MerQube

UBS CMCI Technical Document

Constant Maturity Commodity Index

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www.merqube.com

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1 Executive Summary

The CMCI family is designed to provide diversified exposure across a range of commodities and includes derivative instruments traded in markets in various countries to ensure that it reflects the global commodities market.

The CMCI is designed to provide diversity across commodity maturities. A weighted average amount, calculated through the use of a weight function of relative curve liquidity, is deemed to be invested into each available Standard Constant Maturity ("SCM") and those weightings are maintained by monthly rebalancing. By providing a spectrum of tenors, the CMCI family allows for benchmarking of the commodity markets on various segments of their forward curves

The CMCI is overseen by the Index Administrator, MerQube, Inc. via its internal processes. The Index Administrator controls the creation and operation of the CMCI administrative process, including all stages and processes involved in the production and dissemination of the CMCI. Notwithstanding that the CMCI relies on information from third party sources, the Index Administrator has primary responsibility for all aspects of the Index administration and determination process.

The CMCI is governed by the CMCI Governance Committee, which is comprised of representatives from the Index Administrator and the Index Sponsor. The membership of the CMCI Governance Committee is such that a majority of members are appointed by the Index Administrator, that there be equal membership between the Index Administrator and the Index Sponsor, with a tie-breaking vote held by the Governance Committee chairman, appointed by the Index Administrator.

The CMCI has been established and designed only for the purpose of seeking to achieve the objective stated in this Technical Document. Whilst the CMCI has been designed to operate as a general benchmark for the wider commodities market, the Index Administrator will have certain discretion in choosing commodity future contracts as eligible components from which actual components will be selected on each rebalancing day. The level of the CMCI will be a function of the price, level or value of components comprised in the CMCI. In the absence of a Market Disruption Event Day or a Market Emergency and Force Majeure Event, as defined in 2.3.1.2 and 2.4 the level of the CMCI will be calculated in accordance with the formulae in the Methodology (including in circumstances where the market for a component of the CMCI is illiquid or fragmented).

If the Index Administrator is required or entitled to make a determination in relation to the CMCI pursuant to the Methodology and that determination involves the exercise of discretion with respect to the use of data in determining the level of the CMCI, then the Index Administrator will exercise 'Expert Judgment' as defined in the Discretion and Expert Judgment section of the Methodology Policies document published on the MerQube website.

As further described below, the Index Committee will review the Methodology on an annual basis to evaluate whether the Index Methodology continues to achieve its objectives.

The CMCI Index is a commodity basket, subject to change from time to time, currently composed of 5 commodity groups with 29 components representing 23 commodities (as of 1 August 2018), with exposure diversified between a number of tenors, ranging from 3 Months to 3 Years, subject to liquidity criteria.

The CMCI Index Family is comprised of one composite index (the CMCI), one sub index per commodity group and as many single component indices as there are commodity components.

For each index a Price Index, Excess Return Index (ER) and Total Return Index (TR) are published daily. Index values are published to 3 decimal places.

1.1 TENORS

The CMCI is calculated for specified Standard Constant Maturities (SCM): 3 months (3M), 6 months (6M), 1 year (12M), 2 years (24M) and 3 years (36M) for each Index series; versions of the CMCI are available as a single tenor Index (i.e., CMCI 1 Year, CMCI 3 Months etc.) or as a Benchmark Index, weighted across all available CMCI tenors.

1.2 WEIGHTING METHODOLOGY

The weights of each component are determined based on a blending of Fundamental Weights and Liquidity Weights and are designed to reflect the economic significance and market liquidity for each commodity in the index.

Fundamental Weights are derived from a combination of primary economic indicators such as CPI, PPI, and GDP, as well as commodity-level consumption data,

Liquidity Weights are obtained from a combination of Open Interest and Volume data, as reported on the relevant exchanges,

The Target Weights (TW) of each relevant component in the Index will be subject to weight capping under the 35/20 rules under UCITS IV,

The Tenor Weights of the CMCI Benchmark Index are a function of relative liquidity along the respective forward curves. Weights are updated annually with changes effected during the Annual Maintenance Period at the end of July rebalancing.

The Index Committee reviews the Index at least annually prior to the Index rebalancing. Changes, if any, are affected during the following July Maintenance Periods.

At each month end the index rebalances back to the weights set at the prior Annual Maintenance Period. The Index rebalances monthly over the last three CMCI Business Days of each month and according to the last defined Target and Tenor Weights; and

1.3 EXCEPTIONAL MAINTENANCE EVENTS

In some circumstances, the Index Administrator may declare an event of Force Majeure or an Extraordinary Circumstance and can take any actions that it deems to be necessary or appropriate for the maintenance of the Index and the realization of the objectives of the Index, even if such actions are not specifically provided for under the Index procedure. Any such actions might be taken with immediate effect.

All changes to the Index are proposed by the Index Administrator and material changes are approved by the CMCI Index Committee and may require stakeholder consultation, as further discussed below.

2 Index Terms, FX, Interest Rate, and Business Day Convention

2.1 SUMMARY OF INDEX KEY TERMS

Descriptions in this section are just summaries. For the more in-depth index behavior, refer to the relevant section in the documentation.

2.1.1 Index Calculation Terms

AF	Adjusting Factor, the factor applied to either CTEW or ITW in the procedure leading to the calculation of the new TWAFs
ARR	For any CMCI Business Day, the Available Reference Rate is the rate of interest used to calculate the interest component of the TR Index
ARRA & ARRS	Available Reference Rate Adjustment and Available Reference Rate Scalar, which represent the rate adjustment and the scalar factor, respectively, used in connection with the calculation of the TR Index, when applicable, to reflect any particular funding cost or rate differential applicable and associated with an ICR for an A+/A-1 (S&P) and/or Aa3/P-1 (Moodys) issuer. The ARRA and ARRS can change periodically to reflect market conditions
BV	Basket Value, the sum of Daily Component Values (DCV) of any combination of index components that comprise the CMCI Composite Index or any sub- index
BVF	Basket Value Final
BVI	Basket Value Initial
BVR	Basket Value Ratio, a ratio in use on the day prior to the first maintenance (re- weighting/re-balancing) periods and used in order to maintain continuity of the Index during those transition periods
Caldays	Non CMCI business days between two consecutive Business Days, counted in calendar days. It is used to accrue the TR Index on non CMCI Business Days
CCV	Component Curve Value, for a given component of the CMCI Benchmark Index, the sum for each eligible SCM of, the product of (1) the currency adjusted Daily Constant Maturity Forward Price (XDCMFP) with, (2) the Component Nominal Weight (CNW), with (3) the Tenor Weight Adjusting Factor (TWAF), with (4) the Index composition binary factor (IsIn)
CCYScalar	The adjusting factor used in connection with the foreign currency conversion into U.S. Dollars of non-U.S. Dollar denominated contract
CMB	Constant Maturity Boundary, for each component in the CMCI, the maximum tenor of each SCM. The CMB will be the SCM when the SCM tenor extends out beyond tradable maturity
CMCI Business Day	As per defined in Section 2.3, a day on which the daily minimum CMCI Target Weights (TW) for the composite Index with the shortest available constant maturity components (3M) are greater than or equal to 80%
CMF	Constant Maturity Forwards
CNW	Component Nominal Weights, the nominal weights calculated on the business day preceding the start of the Maintenance Period prior to each Maintenance Period and such that on such day at close of business, the effective weights are equal to Target weights for the following CMCI month

