determinations made by the Index Sponsor 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.

### **Definitions**

*For the purposes of this description of the Excess Return Index:*

**"Disruption Event"** means, in respect of an Option, the S&P 500<sup>®</sup> Index, a Strategy Index and/or the Excess Return Index, an event (other than a Force Majeure Event or an Underlying Index Event) that would require the Index Sponsor to calculate an Option price or the level of the S&P 500<sup>®</sup> Index or make any other determinations in respect of the relevant Option, the S&P 500<sup>®</sup> Index, a Strategy Index or the Excess Return Index on an alternative basis were such event to occur or exist on a day which is a Trading Day (or, if different, the day on which the relevant price(s) for an Option or the relevant level(s) of the S&P 500<sup>®</sup> Index in relation to the relevant Trading Day would, in the ordinary course, be published

or announced by the Related Exchange or the Underlying Index Sponsor (as the case may be). Without limitation to the foregoing, each of the following events shall be a Disruption Event:

- (i) **"Trading Suspension"**: the suspension of trading by the Related Exchange or any Relevant Exchange (as the case may be) or otherwise: (i) in an Option on the Related Exchange or in any additional futures contract or options contract relating to the S&P 500<sup>®</sup> Index on any exchange, trading system or quotation system on which any such futures contracts or options contracts are traded, or (ii) relating to any constituents of the S&P 500<sup>®</sup> Index on any Relevant Exchange;
- (ii) **"Disappearance of an Option Price"**: (i) the failure of trading to commence, or the permanent discontinuation of trading in, a relevant Option on the Related Exchange or (ii) the disappearance of, or of trading on, the S&P 500<sup>®</sup> Index;
- (iii) **"Material Change in Formula or Determination"**: the occurrence since the Excess Return Index Base Date of a material change in the formula for or the method of calculating a relevant Option price or the relevant prices in relation thereto by the Related Exchange or any other relevant party, or a material modification of the Related Exchange's determination and/or dissemination of any Option price or the relevant prices in relation thereto;
- (iv) **"Material Change in Content"**: the occurrence since the Excess Return Index Base Date of a material change in the content, composition or constitution of the S&P 500<sup>®</sup> Index to which a relevant Option 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 or similar tax) on, or in relation to, any relevant Option by any government or taxation authority after the Excess Return Index Base Date, if the direct effect of such imposition, change or removal is to raise or lower an Option price 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 by the Related Exchange or any Relevant Exchange (as the case may be) or otherwise: (i) in a relevant Option or on the Related Exchange or in any additional futures contract or options contract relating to the S&P 500<sup>®</sup> Index on any exchange, trading system or quotation system on which any such futures contracts or options contracts are traded, or (ii) relating to any constituents of the S&P 500<sup>®</sup> Index on any Relevant Exchange;
- (vii) **"De Minimis Trading"**: the number of any relevant Options traded on the Related Exchange on any relevant Trading Day is materially reduced or liquidity in any relevant Option 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 Option or a change in any application or interpretation of such laws, rules or regulations;
- (ix) **"Hedging Disruption"**: Deutsche Bank AG and/or any of its affiliates would be unable, after using reasonable efforts, to: (i) acquire, establish, re-establish, substitute, maintain, unwind or dispose of any transaction(s) or asset(s) necessary to hedge its position in relation to any securities issue or other relevant transactions relating to or calculated by reference to the Excess Return Index, or (ii) realize, recover or remit the proceeds of any such transaction(s) or asset(s), or (iii) avoid incurring an additional liability for taxes of any nature (including, without limitation, any excise, severance, sales, use, value-added, transfer, stamp, documentary, recording or similar tax), or any other charge or expense in respect of any such transaction(s) or asset(s) and such liability did not exist as of the Excess Return Index Base Date;
- (x) **"Material Change in Circumstances"**: the occurrence of any event beyond the control of the Index Sponsor which would make it impossible or not reasonably practicable, for a market counterparty to enter into or maintain or fulfil its obligations under any relevant Option on the Related Exchange or any other relevant trading market;
- (xi) **"Unscheduled Exchange Non-Opening"**: on any day, one or more of the New York Stock Exchange, the NASDAQ Stock Market and/or the Chicago Board Options Exchange does not open on a day when it was scheduled to be open for general business; or
- (xii) **"Exchange Disruption"**: the occurrence or existence on any relevant trading day at the relevant time for the S&P 500<sup>®</sup> Index or at any time during the one hour period that ends at the relevant time for the S&P 500<sup>®</sup> Index:
  - (a) of any event (other than an event as described in paragraph (ii) below) that disrupts or impairs the ability of market participants in general (A) to effect transactions in relation to, or to obtain market values for the relevant constituents of the S&P 500<sup>®</sup> Index on the relevant exchanges or (B) to effect transactions in, or to obtain market values for, options contracts or futures contracts on or relating to the S&P 500<sup>®</sup> Index on the Related Exchange; or
  - (b) the closure on any relevant day of any relevant exchange(s) relating to any constituents of the S&P 500<sup>®</sup> Index, or the Related Exchange prior to its scheduled closing time unless such earlier closing time is

announced by such exchange(s) or the Related Exchange, as the case may be, at least one hour prior to the earlier of (A) the actual closing time for the regular trading session on such exchange(s) or the Related Exchange on such day and (B) the submission deadline (if applicable) for orders to be entered into such exchange(s) or the Related Exchange system for execution at the relevant time on such day; or

- (c) a general moratorium is declared in respect of banking activities in any Relevant Country; or
- (d) a Relevant Country (i) imposes any controls or announces its intention to impose any controls or (ii)(A) implements or announces its intention to implement or (B) changes or announces its intention to change the interpretation or administration of any laws or regulations, which is likely to affect the ability of the Index Sponsor and/or any of its affiliates to acquire, hold, transfer or realize such constituent of the S&P 500<sup>®</sup> Index or to otherwise effect transactions in relation to the S&P 500<sup>®</sup> Index.

**"Force Majeure Event"** means, in respect of the Excess Return 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 affects the calculations or determinations in respect of an Option, the S&P 500<sup>®</sup> Index, any Strategy Index and/or the Excess Return Index.

**"Option"** means an option (including any call or put option) on the S&P 500<sup>®</sup> Index traded on the Related Exchange.

**"Related Exchange"** means the Chicago Board Options Exchange, or any successor exchange, trading system or quotation system on which options or futures contracts on the S&P 500<sup>®</sup> Index are traded, as determined by the Index Sponsor.

**"Relevant Country"** means any country (or any political or regulatory authority thereof) with which the S&P 500<sup>®</sup> Index or a constituent of the S&P 500<sup>®</sup> Index has a material connection having regard to, without limitation, the country or countries in which the S&P 500<sup>®</sup> Index is calculated or published, the issuer of such constituent is incorporated and/or such other factor(s) as may be appropriate.

**"Relevant Exchanges"** means each of the New York Stock Exchange, the NASDAQ Stock Market and the Chicago Board Options Exchange.

**"Trading Day"** means a day, as determined by the Index Sponsor, on which each of the Relevant Exchanges are open for trading during their regular trading session, notwithstanding any such Relevant Exchanges closing prior to their scheduled closing time.

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

- (i) in respect of the S&P 500<sup>®</sup> Index or a Strategy Index:
  - (a) the S&P 500<sup>®</sup> Index or a Strategy Index is not calculated or announced by the Underlying Index Sponsor or the Index Sponsor of the relevant Strategy Index (as applicable) but is calculated by a successor sponsor; or
  - (b) the S&P 500<sup>®</sup> Index or a Strategy Index is replaced by a successor index (a **"Successor Index"**) using the same or substantially similar formula for and method of calculation as used in the calculation of the S&P 500<sup>®</sup> Index or the Strategy Index, or
  - (c) the Underlying Index Sponsor or an Index Sponsor of a relevant Strategy Index:
    - (I) announces that it will make a material change in the formula for or the method of calculating the S&P 500<sup>®</sup> Index or a Strategy Index (as applicable) or in any other way materially modifies the S&P 500<sup>®</sup> Index or a Strategy Index;
    - (II) permanently cancels the S&P 500<sup>®</sup> Index or a Strategy Index and no Successor Index exists;
    - (III) on any relevant Trading Day, fails to calculate and announce any relevant level of the S&P 500<sup>®</sup> Index or a Strategy Index;



- (ii) the failure of the Related Exchange or the Underlying Index Sponsor to announce or publish any information necessary for determining an Option price or the S&P 500<sup>®</sup> Index level (as the case may be);
- (iii) any announcement or publication is made by the Related Exchange of information necessary for determining an Option price that is erroneous or insufficient for the determination of such Option price; or
- (iv) there is a temporary or permanent discontinuance or unavailability of any Relevant Exchange.

**"Underlying Index Sponsor"** means the entity, or the successor entity, that regularly calculates and publishes the level of the S&P 500<sup>®</sup> Index.

#### **Change in Methodology of the Excess Return Index**

In calculating and determining the value of the Excess Return Index, the Index Sponsor will, subject to the provisions below, employ the methodology described above. The application of such methodology by the Index Sponsor will be conclusive and binding. While the Index Sponsor currently employs the above described methodology to calculate the Excess Return Index, no assurance can be given that fiscal, market, regulatory, juridical, financial or other circumstances (including, but not limited to, any changes to or any suspension or termination of or any other events affecting transactions on the same or similar terms to any financial instrument for which values will be derived from the S&P 500<sup>®</sup> Index and its volatility including options and swaps based on the S&P 500<sup>®</sup> Index) 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 Excess Return Index in any manner that it deems necessary or desirable, including (without limitation) to correct any manifest or proven error or to cure, correct or supplement any ambiguity or defective provision contained in this description.

#### **Availability and Publication of the Excess Return Index Closing Level and Adjustments**

The Excess Return Index closing level will be published on Bloomberg under the title "DB US Volatility Harvest ER." The Bloomberg page relating to the Excess Return Index is DBVEHUE, or any successors to such page or service as selected by the Index Sponsor from time to time. Certain details as to levels of the Excess Return Index and adjustments made in respect of the Excess Return Index may be made available on such pages.

*"Deutsche Bank US Volatility Harvest Excess Return Index" is a proprietary index of Deutsche Bank. Any use of such index or its name must be with the consent of Deutsche Bank AG.*

## THE DEUTSCHE BANK US VOLATILITY HARVEST TOTAL RETURN INDEX

### General Description

The Deutsche Bank US Volatility Harvest Total Return Index (the "**Total Return Index**") is intended to reflect the performance of the Deutsche Bank US Volatility Harvest Excess Return Index (the "**Excess Return Index**") plus a funding element in the form of the US Federal Funds effective rate. The Total Return Index was created by Deutsche Bank AG, the Index Sponsor, on August 25, 2010 and is calculated, maintained and published by the Index Sponsor. The closing level of the Total Return Index was set to 100 on December 17, 1999 (the "**Total Return Index Base Date**"). The Total Return Index is denominated in U.S. dollars.

