Macquarie Backwardation Alpha Index

Index Manual
February 2018

NOTICES AND DISCLAIMERS

BASIS OF PROVISION

This Index Manual sets out the rules for the Macquarie Backwardation Alpha Index (the ***Index***) and reflects the methodology for determining the composition and calculation of the Index (the ***Methodology***). The Methodology and the Index derived from this Methodology are the exclusive property of Macquarie Bank Limited (the ***Index Sponsor***). They have been provided to you solely for your internal use and you may not, without the prior written consent of the Index Sponsor, distribute, reproduce, in whole or in part, summarise, quote from or otherwise publicly refer to the contents of the Methodology or use it as the basis of any financial instrument.

DATE OF INDEX MANUAL AND CHANGES TO THE INDICES

The Index Manual contains information as of the date appearing on its cover, and such information may change from time to time. No assurance can be given that the Methodology reflects information subsequent to this date. The Index Sponsor may, however, supplement, amend or withdraw the Methodology at any time if it determines that an Index is no longer calculable under the existing Methodology. The Index Sponsor may also determine that a change to the Methodology is required or desirable to address an error, ambiguity or omission. Such changes may include changes to eligibility requirements or construction as well as changes to the daily Index calculations. If a supplement or amendment is required and such supplement or amendment materially affects the Index Level of the Index, the Index Sponsor will publish such changes to the Methodology, together with the rationale for such changes, 30 days prior to implementation. However if prior publication of the changes is not practicable, the changes and rationale will be published as soon as is reasonably practicable.

If you have been granted written consent by the Index Sponsor to reference the Index in any contract or financial instrument, you should include in such contract or financial instruments robust fall-back provisions to deal with cessation or material modification of the Index.

NOT RESEARCH OR AN OFFER

This document is not a personal recommendation as defined by the Financial Conduct Authority and you should consider whether you can rely upon any opinion or statement contained in this document without seeking further advice tailored for your own circumstances. It is also not investment research, and has not been prepared in accordance with legal requirements designed to promote the independence of such. Any opinions expressed herein may differ from the opinions expressed in other departments including the research department. Nor have the contents of this document been reviewed by any regulatory authority, and the distribution of this document and availability of related financial instruments in certain jurisdictions may be restricted by law.

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The Index and any financial instruments based on the Index may not be suitable for all investors and any investor must made an independent assessment of the appropriateness of any transaction in light of their own objectives and circumstances including the potential risks and benefits of entering into such a transaction. If you are in any doubt about any of the contents of this document, you should obtain independent professional advice.

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Hypothetical back-tested historical values of the Index are not indicative of future performance. The Index Sponsor makes no representation as to the accuracy or appropriateness of, and shall have no liability to you or any other entity for any loss or damage, direct or indirect, arising from the use of the historical values.

DISCLAIMER OF LIABILITY

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In particular, the Index Sponsor and Index Calculation Agent are under no obligation to monitor whether or not a Market Disruption Event has occurred and shall not be liable for any losses resulting from (i) any determination that a Market Disruption Event has occurred or has not occurred in relation to a Contract, (ii) the timing relating to the determination that a Market Disruption Event has occurred in relation to a Contract, or (iii) any actions taken or not taken by the Index Calculation Agent as a result of such determination that an Market Disruption Event has occurred.

NOTICES

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THE MACQUARIE BACKWARDATION ALPHA INDEX

CONTENTS

INTRODUCTION

The Macquarie Backwardation Alpha Index is designed to provide investment exposure to a basket of two commodity indices, each of which is comprised of a basket of commodity futures. The aim of the Index is to combine the two Components, so as to benefit from an "alpha" exposure, that is the residual performance of a commodity index tracking a publicly available commodity reference index (a "Reference Index"), for example, the Bloomberg Commodity Index, with the aim of outperforming by overweighting and underweighting the allocation of Commodities relative to the Reference Index. The Index is designed to be readily accessible to market participants and is calculated daily in both an Excess Return and Total Return format.