CP	Contract Proportion, used to determine the allocation of the Index between two delivery months of the same contract in order to maintain a constant maturity exposure from the contracts included in the CMCI, and defined on a daily basis in reference to two Middle of Delivery Periods (MDP1 and MDP2) and a Daily Constant Maturity Date (DCMD). The CP represent the weighting scheme (cf. CP1, CP2) for the contracts used to build the Daily Constant Maturity Forward Price (DCMFP)
CTEW	Component Tenor Effective Weights, the effective weighting invested on a given commodity component and eligible Standard Constant Maturity
CY	Carry Yield
CV	Curve Value, the sum of Curve Component Values (CCV) of any combination of index components that comprise the CMCI Benchmark Composite Index or any sub-index
CVF	Curve Value Final, see CV
CVI	Curve Value Initial, see CV
CVR	Curve Value Ratio, a ratio in use on the day prior to the first maintenance (re- weighting/re-balancing) period in order to maintain continuity of the Index during those transition periods
DCNP	Daily Contract Nearby Price, the daily contract reference price used in the calculation of the DCMFP, and defined for each component by the ENC list (cf. DCNP1, DCNP2)
DCV	Daily Component Value, the product, for a given component of the CMCI, of (1) the currency adjusted Daily Constant Maturity Forward Price (DCMFP) with, (2) the Component Nominal Weight (CNW)
DEW	Daily Effective Weight, the ratio of – for each component – (1) the Daily Component Value(DCV) and, (2) the Basket Value(BV)
DITRF	Daily Interest-Rate Total Return Formula (please see Section 3.5.3.1 for details), including Interest Rate Return(IRR) and Index Daily Return(IDR)
DOMW	Daily Open Market Weight, which reflects the weight of a contract in the CMCI on a given day, and is equal to the sum of, (1) Daily Effective Weight (DEW) multiplied by, (2) OPEN, the Open markets binary factors taking the value 1 when the market for the relevant Index component is open for trading, and 0 when it is closed. When all markets are open for trading on a given CMCI Business Day, the DOMW is equal to 100%
DRR	For any CMCI Business Day, the product of (1) the ARRS and (2) the sum of the Available Reference Rate (ARR) and the Available Reference Rate Adjustment (ARRA)
DTOIQ	Daily Total Open Interest Quantity as reported by the exchange facility on which the component is traded and/or to which such component is associated, and measured as the Total number of Open interest on all traded contracts or maturities multiplied by the number of units of such commodity per contract
DTVQ	Daily Total Volume Quantity, which is measured as the number of contracts exchanged between buyers and sellers multiplied by the number of units of commodity per contract
EMEL	Exchange& Market Eligibility List
Eligible Tenor	See SCM

ENC	Eligible Nearby Contracts, the contracts on a particular commodity that are included in the calculation of a DCMFP for a given SCM
ER	Excess Return Index, measures for a given basket composition and Standard Constant Maturity, the uncollateralized returns of the CMCI basket components associated with the designated segment of forward curve
ETW	Equal Tenor Weights, for a given component, the weight obtained from the simple equal weight allocation process
FX	FX is the Foreign Currency Rate used to convert a component value expressed in its original currency to the currency in which the Index is quoted. The expression of FX is given according to market standard and practices and adjusted by the CCY factor defined for each CCY pair. The rates used are WM/Refinitiv 4:00 London Closing Mid Rates.
ICR	Index Currency Reference, the currency in which the Index is quoted: USD, EUR
IDR	Index Daily Return, the daily composite basket return weighted appropriately by Rebalancing Proportions (RP) and CNWs to reflect assets held from one CMCI Business Day to the next
IRR	Interest Rate Return, the return reflecting the fixed income performance of the Index in its designated currency from one CMCI Business Day to the next. The IRR is expressed as a scalar factor and is compounded with the IDR to produce the Daily Index Total Return Factor (DITRF). The mathematical expression of IRR is a function of the rate type which is a function of ICR.
MDP	Middle of Delivery Period, a fixed date associated, for each component, to each Futures/Forward contract allowing the calculation of DCMFP (please see Section 3.4.3 for details, cf MDP1, MDP2)
MF	Maintenance Factor, a scalar factor used to maintain the continuity of the Price Index during Maintenance Periods (re-weighting, rebalancing)
Maintenance Period	Monthly period over the last three CMCI Business Days during which CMCI rebalances or rolls into new Target Weights. Please note that July Maintenance Period refers to last three CMCI Business Days of July.
OPEN	Open markets binary factors taking the value 1 when a market is open, and 0 when it is closed
PI	Price Index, for a given basket composition and Standard Constant Maturity (SCM), the measure of the basket price level associated with the designated segment of the forward curve
PY	Price Yield
RP	Rebalancing Proportions (RP), the factors used in the calculation of the Index with function to weight each day in the Maintenance Period over which the Index goes from Old to New CNWs and MFs (cf RP1, RP2)
RY	Roll Yield
SCM	Standard Constant Maturity, a maturity tenor for which the CMCI is calculated
Tenor	See SCM
TR	Total Return Index measures the collateralized returns of the CMCI basket in each currency. Forward curves are equity like reflecting the sum of Excess Return slopes and Interest rate carry

TY	Total Yield
TW	Target Weights
TWAF	Tenor Weight Adjusting Factor, the factor used in the weighting each pair (Commodity Component, SCM) to their CTTW
VI	Volume Indicator. The Volume Indicator (VI) is obtained by compiling total annual consumption data (in volume/quantity terms) for the most recent calendar year. World consumption data were used in all cases, aside from the agriculture sector, where US consumption data are used.
XDCMFP	A notation for the currency Converted value of the Daily Constant Maturity Forward Price
XY	Convexity yield
LRP	Liquidity Reference Period, is the period of time over which the various metrics are calculated, and is defined as the period of six months preceding the Calculation Reference Date (CRD)
LTW	Liquidity Tenor Weights, for a given component, the weight obtained from the liquidity function defined in Section 3.6.5.2. and reflecting the relative liquidity of eligible CMCI Benchmark Standard Constant Maturities or Tenors along the respective forward curves

2.1.2 Index Weighting Calculation Terms

Allocation Methodology	The method chosen in the weighting process for the purpose of aggregating Open Interest and Market Volume data to designated eligible SCM. The method chosen for this purpose is Linear Allocation
ACMVV	Average Component Market Volume Value is the weighted average of the last four calculated CMLV at the time of calculation (please see Section 3.2.4.2 for further reference)
ACOIV	Average Component Open Interest Value, the weighted average of the last four calculated COIV at the time of calculation (please see Section 3.2.3.3 for further reference)
ATMVV	Average Tenor Market Volume Value, the weighted average of the last four calculated TMVV at the time of calculation (please see Section 3.6.4.2 for further reference)
ATOIV	Average Tenor Open Interest Value, the weighted average of the last four calculated TOIV at the time of calculation (please see Section 3.6.2 for further reference)
CCLV	Combined Component Liquidity Weight
CMVV	Component Market Volume Value, is the U.S. Dollar converted value of the average of the DTVQ over the specified Liquidity Reference Period (LRP) (please see Section 3.2.4.1 for further reference)
COIV	Component Open Interest Value reflects the U.S. Dollar value of the open interest on a given commodity trading instrument or component over the relevant period of time and is defined as the U.S. Dollar value of the average of the daily reference contract open interest value over a specified Liquidity Reference Period (LRP) (please see Section 3.2.3.2 for further reference)
CTMVW	Component Tenor Market Volume Weight, is the weight associated to a component c and given Standard Constant Maturity purely derived from Market Volume data (please see Section 3.6.4.3 for further reference)
CTOIW	Component Tenor Open Interest Weight, is the weight associated to a component c and given Standard Constant Maturity purely derived from Open interest data (please see Section 3.6.3 for further reference)
EW	Economic Weight (please see Section 3.3.2.1 for details)

