Macquarie Capped Backwardation Beta Indices

Index Manual March 2017

NOTES AND DISCLAIMERS

BASIS OF PROVISION

This Index Manual sets out the rules for the Macquarie Capped Backwardation Beta Indices (each, an *Index*) and reflects the methodology for determining the composition and calculation of the composition and calculation of each Index (the *Methodology*). The Methodology and each 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, summarize, 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 Levels of an existing 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 an Index in any contract or financial instrument, you should include in such contract or financial instruments robust fallback provisions to deal with cessation or material modification of the Index.

ADDITIONAL INDICES

The Index Sponsor may, at any time, commence calculation and publication of new Indices pursuant to the Methodology. In such circumstances the Index Sponsor will publish a revised version of the Methodology, revised only to augment Appendix A with the new Index Specifications relating to the new Indices.

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

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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 an Index. Any offering or potential transaction that may be related to an 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.

Each Index and any financial instruments based on an 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.

HISTORICAL VALUES OF THE INDICES

Hypothetical back-tested historical values of an 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.

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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 indices 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 Indices, 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 any Index value and do not warrant or guarantee the availability of any 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 an underlying 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 any 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 by the determination that a Market Disruption Event has a Market Disruption Event has occurred by the determination that a Market Disruption Event has a Market Disruptio

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 Indices are based on Contracts, as described in the Methodology. 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 an Index. The Index Sponsor and/or its affiliates may underwrite or issue other securities or financial instruments indexed to an Index, and the Index Sponsor or its affiliates may license an Index for publication or for use by unaffiliated third parties. These activities could present conflicts of interest and could affect the value of an 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.

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INTRODUCTION

Each Index is designed as a commodity index benchmark for long exposure to the commodity markets, tracking a publicly available commodity benchmark index (*Benchmark Index*), for example, the Bloomberg Commodity Index, with the aim of outperforming by overweighting and underweighting the allocation of Commodities relative to the Benchmark Index.

Each Index represents a replicable benchmark 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, each 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 each 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 Commodity will 'roll' from one contracts relating to that commodity (the universe of tradable calendar futures contracts on a commodity, known as the 'futures curve').

The investment strategy of each Index is commonly referred to as "commodity backwardation". Backwardation is the market condition 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 investment strategy for each Index will aim to improve on the performance of the Benchmark Index, subject to a Tracking Error Threshold, by overweighting the most backwardated Commodities and underweighting the least backwardated Commodities. If the shape of the futures curve stays the same, the strategy outperforms the Benchmark Index from the higher roll yields on the overweighted exposure.

Certain commodities are considered to be highly correlated with each other, and therefore are not considered to provide a strong diversification benefit to an Index. Therefore, to ensure each Index is diversified, despite strong backwardation, exposure to similar groups of commodities may be capped. These correlated groups of commodities are defined as "Groups".

GENERAL NOTES ON THE INDICES AND THE METHODOLOGY

The Indices are designed to be replicable and readily accessible to market participants and are calculated daily in an excess 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 an Index on a particular date.

The Indices are calculated and maintained by the Index Calculation Agent and supervised by the Index Sponsor and Oversight Committee, as described below. Once an Index has been created, the Contract that underlies it and the Static Contract Roll Schedule, which determines when the Index rolls from one Contract expiration into another, will be fixed and will not be amended going forward. All

determinations with regard to the Indices are made following the rules set out in this document, without discretion by the Index Sponsor or Index Calculation Agent.

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

DOCUMENT STRUCTURE

This document contains all the information necessary to calculate the Macquarie Capped Backwardation Beta Indices. The Index Specifications serve as inputs to the index calculation section of the document, which describes the process of calculating each excess return and total return index in respect of each Index Business Day. Thus, the index calculation section should be read in conjunction with the appropriate Index Specification for the purposes of replicating a particular Index.

The index methodology, composition and features of a Benchmark Index can be found in the latest handbook or methodology available on the website listed in the relevant Index Specification.

INDEX GOVERNANCE

The Index Sponsor has established an independent oversight committee (the *Oversight Committee*) to review and oversee management of the Index 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 Metals, Mining and Agriculture 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 Index, the intended, expected or known usage of the Index and the materiality of existing or potential conflicts of interest together with overseeing the daily management and operations of the Index.

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 Index and the resolution of any issues which arise in relation to 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 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

Benchmark Index, is as specified in the relevant Index Specification.

Benchmark Multiplier, is the commodity index multiplier for each Benchmark Index as specified in the latest available manual or handbook of the Benchmark Index.

Benchmark Weight, is the weight allocation of each Commodity in the Benchmark Index.

Backwardation, is a futures market when prices of futures contracts closest to expiry (front of the futures curve) are higher than prices of contracts with longer maturity (back of the futures curve).

Commodities, are the underlying commodities of the Benchmark Index, as specified in the relevant Index Specification or as specified in the latest available manual or handbook of the Benchmark Index. Any commodity included (or removed) from the Benchmark Index is automatically included (or removed) from the relevant Index. The total number of commodities is denoted by n.

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

The **Contract Rolling In** of a Commodity on an Index Business Day is the Contract specified in the Static Contract Schedule Table of the Index Specification for the calendar month immediately following — with January following December — the calendar month to which that particular Index Business Day belongs. The Contract Rolling In represents the Contract to which the Index is exposed during and subsequent to the Roll Period in which the Index rolls its exposure from the Contract Rolling Out to the Contract Rolling In.

The **Contract Rolling Out** of a Commodity on an Index Business Day is the Contract specified in the Static Contract Schedule Table of the Index Specification for the calendar month to which that particular Index Business Day belongs. The Contract Rolling Out represents the Contract to which the Index is exposed prior to and during the Roll Period in which the Index rolls its exposure from the Contract Rolling Out to the Contract Rolling In.

Designated Contract Month-Year, is the Month/Year pair used in the name of each contract as established by the relevant Trading Facility and is typically the calendar month/year within which a futures contract can be settled by delivery or the calendar month/year in which the delivery period begins.

Expiration, is the date established by relevant Trading Facility for each Contract and is typically the date on which trading on that particular Contract ceases.

The **First Notice Date**, is established for each Contract by the relevant Trading Facility and is typically the first day on which notices of intent to deliver against futures market positions can be received.

The **Front Month Contract**, on an Index Business Day is the contract closest to Expiration but with First Notice Date succeeding the current Index Business Day for which a Settlement Price can be obtained.

Groups, are Commodities bundled together based on their similarity and are used for weight capping purposes in Section 5.4 (*Weights Calculation*).

Groups	Commodities

Detroloum	WTI Crude, Brent Crude, Gasoil, Heating Oil,				
Petroleum	RBOB Gasoline				
Wheat	Wheat (Chicago), Wheat (Kansas)				
Soybeans	Soybeans, Soybean Meal				
Cattle	Live Cattle, Feeder Cattle				
Natural Gas	Natural Gas				
Lean Hogs	Lean Hogs				
Corn	Corn				
Soybean Oil	Soybean Oil				
Aluminum	Aluminum				
High Grade Copper	High Grade Copper				
Zinc	Zinc				
Nickel	Nickel				
Lead	Lead				
Tin	Tin				
Gold	Gold				
Silver	Silver				
Platinum	Platinum				
Sugar	Sugar				
Cotton	Cotton				
Coffee	Coffee				
Сосоа	Сосоа				
Orange Juice	Orange Juice				

Holding, in respect of a Commodity and an Index Business Day, is a number which is determined by the Index Calculation Agent as described in Section 2 (*Holdings Calculation*) of the Index Calculation section below. The Holding in respect of a Commodity is determined in order to calculate the daily Index Level and represents the proportionate effect on the Index Level of a change in the price of the Underlying Contracts referencing that Commodity.

