SOLACTIVE
German Index Engineering

INDEX GUIDELINE

Deutsche Bank Volatility Buffered Carry Index

Version 1.0

03 June 2019

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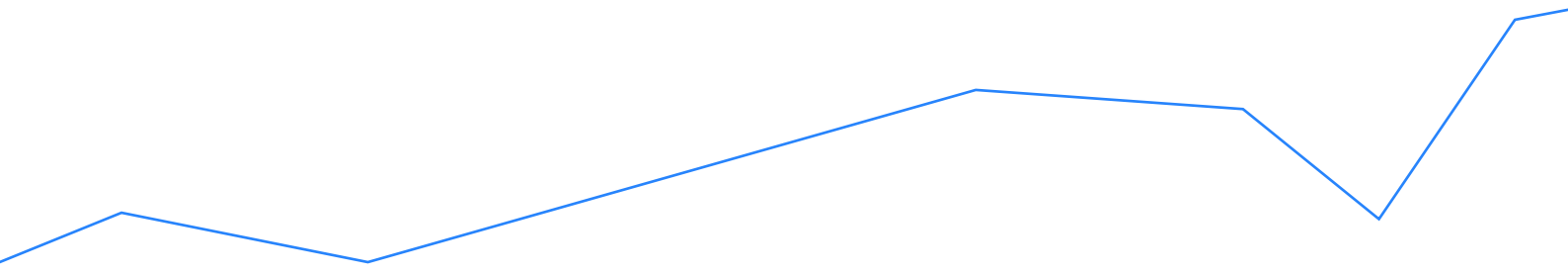

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INTRODUCTION

This document (the "Guideline") is to be used as a guideline with regard to the composition, calculation and maintenance of the Index. Any changes made to the Guideline are initiated by the Committee specified in Section 1.5. The Index is calculated and published by Solactive AG. The name "Solactive" is trademarked.

It contains the underlying principles and rules regarding the structure and operation of the Deutsche Bank Volatility Buffered Carry Index (the "Index"). Solactive AG shall make every effort to implement the applicable regulations. Solactive AG does not offer any explicit or tacit guarantee or assurance, neither pertaining to the results from the use of the Index nor the Index value at any certain point in time nor in any other respect. The Index is merely calculated and published by Solactive AG and it strives to the best of its ability to ensure the correctness of the calculation. There is no obligation for Solactive AG – irrespective of possible obligations to issuers – to advise third parties, including investors and/or financial intermediaries, of any errors in the Index. The publication of the Index by Solactive AG does not constitute a recommendation for capital investment and does not contain any assurance or opinion of Solactive AG regarding a possible investment in a financial instrument based on this Index.

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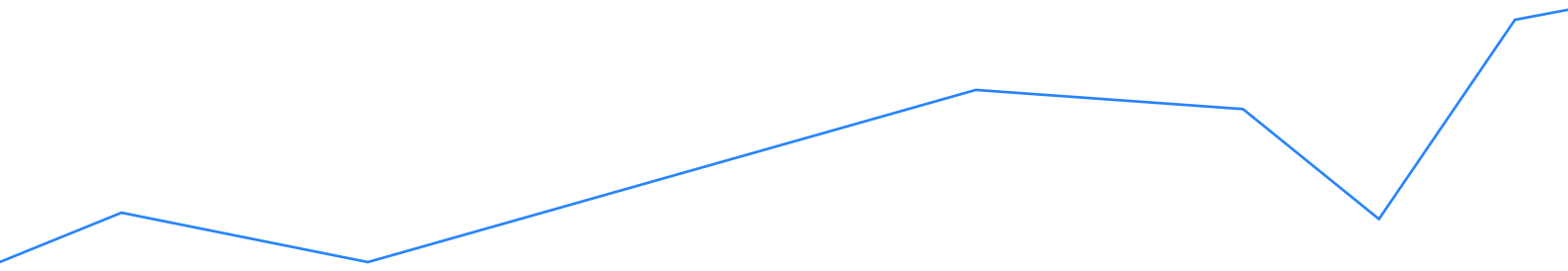
Index Specifications