LME Allocation Methodology	The method chosen in the weighting process for LME data, for the purpose of aggregating Open Interest data to designated prompt dates. The method chosen for this purpose is Simple Allocation (see Section 3.6.4.1 for further reference)
LRP	Liquidity Reference Period, is the period of time over which the various metrics are calculated, and is defined as the period of six months preceding the Calculation Reference Date (CRD)) (please see Section 3.2.3.1 for further reference)
MV	Market Value is obtained by multiplying, (1) the Volume Indicator (VI) for the calculation period of a full year of consumption and/or production for each commodity, by (2) the Price Indicator (PI5) defined for this purpose
MVRP	Market Value Reference Period is the period of time over which Market Value is determined for purposes of the various calculations and is defined as the period of one year preceding the Calculation Reference Date (CRD) (see Section 3.2.2.1 for further reference)
MVW	Market Value Weight (please see Section 3.3.2.4 for details)
PI5	Price Indicator is defined as the average of the prices over the most recent five calendar year periods measured using the first four nearby (resp. maturity pillars) delivery months of each futures strip (resp. the forward curve) during the last three CMCI Business Days of each month during each of the five years in the period, converted by the daily currency exchange rate between the component's currency and the U.S. Dollar (see Section 3.2.2.2 for further reference)
TTW	Temporary Target Weights (see Section 3.3.2.7 for further reference)
SCLW	Sector Component Liquidity Weights (see Section 3.3.2.2 for further reference)
SMVW	Sector Market Volume Weight (please see Section 3.3.2.2 for further reference)
SOIW	Sector Open Interest Weight (please see Section 3.3.2.2 for details)
STW	Sector Target Weight
T1, T2	Time boundaries used for the purpose or allocating Open Interest and Market Volume data to the respective Standard Constant Maturities with aim to measure real liquidity along the various commodity forward curves
TEW	Tradable Economic Weight (see Section 3.3.2.3 for further reference)
TMVV	Tenor Market Volume Value reflects the U.S. Dollar value of the Market Volume on a given commodity trading instrument or component over the relevant period of time and is defined as the U.S. Dollar value of the average of the daily reference contract Market Volume value over a specified Liquidity Reference Period (LRP) and for a specific Standard Constant Maturity (SCM) (see Section 3.6.4.1 for further reference)
TMVW	Tradable Market Value Weight are obtained by combining liquidity, open interest and market value calculations with Market Value Weight calculations by using one third Market Value Weight and two third Combined Component Liquidity Weight (see Section 3.3.2.6 for further reference)
TOIV	Tenor Open Interest Value (TOIV) reflects the U.S. Dollar value of the open interest on a given commodity trading instrument or component over the relevant period of time and is defined as the U.S. Dollar value of the average of the daily reference contract open interest value over a specified Liquidity Reference Period (LRP) and for a specific Standard Constant Maturity (SCM) (see Section 3.6.1 for further reference)
TW	TW Target Weight, the Percentage Index weight fixed for each component represented in the Methodology as determined by the CMCI Weighing engine (see Section 3.3 for further reference)

2.2 FX PRICE/RATE

Table I below features the CMCI FX price/rate sources (please see Appendix A for further details).

Table I. Definition CCY Exchange Rates, CCY Scalars Definitions, and Cross Rates Calculations

CCY	CCY Pair	Quotation	USD: $CCYScalar_{USD,ccy}$	Rate Source
USD			1	
JPY	USD-JPY	JPY per USD	-1	JPY WM Refinitiv 4PM London Closing Mid Price
AUD	AUD-USD	USD per AUD	1	AUD WM Refinitiv 4PM London Closing Mid Price
EUR	EUR-USD	USD per EUR	1	EUR WM Refinitiv 4PM London Closing Mid Price
GBP	GBP-USD	USD per GBP	1	GBP WM Refinitiv 4PM London Closing Mid Price
CAD	USD-CAD	CAD per USD	-1	CAD WM Refinitiv 4PM London Closing Mid Price
CHF	USD-CHF	CHF per USD	-1	CHF WM Refinitiv 4PM London Closing Mid Price

2.3 BUSINESS DAY CONVENTIONS

2.3.1 CMCI Business Day Conventions

2.3.1.1 Daily Minimum Target Weight

A day is deemed an open CMCI Business Day when the daily minimum CMCI Target Weights (TW) for the composite Index with the shortest available constant maturity components (3M) are greater than or equal to 80%. When an Exchange Facility is closed for trading as a result of a normal and foreseeable schedule published by such facility (holidays, and bank holiday), the Target Weights will have 0% weight when calculating the daily minimum CMCI Target weight.

2.3.1.2 Adjustments for Market Disruption Event Day

When an exchange fails to publish a settlement price for components involved in any of the CMCI maintenance procedures (rebalancing or re-weighting), the CMCI Business Day is deemed a market disruption event day.

When an exchange fails to publish a settlement price for components involved in any of the monthly CMCI rebalancing (on the 4th to last business day of the month) the previous business days settlement prices of the individual components will be used to derive the Daily Constant Maturity Forward Price (DCMFP) to calculate the new Component Nominal Weights (CNW's), the Tenor Weight Adjusting Factor (TWAF) and the Maintenance Factors (MF). The previous business day settlement prices of the individual components will also be used to derive the Daily Constant Maturity Forward Price (DCMFP) in the CMCI calculations.

On any CMCI Business Day when an exchange fails to publish a settlement price, the components involved are not rolled. For those contracts or components, the RPs remain identical to the value they had on the CMCI Business Day immediately preceding the market disruption event day in such a way that the maintenance period is extended for as long as no settlement price is made available by the exchange.

The following Table II shows an example of values taken by RP1 and RP2 for a single specific component, for both the PI and the ER Index over the March 2006 maintenance period if 26 February is deemed a market disruption event.

Table II. Rebalancing Period, Calculation of Rebalancing Proportions and Market Disruption Event Days

Theoretical Maintenance Schedule				1st day	2nd day	Last day				
Effective Maintenance Schedule					1st and 2nd day	Last day				
Index	\bday	Feb 22	Feb 23	Feb 24	Feb 27	Feb 28	Mar 01	Mar 02	Mar 03	Mar 06
PI	RP1	1.00	1.00	1.00	0.333	0.00	1.00	1.00	1.00	1.00
	RP2	0.00	0.00	0.00	0.666	1.00	0.00	0.00	0.00	0.00
ER	RP1	1.00	1.00	1.00	1.00	0.333	0.00	1.00	1.00	1.00
	RP2	0.00	0.00	0.00	0.00	0.666	1.00	0.00	0.00	0.00

Source: UBS, MerQube Inc.

If, after a period of five standard business days, no settlement price has been made available by the affected exchange or trading platform, the Index Administrator will determine, in good faith, taking into account the objectives of the Index and the interests of market participants, the one or more exchange settlement or official closing prices necessary for the maintenance of the component and the calculation of the Index.

When a Market Disruption Event Date falls during a non-Maintenance Period, the Index is calculated using the last available trading price available on the exchange, obtained by the Index Administrator from commercially reasonable sources in the market, or determined in good faith by the Index Administrator.

2.3.1.3 Adjustments for FX Market Disruption Event Day

In the event of a reference price source failing to publish a valid fixing rate for a referenced currency exchange rate, the CMCI Business Day is deemed an FX Market Disruption Event Day.

If no fixing price has been made available by the affected price source, the one or more foreign exchange currency rates fixing prices necessary for the calculation of the Index will be obtained by the Index Administrator from commercially reasonable sources in the market, or determined in good faith, bearing in mind both the interests of investors and market participants, and with the aim of maintaining and enhancing the CMCI as a tradable commodity investment benchmark.

A commercially reasonable method would be, for example, the averaging of three foreign exchange broker-dealer quotes at the approximate time when the fixing would have been determined by the price source.