Holdings Calculation Date, is the Index Business Day on which the Target Holdings are periodically calculated in order to rebalance the Holding of each Commodity to the specified Weights, as specified in the relevant Index Specification.

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

Index Calendar, is the set of trading days for the Index and is specified in the relevant Index Specification.

Initial Index Level, is the value of the Index on the Index Start Date and is specified in the relevant Index Specification.

Index Level, is the level of the Index that is calculated according to the relevant section of this Methodology.

Index Start Date, is specified in the relevant Index Specification.

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

Index Ticker, is the name for each Index and is specified in the relevant Index Specification.

The **One-Year Ahead Contract**, on an Index Business Day is the contract with Designated Contract Month-Year exactly one year ahead of the Designated Contract Month-Year of the Front Month Contract. If the Settlement Price of such contract cannot be obtained, the One-Year Ahead Contract on that Index Business Day is the contract closest to Expiration for which a Settlement Price can be obtained provided that its Designated Contract Month-Year exceeds the Designated Contract Month-Year of the Front Month Contract by at least one year. In the event that no such contract exists, the One-Year Ahead Contract will be the contract furthest to Expiration for which a Settlement Price can be obtained.

Roll Start Date is the Index Business Day on which the index exposure periodically starts to move from the Contract Rolling Out into the Contract Rolling In for each Commodity. The Roll Start Date is specified in the relevant Index Specification.

Roll Length is the number of the Index Business Days required to periodically move the exposure from the Contract Rolling Out into the Contract Rolling In for each Commodity. The Roll Length value is specified in the relevant Index Specification.

Roll Period is the set of Index Business Days consisting of the period starting and including Roll Start Date and lasting for the number of Index Business Days established by the Roll Length.

Roll Fraction means the fraction of exposure rolled out of the Contract Rolling Out and into the Contract Rolling In on each Index Business Day of the Roll Period. The Roll Fraction is equal to the inverse of Roll Length.

The **Roll Weights** allocate exposure between the Contract Rolling Out and the Contract Rolling In through a calendar month for each of the Commodities.

Settlement Prices, are the prices, expressed in US dollars, published by the relevant exchange or trading facility and referred by them as the settlement price for that particular contract. If any Index Business Day is not a business day of the relevant exchange or trading facility, then the Settlement Price of that particular contract will be the most recent available price on the most recent business day of the relevant exchange or trading facility.

Signal, is a numeric value assigned to each Commodity which is directly proportional to the level of Backwardation for that Commodity and is described in the Weighting Methodology.

Target Holdings, are a set of multipliers, derived from the Weights, which are utilized to rebalance the allocation of Commodities of the Index throughout the Roll Period. The calculation of Target Holdings is described in Section 2 (*Holdings Calculation*) of the Index Calculation section below.

Top, means the number of Commodities selected for an Index with the highest Signal values, as specified in the relevant Index Specification.

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

Treasury Bill Rate, is the 91-day discount rate for U.S. Treasury Bills, as reported by the U.S.DepartmentoftheTreasury'sTreasuryDirectservice(https://treasurydirect.gov/TA_WS/securities/auctioned).

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 according to the methodology of that Index.

Weights, are the weights periodically established by the Weighting Methodology for each Commodity.

Weighting Methodology, is the weight allocation procedure detailed in Section 5 (*Allocation of Weights to Commodities*) of the Index Calculation section.

INDEX CALCULATION

On a daily basis each Index replicates the returns obtained by holding a basket of Contracts, the Holdings of which are determined according to Section 2 (*Holdings Calculation*) of this Index Calculation section. The futures contract(s) associated with each Index will change through time, with futures contracts being added and removed according to a calendar month contract schedule that is part of the set of parameters specified in its Index Specifications (Appendix A), as described in more detail in Section 1 (*Roll Weights Calculation*) below.

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

SECTION 1: ROLL WEIGHTS CALCULATION

Futures contracts have fixed expiry dates, after which trading comes to an end. In order to accurately reflect a financial investment in a physical commodity, futures contracts are removed from the basket which is tracked by the Index prior to their expiry in a process called "rolling" the futures contracts.

Contracts are rolled on the close of each business day and over a series of business days. Rolling entails adjusting the Contracts the Index references to reduce exposure to the Contract which is scheduled to expire and increase exposure to a further dated Contract. Thus, during the roll period the Index will reference more than one Contract, with the proportion of exposure to each Contract changing on the close of each business day. This is achieved by applying a "roll weight" to each Contract which, over the duration of the roll period, will change to reflect the changing composition of Contract associated with each Index. These weights are then used to calculate the Index on the following business day.

The Roll Weights allocate exposure between the Contract Rolling Out and the Contract Rolling In throughout a calendar month. They also facilitate the rebalancing of the Index during the Roll Period and are calculated daily for each Commodity *t* according to the following rule:

- (i) The Roll Weight of Commodity *i* on Index Business Day *t*, *RW_{i,t}*, is equal to one (1) if the Index Business Day, *t*, precedes the Roll Period for the calendar month to which the Index Business Day *t* belongs.
- (ii) The Roll Weight of Commodity *i* on Index Business Day *t*, $RW_{i,t}$, will decrease by the amount defined by the Roll Fraction on each day of the Roll Period. That is, $RW_{i,t} = RW_{i,t-1} - Roll Fraction$ for each Index Business Day *t* belonging to the Roll Period until $RW_{i,t}$ is equal to zero at the end of the Roll Period.
- (iii) The Roll Weight of Commodity *i* on Index Business Day *t*, *RW_{i,t}*, is set equal to zero
 (0) for all Index Business Days succeeding the Roll Period in the calendar month to which the Index Business Day *t* belongs.
- (iv) If a Market Disruption Event occurs, then each Contract will have its roll postponed as described in Section 4 (*Market Disruption Events and Material Changes to the Futures Underlying an Index*).

For example, the Macquarie Capped Backwardation F3 5% Index has a Roll Period that starts on the fifth (5th) Index Business Day of each month and has a Roll Length of five (5) Index Business Days.

The Roll Weights calculations for January 2014 are then calculated as follows:

• In respect of January 2 to January 7 (inclusive), i.e. from the first (1st) to the fourth (4th) Index Business Day in January, the Roll Weight is equal to one.

- In respect of January 8, which is the first (1st) Index Business Day in the January Roll Period, the Roll Weight is equal to 0.8
- In respect of January 9, which is the second (2nd) Index Business Day in the January Roll Period, the roll weight is equal to 0.6
- In respect of January 10, which is the third (3rd) Index Business Day in the January Roll Period, the Roll Weight is equal to 0.4
- In respect of January 13, which is the fourth (4th) Index Business Day in the January Roll Period, the Roll Weight is equal to 0.2
- In respect of January 14, which is the fifth (5th) Index Business Day in the Roll Period, the Roll Weight is equal to 0
- In respect of all other Index Business Days in January, the roll weight is equal to 0

Established market practice is that indices based on futures contracts are rolled over multiple days, generally starting on the fifth (5th) Index Business Day of each month and continuing over five (5) days. This convention may be changed in order to obtain exposure to specific market mechanics, for example rolling over more than five days in order to further lessen the exposure of the roll to market movements in any one particular day.

