

# Macquarie Extended Roll Minimum Drawdown Carry ex Ags, Lv, Brent & PM Index

**Index Manual  
December 2018**

## NOTICES AND DISCLAIMERS

---

### BASIS OF PROVISION

---

This Index Manual sets out the rules for the Macquarie Extended Roll Minimum Drawdown Carry ex Ags, Lv, Brent & PM Index (the *Index*) and reflects the methodology for determining the composition and calculation of the Index and for determining the composition and calculation of the Index Components (as set out in the Appendices hereto) (together, the *Methodology*).

**The Index Manual assumes the reader is a sophisticated financial market participant, with the knowledge and expertise to understand the investment strategy described herein and the associated risks. It is unsuitable for a retail or unsophisticated audience.**

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 (or a Component of the 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 the daily Index calculations. If a supplement or amendment is required and such supplement or amendment materially affects Index Levels, 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.

The Index Sponsor may withdraw the Index, at any time and without notice, if no financial instruments (in respect of which it has given consent to refer to the Index) are outstanding. The Index Sponsor may, in any case, withdraw the Index, without reason, provided it publishes its intention to do so at least six months prior to cessation of calculation and publication of Index levels.

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.

This document does not constitute a prospectus, offer, invitation or solicitation to buy or sell financial instruments and is not intended to provide the sole basis for any evaluation of the securities or any other financial instruments which may be discussed within, referred to or based upon the Index. Any offering or potential transaction that may be related to the Index will be made separately and subject to distinct documentation and in such case the information contained herein may be superseded in its entirety by such documentation in final form.

The Index and any financial instruments based on the Index may not be suitable for all investors and any investor must make 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.

## HISTORICAL VALUES OF THE INDICES

---

Hypothetical back-tested historical values of the Index (and the Components 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

---

The Methodology is published for information purposes only and does not create any legally binding obligation on the part of the Index Sponsor, Index Calculation Agent and/or their affiliates. This document is intended to provide a summary of the index it purports to describe. The Index Sponsor expressly disclaims (to the fullest extent permitted by applicable law) all warranties (express, statutory or implied) regarding this document and the Methodology or the Index, including but not limited to, all warranties of merchantability, fitness for a particular purpose (including investment by regulated funds) and all warranties arising from course of performance, course of dealing or usage of trade and their equivalents under applicable laws of any jurisdiction. In particular, the Index Sponsor and Index Calculation Agent do not warrant or guarantee the accuracy or timeliness of calculations of the Index value and do not warrant or guarantee the availability of the Index value on any particular date or at any particular time. The Index Sponsor and Index Calculation Agent shall have no liability to any person for delays, omissions or interruptions in the delivery of any Index, including as a result of the failure of prices to be published in respect of any futures contract that ultimately underlies the Index (a *Contract*) or as a result of a Contract

failing to trade for any reason. Although the Index Calculation Agent will obtain information concerning Contracts from publicly available sources it believes reliable, it will not independently verify this information. Accordingly, no representation, warranty or undertaking (express or implied) is made by the Index Sponsor or Index Calculation Agent as to the accuracy and completeness of information concerning the Index.

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

---

The Index is ultimately comprised of Contracts. The Index Sponsor and/or its affiliates actively trade Contracts and options on Contracts. The Index Sponsor and/or its affiliates also actively enter into or trade and market securities, swaps, options, derivatives, and related instruments which are linked to the performance of these Contracts or are linked to the performance of the Index. The Index Sponsor and/or its affiliates may underwrite or issue other securities or financial instruments indexed to the Index, and the Index Sponsor or its affiliates may license the Index for publication or for use by unaffiliated third parties. These activities could present conflicts of interest and could affect the value of the Index. The Index Sponsor trades or may trade as principal in instruments (or related derivatives) linked to an index described in this document, and may have proprietary positions in the instruments (or related derivatives). The Index Sponsor may make a market in such instruments (or related derivatives), which may in extreme circumstances affect the levels of the Index described.

This material is prepared and distributed in the UK by Macquarie Bank Limited, London Branch (MBLLB) and in the EEA member states (other than the UK) by Macquarie Bank International Limited (MBIL) where required. It is intended only for professional clients and eligible counterparties as defined in the rules of the Financial Conduct Authority. MBLLB is registered in England and Wales (Branch No: BR002678, Company No: FC018220, Firm Reference No: 170934). MBIL is incorporated and registered in England and Wales (Company No. 06309906, Firm Reference No. 471080). The registered office for MBLLB and MBIL is Ropemaker Place, 28 Ropemaker Street, London, EC2Y 9HD. MBLLB is authorised and regulated by the Australian Prudential Regulation Authority. Authorised by the Prudential Regulation Authority and subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. Details about the extent of our regulation by the Prudential Regulation Authority are available from us on request. MBIL is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority.

# MACQUARIE EXTENDED ROLL MINIMUM DRAWDOWN CARRY EX AGS, LV, BRENT & PM INDEX

## TABLE OF CONTENTS

---

NOTICES AND DISCLAIMERS .....	2
BASIS OF PROVISION .....	2
DATE OF INDEX MANUAL AND CHANGES TO THE INDICES .....	2
NOT RESEARCH OR AN OFFER.....	3
HISTORICAL VALUES OF THE INDICES .....	3
DISCLAIMER OF LIABILITY.....	3
NOTICES .....	5
MACQUARIE EXTENDED ROLL MINIMUM DRAWDOWN CARRY EX AGS, LV, BRENT & PM INDEX .....	6
INTRODUCTION.....	8
THE INDEX COMPONENTS .....	8
INDEX STRUCTURE AND DOCUMENTATION .....	9
GENERAL NOTES ON THE INDEX AND THE METHODOLOGY .....	9
INDEX GOVERNANCE .....	11
INDEX SPONSOR AND INDEX CALCULATION AGENT.....	12
THE INDEX SPONSOR .....	12
THE INDEX CALCULATION AGENT .....	12
RELATIONSHIP OF THE INDEX SPONSOR AND THE INDEX CALCULATION AGENT .....	12
DEFINITIONS.....	13
INDEX CALCULATION.....	15
SECTION 1: HOLDINGS CALCULATION .....	15
TARGET HOLDINGS CALCULATION ON A HOLDINGS CALCULATION DATE .....	15
DAILY HOLDINGS CALCULATION .....	15
SECTION 2: DAILY INDEX CALCULATION .....	16
SECTION 3: MARKET DISRUPTION EVENTS .....	17
INDEX CALCULATION UNDER MARKET DISRUPTION EVENTS.....	19
<b>APPENDIX A: MACQUARIE COMMODITY STRATEGY MQCP620 EXTENDED ROLL CARRY FRONT EXPOSURE INDEX.....</b>	<b>21</b>
INTRODUCTION.....	22
CALCULATION METHODOLOGY .....	22