The Index represents a replicable index for investment in a broad spectrum of commodities chosen based on global production with sufficient liquidity in order to replicate investment. Physical commodities are not easily investable on a direct and replicable basis. Futures contracts on commodities, however, represent a widely utilized synthetic proxy for direct investment in commodities. For this reason, the Index is constituted by, and reflects the price performance of, a basket of a broad spectrum of exchange traded futures contracts relating to a physical commodity. In order to ensure the continuity of the Index, when the futures contract relating to a Commodity in an Index approaches expiration, it will be replaced by an identical contract with a later expiration (the exposure to the Commodity will "roll" from one Contract into the next). The exposure to each Commodity underlying an Index thus tracks a sequence of futures contracts relating to that Commodity (the universe of tradable calendar futures contracts on a Commodity, known as the "futures curve").

The investment strategy of the Macquarie Backwardation Alpha Index is commonly referred to as "commodity backwardation". Backwardation is the market phenomenon where prices of futures contracts nearer to expiry (front of the futures curve) are higher than prices of futures contracts further from expiry (back of the futures curve). This can be caused by a number of factors depending on the asset class. In commodities, the shape of the futures curve is mainly affected by supply and demand conditions of the underlying commodity, with commodities where demand outpaces supply generally being in “backwardation” and those commodities which are oversupplied generally being in “contango” (the opposite of backwardation, with higher futures prices in the back of the futures curve than the front). The strategy will generally go long the Components with the most backwardated commodities and short the Components with the least backwardated commodities. If the shape of the futures curve stays the same, the strategy profits from the higher roll yields on the long exposure versus lower roll yields on the short exposure. To isolate this source of return in the Index attributed to backwardation and minimize correlation to the broader commodities market, the Macquarie Backwardation Alpha Index will avoid taking outright positions in the commodities market and will aim to have a neutral allocation across commodities (weights add up to zero).

GENERAL NOTES ON THE INDICES AND THE METHODOLOGY

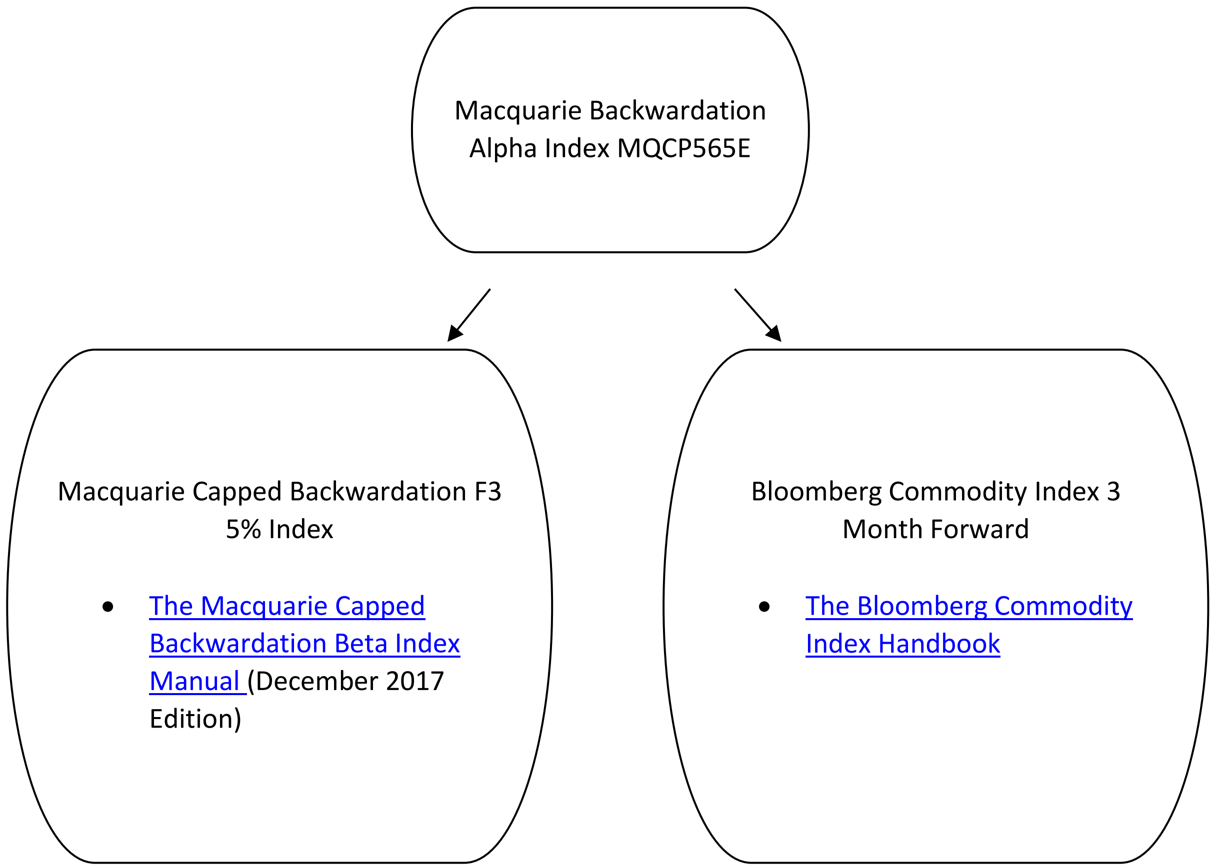
The Index is designed to be replicable and readily accessible to market participants and is calculated daily in both an Excess Return and a Total Return format. To facilitate an understanding of the calculations, this Index Manual contains various worked examples which demonstrate the types of calculations needed to calculate the level of the Index on a particular date.

