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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, if any, 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 ProVol Balanced Index, the Deutsche Bank ProVol Carry Index and the Deutsche Bank ProVol Hedge 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

March 1, 2013

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

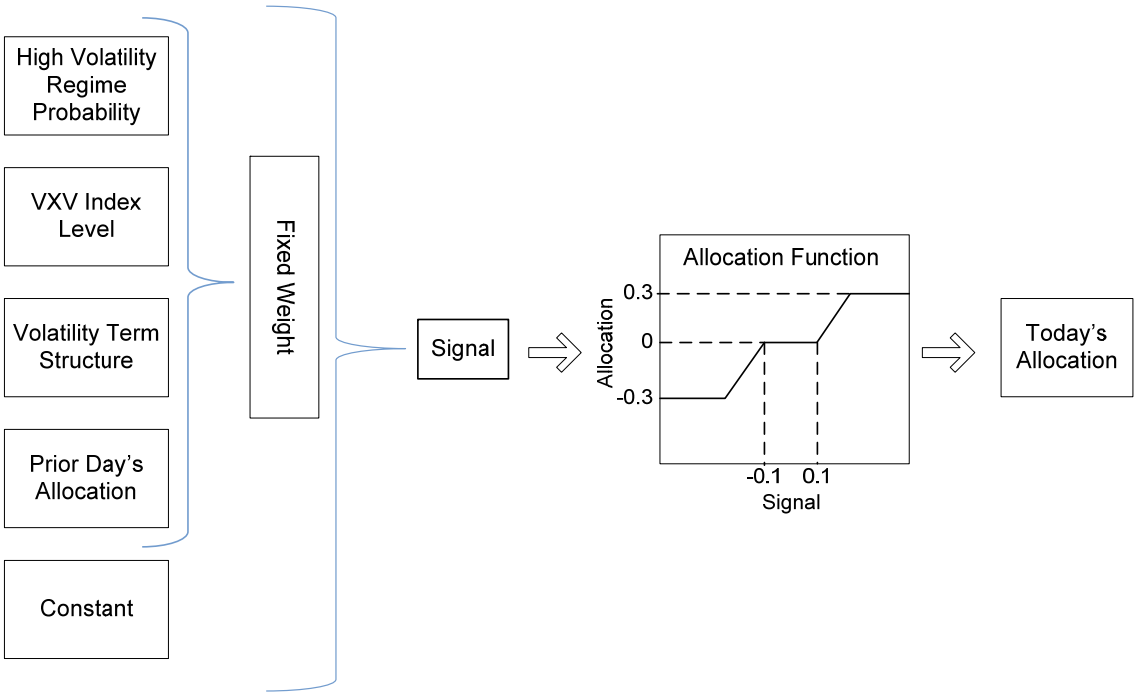
The specific terms of your securities will be described in the relevant pricing supplement, including any additions or changes to the terms specified in the relevant product supplement or the description of the indices set forth in this underlying supplement.

THE DEUTSCHE BANK PROVOL INDICES

The Deutsche Bank ProVol Indices (the "**ProVol Indices**") reflect the economic performance over time, less costs, of a strategy designed to generate returns from the expected volatility of the S&P 500® Index (the "**S&P 500**") by taking a daily rebalanced notional long or short position in the Deutsche Bank Short-Term VIX Futures Index (the "**VIX Futures Index**"). There are three versions of the ProVol Indices, the ProVol Balanced Index, the ProVol Carry Index and the ProVol Hedge Index (each a "**ProVol Index**"). The VIX Futures Index tracks the market's expectation of short-term volatility (also referred to as implied volatility) by means of a daily-rolling notional long position in first month and second month futures contracts on the CBOE Volatility Index® (the "**VIX Index**"). The VIX Index is a benchmark index that measures the market's expectation of 30-day volatility implicit in the prices of CBOE-listed S&P 500 options. We refer to the futures contracts on the VIX Index as the "**VIX futures contracts**."

On each Index Business Day (as defined below), each ProVol Index dynamically adjusts its long or short exposure to the VIX Futures Index based on the size and direction of a signal (the "**Signal**") calculated on that day using three volatility indicators and a resulting allocation to the VIX Futures Index (the "**Allocation**") based on the Signal. The Signal and Allocation are designed generally to have long exposure to the VIX Futures Index during periods of high realized volatility, when there is a high probability that implied volatility will increase, and/or the cost of carrying VIX futures contracts is low, and generally to have short exposure during periods of low realized volatility, when implied volatility is likely to decrease, and/or the cost of carrying VIX futures contracts is high. As a result, each ProVol Index is generally expected to hold long positions in the VIX Futures Index to capture positive returns during periods of increasing volatility and, during periods of low volatility, to hold no position or short positions to generate returns from high carrying costs. Only a strong positive or negative Signal will result in each ProVol Index taking a long or short position in the VIX Futures Index. To reduce cost and risk, a weak Signal will result in a zero Allocation. By dynamically allocating its exposure, each ProVol Index seeks to capture returns from both high and low volatility markets and keep costs and risk lower by holding VIX futures contracts only when it is expected to be advantageous to do so. The calculation of each ProVol Index incorporates a daily deduction of costs.

ProVol Index Signal and Allocation



Volatility is a statistical measure of how much an asset's return varies from the mean of such returns; the more variable the asset's returns, the higher its volatility, and the higher the perceived risk of such asset (all other things being equal). Volatility is one of the market standards for assessing risk. Volatility is generally calculated based on the natural logarithm return of an asset between each observation. Realized volatility is a calculation of this amount of movement historically from prices or levels of the asset observed periodically in the market over a set period. Realized volatility is characterized by the frequency of the observations of the asset price used in the calculation and the period over which

observations are made. For example, six-month daily realized volatility denotes realized volatility calculated from daily closing asset prices over a six-month period. Implied volatility is a market estimate of the volatility an asset will realize over a future period of time. Implied volatility is determined from the market prices of listed options on the asset. For example, one-month implied volatility denotes volatility implicit in the prices of the relevant options with one month to expiration.

Each ProVol Index allocates long or short exposure to the VIX Futures Index based on the size and direction of the Signal and Allocation calculated on each Index Business Day using three volatility indicators: (i) the probability of being in a high-volatility environment as measured by Deutsche Bank's proprietary Volatility Regime Model (the "**High-Volatility Regime Probability**"), (ii) three-month implied volatility as measured by the CBOE S&P 500® 3-Month Volatility Index (the "**VXV Index**") and (iii) the "steepness" of the implied volatility curve as measured by the ratio of the VXV Index to the VIX Index (the "**Volatility Term Structure**"). Each volatility indicator contributes to the Signal positively or negatively based on a fixed weight assigned to such volatility indicator. In addition to the three volatility indicators, the Signal also takes into account the prior day's Allocation, which harnesses the value of past information and makes changes in the volatility exposure more gradual.