DEFINITIONS.....	23
INDEX CALCULATION.....	26
SECTION 1: HOLDINGS CALCULATION .....	26
TARGET HOLDINGS CALCULATION ON A HOLDINGS CALCULATION DATE .....	26
DAILY HOLDINGS CALCULATION .....	27
SECTION 2: DAILY INDEX CALCULATION .....	27
SECTION 3: MARKET DISRUPTION EVENTS .....	28
INDEX CALCULATION UNDER MARKET DISRUPTION EVENTS.....	29
<b>APPENDIX B: MACQUARIE COMMODITY STRATEGY MQCP621 EXTENDED ROLL CARRY DEFERRED</b>	
<b>EXPOSURE INDEX.....</b>	<b>31</b>
INTRODUCTION.....	32
CALCULATION METHODOLOGY .....	32
DEFINITIONS.....	33
INDEX CALCULATION.....	36
SECTION 1: HOLDINGS CALCULATION .....	36
TARGET HOLDINGS CALCULATION ON A HOLDINGS CALCULATION DATE .....	36
DAILY HOLDINGS CALCULATION .....	36
SECTION 2: DAILY INDEX CALCULATION .....	37
SECTION 3: MARKET DISRUPTION EVENTS .....	38
INDEX CALCULATION UNDER MARKET DISRUPTION EVENTS.....	38
CONTACTS.....	41

## INTRODUCTION

---

The Macquarie Extended Roll Minimum Drawdown Carry ex Ags, Lv, Brent & PM Index (hereafter, the *Index*) is a rules-based benchmark for long-short exposure to long-short dated commodity futures. This investment strategy is commonly referred to as 'commodity carry'. It aims to track the storage-related risk premium that can be captured by taking long exposure to long-dated (*deferred*) commodity futures contracts and short exposure to short-dated (*front month*) commodity futures contracts. The existence of the risk premium is justified by the fact that short-term storage is typically more expensive than long-term storage. It is, however, possible that despite this risk premium, deferred futures will underperform front month futures. In such cases, the Index will be negatively affected.

The Index Sponsor implements the long-short exposure by constructing the Index with two equally weighted Components. One Component has a Weight of 100% in the Index (representing the long exposure of the Index), while the other Component has a Weight of -100% in the Index (representing the short exposure of the Index). These Weights are rebalanced monthly, so that the exposure is always 100% to the Component providing exposure to deferred futures and -100% to the Component providing exposure to front month futures, as of the close of the Holdings Calculation Date (as defined below) of each month.

## THE INDEX COMPONENTS

---

Each Component is itself a commodity index, made up of a basket of eight single commodity indices (each such single commodity index tracking a single commodity).

The long Component and the short Component ultimately contain the same commodity futures, in the same static proportions, differing only in respect of the particular part of the futures curve that each Component is exposed to - the 'long' Component ultimately tracks rolling deferred commodity futures while the 'short' Component ultimately tracks rolling front-month commodity futures.

The underlying commodities included in each Component and the proportions assigned to each commodity have been determined by reference to global commodity production and liquidity of available commodity futures contracts. Futures contracts relating to the agricultural and livestock sectors have been excluded, to address the requirements of investors who do not wish to participate in food-related futures contracts. Futures contracts relating to precious metals and Brent crude oil are also excluded, on the basis such futures contracts have, historically, not performed well in commodity carry investment strategies.

The selection of commodities and proportions (or weights) assigned have been determined by the Index Sponsor as a result of a one-off process prior to the creation of the Index and will not change for the life of the Index. Each Component will rebalance to those weights once a month, as described in the relevant appendix to this Manual.