The Index is calculated and maintained by the Index Calculation Agent and supervised by the Index Sponsor and the Oversight Committee, as described below. Once the Index has been created, the Components and Weights (or if appropriate, formula for calculating Weights) will not be amended going forward. All determinations with regard to the Index are made following the rules set out in this document, without discretion by the Index Sponsor or Index Calculation Agent.

The Index is not based upon submissions provided by third parties (or an affiliate of the Index Sponsor or Index Calculation Agent) or expert judgment. The Index is based upon actual transaction data sourced from regulated markets and exchanges.

INDEX MANUAL DOCUMENTATION DIAGRAM

The Macquarie Backwardation Alpha Index is comprised of two Components, the Macquarie Capped Backwardation F3 5% Index and the Bloomberg Commodity Index 3 Month Forward. The documentation for each of these Components can be found in the linked Index Manuals.



INDEX GOVERNANCE

The Index Sponsor has established an independent oversight committee (the ***Oversight Committee***) to review and oversee management of the Indices and resolve any issues that arise. The Oversight Committee is comprised of the following designees, each an employee of Macquarie Bank Limited:

- A Managing Director in the Commodity Markets and Financing division of the Commodities and Financial Markets group;
- A Director from the Legal and Governance group;
- A representative from the Technology division of the Corporate Operations Group;
- A representative from the Risk division of the Risk Management Group; and
- A representative from the Compliance division of the Risk Management Group.

Each member of the Oversight Committee is sufficiently knowledgeable about commodity futures contracts and the commodities markets in general, and is required to act in good faith and in a commercially reasonable manner.

The Index Sponsor will make available upon request the names of the individuals forming the Oversight Committee.

The Oversight Committee has considered the features of the Indices, the intended, expected or known usage of the Indices and the materiality of existing or potential conflicts of interest together with overseeing the daily management and operations of the Indices.

The Oversight Committee has approved the Methodology and this Index Manual and will be available on an ad hoc basis for the approval of any changes to the Methodology, any contemplated cancellation of the Indices and the resolution of any issues which arise in relation to the Indices.

INDEX SPONSOR AND INDEX CALCULATION AGENT

THE INDEX SPONSOR

Macquarie Bank Limited is the Index Sponsor. Notwithstanding anything to the contrary, the Index Sponsor will maintain all ownership rights, expressed or otherwise, with respect to the Index, including the ability to license, sell or transfer any or all of its ownership rights with respect to the Index, including but not limited to terminating and appointing any successor Index Calculation Agent. The Index Calculation Agent is appointed by the Index Sponsor to calculate and maintain each Index from and until such time that the Index Sponsor terminates its relationship with the current Index Calculation Agent and appoints a successor index calculation agent. Any such termination or appointment of a successor will be subject to the approval of the Oversight Committee.

The Index Sponsor may, from time to time, revise, amend and/or supplement this Manual. If such revisions or supplement materially affect the calculation of the Index, the Index Sponsor shall publish a new Manual no later than 30 days prior to implementation of the revised or supplemented rules. If it is not reasonably practicable to publish revised Manual 30 days prior to such changes, the revised Manual will be published as soon as reasonably practicable.