SECTION 2: HOLDINGS CALCULATION

On any Index Business Day, t, each Commodity 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 the Underlying Contracts referencing that Commodity changes. In this section, we outline the Holdings, $\{H_{1,t}, ..., H_{n,t}\}$, calculations on any Index Business Day, t.

During the Roll Period, the Holding of each Commodity *i*, is rebalanced to the set of Target Holdings calculated on the most recent Holdings Calculation Date. Throughout the Roll Period, the Roll Weight is used to split the proportion of the change in Index Level associated to the Holding and the proportion of the Index Level associated to the Target Holding, as described in Section 3 (*Daily Index Calcuation*). The Target Holdings are calculated in accordance with the Weighting Methodology set out in Section 5 (*Allocation of Weights to Commodities*) of this Index Calculation section.

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 obtained on that Holdings Calculation Date, *and* the set of Settlement Prices of the Contract Rolling Out on the same date.

On any Holdings Calculation Date, *R*, let the Weight of each Commodity *i* be denoted by $W_{i,R}$ so that $\{W_{1,R}, ..., W_{n,R}\}$ are the Weights of the *n* Commodities in the Index as determined by the Weighting Methodology of the Index in respect of that Holding Calculations Date, *R*. Analogously, let $\{CRO_{1,R}, ..., CRO_{n,R}\}$ be the set of Settlement Prices of the Contract Rolling Out on that Holdings Calculation Date, *R*. The index Target Holdings, $\{TH_{1,R}, ..., TH_{n,R}\}$, for each of the *n* Commodities in the Index are calculated (rounded to eight decimal points) according to the formula below:

$$TH_{i,R} = \left(\sum_{j=1}^{n} H_{j,R} \times CRO_{j,R}\right) \times \frac{W_{i,R}}{CRO_{i,R}} \text{ for every Commodity } i = 1, \dots, n$$

where $\{H_{1,R}, ..., H_{n,R}\}$ is the set of Holdings prevalent on that Holdings Calculation Date, R.

On the first Holdings Calculation Date, *R*, set of Target Holdings is calculated (rounded to eight decimal points) according to the formula below:

$$TH_{i,R} = I_0 \times \frac{W_{i,R}}{CRO_{i,R}} \text{ for every Commodity } i = 1, \dots, n$$

where I_0 is the Initial Index Level.

For example, for the Macquarie Capped Backwardation F3 5% Index (MQCP024E), we calculate the following Target Holdings on the 6 of December 2016 (December's Holdings Calculation Date):

Commodity	$CRO_{i,R}$	$H_{j,R}$	$W_{i,R}$	$TH_{i,R}$
Soybean Oil	38.2	0	0.0852194	4.970961151
Corn	367.25	0	0	0
WTI Crude	54.14	1.30415386	0.1334175	5.49110574
Cotton	71.76	1.266258275	0.0404634	1.256449975
Gold	1172.9	0.32247495	0	0
High Grade Copper	268.65	0.767509276	0.1253177	1.039419429
Heating Oil	167.51	0	0	0
Coffee	144.3	0	0	0
Wheat (Kansas)	416.75	0	0	0
Live Cattle	111.025	0.573862136	0.0210014	0.421495289
Brent Crude	55.64	0	0.0222664	0.891719256
Lean Hogs	63.625	0	0	0
Aluminum	1711.5	0	0.1250178	0.162764695
Nickel	11644	0.01433592	0	0
Zinc	2805.75	0.08550905	0.0519941	0.041292422
Natural Gas	3.36	0	0.159801	105.9755002
RBOB Gasoline	178.31	1.873873913	0	0
Soybean	1064.75	0.238244231	0.0714086	0.149440437
Sugar	18.98	12.78944144	0.0831144	9.757652012
Silver	16.869	0	0	0
Soybean Meal	326.7	0.55481777	0.0809783	0.552312383
Wheat (Chicago)	419.25	0	0	0

DAILY HOLDINGS CALCULATION

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

- (i) If t is the Index Business Day immediately following the last Index Business Day of the Roll Period (including the potential extension imposed by Market Disruption Events as outlined in Section 4 (*Market Disruption Events and Material Changes to the Futures Underlying an Index*)), the Holdings $\{H_{1,t}, ..., H_{n,t}\}$ are set equal to the Target Holdings $\{TH_{1,R}, ..., TH_{n,R}\}$ calculated on the most recent Holdings Calculation Date, R, preceding the Index Business Day t.
- (ii) On any other Index Business Day, t, the Holding of each Commodity i on that day, $H_{i,t}$, is set to be equal to the Holding of that particular Commodity on the previous Index Business Day, $H_{i,t-1}$.

SECTION 3: DAILY INDEX CALCULATION

The 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 ultimately underlying the Index without taking into consideration the cost of investment capital. On an Index Business Day, t, the Index Level, I_t , is calculated (rounded to eight decimal places) based on the value of the Index on the preceding Index Business Day, I_{t-1} , and the **Index Daily Return**, IDR_t , according to the formula:

$$I_t = I_{t-1} \times (1 + IDR_t).$$

The Index Daily Return, *IDR*_t, is determined according to the formula below:

$$IDR_{t} = \frac{\sum_{i=1}^{n} RW_{i,t-1} \times H_{i,t-1} \times CRO_{i,t} + (1 - RW_{i,t-1}) \times TH_{i,t-1} \times CRI_{i,t}}{\sum_{i=1}^{n} RW_{i,t-1} \times H_{i,t-1} \times CRO_{i,t-1} + (1 - RW_{i,t-1}) \times TH_{i,t-1} \times CRI_{i,t-1}} - 1$$

where:

 $RW_{i,t-1}$ is the Roll Weight of Commodity *i* on the Index Business Day *t-1* immediately preceding the Index Business Day *t*;

 $H_{i,t-1}$ is the Holding of Commodity *i* on the Index Business Day *t*-1 immediately preceding the Index Business Day *t*;

 $TH_{i,t-1}$ is the Target Holding of Commodity *I* on the index Business Day t-1 immediately preceding the Index Business Day t;

 $CRO_{i,t}$ and $CRI_{i,t}$ are the Settlement Prices of the the Contract Rolling Out and the Contract Rolling In of Commodity *i* on the Index Business Day *t*, respectively; and

 $CRO_{i,t-1}$ and $CRI_{i,t-1}$ are the Settlement Prices of the the Contract Rolling Out and the Contract Rolling In of Commodity *i* on the Index Business Day *t-1* immediately preceding the Index Business Day *t*, respectively.