High-Volatility Regime Probability. The Volatility Regime Model is designed to estimate probabilities that the S&P 500 is in a low-, medium- and high-volatility environment. The High-Volatility Regime Probability contributes positively to the Signal, meaning that the Signal will increase if the probability of being in a high-volatility environment increases and decrease if the probability of being in a high-volatility environment decreases.

VXV Index. The VXV Index is similar to the VIX Index, except that it measures the market's expectation of the volatility the S&P 500 will realize over the next 93 days. When three-month implied volatility is high, the likelihood of implied volatility going down typically outweighs the likelihood of implied volatility going up. As a result, the VXV Index contributes negatively to the Signal, meaning that the Signal will decrease if the three-month implied volatility increases and increase if the three-month implied volatility decreases.

Volatility Term Structure. The Volatility Term Structure measures the "steepness" of the implied volatility curve. When the VXV Index level is higher than the VIX Index, reflecting an upward sloping implied volatility curve, longer-dated futures contracts will generally be priced higher than the nearer contracts and spot prices and the market can be described as in "contango." When the VXV Index is lower than the VIX Index, reflecting a downward sloping implied volatility curve, longer-dated futures contracts will generally be priced lower than the nearer contracts and spot prices and the market can be described as in "backwardation." The cost of carrying VIX futures contracts will be positive when the market is in contango and negative (reflecting a profit) when the market is in backwardation. The implied volatility market tends to be in contango most of the time, making it very expensive to continuously carry VIX futures contracts. As the implied volatility curve becomes steeper, the cost of carrying VIX futures contracts will increase. To reduce the carrying cost, the Volatility Term Structure contributes negatively to the Signal, meaning that the Signal will decrease if the "steepness" of the implied volatility curve increases and increase if the "steepness" of the implied volatility curve decreases.

Because the Signal is calculated on each Index Business Day by aggregating the weighted levels of the three volatility indicators, the volatility indicators may offset or reinforce each other. Generally speaking, the Signal is positive when realized volatility is high, there is a high probability that implied volatility will increase, and/or the implied volatility market is in backwardation (to generate returns from negative carrying costs) and is negative when realized volatility is low, there is a high probability that implied volatility will decrease, and/or the implied volatility market is in contango (to generate returns from positive carrying costs). In addition to the three volatility indicators, the Signal also takes into account the prior day's Allocation, which harnesses the value of past information and makes changes in the volatility exposure more gradual. The Allocation on each Index Business Day will be calculated based on the Signal; *provided* that a weak Signal between 0.1 and –0.1 will not result in any Allocation and the Allocation will not exceed the maximum Allocation of 0.3 or –0.3.

The ProVol Index family includes three indices: the ProVol Hedge Index, the ProVol Carry Index and the ProVol Balanced Index. The three indices differ in the leverage factors applied to the Allocation. The ProVol Hedge Index aims to capture more returns from increases in implied volatility than from high carrying costs by applying a leverage factor of 200% (2 times) when the Allocation is positive, generating leveraged long exposure and unleveraged short exposure. On the other hand, the ProVol Carry Index does the opposite and aims to capture more returns from high carrying costs than from increases in implied volatility by applying a leverage factor of 200% (2 times) when the Allocation is negative, generating leveraged short exposure and unleveraged long exposure. The ProVol Balanced Index aims for a balanced approach of capturing returns equally from increases in implied volatility and high carrying costs by applying a leverage factor of 150% (1.5 times) regardless of whether the Allocation is positive or negative.

The closing level of each ProVol Index will be calculated by the Index Sponsor on each Index Business Day based on closing levels of the VIX Futures Index and the Allocation and leverage factor assigned to each ProVol Index, less an index fee ("the "**Index Fee**"). The Index Fee takes into account changes in the notional VIX futures contracts position associated with both the daily rolling from the first month to the second month VIX futures contracts underlying the VIX Futures Index as well as any changes in the size of the notional position in the VIX Futures Index. Each portion of the Index Fee is equal to 0.35% of the dollar value of the VIX futures contracts notionally traded on such Index Business Day, subject to a minimum fee equal to the number of VIX futures contracts notionally traded on such Index Business Day times a fixed multiplier of 0.1. The Index Fee is related to the dollar value or number of contracts notionally traded. Thus, large or more frequent shifts in the Signal or greater or more frequent changes in VIX futures contracts prices will require greater reallocation and will result in higher costs. Additionally, lower VIX futures contracts prices, which require a greater number of contracts to be notionally traded in order to achieve the same value, will also result in higher costs. We expect the Index Fee to average between 1.5bps and 2bps (0.015% and 0.02%) per Index Business Day. However, the actual Index Fee may be substantially higher on days when there is a substantial change in the Allocation or prices of the VIX futures contracts, resulting in a substantial number or value of VIX futures contracts notionally traded. From and including 2006 to and including 2012, the annual Index Fees for the ProVol Indices have ranged from 0.00% to 7.12%. Because the calculation of the ProVol Indices began on September 24, 2012, the annual Index Fees from and including 2006 to and including September 23, 2012 were retroactively calculated.

The ProVol Indices were created by Deutsche Bank AG (the "**Index Sponsor**") on September 24, 2012 and are calculated, maintained and published by the Index Sponsor. The closing level of each ProVol Index was set to 100 on December 20, 2005 (the "**ProVol Base Date**"). An "**Index Business Day**" means a weekday when the New York Stock Exchange, the NASDAQ Stock Market and the Chicago Board Options Exchange are open (each a "**Relevant Exchange**").

The VIX Index

The CBOE Volatility Index®, which we refer to as the VIX Index, is a benchmark index that measures the market's expectation of the S&P 500's volatility (also referred to as implied volatility) over the next 30 days, calculated based on the prices of certain put and call options on the S&P 500. The VIX Index is a volatility index comprised of options rather than stocks, with the price of each option reflecting the market's expectation of future volatility. Thus, when the market's expectation of volatility over the next 30 days increases, the level of the VIX Index generally increases as well and, when the market's expectation of volatility over the next 30 days decreases, the level of the VIX Index generally decreases.

The VIX Index was developed by the Chicago Board Options Exchange (the "**CBOE**") and is calculated, maintained and published by the CBOE. The CBOE has no obligation to continue to publish, and may discontinue the publication of, the VIX Index. The VIX Index is reported by Bloomberg L.P. under the ticker symbol "VIX."