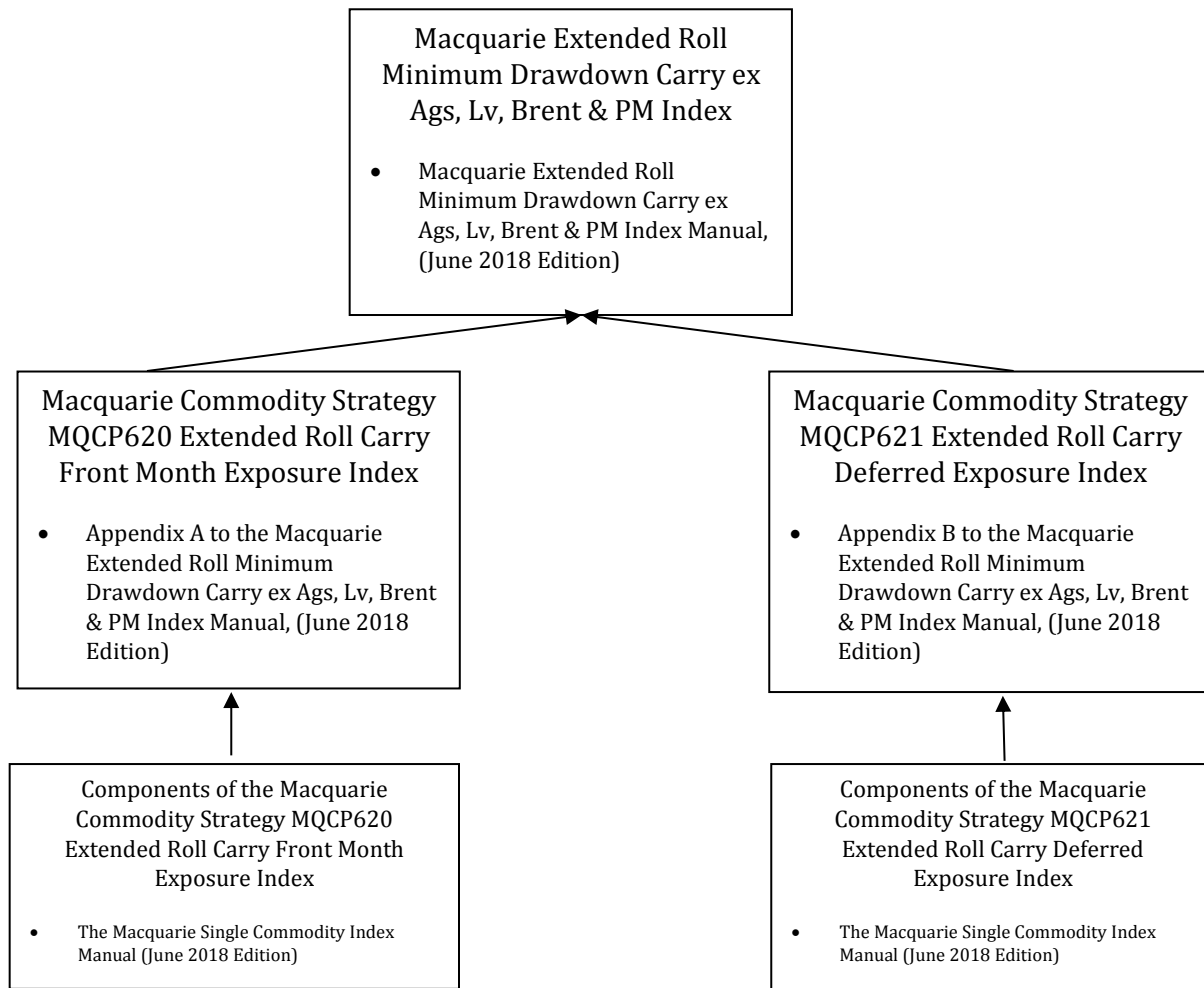


---

## INDEX STRUCTURE AND DOCUMENTATION

---

The below diagram illustrates the components of the Index and the document or documents that describe each component:



---

## GENERAL NOTES ON THE INDEX 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, the Methodology contains various worked examples which demonstrate the types of calculations needed to calculate the level of the Index on a particular date.

The Index (including the Components) is calculated and maintained by the Index Calculation Agent and supervised by the Index Sponsor and Oversight Committee, as described below. Once the Index has been created, the selection of Components that comprise it, the Weights of each Component and the weights of each commodity that underlie each Component will all be fixed and 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 Sponsor will publish the Index Manual as well as any announcements relating to the Index on its website, <http://www.macquarie.com/commodityindexdocumentation>.

Information on the single commodity indices that underlie each Component can be found in the Index Manual, dated June 2018, of the Macquarie Single Commodity Indices, available at <http://www.macquarie.com/commodityindexdocumentation>.

The Index (including the Components) are 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 ultimately based upon actual transaction data sourced from regulated markets and exchanges.

## INDEX GOVERNANCE

---

The Index Sponsor has established an independent oversight committee (the *Oversight Committee*) to review and oversee management of the Index (including the Components thereof) and resolve any issues that arise. The 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 Global 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 Business Operational Risk Management department of the Central division of the Commodities and Global Markets 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 Index, the intended, expected or known usage of the Index and the materiality of existing or potential conflicts of interest and, taking these into account, has approved the Methodology and this Index Manual. The Oversight Committee is also charged with overseeing the daily management and operations of the Index. It will be available on an ad hoc basis for the approval of any changes to the Methodology or Components of the Index, any contemplated cancellation of the Index (or Components) and the resolution of any issues which arise in relation to the Index or Components of the Index.

## 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 (including the Components of the 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 (and Components 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 Manual (including the Appendices hereto).

### 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

---

**Commodity** in respect of an Index, is the physical commodity that underlies the futures contracts referenced by the Index.

**Components** are the components specified in the table below:

Component
Macquarie Commodity Strategy MQCP620 Extended Roll Carry Front Month Exposure Index
Macquarie Commodity Strategy MQCP621 Extended Roll Carry Deferred Exposure Index

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 determined by the Index Calculation Agent. 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.

**Equivalent Holdings**, in respect of an Index Business Day, are numbers which, if applied as Holdings to the Underlying Contracts of the Index, would perfectly describe the performance of the Index in respect of that Index Business Day. Equivalent Holdings are determined in order to facilitate calculation of the Index where any Underlying Contract is subject to a Market Disruption Event. The calculation of Equivalent Holdings is set out in Section 3 (*Market Disruption Events*) of the Index Calculation section below.

**Equivalent Target Holdings**, in respect of an Index Business Day, are numbers which, if applied as Holdings to the Underlying Contracts of the Index, would perfectly describe what the performance of the Index would have been if the Holdings of the Index were instead equal to the Target Holdings of the Index. Equivalent Target Holdings are determined in order to facilitate calculation of the Index where any Underlying Contract is subject to a Market Disruption Event. The calculation of Equivalent Target Holdings is set out in Section 3 (*Market Disruption Events*) of the Index Calculation section below.

**Holding**, in respect of a Component and an Index Business Day, is a number which is determined by the Index Calculation Agent as described in Section 1 (*Holdings Calculation*) of the Index Calculation section below. The Holding in respect of a Component is determined in order to calculate the daily Index Level and represents the proportionate effect on the Index Level of a change in the relevant Component level.