### Total Return Index Calculation

The Total Return Index closing level for any Trading Day (as defined in the Excess Return Index description) is calculated as:

- i) the Total Return Index closing level as of the Relevant Rebalancing Day (as defined in the Excess Return Index description);
- ii) multiplied by the Excess Return Index return, calculated as the Excess Return Index closing level on such Trading Day divided by the Excess Return Index closing level as of the Relevant Rebalancing Day, minus 1;
- iii) plus the Notional Cash Amount.

The "Notional Cash Amount" in respect of any Trading Day which is the first Trading Day immediately following a Relevant Rebalancing Day, equals the product of:

- i) the Total Return Index closing level as of such Trading Day;
- ii) the sum of (a) 1 plus (b) the US Federal Funds effective rate on the Trading Day immediately preceding such Trading Day; and
- iii) the quotient of (a) the number of calendar days from but excluding the Trading Day immediately preceding such Trading Day to and including such Trading Day, as numerator and (b) 360, as denominator.

The "Notional Cash Amount" in respect of any Trading Day which is not the first Trading Day immediately following a Relevant Rebalancing Day, equals the product of:

- i) the Notional Cash Amount as of the immediately preceding Trading Day;
- ii) the sum of (a) 1 plus (b) the US Federal Funds effective rate on the Trading Day immediately preceding such Trading Day; and
- iii) the quotient of (a) the number of calendar days from but excluding the Trading Day immediately preceding such Trading Day to and including such Trading Day, as numerator and (b) 360, as denominator.

The closing level for the Total Return Index will be calculated by the Index Sponsor and rounded if necessary to the sixth decimal place, with 0.0000005 being rounded upwards. However, the closing level will be rounded for publication if necessary to two decimal places, with 0.005 being rounded upwards (see "Availability and Publication of the Total Return Index Closing Level and Adjustments" below).

The methodology described herein is subject to the provision set out in "Consequences of Disruptions" and "Change in Methodology of the Total Return Index" below.

### Consequences of Disruptions

If a Disruption Event, Force Majeure Event or Underlying Index Event occurs on any Trading Day with respect to the Excess Return Index (as described above in the Excess Return Index description), the Index Sponsor will determine in its reasonable discretion whether the occurrence or existence of such event is material in respect of the calculation and/or rebalancing of the Total Return Index. In the event that the Index Sponsor determines that the occurrence or existence of a Disruption Event, Force Majeure Event or Underlying Index Event is material, it will make such determinations and/or adjustments that in its reasonable discretion are required to take account of such event. In particular (and without limitation), the Index Sponsor in exercising its reasonable discretion, may:

- i) make such determinations and/or adjustments in relation to the terms of the Total Return Index as it considers reasonably appropriate to determine any relevant price or level and/or to calculate Total Return Index closing level on such Trading Day; and/or

- ii) defer the determination and publication of the Total Return Index closing level until the next Trading Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event which the Index Sponsor in its reasonable discretion determines to be material, ceases to exist; and/or
- iii) where such Trading Day would otherwise have been a Relevant Rebalancing Day, delay the Relevant Rebalancing Day until the next Trading Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event which the Index Sponsor in its reasonable discretion determines to be material, ceases to exist; and/or
- iv) select a successor exchange to replace the applicable Relevant Exchange and/or a successor index using the same or substantially similar formula for and method of calculation as used in the calculation of the S&P 500<sup>®</sup> Index or Strategy Index (as defined in the Excess Return Index description) (a “**Successor Index**”) to replace the S&P 500<sup>®</sup> Index or in the case of a Strategy Index, a Successor Index which is sponsored by the same index sponsor and whose methodology is substantially similar to the Strategy Index being replaced (as reasonably determined by the Index Sponsor) and, in each case, make such adjustments to the Total Return Index to reflect such selection as it determines reasonably appropriate; and/or
- v) permanently cease to determine, calculate and make available the Total Return Index closing level and cancel the Total Return Index.

### **Index Sponsor**

Unless otherwise provided and subject to “Change in Methodology of the Total Return Index” all determinations made by the Index Sponsor 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 Total Return Index**

In calculating and determining the value of the Total Return Index, the Index Sponsor will, subject to the provisions below, employ the methodology described above. The application of such methodology by the Index Sponsor will be conclusive and binding. While the Index Sponsor currently employs the above described methodology to calculate the Total Return Index, no assurance can be given that fiscal, market, regulatory, juridical, financial or other circumstances (including, but not limited to, any changes to or any suspension or termination of or any other events affecting transactions on the same or similar terms to any financial instrument for which values will be derived from the S&P 500<sup>®</sup> Index and its volatility including options and swaps based on the S&P 500<sup>®</sup> Index) 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 Total Return Index in any manner that it deems necessary or desirable, including (without limitation) to correct any manifest or proven error or to cure, correct or supplement any ambiguity or defective provision contained in this description.

### **Availability and Publication of the Total Index Closing Level and Adjustments**

The Total Index closing level will be published on Bloomberg under the title “DB US Volatility Harvest TR.” The Bloomberg page relating to the Total Return Index is DBVEHUT, or any successors to such page or service as selected by the Index Sponsor from time to time. Certain details as to levels of the Total Return Index and adjustments made in respect of the Total Return Index may be made available on such pages.

*“Deutsche Bank US Volatility Harvest Total Return Index” is a proprietary index of Deutsche Bank. Any use of such index or its name must be with the consent of Deutsche Bank AG.*

## THE DEUTSCHE BANK US VOLATILITY HARVEST TOTAL RETURN NET INDEX

### General Description

The Deutsche Bank US Volatility Harvest Total Return Net Index (the "**Total Return Net Index**") is intended to reflect the performance of the Deutsche Bank US Volatility Harvest Total Return Index (the "**Total Return Index**") less a 1% (100 basis points) per annum fee. The Total Return Net Index was created by Deutsche Bank AG, the Index Sponsor, on August 25, 2010 and is calculated, maintained and published by the Index Sponsor. The closing level of the Total Return Net Index was set to 100 on December 17, 1999 (the "**Total Return Net Index Base Date**"). The Total Return Net Index is denominated in U.S. dollars.

### Total Return Net Index Calculation

The Total Return Net Index closing level for any Trading Day (as defined in the Excess Return Index description) is calculated as:

- i) the Total Return Net Index closing level as of the Relevant Rebalancing Day (as defined in the Excess Return Index description);
- ii) multiplied by the Total Return Index return, calculated as the Total Return Index closing level on such Trading Day divided by the Total Return Index closing level as of the Relevant Rebalancing Day;
- iii) minus a cumulative running fee, calculated as the product of
  - (a) the Total Return Net Index closing level as of the Relevant Rebalancing Day,
  - (b) 1% (100 basis points) and
  - (c) the quotient of (x) the number of days from but excluding the immediately preceding Relevant Rebalancing Day to but including such Trading Day, as numerator and by (y) 365, as denominator.

The Total Return Net Index closing level will be calculated by the Index Sponsor and rounded if necessary to the sixth decimal place, with 0.0000005 being rounded upwards. However, the closing level will be rounded for publication if necessary to two decimal places, with 0.005 being rounded upwards (see "Availability and Publication of the Total Return Net Index Closing Level and Adjustments" below).

The methodology described herein is subject to the provision set out in "Consequences of Disruptions" and "Change in Methodology of the Total Return Net Index" below.

### Consequences of Disruptions

If a Disruption Event, Force Majeure Event or Underlying Index Event occurs on any Trading Day with respect to the Excess Return Index (as described above in the Excess Return Index description), the Index Sponsor will determine in its reasonable discretion whether the occurrence or existence of such event is material in respect of the calculation and/or rebalancing of the Total Return Net Index. In the event that the Index Sponsor determines that the occurrence or existence of a Disruption Event, Force Majeure Event or Underlying Index Event is material, it will make such determinations and/or adjustments that in its reasonable discretion are required to take account of such event. In particular (and without limitation), the Index Sponsor in exercising its reasonable discretion, may:

- i) make such determinations and/or adjustments in relation to the terms of the Total Return Net Index as it considers reasonably appropriate to determine any relevant price or level and/or to calculate Total Return Net Index closing level on such Trading Day; and/or
- ii) defer the determination and publication of the Total Return Net Index closing level until the next Trading Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event which the Index Sponsor in its reasonable discretion determines to be material, ceases to exist; and/or
- iii) where such Trading Day would otherwise have been a Relevant Rebalancing Day, delay the Relevant Rebalancing Day until the next Trading Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event which the Index Sponsor in its reasonable discretion determines to be material, ceases to exist; and/or
- iv) select a successor exchange to replace the applicable Relevant Exchange and/or a successor index using the same or substantially similar formula for and method of calculation as used in the calculation of the S&P 500<sup>®</sup> Index or Strategy Index (as defined in the Excess Return Index description) (a "**Successor Index**") to replace the S&P 500<sup>®</sup> Index or in the case of a Strategy Index, a Successor Index which is sponsored by the same index sponsor and whose methodology is substantially similar to the Strategy Index being replaced (as reasonably

determined by the Index Sponsor) and, in each case, make such adjustments to the Total Return Net Index to reflect such selection as it determines reasonably appropriate; and/or

- v) permanently cease to determine, calculate and make available the Total Return Net Index closing level and cancel the Total Return Net Index.

### **Index Sponsor**

Unless otherwise provided and subject to “Change in Methodology of the Total Return Net Index” all determinations made by the Index Sponsor 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 Total Return Net Index**

In calculating and determining the value of the Total Return Net Index, the Index Sponsor will, subject to the provisions below, employ the methodology described above. The application of such methodology by the Index Sponsor will be conclusive and binding. While the Index Sponsor currently employs the above described methodology to calculate the Total Return Net Index, no assurance can be given that fiscal, market, regulatory, juridical, financial or other circumstances (including, but not limited to, any changes to or any suspension or termination of or any other events affecting transactions on the same or similar terms to any financial instrument for which values will be derived from the S&P 500<sup>®</sup> Index and its volatility including options and swaps based on the S&P 500<sup>®</sup> Index) 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 Total Return Net Index in any manner that it deems necessary or desirable, including (without limitation) to correct any manifest or proven error or to cure, correct or supplement any ambiguity or defective provision contained in this description.