Although the VIX Index measures the 30-day volatility of the S&P 500 implied by the out-of-the-money put and call options on the level of the S&P 500 ("**SPX Options**"), 30-day options are only available once a month. To arrive at the VIX Index level, a broad range of out-of-the-money SPX Options expiring on the two closest nearby months ("**Near Term Options**" and "**Next Term Options**," respectively), usually in the first and second contract months, are selected in order to derive a measure of 30-day market implied volatility. SPX Options having a maturity of less than eight days are excluded at the outset. When the Near Term Options have eight days or less left to expiration, the VIX Index rolls to the second and third contract months in order to minimize pricing anomalies that occur close to expiration. The VIX Index is calculated independently of any particular option pricing model and in doing so seeks to eliminate any biases which may otherwise be included in using options pricing methodology based on certain assumptions. The model-free implied volatility for each month is calculated using a strike-weighted sum of the prices of the options for that month. The 30-day implied volatility is then interpolated from the implied volatilities of these two near expiries.

VIX Futures Contracts

VIX futures contracts were first launched for trading by the CBOE in 2004. The VIX Index futures have expirations ranging from the front month consecutively out to the eighth month. VIX futures contracts allow investors the ability to invest in forward implied volatility based on their view of the future direction of the VIX Index. Investors that believe the implied volatility of the S&P 500 will increase may buy VIX futures contracts, expecting that the level of the VIX Index will increase. Conversely, investors that believe that the implied volatility of the S&P 500 will decline may sell VIX futures contracts, expecting that the level of the VIX Index will fall.

An exchange-traded futures contract provides for the purchase and sale of a specified type and quantity of an underlying asset or financial instrument at a stated delivery time for a fixed price. Because the VIX Index is not a tangible

item that can be purchased and sold directly, a VIX futures contract provides for the payment and receipt of cash based on the level of the VIX Index at settlement or liquidation of the contract.

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

Roll yield, which can be either positive or negative, is generated as a result of rolling futures contracts. When longer-dated contracts are priced lower than the nearer contract and spot prices, the market is in "backwardation," and positive roll yield may be generated when higher-priced near-term futures contracts are "sold" to "buy" and hold lower priced longer-dated contracts. When the opposite is true and longer-dated contracts are priced higher than the nearer contracts and spot prices, the market is in "contango," and negative roll yields (or roll costs) may result from the "sale" of lower priced near-term futures contracts to "buy" and hold higher priced longer-dated contracts.

The VIX Futures Index

The VIX Futures Index is an excess return index that tracks 30-day forward implied volatility of the S&P 500 by means of a daily-rolling notional long position in first month and second month futures contracts on the VIX Index. The VIX Futures Index rolls daily throughout each month from the first month VIX futures contracts into the second month VIX futures contracts. As a daily rolling index, the VIX Futures Index aims to maintain a long exposure to VIX futures contracts with a constant weighted average maturity of 30 days. Thus, when the prices of the relevant VIX futures contracts increase, reflecting the market's increased expectation of volatility over the next 30 days, the level of the VIX Futures Index generally increases as well and, when the prices of the relevant VIX futures contracts decrease, reflecting the market's decreased expectation of volatility over the next 30 days, the level of the VIX Futures Index generally decreases. In addition, the VIX Futures Index will benefit from the positive roll yields generated in "backwardation" markets when the second month VIX futures contracts are priced lower than the first month VIX futures contracts, and will be adversely affected by the negative roll yields generated in "contango" markets when the second month VIX futures contracts are priced higher than the first month VIX futures contracts.

Contract Rebalancing

The VIX Futures Index has a monthly rolling cycle. Each roll period (the "**Monthly Roll Period**") starts from (and excluding) a Monthly Roll Date and ends on (and including) the next Monthly Roll Date. The Monthly Roll Date for each month is typically the Tuesday prior to the monthly settlement date of the VIX futures contracts, which is generally 31 calendar days prior to the SPX Option expiration date for the following month. Each Monthly Roll Date will be determined based on the following rules:

Step 1: Take the third Friday of the following month (if it is not an Index Business Day, the immediately preceding Index Business Day). This is the SPX Option expiration date for the following month.

Step 2: Deduct 30 calendar days from the SPX Option expiration date for the following month determined in Step 1.

Step 3: The "**Monthly Roll Date**" is the one Index Business Day prior to the date determined in Step 2.

On the first Index Business Day during the Monthly Roll Period, all of the weight in the VIX Futures Index is allocated to the first month VIX futures contracts. On each subsequent Index Business Day in the Monthly Roll Period, a fraction of the first month VIX futures contracts is sold and an equal notional amount of the second month VIX futures contracts is purchased. The fraction, or quantity, of the notional amount of first and second month VIX futures contracts purchased or sold on an Index Business Day is equal to 1/D, where D is the total number of Index Business Days in the current Monthly Roll Period. For example, if there are 20 Index Business Days in the current Monthly Roll Period, 1/20 in the first month VIX futures contracts will be sold and 1/20 in the second month VIX futures contracts will be purchased on each Index Business Day following the Monthly Roll Date. On the last Index Business Day of the Monthly Roll Period (the Monthly Roll Date), the weight of the VIX Futures Index is only 1/20 in the first month VIX futures contracts. This 1/20 position in

the first month VIX futures contracts will then be sold at the close on such Index Business Day. In this way, the initial position in the first month VIX futures contracts is progressively moved to the second month VIX futures contracts over the course of the Monthly Roll Period, until the following Monthly Roll Period starts and the old second month VIX futures contracts become the new first month VIX futures contracts.

Calculation of the VIX Futures Index

The Index Sponsor will calculate the level of the VIX Futures Index (the "**VIX Futures Index Level**") on each Index Business Day based on (i) the VIX Futures Index Level on the immediately preceding Index Business Day and (ii) the changes in the market value of the notional positions in the first month and second month VIX futures contracts.