**Holdings Calculation Date** is the Index Business Day on which the Target Holdings are periodically calculated in order to rebalance the Holding of each Component back to the specified Weights. Up to and including 1 December 2018, the Holdings Calculation Date is the last Index Business Day of each calendar month. After 1 December 2018, the Holdings Calculation Date is the 13<sup>th</sup> Index Business Day of each calendar month.

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

**Index Business Days** are the days in the Index Calendar.

**Index Level** is the Level of the Index that is calculated according to the relevant section of this Methodology

**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 04-Jan-2000 (for both excess return and total return versions of the Index).

**Initial Index Level** is 100.

**Index Ticker** means, for the Excess Return Index, **MQCP625E** Index (Bloomberg)

**Market Disruption Events** are events which affect the ability of market participants to trade at the published Settlement Price of a futures contract or other security that is necessary for the exact replication of the Index. The details of what constitutes a Market Disruption Event and the ways in which such events affect the calculation of the Index Level are explained in Section 3 (*Market Disruption Events*) of the Index Calculation section below.

**Target Holdings** are a set of multipliers, derived from the Weights, which are utilised to rebalance the Components of the Index on each Holdings Calculation Date. Calculation of Target Holdings is described in Section 1 (*Holdings Calculation*) of the Index Calculation section below.

**Trading Facility** means each regulated futures exchange, facility or platform on or through which the Underlying Contracts of the Index are traded.

**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 such 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 Date, scheduled to be an underlying of the Index.

**Weights** are the weights periodically established by the Weighting Methodology.

**Weighting Methodology:** On each Holdings Calculation Date, the Weights of the Macquarie Extended Roll Minimum Drawdown Carry ex Ags, Lv, Brent & PM Index, which are used to determine the Holdings of the Index in respect of each Holdings Calculation Date, shall be set according to the table below:

Component	Weight
Macquarie Commodity Strategy MQCP620 Extended Roll Carry Front Month Exposure Index	-100%
Macquarie Commodity Strategy MQCP621 Extended Roll Carry Deferred Exposure Index	100%

---

## INDEX CALCULATION

---

The following sections detail how the Index Calculation Agent will calculate the daily Index Levels of the Index based on inputs set out in the Definitions section.

---

### SECTION 1: HOLDINGS CALCULATION

---

On any Index Business Day,  $t$ , each Component  $i$  has a Holding,  $H_{i,t}$ , associated with it. 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,  $t$ .

On the Holdings Calculation Date of the Index, the Holding of each Component  $i$ , is rebalanced in accordance with the Weighting Methodology.

---

#### 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:

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

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

For example if, on the Index Business Day preceding a Holdings Calculation Date,  $R$ , the Index level 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  $100 \times (0.4) / 80 = 0.5$

---

#### 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

---

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 Excess Return Index represents the performance of a synthetic, unfunded exposure to the Components of the Index, that is, the Index tracks what an investor would receive if it purchased or sold the futures contracts underlying 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 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 Definitions section above.

For example, if the 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:



$$I_t = 102.0564 + 1.72 \times (32.83 - 32.48) + 1.48 \times (31.49 - 31.21) = 103.0728$$

The Total Return Index represents a synthetic, funded exposure to the Components of the Index, that is, the Index tracks what an investor would receive if it purchased or sold the futures contracts underlying 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. The returns of the Total Return Index are thus the same as those of the Excess Return Index, with the addition of a “cash” return that is based on the Treasury Bill Rate. 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 Definitions section above.

For example, in respect of an Index Business Day, if the Treasury Bill Rate for the most recent US Treasury Bill Auction is 0.92%, and the number of calendar days between the Index Business Day and the Index Business Day that immediately precedes it is 3, the Collateral Return is equal to

$$\left[ \frac{1}{1 - \frac{91}{360} \times 0.92\%} \right]^{3/91} - 1 = 0.00768\%$$

---

### SECTION 3: MARKET DISRUPTION EVENTS

---

The Index is ultimately comprised of a set of futures on physical commodities (the *Underlying Contracts*). On any given Index Business Day, disruptions can occur that prevent these Underlying Contracts from being traded. When this happens, it is necessary for the calculations of the 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 futures 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.

On a Holdings Calculation Date, this is generally achieved by delaying any changes to the composition of each Component (or component of a Component) that is directly dependent on the disrupted Underlying Contracts. On any other Index Business Day, given replication of the Index does not require trading of Underlying Contracts on such days, in the event that a price is not available for a particular Underlying Contract, that price will be appropriately substituted by the Index Calculation Agent in order for the calculations in respect of a particular Index Business Day to take place.

With respect to the 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 Calculation Agent:

- (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) any other event, if the Index Sponsor reasonably determines that the event materially interferes with the ability of market participants to hedge the Index; or
- (v) the occurrence of a Market Disruption Event in respect of an Underlying Contract that shares the same Commodity.

The Index Calculation Agent will determine the Index Level under Market Disruption Events in accordance with the following section.

## INDEX CALCULATION UNDER MARKET DISRUPTION EVENTS

---

If, on a Holdings Calculation Date  $R$ , a Market Disruption Event with respect to one or more Underlying Contracts occurs (such day, a “Disrupted Holdings Calculation Date” and each such Contract a “Disrupted 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 Date  $R$  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 sub-paragraphs (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 the set of holdings  $\{H'_{1,R}, \dots, H'_{m,R}\}$  of Underlying Contracts  $\{F_1 \dots F_m\}$  which perfectly describes the returns of the Index in the time period from the immediately preceding Holdings Calculation Date to the Holdings Calculation Date  $R$ .

The Equivalent Target Holdings is a set of target holdings  $\{TH'_{1,t}, \dots, TH'_{m,t}\}$  for the Underlying Contracts, which perfectly describes the returns of the Index on the days following the Disrupted Holdings Calculation Date and until the first subsequent Holdings Calculation Date.