THE INDEX CALCULATION AGENT

The Technology division of the Corporate Operations Group (***COG***) of Macquarie Bank Limited acts as "Index Calculation Agent" in respect of the Index as of the date of this Manual. The methodology employed by the Index Calculation Agent in determining the composition and calculation of the Index is set out in the calculations and procedures described in this document.

RELATIONSHIP OF THE INDEX SPONSOR AND THE INDEX CALCULATION AGENT

The Index Calculation Agent is appointed by the Index Sponsor, subject to the approval of the Index Oversight Committee. While, as of the date of publication of these rules, both the Index Sponsor and the Index Calculation Agent form part of Macquarie Bank Limited, they are independent divisions within the bank and employees discharging the obligations of the Index Calculation Agent have separate lines of reporting and accountability from the employees performing the functions of the Index Sponsor.

DEFINITIONS

Component is each of the Components specified in Table 1, included in Section 1 below. 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 last Index Business Day of a given calendar month.

Index Business Days are the days in the Index Calendar.

Index Calendar is the set of trading days of the New York Mercantile Exchange.

Index Name is the Macquarie Backwardation Alpha Index.

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 29th February 2000.

Index Ticker is MQCP565E Index (Bloomberg) for the Excess Return Index and MQCP565T Index (Bloomberg) for the Total Return Index.

Initial Index Level is the level of the Index on the Index Start Date, specified as 100.

Settlement Prices, in respect of an Index Business Day, are the prices of the Underlying Contracts, expressed in US dollars, published by the relevant Trading Facility and referred by them as the settlement price for that particular Contract. If the Index Business Day is not a trading day of the relevant Trading Facility, then the Settlement Price of that particular Contract will be the most recent available price on the most recent trading day of the relevant Trading Facility.

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 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, indirectly, via its Components, an underlying of the Index or, if that Index Business Day is a Holdings Calculation Day, scheduled to be an underlying of the Index via its Components according to the methodology of the Components of the Index.

Weights are the weights periodically established according to Section 1 below.

CALCULATION OF THE MACQUARIE BACKWARDATION ALPHA INDEX

The Macquarie Backwardation Alpha Index is meant to provide exposure to its two Components. A +100% weight is allocated to the long Component and a -100% weight is allocated to the short Component on each Holdings Calculation Date.

Section 1 describes the weights that are assigned to each of the Components of the Index.

Section 2 describes the day-to-day calculation of the Index

Section 3 describes Market Disruption Events and the modifications to the calculations that the Index Sponsor will perform to determine the Index Level during and following any market disruptions.

SECTION 1: WEIGHT AND HOLDINGS CALCULATION

On each Holdings Calculation Date, the Weights of the Macquarie Backwardation Alpha Index shall be set according to the table below:

Table 1 – Index components and weights

Component	Weight
Macquarie Capped Backwardation F3 5% Index	+100%
Bloomberg Commodity Index 3 Month Forward	-100%

The calculation and methodology of the Macquarie Capped Backwardation F3 5% Index is described in the "Macquarie Capped Backwardation Beta Index" Manual, which is available on request or at https://static.macquarie.com/dafiles/Internet/mgl/global/shared/corporate/trading-and-hedging/commodities/macquarie-capped-backwardation-beta-index-manual.pdf?v=2

The calculation and methodology of the Bloomberg Commodity Index 3 Month Forward is described in the "Bloomberg Commodity Index Handbook", which is available at https://data.bloomberglp.com/indices/sites/2/2017/10/BCOM_methodology_20171013.pdf

On any Index Business Day, t, each Component i has a Holding, $H_{i,t}$, associated with it. This Holding represents the proportion in which the Index Level will change when the level of that Component changes. As outlined in the next section, the Holdings, $\{H_{1,t}, \ldots, H_{n,t}\}$, of the n Components are used as inputs on the daily calculation of the Index. In this section, we outline the Holdings, $\{H_{1,t}, \ldots, H_{n,t}\}$, 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 $\{W_{1,R}, \ldots., W_{n,R}\}$ 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 $\{C_{1,R-1}, \ldots., C_{n,R-1}\}$ 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, $\{TH_{1,R}, \ldots., TH_{n,R}\}$, for each of the *n* Components in the Index are calculated according to the formula below:

$$TH_{i,R} = I_{R-1} \times \frac{W_{i,R}}{C_{i,R-1}} \; for\ every\ Component\ i = 1, \ldots, n$$

