



MACQUARIE

Macquarie Composite Index Methodology

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The Macquarie Composite Index Methodology (hereinafter, the *Methodology*) is a generic methodology for calculating indices that are composed of indices of futures or other composite indices. An index constructed by applying the Methodology to a set of inputs is hereinafter generically called the *Index*. The Methodology outlines the calculations of daily index values for Excess Return and Total Return versions of the Index given the set of inputs specified in its Index Specification document.

Definitions

Component is each of the Components specified in the Index Specification. The total number of Components is denoted by n .

Component Level in respect of an Index Business Day, is the closing level of each Component as published by its index sponsor. If the Index Business Day is not a day on which the Component is scheduled to be published, the Component Level for that day will be the most recent available Component Level on the most recent publication day.

Contract is a futures contract traded in a Trading Facility and having a commodity as underlying.

Holdings Calculation Date is the Index Business Day on which the Target Holdings are periodically calculated. The Holdings Calculation Date is specified in the Index Specification.

Index Business Days are the days in the Index Calendar as specified in the Index Specification.

Index Sponsor is Macquarie Bank Limited (Macquarie), the entity that publishes or announces (directly or through an agent) the daily level of the Index.

Index Start Date is the Index Business Day specified as such in the Index Specification.

Initial Index Level is the level of the Index on the Index Start Date specified as such in the Index Specification.

Target Holdings are a set of multipliers used for the daily calculations of the Index derived from the Weights.

Trading Facility The exchange, facility or platform on or through which a particular Contract is traded. A Trading Facility may, but is not required to, be a contract market, exempt electronic trading facility, derivatives transaction execution facility, exempt board of trade or foreign board of trade, as such terms are defined in the U.S. Commodity Exchange Act and the rules and regulations promulgated thereunder.

Treasury Bill Rate in respect of any Index Business Day, is the 91-day discount rate for U.S. Treasury Bills, as reported by the U.S. Department of the Treasury's Treasury Direct service (<http://www.treasurydirect.gov/RI/OFBills>) on the most recent of the weekly auction dates prior to said Index Business Day.

The **Underlying Contracts** in respect of an Index Business Day are all Contracts which are, directly or indirectly, an underlying of the Index or, if that Index Business Day is a Holdings Calculation Day, scheduled to be an underlying of the Index according to the methodology of that Index or that of its Components.

Weights are the weights periodically established by the Weighting Methodology specified in the Index Specification.

Section 1: Holdings Calculation

On any Index Business Day, t , each Component i has a Holding, $H_{i,t}$ associated with it. As outlined in the next section, the Holdings, $\{H_{1,t}, \dots, H_{n,t}\}$, of the n Components are used as inputs on the daily calculation of the Index. In this section, we outline the Holdings, $\{H_{1,t}, \dots, H_{n,t}\}$, calculations on any Index Business Day, t .

Target Holdings calculation on a Holdings Calculation Date

The calculation of the Target Holdings on a Holdings Calculation Date, R , requires as input the set of Weights in respect of that Holdings Calculation Date R and the Component Levels of the Components on the Index Business Day immediately preceding that Holdings Calculations Date, R .

On any Holdings Calculation Date, R , let the Weight of each Component i be denoted by $W_{i,R}$ so that $\{W_{1,R}, \dots, W_{n,R}\}$ are the Weights of the n Components in the Index as determined by the Weighting Methodology of the Index in respect of the Holdings Calculation Date R . Analogously, let $\{C_{1,R-1}, \dots, C_{n,R-1}\}$ be the set of Component Levels of the Components on the Index Business Day immediately preceding the Holdings Calculation Date, R . The index Target Holdings, $\{TH_{1,R}, \dots, TH_{n,R}\}$, for each of the n Components in the Index are calculated according to the formula below:

$$TH_{i,R} = I_R \times \frac{W_{i,R}}{C_{i,R-1}} \text{ for every Component } i = 1, \dots, n$$

where I_{R-1} is the Index Level on the Index Business Day immediately preceding the Holdings Calculation Date R .

Daily Holdings calculation

On any Index Business Day, t , the set of Holdings $\{H_{1,t}, \dots, H_{n,t}\}$ is calculated according to the following rule:

- (i) If t is the Index Business Day immediately following the Holdings Calculation Date R , the Holdings $\{H_{1,t}, \dots, H_{n,t}\}$ are set equal to the Target Holdings $\{TH_{1,R}, \dots, TH_{n,R}\}$ calculated on that Holdings Calculations Date.
- (ii) On any other Index Business Day, t , the Holding of each Component i on that day, $H_{i,t}$ is set to be equal to the Holding of that particular Component on the previous Index Business Day, $H_{i,t-1}$.

Section 2: Daily Index Calculation

On each Index Business Day, t , the Excess Return Index level, I_t , is calculated (rounded to seven significant figures) based on the value of the Excess Return Index on the preceding Index Business Day, I_{t-1} , and the change in level of each of the Components, according to the formula:

$$I_t = I_{t-1} + \sum_i H_{i,t}(C_{i,t} - C_{i,t-1})$$

where:

- I_t is the Index Level on the close of day t ;
- $H_{i,t}$ is the Holding of Component i on the Index Business Day t ;
- $C_{i,t}$ is the level of Component i on the Index Business Day t ;
- $t-1$ is the Index Business Day immediately preceding Index Business Day t

The Index Start Date as well as the Excess Return Index Starting Level, which is the value of the Excess Return Index on the Index Start Date, are specified in the Index Specification.