### **Availability and Publication of Total Return Net Index Closing Level and Adjustments**

The Total Return Net Index closing level will be published on Bloomberg under the title “DB US Volatility Harvest TR Net.” The Bloomberg page relating to the Total Return Net Index is DBVEHUTN, or any successors to such page or service as selected by the Index Sponsor from time to time. Certain details as to levels of the Total Return Net Index and adjustments made in respect of the Total Return Net Index may be made available on such pages.

*“Deutsche Bank US Volatility Harvest Total Return Net Index” is a proprietary index of Deutsche Bank. Any use of such index or its name must be with the consent of Deutsche Bank AG.*

# THE DEUTSCHE BANK IMPACT DOLLAR EQUITY VOLATILITY BID INDEX (“IMPACT”)

The Deutsche Bank ImpAct Dollar Equity Volatility BID Index (“**ImpAct**”) tracks the performance of a strategy of selling volatility with respect to the S&P 500<sup>®</sup> Index. ImpAct was created by Deutsche Bank AG, the Index Sponsor, on September 26, 2007 and is calculated, maintained and published by the Index Sponsor. The ImpAct closing level was set to 100 on December 17, 1999 (the “**ImpAct Base Date**”) and ImpAct is denominated in U.S. dollars.

## Investment Strategy and Index Composition

### *Investment Strategy*

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 of the 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. The 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.

Variance is the square of volatility and is used in certain products in the over-the-counter (“**OTC**”) derivatives market in place of volatility due to mathematical properties that make it simpler for financial institutions to value and hedge those products.

In general, the realized volatility (or variance) of an asset for a given period of time will differ from its implied volatility (or variance) as calculated at or before the beginning of such period. Market participants may seek to implement an investment strategy based on taking positions in the direction and magnitude of this difference. One vehicle for doing so is an OTC derivative instrument referred to as a “**variance swap**”.

A variance swap is a contract on the realized variance of an underlying asset, typically an equity security or equity index, over the life of the contract. The buyer agrees at the outset to pay a fixed amount (known as the “**strike**”) at the expiry of the swap, and in return receives a payout, also at expiry, from the counterparty selling the swap. The value of such payout depends on the realized variance of the underlying asset during the life of the swap. If the variance of the underlying asset realized over the life of the swap exceeds the strike variance of the contract, the buyer will make a profit. Otherwise, the trade will result in a loss to the buyer and a profit to the seller.

### *Index Composition*

ImpAct, which is composed of a short position in a variance swap, reflects a strategy of notionally selling variance swaps that aim to capture the difference between implied and realized volatility of the S&P 500<sup>®</sup> Index. Variance is the square of volatility. Variance swaps are used as the basis for ImpAct because variance swaps are more common in the OTC derivatives market than volatility swaps and have mathematical properties that make them more convenient for financial institutions to value and hedge by means of a portfolio of options.

The performance of ImpAct depends on the difference between the strike of a variance swap set by reference to the implied volatility of the S&P 500<sup>®</sup> Index (as calculated based on listed-option prices), and a measure of the volatility actually realized by the S&P 500<sup>®</sup> Index through expiry. ImpAct appreciates when the implied volatility of the S&P 500<sup>®</sup> Index is greater than the realized volatility of the S&P 500<sup>®</sup> Index and depreciates when realized volatility is greater than implied volatility.

ImpAct uses the methodology described below to calculate the implied variance level of the S&P 500<sup>®</sup> Index from listed-options prices. This methodology is similar but not identical to the methodology the Chicago Board Options Exchange (the “**CBOE**”) uses to calculate its “**VIX**” Volatility Index, which reflects the market expectations for the 30-day volatility of the S&P 500<sup>®</sup> Index return.

### *Roll-Over*

The short position of ImpAct in a variance swap based on the S&P 500<sup>®</sup> Index is entered into at each month's listed-options expiration date (each such expiration date, a “**Rebalancing Date**”) and is effective until the next month's expiry. At that time, the existing swap is settled and a new short swap position is entered into with a recalculated strike and notional amount. The short swap is thus effectively “rolled-over.” Rebalancing Dates typically fall on the third Friday of each month but will fall on the prior day that is a Trading Day if a scheduled Rebalancing Date is not a Trading Day. The period beginning on a Rebalancing Date when a notional variance swap with a particular strike and notional amount is established and ending the next Rebalancing Date when such notional variance swap is settled is referred to as a “**Rebalancing Period**”.

The notional amount of the new notional variance swap to be entered into on each Rebalancing Date is set such that ImpAct would drop to 50% of its then current level over the next month if the realized volatility was four times the strike for that variance swap.

The closing level for ImpAct is calculated daily. The closing prices of options on the S&P 500<sup>®</sup> Index listed on the CBOE are used in the calculation of the closing level for ImpAct except on those days that are Rebalancing Dates, when the market open prices from the CBOE for the listed options are used instead.

### **Calculation of ImpAct**

On each Rebalancing Date, a notional variance swap is created, which is deemed to have been sold by ImpAct. This notional variance swap has a strike and a notional amount established as described below and an expiration date on the Rebalancing Date in the following month.

#### *Options on the S&P 500<sup>®</sup> Index and Determination of Option Strip*

Options on the S&P 500<sup>®</sup> Index are traded on the CBOE. These options are cash settled and are “European,” meaning that they may be exercised only on their expiration date. An option may be a “call option”, in which the purchaser has a right to receive payment based on the excess, if any, of the level of the S&P 500<sup>®</sup> Index on the option expiration date over the strike price set for the option (and the seller has the obligation to make such payment), or a “put option”, in which the purchaser has the right to receive payment based on the excess, if any, of the strike price set for the option over the S&P 500<sup>®</sup> Index level on the option expiration date (and the seller has the obligation to make such payment). In determining the amount payable upon expiration, each point of difference between the S&P 500<sup>®</sup> Index level and strike is multiplied by \$100. The expiration date for options is generally the third Friday of the expiration month.

Both call and put options on the S&P 500<sup>®</sup> Index are generally quoted on the CBOE for a range of strikes around the current index level (generally at intervals of five points), with options being quoted having expiration dates in each of the next three months and in three subsequent quarter-end months. For each strike, both “**bid**” and “**ask**” prices are quoted for both call and put options, with a bid representing the price which market participants are offering to buy the option, and an ask representing the price at which market participants are offering to sell the option. Premium quotes for options are stated in decimals, with each point equaling \$100. In describing the price of an option, the “**mid-market**” price is also often referred to, which is the average between the bid and the ask price for the option. For the range of options with different strikes but the same expiration date, the strike for which the difference is smallest between the mid-market price for call options and the mid-market price for put options is referred to as the “**at-the-money**” (**ATM**) strike, because it is viewed as being nearest the market’s anticipated level for the option at the expiration date. A call is referred to as “**out-of-the-money**” (**OTM**) if its strike is greater than the strike of the ATM option, and a put is out-of-the-money if its strike is less than the strike of the ATM option.

In order to calculate the strike for the variance swap underlying ImpAct, a portfolio of S&P 500<sup>®</sup> Index options, referred to as the “**Option Strip**”, is defined. The Option Strip consists of the OTM options with strike prices within three standard deviations (based on the closing VIX level as of the Rebalancing Date) of the one-month “**forward**” S&P 500<sup>®</sup> Index level.

The one-month forward S&P 500<sup>®</sup> Index level is an expression of market participants’ expectation of what the S&P 500<sup>®</sup> Index level will be on the following Rebalancing Date. It is estimated as the sum of (i) the ATM strike for options on the S&P 500<sup>®</sup> Index having an expiration date on the next Rebalancing Date and (ii) the future value of the difference of the bid prices of the call and put options at such strike (calculated using the continuous risk-free rate based on Deutsche Bank’s USD NYC closing Treasury yield curve).

#### *Calculation of Implied Variance, Strike and Notional Amount*

The implied variance of the S&P 500<sup>®</sup> Index is calculated based upon the bid prices for the OTM options in the Option Strip and their strike prices, the forward price of the S&P 500<sup>®</sup> Index, the time until the next Rebalancing Date and the risk-free interest rate. The calculation is similar to the calculation used by the CBOE to calculate the VIX level, though the VIX uses all non-zero-bid price OTM options rather than restricting such OTM options as ImpAct does.

The variance swap notional amount is set on each Rebalancing Date at an amount such that, if the realized volatility is equal to four times the strike level, ImpAct will drop by 50%.

#### *Index Calculation*

The ImpAct level as of the close of each day in a Rebalancing Period equals the ImpAct level as of the Rebalancing Date that began such Rebalancing Period, plus the cumulative profit or loss of the current notional variance swap short position from such Rebalancing Date through such date.

The cumulative profit or loss is calculated by multiplying the notional amount of the swap by the strike of the swap less the “**current variance**”.

The current variance as of a given day is calculated as a weighted combination of (i) the “**realized variance**” from the Rebalancing Date that started the Rebalancing Period through and including the day in question and (ii) the “**implied variance**” from such day until the next Rebalancing Date, with the weighting of each being based on the number of calendar days in each sub-period.

The realized variance is the variance of the natural logarithm of the daily return of the closing market level of the S&P 500® Index in such period, calculated using the standard mathematical formula and assuming a mean log-return of zero.

The implied variance is calculated using the same formula as for the strike price, except that, for the last six calendar days of the Rebalancing Period, the implied variance is held constant at the level calculated using such formula for the seventh calendar day prior to the next Rebalancing Date (or the previous Trading Day if such seventh day is not a Trading Day). The Option Strip and other relevant parameters used in the calculation of the implied variance as of any date are determined as of the date of such calculation and thus will not in general correspond to those used in the calculation of the strike price for the swap.

The ImpAct closing level will be calculated by the Index Sponsor and rounded if necessary to the sixth decimal place, with 0.0000005 being rounded upwards. However, the ImpAct closing level will be rounded for publication if necessary to two decimal places, with 0.005 being rounded upwards (see “Availability and Publication of ImpAct Closing Level and Adjustments” below).

The methodology described herein is subject to the provision set out in “Change in Methodology of ImpAct” below.

### **Consequences of Disruptions**

If a Disruption Event (defined below), a Force Majeure Event (defined below) or Underlying Index Event (defined below) occurs on any Trading Day, the Index Sponsor will determine in its reasonable discretion whether the occurrence or existence of such event is material in respect of the calculation and/or rebalancing of ImpAct. In the event that the Index Sponsor determines that the occurrence or existence of a Disruption Event, Force Majeure Event or Underlying Index Event is material, it will make such determinations and/or adjustments that in its reasonable discretion are required to take account of such event. In particular (and without limitation), the Index Sponsor in exercising its reasonable discretion, may:

- i) make such determinations and/or adjustments in relation to the terms of ImpAct as it considers reasonably appropriate to determine any relevant price or level and/or to calculate the ImpAct closing level on such Trading Day; and/or
- ii) defer the determination and publication of the ImpAct closing level until the next Trading Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event which the Index Sponsor in its reasonable discretion determines to be material, ceases to exist; and/or
- iii) where such Trading Day would otherwise have been a Rebalancing Date, delay the Rebalancing Date until the next Trading Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event which the Index Sponsor in its reasonable discretion determines to be material, ceases to exist; and/or
- iv) in the case of an Underlying Index Event, in its reasonable discretion, select a successor exchange to replace the CBOE and/or a successor index to replace the affected Underlying Index and, in each case, make such adjustments to ImpAct to reflect such selection as it determines reasonably appropriate; and/or
- v) permanently cease to determine, calculate and make available the ImpAct closing level and cancel ImpAct.