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 Date and until all Market Disruption Events that occurred on the Disrupted Holdings Calculation Date have ceased, the Equivalent Holdings  $\{H'_{1,t}, \dots, H'_{m,t}\}$  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 Date  $R$

$SCH_{j,t}$  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 Date 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 Date, the Index Calculation Agent shall, in good faith, 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 Date shall be the Equivalent Target Holding.
- (vi) On the second consecutive non-disrupted Index Business Day immediately following a Disrupted Holdings Calculation Date, the Index Calculation Agent will resume calculation of the Index in accordance with Section 2 (*Daily Index Calculation*).

Further explanation of Holdings and Equivalent Holdings:

In respect of any given Index Business Day, the Index is represented as a basket of its Components with a Holding in respect of each Component determined on the immediately preceding Holdings Calculation Date according to the Holdings Calculation section above. For the purposes of determination of whether disruption to futures trading affects the Index, however, the Holdings of the Index must instead be expressed in terms of the futures contracts that ultimately underlie the Index. As the Index is a linear basket of its Components, and because the same holds true of all components of those Components, (whether they themselves are futures or indices), it is possible to work through the Holdings of the Index, and, by ultimately breaking down each index to the futures contracts that comprise it, determine a new set of Holdings that, in respect of that Index Business Day, exactly represents the composition of the Index in terms of its Underlying Contracts.

**APPENDIX A: MACQUARIE COMMODITY STRATEGY MQCP620  
EXTENDED ROLL CARRY FRONT EXPOSURE INDEX**

---

## INTRODUCTION

---

This Appendix describes calculation of the Macquarie Commodity Strategy MQCP620 Extended Roll Carry Front Month Exposure Index (the *Index*). The Index was designed to form part of the Macquarie Extended Roll Minimum Drawdown Carry ex Ags, Lv, Brent & PM Index (the *Top Index*), but can be read on a stand-alone basis, without reference to the calculation methodology set out in body of this Index Manual. Accordingly, terms defined in this Appendix bear the meaning for the purpose of this Appendix only.

The Index is designed to track exposure to a basket of eight single commodity indices (the *Components* of the Index). The Components, selected for the purpose of the Top Index (see the Introduction on page 7 of this Index Manual) each track a single “front-month commodity future” commodity future.

“Front-month” commodity futures refer to futures contracts with expirations typically included in broad benchmark commodity indices that track the set of commodity futures closest to expiration. The “front-month” set of contract expirations were then adjusted to address certain risks related to seasonality, such as long and short exposure to futures in a single commodity which have expiries that represent different crop years or different seasons.

## CALCULATION METHODOLOGY

---

The Index calculation methodology is outlined in the Index Calculation section below. To facilitate an understanding of the calculations, the Methodology contains various worked examples which demonstrate the types of calculations needed to calculate the level of the Index on a particular date.

## DEFINITIONS

---

**Components** are the components specified in the table below:

Component
Macquarie Extended Roll Minimum Drawdown Aluminium ER (S)
Macquarie Extended Roll Minimum Drawdown Nickel ER (S)
Macquarie Extended Roll Minimum Drawdown Zinc ER (S)
Macquarie Extended Roll Minimum Drawdown WTI Crude Oil ER (S)
Macquarie Extended Roll Minimum Drawdown Heating Oil ER (S)
Macquarie Extended Roll Minimum Drawdown Natural Gas ER (S)
Macquarie Extended Roll Minimum Drawdown Unleaded Gasoline ER (S)
Macquarie Extended Roll Minimum Drawdown High Grade Copper ER (S)

The total number of Components is denoted by  $n$ .

These Components are calculated in accordance with the Macquarie Single Commodity Indices methodology, the latest version of which can be found in the following website: <http://www.macquarie.com/mgl/com/commodityindexdocumentation>

**Component Level**, in respect of an Index Business Day, is the closing level of each Component as determined by the Index Calculation Agent. 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.

**Equivalent Holdings**, in respect of an Index Business Day, are numbers which, if applied as Holdings to the Underlying Contracts of the Index, would perfectly describe the performance of the Index in respect of that Index Business Day. Equivalent Holdings are determined in order to facilitate calculation of the Index where any Underlying Contract is subject to a Market Disruption Event. The calculation of Equivalent Holdings is set out in Section 3 (*Market Disruption Events*) of the Index Calculation section below.

**Equivalent Target Holdings**, in respect of an Index Business Day, are numbers which, if applied as Holdings to the Underlying Contracts of the Index, would perfectly describe what the performance of the Index would have been if the Holdings of the Index were instead equal to the Target Holdings of the Index. Equivalent Target Holdings are determined in order to facilitate calculation of the Index where any Underlying Contracts is subject to a Market Disruption Event. The calculation of Equivalent Target Holdings is set out in Section 3 (*Market Disruption Events*) of the Index Calculation section below.

**Holding**, in respect of a Component and an Index Business Day, is a number which is determined by the Index Calculation Agent as described in Section 1 (*Holdings Calculation*) of the Index Calculation section below. The Holding in respect of a Component is determined in order to calculate the daily Index Level and represents the proportionate effect on the Index Level of a change in the relevant Component level.

**Holdings Calculation Date** is the Index Business Day on which the Target Holdings are periodically calculated in order to rebalance the Holding of each Component back to the specified Weights. Up to and including 1 December 2018, the Holdings Calculation Date is the last Index Business Day of each calendar month. After 1 December 2018, the Holdings Calculation Date is the 13th Index Business Day of each calendar month.

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

**Index Business Days** are the days in the Index Calendar.

**Index Level** is the Level of the Index that is calculated according to the relevant section of this Methodology

**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 04-Jan-2000.

**Initial Index Level** is 100.

**Index Ticker** means MQCP620E Index (Bloomberg).

**Market Disruption Events** are events which affect the ability of market participants to trade at the published Settlement Price of a futures contract or other security that is necessary for the exact replication of the Index. The details of what constitutes a Market Disruption Event and the ways in which such events affect the calculation of the Index Level are explained in Section 3 (*Market Disruption Events*) of the Index Calculation section below.