In the event the rate source becomes permanently deficient, the Index Administrator may characterize the event as a Force Majeure Event and decide to replace it by a new source effective immediately thereafter.

2.3.1.4 Interest Rate Disruption Event

In the event of a holiday, a Market Disruption Event day affecting the release of an interest rate reference, or other disruption in treasury auction calendars, the last available rate is used until the next rate becomes available.

In the event of the interest rate source becoming permanently deficient, the Index Administrator may characterize the event as a Force Majeure Event and decide to replace it by a new source effective immediately thereafter.

2.3.2 CM-BCOM Business Day Conventions

A CM-BCOM Business Day shall be deemed to be any day which is a CMCI Business Day (as per Section 2.3.1), provided that the Maintenance Period applicable to the CM-BCOM shall have the meaning given to this term in Section 4.1.2 (Determination of CM-BCOM Target Weights).

2.3.3 CMSP Business Day Conventions

A CMSP Business Day shall be deemed to be any day which is a CMCI Business Day (as per Section 2.3.1), provided that the Maintenance Period applicable to the CMSP shall have the meaning given to this term in Section 5.1.2 (Determination of CMSP Target Weights).

2.4 MARKET EMERGENCY AND FORCE MAJEURE

In some extraordinary circumstances, the Index Administrator may characterize the situation as a Market Emergency and Force Majeure Event, if, in the judgment of the Index Administrator the circumstances are reasonably likely to have a material adverse effect on the tradability of the CMCI or the ability of the Index to serve as a tradable benchmark for the commodities market.

Such circumstances include the following:

- The imposition of a currency control mechanism,
- The adoption or issuance of tax related rules, regulations, orders or other actions,
- an announcement or other public action regarding scientific discoveries or events relating to the commodities markets,
- A governmental, regulatory or other public announcement that is reasonably likely to affect the commodity markets generally,
- Any climate or weather-related emergencies,
- A war,
- A terrorist event,
- Any event other than those specifically identified herein, making the calculation of the CMCI impossible or infeasible either on a technical basis or otherwise, or that makes the CMCI non representative of market prices or undermines the realization of the objectives of the Index,
- Any event creating a situation of unfair advantage or disadvantage for any market participant, group of market participants or the Index Administrator

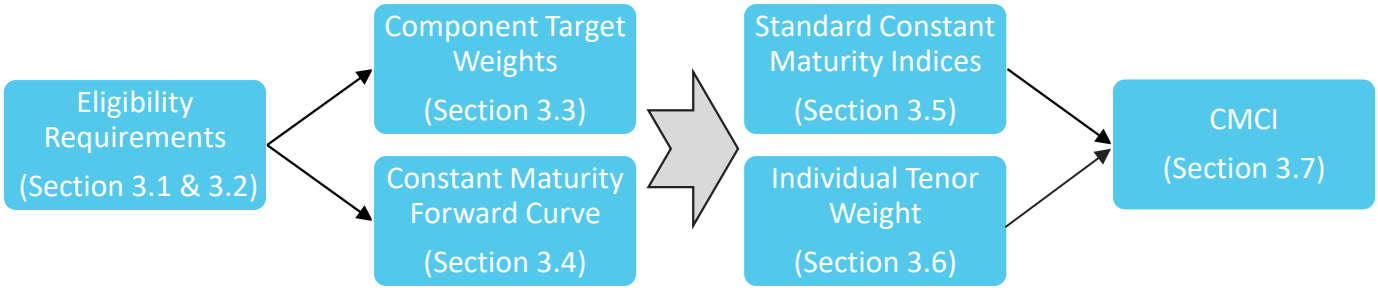
Whenever a Market Emergency and Force Majeure Event has been identified or declared, the Index Administrator can decide to take any appropriate action, including:

- The replacement of a Daily Contract Nearby Price (DCNP) when there is a manifest error in the officially settled price or when a market abuse (please see the U.K. Financial Services Authority, FSA, definitions) is likely to have taken place,
- The temporary or final revoking of the membership of a Component in the Index,
- The immediate change of an Index parameter,
- The suspension of the calculation of the Index, a sub-Index, a Standard Constant Maturity series or a currency series, or,
- In general, any action necessary to preserve the reputation of the CMCI as fair and tradable commodity benchmark

3 The CMCI Index

This session describes the construction of the CMCI Index, as illustrated in the flow chart below.

EXHIBIT 1: COMPLETE OVERVIEW OF THE CMCI Construction Process



3.1 PRIMARY ELIGIBILITY REQUIREMENTS OF CMCI COMPONENT CANDIDATES

The primary requirements for inclusion of a contract in the CMCI are related to the nature of the instrument as well as some technical characteristics including country of origin, trading characteristics, foreign exchange controls, availability and accuracy of contract, price and volume data etc.

3.1.1 COMMODITY INSTRUMENTS

The components must be traded instruments based on single commodities, defined for this purpose as follows:

- A commodity is a raw material that is homogenous in nature,
- It is consumed or used as an input in a production process,
- It is tradable on an exchange.

Weather derivatives or emissions markets are therefore excluded from this definition, as they are not commodities in the strict sense of the term. Freight markets are closely related to commodities markets and participate actively in the formation of prices via various arbitrage processes, but are considered by the Index Committee as markets for transportation and therefore exclude them form the definition above. Electricity markets (i.e. Power) on the other hand, are included in the definition.

Market participants must be able to trade instruments included in the Index at a price set by market forces. The prices of the instruments must be directly derived from the price of the physical commodity underlying those instruments.

3.1.2 PHYSICAL DELIVERY OR SETTLEMENT OF UNDERLYING COMMODITIES

In order to be included in the Index, an instrument must be physically deliverable into a physical commodity or cash settled against a publicly available physical commodity reference price (such as Platts Marketscan, Reuters, etc.). Prices of the derivative instrument must be determined in a competitive market and through a tradable process directly linked to the underlying commodity market.

Financially settled instruments may be eligible for index inclusion if their settlement mechanism references an acceptable physical market reference, or the reference is a price index deemed representative of the underlying market prices.

3.1.3 GEOGRAPHICAL REQUIREMENTS

Instruments included in the Index must be listed or traded on an exchange that is based in a country that is a member

of the Organization for Economic Cooperation and Development (OECD), or that is otherwise included on the country eligibility list maintained by the CMCI Governance Committee for this purpose.

As of July 1st, 2022, the country eligibility list stands as follows:

- United States,
- Canada,
- Australia,
- New Zealand,
- France,
- United Kingdom,
- Germany,
- Italy,
- Spain.
- Switzerland,
- Republic of South Africa,
- China,
- South Korea,
- Singapore,
- Brazil,
- Argentina,
- Japan,
- Any combination or group of countries of the above list.

The country eligibility list may be revised from time to time by the CMCI Governance Committee, in consultation with the CMCI Advisory Committee. A country will be included on the eligibility list, even if it is not an OECD country, if it is considered appropriate for inclusion in light of the purpose and objectives of the Index, and (i) the country has an adequate system of law and regulations; and (ii) trading of the relevant commodity and instruments is conducted in such country in a manner that is consistent with the other requirements for inclusion in the Index. Conversely, countries included on the eligibility list may subsequently be deleted based upon these considerations.

3.1.4 ELIGIBLE EXCHANGES AND MARKET PLATFORMS

Instruments included in the Index must be included on the exchange and market eligibility list maintained by the CMCI Governance Committee for this purpose.