### **Index Sponsor**

Unless otherwise provided and subject to “Change in Methodology of ImpAct” all determinations made by the Index Sponsor 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.

### **Definitions**

*For the purposes of this description of ImpAct:*

**“Disruption Event”** means, in respect of an Option and/or ImpAct, an event (other than a Force Majeure Event or an Underlying Index Event) that would require the Index Sponsor to calculate an Option price or the level of the S&P 500® Index or make any other determinations in respect of the relevant Option or ImpAct on an alternative basis were such event to occur or exist on a day which is a Trading Day (or, if different, the day on which the relevant price(s) for an Option in relation to the relevant Trading Day would, in the ordinary course, be published or announced by the Related Exchange). Without limitation to the foregoing, each of the following events shall be a Disruption Event:



- (i) **"Trading Suspension"**: the suspension of trading by the Related Exchange or any Relevant Exchange (as the case may be) or otherwise: (i) in an Option on the Related Exchange or in any additional futures contract or options contract relating to the S&P 500<sup>®</sup> Index on any exchange, trading system or quotation system on which any such futures contracts or options contracts are traded, or (ii) relating to any constituents of the S&P 500<sup>®</sup> Index on any Relevant Exchange;
- (ii) **"Disappearance of an Option Price"**: (i) the failure of trading to commence, or the permanent discontinuation of trading in, a relevant Option on the Related Exchange or (ii) the disappearance of, or of trading on, the S&P 500<sup>®</sup> Index;
- (iii) **"Material Change in Formula or Determination"**: the occurrence since the ImpAct Base Date of a material change in the formula for or the method of calculating a relevant Option price or the relevant prices in relation thereto by the Related Exchange or any other relevant party, or a material modification of the Related Exchange's determination and/or dissemination of any Option price or the relevant prices in relation thereto;
- (iv) **"Material Change in Content"**: the occurrence since the ImpAct Base Date of a material change in the content, composition or constitution of the S&P 500<sup>®</sup> Index to which a relevant Option 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 or similar tax) on, or in relation to, any relevant Option by any government or taxation authority after the ImpAct Base Date, if the direct effect of such imposition, change or removal is to raise or lower an Option price 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 by the Related Exchange or any Relevant Exchange (as the case may be) or otherwise: (i) in a relevant Option or on the Related Exchange or in any additional futures contract or options contract relating to the S&P 500<sup>®</sup> Index on any exchange, trading system or quotation system on which any such futures contracts or options contracts are traded, or (ii) relating to any constituents of the S&P 500<sup>®</sup> Index on any Relevant Exchange;
- (vii) **"De Minimis Trading"**: the number of any relevant Options traded on the Related Exchange on any relevant Trading Day is materially reduced or liquidity in any relevant Option 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 Option or a change in any application or interpretation of such laws, rules or regulations;
- (ix) **"Hedging Disruption"**: Deutsche Bank AG and/or any of its affiliates would be unable, after using reasonable efforts, to: (i) acquire, establish, re-establish, substitute, maintain, unwind or dispose of any transaction(s) or asset(s) necessary to hedge its position in relation to any securities issue or other relevant transactions relating to or calculated by reference to ImpAct, or (ii) realize, recover or remit the proceeds of any such transaction(s) or asset(s), or (iii) avoid incurring an additional liability for taxes of any nature (including, without limitation, any excise, severance, sales, use, value-added, transfer, stamp, documentary, recording or similar tax), or any other charge or expense in respect of any such transaction(s) or asset(s) and such liability did not exist as of the ImpAct Base Date;
- (x) **"Material Change in Circumstances"**: the occurrence of any event beyond the control of the Index Sponsor which would make it impossible or not reasonably practicable, for a market counterparty to enter into or maintain or fulfil its obligations under any relevant Option on the Related Exchange or any other relevant trading market;
- (xi) **"Unscheduled Exchange Non-Opening"**: on any day, one or more of the New York Stock Exchange, the NASDAQ Stock Market and/or the Chicago Board Options Exchange does not open on a day when it was scheduled to be open for general business; or
- (xii) **"Exchange Disruption"**: the occurrence or existence on any relevant trading day at the relevant time for the S&P 500<sup>®</sup> Index or at any time during the one hour period that ends at the relevant time for the S&P 500<sup>®</sup> Index:
  - (a) of any event (other than an event as described in paragraph (ii) below) that disrupts or impairs the ability of market participants in general (A) to effect transactions in relation to, or to obtain market values for the relevant constituents of the S&P 500<sup>®</sup> Index on the relevant exchanges or (B) to effect transactions in, or to obtain market values for, options contracts or futures contracts on or relating to the S&P 500<sup>®</sup> Index on the Related Exchange; or

- (b) the closure on any relevant day of any relevant exchange(s) relating to any constituents of the S&P 500<sup>®</sup> Index, or the Related Exchange prior to its scheduled closing time unless such earlier closing time is announced by such exchange(s) or the Related Exchange, as the case may be, at least one hour prior to the earlier of (A) the actual closing time for the regular trading session on such exchange(s) or the Related Exchange on such day and (B) the submission deadline (if applicable) for orders to be entered into such exchange(s) or the Related Exchange system for execution at the relevant time on such day; or
- (c) a general moratorium is declared in respect of banking activities in any Relevant Country; or
- (d) a Relevant Country (i) imposes any controls or announces its intention to impose any controls or (ii)(A) implements or announces its intention to implement or (B) changes or announces its intention to change the interpretation or administration of any laws or regulations, which is likely to affect the ability of the Index Sponsor and/or any of its affiliates to acquire, hold, transfer or realize such constituent of the S&P 500<sup>®</sup> Index or to otherwise effect transactions in relation to the S&P 500<sup>®</sup> Index.

**"Force Majeure Event"** means, in respect of ImpAct, 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 affects the calculations or determinations in respect of an Option and/or ImpAct.

**"Option"** means an option (including any call or put option) on the S&P 500<sup>®</sup> Index traded on the Related Exchange.

**"Related Exchange"** means the Chicago Board Options Exchange, or any successor exchange, trading system or quotation system on which options or futures contracts on the S&P 500<sup>®</sup> Index are traded, as determined by the Index Sponsor.

**"Relevant Country"** means any country (or any political or regulatory authority thereof) with which the S&P 500<sup>®</sup> Index or a constituent of the S&P 500<sup>®</sup> Index has a material connection having regard to, without limitation, the country or countries in which the S&P 500<sup>®</sup> Index is calculated or published, the issuer of such constituent is incorporated and/or such other factor(s) as may be appropriate.

**"Relevant Exchanges"** means each of the New York Stock Exchange, the NASDAQ Stock Market and the Chicago Board Options Exchange.

**"Trading Day"** means a day, as determined by the Index Sponsor, on which each of the Relevant Exchanges are open for trading during their regular trading session, notwithstanding any such Relevant Exchanges closing prior to their scheduled closing time.

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

- (i) in respect of the S&P 500<sup>®</sup> Index or the VIX:
  - (a) the S&P 500<sup>®</sup> Index or the VIX is not calculated or announced by the Underlying Index Sponsor (as applicable) but is calculated by a successor sponsor; or
  - (b) the S&P 500<sup>®</sup> Index or the VIX is replaced by a successor index (a **"Successor Index"**) using the same or substantially similar formula for and method of calculation as used in the calculation of the S&P 500<sup>®</sup> Index or the VIX; or
  - (c) the Underlying Index Sponsor:
    - (I) announces that it will make a material change in the formula for or the method of calculating the S&P 500<sup>®</sup> Index or the VIX (as applicable) or in any other way materially modifies the S&P 500<sup>®</sup> Index or the VIX;
    - (II) permanently cancels the S&P 500<sup>®</sup> Index or the VIX and no Successor Index exists; and/or
    - (III) on any relevant Trading Day, fails to calculate and announce any relevant level of the S&P 500<sup>®</sup> Index or the VIX; or
- (ii) the failure of the Related Exchange or the Underlying Index Sponsor to announce or publish any information necessary for determining an Option price or the S&P 500<sup>®</sup> Index level (as the case may be); or
- (iii) any announcement or publication is made by the Related Exchange of information necessary for determining an Option price that is erroneous or insufficient for the determination of such Option price; or
- (iv) there is a temporary or permanent discontinuance or unavailability of any Relevant Exchange.

**"Underlying Index Sponsor"** means the entity, or the successor entity, that regularly calculates and publishes the level of the S&P 500<sup>®</sup> Index and the VIX.

### **Change in Methodology of ImpAct**

In calculating and determining the value of ImpAct, the Index Sponsor will, subject to the provisions below, employ the methodology described above. The application of such methodology by the Index Sponsor will be conclusive and binding. While the Index Sponsor currently employs the above described methodology to calculate ImpAct, no assurance can be given that fiscal, market, regulatory, juridical, financial or other circumstances (including, but not limited to, any changes to or any suspension or termination of or any other events affecting transactions on the same or similar terms to any financial instrument for which values will be derived from the S&P 500<sup>®</sup> Index and its volatility including options and swaps based on the S&P 500<sup>®</sup> Index) 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 ImpAct Sponsor will be entitled to make any such modification or change. The Index Sponsor may also make modifications to the terms of ImpAct in any manner that it deems necessary or desirable, including (without limitation) to correct any manifest or proven error or to cure, correct or supplement any ambiguity or defective provision contained in this description.

### **Availability and Publication of ImpAct Closing Level and Adjustments**

The ImpAct closing level will be published on Bloomberg under the title "DBIQ ImpAct Dollar Equity Volatility BID Index." The Bloomberg page relating to ImpAct is DBVEUSDB, or any successors to such page or service as selected by the Index Sponsor from time to time. Certain details as to levels of ImpAct and adjustments made in respect of ImpAct may be made available on such pages.