The VIX Futures Index Level on each Index Business Day is calculated as follows:

$$IL_{VF}(t) = IL_{VF}(t-1) + [H_1(t) \times (P_1(t) - P_1(t-1)) + H_2(t) \times (P_2(t) - P_2(t-1))]$$

where:

$IL_{VF}(t)$	=	the VIX Futures Index Level on the relevant Index Business Day
$IL_{VF}(t-1)$	=	the VIX Futures Index Level on the immediately preceding Index Business Day
$H_1(t)$	=	the notional holding of the first month VIX futures contracts on the relevant Index Business Day
$H_2(t)$	=	the notional holding of the second month VIX futures contracts on the relevant Index Business Day
$P_1(t)$	=	the settlement price of the first month VIX futures contracts on the relevant Index Business Day
$P_2(t)$	=	the settlement price of the second month VIX futures contracts on the relevant Index Business Day

The notional holding of the first month VIX futures contracts on the relevant Business Day ($H_1(t)$) is equal to (i)(a) the VIX Futures Index Level on the immediately preceding Index Business Day *divided by* (b) the weighted average settlement price for the immediately preceding Index Business Day ($P_{AVG}(t-1)$) *multiplied by* (ii) the Roll Weight for the first VIX futures contract on such Index Business Day. Similarly, the notional holding of the second month VIX futures contracts on the relevant Business Day ($H_2(t)$) is equal to (i)(x) the VIX Futures Index Level on the immediately preceding Index Business Day *divided by* (y) the weighted average settlement price for the immediately preceding Index Business Day ($P_{AVG}(t-1)$) *multiplied by* (ii) the Roll Weight for the second VIX futures contract on such Index Business Day.

The "**Roll Weight**" is designed to reflect the rolling each day from the first month VIX futures contracts into the second month VIX futures contracts. The Roll Weight for the first month VIX futures contracts on each Business Day ($RW_1(t)$) is equal to (i) one *plus* the number of Index Business Days from (and excluding) such Index Business Day to (and including) the following Monthly Roll Date *divided by* (b) "D," the total number of Index Business Days from (but excluding) the previous Monthly Roll Date to (and including) the following Monthly Roll Date. The Roll Weight for the second month VIX futures contracts on the same Index Business Day ($RW_2(t)$) is equal to (i) one *minus* (ii) the Roll Weight for the first month VIX futures contracts as calculated above. For example, if there are 20 Index Business Days in the current Monthly Roll Period, on the fourth Index Business Day during the Monthly Roll Period, the Roll Weight for the first month VIX futures contracts is 17/20 and the Roll Weight for the second month VIX futures contracts is 3/20.

The weighted average settlement price for the immediately preceding Index Business Day is calculated as follows:

$$P_{AVG}(t-1) = RW_1(t) \times P_1(t-1) + RW_2(t) \times P_2(t-1)$$

where:

$P_{AVG}(t-1)$	=	the weighted average settlement price for the immediately preceding Index Business Day
$RW_1(t)$	=	the Roll Weight for the first month VIX futures contracts

$P_1(t-1)$	=	the first month VIX futures contracts settlement price on the immediately preceding Index Business Day
$RW_2(t)$	=	the Roll Weight for the second month VIX futures contracts
$P_2(t-1)$	=	the second month VIX futures contracts settlement price on the immediately preceding Index Business Day

Volatility Indicators

The ProVol Index allocates long or short exposure to the VIX Futures Index based on the size and direction of the Signal and resulting Allocation calculated on each Index Business Day using three volatility indicators: (1) the High-Volatility Regime Probability, which is the probability of the S&P 500 being in a high-volatility environment as estimated by Deutsche Bank's proprietary Volatility Regime Model; (2) the VXV Index and (3) the Volatility Term Structure. The High-Volatility Regime Probability contributes positively to the Signal, while the VXV Index and the Volatility Term Structure contribute negatively to the Signal.

Volatility Indicator 1 – Volatility Regime Model

The High-Volatility Regime Probability is the probability of the S&P 500 being in a high-volatility environment as estimated by Deutsche Bank's proprietary Volatility Regime Model (the "**Model**"). The Model is designed to calculate probabilities that the S&P 500 is in a low-volatility environment, a medium-volatility environment or a high-volatility environment on any given day based on a statistical review of the observed daily total returns of the S&P 500 during the period from January 4, 1988 (the "**Model Base Date**") to the day of estimation.

The Model is based on the observation that the distribution of equity returns is different in different volatility environments. For example, low-volatility environments have been more likely to generate smaller, positive returns for the S&P 500 over the historical period, while high-volatility environments have been more likely to generate larger, negative returns over the historical period. The Model assumes the performance of the S&P 500 can be classified into three distinct regimes, the "Low-Volatility Regime," "Medium-Volatility Regime" and "High-Volatility Regime," each characterized by certain statistically derived parameters (the "**Regime Parameters**"), including the expected volatility of the S&P 500 (on a daily and annualized basis), the expected daily return of the S&P 500 and the expected long-term probability that the S&P 500 will be in a particular regime.

The probability of the S&P 500 being in a particular regime on a given day (each, a "**Regime Probability**") is not directly observable through the volatility levels of the S&P 500 on that particular day. Instead, the Model calculates the probability of the S&P 500 being in each regime based on the daily return of the S&P 500 on that day, taking into account the Regime Probabilities for the previous day, which in turn take account of previous probability calculations based on the daily returns of the S&P 500 from the Base Date. Each new daily return of the S&P 500 is processed through the Model as an additional datum, and based on the input of such additional datum, the Model's calculation of Regime Probabilities is updated.

Unlike a realized-volatility metric, which on any given day measures the volatility of an underlying asset over a fixed period of time in the past, the Model is intended to help navigate regime transitions by distinguishing between temporary volatility spikes and what the Model counts as true regime changes.

The Model is constructed and maintained by Deutsche Bank AG, London Branch (the "**Model Sponsor**"). On each Calculation Date (as defined below), the Model Sponsor will calculate the Regime Probabilities for such Calculation Date as described below under "Calculation of Regime Probabilities."

Features of the Volatility Regime Model

Two principal factors affect the calculation of the Regime Probabilities: (i) the magnitude and direction of the daily total return of the S&P 500 on the relevant Calculation Date and (ii) the Model's calculation of the Regime Probabilities on the immediately preceding Calculation Date.

In general, the magnitude and direction of the daily total return of the S&P 500 can be expected to have the following effects on each Calculation Date, all else being equal: a particularly volatile day should favor an increase in the Regime Probability for the High-Volatility Regime at the expense of the other two regimes. Conversely, a particularly quiet day should favor an increase in the Regime Probability for the Low-Volatility Regime at the expense of the other two regimes.

In addition, a positive daily move in the level of the S&P 500 should favor an increase in the Regime Probability for the Low-Volatility Regime and a decline in the Regime Probability for the High Volatility Regime. Conversely, a negative daily move in the level of the S&P 500 should favor an increase in the Regime Probability for the High-Volatility Regime and a decline in the Regime Probability for the Low-Volatility Regime. The Regime Probability for the Medium-Volatility Regime should be neutral to the direction of a daily move. However, the magnitude of a daily move has significantly more impact on the Regime Probabilities than the direction of such move. For instance, a return that is both large and positive would generally be expected to lead to an increase in the Regime Probability for the High-Volatility Regime, while a return that is both small and negative would generally be expected to lead to an increase in the Regime Probability for the Low-Volatility Regime.