As of July 1, 2022, the exchange and market eligibility list stands as shown in Table III

Table III. Exchange and Market Eligibility List

Country	Exchange Mnemonic	Exchange Description	Traded Products
US	CME*	Chicago Mercantile Exchange	Bio-Energy, Energy, Ags, Precious Metals, Livestock, Fertilisers, Energy, Power, Freight, Emissions
	ICE US	ICE Futures US	Ags, Bio-Energy, Softs
	MGEX	Minneapolis Grain Exchange	Ags
Canada	ICE Canada	ICE Futures Canada	Ags
Australia	SFE	Sydney Futures Exchange	Ags, Power
	ASX	Australia Stock Exchange	Ags, Energy
France	EURONEXT	Euronext	Ags
U.K.	ICE	Intercontinental Exchange	Energy, Power, Emissions
	ECX	European Climate Exchange	Emissions
	LME	London Metal Exchange	Industrial Metals, Basic Materials
Germany	EEX	European Energy Exchange	Power, Emissions
	WTB	Hanover Commodity Exchange	Ags
	EUREX	EUREX	Ags
South Korea	KRX	Korea Exchange	Precious Metals, Livestock
Singapore	SICOM	Singapore Commodity Exchange	Ags, Basic Materials
	SGX	Singapore Exchange	Ags (see JADE)
Japan	TOCOM	Tokyo Commodity Exchange	Precious Metals, Industrial Metals, Energy, Ags
Argentina	MATba	Mercado a Termino Buenos Aires S.A.	Ags
	ROFEX	Mercado a Termino de Rosario	Ags

The exchange and market eligibility list (EMEL) may be revised by the CMCI Governance Committee, in consultation with the CMCI Advisory Committee. An exchange or market will generally be included on the eligibility list, if (i) the exchange has adequate governance and management procedures that can be considered fit and proper according to the U.K.'s Financial Service Authority (FSA) definitions; (ii) trading on such exchange or market has been free of any significant market disruptions involving a major commodity market participant in the past three years; and (iii) trading of the relevant commodity and instruments is conducted in such exchange or market in a manner that is consistent with the other requirements for inclusion in the Index. If an exchange is not part of the country eligibility list and if it is considered appropriate for inclusion in light of the purpose and objectives of the Index, the CMCI Governance Committee may decide to include it within the Index; and conversely, exchanges or platforms included on the exchange and market eligibility list may subsequently be deleted based upon these considerations.

3.1.5 TRADING REQUIREMENTS

To be eligible for inclusion in the CMCI, instruments must be generally available for trading by participants in the relevant market, and daily settlement or closing prices must be made available publicly or made available to the Index Sponsors.

Instrument prices must be determined by market forces and via a competitive process.

Listed instruments must be scheduled to be available for trading for at least two hours a day on each business day and instruments traded over the counter (OTC) must be available for trading, in one form or another, for at least four hours a day on each CMCI Business Day.

Instruments traded in OTC markets are eligible for inclusion in the CMCI, if they satisfy the eligibility criteria and the CMCI Governance Committee, in consultation with the CMCI Advisory Committee, determines that their inclusion is consistent with and will advance the purposes and objectives of the Index. In considering the inclusion of an OTC instrument, the CMCI Governance Committee and the CMCI Advisory Committee will examine a variety of factors, such as the nature of the trading market, the availability and reliability of prices and whether the OTC contracts are cleared. However, the CMCI Governance Committee may consider any factors it deems relevant and is not required to take any particular factors into account.

Instruments traded via auctions may not be included in the CMCI.

3.1.6 ADDITIONAL CHARACTERISTICS

3.1.6.1 HEDGING INSTRUMENTS

In order to be included in the Index, an instrument must be a futures or forward instrument (including swaps) and feature clearly specified expirations and terms.

The instrument must be available for trading in a form acceptable by the CMCI Governance Committee, in consultation with the CMCI Advisory Committee. For an instrument to be eligible for Index membership, its expiries (futures) or maturities (forwards or swaps) must be available for trading for at least six months before their expiration.

3.1.6.2 FOREIGN EXCHANGE CONTROLS

The foreign exchange mechanisms associated with the currency of a component must be free of any temporary or permanent government constraints. An instrument is not eligible for Index membership if a currency board or a foreign exchange control of any form is in place, has been in place at any time during the last seven years, or, in the judgment of the CMCI Governance Committee, is reasonably likely to reappear in the future.

Both spot and forward foreign exchange transactions as well as borrowing and lending transactions must be executable in reasonable size, without delay, without any approval, clearance or quota process entitling them.

Profits (or losses) realized via investment in the underlying instrument must be freely transferable into U.S. Dollar, Euro, Swiss Franc, and Japan Yen, by nationals or non-nationals participants without restrictions (for sake of clarify, foreign nationals are granted access to the exchanges on which such instruments are traded without restrictions).

3.1.6.3 DATA AVAILABILITY AND INTEGRITY

Contract, price and volume data must be available from a reliable source, as determined by the CMCI Governance Committee, and must be consistent and available on a timely basis.

Price and volume data must have been available for at least six months prior to the date on which a trading instrument is considered for inclusion in the CMCI, unless otherwise determined by the CMCI Governance Committee, in consultation with the CMCI Advisory Committee.

3.1.6.4 MINIMUM TENOR, NUMBER OF TRADABLE CONTRACTS/MATURITIES AND REASONABLE DISTRIBUTION OF OPEN INTEREST

To satisfy primary eligibility requirements, a component's forward curve or futures strip minimum tenor (time to maturity) must be at least twelve months from any date on which the CMCI is calculated. For Futures components, a required minimum of four maturities traded per calendar year is imposed. For over the counter (OTC) instruments (i.e. forward and/or swaps), a required minimum of eight standard maturities, per calendar year is imposed with a minimum of four liquid maturities tradable for the first six months, as determined by the CMCI Governance Committee in consultation with, and based on the recommendations of the CMCI Advisory Committee.

For component to be considered for index inclusion, they also have to satisfy the criteria of calculability of the Index for at least the first two Standard Constant Maturity Pillars (the 3M and the 6M). Therefore, as recommended by the CMCI Advisory Committee at the request of the CMCI Governance Committee, the Open interest has to be reasonably distributed along the strip of Eligible Nearby Contracts (ENC) or forward curve, in such a way that the calculation of both the CMCI-3M and 6M indices is made possible.

The components that do not satisfy the criteria of reasonable distribution of open interest are therefore not included in the CMCI.

3.1.6.5 MINI CONTRACTS

A mini contract is similar to an existing instrument on a given exchange or trading platform. The terms of a mini contract must be identical to those of its larger counterpart in all aspect but contract size.

Mini contracts are not eligible for index membership.

3.1.6.6 NEW INSTRUMENTS AND RE-LISTED INSTRUMENTS

For a newly created or a re-listed instrument to be considered eligible for inclusion, it must have been available for trading for at least six months from the date it was made available or re-listed and must satisfy all primary and secondary requirements.

3.2 SECONDARY REQUIREMENTS: MARKET VALUE AND LIQUIDITY

Component candidates satisfying the initial requirement must satisfy a series of pure financial thresholds based on Market Value (defined in 3.2.2) and Liquidity measures, including the measure of Open Interest (defined in 3.2.3) and Volume (defined in Section 3.2.4).

3.2.1 CALCULATION REFERENCE DATE (CRD)

The Calculation Reference Date (CRD) is a date used as a reference point in time for the calculation of all the relevant CMCI metrics defined below. In all the rest of the document, it is always noted d.

The date taken as a reference for all the relevant liquidity and market value calculations is the last CMCI Business Day of the semester (six-month period) preceding a regularly scheduled CMCI Governance Committee meeting[1].

For all fundamental weighting data, the latest full calendar year data available prior to the Calculation Reference Date is used.

3.2.2 MARKET VALUE

The CMCI uses the concept of Market Value (MV) in calculating several of the liquidity requirements for Index eligibility and determining the weights of selected components within each commodity group (after the determination of the sector weights, as discussed below).