*"Deutsche Bank ImpAct Dollar Equity Volatility BID Index" is a proprietary index of Deutsche Bank. Any use of such index or its name must be with the consent of Deutsche Bank.*

# THE DEUTSCHE BANK EQUITY MEAN REVERSION ALPHA INDEX™ (“EMERALD”)

The Deutsche Bank Equity Mean Reversion Alpha inDex™ (“**EMERALD**”) tracks the performance of a strategy of buying daily volatility and selling weekly volatility with respect to the S&P 500® Index on a weekly rolling basis. EMERALD was created by Deutsche Bank AG, the Index Sponsor, on October 12, 2009 and is calculated, maintained and published by the Index Sponsor. The closing level of EMERALD was set to 100 on March 16, 1998 (the “**EMERALD Base Date**”). EMERALD is denominated in U.S. dollars.

## Investment Strategy and Index Construction

### *Investment Strategy*

The tendency of daily returns of an index level to be followed by daily returns in the opposite direction is referred to as negative serial correlation. The net weekly change of an index exhibiting negative serial correlation would under-represent the amount by which the index moved during the week, and realized volatility measured from daily returns of such an index would exceed realized volatility measured from weekly returns.

EMERALD reflects a strategy that aims to monetize any negative serial correlation exhibited by the S&P® 500 Index by periodically buying daily volatility and selling weekly volatility on the S&P 500® Index in equal notional amounts. EMERALD will increase if daily realized volatility exceeds weekly realized volatility over a given week, and decrease if weekly realized volatility exceeds daily realized 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 of the 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. The 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.

Variance is the square of volatility and is used in certain products in the over-the-counter derivatives market in place of volatility due to mathematical properties that make it simpler for financial institutions to value and hedge those products. EMERALD primarily uses variance in its calculations for this reason, but uses and refers to volatility as a standard reference measure consistent with market practice.

### *Index Construction*

EMERALD is a composite of five weekday sub-indices, one each for Monday, Tuesday, Wednesday, Thursday, and Friday, each beginning on a weekday and resetting on the corresponding weekday in the following week (each a “**Sub-Index**” and together the “**Sub-Indices**”). Each Sub-Index represents, for each weekly period, a notional investment of a specified amount in the difference of the daily-observation variance of the S&P 500® Index less the weekly-observation (or period-end-observation, when considered intraweek) variance thereof.

Each week, the notional amount of each Sub-Index is reset on its respective weekday to an amount such that the Sub-Index level would change by approximately 10% if the weekly-observation volatility is lower (resulting in a positive change to the index) or higher (resulting in a negative change to the index) than the daily-observation volatility by 15% of the volatility at resetting (calculated as described below) over a 6 month period. (This relationship is hypothetical and is impacted by the absolute levels at which the daily and weekly volatilities are realized over the period. Higher volatilities result in a greater change; lower volatilities in a lesser change.)

The “volatility at resetting” is calculated as the average of (i) the daily realized volatility over the past 3 months and (ii) the 6-month implied volatility on the reset day. The 6-month implied volatility is calculated from the mid-market expected variances of all available S&P 500® listed option expiry dates to form a fair implied variance curve, from which the 6-month implied variance is linearly interpolated. The 6-month implied volatility is the square root of the 6-month implied variance.

The daily observed volatility of each Sub-Index is scaled by a factor of 0.98, which is intended to approximate the costs and expenses of hedging exposure to the strategy underlying EMERALD. Historically, this cost factor has been on average approximately 1 basis point (0.01%) per trading day.

## Calculation of the Index Closing Level

The Index closing level for EMERALD for any Trading Day (as defined below) is calculated by adding to the Index

closing level as of the prior Trading Day the change in level of each Sub-Index from such prior day to the current day (with the Sub-Index level of the day prior to the first day of a weekly period being deemed to be 0).

The Index closing level for EMERALD and each of the Sub-Indices will be calculated by the Index Sponsor and rounded if necessary to the sixth decimal place, with 0.0000005 being rounded upwards. However, the Index closing level will be rounded for publication if necessary to two decimal places, with 0.005 being rounded upwards (see "Availability and Publication of EMERALD Closing Level and Adjustments" below).

The methodology described herein is subject to the provision set out in "Change in Methodology of EMERALD" below.

### **Index Sponsor**

Unless otherwise provided and subject to "Change in Methodology of EMERALD" all determinations made by the Index Sponsor 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.

### **Definitions**

*For the purposes of this description of EMERALD:*

**"Disruption Event"** means, in respect of EMERALD on any day, an event (other than a Force Majeure Event and including a national holiday or a day of national mourning) that would require the Index Sponsor to calculate the S&P 500<sup>®</sup> Index, derivatives based on the S&P 500<sup>®</sup> Index, and/or the implied volatility of the S&P 500<sup>®</sup> Index on an alternative basis were such event to occur or exist on such day, all as determined by the Index Sponsor. Without limitation, each of the following may be a Disruption Event if so determined by the Index Sponsor:

- (i) **"Price Source Disruption"**: a price source is temporarily or permanently discontinued, unavailable or not announced or published thereby preventing or restricting the information necessary for determining the S&P 500<sup>®</sup> Index or its volatility;
- (ii) **"Trading Suspension"**: a material suspension of trading in any instrument relevant to the calculation of EMERALD (a **"relevant instrument"**);
- (iii) **"Disappearance of Relevant Instrument"**: the failure of trading to commence, or the permanent discontinuation of trading in any relevant instrument;
- (iv) **"Material Change in Formula"**: the occurrence of a material change in the formula for or the method of calculating any relevant instrument;
- (v) **"De Minimis Trading"**: the number of units of a relevant instrument traded on any relevant date is materially reduced or liquidity in the market for any relevant instrument is otherwise reduced for any reason;
- (vi) **"Change of Law or Rules"**: any change in, or amendment to, the laws, rules or regulations relating to any relevant instrument or a change in any application or interpretation of such laws, rules or regulations;
- (vii) **"Pricing Disruption"**: the Index Sponsor is temporarily or permanently unable to calculate or determine the value of any relevant instrument; or
- (viii) **"Settlement Disruption"**: the Index Sponsor determines in its sole and absolute discretion that trading in, or settlement in respect of any relevant instrument is subject, temporarily or permanently, to any material disruption.

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

**"Relevant Exchanges"** means each of the New York Stock Exchange, the NASDAQ Stock Market and the Chicago Board Options Exchange.

**"Trading Day"** means a day, as determined by the Index Sponsor, on which each of the Relevant Exchanges are open for trading during their regular trading session, notwithstanding any such Relevant Exchanges closing prior to their scheduled closing time.

### **Change in Methodology of EMERALD**

In calculating and determining the value of EMERALD, the Index Sponsor will, subject to the provisions below, employ the methodology described above. The application of such methodology by the Index Sponsor will be conclusive and binding. While the Index Sponsor currently employs the above described methodology to calculate EMERALD, no assurance can be given that fiscal, market, regulatory, juridical, financial or other circumstances (including, but not limited

to, any changes to or any suspension or termination of or any other events affecting transactions on the same or similar terms to any financial instrument for which values will be derived from the S&P 500<sup>®</sup> Index and its volatility including options and swaps based on the S&P 500<sup>®</sup> Index) will not arise that would, in the view of the Index Sponsor, necessitate a modification of or change to such methodology and the Index Sponsor will be entitled to make any such modification or change if necessary in order for EMERALD to be calculable. The Index Sponsor may also make modifications to EMERALD to correct any manifest or proven error or to cure, correct or supplement any ambiguity or defective provision contained in this description.

#### **Availability and Publication of EMERALD Closing Level and Adjustments**

The EMERALD closing level will be published on Bloomberg under the title “DB EMERALD.” The Bloomberg page relating to EMERALD is DBVEMR or any successor to such page or service as selected by the Index Sponsor from time to time. Certain details as to levels of EMERALD and adjustments made in respect of EMERALD may be made available on such page.

*“Equity MEan Reversion ALpha inDex<sup>TM</sup>” or “EMERALD<sup>®</sup>” is a proprietary index of Deutsche Bank. “Equity MEan Reversion ALpha inDex<sup>TM</sup>” and “EMERALD<sup>®</sup>” are trademarks of Deutsche Bank AG. Any use of such index or its name must be with the consent of Deutsche Bank.*

## THE DEUTSCHE BANK EQUITY MEAN REVERSION ALPHA INDEX EMERGING MARKETS ("EMERALD EM")

The Deutsche Bank Equity MEan Reversion ALpha inDex Emerging Markets ("EMERALD EM") tracks the performance of a strategy of buying daily volatility and selling weekly volatility with respect to the iShares® MSCI Emerging Markets Index Fund (the "Fund") on a weekly rolling basis. EMERALD EM was created by Deutsche Bank AG, the Index Sponsor, on January 13, 2011 (the "EMERALD EM Live Date") and is calculated, maintained and published by the Index Sponsor. The closing level of EMERALD EM was set to 100 on December 30, 2005 (the "EMERALD EM Base Date"). EMERALD EM is denominated in U.S. dollars.

### Investment Strategy and Index Construction

#### *Investment Strategy*

The tendency of daily returns of the price of an asset to be followed by daily returns in the opposite direction is referred to as negative serial correlation. The net weekly change of the price of an asset exhibiting negative serial correlation would under-represent the amount by which the price of the asset moved during the week, and realized volatility measured from daily returns of the price of such asset would exceed realized volatility measured from weekly returns.

EMERALD EM reflects a strategy that aims to monetize any negative serial correlation exhibited by the shares of the iShares® MSCI Emerging Markets Index Fund (the "**Fund Shares**") by periodically buying daily volatility and selling weekly volatility on the Fund Shares in equal notional amounts. EMERALD EM will increase if daily realized volatility exceeds weekly realized volatility over a given week, and decrease if weekly realized volatility exceeds daily realized 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 of the 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. The 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.

Variance is the square of volatility and is used in certain products in the over-the-counter derivatives market in place of volatility due to mathematical properties that make it simpler for financial institutions to value and hedge those products. EMERALD EM primarily uses variance in its calculations for this reason, but uses and refers to volatility as a standard reference measure consistent with market practice.

#### *EMERALD EM Construction*

EMERALD EM is a composite of five weekday sub-indices, one each for Monday, Tuesday, Wednesday, Thursday, and Friday, each beginning on a weekday and resetting on the corresponding weekday in the following week (each a "**Sub-Index**" and together the "**Sub-Indices**"). Each Sub-Index represents, for each weekly period, a notional investment of a specified amount in the difference of the daily-observation variance of the Fund Shares less the weekly-observation (or period-end-observation, when considered intraweek) variance thereof.