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1 INDEX SPECIFICATIONS

- The Deutsche Bank Volatility Buffered Carry Index is an Index of Deutsche Bank AG and is calculated and distributed by Solactive AG.
- The Index is a VIX options strategy designed by Deutsche Bank to attempt to capture the carry and rolldown in the VIX Index while limiting losses in the event of a market drawdown. The strategy sells a two-month 40 delta call option on each listed VIX option expiry date, and buys a four-month 20 delta call option if the strike is below 40. Over time, this trading strategy establishes a constant position of being short a one-month and two-month call spread while being long a three-month and four-month call (6 total option positions). The strategy also implements a "stop loss" mechanism whereby it will unwind the one-month or two-month call spread if the respective short call position reaches a delta of 70.
- The Index is calculated as an Excess Return Index and published in USD.

1.1 SHORT NAME AND ISIN

The Index is distributed under ISIN DE000SLA0PA1, the WKN is SLA0PA. The Index is published on Reuters under the code .DBVIXBCS and on Bloomberg under the code DBVIXBCS Index.

1.2 INITIAL VALUE

The Index is based on 1000 at the close of trading on the Index Base Date.

1.3 DISTRIBUTION

The Index is published via the price marketing services of Boerse Stuttgart GmbH and is distributed to all affiliated vendors, including Bloomberg. Each vendor decides on an individual basis as to whether it will distribute/display the Index via its information systems.

1.4 PRICES AND CALCUATION FREQUENCY

The price of the Index is calculated on each Trading Day based on the most recent trade prices for futures and the most recent mid prices for options at or before the (Delta) Observation Time as determined by the Exchange on which the Index Components are listed. Should there be no current prices available, the prices for the preceding Trading Day are used in the calculation.

The Index is calculated once every Trading Day around 5:00 p.m., EST. In the event that data cannot be provided to the pricing services of Boerse Stuttgart GmbH, the Index cannot be distributed.

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1.5 OVERSIGHT

A Committee composed of staff from Solactive AG (the "Committee" or the "Index Committee") is responsible for decisions regarding the composition of the Indices as well as any amendments to the rules.

Members of the Committee can recommend changes to the Guideline and submit them to the Committee for approval.

1.6 PUBLICATION

All specifications and information relevant for calculating the Index are made available on the http://www.solactive.com web page and sub-pages.

1.7 HISTORICAL DATA

Historical data will be maintained from the Index Launch Date.

1.8 LICENSING

Licenses to use the Index as the underlying value for derivative instruments are issued to stock exchanges, banks, financial services providers and investment houses by Deutsche Bank AG.

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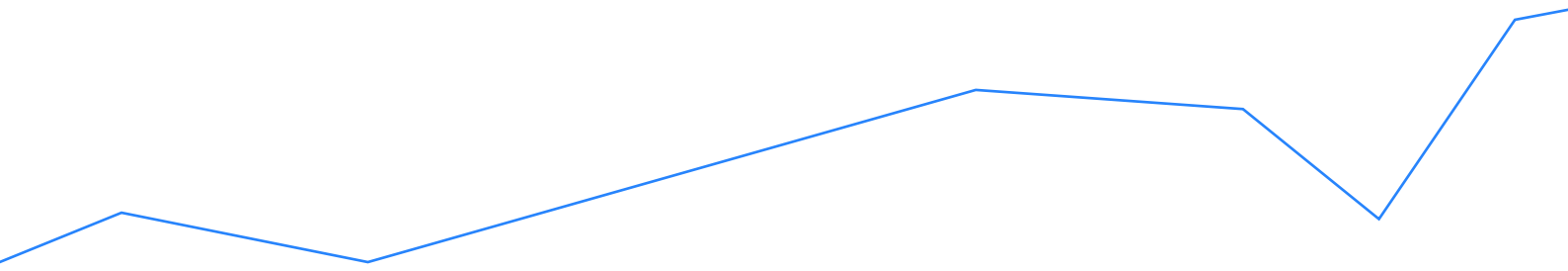
Composition of the Index



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2 COMPOSITION OF THE INDEX

2.1 DETERMINATION OF NEW OPTIONS

On each Rebalancing Day, the Index will make the following notional investments in the CBOE Volatility Index ("VIX"):

(i) Sell a call option with the Second Option Expiry Date and strike $K_{2m,t}$ with number of options traded equal to N_i

(ii) Buy a call option with the Fourth Option Expiry Date and strike $K_{4m,t}$ with number of options traded equal to N_i if strike $K_{4m,t}$ is less than 40 (non-exclusive).