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

For example, on 8 December 2016, the Index Level for the Macquarie Capped Backwardation F3 5% Index (MQCP024E) has an Index Daily Return of $IDR_t = -0.8181136239\%$:

Commodity	$RW_{i,t-1}$	$H_{i,t-1}$	$CRO_{i,t-1}$	$CRI_{i,t-1}$	CRO _{i,t}	CRI _{i,t}	$TH_{i,t-1}$
Soybean Oil	0.8	0	38.33	38.33	37.69	37.69	4.970961151
Corn	0.8	0	364.75	364.75	360.25	360.25	0
WTI Crude	0.8	1.3041539	53.25	53.25	53.96	53.96	5.49110574
Cotton	0.8	1.2662583	71.42	71.42	71.69	71.69	1.256449975
Gold	0.8	0.322475	1180.4	1183.2	1175.4	1178.3	0
High Grade Copper	0.8	0.7675093	265.15	265.15	263.3	263.3	1.039419429
Heating Oil	0.8	0	165.34	165.34	165.57	165.57	0
Coffee	0.8	0	144.05	144.05	143.75	143.75	0
Wheat (Kansas)	0.8	0	411.75	411.75	416.25	416.25	0
Live Cattle	0.8	0.5738621	110.8	102.15	110.425	101.5	0.421495289
Brent Crude	0.8	0	54.83	55.43	55.55	56.07	0.891719256
Lean Hogs	0.8	0	65.775	76.2	66.35	76.4	0
Alumnium	0.8	0	1708.75	1708.75	1725.25	1725.25	0.162764695
Nickel	0.8	0.0143359	11443.5	11443.5	11138	11138	0
Zinc	0.8	0.0855091	2746.5	2746.5	2694.5	2694.5	0.041292422
Natural Gas	0.8	0	3.339	3.339	3.39	3.39	105.9755002
RBOB Gasoline	0.8	1.8738739	175.75	175.75	175.54	175.54	0
Soybean	0.8	0.2382442	1066.75	1066.75	1045.25	1045.25	0.149440437
Sugar	0.8	12.789441	19.12	19.12	18.96	18.96	9.757652012
Silver	0.8	0	17.335	17.335	17.155	17.155	0
Soybean Meal	0.8	0.5548178	326.6	326.6	320.2	320.2	0.552312383
Wheat (Chicago)	0.8	0	412.5	412.5	418.75	418.75	0

and an Index Level of $I_t = 410.89967629 * (1 - 0.008181136239) = 407.53805005.$

SECTION 4: MARKET DISRUPTION EVENTS AND MATERIAL CHANGES TO THE FUTURES UNDERLYING AN INDEX

Each Index is ultimately comprised of a set of futures on physical commodities. 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.

During a Roll Period, this is generally achieved by delaying any changes to the composition of each affected Index. On any other Index Business Day, given that the replication of an Index does not require trading of Contracts on such days, in the event that a price is not available for a Contract, a price will be appropriately substituted in order for the calculations in respect of a particular Index Business Day to take place.

With respect to the daily calculation of an Index, a "Market Disruption Event" means the occurrence of one or more of the following events, as determined by the Index Calculation Agent:

- a material limitation, suspension, or disruption of trading in one (or more) of the Contracts underlying the Index which results in a failure by the relevant Trading Facility to report or announce a settlement price for such Contract on the day on which such event occurs or any succeeding day on which it continues to occur;
- (ii) the settlement price published by the relevant Trading Facility for one (or more) Contract underlying the Index 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;
- (iii) any other event, if the Index Calculation Agent reasonably determines that the event materially interferes with the ability of market participants to hedge the Index.

ROLL WEIGHT CALCULATION UNDER MARKET DISRUPTION EVENTS

When a Market Disruption Event occurs during a Roll Period, the approach taken by the Index Calculation Agent is to delay changes to the Index composition until the Market Disruption Event affecting the Index has concluded, provided that in the event that a Market Disruption Event continues for multiple days, the Index Calculation Agent will make a good faith determination in respect of the market price to be attributed to the affected Contracts.

If, on an Index Business Day during the Roll Period, *t*, a Market Disruption Event occurs, then the Commodity with an underlying Contract affected by the Market Disruption Event will have its roll postponed according to the following methodology:

(i) For each Commodity *i* not affected by the Market Disruption Event, the Roll Weight, *RW*_{*i*,*t*} is defined in the usual course, as in Section 1 (*Roll Weights Calculation*).

- (ii) For each Commodity *i* affected by the Market Disruption Event, the Roll Weight, $RW_{i,t}$, will be set equal its previous value, i.e., $RW_{i,t} = RW_{i,t-1}$.
- (iii) If the Roll Period falls in January, the Roll Weight on subsequent Index Business Days not affected by a Market Disruption Event will be determined without taking into account the Index Business Days on which a Market Disruption Event occurred or was continuing.
- (iv) If the Roll Period does not fall in January, the postponed portion of the roll in (ii) above will roll on the first Index Business Day not affected by Market Disruption Events.

In the event that the Roll Period ends without the Roll Weight being fully redistributed into the Contract Rolling In, then the Roll Period is extended until there is no Market Disruption Event. If the Roll Period is extended five (5) days, then the Index Calculation Agent will determine the Settlement Price in order to effect that portion of the roll. It is anticipated, however, that the Index Calculation Agent will only need to make such determination under extraordinary circumstances.

For example, on 10 March 2014, the price for the Lean Hogs April 2014 contract was a limit price, triggering a disruption under limb (i) of Section 4 (*Market Disruption Events and Material Changes to the Futures Underlying an Index*). This disruption ceased to exist on March 11, 2014. Therefore, the calculation of roll weights was modified as follows:

- The Roll Weight of Lean Hogs in the Macquarie Capped Backwardation F0 5% Index (MQCP028E) in respect of March 10, 2014 was equal to 0.2 instead of 0.4
- Since there was no Market Disruption in respect of March 11, 2014, the Roll Weight in respect of this date was equal to 0.6
- The Roll Weights in respect of following Index Business Days were calculated according to Section 1 (*Roll Weights Calculation*) above

MATERIAL CHANGES TO THE FUTURES UNDERLYING AN INDEX

If, in respect of an Index:

- (i) The specifications of a Contract are altered by the relevant Trading Facility in such a way as to materially affect the ability of the Index to represent a financial investment in the underlying commodity of those futures; or
- (ii) Contracts with the appropriate underlying commodity are no longer traded in the Trading Facility corresponding to an Index,

then the Index Sponsor may, with the approval of the Oversight Committee:

- (i) Alter the specification of the Index in such a way as to ensure that the Index accurately represents a financial investment in the appropriate commodity; or
- (ii) Discontinue the Index.

SECTION 5: ALLOCATION OF WEIGHTS TO COMMODITIES

In accordance with the investment strategy of the Indices, the principle behind the weight allocation procedure (*Weighting Methodology*) is to overweight the Commodities with the most Backwardation

and underweight the Commodities with the least Backwardation relative to the Benchmark Index. The aim is to outperform the Benchmark Index, subject to a Tracking Error Threshold. Therefore, the weights will be constrained to target an overall volatility of the performance difference between the Index and the Benchmark Index below the Tracking Error Threshold. (The Tracking Error Threshold confines the difference between the performance of the Index and the performance of the Benchmark Index.) Lastly, to ensure the Index is diversified, the exposure to Commodities in the same Group will be capped – the Petroleum Group (the largest Group) will be allowed to be as high as 35%, whilst all other Groups will be below or equal to 20%.

The Weighting Methodology will first calculate a Signal for each Commodity. The Signal is a measure of the degree of Backwardation observed for each Commodity. Each Commodity is assigned a projected return based on these Signals: the Signals are ranked and the Top Commodities with the strongest degree of Backwardation (highest Signals) are assigned a projected return of plus one standard deviation, while the remaining Commodities are assigned a projected return of minus one standard deviation.

The weighting allocation of each Commodity in an Index is selected to not exceed by more than three times the weighting allocation of the same Commodity in the Benchmark Index. The Weighting Methodology will therefore need to calculate the Benchmark Weight allocation for each Commodity (described in Section 5.4 (*Weights Calculation*)) subject to this constraint.