The Model's calculation of the Regime Probabilities for each Calculation Date is directly affected by the Regime Probabilities on the Calculation Date immediately preceding such Calculation Date. In that sense, the Model has "memory." In addition, the regimes are "sticky," meaning that to the extent the Model calculates a high probability of being in a given regime, the Model operates in a way that favors maintaining the probability of being in that regime, thus making shifts between volatility regimes less frequent.

Regime Parameters and Transition Matrix

As noted above, each regime has a set of Regime Parameters including the expected volatility of the S&P 500 (on a daily and annualized basis), the expected daily return of the S&P 500 and the expected long-term probability that the S&P 500 will be in a particular regime. In addition, the Model includes a transition matrix (the "**Transition Matrix**") that sets forth the expected probability of the S&P 500 staying in the same regime or of transitioning from one regime to another (each, a "**Transition Probability**").

The Regime Parameters and the Transition Matrix have been determined by applying a statistical procedure known as "Maximum Likelihood Estimation" ("**MLE**") to the daily total returns of the S&P 500 from the Model Base Date to June 14, 2011 (the "**Model Period**"). MLE is a method of estimating the parameters of a statistical model. When applied to an observed data set and a given statistical model, MLE can determine the values of the model's parameters that make the observed data the most probable. The MLE procedure starts off by determining the likelihood of a single day observation given a fixed set of model parameters. The total likelihood of an entire data set is the product of the individual likelihood values for every observation in the data set. MLE then searches the entire parameter space to come up with the set of parameters that produce the maximum total likelihood for the given data set. The Regime Parameters in Table 1 below and the Transition Matrix in Table 2 below are the set of parameters that produce the maximum total likelihood for the daily total returns of the S&P 500 during the Model Period using the MLE procedure. The Model Sponsor will not revise the Regime Parameters and the Transition Matrix based on the daily returns of the S&P 500 outside the Model Period.

Table 1: Regime Parameters*

	Low Volatility	Medium Volatility	High Volatility
Expected Long-Term Probability	47%	46%	7%
Expected Daily Return	0.1%	0.01%	-0.2%
Expected Daily Volatility	0.6%	1.1%	2.8%
Annualized Expected Volatility	9.5%	18.1%	44.4%

* The numbers appearing in Table 1 have been rounded for ease of presentation.

As demonstrated by the "Expected Long-Term Probability" parameters, the Model expects the S&P 500 to be in the Low- and Medium-Volatility Regimes most of the time, and only be in the High-Volatility Regime occasionally. The parameters indicate that the Low-Volatility Regime tends to generate small daily returns (i.e. low volatility moves) with a bias towards positive returns, the Medium-Volatility Regime tends to generate somewhat larger daily returns (i.e. medium volatility moves) with little directional bias and the High-Volatility Regime tends to generate large daily returns (i.e. high volatility moves) with a bias towards negative returns.

Table 2: Transition Matrix*

	From Low Volatility	From Medium Volatility	From High Volatility
To Low Volatility	98.5%	1.5%	0.0%
To Medium Volatility	1.4%	97.9%	3.9%
To High Volatility	0.05%	0.6%	96.1%

* The numbers appearing in Table 2 have been rounded for ease of presentation.

As demonstrated by the Transition Matrix, which sets the probability of staying in the Low-, Medium- and High-Volatility Regimes at 98.5%, 97.9% and 96.1%, respectively, the Model expects the regimes to be "sticky," meaning that the S&P 500 should generally stay in the same regime and transitions from one regime to another should be infrequent. To the extent the S&P 500 is calculated to be in the Low-Volatility Regime, the probability of jumping into the High-Volatility Regime overnight is close to 0%. Similarly, to the extent the S&P 500 is calculated to be in the High-Volatility Regime, the probability of jumping into the Low-Volatility Regime overnight is close to 0%. However, an extreme single-day move could lead to a transition from the Low-Volatility Regime to the High-Volatility Regime.

Calculation of Regime Probabilities

On each Calculation Date, the Model will determine the Regime Probabilities through the following steps using the Regime Parameters shown in Table 1 and the Transition Matrix shown in Table 2. First, the Model will determine the expected likelihood of such day's return coming from each of the volatility regimes (each, an "**Expected Probability**"). The Expected Probability for each regime (which we also refer to as the "current regime") is calculated by adding the following results: (i) the product of the "old" Regime Probability for the current regime on the immediately preceding Calculation Date and the Transition Probability of staying in the current regime and (ii) for each of the other two regimes, the product of the "old" Regime Probability for that regime and the Transition Probability of transitioning from that regime into the current regime. This step will modify the "old" Regime Probabilities by taking into account the probabilities of the S&P 500 transitioning from one regime to another.

Second, the Model will determine the single-day likelihood factors for each regime (each, a "**Single-Day Likelihood Factor**") by comparing the daily total return of the S&P 500 on such Calculation Date with the Regime Parameters. In general, small daily returns (i.e. low volatility moves) tend to generate Single-Day Likelihood Factors in favor of the Low-Volatility Regime and to a less extent the Medium-Volatility Regime. Conversely, large daily returns (i.e. high volatility moves) tend to generate Single-Day Likelihood Factors in favor of the High-Volatility Regime and to a less extent the Medium-Volatility Regime. Moderate daily returns (i.e. medium volatility moves) tend to generate Single-Day Likelihood Factors in favor of the Medium-Volatility Regime. In addition, positive daily returns tend to generate Single-Day Likelihood Factors in favor of the Low-Volatility Regime and not in favor of the High-Volatility Regime. Conversely, negative daily returns tend to generate Single-Day Likelihood Factors in favor of the High-Volatility Regime and not in favor of the Low-Volatility Regime. The Single-Day Likelihood Factor for the Medium-Volatility Regime is approximately neutral to the direction of daily returns. The size of the daily returns has significantly more impact on the Single-Day Likelihood Factors than the direction. The absolute size of the Single-Day Likelihood Factors is not important; it is their size relative to each other that is important in determining the "new" Regime Probabilities on the Calculation Date.

Third, after determining the Single-Day Likelihood Factor for each regime, the Model will determine the "new" Regime Probabilities on the Calculation Date by (i) multiplying the Single-Day Likelihood Factor of each regime by the Expected Probability for such regime and (ii) dividing each of the results by the sum of the results for all three regimes. The "new" Regime Probabilities will indicate the probabilities of the S&P 500 being in the Low-, Medium- and High-Volatility Regimes on such Calculation Date. On the next Calculation Date, the new daily return of the S&P 500 will be processed in a similar manner through the Model as an additional datum, and the Model's calculation of Regime Probabilities will be updated based on the input of such additional datum.