Each week, the notional amount of each Sub-Index is reset on its respective weekday to an amount such that the Sub-Index level would change by approximately 10% if the weekly-observation volatility is lower (resulting in a positive change to the index) or higher (resulting in a negative change to the index) than the daily-observation volatility by 15% of the volatility at resetting. (This relationship is hypothetical and is impacted by the absolute levels at which the daily and weekly volatilities are realized over the period. Higher volatilities result in a greater change; lower volatilities in a lesser change.) The "volatility at resetting" is equal to the realized daily volatility over the past 3 months.

The daily observation volatility of each Sub-Index is scaled by a factor of 0.97, which is intended to approximate the costs and expenses of hedging exposure to the strategy underlying EMERALD EM. Historically, this cost factor has been on average approximately 1.5 basis points (0.015%) per trading day.

In calculating the variance over an applicable period, certain corporate actions may have an effect on the price of the Fund Shares and as a result, (i) if the ex-date of a cash or share distribution to be made by the Fund (i.e. the first day a buyer of Fund Shares would not be entitled to receive such distribution) occurs during that period, the price of the Fund Shares for each day during that period prior to the ex-date will be reduced by the value of such cash or share distribution, (ii) if the effective date of a share split or reverse-share split of the Fund occurs during that period, the price of the Fund

Shares for each day during that period prior to the effective date will be adjusted based on the number of Fund Shares immediately before and after the share split or reverse-share split, (iii) if the effective date of a spin-off or split-off of part of the Fund occurs during that period, the price of the Fund Shares for the portion of the Fund that was not spun-off or split-off for each day during that period prior to the effective date will be adjusted based on the capital of the Fund immediately before and after the spin-off or split-off and (iv) if the Fund issues transferable rights or warrants to all holders of the Fund Shares to subscribe for or purchase Fund Shares at an exercise price per share that is less than the closing price of the Fund Shares on the Trading Day before the ex-dividend date for the issuance and such ex-dividend date is during that period, the price of the Fund Shares for each day during that period prior to the ex-dividend date will be adjusted based on the discount to the market price of the Fund Shares, in each case to remove the effect such corporate actions would otherwise have on the price of the Fund Shares and the calculation of variance during that period.

### **Calculation of the EMERALD EM Closing Level**

The EMERALD EM closing level for any Trading Day (as defined below) is calculated by adding to the EMERALD EM closing level as of the prior Trading Day the change in level of each Sub-Index from such prior day to the current day (with the Sub-Index level of the day prior to the first day of a weekly period being deemed to be 0).

The EMERALD EM closing level and the closing level for each of the Sub-Indices will be calculated by the Index Sponsor and rounded if necessary to the sixth decimal place, with 0.0000005 being rounded upwards. However, the EMERALD EM closing level will be rounded for publication if necessary to two decimal places, with 0.005 being rounded upwards (see "Availability and Publication of EMERALD EM Closing Level and Adjustments" below).

The methodology described herein is subject to the provision set out in "Change in Methodology of EMERALD EM" below.

### **Consequences of Disruptions**

If a Disruption Event (defined below), a Force Majeure Event (defined below) or an Underlying Index Event (described below) occurs on any Trading Day, the Index Sponsor will determine in its reasonable discretion whether the occurrence or existence of such event is material in respect of the calculation and/or resetting of EMERALD EM. In the event that the Index Sponsor determines that the occurrence or existence of a Disruption Event, Force Majeure Event or Underlying Index Event is material, it will make such determinations and/or adjustments that in its reasonable discretion are required to take into account such event. In particular (and without limitation), the Index Sponsor in exercising its reasonable discretion, may:

- i) make such determinations and/or adjustments in relation to the terms of EMERALD EM as it considers reasonably appropriate to determine any relevant price or level and/or to calculate the EMERALD EM closing level on such Trading Day; and/or
- ii) defer the determination and publication of the EMERALD EM closing level until the next Trading Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event ceases to exist; and/or
- iii) where such Trading Day would otherwise have been a reset date, delay the reset date until the next Trading Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event ceases to exist; and/or
- iv) select (a) a successor fund that tracks the performance of the Underlying Index (or its Successor Index, defined below) to replace the Fund, (b) the Underlying Index (or its Successor Index) to replace the Fund, (c) a successor exchange to replace the applicable Relevant Exchange and/or (d) a Successor Index to replace the Underlying Index and, in each case, make such adjustments to EMERALD EM to reflect such selection as it determines reasonably appropriate; and/or
- v) permanently cease to determine, calculate and make available the EMERALD EM closing level and cancel EMERALD EM.

### **Index Sponsor**

Unless otherwise provided and subject to "Change in Methodology of EMERALD EM" all determinations made by the Index Sponsor 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.

### **Definitions**

*For the purposes of this description of EMERALD EM:*

**"Disruption Event"** means, in respect of EMERALD EM, the Fund Shares, an Option, and/or the Underlying Index, on any day, an event (other than a Force Majeure Event or an Underlying Index Event) that would require the Index Sponsor to calculate the price of the Fund Shares, an Option price or the level of the Underlying Index or make any other determinations in respect of the Fund Shares, the relevant Option, the Underlying Index or EMERALD EM on an alternative basis were such event to occur or exist on a day which is a Trading Day (or, if different, the day on which the



relevant price(s) for Fund Shares or an Option or the relevant level(s) of the Underlying Index in relation to the relevant Trading Day would, in the ordinary course, be published or announced by the Relevant Exchange or the Underlying Index Sponsor (as the case may be)).

Without limitation, each of the following may be a Disruption Event if so determined by the Index Sponsor:

- (i) **"Change of Law or Rules"** means there is a change in, or amendment to, the laws, rules or regulations relating to the Fund Shares or any Option or a change in any application or interpretation of such laws, rules or regulations.
- (ii) **"De-Listing"** means that the Relevant Exchange announces that pursuant to its rules, the Fund Share ceases (or will cease) to be listed, traded or publicly quoted on the Exchange for any reason and is not immediately re-listed, re-traded or re-quoted on an exchange, trading system or quotation system acceptable to the Index Sponsor.
- (iii) **"De Minimis Trading"** means the number of any relevant Fund Shares or Options traded on the Relevant Exchange on any relevant Trading Day is materially reduced or liquidity in the Fund Shares or any relevant Option is otherwise reduced for any reason.
- (iv) **"Disappearance of a Price"** means (i) the failure of trading to commence, or the permanent discontinuation of trading in, the Fund Shares on the Relevant Exchange, (ii) the failure of trading to commence, or the permanent discontinuation of trading in, a relevant Option on the Relevant Exchange or (iii) the disappearance of, or of trading on, the Underlying Index.
- (v) **"Hedging Disruption"** means that Deutsche Bank AG and/or any of its affiliates would be unable, after using reasonable efforts, to: (i) acquire, establish, re-establish, substitute, maintain, unwind or dispose of any transaction(s) or asset(s) necessary to hedge its position in relation to any securities issue or other relevant transactions relating to or calculated by reference to EMERALD EM, or (ii) realize, recover or remit the proceeds of any such transaction(s) or asset(s), or (iii) avoid incurring an additional liability for taxes of any nature (including, without limitation, any excise, severance, sales, use, value-added, transfer, stamp, documentary, recording or similar tax), or any other charge or expense in respect of any such transaction(s) or asset(s) and such liability did not exist as of the EMERALD EM Live Date.
- (vi) **"Material Change in Circumstance"** means the occurrence of any event beyond the control of the Index Sponsor which would make it impossible or not reasonably practicable, for a market counterparty to enter into or maintain or fulfil its obligations under the Fund Shares or any relevant Option on the Relevant Exchange or any other relevant trading market.
- (vii) **"Material Change in Content"** means the occurrence since the EMERALD EM Live Date of a material change in the content, composition or constitution of the Fund or the Underlying Index.
- (viii) **"Material Change in Formula or Determination"** means the occurrence since the EMERALD EM Live Date of a material change in the formula for or the method of calculating the Fund Share price, a relevant Option price or the relevant prices in relation thereto by the Relevant Exchange or any other relevant party, or a material modification of the Relevant Exchange's determination and/or dissemination of a Fund Share price, any Option price or the relevant prices in relation thereto.
- (ix) **"Reorganization Event"** means (i) the Fund Shares are reclassified or changed; (ii) the Fund has been subject to a merger, consolidation or other combination and either is not the surviving entity or is the surviving entity but all the outstanding Fund Shares are exchanged for or converted into other property; (iii) a statutory share exchange involving the outstanding Fund Shares and the securities of another entity occurs; (iv) the Fund sells or otherwise transfers its property and assets as an entirety or substantially as an entirety to another entity; (v) the Fund is liquidated, dissolved or wound up or is subject to a proceeding under any applicable bankruptcy, insolvency or other similar law; (vi) another entity completes a tender or exchange offer for all the outstanding Fund Shares or (vii) any other event occurs that has a diluting or concentrative or other effect on the theoretical value of the Fund Shares that is not otherwise considered herein.
- (x) **"Tax Disruption"** means the imposition of, change in or removal of any tax (including, without limitation, any excise, severance, sales, use, value-added, transfer, stamp, documentary, recording or similar tax) on, or in relation to, Fund Shares or any relevant Option by any government or taxation authority after the EMERALD EM Live Date, if the direct effect of such imposition, change or removal is to raise or lower the Fund Share price or an Option price on any relevant day from what it would have been without that imposition, change or removal.
- (xi) **"Trading Limitation"** means a limitation is imposed on trading by the Relevant Exchange or otherwise: (i) in Fund Shares on the Relevant Exchange, (ii) in a relevant Option on the Relevant Exchange or in any additional futures contract or options contract relating to the Underlying Index on any exchange, trading system or

quotation system on which any such futures contracts or options contracts are traded, or (iii) relating to any constituents of the Underlying Index on any Relevant Exchange.

- (xii) **"Trading Suspension"** means the suspension of trading by the Relevant Exchange or otherwise: (i) in Fund Shares on the Relevant Exchange, (ii) in an Option on the Relevant Exchange or in any additional futures contract or options contract relating to the Underlying Index on any exchange, trading system or quotation system on which any such futures contracts or options contracts are traded, or (ii) relating to any constituents of the Underlying Index on any Relevant Exchange.
- (xiii) **"Trading System Breakdown or Failure"** means a breakdown or failure in the price and trade reporting systems of the Relevant Exchange as a result of which the reported trading prices for Fund Shares, Options or any constituents of the Underlying Index during the principal trading session in such market are materially inaccurate.
- (xiv) **"Unscheduled Exchange Non-Opening"** means, on any day, one or more of the Relevant Exchanges does not open on a day when it was scheduled to be open for general business.

**"Force Majeure Event"** means an event or circumstance other than an 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 affects the calculations or determinations in respect of EMERALD EM, the Fund Shares, an Option, and/or the Underlying Index.

