

# THOMSON REUTERS/CORECOMMODITY CRB INDEX CALCULATION SUPPLEMENT

SEPTEMBER 2013

## **Thomson Reuters/CoreCommodity CRB Index Calculation Supplement**

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Section 1 of this document describes how to compute each individual commodity performance series. Section 2 describes the calculation of the Thomson Reuters/CoreCommodity CRB Index, along with the rebalancing methodology. Section 3 describes the commodities and weights in the Thomson Reuters/CoreCommodity CRB Index and the included contract months for each commodity. Section 4 describes certain market disruption and emergency provisions applicable to the Thomson Reuters/CoreCommodity CRB Index. Section 5 addresses certain other issues related to ongoing index construction and calculation, including the role of the Thomson Reuters/CoreCommodity CRB Index Oversight Committee.

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## **Section 1. Computation of Individual Commodity Performance Series (“CPS”) and Percent Return Series (“PR”)**

For each commodity  $i$ , a performance series (“Commodity Performance Series”) is calculated. These performance series are then used to calculate the Thomson Reuters/CoreCommodity CRB Index.

The CPS at time  $t = 0$  is scaled to equal 100 while for any time  $t$  the CPS is given by:

$$CPS_{t,i} = CPS_{t-1,i} \times \left( \frac{W_{t-1,i}^F \times P_{t,i}^F + W_{t-1,i}^B \times P_{t,i}^B}{W_{t-1,i}^F \times P_{t-1,i}^F + W_{t-1,i}^B \times P_{t-1,i}^B} \right), \quad t > 0$$

for  $i = 1$  to 19

where:

$CPS_{t,i}$  = Commodity Performance Series for  $i^{\text{th}}$  commodity at time  $t$ .

$W_{t,i}^F$  = Weight in the Front Month for commodity  $i$  at time  $t$ .

$W_{t,i}^B$  = Weight in the Back Month for commodity  $i$  at time  $t$ .

$P_{t,i}^F$  = Price of the Front Month Futures Contract for Commodity  $i$  at time  $t$ .

and

$P_{t,i}^B$  = Price of the Back Month Futures Contract for Commodity  $i$  at time  $t$ .

### **N.B.:**

- 1) The performance series for each commodity reflects a constant dollar investment such that the rolling of the futures contracts requires neither the addition nor withdrawal of funds.
- 2) The Front Month, or the Active Contract, is the month closer to expiration; the Back Month becomes the Front Month when the Back Month weight reaches 100%.
- 3) All values throughout this document are rounded to six decimal places.
- 4) All commodity contracts roll over the first four Business Days of the month such that the weight in the Front Month at the end of the first rollover day is 75% and the weight in the Back Month is 25%. The weight shifts from the Front Month to the Back Month by 25% per rollover day until the Back Month reaches 100% at the end of the fourth Business Day. (See Section 4 for information regarding rollover disruption events.)

The CPS are then used to construct the Percent Return Series (“PR”) for each commodity.

## Section 2. Computation of the Thomson Reuters/CoreCommodity CRB Index

The Thomson Reuters/CoreCommodity CRB Index<sub>t</sub>, is the Thomson Reuters/CoreCommodity CRB Index at time t, which is simply the sum of all the PR, viz.,

$$\text{Thomson Reuters/CoreCommodity CRB Index}_t = \sum_{i=1}^{19} PR_{t,i}$$

At the close of business on June 17, 2005, the value of the Thomson Reuters/CoreCommodity CRB Index, the Thomson Reuters/CoreCommodity CRB Total Return Index and each PR was as follows:

Thomson Reuters/CoreCommodity CRB Index	310.982965
Thomson Reuters/CoreCommodity CRB Total Return Index	272.908736
WTI Crude Oil	74.947877
Unleaded Gas (now RBOB Gasoline)	16.239293
Heating Oil	15.775786
Natural Gas	19.613922
Corn	18.816349
Soybeans	19.456962
Live Cattle	17.079943
Gold	18.349545
Aluminum	18.247679
Copper	18.594517
Sugar	15.075189
Cotton	14.953757
Cocoa	15.743277
Coffee	13.179630
Nickel	3.031574
Wheat	3.086284
Lean Hogs	2.824855
Orange Juice	3.055826
Silver	2.910700

Subsequent values of each PR are computed as follows:

$$PR_{t,i} = PR_{t-1,i} \times (CPS_{t,i} / CPS_{t-1,i})$$

At the end of the sixth Business Day<sup>1</sup> of each month, the Thomson Reuters/CoreCommodity CRB Index is rebalanced and the PR for each commodity is rescaled such that:

$$PR_i = W_i \times \text{Thomson Reuters/CoreCommodity CRB Index}$$

for i = 1 to 19

where:

$W_i$  = Index weight of commodity i, such that  $0 \leq W_i \leq 1, \forall i$  and  $\sum_{i=1}^{19} W_i = 1$ .

and the value of each PR at the end of the seventh Business Day is equal to:

$$PR_{r,i} = \text{Thomson Reuters/CoreCommodity CRB Index}_{r-1} \times W_i \times (CPS_{r,i} / CPS_{r-1,i})$$

where r is defined as the seventh Business Day of the month.