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

For example if, on the Index Business Day preceding a Holdings Calculation Date, R, the Index level of an Index is 100, the Component Level is 80 and the Weight of that Component is 40%, then the Target Holding of that Component in respect of that Holdings Calculation Date will be equal to 100*(0.4)/80 = 0.5

DAILY HOLDINGS CALCULATION

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

(i) If *t* is the Index Business Day immediately following the Holdings Calculation Date R, the Holdings $\{H_{1,t}, \ldots, H_{n,t}\}$ are set equal to the Target Holdings $\{TH_{1,R}, \ldots., TH_{n,R}\}$ 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

The Index is available in both an Excess Return and a Total Return format. The calculation of the Index Level differs depending on which of these two performance benchmarks the Index tracks.

The Index Start Date as well as the Initial Index Level, which is the value of the Index on the Index Start Date, are specified in the Definitions section above.

The Excess Return Index represents the performance of a synthetic, unfunded exposure to the Underlying Contracts in an Index, that is, the Index tracks what an investor would receive if it purchased or sold the futures contracts underlying the Components of the Index without taking into consideration the cost of investment capital.

On each Index Business Day, *t*, the Excess Return Index Level, I_t, is calculated (rounded to eight decimal places) 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:

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

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

For example, if an Index were comprised of two components which had the following Component levels:

	Component 1	Component 2
Index Business Day t-1	32.48	31.21
Index Business Day t	32.83	31.49

and the following Holdings:

	Holding
Component 1	1.72
Component 2	1.48

then if the Index Level on Index Business Day t-1 was equal to 102.0564, the Index Level on Index Business Day t will be equal to:

$$I_t = 102.0564 + 1.72 \times (32.83 - 32.48) + 1.48 \times (31.21 - 31.49) = 102.244$$

The Index Level on Business Day t would be 102.244.

The Total Return Index represents a synthetic, funded exposure to the Underlying Contracts in an Index, that is, the Index tracks what an investor would receive if it purchased or sold the futures contracts underlying the Components of the Index, and simultaneously invested, at a risk-free rate, a USD sum of money equal to the aggregate notional associated with all bought futures contracts.

On an Index Business Day, t, the Total Return Index Level, TI_t, is calculated (rounded to eight decimal places) 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* $\frac{I_t}{I_{t-1}} - 1$

SECTION 3: MARKET DISRUPTION EVENTS

The Index is comprised of two Components, each comprised of indices on several futures contracts, or may be comprised of one or more futures contracts on a particular commodity. On any given Index Business Day, disruptions can occur that prevent these contracts from being traded. When this happens, it is necessary for the calculations of the affected Index to be adjusted so that it remains replicable by market participants i.e. adjustments must be made to the Index calculations to ensure that the Index Levels reflect contract prices that were attainable in the market at the times they would need to be traded in order to replicate the performance of the Index.

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 Calculation Agent 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 of 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 Calculation Agent determines that the event materially interferes with the ability of market participants 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

When a Market Disruption Event occurs or is continuing on a particular Index Business Day, the Index Calculation Agent will determine the basket of futures contracts that is equivalent to the basket of Underlying Contracts that the Index represents, in respect of that Index Business Day and in accordance with the Index Rules. Once this basket is determined, the Index Calculation Agent will make such adjustments as are necessary to ensure the Index Levels reflect contract prices that were attainable in the market at the times they would need to be traded in order to replicate the performance of the Index, as described below:

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:

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

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 Calculation Agent shall determine the Equivalent Holdings and the Equivalent Target Holdings with respect to the Index. The Equivalent Holdings is a set of holdings $\{H'_{1,R}, \ldots, H'_{m,R}\}$ which corresponds to the Underlying Contracts $\{F_1 \ldots F_m\}$ 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 $\{TH'_{1,t}, \ldots, TH'_{m,t}\}$ 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 $\{H'_{1,t}, \ldots, H'_{m,t}\}$ 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 $\begin{cases} H'_{j,t-1} - TH'_{j,R} & if\ j\ is\ a\ Disrupted\ Contract;\ or \\ & 0\ otherwise \end{cases}$

$H'_{j,t-1}$ 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 Calculation Agent 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.

Reference Index - Disclaimer

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