3.2.2.1 MARKET VALUE REFERENCE PERIOD (MVRP)

The Market Value Reference Period (MVRP) is the period of time over which Market Value is determined for purposes of the various calculations and is defined as the period of one year preceding the Calculation Reference Date (CRD).

3.2.2.2 DEFINITION OF MARKET VALUE (MV)

Market Value (MV) is obtained by multiplying, (1) the Volume Indicator (VI) for the calculation period of a full year of consumption and/or production for each commodity, by (2) the Price Indicator (PI5) defined for this purpose.

The Volume Indicator (VI) is obtained by compiling total annual consumption data (in volume/quantity terms) for the most recent calendar year. World consumption data are used for all calculations. VI is updated on an annual basis for the purpose of the CMCI Governance Committee meeting scheduled for April.

With respect to each commodity included in the Index, the Index Administrator, in consultation with the CMCI Advisory Committee, will identify the appropriate sources to be used to obtain the necessary fundamental data. In addition, the CMCI Governance Committee, in consultation with the CMCI Advisory Committee, will determine whether it is appropriate to consider world or regional trading volume data in connection with a particular commodity, based on such factors as the use or pricing of the commodity, or its production, consumption or transportation. Similarly, the CMCI Governance Committee, in consultation with the CMCI Advisory Committee, could, under certain circumstances, determine that the weighting of commodities in the Index should be based on regional volume data or that the fundamental figures should be determined based on world or regional production, rather than consumption, data. This may occur, for example, at times of rapid change in consumption patterns or available technology. In such instances, the CMCI Governance Committee will use the appropriate data to derive approximate volume figures.

PI5 is defined as the average of the prices over the most recent five calendar year periods measured using the first four nearby delivery months of each futures strip during the last three CMCI Business Days of each month during each of the five years in the period, converted by the daily currency exchange rate between the component's currency and the U.S. Dollar, as follows:

$$MV_{c,USD,d} = VI_c \times PI5_{c,USD,d} \quad (1)$$

$$PI5_{c,USD,d} = \frac{1}{60}\sum_{m=0}^{59}\left(\frac{1}{3}\sum_{i=1}^{3}\frac{1}{4}\sum_{n=1,4} F_{n,c,CCY,d-m-(i+1)} \times \left(FX_{USD,CCY,d-m-(i+1)}\right)^{CCYScalar_{USD,CCY}}\right) \quad (2)$$

where

VI_c	is the Volume Indicator defined for a commodity component c,
$PI5_{c,USD,d}$	is the Price Indicator in USD defined for a commodity component c, at date d,
$F_{n,c,CCY,d-m-(i+1)}$	is, for a commodity c, the Forward or Futures Price of the nth nearby, taken at date d minus m month and minus (i+1) days. When i equals one, the date is the last CMCI Business Day of the month.
$FX_{USD,CCY,d-m-(i+t)}$	is the Currency exchange rate between the quotation currency of the commodity instrument and the U.S. Dollar (as defined in Section 2.2), When i equals one, the date is the last CMCI Business Day of the month.

,

d	the Calculation Reference Date (CRD),
m	is a counter of months,
i	is a counter of days,
$CCYScalar_{USD,CCY}$	is +1 or –1 (please see Table I in Section 2.2).

3.2.3 LIQUIDITY: OPEN INTEREST CALCULATIONS

3.2.3.1 THE LIQUIDITY REFERENCE PERIOD (LRP)

The Liquidity Reference Period (LRP), which is the period of time over which the various metrics described in this section are calculated, is defined as the period of six months preceding the Calculation Reference Date (CRD).

3.2.3.2 DEFINITION OF COMPONENT OPEN INTEREST VALUE (COIV)

The Component Open Interest Value (COIV) reflects the U.S. Dollar value of the open interest on a given commodity trading instrument or component over the relevant period of time and is defined as the U.S. Dollar value of the average of the daily reference contract open interest value over a specified Liquidity Reference Period (LRP).

$$COIV_{USD,d} = \frac{1}{BD}\sum_{i=0}^{BD-1}\left(DTOIQ_{d-i} \times P_{1,CCY,t-i}\right) \times \left(FX_{USD,CCY,d-i}\right)^{CCYScalar_{USD,CCY}} \tag{3}$$

where:

$DTOIQ_{d-i}$ is, for a Calculation Reference Date d minus i days, the Daily Total Open Interest Quantity as reported by the exchange facility on which the component is traded and/or to which such component is associated, and measured as the Total Open Interest on all traded contracts or maturities multiplied by the number of units of such commodity per contract,

$P_{1,CCY,t-i}$ is the component's first nearby price taken at date d minus i days. When i equals zero, the date is the CRD,

d the Calculation Reference Date (CRD),

BD the number of CMCI Business Days from and including the first day of the LRP, to and including the last day of the LRP (the CRD itself).

3.2.3.3 AVERAGE COMPONENT OPEN INTEREST VALUE (ACOIV)

The Average Component Open Interest Value (ACOIV) is the weighted average of the four most recent calculated COIV at the time of calculation, with the weights assigned to each of the four COIVs, for purposes of averaging, being 35% for the most recent COIV, and 30%, 25% and 10%, respectively, for each of the COIVs calculated for the previous periods, as follows:

$$ACOIV_{c,USD,d} = \frac{\sum_{i=1}^{4} COIV_{c,USD,i} \times w_i}{\sum_{i=1}^{4} 1_{COIV_i<>0} \times w_i} \tag{4}$$

where: $w_i = \{35\%, 30\%, 25\%, 10\%\}$, and $i = 1$ refers to the most recent period in the average.

3.2.3.4 ADMISSION

In order to be admitted in the Index, the Average Component Open Interest Value (ACOIV) must be at least 300 million U.S. Dollars at the time of calculation. Compliance with this requirement is verified prior to each regularly scheduled CMCI Governance Committee meeting.

3.2.3.5 MAINTENANCE

In order to remain in the CMCI subsequent to initial admission, a component's ACOIV must remain at least equal to 250 million U.S. Dollars at the time of calculation as of the Annual Rebalancing Reference Date.

3.2.4 LIQUIDITY: MARKET VOLUME CALCULATIONS

3.2.4.1 DEFINITION OF COMPONENT MARKET VOLUME VALUE (CMVV)

The Component Market Volume Value (CMVV) measures the U.S. Dollar value of the volume of a given commodity trading instrument or component that is traded over the relevant period and is defined as the U.S. Dollar converted value of the average of the total daily component volume over the specified Liquidity Reference Period (LRP).

$$CMVV_{USD,d} = \frac{1}{BD}\sum_{i=0}^{BD-1}\left(DQTV_{d-i} \times P_{1,CCY,t-i}\right) \times \left(FX_{USD,CCY,d-i}\right)^{CCYScalar_{USD,CCY}} \tag{5}$$

where:

$DQTQ$ is, for a Calculation Reference Date d, the Daily Total Volume Quantity measured daily by the Index Sponsors as the number of contracts exchanged between buyers and sellers multiplied by the number of units of commodity per contract,

$P_{1,CCY,t-i}$ is the component's first nearby price taken at date d minus I days. When i equals zero, the date is the CRD,

d the Calculation Reference Date (CRD),

BD the number of CMCI Business Days from and including the first day of the LRP, to and including the last day of the LRP (the CRD itself).

Some markets see most of their transactions effected on an over-the-counter and exchange cleared basis (OTC Exchange Cleared, also known as OTC Cleared). Transactions are executed OTC and reported to the exchange or clearing house for clearing such that no direct bilateral credit risk persists between the original parties after the respective give up is effected. In those markets, the OTC volume is usually a much better indicator of the actual market trading volume, but conventions for measuring such volume can differ drastically across markets.