On the Model Base Date, the Regime Probability for each of the Low-, Medium- and High-Volatility Regimes was set to be equal to the "Expected Long-Term Probability" parameters of 47%, 46% and 7%, respectively.

The following example illustrates the calculation of the Regime Probabilities on a Calculation Date and assumes that (i) the Regime Probabilities for the Low-, Medium- and High-Volatility Regimes on the immediately preceding Calculation Date are 75%, 15% and 10%, respectively and (ii) the daily total return of the S&P 500 on such Calculation Date is 1.0%.

Step 1: Calculate the Expected Probabilities

The Expected Probabilities for each regime will be calculated using the Transition Matrix in Table 2 and the Regime Probabilities on the immediately preceding Calculation Date. For example, the Expected Probability for the Low-Volatility Regime will be equal to the sum of:

(i) the product of the Regime Probability for the Low-Volatility Regime on the immediately preceding Calculation Date (75%) and the probability of staying in the Low-Volatility Regime (98.5%);

(ii) the product of the Regime Probability for the Medium-Volatility Regime immediately preceding Calculation Date (15%) and the probability of transitioning from the Medium-Volatility Regime into the Low-Volatility Regime (1.5%); and

(iii) the product of the Regime Probability for the High-Volatility Regime immediately preceding Calculation Date (10%) and the probability of transitioning from the High-Volatility Regime into the Low-Volatility Regime (0.0%).

The Expected Probabilities for the Medium- and High-Volatility Regimes will be calculated in a similar manner as shown below:

For Low-Volatility Regime: 75% x 98.5% + 15% x 1.5% + 10% x 0.0% = 74.1%

For Medium-Volatility Regime: 75% x 1.4% + 15% x 97.9% + 10% x 3.9% = 16.1%

For High-Volatility Regime: 75% x 0.05% + 15% x 0.6% + 10% x 96.1% = 9.7%

Step 2: Calculate the Single-Day Likelihood Factors

The Single-Day Likelihood Factors for each regime will be determined by the Model based on the alignment of the daily total return of the S&P 500 and the various Regime Parameters. For example, if the daily total return of the S&P 500 on a Calculation Date is 1.0%, the Single-Day Likelihood Factors would be 21.586, 24.258 and 12.998 for the Low-, Medium- and High-Volatility Regimes, respectively. Because the daily total return of 1.0% (meaning that the daily volatility of the S&P 500 on the Calculation Date is also 1.0%) is closer to the "Expected Daily Volatility" and "Expected Daily Return" parameters of the Low-Volatility and Medium-Volatility Regimes, the Single-Day Likelihood Factors generated by this return are in favor of such regimes. Because the daily total return of 1.0% is positive and the volatility is relatively small in size (as compared to the Expected Daily Volatility of 2.8% for the High-Volatility Regime), the Single-Day Likelihood Factors are not in favor of the High-Volatility Regime.

Step 3: Calculate the Regime Probabilities

The Regime Probability for each regime will be equal to the quotient, the numerator of which is the product of (i) the Single-Day Likelihood Factor for such regime and (ii) the Expected Probability for such regime, and the denominator of which is the sum of the products of the Single-Day Likelihood Factor and the Expected Probability for each regime. Because the Single-Day Likelihood Factors in this example are more in favor of the Medium-Volatility Regime, less in favor of the Low-Volatility Regime and least in favor of the High-Volatility Regime, the Regime Probability increases from 15% to 18.5% for the Medium-Volatility Regime, increases slightly from 74.1% to 75.5% for the Low-Volatility Regime and decreases from 10% to 6.0% for the High-Volatility Regime.

$$\text{Low-Volatility Regime Probability} = \frac{21.586 \times 74.1\%}{21.586 \times 74.1\% + 24.258 \times 16.1\% + 12.998 \times 9.7\%} = 75.5\%$$

$$\text{Medium Volatility Regime Probability} = \frac{24.258 \times 16.1\%}{21.586 \times 74.1\% + 24.258 \times 16.1\% + 12.998 \times 9.7\%} = 18.5\%$$

$$\text{High-Volatility Regime Probability} = \frac{12.998 \times 9.7\%}{21.586 \times 74.1\% + 24.258 \times 16.1\% + 12.998 \times 9.7\%} = 6.0\%$$

"**Calculation Date**" means a day, as determined by the Model Sponsor, on which the New York Stock Exchange and the NASDAQ Stock Market are open for trading during their regular trading session, notwithstanding any such relevant exchange closing prior to its scheduled closing time.

The High-Volatility Regime Probability will be used as a volatility indicator for purposes of calculating the Signal.

Volatility Indicator 2 – The VXV Index

The CBOE S&P 500® 3-Month Volatility Index, which we refer to as the VXV Index, was developed by the CBOE and is calculated, maintained and published by the CBOE. The VXV Index is a benchmark index designed to measure the market's expectation of volatility of the S&P 500 over the next 93 days, and calculated based on the prices of certain put and call options on the S&P 500. During periods of market instability, the prices of options linked to the S&P 500 typically increase (assuming all other relevant factors remain constant or have negligible changes). This, in turn, causes the level of the VXV Index to increase. The VXV Index has historically had negative correlations to the S&P 500.

The VXV Index is calculated similarly to the VIX Index except that the VXV Index is designed to measure the market's expectation of volatility the S&P 500 over the next 93 days, rather than the next 30 days. The calculation of the VXV Index involves a formula that uses the prices of a weighted series of out-of-the-money SPX Options to derive a constant 93-day forward measure of market volatility. The VXV Index is calculated independently of any particular option pricing model and in doing so seeks to eliminate any biases which may otherwise be included in using options pricing methodology based on certain assumptions.

CBOE lists SPX Option series in three near-term contract months plus at least three additional contracts expiring on the March quarterly cycle; that is, on the third Friday of March, June, September and December. To arrive at the VXV Index level, a broad range of out-of-the-money SPX Options with expiration dates that most closely bracket a 93-day maturity are selected. The results of each of the contract months are then interpolated to arrive at a single value with a constant maturity of 93-days to expiration. For example, when SPX contract months are sequential; that is, expiring one month apart, the "roll" is a smooth transition from one set of options to the next. Yet, when the expiration dates of the SPX Options used to calculated the VXV Index are two to three months apart, there is a "jump" in the option weights by as much as 35% in order to maintain a constant weighted average maturity of 93-days to expiration.