Where:

$K_{2m,t}$ = closest listed strike on the Exchange for the Second Option Expiry Date with delta equal to 40 percent (40%), as calculated using the formula in Section 3.6 as determined at the Delta Observation Time

$K_{4m,t}$ = closest listed strike on the Exchange for the Fourth Option Expiry Date with delta equal to 20 percent (20%), as calculated using the formula in Section 3.6 as determined at the Delta Observation Time

N_i = The number of options traded for the ith option, calculated as follows:

$$N_i = I_{t-1} * 2\%$$

Where:

I_{t-1} = Index Value on the Trading Day immediately preceding Trading Day t

2.2 UNWINDING OF OPTIONS

On each Trading Day, any un-expired option which the Index had notionally sold will be unwound (by notionally buying such option) if

(i) the delta of the option is equal to 70 percent (70%) or higher as calculated using the formula in Section 3.6 as determined at the Delta Observation Time, and

(ii) there is no bought call option with an equivalent VIX Index Option Expiry Date

For avoidance of doubt, the sold call will not be unwound if there is a bought call with the same expiry.

The options will be unwound in accordance with Section 3.5.

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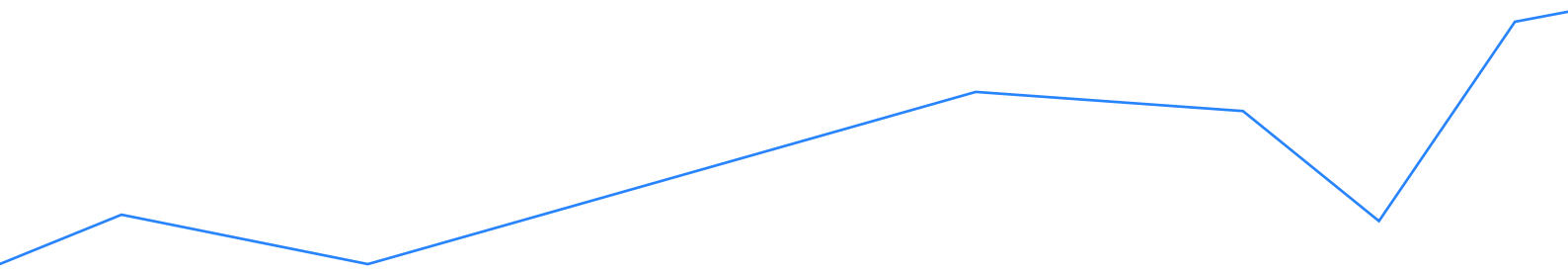
Calculation of the Index



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3 CALCULATION OF THE INDEX

3.1 CALCULATION OF THE INDEX

The Index Value on Trading Day t is calculated in accordance with the following formula:

$$I_t = I_0 - \mathrm{OPrem_t} + OMtM_t + OExp_t + OUnw_t$$

with:

I_t = Index Value on Trading Day t

I_o = Index Value on the Index Base Date

$\mathrm{OPrem_t}$ = Option Premium value on Trading Day t

$\mathrm{OMtM_t}$ = Option Mark-to-Market value on Trading Day t

$\mathrm{OExp_t}$ = Option Expiry value on Trading Day t

$\mathrm{OUnw_t}$ = Option Unwind value on Trading Day t

3.2 OPTION PREMIUM CALCULATION

The Option Premium value on Trading Day t is calculated in accordance with the following formula:

$$OPrem_t = \sum_{i \in OptionsTraded} BuySell_i * N_i * Premium_i$$

with

$\mathrm{OptionsTraded}$ = All options that have been notionally traded by the Index from the Index Base Date to and including Trading Day t

$BuySell_i$ = +1 if the Index is buying the option, and -1 if the Index is selling the option on the Rebalancing Day the ith option was notionally traded.

