

RBC Commodity Index

Weight Assignment

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This document contains a description of the RBC Commodity Index “Weight Assignment” methodology.



RBC Capital Markets

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Description of the Methodology

The purpose of this document is to provide a detailed description of the Weight Assignment methodology used in RBC Quantitative Investment Strategies.¹

Section 1. Terms and Notations

Term/Notation	Definition
Index Business Day	Any weekday that is not an NYSE holiday.
n	Denotes the number of Underlying Indices and Index Commodities included in the customized basket.
UI^i	Denotes the i^{th} Underlying Index or Index Commodity which is to be allocated an Assigned Target Weight. Note that $1 \leq i \leq n$.
$WAC(T)$	Denotes the most recent Weight Assignment Calculation Day before Index Business Day T . This is the Index Business Day on which the Assigned Target Weights for all UI^i are determined. Please refer to Section 3 of “Index Information” for the Weight Assignment Calculation Day of a specific index.
$W_{WAC(T)}^i$	Denotes the Base Target Weight assigned to the UI^i on the most recent Rebalance Date before Index Business Day T . Please refer to Section 3 of “Index Information” for the Base Target Weights of a specific index.
$\tilde{W}_{WAC(T)}^i$	Denotes the Assigned Target Weight for UI^i on Weight Assignment Calculation Day $WAC(T)$. If T_1, T_2 are consecutive Weight Assignment Calculation Dates then: <ul style="list-style-type: none"> Any alterations to the Assignment Target Weights must be submitted prior to Index Business Day $T_1 - 1$. $\tilde{W}_{WAC(T_1)}^i$ will be effective for the Index level calculation from $T_1 + 1$ to T_2 inclusive. Please refer to Section 3 of “Index Information” for the Assigned Target Weights of a specific index.
$S_{WAC(T)}^i$	Denotes the Weight Assignment Signal for UI^i on the Weight Assignment Calculation Day $WAC(T)$. Please refer to Section 3 of “Index Information” for the Weight Assignment Signal used in a specific index.
$FCS_{WAC(T)}$	Denotes the Filtered Commodity Set determined on Weight Assignment Calculation Day $WAC(T)$. The Filtered Commodity Set is a sub-collection of the Underlying Indices that are selected based on their Weight Assignment Signals.
$N_{WAC(T)}$	Denotes the Order of the Filtered Commodity Set on Weight Assignment Calculation Day $WAC(T)$. The Order of the Filtered Commodity Set is the number of Underlying Indices included in the Filtered Commodity Set. Please refer to Section 3 of “Index Information” for the Order of the Filtered Commodity Set of a specific index.

¹ This document is issued as an addendum to each of the “Index Methodology – RBC Basket of Commodity Indices Excess Return Index” dated May 8, 2017, and the “RBC Index Methodology – Excess Return and Total Return” dated May 8, 2017 (collectively, the “Index Methodology”). For greater certainty, the Disclaimer on page A of the Index Methodology applies equally to this document.

Section 2. Weight Assignment

On each Weight Assignment Calculation Day $WAC(T)$, the following steps are performed:

Step 1: Calculate Weight Assignment Signals

For the i^{th} Underlying Index or Index Commodity, calculate the Weight Assignment Signal $s_{WAC(T)}^i$ by following the corresponding signal generation method.

Step 2: Rank Commodities based on Weight Assignment Signals

Rank all the $s_{WAC(T)}^i$ in descending order, breaking ties by following the tie breaking rules described in the “Index Description” document of a specific Index. Denote the rank for $s_{WAC(T)}^i$ as $Rank_{WAC(T)}^i$.

Step 3: Determine the Filtered Commodity Set

The Filtered Commodity Set $FCS_{WAC(T)}$ is determined as the top $N_{WAC(T)}$ ranked commodities based on the ranks $Rank_{WAC(T)}^i$ of the commodities in the basket. The specific value of $N_{WAC(T)}$ for determining the Filtered Commodity Set is given in Section 3 of “Index Information” of a specific Index.

Step 4: Weight Assignment

The Assigned Target Weight $\tilde{w}_{WAC(T)}^i$ for the i^{th} Underlying Index or Index Commodity UI^i is determined based on one of the following methods:

- **Method 1: Equal Weighting**

In the Equal Weighting method, the sum of Base Target Weights are equally assigned over the commodities in the Filtered Commodity Set:

$$\begin{cases} \tilde{w}_{WAC(T)}^i = \frac{1}{N_{WAC(T)}} \times \sum_{j=1}^n w_{WAC(T)}^j & \text{if } UI^i \in FCS_{WAC(T)}, \\ \tilde{w}_{WAC(T)}^i = 0 & \text{otherwise.} \end{cases}$$

- **Method 2: Ranking**

In the Ranking method, the sum of the Base Target Weights is allocated to the commodities in the Filtered Commodity Set in proportion to the product of their rank and Base Target Weight.

$$\begin{cases} \tilde{w}_{WAC(T)}^i = \frac{Rank_{WAC(T)}^i \cdot w_{WAC(T)}^i}{\sum_{\{j|UI^j \in FCS_{WAC(T)}\}} Rank_{WAC(T)}^j \cdot w_{WAC(T)}^j} \times \sum_{j=1}^n w_{WAC(T)}^j & \text{if } UI^i \in FCS_{WAC(T)}, \\ \tilde{w}_{WAC(T)}^i = 0 & \text{otherwise.} \end{cases}$$

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