There are no futures contracts trading on the VXV Index. The VXV Index was launched by the CBOE on November 12, 2007.

Volatility Indicator 3 – Volatility Term Structure

The Volatility Term Structure is the "steepness" of the implied volatility curve as measured by the ratio between the VXV Index and the VIX Index. When the VXV Index level is higher than the VIX Index, reflecting an upward sloping implied volatility curve, longer-dated futures contracts will generally be priced higher than the nearer contracts and spot prices and the market is in contango. When the VXV Index is lower than the VIX Index, reflecting a downward sloping implied volatility curve, longer-dated futures contracts will generally be priced lower than the nearer contracts and spot prices and the market is in backwardation. The cost of carrying VIX futures contracts will be positive (reflecting a loss) in a contango market and negative (reflecting a profit) in a backwardation market. The implied volatility market tends to be in contango most of the time, making it very expensive to continuously carry VIX futures contracts. As the Volatility Term Structure increases, reflecting a steeper implied volatility curve, the cost of carrying VIX futures contracts will increase.

Calculation of the Signal

The Signal is calculated on each Index Business Day by aggregating the weighted levels of the three volatility indicators. Generally speaking, the Signal is positive when realized volatility is high, there is a high probability that implied volatility will increase, and/or the implied volatility market is in backwardation (to generate returns from negative carrying costs) and is negative when realized volatility is low, there is a high probability that implied volatility will decrease, and/or the implied volatility market is in contango (to generate returns from positive carrying costs). In addition to the three volatility indicators, the Signal also takes into account the prior day's Allocation, which harnesses the value of past information and makes changes in volatility exposure more gradual.

The Signal will be calculated on each Index Business Day as follows:

$$X(t) = 0.28 + 0.65 \times pH(t-1) - 0.29 \times VXV(t-1)/20 - 0.05 \times [VXV(t-1)/VIX(t-1)] + 0.81 \times F(t-1)$$

where:

X(t)	=	The Signal on the relevant Index Business Day
pH(t – 1)	=	The High Volatility Regime Probability on the immediately preceding Index Business Day
VXV(t – 1)	=	The level of the VXV Index on the immediately preceding Index Business Day
VIX(t – 1)	=	The level of the VIX Index on the immediately preceding Index Business Day
F(t – 1)	=	The allocation to the VIX Futures Index on the immediately preceding Index Business Day

The Allocation on each Index Business Day will be calculated based on the Signal; *provided* that a weak Signal between 0.1 and –0.1 will result in a zero Allocation and the Allocation will not exceed the maximum Allocation of 0.3 or –0.3.

The Allocation on each Index Business Day will be calculated as follows:

(i) If the Signal on such Index Business Day is equal to or greater than zero, the Allocation will equal the product of (a) 1.5 and (b) the Signal *minus* 0.1, subject to the minimum Allocation of zero and the maximum positive Allocation of 0.3.

(ii) If the Signal on such Index Business Day is less than zero, the Allocation will equal the product of (a) 1.5 and (b) the Signal *plus* 0.1, subject to the minimum Allocation of zero and the maximum negative Allocation of –0.3.

Calculation of the ProVol Indices

Each ProVol Index measures the return of a daily rebalanced notional long or short position in the VIX Futures Index. The level of each ProVol Index (the "**ProVol Index Level**") on each Index Business Day is calculated based on (i) the relevant ProVol Index Level on the immediately preceding Index Business Day and (ii) the changes in the market value of the notional position in the VIX Future Index *minus* the Index Fee.

Each ProVol Index Level on each Index Business Day is calculated as follows:

$$IL(t) = IL(t-1) + H_{VF}(t) \times [IL_{VF}(t) - IL_{VF}(t-1)] - C(t)$$

Where,

$IL(t)$	=	the ProVol Index Level on the relevant Index Business Day
$IL(t-1)$	=	the ProVol Index Level on the immediately preceding Index Business Day
$H_{VF}(t)$	=	the notional holding of the VIX Futures Index on the relevant Index Business Day
$IL_{VF}(t)$	=	the VIX Futures Index Level on the relevant Index Business Day
$IL_{VF}(t-1)$	=	the VIX Futures Index Level on the immediately preceding Index Business Day
$C(t)$	=	the Index Fee on the relevant Index Business Day

$H_{VF}(t)$, which is the notional holding of the VIX Futures Index on each Index Business Day, is equal to (i) the ProVol Index Level on the immediately preceding Index Business Day *multiplied by* (ii) the Weight of the VIX Futures Index on such Index Business Day *divided by* (iii) the VIX Futures Index Level on the immediately preceding Index Business Day.

The weight of the VIX Futures Index in the ProVol Index (the "**Weight**") on each Index Business Day will be calculated based on the Allocation on such Index Business Day and the applicable leverage factor as follows:

(i) If the Allocation is greater than zero, then the Weight will be equal to the product of the Allocation and the long leverage factor for the specific version of the ProVol Index:

ProVol Hedge Index: 2

ProVol Carry Index: 1

ProVol Balanced Index: 1.5

(ii) If the Allocation is equal to zero, then the Weight will be zero.

(iii) If the Allocation is less than zero, then the Weight will be equal to the product of the Allocation and the short leverage factor for the specific version of the ProVol Index:

ProVol Hedge Index: 1

ProVol Carry Index: 2

ProVol Balanced Index: 1.5

The Index Fee takes into account changes in the notional VIX futures contracts position associated with both the daily rolling from the first month to the second month VIX futures contracts underlying the VIX Futures Index as well as any changes in the size of the notional position in the VIX Futures Index. Each portion of the Index Fee is equal to 0.35% of the dollar value of the futures contracts notionally traded on such Index Business Day, subject to a minimum fee equal to the number of futures contracts notionally traded on such Index Business Day times a fixed multiplier of 0.1. The Index Fee is related to the dollar value or number of contracts notionally traded. Thus, large or more frequent shifts in the Signal or greater or more frequent changes in VIX futures contracts prices will require greater reallocation and will result in higher costs. Additionally, lower VIX futures contracts prices, which require a greater number of contracts to be notionally traded in order to achieve the same value, will also result in higher costs. We expect the Index Fee to average between 1.5bps and 2bps (0.015% and 0.02%) per Index Business Day. However, the actual Index Fee may be substantially higher on days when there is a substantial change in the Allocation or prices of the VIX futures contracts, resulting in a substantial number or value of VIX futures contracts notionally traded. From and including 2006 to and including 2012, the annual Index Fees for the ProVol Indices have ranged from 0.00% to 7.12%. Because the calculation of the ProVol Indices began on September 24, 2012, the annual Index Fees from and including 2006 to and including September 23, 2012 were retroactively calculated.

