

INDEX GUIDELINE

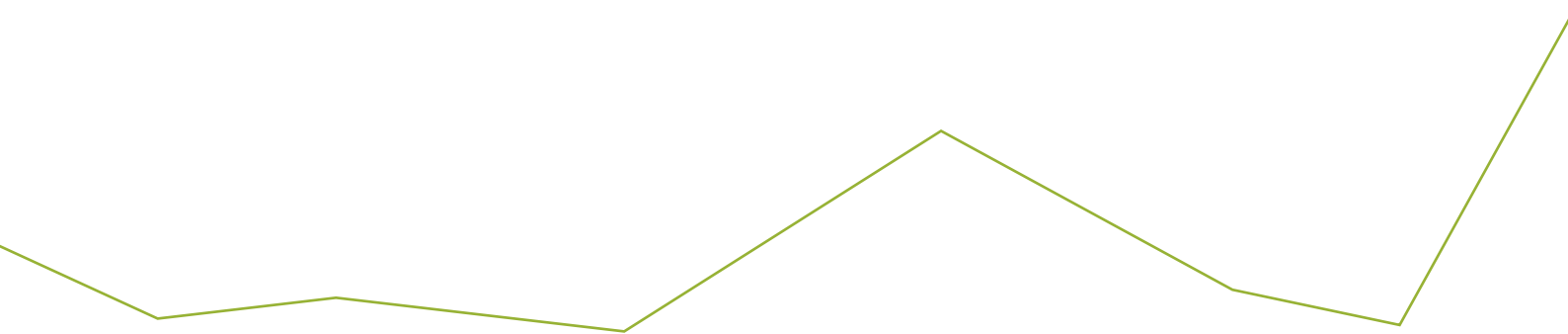
RBC Rolling Futures Index Family

Version 0.1

12 October 2020

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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 Family. Any changes made to the Guideline are initiated by the Committee specified in Section 1.5. The Index Family 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 RBC Rolling Futures Index Family (the "Indices"). 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 Indices nor the Index values at any certain point in time nor in any other respect. The Indices are 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 Indices. The publication of the Indices 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 these Indices.



1 INDEX SPECIFICATIONS

- The RBC Rolling Futures Index Family (the "Indices") are Indices of RBC Capital Markets and are calculated and distributed by Solactive AG.
- Each index tracks the performance of an equity index future or treasury bond future and rolls the exposure during the Roll Period from the Lead Contract Month Future into the Next Contract Month Future.

1.1 SHORT NAME AND ISIN

The Indices are distributed under the identifiers stated in section 5.1.

1.2 INITIAL VALUE

The Indices will be based on 100 on the respective Index Base Date stated in section 5.1.

1.3 DISTRIBUTION

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

1.4 PRICES AND CALCULATION FREQUENCY

The price of each Index is calculated on each Trading Day based on the Buying Price on the respective Exchanges on which the respective Index Components are listed. The most recent settlement prices of all Index Components are used. Should there be no current settlement price available, the most recent settlement price on Reuters for the preceding Trading Day is used in the calculation.

The Index is calculated once a Business Day. In the event that data cannot be provided to the pricing services of Boerse Stuttgart AG the Indices cannot be distributed.

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 Base Date of the Indices.



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 RBC Capital Markets.

2 CALCULATION OF THE INDICES

2.1 TERMS AND NOTATIONS

I_t	Index level of the Rolling Future Index on Trading Day t
I_{t-1}	Index level of the Rolling Future Index on the Trading Day immediately preceding Index Trading Day t.
$W_{L,t}$	Notional Weight for the Lead Month Contract Future ("L") on Trading Day t
$W_{N,t}$	Notional Weight for the Next Month Contract Future ("N") on Trading Day t
$BP_{L,t}$	Buying Price of L on Trading Day t
$BP_{N,t}$	Buying Price of N on Trading Day t
$SP_{L,t}$	Settlement Price of L on Trading Day t
$SP_{N,t}$	Settlement Price of N on Trading Day t
$MP_{L,t}$	The Middle Price of the First Tick of L After 4PM EST on Trading Day t
$MP_{N,t}$	The Middle Price of the First Tick of N After 4PM EST on Trading Day t
$SP_{L,t}$	Settlement Price of L on Trading Day t
$SP_{N-L,t}$	Spread transaction price of N less L at the Settlement time on Trading Day t
$SP^*_{L,t}$	Settlement Price of the L BTIC for the relevant Future on Trading Day t
$SP^*_{N,t}$	Settlement Price of the N BTIC for the relevant Future on Trading Day t
L	Number of Roll Days (Defined in Section 5.1.2)
D	Distance to Anchor Date (Defined in Section 5.1.2)
RD	The Trading Day that is D Trading Days prior to the Anchor Date ("ADL")
RSD_L	The Trading Day that is N scheduled Trading Days prior to the Roll Date (the Roll Start Date)
LTD_(L or N)	The Last Trading Day of the relevant contract, L or N
RP_t	The N scheduled Trading Days that immediately precede and include RD
AD_L	The First Notice Date or the Last Trade Date for Bond Futures and Equity Futures respectively
Moving Weight (MW)	1/N
BD_{t,t*}	The number of scheduled Trading Days between two scheduled Trading Days t (excluded) and t* (included)
TC	The Trading Cost
Unit_{L,t}	Number of Contracts of L on Trading Day t
	$\text{Unit}_{L,t} = \frac{\text{RPV}_{t-1,t} \times W_{L,t}}{\text{BP}_{L,t}}$
Unit_{N,t}	Number of Contracts of N on Trading Day t
	$\text{Unit}_{N,t} = \frac{\text{RPV}_{t-1,t} \times W_{N,t}}{\text{BP}_{N,t}}$