An optimization function based on the projected returns is then maximized to find the optimal set of weights. This optimization is subject to four constraints:

- 1. **100% allocation**. The Weights should add up to one i.e. the Index is fully invested (no underleverage/leverage)
- 2. **Benchmark Index Tracking Error**. The Index imposes a volatility upper bound to the performance difference between the Benchmark Index and the Index.
- 3. Weight divergence bounds. The allocation to each Commodity needs to be positive (long exposure only) and within three times the allocation given to it in the Benchmark Index.
- 4. Weight diversification bounds. The exposure to Commodities in the same Group will be capped the Petroleum Group (the largest Group) will be allowed to be as high as 35%, while all other Groups will be below or equal to 20%.

The Weighting Methodology is outlined in detail in the next sections as follows:

Section 5.1 describes how the set of Signals are calculated; Section 5.2 describes how the set of Expected Returns and Covariances are calculated; Section 5.3 describes how the set of Benchmark Weights are calculated; Section 5.4 describes the calculation of the Weights using inputs from Section 5.2 and 5.3; and Section 5.5 provides a worked out example.

SECTION 5.1: SIGNALS CALCULATION

For each Commodity, on a Holdings Calculation Date, R, the Signal $S_{i,R}$ corresponding to Commodity i is calculated according to the formula below:

$$S_{i,R} = \left(\frac{P_{i,R}^0}{P_{i,R}^{1Y}} - 1\right)$$

where $P_{i,R}^0$ is the Settlement Price for the Front Month Contract and $P_{i,R}^{1Y}$ is the Settlement Price of the One-Year Ahead Contract on Holdings Calculation Date *R*.

To calculate the set of Expected Returns, we first define the set of Three Month Covariances for the underlying Commodities as:

$$\sigma_{i,j,R} = \left(\frac{252}{63}\right) \times$$

$$\sum_{p=0}^{62} \left(\frac{BUC_{i,R-p}}{BUC_{i,R-p-1}} - \frac{\sum_{q=0}^{62} \frac{BUC_{i,R-q}}{BUC_{i,R-q-1}}}{63} \right) \times \left(\frac{BUC_{j,R-p}}{BUC_{j,R-p-1}} - \frac{\sum_{q=0}^{62} \frac{BUC_{j,R-q}}{BUC_{j,R-q-1}}}{63} \right)$$
for all i = 1, ..., n and j = 1, ..., n.

where the time series of prices $\{BUC_{i,R-p} | p = 0, ..., 62\}$ refers to the Settlement Prices of the Benchmark Index's Underlying Contract of Commodity *i* on each of the last 63 Index Business Days ending on the Holdings Calculation Date, *R*. If any Index Business Day is not a trading day for the relevant Trading Facility, then the Settlement Price of that particular Benchmark Index's Underlying Contract will be the Settlement Price of the most recent trading day for the relevant Trading Facility immediately preceding the Index Business Day *R*.

The set of Signals $\{S_{1,R}, ..., S_{n,R}\}$ is used to define the set of Expected Returns as

$$r_{i,R} = +\sqrt{\sigma_{i,i,R}}$$

for the Commodity i with the Top largest $S_{i,R}$ within the set of signals { $S_{1,R}$, ..., $S_{n,R}$ } and

$$r_{i,R} = -\sqrt{\sigma_{i,i,R}}$$

for all other Commodities.

The set of Expected Returns are inputs to the calculation of the set of weights, $\{W_{1,R}, ..., W_{n,R}\}$ outlined in the next section.

SECTION 5.3: BENCHMARK WEIGHTS CALCULATION

On a Holdings Calculation Date, R, each Commodity i has associated with it a corresponding Benchmark Weight, $BW_{i,R}$, given by the formula below:

$$BW_{i,R} = \frac{M_{i,R} \times BUC_{i,R}}{\sum_{j=1}^{n} M_{j,R} \times BUC_{j,R}}$$

where $M_{i,R}$ stands for the Benchmark Multipliers corresponding to Commodity *i* as specified in the Index Specification and $BUC_{i,R}$ stands for the Settlement Price of the Benchmark Index's Underlying Contract of Commodity *i* on the Holdings Calculation Date *R*.

SECTION 5.4: WEIGHTS CALCULATIONS

The set of weights, $\{W_{1,R}, ..., W_{n,R}\}$ is the solution to the following maximization problem:

$$\max_{\{x_1,\ldots,x_n\}} \sum_{i=1}^n r_{i,R} \times x_i - \frac{1}{2} \sum_{i=1}^n \sum_{j=1}^n (x_i - BW_{i,R}) \times \sigma_{i,j,R} \times (x_j - BW_{j,R})$$

which looks to maximize the set of projected returns subject to the four constraints mentioned in the introduction to this section:

$$\sum_{i=1}^{n} x_i = 1 \, (100\% \, allocation)$$

 $\sum_{i=1}^{n} \sum_{j=1}^{n} (x_i - BW_{i,R}) \times \sigma_{i,j,R} \times (x_j - BW_{j,R}) \leq (Tracking \ Error \ Threshold)^2$

(Benchmark Index Tracking Error)

$$3 \times BW_{i,R} \ge x_i \ge 0$$
 for all $i = 1, ..., n$. (Weight divergence bounds) and

 $\sum_{\substack{Commodity_i \in Petroleum \\ \neq Petroleum (Weight diversification bounds)}} x_i \leq 35\% \text{ and } \sum_{\substack{Commodity_i \in Group \\ \notin Commodity_i \in Group \\ \neq Commodity_i \in Group \\ = Commodity_i \in Group \\ =$

and is defined as:

$$W_{i,R} = x_{i,R}$$
 for all $i = 1, ..., n$.

The solution to the maximization problem above may differ slightly depending, among other things, on the linear programming technique used to solve the optimization problem. For transparency, the Index Sponsor of an Index will calculate the weights, $\{W_{1,R}, ..., W_{n,R}\}$ using standard linear programming techniques and will make the set of weights $\{W_{1,R}, ..., W_{n,R}\}$ used for the purpose of the Index calculations on every Holdings Calculation Date available on request, up to seven (7) decimal points.

To illustrate the Weighting Methodology, the following sets out the Weights calculation for the Macquarie Capped Backwardation F3 5% Index (MQCP024E) rebalance in December 2016. The Holdings Calculation Date for the Weights used throughout December 2016 is 7 December 2016 (the 5th Index Business Day of the month).

To calculate the Signals we need to first identify the Front Month and One-Year Ahead Contracts for each Commodity:

TABLE 1: FRONT MONTH/ONE YEAR-AHEAD CONTRACTS

	F	ront Month Con	tract	One-Year Ahead Contract				
Commodity	Contract	Expiry	Settlement	Contract	Expiry	Settlement		
Soybean Oil	BOF17	13/01/2017	37.82	BOF8	12/01/2018	37.38		
Corn	CH17	14/03/2017	360.5	CH8	14/03/2018	397.75		
WTI Crude	CLF17	20/12/2016	50.93	CLF8	19/12/2017	54.93		
Cotton	CTH17	09/03/2017	71.33	CTH8	07/03/2018	69.96		
Gold	GCF17	27/01/2017	1168.8	GCG8	26/02/2018	1186.9		
High Grade Copper	HGF17	27/01/2017	267.45	HGF8	29/01/2018	269.25		
Heating Oil	HOF17	30/12/2016	163.79	HOF8	29/12/2017	174.64		
Coffee	KCH17	21/03/2017	142	KCH8	19/03/2018	154		
Wheat (Kansas)	KWH17	14/03/2017	405	KWH8	14/03/2018	479.25		
Live Cattle	LCG17	28/02/2017	111.05	LCG8	28/02/2018	99.325		
Brent Crude	LCOG17	29/12/2016	53.93	LCOG8	28/12/2017	56.76		
Lean Hogs	LHZ16	14/12/2016	53.375	LHZ7	14/12/2017	59.075		
Aluminum	MALZ16	19/12/2016	1712.5	LAZ17	18/12/2017	1724.75		
Nickel	MNIZ16	19/12/2016	11568	LNZ7	18/12/2017	11735.5		
Zinc	MZNZ16	19/12/2016	2785	LXZ7	18/12/2017	2788.75		
Natural Gas	NGF17	28/12/2016	3.635	NGF8	27/12/2017	3.638		
RBOB Gasoline	RBF17	30/12/2016	153.59	RBF8	29/12/2017	156.17		
Soybean	SF17	13/01/2017	1047.75	SF8	12/01/2018	1027.5		
Sugar	SBH17	28/02/2017	19.51	SBH8	28/02/2018	18.07		
Silver	SIF17	27/01/2017	16.771	SIF8	29/01/2018	17.108		
Soybean Meal	SMF17	13/01/2017	321.9	SMF8	12/01/2018	318.2		
Wheat (Chicago)	WH17	14/03/2017	406.75	WH8	14/03/2018	477.75		

