



BNP PARIBAS
CORPORATE & INSTITUTIONAL BANKING

BNP PARIBAS INDICES
INDEX METHODOLOGY SUPPLEMENT
Optimized Roll Commodity Monthly FX-Hedged TR
Indices

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This document (the “**BNP Paribas Index Methodology Supplement**”) supplements, forms a part of and is subject to the BNP Paribas Index Handbook dated 20 November 2015 (the “**Handbook**”), as may be amended, supplemented, replaced or superseded from time to time, the First General Supplement dated 1 May 2018 and any subsequent supplement. The current version of the Handbook and all supplements thereto may be downloaded from <https://indx.bnpparibas.com/>.

The Handbook, as amended by the First General Supplement, and this BNP Paribas Index Methodology Supplement together comprise the “**BNP Paribas Index Rules**” for the BNP Paribas Index described herein. In the event of an inconsistency, the following order of precedence will prevail for the purposes of the BNP Paribas Index described herein: (i) this BNP Paribas Index Methodology Supplement, (ii) a supplement to the Handbook that by its terms applies to certain features of the BNP Paribas Index, (iii) any General Supplement, and (iv) the Handbook. Terms used herein, but not defined, bear the meaning set forth in the Handbook, the First General Supplement or any other supplement thereto, or in any applicable Technical Annex.

The BNP Paribas Index Rules will be made available upon request and, if applicable, subject to confidentiality or other agreements between BNP Paribas and the relevant party. Any information provided with respect to a BNP Paribas Index or the BNP Paribas Index Rules is provided on a confidential basis and solely for information purposes. By accepting a copy of the BNP Paribas Index Rules, you agree that you will not disclose, reproduce, redistribute or transmit, in whole or in part, the BNP Paribas Index Rules without the written consent of the Index Sponsor.

BNP Paribas reserves the right to amend, supplement, replace or supersede the BNP Paribas Index Rules from time to time and shall have no liability for any such amendment or adjustment. The BNP Paribas Index Rules are subject to change at any time. Any subsequent BNP Paribas Index Rules published by the Index Sponsor will supersede any previous versions.

Nothing contained in the BNP Paribas Index Rules should be construed as an offer or solicitation of any transaction.

Description of the BNP Paribas Index Methodology

The series of indices described in this BNP Paribas Index Methodology Supplement is comprised of three commodity indices (each a “**BNP Paribas Index i=1 to 3**”, and together the “**BNP Paribas Indices**”), whose objective is to provide FX-hedged exposure to the Optimized Roll Commodity Index TR (the “**BNP Paribas Index Component 1**”) in EUR for BNP Paribas Index 1, in GBP for BNP Paribas Index 2, and in CHF for BNP Paribas Index 3.

Each BNP Paribas Index i=1 to 3 achieves its objective by investing in the relevant currency exchange rate and in BNP Paribas Index Component 1, the details of which are as set forth in Table 1 of Annex 2 (*BNP Paribas Index Components*) of this BNP Paribas Index Methodology Supplement.

Calculation of the BNP Paribas Index Level

On each BNP Paribas Index Level Calculation Date, the Index Calculation Agent calculates the BNP Paribas Index Level in accordance with the provisions of the BNP Paribas Index Rules and as described below.

The BNP Paribas Indices are comprised of BNP Paribas Index Component 1, to which a Currency Conversion Mechanism is applied in order to calculate the BNP Paribas Index Level in EUR for BNP Paribas Index 1, in GBP for BNP Paribas Index 2, and in CHF for BNP Paribas Index 3.

BNP Paribas Index Component 1 is a USD-denominated index. As such, the USD is said to be the “**BNP Paribas Index Component Currency**”.

EUR, GBP, and CHF are each a “**BNP Paribas Index Currency**” for BNP Paribas Index i=1 to 3 respectively.

The objective of the Currency Conversion Mechanism is to offer exposure, in the relevant BNP Paribas Index Currency, to the performance of the BNP Paribas Index Component measured in BNP Paribas Index Component Currency, while minimizing the impact of the fluctuations of the level of the exchange rate between the BNP Paribas Index Component Currency and the relevant BNP Paribas Index Currency.