RPV_{s,t} Reference Portfolio Value on Trading Day t with the Number of Contracts on Trading Day s and it's calculated according to the following formula:

$$RPV_{s,t} = \text{Unit}_{L,s} \times BP_{L,t} + \text{Unit}_{N,s} \times BP_{N,t}$$

With:

$$RPV_{\text{Index Start Date}-1, \text{Index Start Date}} = 100$$

$$RPV_{\text{Index Start Date}, \text{Index Start Date}} = 100$$

2.2 INDEX FORMULA

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

$$I_t = \begin{cases} I_{t-1} * \frac{RPV_{t-1,t}}{RPV_{t-1,t-1}} & \text{if } t \text{ not in rolling period} \\ I_{t-1} * \frac{RPV_{t-1,t}}{RPV_{t-1,t-1}} * (1 - TC) & \text{if } t \text{ in rolling period} \end{cases}$$

With $I_{\text{Index Start Date}} = 100$

2.3 ROLL WEIGHTS

The Roll Weights for the Lead Future Contract for all Indices are given below:

When Trading Day t falls within the Roll Period, then:

$$W_{L,t} = BD_{t, RD} \times MW$$

and when Trading Day t falls between the RD (excluded) and the LTDL (included), then:

$$W_{L,t} = 0$$

Otherwise:

$$W_{L,t} = 1$$

$$W_{N,t} = 1 - W_{L,t}$$

2.4 BUYING PRICE

The Buying Price is the price referenced to establish the index level and also the cost of rolling from the current contract to the next.

2.4.1 SPREAD METHOD

2.4.1.1 With Settlement Price

$$BP_{L,t} = SP_{L,t}$$

$$BP_{N,t} = \begin{cases} SP_{L,t} + SP_{N-L,t} & \text{if } t \in \text{Roll Period} \\ SP_{N,t} & \text{otherwise} \end{cases}$$



2.4.1.2 With Mid Price at 4PM EST

$$BP_{L,t} = MP_{L,t}$$

$$BP_{N,t} = \begin{cases} MP_{L,t} + SP_{N-L,t} & \text{if } t \in \text{Roll Period} \\ MP_{N,t} & \text{otherwise} \end{cases}$$

If the Mid-Price is not available, the settlement price will be used.

2.4.2 BASIS TRADE AT INDEX CLOSE (“BTIC”) METHOD

$$BP_{L,t} = CP_t + SP_{L,t}^*$$

$$BP_{N,t} = \begin{cases} CP_t + SP_{L,t}^* + SP_{N-L,t} & \text{if } t \in \text{Roll Period} \\ CP_t + SP_{N,t}^* & \text{otherwise} \end{cases}$$

2.4.3 STANDARD METHOD

$$BP_{L,t} = SP_{L,t}$$

$$BP_{N,t} = SP_{N,t}$$

2.5 MARKET DISRUPTION EVENTS

From time to time, market disruption events may occur that will result in the postponement of an Index and/or the adjustment of the roll period. A Market Disruption Day will be deemed to have occurred if any of the following events occur:

- i. The Settlement Price of an Index Constituent is not published by the Exchange by 5:00 PM Eastern Time for the US instruments 6:00 PM CET for the European instruments;
- ii. The Settlement Price of an Index Constituent is a Limit price (as defined by the applicable Exchange);

If any of these events occur on a Trading Day not included in the Roll Period, no immediate action will be taken, but in case of missing Settlement Prices if the applicable Exchange publishes a Settlement Price later the Index will be restated for that particular Trading Day. If any of these events occur on a Trading Day included in the Roll Period, the portion of the roll that was to take place on the Market Disruption Day will take place on the next non-Market Disruption Trading Day. For instance, if the Market Disruption Day occurred on the 7th Trading Day of the month, the portion that was to be rolled on day 7 will be added to the roll on the 8th Trading Day.