For each Commodity, the Signal is calculated as the ratio of the Front Month Contract Price divided by the One-Year Ahead Contract Price.

The Top Signals (i.e. with respect to the Macquarie Capped Backwardation F3 5% Index (MQCP024E), the top ten Commodities with the most Backwardation) will be assigned a projected return of plus one standard deviation. The remaining twelve Commodities will be assigned a projected return of minus one standard deviation:

TABLE 2: SIGNALS AND PROJECTED RETURNS

Commodity	Signal	Expected Return
Live Cattle	0.1180	16.55%
Sugar	0.0797	23.46%
Soybean	0.0197	15.61%

Cotton	0.0196	18.01%
Soybean Oil	0.0118	24.09%
Soybean Meal	0.0116	19.58%
Natural Gas	-0.0008	24.03%
Zinc	-0.0013	31.03%
High Grade Copper	-0.0067	20.11%
Aluminum	-0.0071	15.39%
Nickel	-0.0143	-30.71%
Gold	-0.0152	-13.75%
RBOB Gasoline	-0.0165	-28.08%
Silver	-0.0197	-26.22%
Brent Crude	-0.0499	-34.19%
Heating Oil	-0.0621	-32.22%
WTI Crude	-0.0728	-35.83%
Coffee	-0.0779	-26.71%
Corn	-0.0937	-21.24%
Lean Hogs	-0.0965	-22.53%
Wheat (Chicago)	-0.1486	-19.62%
Wheat (Kansas)	-0.1549	-19.08%

For each Commodity, the standard deviation is the square root of the variance of that Commodity which can be found below in Table 3 under the row and column of the same Commodity. For example, the standard deviation of WTI Crude is $\sqrt{0.128402954958819} = 0.358333580562608$, which in Table 2 has a negative sign because WTI Crude is in the bottom twelve Signals.

To calculate the covariance matrix in the below table, we need the time series of the Benchmark Index's Underlying Contract Settlement Prices over the past 64 Index Business Days (7 September 2016 to 6 December 2016). From the Underlying Contracts Settlement Prices we then calculate 63 returns and use these to calculate the covariance matrix using the standard formula outlined in Section 5.3 (*Benchmark Weights Calculation*).

TABLE 3: COVARIANCE MATRIX

	Bean Oil	Corn	WTI	Cotton	Gold	Copper	Heating Oil	Coffee	Kansas Wheat	Live Cattle	Brent	Live Hogs	Alumnium	Nickel	Zinc	Natural Gas	Gasoline	Soybean	Sugar	Silver	Soybean Meal	Wheat
Bean Oil	5.80%	1.05%	1.71%	1.27%	-0.18%	0.64%	1.64%	-0.24%	0.16%	0.03%	1.56%	0.56%	0.38%	2.13%	2.04%	0.33%	1.53%	1.80%	-0.43%	0.89%	-0.51%	-0.02%
Corn	1.05%	4.51%	0.95%	0.86%	0.01%	0.07%	0.88%	0.05%	2.46%	-0.53%	0.96%	1.10%	0.32%	0.56%	1.18%	0.20%	0.96%	2.21%	-0.17%	0.01%	2.61%	2.78%
WTI	1.71%	0.95%	12.84%	0.73%	0.30%	0.63%	11.27%	0.96%	0.52%	-0.33%	12.22%	0.72%	1.61%	3.48%	0.70%	1.75%	9.66%	0.62%	0.32%	1.02%	0.26%	0.44%
Cotton	1.27%	0.86%	0.73%	3.24%	0.39%	-0.07%	0.42%	1.26%	-0.12%	-0.05%	0.64%	0.64%	-0.03%	1.24%	0.65%	-0.26%	0.36%	0.88%	-0.28%	0.87%	0.64%	0.02%
Gold	-0.18%	0.01%	0.30%	0.39%	1.89%	0.21%	0.35%	1.11%	0.46%	-0.49%	0.33%	-0.24%	0.54%	0.55%	0.29%	-0.59%	0.08%	0.02%	-0.57%	2.98%	0.12%	0.43%
Copper	0.64%	0.07%	0.63%	-0.07%	0.21%	4.04%	0.56%	-0.13%	-0.26%	-0.01%	0.53%	0.23%	1.72%	3.01%	3.30%	-0.44%	0.25%	0.35%	-0.43%	1.72%	0.14%	-0.42%
Heating Oil	1.64%	0.88%	11.27%	0.42%	0.35%	0.56%	10.38%	0.41%	0.48%	-0.31%	10.80%	0.56%	1.46%	2.73%	0.75%	1.75%	8.79%	0.72%	0.13%	1.12%	0.43%	0.37%
Coffee	-0.24%	0.05%	0.96%	1.26%	1.11%	-0.13%	0.41%	7.13%	0.78%	-1.14%	0.96%	-0.29%	0.63%	3.15%	1.25%	0.58%	0.14%	0.22%	1.91%	0.83%	0.56%	1.01%
Kansas Wheat	0.16%	2.46%	0.52%	-0.12%	0.46%	-0.26%	0.48%	0.78%	3.64%	-0.45%	0.47%	-0.73%	0.16%	0.18%	-0.29%	-0.13%	0.48%	0.81%	0.14%	0.59%	1.20%	3.51%
Live Cattle	0.03%	-0.53%	-0.33%	-0.05%	-0.49%	-0.01%	-0.31%	-1.14%	-0.45%	2.74%	-0.32%	0.76%	-0.60%	-1.23%	-0.46%	-0.69%	-0.11%	-0.14%	0.64%	-0.60%	-0.18%	-0.71%
Brent	1.56%	0.96%	12.22%	0.64%	0.33%	0.53%	10.80%	0.96%	0.47%	-0.32%	11.69%	0.67%	1.54%	3.23%	0.70%	1.72%	9.26%	0.62%	0.36%	1.00%	0.32%	0.42%
Live Hogs	0.56%	1.10%	0.72%	0.64%	-0.24%	0.23%	0.56%	-0.29%	-0.73%	0.76%	0.67%	5.08%	0.56%	0.61%	0.86%	0.19%	0.53%	1.09%	0.49%	-0.75%	1.23%	-0.46%
Alumnium	0.38%	0.32%	1.61%	-0.03%	0.54%	1.72%	1.46%	0.63%	0.16%	-0.60%	1.54%	0.56%	2.37%	1.91%	1.60%	-0.29%	1.23%	0.23%	-0.34%	1.19%	0.12%	0.18%
Nickel	2.13%	0.56%	3.48%	1.24%	0.55%	3.01%	2.73%	3.15%	0.18%	-1.23%	3.23%	0.61%	1.91%	9.43%	3.74%	0.60%	1.91%	1.23%	0.40%	2.15%	0.77%	0.14%
Zinc	2.04%	1.18%	0.70%	0.65%	0.29%	3.30%	0.75%	1.25%	-0.29%	-0.46%	0.70%	0.86%	1.60%	3.74%	9.63%	1.40%	0.46%	1.75%	-0.15%	0.89%	1.25%	-0.85%
Natural Gas	0.33%	0.20%	1.75%	-0.26%	-0.59%	-0.44%	1.75%	0.58%	-0.13%	-0.69%	1.72%	0.19%	-0.29%	0.60%	1.40%	5.77%	1.33%	0.20%	0.55%	-1.52%	0.09%	-0.21%
Gasoline	1.53%	0.96%	9.66%	0.36%	0.08%	0.25%	8.79%	0.14%	0.48%	-0.11%	9.26%	0.53%	1.23%	1.91%	0.46%	1.33%	7.88%	0.44%	0.13%	0.53%	0.06%	0.46%
Soybean	1.80%	2.21%	0.62%	0.88%	0.02%	0.35%	0.72%	0.22%	0.81%	-0.14%	0.62%	1.09%	0.23%	1.23%	1.75%	0.20%	0.44%	2.44%	0.17%	0.29%	2.46%	0.79%
Sugar	-0.43%	-0.17%	0.32%	-0.28%	-0.57%	-0.43%	0.13%	1.91%	0.14%	0.64%	0.36%	0.49%	-0.34%	0.40%	-0.15%	0.55%	0.13%	0.17%	5.50%	-1.24%	0.60%	0.02%
Silver	0.89%	0.01%	1.02%	0.87%	2.98%	1.72%	1.12%	0.83%	0.59%	-0.60%	1.00%	-0.75%	1.19%	2.15%	0.89%	-1.52%	0.53%	0.29%	-1.24%	6.87%	-0.11%	0.65%
Soybean Meal	-0.51%	2.61%	0.26%	0.64%	0.12%	0.14%	0.43%	0.56%	1.20%	-0.18%	0.32%	1.23%	0.12%	0.77%	1.25%	0.09%	0.06%	2.46%	0.60%	-0.11%	3.83%	1.29%
Wheat	-0.02%	2.78%	0.44%	0.02%	0.43%	-0.42%	0.37%	1.01%	3.51%	-0.71%	0.42%	-0.46%	0.18%	0.14%	-0.85%	-0.21%	0.46%	0.79%	0.02%	0.65%	1.29%	3.85%