**Target Holdings** are a set of multipliers, derived from the Weights, which are utilised to rebalance the Components of the Index on each Holdings Calculation Date. Calculation of Target Holdings is described in Section 1 (*Holdings Calculation*) of the Index Calculation section below.

**Trading Facility** means each regulated futures exchange, facility or platform on or through which the Underlying Contracts of the Index are traded.

**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 such 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 Date, scheduled to be an underlying of the Index.

**Weights** are the weights periodically established by the Weighting Methodology.

**Weighting Methodology:** On each Holdings Calculation Date, the Weights of the MQCP620E Index, which are used to determine the Holdings of the Index in respect of each Holdings Calculation Date, shall be set according to the table below:



<b>Component</b>	<b>Weight</b>
Macquarie Extended Roll Minimum Drawdown Aluminium ER (S)	13.758%
Macquarie Extended Roll Minimum Drawdown Nickel ER (S)	6.749%
Macquarie Extended Roll Minimum Drawdown Zinc ER (S)	7.83%
Macquarie Extended Roll Minimum Drawdown WTI Crude Oil ER (S)	16.182%
Macquarie Extended Roll Minimum Drawdown Heating Oil ER (S)	8.567%
Macquarie Extended Roll Minimum Drawdown Natural Gas ER (S)	19.02%
Macquarie Extended Roll Minimum Drawdown Unleaded Gasoline ER (S)	8.73%
Macquarie Extended Roll Minimum Drawdown High Grade Copper ER (S)	19.164%

---

## INDEX CALCULATION

---

The following sections detail how the Index Calculation Agent will calculate the daily Index Levels of the Index based on inputs set out in the Definitions section.

---

### SECTION 1: HOLDINGS CALCULATION

---

On any Index Business Day,  $t$ , each Component  $i$  has a Holding,  $H_{i,t}$ , associated with it. 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,  $t$ .

On the Holdings Calculation Date of each calendar month, the Holding of each Component  $i$ , is rebalanced according with the Weighting Methodology.

---

#### 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:

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

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

For example if, on the Index Business Day preceding a Holdings Calculation Date,  $R$ , the Index level 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  $100 \times (0.4) / 80 = 0.5$

## 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

---

The Index represents the performance of a synthetic, unfunded exposure to the Components of the Index, that is, the Index tracks what an investor would receive if it purchased or sold the futures contracts underlying the Index, without taking into consideration the cost of investment capital. On each Index Business Day,  $t$ , the Index level,  $I_t$ , is calculated (rounded to seven significant figures) based on the value of the 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 Index Starting Level, which is the value of the Index on the Index Start Date, are specified in the Definitions section.

For example, if the 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:

$$I_t = 102.0564 + 1.72 \times (32.83 - 32.48) + 1.48 \times (31.49 - 31.21) = 103.0728$$

### SECTION 3: MARKET DISRUPTION EVENTS

---

The Index is ultimately comprised of a set of futures on physical commodities (the *Underlying Contracts*). On any given Index Business Day, disruptions can occur that prevent these Underlying Contracts from being traded. When this happens, it is necessary for the calculations of each Index to be adjusted so that they all remain replicable by market participants i.e. adjustments must be made to the Index calculations to ensure that the Index Levels reflect futures 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.

On a Holdings Calculation Date, this is generally achieved by delaying any changes to the composition of each Component that is directly dependent on the disrupted Underlying Contracts. On any other Index Business Day, given replication of the Index does not require trading of Underlying Contracts on such days, in the event that a price is not available for a particular Underlying Contract, that price will be appropriately substituted by the Index Calculation Agent in order for the calculations in respect of a particular Index Business Day to take place.

With respect to the 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 Calculation Agent :

- (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) any other event, if the Index Sponsor reasonably determines that the event materially interferes with the ability of market participants to hedge the Index; or
- (v) the occurrence of a Market Disruption Event in respect of an Underlying Contract that shares the same Commodity.

The Index Calculation Agent will determine the Index Level under Market Disruption Events in accordance with the following section.

## INDEX CALCULATION UNDER MARKET DISRUPTION EVENTS

---

If, on a Holdings Calculation Date  $R$ , a Market Disruption Event with respect to one or more Underlying Contracts occurs (such day, a “Disrupted Holdings Calculation Date” and each such Contract a “Disrupted 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 Date  $R$  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 sub-paragraphs (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 the set of holdings  $\{H'_{1,R}, \dots, H'_{m,R}\}$  of Underlying Contracts  $\{F_1 \dots F_m\}$  which perfectly describes the returns of the Index in the time period from the immediately preceding Holdings Calculation Date to the Holdings Calculation Date  $R$ .

The Equivalent Target Holdings is a set of target holdings  $\{TH'_{1,t}, \dots, TH'_{m,t}\}$  for the Underlying Contracts, which perfectly describes the returns of the Index on the days following the Disrupted Holdings Calculation Date and until the first subsequent Holdings Calculation Date.

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 Date and until all Market Disruption Events that occurred on the Disrupted Holdings Calculation Date have ceased, the Equivalent Holdings  $\{H'_{1,t}, \dots, H'_{m,t}\}$  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 Date  $R$

$SCH_{j,t}$  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 Date, 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 Date, the Index Calculation Agent shall, in good faith, 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 Date shall be the Equivalent Target Holding.
- (vi) On the second consecutive non-disrupted Index Business Day immediately following a Disrupted Holdings Calculation Date, the Index Calculation Agent will resume calculation of the index in accordance with Section 2 (*Daily Index Calculation*).