$\mathrm{Premium}_i$ = the premium paid or received upon notionally trading the ith option on the Rebalancing Day of the ith option (td), calculated as follows:

$$Premium_i = OP_{i,td} + BuySell_i * CostSpread_{i,td}$$

Where:

$\mathrm{OP}_{i,td}$ = The mid price of the ith option, as calculated as the arithmetic mean of the bid and ask price as observed at the Trade Observation Time on the Rebalancing Day the option was notionally traded

$\text{CostSpread}_{\text{i,td}}$ = the costs of notionally trading the ith option on the Rebalancing Day the ith option was notionally traded, calculated as follows:

$$\text{CostSpread}_{\text{i,td}} = max\left[0.04, 0.2\% * FP_{i,td}\right]$$

With:

$FP_{i,td}$ = VIX future price on the Rebalancing Day the ith option was notionally traded with an expiry equivalent to that of the ith option, as observed at the Trade Observation Time

3.3 OPTION MARK-TO-MARKET CALCULATION

The Option Mark-to-Market value on Trading Day t is calculated in accordance with the following formula:

$$OMtM_{\text{t}} = \sum_{j \in OptionsPortfolio} BuySell_j * N_j * OP_{j,t} + \sum_{k \in OptionsTraded_t} BuySell_k * N_k * Premium_k$$

with:

OptionsPortfolio = All un-expired options that have been notionally traded by the Index from the Index Base Date to (and excluding) Trading Day t. For avoidance of doubt, the Options Portfolio will not include any options that expire or unwind on or before t.

OptionsTraded_t = All options that have been notionally traded by the Index on Trading Day t

3.4 OPTION EXPIRY CALCULATION

The Option Expiry value on Trading Day t is calculated in accordance with the following formula:

$$OExp_{\text{t}} = \sum_{m \in OptionsExpired} BuySell_m * N_m * SV_m$$

with:

OptionsExpired = All options that have been notionally traded by the Index and have expired from the Index Base Date to (and including) Trading Day t.

SV_m = Settlement value of the mth option on its expiry date (ed), calculated as follows:

$$SV_m = max\left[0, VSV_{m,ed} - K_m\right]$$

With:

$VSV_{m,ed}$ = Level of the CBOE Volatility S&P 500 Option Settlement Value Index on the expiry date of the mth option

K_m = Strike of the mth option

3.5 OPTION UNWIND CALCULATION

The Option Unwind value on Trading Day t is calculated in accordance with the following formula:

$$OUnw_t = \sum_{p \in OptionsUnwind} BuySell_p * N_p * UV_p$$

with:

$\mathrm{OptionsUnwind}$ = All options that have been notionally traded by the Index and have been unwound from the Index Base Date to (and including) Trading Day t.

UV_p = Unwind value of the mth option on the Trading Day it was unwound (ud), calculated as follows:

$$UV_p = OP_{p,ud} - BuySell_p * CostSpread_{p,ud}$$

3.6 DELTA CALCULATION

The Delta in respect of a Trading Day t and the ith option is the percentage delta as calculated by the Black formula:

$$Delta_{i,t} = N(d_{1,i,t}) * \exp(-r_t * T_{i,t})$$

Where:

$$d_{1,i,t} = \frac{ln\left(\frac{FP_{i,t}}{K_i}\right) + \frac{\sigma_{i,t}^2}{2} * t_{i,t}}{\sigma_{i.t} * \sqrt{t_{i,t}}}$$

With:

$\mathrm{N()}$ = the standard normal cumulative distribution function

$\mathrm{FP_{i,t}}$ = Future price of the VIX future with expiry equal to the ith option's expiry date on Trading Day t

$t_{i,t}$ = number of Trading Days in the period commencing on date t (non-inclusive) and ending on the ith option's expiry date (inclusive), divided by 252

$T_{i,t}$ = number of calendar days in the period commencing on date t (non-inclusive) and ending on the ith option's expiry date (inclusive), divided by 365

r_t = Interest Rate on Trading Day t

$\sigma_{i.t}$ = Volatility level of the ith option on date t, determined by inverting the Black formula

$$OP_{i,t} = \left[FP_{i,t} * N\left(d_{1,i,t}\right) - K_i * N\left(d_{1,i,t} - \sigma_{i.t} * \sqrt{t_{i,t}}\right)\right] * \exp(-r_t * T_{i,t})$$

and using an iterative process.