The S&P 500

The S&P 500® Index, which we refer to as the S&P 500, is intended to provide a broad performance benchmark for the U.S. equity markets. The daily calculation of the value of the S&P 500 is based on the relative value of the aggregate market value of the common stocks of 500 companies as of a particular time compared to the aggregate average market value of the common stocks of 500 similar companies during the base period of the years 1941 through 1943. The 500 companies are not the 500 largest companies listed on the New York Stock Exchange and not all 500 companies are listed on such exchange.

The index sponsor chooses companies for inclusion in the S&P 500 with the objective of achieving a distribution by broad industry groupings that approximates the distribution of these groupings in the common stock population of the U.S. equity market. The index sponsor may from time to time, in its sole discretion, add companies to, or delete companies from, the S&P 500 to achieve the objectives stated above. Relevant criteria employed by the index sponsor include the viability of the particular company, the extent to which that company represents the industry group to which it is assigned, the extent to which the company's common stock is widely held and the market value and trading activity of the common stock of that company.

Consequences of Disruptions

If a Disruption Event (as defined below), a Force Majeure Event (as defined below) or an Underlying Index Event (as defined below) occurs on any Index Business 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 ProVol Indices. 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 ProVol Indices as it considers reasonably appropriate to determine any relevant price or level and/or to calculate the ProVol Index Levels on such Index Business Day;

(ii) defer the determination and publication of the ProVol Index Levels until the next Index Business Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event ceases to exist;

(iii) where such Index Business Day would otherwise have been a roll date for the VIX Futures Index, delay such roll date until the next Index Business Day on which the relevant Disruption Event, Force Majeure Event or Underlying Index Event ceases to exist;

(iv) select a successor exchange to replace the applicable Relevant Exchange and/or a successor index to replace the affected Underlying Index and, in each case, make such adjustments to the ProVol Indices to reflect such selection as it determines reasonably appropriate; and/or

(v) permanently cease to determine, calculate and make available the ProVol Index Levels and cancel the ProVol Indices.

Index Sponsor

Unless otherwise provided and subject to "Change in Methodology," 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 ProVol Indices:

"**Disruption Event**" means, in respect of an Underlying Contract, Underlying Index and/or ProVol Index, 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 Underlying Contract or the level of an Underlying Index or make any other determinations in respect of the relevant Underlying Contract, Underlying Index or ProVol Index on an alternative basis were such event to occur or exist on a day which is an Index Business Day (or, if different, the day on which the relevant price(s) for the Underlying Contract or the relevant level(s) of the Underlying Index in relation to the relevant Index Business Day would, in the ordinary course, be calculated, published or announced by the Related Exchange or the relevant Underlying Index Sponsor, as applicable). 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 Underlying Contract on the Related Exchange or in any additional futures contract or options contract relating to the VIX Index or the S&P 500 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 on any Relevant Exchange;

(ii) "**Disappearance of an Underlying Contract Price**:" (i) the failure of trading to commence, or the permanent discontinuation of trading in, a relevant Underlying Contract on the Related Exchange or (ii) the disappearance of the S&P 500 or VIX Index;

(iii) "**Material Change in Formula or Determination**:" the occurrence since the ProVol Base Date of a material change in the formula for or the method of calculating a relevant Underlying Contract 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 Underlying Contract price or the relevant prices in relation thereto;

(iv) "**Material Change in Content**:" the occurrence since the ProVol Base Date of a material change in the content, composition or constitution (i) of the S&P 500 to which a relevant SPX Option relates or (ii) of the VIX Index to which a relevant VIX futures contract 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 Underlying Contract by any government or taxation authority after the ProVol Base

Date, if the direct effect of such imposition, change or removal is to raise or lower an Underlying Contract 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 Underlying Contract or on the Related Exchange or in any additional futures contract or options contract relating to the S&P 500 or the VIX 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 or the VIX Index on any Relevant Exchange;

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

(viii) "**Change of Law or Rules**:" there is a change in, or amendment to, the laws, rules or regulations relating to any Underlying Contract 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 ProVol Indices, 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 ProVol 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 Underlying Contract 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 Index Business Day at the relevant time for the S&P 500 or the VIX Index or at any time during the one hour period that ends at the relevant time for the S&P 500 or the VIX 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 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 or the VIX Index on the Related Exchange;

b. the closure on any relevant day of any Relevant Exchange(s) relating to any constituents of the S&P 500, 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;

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 or to otherwise effect transactions in relation to the S&P 500 or the VIX Index.

"**Force Majeure Event**" means, in respect of the ProVol Indices, 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 Underlying Contract, Underlying Index and/or ProVol Index.

"**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 or the VIX 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, the VIX Index or a constituent of the S&P 500 has a material connection having regard to, without limitation, the country or countries in which the S&P 500 or VIX 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.

"**Underlying Contract**" means the SPX Option or the VIX futures contract.

"**Underlying Index**" means each of the S&P 500, the VIX Futures Index, the VIX Index or the VXV Index.

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

(i) in respect of an Underlying Index:

a. The Underlying Index is not calculated or announced by the Underlying Index Sponsor of the relevant Volatility Index (as applicable) but is calculated by a successor sponsor acceptable to the Index Sponsor;

b. 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

c. 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; or

iii. on any relevant Index Business Day, fails to calculate and announce any relevant level of the Underlying Index;

(ii) the failure of the Related Exchange, the Underlying Index Sponsor to announce or publish any information necessary for determining the price of an Underlying Contract or the level of an Underlying Index (as the case may be);

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

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

"**Underlying Index Sponsor**" means, with respect to an Underlying Index, the entity, or the successor entity, that regularly calculates and publishes such Underlying Index.

Change in Methodology

In calculating and determining the value of the ProVol Indices, 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 ProVol Indices, the Index Sponsor may modify the methodology used to determine the ProVol Indices as it deems appropriate if the Index Sponsor is of the view that such change is required in light of 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 (i) the S&P 500 and its volatility including options based on the S&P 500 or (ii) the VIX Index and the futures contracts on the VIX Index). The Index Sponsor may also make modifications to the terms of the ProVol Indices 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 ProVol Indices' Closing Level and Adjustments

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

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

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

The "Deutsche Bank ProVol Hedge Index," "Deutsche Bank ProVol Carry Index" and "Deutsche Bank ProVol Balanced Index" are proprietary indices of Deutsche Bank AG. Any use of such indices or their names must be with the consent of Deutsche Bank AG.