The Thomson Reuters/CoreCommodity CRB Index Total Return includes a risk-free rate of return that is reinvested into the Index and is calculated as follows:

$$\text{Index TR}_t = \text{Index TR}_{t-1} \times \left[ TB_t + \frac{\text{Index}_t}{\text{Index}_{t-1}} \right] \times (TB_t + 1)^{\text{Days}-1}$$

where:

Days = The number of calendar days between time t and time t - 1.

$$TB_t = \left[ \frac{1}{1 - \frac{91}{360} \times TBR_{t-1}} \right]^{\frac{1}{91}} - 1$$

and

$TBR_{t-1}$  = 91 day Treasury Bill rate at time t - 1.

<sup>1</sup> Business Day is defined as any day on which the New York Mercantile Exchange is open for business.

### Section 3. Thomson Reuters/CoreCommodity CRB Index Composition

This Section presents the commodities included in the Thomson Reuters/CoreCommodity CRB Index and their respective weightings in the Index.

#### Commodities Included in the Thomson Reuters/CoreCommodity CRB Index

	Commodity	Index Weight	Contract Months	Exchange
<b>Group I</b>	WTI Crude Oil	23%	Jan - Dec	NYMEX
	Heating Oil	5%	Jan - Dec	NYMEX
	RBOB Gasoline	5%	Jan - Dec	NYMEX
	<b>Total</b>	<b>33%</b>		
<b>Group II</b>	Natural Gas	6%	Jan - Dec	NYMEX
	Corn	6%	Mar, May, Jul, Sep, Dec	CBOT
	Soybeans	6%	Jan, Mar, May, Jul, Nov	CBOT
	Live Cattle	6%	Feb, Apr, Jun, Aug, Oct, Dec	CME
	Gold	6%	Feb, Apr, Jun, Aug, Dec	COMEX
	Aluminum	6%	Mar, Jun, Sep, Dec	LME
	Copper	6%	Mar, May, Jul, Sep, Dec	COMEX
	<b>Total</b>	<b>42%</b>		
<b>Group III</b>	Sugar	5%	Mar, May, Jul, Oct	NYBOT
	Cotton	5%	Mar, May, Jul, Dec	NYBOT
	Coffee	5%	Mar, May, Jul, Sep, Dec	NYBOT
	Cocoa	5%	Mar, May, Jul, Sep, Dec	NYBOT
	<b>Total</b>	<b>20%</b>		
<b>Group IV</b>	Nickel	1%	Mar, Jun, Sep, Dec	LME
	Wheat	1%	Mar, May, Jul, Sep, Dec	CBOT
	Lean Hogs	1%	Feb, Apr, Jun, Jul, Aug, Oct, Dec	CME
	Orange Juice	1%	Jan, Mar, May, Jul, Sep, Nov	NYBOT
	Silver	1%	Mar, May, Jul, Sep, Dec	COMEX
	<b>Total</b>	<b>5%</b>		