The Currency Conversion Mechanism involves the use of Forward and Spot FX transactions.

On each BNP Paribas Index Level Calculation Date, each BNP Paribas Index Level is equal to the product of 1/ the BNP Paribas Index Level as of the immediately preceding Rebalancing Date (as described below), 2/ the sum of a/ the growth of the BNP Paribas Index between the immediately preceding Rebalancing Date and the BNP Paribas Index Level Calculation date, expressed in BNP Paribas Index Currency, and b/ the FX Hedge Return.

The FX Hedge Return corresponds to the difference between 1/ the value of the 1-month Forward (calculated in accordance with the provisions of Section 4 (*Calculation of FX 1-Month Forward*) of Annex 1) as of the Rebalancing Date immediately preceding BNP Paribas Index Level Calculation Date and 2/ the value of this same forward estimated as of that BNP Paribas Index Level Calculation Date, divided by the Spot (calculated in accordance with the provisions of Section 2 (*Calculation of the FX Spot*) of Annex 1) as of the FX-Hedge Reference Date immediately preceding the Rebalancing Date, and divided by the performance of the BNP Paribas Index Level between the Reference Date and the Rebalancing Date. The value of the 1-month Forward is estimated between two consecutive Rebalancing Dates by performing a linear interpolation between the Spot and 1-month Forward, using the correct FX Convention for the relevant BNP Paribas Index Component 2, (as set out in Annex 2, Table 1 – *BNP Paribas Index Components*).

The BNP Paribas Index Components

The BNP Paribas Index is comprised of a synthetic portfolio of assets. There is no actual portfolio of assets to which any person is entitled or has any ownership interest. The BNP Paribas Index does not entail the actual execution of any transactions with respect to the BNP Paribas Index Components. The BNP Paribas Index Methodology synthetically replicates all of the referenced BNP Paribas Index Components and any related transactions.

BNP Paribas Index Component 1 of each BNP Paribas Index in this series is the Optimized Roll Commodity Total Return Index, as sponsored by BNP Paribas and calculated by S&P Dow Jones Indices LLC.

The objective of BNP Paribas Index Component 1 is to provide long-only Total Return exposure to 22 different commodities, while reducing the carry costs usually associated with holding commodities futures contracts, using a methodology set forth in a BNP Paribas Index Methodology Supplement (the “**BNP Paribas Index Component Rules**”). In this context, the “carry cost” refers to the total cost of holding a particular physical commodity (such as transport or storage costs) and the impact of shifting supply and demand levels. Carry cost is reflected in the prices of futures contracts for such commodity and therefore in the level of an index comprised of such futures contracts. The carry cost may be positive or negative depending on whether the underlying commodities futures contracts are in contango (upward sloping) or backwardation (downward sloping).

Additional information in respect of BNP Paribas Index Component 1 is contained within the BNP Paribas Index Component Rules, a copy of which is available from the Index Sponsor on request.

BNP Paribas Index 1, Optimized Roll Commodity Monthly EUR-Hedged Total Return Index:

BNP Paribas Index Component 2 of this BNP Paribas Index is the EUR/USD Currency Exchange Rate (as set out in Annex 2, Table 1 – *BNP Paribas Index Components*).

BNP Paribas Index 2, Optimized Roll Commodity Monthly GBP-Hedged Total Return Index:

BNP Paribas Index Component 2 of this BNP Paribas Index is the GBP/USD Currency Exchange Rate (as set out in Annex 2, Table 1 – *BNP Paribas Index Components*).

BNP Paribas Index 3, Optimized Roll Commodity Monthly CHF-Hedged Total Return Index:

BNP Paribas Index Component 2 of this BNP Paribas Index is the USD/CHF Currency Exchange Rate (as set out in Annex 2, Table 1 – *BNP Paribas Index Components*).

BNP Paribas Index Fees

The BNP Paribas Index does not incorporate any charge, cost, expense or fee (the “**BNP Paribas Index Fees**”).