**"Option"** means an option (including any call or put option) or future on the Fund traded on the Relevant Exchange.

**"Relevant Exchange"** means, (i) in relation to the Fund Shares, the primary exchange, trading system or quotation system on which the Fund Shares are listed or traded or any successor to such exchange, trading system or quotation system, (ii) in relation to any Options, the primary organized exchanges, quotation systems or markets of trading such Options and (iii) in relation to the Underlying Index, the primary exchange, trading system or quotation system on which the constituents of the Underlying Index are listed or traded, each as determined by the Index Sponsor in its reasonable discretion.

**"Trading Day"** means a day, as determined by the Index Sponsor, on which the New York Stock Exchange and NASDAQ Stock Market, or in the case of an Option, the Chicago Board Options Exchange, are open for trading during their regular trading session, notwithstanding any such relevant exchange closing prior to its scheduled closing time.

**"Underlying Index"** means the MSCI Emerging Markets Index.

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

- (i) in respect of the Underlying Index:
  - (A) (I) the Underlying Index is not calculated or announced by the Underlying Index Sponsor but is calculated by a successor sponsor; or
  - (II) the Underlying Index is replaced by a successor index (a **"Successor Index"**) using the same or substantially similar formula for and method of calculation as used in the calculation of the Underlying Index; or
  - (B) the Underlying Index Sponsor:
    - (I) 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;
    - (II) permanently cancels the Underlying Index and no Successor Index exists; and/or
    - (III) on any relevant Trading Day, fails to calculate and announce any relevant level of the Underlying Index; or
- (ii) the failure of the Relevant Exchange or the Underlying Index Sponsor to announce or publish any information necessary for determining the price of the Fund Shares, an Option price or the Underlying Index level (as the case may be); or
- (iii) any announcement or publication is made by the Relevant Exchange of information necessary for determining the price of the Fund Shares and/or an Option price that is erroneous or insufficient for the determination of such price; or
- (iv) there is a temporary or permanent discontinuance or unavailability of any Relevant Exchange.

**"Underlying Index Sponsor"** means the entity that regularly calculates and publishes the Underlying Index Level which as of the EMERALD EM Live Date was MSCI, Inc.

## **Change in Methodology of EMERALD EM**

In calculating and determining the value of EMERALD EM, the Index Sponsor will, subject to the provisions below, employ the methodology described above. The application of such methodology by the Index Sponsor will be conclusive and binding. While the Index Sponsor currently employs the above described methodology to calculate EMERALD EM, no assurance can be given that fiscal, market, regulatory, juridical, financial or other circumstances (including, but not limited to, any changes to or any suspension or termination of or any other events affecting transactions on the same or similar terms to any financial instrument for which values will be derived from the iShares<sup>®</sup> MSCI Emerging Markets Index Fund and its volatility including options and swaps based on the iShares<sup>®</sup> MSCI Emerging Markets Index Fund) will not arise that would, in the view of the Index Sponsor, necessitate a modification of or change to such methodology and the Index Sponsor will be entitled to make any such modification or change if necessary in order for EMERALD EM to be calculable. The Index Sponsor may also make modifications to EMERALD EM to correct any manifest or proven error or to cure, correct or supplement any ambiguity or defective provision contained in this description.

## **Availability and Publication of EMERALD EM Closing Level and Adjustments**

The EMERALD EM closing level will be published on Bloomberg under the title “Deutsche Bank EMERALD EM”. The Bloomberg page relating to EMERALD EM is “DBVEMREM”, or any successor to such page or service as selected by the Index Sponsor from time to time. Certain details as to levels of EMERALD EM and adjustments made in respect of EMERALD EM may be made available on such pages.

*“Equity Mean Reversion Alpha Index Emerging Markets” or “EMERALD EM” is a proprietary index of Deutsche Bank. Any use of such index or its name must be with the consent of Deutsche Bank.*

# THE DEUTSCHE BANK EQUITY LONG VOLATILITY INVESTMENT STRATEGY II INDEX (“ELVIS II”)

The Deutsche Bank Equity Long Volatility Investment Strategy II Index (“ELVIS II”) tracks the performance of a long position in a 3-month forward 6-month variance swap on the S&P<sup>®</sup> 500 Index (“**3M6M swap**”). ELVIS II was created by Deutsche Bank AG, the Index Sponsor, on August 9, 2010 and is calculated, maintained and published by the Index Sponsor. The closing level of ELVIS II was set to 100 on March 16, 1990 (the “**ELVIS II Base Date**”). ELVIS II is denominated in U.S. dollars.

## Investment Strategy and Index Construction

### *Investment Strategy*

ELVIS II utilizes a strategy that aims to capture and monetize the movements of equity market implied volatility through a long position in 3M6M swaps on the S&P<sup>®</sup> 500 Index. A forward variance swap obligates its holder to enter into a spot (or current starting) variance swap at a later date at a pre-specified variance swap price or “**strike**.” A 3M6M swap is a variance swap starting in 3 months and lasting for 6 months. Forward variance swaps are used to take a view on future movements of implied volatility. When sold or unwound prior to the variance swap start date, the gain or loss on the forward variance swap will relate only to changes in implied volatility and not to any realized volatility of the underlying, which would otherwise be measured during the life of the variance swap.

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 of the 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. The 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.

Variance is the square of volatility and is used in certain products in the over-the-counter derivatives market in place of volatility due to mathematical properties that make it simpler for financial institutions to value and hedge those products. ELVIS II primarily uses variance in its calculations, but uses and refers to volatility as a standard reference measure, which is consistent with market practice.

### *Index Construction*

ELVIS II tracks the performance of a notional investment in 3M6M swaps on the S&P 500<sup>®</sup> Index. The ELVIS II level is based on the difference between the prevailing 3M6M swap strike and the 3M6M swap strike set on the previous rebalancing day, reduced by the daily running cost, and is calculated on each ELVIS II calculation day as the product of:

- i) (a) the 3M6M swap strike as of such day, minus (b) the 3M6M swap strike as of the previous rebalancing day, minus (c) the running cost; and
- ii) the 3M6M swap notional amount as of the previous rebalancing day.

Since variance is additive in time (i.e. a 6-month variance swap is equivalent to two consecutive 3-month variance swaps), the 3M6M swap is therefore replicated by a portfolio holding a roughly 1/2 short position in a 3-month spot variance swap and a roughly 3/2 long position in a 9-month spot variance swap. The expiry dates of the 3-month and 9-month spot variance swaps in the replicating portfolio are the same as the 3M6M swap start date and end date, respectively. Therefore, the 3M6M swap strike as of any Trading Day (as defined below) is calculated as the time-weighted difference between the strikes of a spot variance swap with a time to maturity that is 9-months from the previous rebalancing day (the “**9M spot variance swap**”) and a spot variance swap with a time to maturity that is 3-months from the previous rebalancing day (the “**3M spot variance swap**”), as follows:

$3M6M = 9M \times T2 / (T2 - T1) - 3M \times T1 / (T2 - T1)$ , where:

“3M6M” is the strike of the 3M6M swap

“9M” is the strike of the 9M spot variance swap;

“3M” is the strike of the 3M spot variance swap;

“T1” is the time to maturity, in Trading Days, of the 3M spot variance swap; and

“T2” is the time to maturity, in Trading Days of the 9M spot variance swap.

The variance swap strikes for the 3M and 9M spot variance swaps are calculated from mid-market prices of all available S&P 500<sup>®</sup> listed at-the-money and out-of-the-money call and put options with the corresponding expiry, as published on the Chicago Board Options Exchange, whose (i) bid price is greater than or equal to U.S.\$ 0.05 and (ii) mid-price is greater than or equal to U.S.\$ 0.10. All variance swap strikes are quoted in volatility points, not variance.

Because the variance swap strikes are based on mid-market prices, they do not take into account transaction costs (bid-offer spreads) that would be associated with trading or hedging variance swaps. To account for this, a daily running cost is deducted from the ELVIS II level, as described further below under “Running Cost”.

ELVIS II rebalances on March, June, September and December option expiry days, i.e. the 3rd Friday of the relevant month if it is a Trading Day, otherwise the previous Trading Day. On each rebalancing day, the forward variance swap becomes a spot variance swap. However, the now-6-month spot variance swap is notionally unwound and a new 3M6M swap is notionally entered into. The swap start date of the new contract is the 3rd Friday of the 3rd month after the rebalancing date. The swap end date of the new contract is the 3rd Friday of the 9th month after the rebalancing date. If either of these two Fridays is not a business day, the previous Trading Day is used instead.

On each rebalancing day, the 3M6M swap notional amount is calculated and reset so that there is a higher notional when volatility is low and a lower notional when volatility is high. The forward variance swap notional (for the period from, but excluding such rebalancing day, to, and including the next rebalancing day) will equal the product of:

- i) the closing level of ELVIS II on the quarterly rebalancing date; and
- ii) the quotient of (a) 0.2, as numerator and (b) the square of the 3M6M swap strike on the day in which it is notionally entered into, as denominator.

### **Running Cost**

A cost equivalent to 2.0% of the 9-month spot variance strike level is deducted from ELVIS II over each roll period.

The forward variance strike level for the 3M6M swap is determined based on variance strike levels of the 3-month and 9-month spot variance swaps. These variance strike levels are “time-weighted” as described above to determine the forward variance strike level. Based on that calculation, raising the 9-month spot variance strike level by 2.0% of the fair strike level is approximately equal to increasing the 3-month forward 6-month variance strike level by 3.0% of the fair strike level (the exact amount will depend of the number of Trading Days in each period and the relative levels of the 3-month and 9-month spot variance strikes).

As an example, if the forward variance strike is 20, the cost applied to ELVIS II over the quarterly roll period would be approximately 0.60 volatility points. Since each forward variance swap is both bought and sold, resulting in two transactions per roll period, the effective rolling cost in such a scenario is 0.30 volatility points per transaction.

Historically, this cost factor has amounted to approximately 1.3 basis points (0.013%) per day.

### **Index Calculation**

The closing level for ELVIS II will be calculated by the Index Sponsor on each Trading Day (as defined below) and rounded if necessary to the sixth decimal place, with 0.0000005 being rounded upwards. However, the closing level will be rounded for publication if necessary to two decimal places, with 0.005 being rounded upwards (see “Availability and Publication of ELVIS II Closing Level and Adjustments” below).

The methodology described herein is subject to the provision set out in “Consequences of Disruptions” and “Change in Methodology of ELVIS II” below.