3.7 ACCURACY

> The value of the Index will be rounded to two decimals for the purpose of publication.

3.8 MISCELLANEOUS

3.8.1 Recalculation

Solactive AG makes the greatest possible efforts to accurately calculate and maintain its indices. However, the occurrence of errors in the index determination process cannot be ruled out. In such cases Solactive AG adheres to its publicly available Correction Policy.

3.8.2 Market Disruption

In periods of market stress Solactive AG calculates its indices following predefined and exhaustive arrangements set out in its publicly available Disruption Policy.

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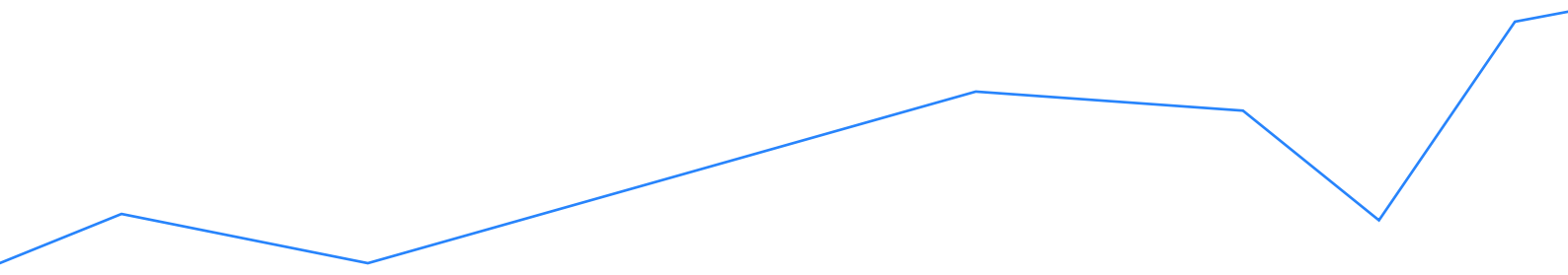
Disruptions and Consequences



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4 DISRUPTIONS AND CONSEQUENCES

Terms used in this Section 4.1 (Consequences of Disruptions) have the meanings given to them in Section 5 (Definitions).

4.1 Consequences of a Disruption Event

If a Disruption Event occurs or is continuing on any Trading Day, the Index Administrator will determine in its reasonable discretion whether the occurrence or existence of such event is material in respect of the notional buying and/or selling of Options and/or the calculation of the Index. In the event that the Index Administrator determines that the occurrence or existence of a Disruption Event is material in respect of the notional buying and/or selling of Options and/or the calculation of the Index, the Index Administrator may:

1) determine any relevant price, value, amount, rate or level required in order to calculate the Index Level in respect of such Trading Day;

2) suspend the notional buying and/or selling of Options and/or defer the determination and publication of the Index Level until the next Trading Day on which the Index Administrator determines that no Disruption Event exists; provided that where any such suspension of the notional buying and/or selling of Options and/or deferral of determination and publication continues for a period of 10 consecutive Trading Days, then the Index Administrator will:

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

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

3) make such determinations and/or adjustments in relation to the Index Rules as it considers reasonably appropriate with regard to preserving the economic intention of the methodology of the Index as set out in this Index Description;

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

5) permanently cease to determine, calculate and make available the Index Level and cancel the Index.

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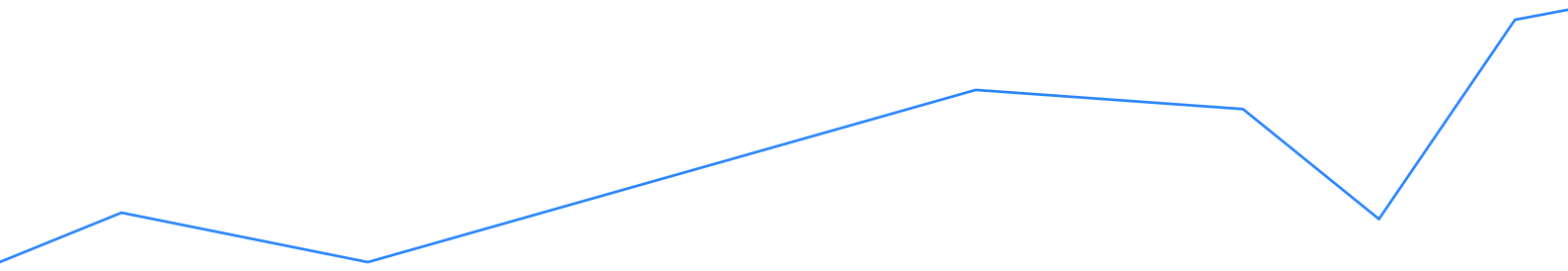
Definitions