BNP Paribas Index Definitions

BNP Paribas Index:	<p>Optimized Roll Commodity Monthly EUR-Hedged Total Return Index (Bloomberg page: EBCIWTET Index)</p> <p>Optimized Roll Commodity Monthly GBP-Hedged Total Return Index (Bloomberg page: EBCIWTGT Index)</p> <p>Optimized Roll Commodity Monthly CHF-Hedged Total Return Index (Bloomberg page: EBCIWTCT Index)</p>
BNP Paribas Index Status:	Public Index
BNP Paribas Index Family:	Commodity Indices
Index Sponsor:	BNP Paribas
Index Calculation Agent:	S&P Dow Jones Indices LLC
Weighting Determination Agent:	Not Applicable
BNP Paribas Index Launch Date	<p>Optimized Roll Commodity Monthly EUR-Hedged Total Return Index: @LAUNCH_DATE@</p> <p>Optimized Roll Commodity Monthly GBP-Hedged Total Return Index: @LAUNCH_DATE@</p> <p>Optimized Roll Commodity Monthly CHF-Hedged Total Return Index: @LAUNCH_DATE@</p>
BNP Paribas Index Start Date	<p>Optimized Roll Commodity Monthly EUR-Hedged Total Return Index: 31 May 2001</p> <p>Optimized Roll Commodity Monthly GBP-Hedged Total Return Index: 31 May 2001</p> <p>Optimized Roll Commodity Monthly CHF-Hedged Total Return Index: 31 May 2001</p>
BNP Paribas Index Currency:	<p>Optimized Roll Commodity Monthly EUR-Hedged Total Return Index: EUR</p> <p>Optimized Roll Commodity Monthly GBP-Hedged Total Return Index: GBP</p> <p>Optimized Roll Commodity Monthly CHF-Hedged Total Return Index: CHF</p>
BNP Paribas Index Composition	
BNP Paribas Index Components:	As described in Table 1 (<i>BNP Paribas Index Components</i>) of Annex 2
BNP Paribas Index Reference Rates:	Not Applicable
BNP Paribas Index Component Selection Indicators:	Not Applicable
BNP Paribas Index Features	
Return Type:	Total Return

Rebalancing:	Applicable. See Annex 1
BNP Paribas Index Component Weighting Determination Dates:	Not Applicable.
Rebalancing Dates:	The last Scheduled Trading Day of each calendar month..
BNP Paribas Index Fees:	Not Applicable.
Currency Conversion Mechanism:	Applicable. See Annex 1.
Volatility Control Mechanism:	Not Applicable.
Calculation and Publication of the BNP Paribas Index Level:	
Initial BNP Paribas Index Level:	100, as of the BNP Paribas Index Start Date.
Frequency of calculation of BNP Paribas Index Level:	Once per day, on each BNP Paribas Index Level Calculation Date.
BNP Paribas Index Publication Date:	The Business Day following each BNP Paribas Index Level Calculation Date
BNP Paribas Index Publication Page:	<p>Optimized Roll Commodity Monthly EUR-Hedged Total Return Index:</p> <p style="padding-left: 40px;">Bloomberg Page: <EBCIWTET Index></p> <p style="padding-left: 40px;">Reuters Page: .EBCIWTET</p> <p>Optimized Roll Commodity Monthly GBP-Hedged Total Return Index:</p> <p style="padding-left: 40px;">Bloomberg Page: <EBCIWTGT Index></p> <p style="padding-left: 40px;">Reuters Page: .EBCIWTGT</p> <p>Optimized Roll Commodity Monthly CHF-Hedged Total Return Index: CHF</p> <p style="padding-left: 40px;">Bloomberg Page: <EBCIWTCT Index></p> <p style="padding-left: 40px;">Reuters Page: .EBCIWTCT</p>
Website where current composition of the BNP Paribas Index is published:	https://indx.bnpparibas.com
<p>Price Disrupted Days:</p> <p>Section 4.3 of the Handbook (<i>Price Disrupted Days</i>) will be deleted in its entirety and replaced with the following:</p> <p>“4.3 Price Disrupted Days</p> <p>“If any Scheduled BNP Paribas Index Business Day is a Price Disrupted Day in respect of one or more BNP Paribas Index Components (each an “affected BNP Paribas Index Component”), then the Index Calculation Agent will postpone calculation of the BNP Paribas Index Level to the next Scheduled BNP Paribas Index Business Day which is not a Price Disrupted Day, for a period not exceeding the Maximum Days of Disruption;</p> <p>provided that if each subsequent Scheduled BNP Paribas Index Business Day is also a Price Disrupted Day up to and including the Maximum Number of Days of Price Disruption, the Index</p>	