### **Consequences of Disruptions**

If a Disruption Event (defined below), a Force Majeure Event (defined below) or Underlying Index Event (defined below) occurs on any Trading Day, the Index Sponsor will determine in its reasonable discretion whether the occurrence or existence of such event is material in respect of the calculation and/or rebalancing of ELVIS II. In the event that the Index Sponsor determines that the occurrence or existence of a Disruption Event, Force Majeure Event or Underlying Index Event is material, it will make such determinations and/or adjustments that in its reasonable discretion are required to take account of such event. In particular (and without limitation), the Index Sponsor in exercising its reasonable discretion, may:

- i) make such determinations and/or adjustments in relation to the terms of ELVIS II as it considers reasonably appropriate to determine any relevant price or level and/or to calculate the ELVIS II closing level on such Trading

Day; and/or

- ii) defer the determination and publication of the ELVIS II closing level until the next Trading Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event ceases to exist; and/or
- iii) where such Trading Day would otherwise have been a rebalancing date, delay the rebalancing date until the next Trading Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event ceases to exist; and/or
- iv) in the case of an Underlying Index Event, in its reasonable discretion, select a successor exchange to replace the Related Exchange and/or a successor index to replace the affected Underlying Index and, in each case, make such adjustments to ELVIS II to reflect such selection as it determines reasonably appropriate; and/or
- v) permanently cease to determine, calculate and make available the ELVIS II closing level and cancel ELVIS II.

## Index Sponsor

Unless otherwise provided and subject to "Change in Methodology of ELVIS II" all determinations made by the Index Sponsor 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.

## Definitions

*For the purposes of this description of ELVIS II:*

**"Disruption Event"** means, in respect of an Option and/or ELVIS II, an event (other than a Force Majeure Event or an Underlying Index Event) that would require the Index Sponsor to calculate an Option price or the level of the S&P 500<sup>®</sup> Index or make any other determinations in respect of the relevant Option or ELVIS II on an alternative basis were such event to occur or exist on a day which is a Trading Day (or, if different, the day on which the relevant price(s) for an Option in relation to the relevant Trading Day would, in the ordinary course, be published or announced by the Related Exchange. Without limitation to the foregoing, each of the following events shall be a Disruption Event:

- (i) **"Trading Suspension"**: the suspension of trading by the Related Exchange or any Relevant Exchange (as the case may be) or otherwise: (i) in an Option on the Related Exchange or in any additional futures contract or options contract relating to the S&P 500<sup>®</sup> Index on any exchange, trading system or quotation system on which any such futures contracts or options contracts are traded, or (ii) relating to any constituents of the S&P 500<sup>®</sup> Index on any Relevant Exchange;
- (ii) **"Disappearance of an Option Price"**: (i) the failure of trading to commence, or the permanent discontinuation of trading in, a relevant Option on the Related Exchange or (ii) the disappearance of, or of trading on, the S&P 500<sup>®</sup> Index;
- (iii) **"Material Change in Formula or Determination"**: the occurrence since the ELVIS II Base Date of a material change in the formula for or the method of calculating a relevant Option price or the relevant prices in relation thereto by the Related Exchange or any other relevant party, or a material modification of the Related Exchange's determination and/or dissemination of any Option price or the relevant prices in relation thereto;
- (iv) **"Material Change in Content"**: the occurrence since the ELVIS II Base Date of a material change in the content, composition or constitution of the S&P 500<sup>®</sup> Index to which a relevant Option 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 or similar tax) on, or in relation to, any relevant Option by any government or taxation authority after the ELVIS II Base Date, if the direct effect of such imposition, change or removal is to raise or lower an Option price 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 by the Related Exchange or any Relevant Exchange (as the case may be) or otherwise: (i) in a relevant Option or on the Related Exchange or in any additional futures contract or options contract relating to the S&P 500<sup>®</sup> Index on any exchange, trading system or quotation system on which any such futures contracts or options contracts are traded, or (ii) relating to any constituents of the S&P 500<sup>®</sup> Index on any Relevant Exchange;
- (vii) **"De Minimis Trading"**: the number of any relevant Options traded on the Related Exchange on any relevant Trading Day is materially reduced or liquidity in any relevant Option 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 Option or a change in any application or interpretation of such laws, rules or regulations;

- (ix) **"Hedging Disruption"**: Deutsche Bank AG and/or any of its affiliates would be unable, after using reasonable efforts, to: (i) acquire, establish, re-establish, substitute, maintain, unwind or dispose of any transaction(s) or asset(s) necessary to hedge its position in relation to any securities issue or other relevant transactions relating to or calculated by reference to ELVIS II, or (ii) realize, recover or remit the proceeds of any such transaction(s) or asset(s), or (iii) avoid incurring an additional liability for taxes of any nature (including, without limitation, any excise, severance, sales, use, value-added, transfer, stamp, documentary, recording or similar tax), or any other charge or expense in respect of any such transaction(s) or asset(s) and such liability did not exist as of the ELVIS II Base Date;
- (x) **"Material Change in Circumstances"**: the occurrence of any event beyond the control of the Index Sponsor which would make it impossible or not reasonably practicable, for a market counterparty to enter into or maintain or fulfil its obligations under any relevant Option on the Related Exchange or any other relevant trading market;
- (xi) **"Unscheduled Exchange Non-Opening"**: on any day, one or more of the New York Stock Exchange, the NASDAQ Stock Market and/or the Chicago Board Options Exchange does not open on a day when it was scheduled to be open for general business; or
- (xii) **"Exchange Disruption"**: the occurrence or existence on any relevant trading day at the relevant time for the S&P 500<sup>®</sup> Index or at any time during the one hour period that ends at the relevant time for the S&P 500<sup>®</sup> Index:
  - (a) of any event (other than an event as described in paragraph (ii) below) that disrupts or impairs the ability of market participants in general (A) to effect transactions in relation to, or to obtain market values for the relevant constituents of the S&P 500<sup>®</sup> Index on the relevant exchanges or (B) to effect transactions in, or to obtain market values for, options contracts or futures contracts on or relating to the S&P 500<sup>®</sup> Index on the Related Exchange; or
  - (b) the closure on any relevant day of any relevant exchange(s) relating to any constituents of the S&P 500<sup>®</sup> Index, or the Related Exchange prior to its scheduled closing time unless such earlier closing time is announced by such exchange(s) or the Related Exchange, as the case may be, at least one hour prior to the earlier of (A) the actual closing time for the regular trading session on such exchange(s) or the Related Exchange on such day and (B) the submission deadline (if applicable) for orders to be entered into such exchange(s) or the Related Exchange system for execution at the relevant time on such day; or
  - (c) a general moratorium is declared in respect of banking activities in any Relevant Country; or
  - (d) a Relevant Country (i) imposes any controls or announces its intention to impose any controls or (ii)(A) implements or announces its intention to implement or (B) changes or announces its intention to change the interpretation or administration of any laws or regulations, which is likely to affect the ability of the Index Sponsor and/or any of its affiliates to acquire, hold, transfer or realize such constituent of the S&P 500<sup>®</sup> Index or to otherwise effect transactions in relation to the S&P 500<sup>®</sup> Index.

**"Force Majeure Event"** means, in respect of ELVIS II, 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 affects the calculations or determinations in respect of an Option and/or ELVIS II.

**"Option"** means an option (including any call or put option) on the S&P 500<sup>®</sup> Index traded on the Related Exchange.

**"Related Exchange"** means the Chicago Board Options Exchange, or any successor exchange, trading system or quotation system on which options or futures contracts on the S&P 500<sup>®</sup> Index are traded, as determined by the Index Sponsor.

**"Relevant Country"** means any country (or any political or regulatory authority thereof) with which the S&P 500<sup>®</sup> Index or a constituent of the S&P 500<sup>®</sup> Index has a material connection having regard to, without limitation, the country or countries in which the S&P 500<sup>®</sup> Index is calculated or published, the issuer of such constituent is incorporated and/or such other factor(s) as may be appropriate.

**"Relevant Exchanges"** means each of the New York Stock Exchange, the NASDAQ Stock Market and the Chicago Board Options Exchange.

**"Trading Day"** means a day, as determined by the Index Sponsor, on which each of the Relevant Exchanges are open for trading during their regular trading session, notwithstanding any such Relevant Exchanges closing prior to their scheduled closing time.

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

- (i) in respect of the S&P 500<sup>®</sup> Index:

- (a) the S&P 500<sup>®</sup> Index is not calculated or announced by the Underlying Index Sponsor but is calculated by a successor sponsor acceptable to the Index Sponsor; or
- (b) the S&P 500<sup>®</sup> Index is replaced by a successor index (a "**Successor Index**") using the same or substantially similar formula for and method of calculation as used in the calculation of the S&P 500<sup>®</sup> Index; or
- (c) the Underlying Index Sponsor:
  - (I) announces that it will make a material change in the formula for or the method of calculating the S&P 500<sup>®</sup> Index or in any other way materially modifies the S&P 500<sup>®</sup> Index;
  - (II) permanently cancels the S&P 500<sup>®</sup> Index and no Successor Index exists; and/or
  - (III) on any relevant Trading Day, fails to calculate and announce any relevant level of the S&P 500<sup>®</sup> Index; or
- (ii) the failure of the Related Exchange or the Underlying Index Sponsor to announce or publish any information necessary for determining an Option price or the S&P 500<sup>®</sup> Index level (as the case may be); or
- (iii) any announcement or publication is made by the Related Exchange of information necessary for determining an Option price that is erroneous or insufficient for the determination of such Option price; or
- (iv) there is a temporary or permanent discontinuance or unavailability of any Relevant Exchange.

**"Underlying Index Sponsor"** means the entity, or the successor entity, that regularly calculates and publishes the level of the S&P 500<sup>®</sup> Index.

### **Change in Methodology of ELVIS II**

In calculating and determining the value of ELVIS II, the Index Sponsor will, subject to the provisions below, employ the methodology described above. The application of such methodology by the Index Sponsor will be conclusive and binding. While the Index Sponsor currently employs the above described methodology to calculate ELVIS II, no assurance can be given that fiscal, market, regulatory, juridical, financial or other circumstances (including, but not limited to, any changes to or any suspension or termination of or any other events affecting transactions on the same or similar terms to any financial instrument for which values will be derived from the S&P 500<sup>®</sup> Index and its volatility including options and swaps based on the S&P 500<sup>®</sup> Index) 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 ELVIS II in any manner that it deems necessary or desirable, including (without limitation) to correct any manifest or proven error or to cure, correct or supplement any ambiguity or defective provision contained in this description.

### **Availability and Publication of ELVIS II Closing Level and Adjustments**

The ELVIS II closing level will be published on Bloomberg under the title "DB ELVIS II." The Bloomberg page relating to ELVIS II is DBVELVII, or any successors to such page or service as selected by the Index Sponsor from time to time. Certain details as to levels of ELVIS II and adjustments made in respect of ELVIS II may be made available on such pages.