Next, the optimization function based on the projected returns using standard linear programming techniques is undertaken to find the solution.

The Weight invested in each Benchmark Index's Underlying Contract is positive and bounded by a multiple (3 times) of the associated Benchmark Weight. The sum of all Weights add up to 100% and the exposure to Commodities in the same Group will be capped – the Petroleum Group (the largest Group) will be allowed to be as high as 35%, while all other Groups will be below or equal to 20%.

For each Commodity, the Benchmark Weight is the product of the Benchmark Multiplier and the Settlement Price of the Benchmark Index's Underlying Contract on the Holdings Calculation Date for that Commodity, divided by the sum of the product of the Benchmark Multiplier and the Benchmark Index's Underlying Contract on the Holdings Calculation Date for all underlying Commodities:

Commodity	Benchmark Multiplier	Benchmark Index's Underlying Contract Settlement Price	Benchmark Weight
Soybean Oil	2.52	38.2	0.0284
Corn	0.55	367.25	0.0597
WTI Crude	5.62	54.14	0.0897
Cotton	0.64	71.76	0.0135
Gold	0.28	1175.7	0.0956
High Grade Copper	0.97	268.65	0.0766
Heating Oil	0.92	167.51	0.0456
Coffee	0.51	144.3	0.0215
Wheat (Kansas)	0.07	416.75	0.0081
Live Cattle	0.69	102	0.0208
Brent Crude	5.76	56.24	0.0954
Lean Hogs	0.90	74.725	0.0198
Aluminum	0.08	1711.5	0.0417
Nickel	0.01	11644	0.0249
Zinc	0.04	2805.75	0.0359
Natural Gas	97.71	3.36	0.0968
RBOB Gasoline	0.83	178.31	0.0437
Soybean	0.17	1064.75	0.0548
Sugar	6.66	18.98	0.0373
Silver	7.98	16.869	0.0397
Soybean Meal	0.28	326.7	0.0270
Wheat (Chicago)	0.19	419.25	0.0235

TABLE 4: COMMODITY MULTIPLIER AND BENCHMARK WEIGHT

Benchmark Weights can then be used to specify the weight bounds in the optimisation to obtain the optimised weights:

TABLE 5: OPTIMIZED WEIGHTS

Commodity	Optimised Weight
Soybean Oil	8.52%
Corn	0.00%
WTI Crude	13.34%
Cotton	4.05%
Gold	0.00%
High Grade Copper	12.53%
Heating Oil	0.00%
Coffee	0.00%
Wheat (Kansas)	0.00%
Live Cattle	2.10%
Brent Crude	2.23%
Lean Hogs	0.00%
Aluminum	12.50%
Nickel	0.00%
Zinc	5.20%
Natural Gas	15.98%
RBOB Gasoline	0.00%
Soybean	7.14%
Sugar	8.31%
Silver	0.00%
Soybean Meal	8.10%
Wheat (Chicago)	0.00%

After the optimization, the resulting Weights constituting the portfolio satisfy the diversification Group capping and maximum permitted weights for each Group:

TABLE 6: OPTIMIZED	WEIGHTS	SATISEY THE	DIVERSIFICATION	CAPS
	WEIGHIS	JANJI IIIL	DIVENSITICATION	CAIJ

Group	Commodity	Weight	Group Max Weight
	WTI Crude	13.34%	
Datroloum	RBOB Gasoline	0.00%	250/
Petroleum	Heating Oil	0.00%	33%
	Brent Crude	2.23%	
Wheat	Wheat (Chicago)	0.00%	20%

	Wheat (Kansas)	0.00%	
Soybean	Soybean	7.14%	200/
Soybean Meal	Soybean Meal	8.10%	20%
Soybean Oil	Soybean Oil	8.52%	20%
Corn	Corn	0.00%	20%
Cotton	Cotton	4.05%	20%
High Grade Copper	High Grade Copper	12.53%	20%
Coffee	Coffee	0.00%	20%
Live Cattle	Live Cattle	2.10%	20%
Lean Hogs	Lean Hogs	0.00%	20%
Aluminum	Aluminum	12.50%	20%
Nickel	Nickel	0.00%	20%
Zinc	Zinc	5.20%	20%
Natural Gas	Natural Gas	15.98%	20%
Sugar	Sugar	8.31%	20%
Gold	Gold	0.00%	20%
Silver	Silver	0.00%	20%