Calculation Agent will contact the Index Sponsor, who will determine whether or not the circumstances causing the Price Source Disruption constitute a BNP Paribas Index Adjustment Event, and:

- (i) if a BNP Paribas Index Adjustment Event has occurred, the Index Sponsor will determine the consequence of the BNP Paribas Index Adjustment Event in accordance with the provisions of Section 5.2 (*Consequences of a BNP Paribas Index Adjustment Event*); or
- (ii) if a BNP Paribas Index Adjustment Event has not occurred, the Index Calculation Agent shall resume regular calculation and publication of the BNP Paribas Index Level and rebalancing of BNP Paribas Index Level and rebalancing of the BNP Paribas Index using the last value which was available for the affected BNP Paribas Index Component(s), or if the Index Sponsor determines that the use of the last value for the affected BNP Paribas Index Component(s) would result in a BNP Paribas Index Level that is not consistent with the strategy and objective of the BNP Paribas Index, use its good faith estimate of the value that would prevail on such day but for the occurrence of the Price Disrupted Day and calculate and publish the BNP Paribas Index Level and rebalance the BNP Paribas Index accordingly.”

The definition of “*Price Disrupted Day*” in the Handbook shall be deleted in its entirety and replaced with the following:

“**Price Disrupted Day**” means any relevant Scheduled Trading Day on which a Price Source Disruption has occurred or is continuing in respect of a BNP Paribas Index Component.”

BNP Paribas Index Adjustment Events:

Section 5 (*BNP Paribas Index Adjustment Events and Consequences*) of the Handbook, as amended by the First General Supplement shall apply.

BNP Paribas Index Potential Adjustment Events:

Not Applicable

Amended definitions and provisions applicable to the BNP Paribas Index:

The defined terms in the Master Definitions Annex of the Handbook below shall be replaced as follows:

“**Scheduled Trading Day**” means each London and New York Business Day.

Bespoke definitions and provisions applicable to the BNP Paribas Index:

The following new definitions shall be added to the Handbook:

“**London and New York Business Day**” means a day (other than a Saturday or Sunday) on which commercial banks are open for general business (including dealings in foreign exchange and foreign currency deposits) in London and in New York City.

“**FX-Hedge Reference Date**” means the Scheduled Trading Day immediately preceding the Rebalancing Date.

Date offsets:

For any BNP Paribas Index Level Calculation Date t , and for any integer value j , $t + j$ (respectively $t - j$) refers to the BNP Paribas Index Level Calculation Date that is j BNP Paribas Index Level Calculation Dates following (respectively preceding) BNP Paribas Index Level Calculation Date t . For example, $t - 1$ refers to the BNP Paribas Index Level Calculation Date immediately preceding BNP Paribas Index Level Calculation Date t .

Notations used in Annex 1:

“**Reb**” means the Rebalancing Date immediately preceding BNP Paribas Index Level Calculation Date t .

“**Ref**” means the FX-Hedge Reference Date immediately preceding the last occurring Rebalancing Date prior to BNP Paribas Index Level Calculation Date t .

Annex 1

BNP Paribas Index Methodology for the Optimized Roll Commodity Monthly FX-Hedged Total Return Indices:

1. Calculation of the BNP Paribas Index Level:

On each BNP Paribas Index Level Calculation Date t , the BNP Paribas Index Level shall be determined in accordance with the following formula:

On the BNP Paribas Index Start Date $t = t_0$

$$I_{t_0} = 100$$

And for each BNP Paribas Index Level Calculation Date t subsequent to t_0 :

$$I_t = I_{Reb} \times \left(\frac{IC_t^1 \times FXS_t}{IC_{Reb}^1 \times FXS_{Reb}} + FXHR_t \right)$$

Where:

- IC_t^1 is the Settlement Price for BNP Paribas Index Component 1 on BNP Paribas Index Level Calculation Date t ;
- IC_{Reb}^1 is the Settlement Price for BNP Paribas Index Component 1 on Rebalancing Date Reb ;
- FXS_t is the FX Spot Level for BNP Paribas Index Component 2 on BNP Paribas Index Level Calculation Date t , calculated in accordance with the provisions of Section 2 (*Calculation of the FX Spot Level*) below;
- FXS_{Reb} is the FX Spot Level for BNP Paribas Index Component 2 on Rebalancing Date Reb , calculated in accordance with the provisions of Section 2 (*Calculation of the FX Spot Level*) below; and
- $FXHR_t$ is the FX-Hedge Return on BNP Paribas Index Level Calculation Date t , as calculated in accordance with the provisions of Section 3 (*Calculation of FX-Hedge Return*) below.

3. Calculation of the FX Spot Level:

On each BNP Paribas Index Level Calculation Date t , the FX Spot shall be calculated in accordance with the following formulae:

- (a) If FX Convention for BNP Paribas Index Component 2 is “European Terms” (as set forth in Annex 2, Table 1 – *BNP Paribas Index Components*) then

$$FXS_t = FXFixing_t$$

- (b) If FX Convention for BNP Paribas Index Component 2 is “American Terms” (as set forth in Annex 2, Table 1 – *BNP Paribas Index Components*) then

$$FXS_t = \frac{1}{FXFixing_t}$$

Where:

$FXFixing_t$ is the Settlement Price of BNP Paribas Index Component 2 on BNP Paribas Index Level Calculation Date t , as published on the relevant BNP Paribas Index Component Pricing Page set forth in Annex 2, Table 1 – *BNP Paribas Index Components*.

3. Calculation of FX-Hedge Return:

On each BNP Paribas Index Level Calculation Date t , the FX-Hedge Return shall be determined in accordance with the following formula:

$$HR_t = \frac{I_{Ref}}{I_{Reb}} \times \left[\frac{FX1MF_{Reb}}{FXS_{Ref}} - \frac{IFXF_t}{FXS_{Ref}} \right]$$

Where:

- I_{Ref} is the BNP Paribas Index Level on FX-Hedge Reference Date Ref ;
- I_{Reb} is the BNP Paribas Index Level on Rebalancing Date Reb ;
- $FX1MF_{Reb}$ is the FX 1-Month Forward for BNP Paribas Index Component 2 on Rebalancing Date Reb , as calculated in accordance with the provisions of Section 4 (*Calculation of FX 1-Month Forward*) below;
- FXS_{Ref} is the FX Spot Level for BNP Paribas Index Component 2 on FX-Hedge Reference Date Ref , as calculated in accordance with the provisions of Section 2 (*Calculation of FX Spot Level*) above; and
- $IFXF_t$ is the Interpolated Forward for BNP Paribas Index Component 2 on BNP Paribas Index Level Calculation Date t , as calculated in accordance with the provisions of Section 5 (*Calculation of Interpolated Forward*) below.

4. Calculation of FX 1-Month Forward:

On each BNP Paribas Index Level Calculation Date t , the FX 1-Month Forward shall be calculated in accordance with the following formulae:

$$FX1MF_t = FXS_t + FX1MSpread_t$$

With

- (a) If FX Convention for BNP Paribas Index Component 2 is “European Terms” (as set forth in Annex 2, Table 1 – *BNP Paribas Index Components*) then

$$FX1MSpread_t = 1MSpreadFixing_t$$

- (b) If FX Convention for BNP Paribas Index Component 2 is “American Terms” (as set forth in Annex 2, Table 1 – *BNP Paribas Index Components*) then

$$FX1MSpread_t = \frac{1}{1MSpreadFixing_t + \frac{1}{FXS_t}} - FXS_t$$

Where:

- $1MSpreadFixing_t$ is the one-month Spread of BNP Paribas Index Component 2 on BNP Paribas Index Level Calculation Date t , as published on the relevant BNP Paribas Index Component Pricing Page set forth in Annex 2, Table 1 – *BNP Paribas Index Components* ; and
- FXS_{Ref}^2 is the FX Spot Level for BNP Paribas Index Component 2 on BNP Paribas Index Level Calculation Date t as calculated in accordance with the provisions of Section 2 (*Calculation of FX Spot Level*) above.