The CMCI Governance Committee, in consultation with the CMCI Advisory Committee, will use reasonable measures to promote consistency of approach across OTC and Exchange-traded markets.

3.2.4.2 AVERAGE COMPONENT MARKET VOLUME VALUE (ACMVV)

The Average Component Market Volume Value (ACMVV) is the weighted average of the four most recent calculated CMVVs at the time of calculation, with the weights assigned to each of the four CMVVs for purposes of averaging being 35% for the most recent CMVV, and 30%, 25% and 10%, respectively, for each of the CMVVs calculated for the previous periods, as follows:

$$ACMVV_{c,USD,d} = \frac{\sum_{i=1}^{4} CMVV_{c,USD,i} \times w_i}{\sum_{i=1}^{4} 1_{CMVV_i<>0} \times w_i} \tag{6}$$

where: $w_i = \{35\%, 30\%, 25\%, 10\%\}$, and $i = 1$ refers to the most recent period in the average.

3.2.4.3 ADMISSION

In order to be admitted to the Index, the average daily liquidity of a contract, as measured by the Average Component Market Volume Value (ACMVV), must represent at least 4% of the open interest value as measured by The Average Component Open Interest Value (ACOIV) as of the Annual Rebalancing Reference Date.

3.2.4.4 MAINTENANCE

In order to remain in the Index, the underlying ACMVV of a contract must satisfy a maintenance test of 3.5% of the Average Component Open Interest Value (ACOIV) as of the Annual Rebalancing Reference Date.

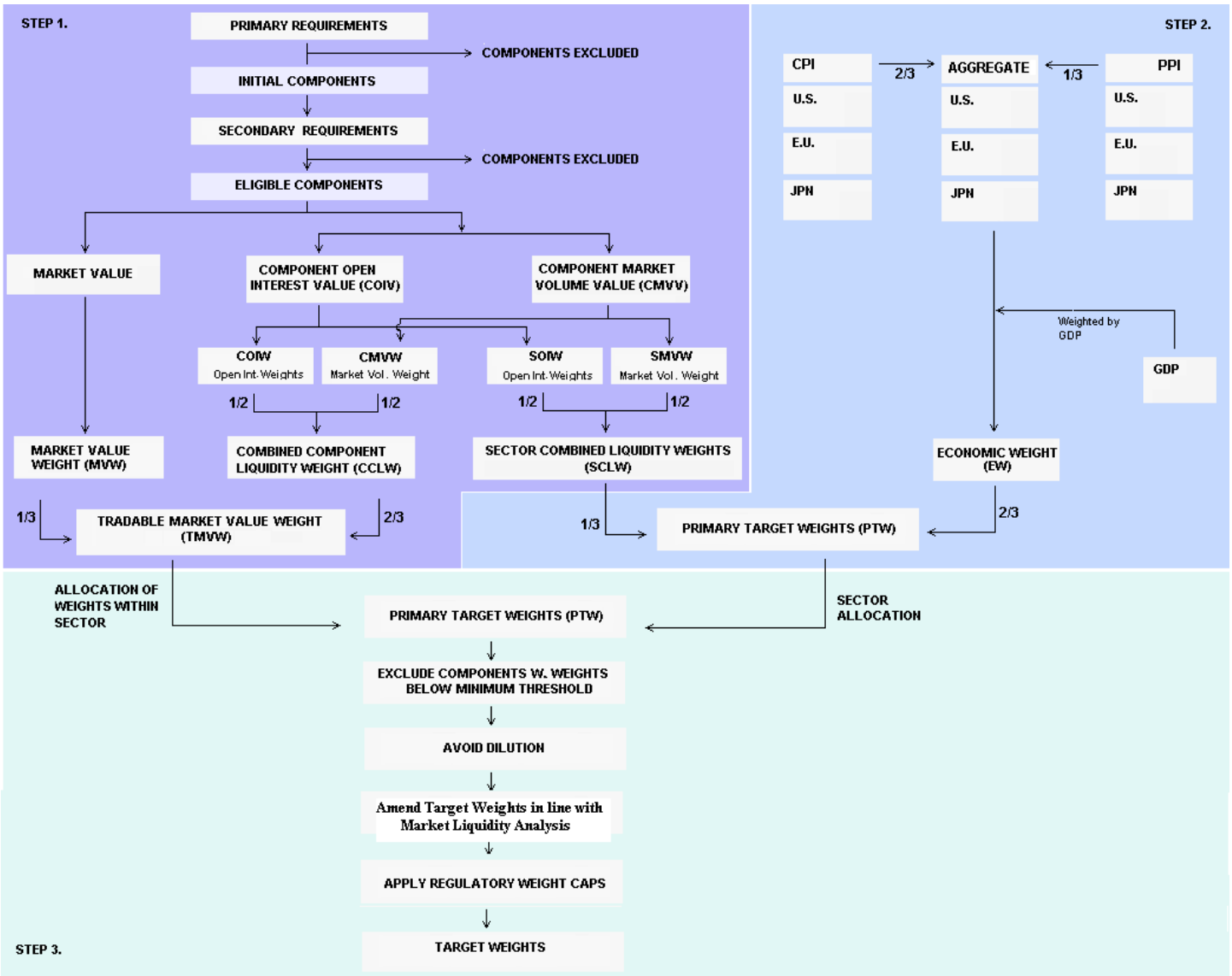
3.3 CMCI TARGET WEIGHTS (TWS)

3.3.1 Overview of the CMCI Target Weights

The weighting process for the CMCI is designed to reflect the economic significance and market liquidity of each commodity. CPI and PPI data are used to determine sector weights for the index and use consumption data to calculate the individual contract weights. Combined with liquidity metrics, the Index blends a fundamental approach with market dynamics to produce an innovative and unique index.

The Target Weights are calculated on the basis of a number of sequential steps and are common to all CMCI Standard Constant Maturities. There is a two-stage approach to this process. First, regional CPI, PPI and GDP data are used to produce the Economic Weight (EW) of each of the five sectors of the CMCI. Tradable Economic Weights (TEW) are calculated on a sector basis by overlaying these results with a liquidity screen. Second, the market value of consumption is used to calculate the individual instrument weight (Market Value Weights (MVW)) of each commodity. Again, with a liquidity screen, the Target Weight (TW) for the Index are determined.

EXHIBIT 2: COMPLETE OVERVIEW OF THE CMCI Target Weight Determination



Liquidity metrics are volatile and more prone to abrupt changes, so the CMCI Governance Committee updates it twice a year in April and October. Fundamental data, in turn, is significantly more stable and is updated only once a year in April. The CMCI Governance Committee can therefore update Target Weights (TWs) twice a year. The blending of fundamental and liquidity weights is always effected during the following July and January Maintenance Periods.

The Index Target Weights (TWs) methodology and the self-executing rebalancing methodology of the Index are designed to manage changes to the Index Target Weights (TWs).

If any event or series of events takes place that, in the judgment of the CMCI Governance Committee, in consultation with the CMCI Advisory Committee, is reasonably likely to have an adverse effect on the maintenance of the CMCI as a representative index, it will constitute Extraordinary Circumstances. If any of the above occur, the CMCI Governance Committee, in consultation with the CMCI Advisory Committee, has the ability to change the Target Weights at times other than bi-annual Governance Committee meetings if it determines that such action is necessary or advisable in order to protect or enhance the tradability of the Index. The Extraordinary Circumstances, can include, but are not limited to:

- declining or rising trading volumes, instrument delisting or creation (when declining trading volumes are posing a threat to the CMCI stability and tradability),
- critical changes in commodity production or consumption patterns,
- changes in foreign exchange regimes,
- general macroeconomic or political events, and
- all types of legal changes, tax rulings and official decisions presenting a threat to CMCI investors and/or Index Sponsors.