Further explanation of Holdings and Equivalent Holdings:

In respect of any given Index Business Day, the Index is represented as a basket of its Components with a Holding in respect of each Component determined on the immediately preceding Holdings Calculation Date according to the Holdings Calculation section above. For the purposes of determination of whether disruption to futures trading affects the Index, however, the Holdings of the Index must instead be expressed in terms of the futures contracts that ultimately underlie the Index. As the Index is a linear basket of its Components, and because the same holds true of all components of those Components, (whether they themselves are futures or indices), it is possible to work through the Holdings of the Index, and, by ultimately breaking down each index to the futures contracts that comprise it, determine a new set of Holdings that, in respect of that Index Business Day, exactly represents the composition of the Index in terms of its Underlying Contracts.

**APPENDIX B: MACQUARIE COMMODITY STRATEGY MQCP621  
EXTENDED ROLL CARRY DEFERRED EXPOSURE INDEX**

---

## INTRODUCTION

---

This Appendix describes calculation of the Macquarie Commodity Strategy MQCP621 Extended Roll Carry Deferred Exposure Index (the *Index*). The Index was designed to form part of the Macquarie Extended Roll Minimum Drawdown Carry ex Ags, Lv, Brent & PM Index (the *Top Index*), but can be read on a stand-alone basis, without reference to the calculation methodology set out in body of this Index Manual. Accordingly, terms defined in this Appendix bear the meaning for the purpose of this Appendix only.

The Index is designed to track exposure to a basket of eight single commodity indices (the *Components* of the Index). The Components, selected for the purpose of the Top Index (see the Introduction on page 7 of this Index Manual) each track a single “deferred” commodity future. “Deferred” commodity futures refer to futures contracts with expirations typically included in broad benchmark three-month forward commodity indices. The “deferred” set of contract expirations were then adjusted to address certain risks related to seasonality, such as long and short exposure to futures in a single commodity which have expiries that represent different crop years or different seasons.

## CALCULATION METHODOLOGY

---

The Index calculation methodology is outlined in the Index Calculation section below. To facilitate an understanding of the calculations, the Methodology contains various worked examples which demonstrate the types of calculations needed to calculate the level of the Index on a particular date.



## DEFINITIONS

---

**Components** are the components specified in the table below:

Component
Macquarie Extended Roll Minimum Drawdown Aluminium ER (L)
Macquarie Extended Roll Minimum Drawdown Nickel ER (L)
Macquarie Extended Roll Minimum Drawdown Zinc ER (L)
Macquarie Extended Roll Minimum Drawdown WTI Crude Oil ER (L)
Macquarie Extended Roll Minimum Drawdown Heating Oil ER (L)
Macquarie Extended Roll Minimum Drawdown Natural Gas ER (L)
Macquarie Extended Roll Minimum Drawdown Unleaded Gasoline ER (L)
Macquarie Extended Roll Minimum Drawdown High Grade Copper ER (L)

The total number of Components is denoted by  $n$ .

These Components are calculated in accordance with the Macquarie Single Commodity Indices methodology, the latest version of which can be found in the following website: <http://www.macquarie.com/mgl/com/commodityindexdocumentation>

**Component Level**, in respect of an Index Business Day, is the closing level of each Component as determined by the Index Calculation Agent. 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.

**Equivalent Holdings**, in respect of an Index Business Day, are numbers which, if applied as Holdings to the Underlying Contracts of the Index, would perfectly describe the performance of the Index in respect of that Index Business Day. Equivalent Holdings are determined in order to facilitate calculation of the Index where any Underlying Contract is subject to a Market Disruption Event. The calculation of Equivalent Holdings is set out in Section 3 (*Market Disruption Events*) of the Index Calculation section below.

**Equivalent Target Holdings**, in respect of an Index Business Day, are numbers which, if applied as Holdings to the Underlying Contracts of the Index, would perfectly describe what the performance of the Index would have been if the Holdings of the Index were instead equal to the Target Holdings of the Index. Equivalent Target Holdings are determined in order to facilitate calculation of the Index where any Underlying Contract is subject to a Market Disruption Event. The calculation of Equivalent Target Holdings is set out in Section 3 (*Market Disruption Events*) of the Index Calculation section below.

**Holding**, in respect of a Component and an Index Business Day, is a number which is determined by the Index Calculation Agent as described in Section 1 (*Holdings Calculation*) of the Index Calculation section below. The Holding in respect of a Component is determined in order to calculate the daily Index Level and represents the proportionate effect on the Index Level of a change in the relevant Component level.

**Holdings Calculation Date** is the Index Business Day on which the Target Holdings are periodically calculated in order to rebalance the Holding of each Component back to the specified Weights. Up to and including 1 December 2018, the Holdings Calculation Date is the last Index Business Day of each calendar month. After 1 December 2018, the Holdings Calculation Date is the 13th Index Business Day of each calendar month.

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

**Index Business Days** are the days in the Index Calendar.

**Index Level** is the Level of the Index that is calculated according to the relevant section of this Methodology

**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 04-Jan-2000.

**Initial Index Level** is 100.

**Index Ticker** means MQCP621E Index (Bloomberg).

**Market Disruption Events** are events which affect the ability of market participants to trade at the published Settlement Price of a futures contract or other security that is necessary for the exact replication of the Index. The details of what constitutes a Market Disruption Event and the ways in which such events affect the calculation of the Index Level are explained in Section 3 (*Market Disruption Events*) of the Index Calculation section below.

**Target Holdings** are a set of multipliers, derived from the Weights, which are utilised to rebalance the Components of the Index on each Holdings Calculation Date. Calculation of Target Holdings is described in Section 1 (*Holdings Calculation*) of the Index Calculation section below.

**Trading Facility** means each regulated futures exchange, facility or platform on or through which the Underlying Contracts of the Index are traded.

**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 such 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 Date, scheduled to be an underlying of the Index.