5. Calculation of Interpolated Forward:

On each BNP Paribas Index Level Calculation Date t , the Interpolated Forward shall be calculated in accordance with the following formula:

$$IFXF_t = FXS_t + \frac{D - d}{D} \times (FX1MF_t - FXS_t)$$

Where:

- FXS_t is the FX Spot Level for BNP Paribas Index Component 2 on BNP Paribas Index Level Calculation Date t as calculated in accordance with the provisions of Section 2 (*Calculation of FX Spot Level*) below;;
- D is the day rank of the Rebalancing Date Reb immediately following BNP Paribas Level Calculation Date t . (for instance, if the immediately following Rebalancing Date is 29th March 18, $D=29$). d means that BNP Paribas Index Level Calculation Date t is the d^{th} calendar day of the calendar month in which BNP Paribas Index Level Calculation Date t falls. On each Rebalancing Date, d equals D ; and
- $FX1MF_t$ is the FX 1-Month Forward for BNP Paribas Index Component 2 on BNP Paribas Index Level Calculation Date t as calculated in accordance with the provisions of Section 4 (*Calculation of FX 1-Month Forward*) above.

Annex 2

Table 1 – BNP Paribas Index Components

BNP Paribas Index		BNP Paribas Index Component	BNP Paribas Index Component Type	BNP Paribas Index Component Currency	FX Convention	Price Source	BNP Paribas Index Component Pricing Page	
1	Optimized Roll Commodity Monthly EUR-Hedged Total Return Index	1	Optimized Roll Commodity Total Return Index	Commodity index	USD	Not applicable	S&P Dow Jones Indices LLP	Bloomberg: EBCIWTT Index
		2	EURUSD	Currency Exchange Rate	Not applicable	European Terms	The WM Company / Reuters and Bloomberg	In respect of (i) the Settlement Price , the rate appearing on Bloomberg Screenpage WMCO at 4:00 pm London Time under “USD Closing Prices” opposite the Currency’s code in the “Mid” column and (ii) the 1M Spread , the WMCO EUR / USD 1-Month Spread at 4:00pm London Time as published on Reuters page USDEUR1MFXM=WM from May 23rd 2008 included, and the Bloomberg source EUR1M BGNL Curncy before.
2	Optimized Roll Commodity Monthly GBP-Hedged Total Return Index	1	Optimized Roll Commodity Total Return Index	Commodity index	USD	Not applicable	S&P Dow Jones Indices LLP	Bloomberg: EBCIWTT Index
		2	GBPUSD	Currency Exchange Rate	Not applicable	European Terms	The WM Company / Reuters and Bloomberg	In respect of (i) the Settlement Price , the rate appearing on Bloomberg Screenpage WMCO at 4:00 pm London Time under “USD Closing Prices” opposite the Currency’s code in the “Mid” column and (ii) the 1M Spread , the WMCO GBP / USD 1-Month Spread at 4:00pm London Time as published on Reuters page USDGBP1MFXM=WM from May 23rd 2008 included, and the Bloomberg source GBP1M BGNL Curncy before.
3	Optimized Roll Commodity	1	Optimized Roll	Commodity index	USD	Not applicable	S&P Dow Jones Indices LLP	Bloomberg: EBCIWTT Index

	Monthly CHF-Hedged Total Return Index		Commodity Total Return Index					
		2	USDCHF	Currency Exchange Rate	Not applicable	American Terms	The WM Company / Reuters and Bloomberg	In respect of (i) the Settlement Price , the rate appearing on Bloomberg Screenpage WMCO at 4:00 pm London Time under "USD Closing Prices" opposite the Currency's code in the "Mid" column and (ii) the 1M Spread , the WMCO USD / CHF 1-Month Spread at 4:00pm London Time as published on Reuters page USDCHF1MFXM=WM from May 23rd 2008 included, and the Bloomberg source CHF1M BGNL Curncy before.