#### Active Contract Month by Calendar Month

Commodity	Exchange	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
WTI Crude Oil	NYMEX	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Heating Oil	NYMEX	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
RBOB Gasoline	NYMEX	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Natural Gas	NYMEX	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Corn	CBOT	Mar	Mar	May	May	Jul	Jul	Sep	Sep	Dec	Dec	Dec	Mar
Soybeans	CBOT	Mar	Mar	May	May	Jul	Jul	Nov	Nov	Nov	Nov	Jan	Jan
Live Cattle	CME	Feb	Apr	Apr	Jun	Jun	Aug	Aug	Oct	Oct	Dec	Dec	Feb
Gold	COMEX	Feb	Apr	Apr	Jun	Jun	Aug	Aug	Dec	Dec	Dec	Dec	Feb
Aluminum	LME	Mar	Mar	Jun	Jun	Jun	Sep	Sep	Sep	Dec	Dec	Dec	Mar
Copper	COMEX	Mar	Mar	May	May	Jul	Jul	Sep	Sep	Dec	Dec	Dec	Mar
Sugar	NYBOT	Mar	Mar	May	May	Jul	Jul	Oct	Oct	Oct	Mar	Mar	Mar
Cotton	NYBOT	Mar	Mar	May	May	Jul	Jul	Dec	Dec	Dec	Dec	Dec	Mar
Cocoa	NYBOT	Mar	Mar	May	May	Jul	Jul	Sep	Sep	Dec	Dec	Dec	Mar
Coffee	NYBOT	Mar	Mar	May	May	Jul	Jul	Sep	Sep	Dec	Dec	Dec	Mar
Nickel	LME	Mar	Mar	Jun	Jun	Jun	Sep	Sep	Sep	Dec	Dec	Dec	Mar
Wheat	CBOT	Mar	Mar	May	May	Jul	Jul	Sep	Sep	Dec	Dec	Dec	Mar
Lean Hogs	CME	Feb	Apr	Apr	Jun	Jun	Jul	Aug	Oct	Oct	Dec	Dec	Feb
Orange Juice	NYBOT	Mar	Mar	May	May	Jul	Jul	Sep	Sep	Nov	Nov	Jan	Jan
Silver	COMEX	Mar	Mar	May	May	Jul	Jul	Sep	Sep	Dec	Dec	Dec	Mar

## **Section 4. Market Disruption Provisions**

### ***Rollover Disruptions***

A Rollover Disruption Event (“RDE”) is defined as any day, on which a commodity is scheduled to roll, in which either: 1) the front month or back month contracts for the commodity settle at the daily maximum or minimum price as determined by the rules for the relevant exchange, or 2) the exchange fails to publish an official settlement price for the commodity, or 3) the exchange on which the commodity trades is not scheduled to be open.

If a RDE occurs for any commodity, that portion of the rollover *for that commodity only* which was scheduled to occur on that day will be deferred until the next Business Day upon which no RDE occurs for that commodity. For example, if a RDE occurred on the first day upon which corn was scheduled to roll, then the amount to be rolled on the second day would increase to 50%. If a second and third consecutive RDE occurred on the next two days upon which corn was scheduled to roll then the entire roll would take place at the end of the first Business Day in which there was no RDE. These hypothetical rollover disruptions in corn would have no impact on the rollover schedule for other commodities in the Thomson Reuters/CoreCommodity CRB Index.

### ***Rebalancing Disruptions***

If, on any date the Thomson Reuters/CoreCommodity CRB Index is scheduled to rebalance (defined above as the 6<sup>th</sup> Business Day of each month), an official settlement price for any one or more of the commodities in the Thomson Reuters/CoreCommodity CRB Index is unavailable, then the price used in rebalancing the Thomson Reuters/CoreCommodity CRB Index for those commodities will be the price on the previous Business Day upon which a price is available. In the event any one or more individual commodities settle at the daily maximum price or the daily minimum price, that price will be used for the purpose of rebalancing the Index.

### ***Market Emergencies***

A “Market Emergency” is herein defined as any unscheduled and extraordinary condition in which market liquidity is interrupted (such as an event resulting in the unscheduled closing of one or more futures exchanges). Should a Market Emergency occur, the Thomson Reuters/CoreCommodity CRB Index Oversight Committee reserves the right to take such action with respect to the Thomson Reuters/CoreCommodity CRB Index, as it deems appropriate given the circumstances. The Thomson Reuters/CoreCommodity CRB Index Oversight Committee will attempt to notify interested parties of any such actions as well in advance as is practicable. There is no assurance, however, that a Market Emergency, the actions taken in response to such Market Emergency, or any other force majeure event, will not have an adverse effect on the value of the Thomson Reuters/CoreCommodity CRB Index or the manner in which it is calculated.

**Section 5. Ongoing Index Calculation and the Thomson Reuters/CoreCommodity CRB Index Oversight Committee**

The role of the Thomson Reuters/CoreCommodity CRB Index Oversight Committee (the “Committee”) is to meet on an annual basis (and from time to time if necessary) in order to review and/or modify the operation and calculation of the Thomson Reuters/CoreCommodity CRB Index and procedures relating thereto, and to review proposals by CoreCommodity or Thomson Reuters to modify the Thomson Reuters/CoreCommodity CRB Index. The Committee will be comprised of 4 persons, appointed by CoreCommodity and Thomson Reuters. Committee members will be chosen in order to bring expertise from a wide variety of backgrounds. Modifications to the Thomson Reuters/CoreCommodity CRB Index shall be subject to approval by the Committee. The Committee will have a significant degree of discretion with regard to the operation and calculation of the Thomson Reuters/CoreCommodity CRB Index and may exercise its discretion, as it deems appropriate.



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