APPENDIX A - INDEX SPECIFICATIONS

Index Name:	The Macquarie Capped Backwardation F0 5% Index													
Benchmark	Bloomberg Commodity Index, available:													
Index:	http://www.bloombergindices.com/bloomberg-commodity-index-family/													
Holdings Calculation Date:	The fourth (4th) Index Business Day of a given calendar month													
Initial Index Level:	100													
Index Calendar:	NYMEX													
Index Start Date:	30	30 December 1999												
Index Ticker:	MQCP028E													
Roll Length:	Five (5) Index Business Days													
Roll Start Date:	Tł	The fifth (5th) Index Business Day of the month												
			1											
			Underlying contract for each month (Contract rolling out during the month)											
	ľ	Commodity	Jan	Feb	Mar	Apr	Mav	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	1	Natural Gas	Н	н	к	к	, N	N	U	U	×	X	F+	F+
	2	WTI Crude	Н	Н	K	К	N	N	U	U	X	X	F+	F+
	3	Brent Crude	Н	К	К	N	Ν	U	U	х	Х	F+	F+	H+
	4	RBOB Gasoline	Н	Н	К	К	Ν	N	U	U	х	х	F+	F+
	5	Heating Oil	Н	Н	К	К	Ν	Ν	U	U	Х	Х	F+	F+
Static	6	Live Cattle	G	J	J	М	М	Q	Q	V	V	Z	Z	G+
Contract	7	Lean Hogs	G	J	J	М	М	Ν	Q	V	V	Ζ	Z	G+
Schedule Table:	8	Wheat (Chicago)	Н	Н	К	К	Ν	Ν	U	U	Ζ	Ζ	Z	H+
	9	Wheat (Kansas)	Н	Н	К	К	Ν	Ν	U	U	Ζ	Ζ	Z	H+
	10	Corn	Н	Н	К	К	Ν	Ν	U	U	Ζ	Ζ	Z	H+
	11	Soybeans	Н	Н	К	К	Ν	Ν	Х	Х	Х	Х	F+	F+
	12	Soybean Oil	Н	Н	К	К	Ν	Ν	Z	Z	Ζ	Z	F+	F+
	13	Soybean Meal	Н	Н	К	К	Ν	Ν	Ζ	Z	Ζ	Z	F+	F+
	14	Aluminum	Н	Н	К	К	Ν	Ν	U	U	Х	Х	F+	F+
	15	High Grade Copper	Н	Н	К	К	Ν	Ν	U	U	Z	Z	Z	H+
	16	Zinc	Н	Н	К	К	Ν	Ν	U	U	х	х	F+	F+
	17	Nickel	Н	Н	К	К	Ν	Ν	U	U	Х	Х	F+	F+

	18	Lead	Н	Н	К	К	Ν	N	U	U	Х	Х	F+	F+
	19	Tin	Н	Н	К	К	N	Ν	U	U	Х	Х	F+	F+
	20	Gold	G	J	J	М	М	Q	Q	Z	Z	Z	Z	G+
	21	Silver	Н	Н	К	К	N	N	U	U	Z	Z	Z	H+
	22	Platinum	J	J	J	N	N	N	V	V	V	F+	F+	F+
	23	Sugar	Н	Н	К	К	N	N	V	V	V	H+	H+	H+
	24	Cotton	Н	Н	К	К	N	N	Z	Z	Z	Z	Z	H+
	25	Coffee	Н	Н	К	К	N	Ν	U	U	Z	Z	Z	H+
	26	Сосоа	Н	Н	К	К	N	Ν	U	U	Z	Z	Z	H+
	27	Gas Oil	Н	Н	К	К	N	Ν	U	U	х	Х	F+	F+
	28	Orange Juice	Н	Н	К	К	N	Ν	U	U	х	Х	F+	F+
	29	Feeder Cattle	Н	Н	К	К	Q	Q	Q	V	V	F+	F+	F+
Тор:	10	1												
Tracking														
Error Threshold:	Fiv	/e percent (5%)												

Index Name:	The Macquarie Capped Backwardation F3 5% Index														
Benchmark	Bloomberg Commodity Index, available:														
Index:	http://www.bloombergindices.com/bloomberg-commodity-index-family/														
Holdings Calculation Date:	The fourth (4th) Index Business Day of a given calendar month														
Initial Index Level:	NYMEX														
Index Calendar:	100														
Index Start Date:	30 December 1999														
Index Ticker:	MQCP024E Index														
Roll Length:	Five (5) Index Business Days														
Roll Start Date:	The fifth (5th) Index Business Day of the month														
	_														
					10	Undei `ontra	riying c ct rollir	ontra	ct for i	each n Ig the	month				
	ľ	Commodity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	1	Natural Gas	К	N	N	U	U	Х	Х	F+	F+	H+	H+	K+	
	2	WTI Crude	К	N	N	U	U	х	Х	F+	F+	H+	H+	K+	
	3	Brent Crude	Ν	N	U	U	Х	Х	F+	F+	H+	H+	K+	K+	
	4	RBOB Gasoline	К	Ν	Ν	U	U	Х	Х	F+	F+	H+	H+	K+	
	5	Heating Oil	К	Ν	Ν	U	U	Х	Х	F+	F+	H+	H+	K+	
Static	6	Live Cattle	М	М	Q	Q	V	V	Z	Z	G+	G+	J+	J+	
Contract	7	Lean Hogs	М	М	Ν	Q	V	V	Z	Z	G+	G+	J+	J+	
Schedule Tablo:	8	Wheat (Chicago)	К	Ν	Ν	U	U	Z	Z	Z	H+	H+	H+	K+	
Table.	9	Wheat (Kansas)	К	Ν	Ν	U	U	Z	Z	Z	H+	H+	H+	K+	
	10	Corn	К	Ν	Ν	U	U	Z	Z	Z	H+	H+	H+	K+	
	11	Soybeans	К	Ν	Ν	Х	Х	Х	Х	F+	F+	H+	H+	K+	
	12	Soybean Oil	К	N	N	Z	Z	Z	Z	F+	F+	H+	H+	K+	
	13	Soybean Meal	К	N	N	Z	Z	Z	Z	F+	F+	H+	H+	K+	
	14	Aluminum	К	Ν	Ν	U	U	Х	Х	F+	F+	H+	H+	K+	
	15	High Grade Copper	К	Ν	N	U	U	Z	Z	Z	H+	H+	H+	K+	
	16	Zinc	К	Ν	N	U	U	Х	Х	F+	F+	H+	H+	K+	
	17	Nickel	К	Ν	Ν	U	U	Х	Х	F+	F+	H+	H+	K+	

	18	Lead	К	Ν	Ν	U	U	Х	Х	F+	F+	H+	H+	K+
	19	Tin	К	N	N	U	U	Х	Х	F+	F+	H+	H+	K+
	20	Gold	М	М	Q	Q	Z	Z	Z	Z	G+	G+	J+	J+
	21	Silver	К	Ν	Ν	U	U	Z	Z	Z	H+	H+	H+	K+
	22	Platinum	Ν	Ν	Ν	V	V	V	F+	F+	F+	J+	J+	J+
	23	Sugar	К	N	N	V	V	V	H+	H+	H+	H+	H+	K+
	24	Cotton	К	Ν	Ν	Z	Z	Z	Z	Z	H+	H+	H+	K+
	25	Coffee	К	N	N	U	U	Z	Z	Z	H+	H+	H+	K+
	26	Сосоа	К	N	N	U	U	Z	Z	Z	H+	H+	H+	K+
	27	Gas Oil	К	Ν	Ν	U	U	Х	Х	F+	F+	H+	H+	K+
	28	Orange Juice	К	N	N	U	U	Х	Х	F+	F+	H+	H+	K+
	29	Feeder Cattle	К	Q	Q	Q	V	V	F+	F+	F+	H+	H+	K+
Top:	10)												
Tracking														
Error	Fi	ve percent (5%)												
Threshold:														

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