**Weights** are the weights periodically established by the Weighting Methodology.

**Weighting Methodology:** On each Holdings Calculation Date, the Weights of the MQCP621E Index, which are used to determine the Holdings of the Index in respect of each Holdings Calculation Date, shall be set according to the table below:

<b>Component</b>	<b>Weight</b>
Macquarie Extended Roll Minimum Drawdown Aluminium ER (L)	13.758%
Macquarie Extended Roll Minimum Drawdown Nickel ER (L)	6.749%
Macquarie Extended Roll Minimum Drawdown Zinc ER (L)	7.83%
Macquarie Extended Roll Minimum Drawdown WTI Crude Oil ER (L)	16.182%
Macquarie Extended Roll Minimum Drawdown Heating Oil ER (L)	8.567%
Macquarie Extended Roll Minimum Drawdown Natural Gas ER (L)	19.02%
Macquarie Extended Roll Minimum Drawdown Unleaded Gasoline ER (L)	8.73%
Macquarie Extended Roll Minimum Drawdown High Grade Copper ER (L)	19.164%

---

## INDEX CALCULATION

---

The following sections detail how the Index Calculation Agent will calculate the daily Index Levels of the Index based on inputs set out in the Definitions section.

---

### SECTION 1: HOLDINGS CALCULATION

---

On any Index Business Day,  $t$ , each Component  $i$  has a Holding,  $H_{i,t}$ , associated with it. 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,  $t$ .

On the Holdings Calculation Date of each calendar month, the Holding of each Component  $i$ , is rebalanced in accordance with the Weighting Methodology.

---

#### 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:

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

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

For example if, on the Index Business Day preceding a Holdings Calculation Date,  $R$ , the Index level 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  $100 \times (0.4) / 80 = 0.5$

---

#### 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

---

The Index represents the performance of a synthetic, unfunded exposure to the Components of the Index, that is, the Index tracks what an investor would receive if it purchased or sold the futures contracts underlying the Index, without taking into consideration the cost of investment capital. On each Index Business Day,  $t$ , the Index level,  $I_t$ , is calculated (rounded to seven significant figures) based on the value of the 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 Index Starting Level, which is the value of the Index on the Index Start Date, are specified in the Definitions section of this document.

For example, if the 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:

$$I_t = 102.0564 + 1.72 \times (32.83 - 32.48) + 1.48 \times (31.49 - 31.21) = 103.0728$$

## SECTION 3: MARKET DISRUPTION EVENTS

---

The Index is ultimately comprised of a set of futures on physical commodities (the *Underlying Contracts*). On any given Index Business Day, disruptions can occur that prevent these Underlying Contracts from being traded. When this happens, it is necessary for the calculations of each Index to be adjusted so that they all remain replicable by market participants i.e. adjustments are made to the Index calculations to ensure that the Index Levels reflect futures 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.

On a Holdings Calculation Date, this is generally achieved by delaying any changes to the composition of each Component that is directly dependent on the disrupted Underlying Contracts. On any other Index Business Day, given replication of the Index does not require trading of Underlying Contracts on such days, in the event that a price is not available for a particular Underlying Contract, that price will be appropriately substituted by the Index Calculation Agent in order for the calculations in respect of a particular Index Business Day to take place.

With respect to the 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 Calculation Agent:

- (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) any other event, if the Index Sponsor reasonably determines that the event materially interferes with the ability of market participants to hedge the Index; or
- (v) the occurrence of a Market Disruption Event in respect of an Underlying Contract that shares the same Commodity.

The Index Calculation Agent will determine the Index Level under Market Disruption Events in accordance with the following section.

### INDEX CALCULATION UNDER MARKET DISRUPTION EVENTS

---

If, on a Holdings Calculation Date  $R$ , a Market Disruption Event with respect to one or more Underlying Contracts occurs (such day, a “Disrupted Holdings Calculation Date” and each such Contract a “Disrupted 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 Date 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 sub-paragraphs (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 the set of holdings  $\{H'_{1,R}, \dots, H'_{m,R}\}$  of Underlying Contracts  $\{F_1 \dots F_m\}$  of the Index which perfectly describes the returns of the Index in the time period from the immediately preceding Holdings Calculation Date to the Holdings Calculation Date R.

The Equivalent Target Holdings is a set of target holdings  $\{TH'_{1,t}, \dots, TH'_{m,t}\}$  for the Underlying Contracts, which perfectly describes the returns of the Index on the days following the Disrupted Holdings Calculation Date and until the first subsequent Holdings Calculation Date.

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 Date and until all Market Disruption Events that occurred on the Disrupted Holdings Calculation Date have ceased, the Equivalent Holdings  $\{H'_{1,t}, \dots, H'_{m,t}\}$  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 Date 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 Date 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 Date, the Index Calculation Agent shall, in good faith, 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 Date shall be the Equivalent Target Holding.
- (vi) On the second consecutive non-disrupted Index Business Day immediately following a Disrupted Holdings Calculation Date, the Index Calculation Agent will resume calculation of the Index in accordance with Section 2 (*Daily Index Calculation*).

Further explanation of Holdings and Equivalent Holdings:

In respect of any given Index Business Day, the Index is represented as a basket of its Components with a Holding in respect of each Component determined on the immediately preceding Holdings Calculation Date according to the Holdings Calculation section above. For the purposes of determination of whether disruption to futures trading affects the Index, however, the Holdings of the Index must instead be expressed in terms of the futures contracts that ultimately underlie the Index. As the Index is a linear basket of its Components, and because the same holds true of all components of those Components, (whether they themselves are futures or indices), it is possible to work through the Holdings of the Index, and, by ultimately breaking down each index to the futures contracts that comprise it, determine a new set of Holdings that, in respect of that Index Business Day, exactly represents the composition of the Index in terms of its Underlying Contracts.



## CONTACTS

---

For more information on the Macquarie Extended Roll Minimum Drawdown Carry ex Ags, Lv, Brent & PM Index please contact:

Arun Assumall

[Arun.Assumall@macquarie.com](mailto:Arun.Assumall@macquarie.com)

Maia Mathieson

[Maia.Mathieson@macquarie.com](mailto:Maia.Mathieson@macquarie.com)