If the Market Disruption Event continues over a period of eight Trading Days for Treasury Bond futures or seven days for the Equity Indices Futures, then the Committee will determine the necessary action (including but not limited to taking into account the market conditions prevailing at this point in time, the last quoted Prices for each of the Index Components as well as any other conditions that it deems relevant for calculating the Index value) such that the affected securities resulting from the Market Disruption Event are no longer causing such disruption to occur.



2.6 MISCELLANEOUS

2.5.1 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 DEFINITIONS

“Lead Contract Month future” means the future contract given in the roll schedule under Section 5.2.

“Next Contract Month future” means the future contract given in the roll schedule under Section 5.2 for the month following the current month.

“Trading Day” means any day in which the respective exchange is open and publishes a Contract Settlement Price for the Designated Relevant Contracts.

“Exchange” is defined in section 5.1.2

“Anchor Date”: means “Last Trading Day” or “First Notice Day”, the last day the Lead Contract Month Future can be traded on the Exchange which is usually the third Friday of the months March, June, September and December. Defined in section 5.1.2

“Extraordinary Event” is referring to the case if one or more contracts mentioned in the roll schedule under Section 4.4 are not listed anymore.

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

The “Index Currency” can be seen in Section 5.1.

The “Index Baser Date” can be seen in Section 5.1.

A “Market Disruption Event” is defined in section 2.5.

“Index Live Date”: TBD

4 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.



5 APPENDIX

5.1 Indices in the RBC Rolling Futures Index Family

5.1.1 Indices Identifiers

Name	ISIN	RIC	TICKER	Index Start Date
RBC US Equity Rolling Futures B5 ER Index		.RBCEU5UE	RBCEU5UE	30-June-2004
RBC US 5Y Note Rolling Futures S5 ER Index		.RBCRF5UE	RBCRF5UE	30-June-2004
RBC US 10Y Note Rolling Futures S5 ER Index		.RBCRT5UE	RBCRT5UE	30-June-2004
RBC US Long Bond Note Rolling Futures S5 ER Index		.RBCRL5UE	RBCRL5UE	30-June-2004

5.1.2 Calculation Parameters:

Index	Exchange	Future Contract	Anchor Date	N	D	TC	Buying Price
RBCEU5UE	CME	ES	Last Trading Day	5	3	0.00004	Spread Method with Mid Price at 4PM EST
RBCRF5UE	CBOE	FV	First Notice Day	5	3	0	Spread Method with Settlement Price
RBCRT5UE	CBOE	TY	First Notice Day	5	3	0	Spread Method with Settlement Price
RBCRL5UE	CBOE	US	First Notice Day	5	3	0	Spread Method with Settlement Price

5.1.3 Backtest Method

For RBCRF5UE, RBCRT5UE, RBCRL5UE :

From Index Start Date to August 19th 2008 the index follows the "Standard Method (2.4.3)" to establish the Buying Price. From and including the 20th of August 2008, the Index follows "Spread Method (2.4.1.1)".

For RBCEU5UE:

From Index Start Date to June 29th 2007 (included) the index follows the "Standard Method (2.4.3)" to establish the Buying Price using Settlement prices.

Starting from July 2nd 2007 (included) the index follows the "Standard Method (2.4.1.1)" to establish the Buying Price using Mid prices (Settlement price is used in case the MID price is missing).

Starting from the 3rd of October 2008 (included) the index follows the "Spread Method (2.4.1.2)" to establish the Buying Price using Mid prices (Settlement price is used in case the MID price is missing).

Starting from Index Live Date, the index follows the "Spread Method (2.4.1.2)" to establish the Buying Price using Settlement prices.



5.2 Contract Schedules

Lead Month Contract Future

Future / Month	1	2	3	4	5	6	7	8	9	10	11	12	
ES		H	H	H	M	M	M	U	U	U	Z	Z	Z
TY		H	H	M	M	M	U	U	U	Z	Z	Z	H+
US		H	H	M	M	M	U	U	U	Z	Z	Z	H+
FV		H	H	M	M	M	U	U	U	Z	Z	Z	H+

Next Month Contract Future

Future / Month	1	2	3	4	5	6	7	8	9	10	11	12	
ES		M	M	M	U	U	U	Z	Z	Z	H+	H+	H+
TY		M	M	U	U	U	Z	Z	Z	H+	H+	H+	M+
US		M	M	U	U	U	Z	Z	Z	H+	H+	H+	M+
FV		M	M	U	U	U	Z	Z	Z	H+	H+	H+	M+

A "+" defines a contract of the following year. The following naming convention of the contracts holds:

Identifier	Month	Identifier	Month
F	January	N	July
G	February	Q	August
H	March	U	September
J	April	V	October
K	May	X	November
M	June	Z	December

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