On an Index Business Day, t , the Total Return Index level, TI_t , is calculated (rounded to seven significant figures) based on the value of the Total Return Index on the preceding Index Business Day, TI_{t-1} , the Index Daily Return, IDR_t , and the **Collateral Return**, CR_t , according to the formula:

$$TI_t = TI_{t-1} \times (1 + IDR_t + CR_t)$$
$$CR_t = \left[\frac{1}{1 - \frac{91}{360} \times TBAR_{t-1}} \right]^{days/91} - 1$$

where

$TBAR_{t-1}$ is the Treasury Bill Rate of the most recent weekly US Treasury Bill auction prior to the Index Business Day t ;
 $days$ is the number of calendar days between the Index Business Day t and the previous Index Business Days $t-1$; and
 IDR_t is equal to $\frac{I_t}{I_{t-1}} - 1$

The Index Start Date as well as the Total Return Index Level, which is the value of the Index Start Date, are specified in the Index Specification.

Section 3: Market Disruption Events

With respect to the daily calculation of the Index, a “Market Disruption Event” means the occurrence, in respect of one or more Underlying Contracts, of one or more of the following events as determined by the Index Sponsor in its sole discretion:

- (i) a failure by the relevant Trading Facility to report or announce a settlement price for an Underlying Contract;
- (ii) all trading in an Underlying Contract the Index is suspended and does not recommence at least ten minutes prior to the actual closing time of the regular trading session;
- (iii) the settlement price published by the relevant Trading Facility for one (or more) Underlying Contracts is a “limit price”, which typically means that the Trading Facility published settlement price for such Contract for a trading day has increased or decreased from the previous trading day’s settlement price by the maximum amount permitted under applicable rules of the Trading Facility;
- (iv) the index sponsor of a Component fails to publish a Component Level in respect of an Index Business Day;
- (v) any other event, if the Index Sponsor determines in its sole discretion that the event materially interferes with the ability of the Index Sponsor or any of its affiliates to hedge the Index;
- (vi) the occurrence of a Market Disruption Event in respect of an Underlying Contract that shares the same Commodity.

Index calculation under Market Disruption Events

If, on a Holdings Calculation Day R (hereinafter called the “Disrupted Holdings Calculation Day”), a Market Disruption Event with respect to one or more Underlying Contracts occurs (each such Contract a “Disrupted

Contract” until the first Index Business Day on which no Market Disruption Event exists or is continuing in respect of that Contract), then the Index Calculation for subsequent Index Business Days until the second consecutive non-disrupted Index Business Day will be modified as follows:

- (i) As long as a Market Disruption Event that occurred or was continuing on the Holdings Calculation Day R is continuing, the Index Level will be calculated according to the following formula:

$$I_t = I_{t-1} + \sum_j H'_{j,t}(f_{j,t} - f_{j,t-1})$$

Where

$H'_{j,t}$ is the Equivalent Holding for Underlying Contract j as calculated according to points (ii)-(v) below

$f_{j,t}$ is the settlement price of Underlying Contract j as of the Index Business Day t

- (ii) The Index Sponsor shall determine the Equivalent Holdings and the Equivalent Target Holdings with respect to the Index. The Equivalent Holdings is a set of holdings $\{H'_{1,R}, \dots, H'_{m,R}\}$ which corresponds to the Underlying Contracts $\{F_1 \dots F_m\}$ of the Index and perfectly describes the returns of the Index in the time period from the immediately preceding Holdings Calculation Day to the Holdings Calculation Day R. The Equivalent Target Holdings is a set of target holdings $\{TH'_{1,b}, \dots, TH'_{m,b}\}$ for the Underlying Contracts, which perfectly describes the returns of the Index on the days following the Disrupted Holdings Calculation Day and until the first subsequent Holdings Calculation Day. The Equivalent Holdings and the Equivalent Target Holdings shall be determined for all Underlying Contracts, therefore some $H'_{j,t}$ and/or $TH'_{j,t}$ may have a value of 0.
- (iii) On the Index Business Day immediately following a Disrupted Holdings Calculation Day and until all Market Disruption Events that occurred on the Disrupted Holdings Calculation Day have ceased, the Equivalent Holdings $\{H'_{1,b}, \dots, H'_{m,b}\}$ are calculated based on the following formula:

$$H'_{j,t} = TH'_{j,R} + SCH_{j,t}$$

Where:

$TH'_{j,R}$ means the Equivalent Target Holding of Contract j on Holdings Calculation Day R

$SCH_{j,t}$ means $\begin{cases} H'_{j,t-1} - TH'_{j,R} & \text{if } j \text{ is a Disrupted Contract; or} \\ 0 & \text{otherwise} \end{cases}$

$H'_{j,t-1}$ means the Equivalent Holding of Contract j on Index Business Day $t-1$

- (iv) For each Disrupted Contract j , the Equivalent Holding $H'_{j,t}$ shall be equal to the Equivalent Target Holding $TH'_{j,t}$ on the first Index Business Day following a Disrupted Holdings Calculation Day, on which no Market Disruption Event in respect of that Contract j occurs or is continuing. If a Market Disruption Event continues for more than 5 Index Business Days following a Disrupted Holdings Calculation Day, the Index Sponsor shall, in good faith and in a commercially reasonable manner, determine the levels of each Disrupted Component j that will be used in the calculation of Holdings and Index Levels.
- (v) For each Underlying Contract that is not a Disrupted Contract, the Holding $H_{j,t}$ on the Index Business Day immediately following the Disrupted Holdings Calculation Day shall be the Equivalent Target Holding.
- (vi) On the second consecutive non-disrupted Index Business Day immediately following a Disrupted Holdings Calculation Day, the Index Sponsor will resume calculation of the index in accordance with section 2

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