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5 DEFINITIONS

"Trading Day" means any day except Saturday and Sunday on which the Exchange is scheduled to be open for trading in VIX products.

The "Exchange" is the Chicago Board of Options Exchange (CBOE).

The "Index Calculator" is Solactive AG or any other appropriately appointed successor in this function.

The "Index Administrator" is Solactive AG or any other appropriately appointed successor in this function.

The "Index Currency" is USD.

The "Index Base Date" is the 16th April 2008.

The "Rebalancing Day" is each VIX Index Option Expiry Date, which is typically a Wednesday that is 30 days prior to the third Friday of each calendar month.

The "Second Option Expiry Date" is the second listed VIX Index Option Expiry Date on the Exchange following Trading Day t

The "Fourth Option Expiry Date" is the fourth listed VIX Index Option Expiry Date on the Exchange following Trading Day t

The "Delta Observation Time" is the scheduled closing time of the New York Stock Exchange on the Trading Day immediately prior to a Rebalancing Day (typically 4:00pm on each Trading Day and 1:00pm on days the NYSE has been designated for an early close)

The "Trade Observation Time" is the scheduled closing time of the New York Stock Exchange on each Trading Day (typically 4:00pm on each Trading Day and 1:00pm on days the NYSE has been designated for an early close)

The "Interest Rate" is the 3-month USD LIBOR rate, as published on Reuters under the RIC "USD3MFSR="

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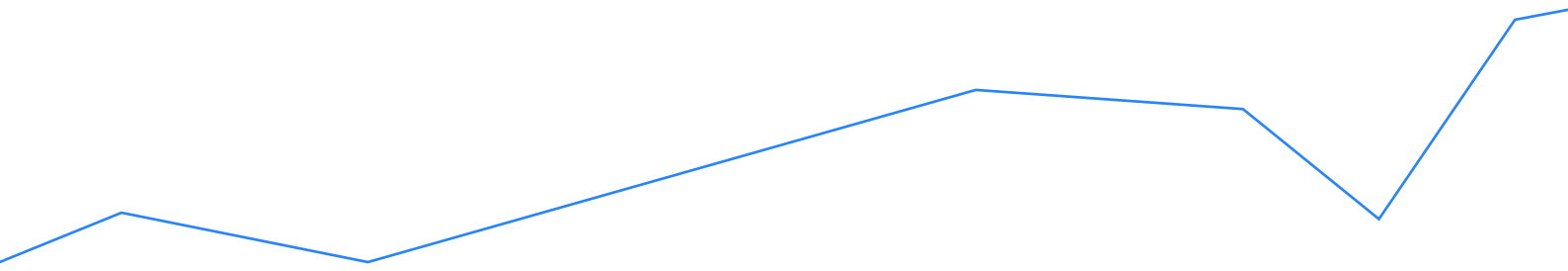
Appendix



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6 APPENDIX

6.1 CONTACT DATA

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6.2 CHANGES IN CALCULATION METHOD

The application by the Index Calculator of the method described in this document is final and binding. The Index Calculator shall apply the method described above for the composition and calculation of the Index. However, it cannot be excluded that the market environment, supervisory, legal, financial or tax reasons may require changes to be made to this method. The Index Calculator may also make changes to the terms and conditions of the Index and the method applied to calculate the Index that it deems to be necessary and desirable in order to prevent obvious or demonstrable error or to remedy, correct or supplement incorrect terms and conditions. The Index Calculator is not obliged to provide information on any such modifications or changes. Despite the modifications and changes, the Index Calculator will take the appropriate steps to ensure a calculation method is applied that is consistent with the method described above.