3.3.2 Calculation of CMCI Target Weights (Component)

3.3.2.1 Economic Weights (EW)

Using widely public and available data such as CPI and PPI baskets in three major world regions (U.S., Europe, and Japan), weighted by the relative size of those economies using respective GDP data, the Economic Weights intend to provide a regional aggregation of personal and business commodity consumption patterns (assumptions and data available on request).

The measures and calculations are performed by UBS Equity and Commodities research (further details available on request).

GDP data for the period of the most recent available full calendar year is obtained and used to calculate GDP weights for each regions/country. GDP data at purchasing power parity (PPP) exchange rates is used to determine the relative size of each regional economy.

DEFINE SECTORS AND CPI AND PPI INDICES
The component weights of CPI and PPI indexes for the US, Europe, and Japan for the most recent weighting period are obtained. For each region and for each index, using the reported consumption weights of each data series, UBS Equity and Commodities research groups the line items of goods (excluding services) into five main categories (sectors): Energy, Precious Metals, Industrial Metals, Agriculture, and Livestock. Reflecting the relative size of consumption in the global economy, CPI data is assigned a 2/3 weight and PPI data a 1/3 weight for each region to calculate regional EWs for each of the five sectors.
Then the GDP weights are blended with the CPI/PPI regional Economic Weights to produce a World aggregate Economic Weight. This is done by multiplying the combined CPI/PPI weight by the share of global GDP for each region.

3.3.2.2 Sector Open Interest Weights (SOIW), Sector Market Volume Weights (SMVW) and Sector Combined Liquidity Weights (SCLW)

From the list of selected instruments, the Sector Open Interest Weights (SOIW) and Sector Market Volume Weights (SMVW) are calculated in the following way:

$$SOIW_{Sector} = \frac{\sum_{c \in Sector} ACOIV_c}{\sum_c ACOIV_c} \tag{7}$$

$$SMVW_{Sector} = \frac{\sum_{c \in Sector} ACMVV_c}{\sum_c ACMVV_c} \tag{8}$$

Sector Combined Liquidity Weight (SCLW) is then calculated as follows:

$$SCLW_{Sector} = \frac{1}{2} SOIW_{Sector} + \frac{1}{2} SMVW_{Sector} \tag{9}$$

3.3.2.3 Tradable Economic Weights (TEW)

Liquidity calculations are combined with Economic Weight (EW) calculations by using 2/3 Economic Weights and 1/3 liquidity weight to create Tradable Economic Weights.

$$TEW_{Sector} = \frac{2}{3} EW_{Sector} + \frac{1}{3} SCLW_{Sector} \tag{10}$$

3.3.2.4 Market Value Weights (MVW)

Market Value Weights (MVW) for the Index are calculated for the list of selected instruments. This stage of the process is designed to calculate the weights of the individual components in the Index. More specifically, this process determines the relative importance of each selected instrument within the sector based on the Tradable Economic Weights (TEW) produced in the manner set forth above.

Our analysis is based on the U.S. Dollar value of consumption of each instrument. World consumption data were used for the calculations U.S. Dollar value of consumption is calculated using the most recent full calendar year consumption data in volume/quantity terms multiplied by the trailing five-year average market price in U.S. Dollars, in a unit that corresponds to consumption. Within each sector, the relative importance of each instrument was calculated by dividing that instrument's dollar value of consumption by the total sector U.S. Dollar value consumption.

Determination of Petroleum product weights

As with all other sectors, the relative importance, as measured by volume consumption, of each instrument within the Energy sector to determine its target market weight. However, within the Energy sector, crude oil is the primary input for production of several refined products (e.g., Heating oil, Gasoil, Gasoline) that are also selected instruments within the Index.

To factor this into the total consumption of petroleum products (in volume/quantity terms) are divided into two categories - crude oil and refined products (as shown in Exhibit IV below). This attributes one half of consumption to the input, crude oil, and the other half to the outputs, the refined products. This avoids the potential problem of double counting the relative importance of petroleum products in the Index.

The following assumptions are made to determine the fundamental weights of each of the specific instruments:

- An equal split of WTI and Brent crude oil consumption is assumed. Where appropriate, WTI and Brent consumption is divided by the number of instruments in the Index that reflect the specific oil commodity.
- Within the refined product grouping, data for the EU and US is used to determine the appropriate consumption levels for gasoline, heating oil, and gas oil. The International Energy Agency (IEA) breaks refined products into nine categories: LPG and Ethane, Naphtha, Motor Gasoline, Jet and Kerosene, Gas/Diesel Oil, Diesel, Other Gasoil, Residual Fuels, other products, as shown in Exhibit V.
- For purposes of the Index, the energy sector includes only contracts for heating oil, gasoil and gasoline. Thus, to allocate consumption of the IEA categories within these contracts, they are grouped by product and region as follows (Table IV. below):

Table IV. ATTRIBUTION OF PETROLEUM PRODUCTS TO CMCI COMPONENT COMMODITIES

Commodity Component	Americas	Europe
LPG and Ethane	-	-
Naphtha	Gasoline	-
Motor Gasoline	Gasoline	Gasoline
Jet and Kerosene	Heating Oil	Gasoil
Gas/Diesel Oil	Heating Oil	Gasoil
Diesel	Heating Oil	Gasoil
Other Gasoil	Heating Oil	Gasoil
Residual Fuels	-	-
Other Products	-	-
LPG and Ethane	-	-

- Consumption data for these groups is aggregated for the US and EU and the share (in %) of each contract of the refined product total is calculated. The relative share of each product is then multiplied by the allocation of refined petroleum consumption, as calculated above, to create consumption (in volume terms) of each refined product.

Finally, for each instrument, U.S. Dollar value of consumption is calculated by multiplying consumption in volume/quantity terms, as determined above, by price. Total U.S. Dollar value of energy consumption is simply the sum of each energy instruments' U.S. Dollar value. Multiplying the share of each instrument as a percentage of the total by the Tradable Economic Weight (TEW) gives the Target Market Value (TMV) for each energy instrument.

Determination of weights for non-Petroleum commodities

The following calculations were made to account for usage of multiple instruments in the Index that reflect the same underlying commodity:

- For Gold, Copper, Coffee, Cocoa, Sugar, Canola/Rapeseed and Wheat, consumption is split equally into the respective number of selected instruments.
- For Soybeans, Soybean Meal, and Soybean Oil, the overall weight given to the combined three instruments is based on total consumption of Soybeans. The split of the three instruments is determined by world consumption data available for these specific instruments.
- For Frozen Concentrate Orange Juice we the quantity of oranges consumed is divided by five (5) to reflect differences in the concentration of fresh orange juice and frozen concentrate orange juice.
- For each of the above cases, the resulting consumption in volume terms is multiplied by the trailing five-year average market price to calculate the U.S. Dollar value of consumption.

Finally, within each sector, the MVW was calculated by multiplying the sector TEW by the relative instrument importance calculated above. Thus, the sum of all of the instruments in each sector will equal the TEW levels.

3.3.2.5 Component Open Interest Weights (COIW), Component Market Volume Weights (CMVW) and Combined Component Liquidity Weights (CCLW)

Average Daily Total Open Interest Quantity (ATOIQ) is defined as:

$$ATOIQ_d = \frac{1}{BD}\sum_{i=0}^{BD-1} DTOIQ_{d-i} \tag{11}$$

where:

$DTOIQ_{d-i}$ is, for a Calculation Reference Date d minus i days, the Daily Total Open Interest Quantity as reported by the exchange facility on which the component is traded and/or to which such component is associated, and measured as the Total Open Interest on all traded contracts or maturities,

d the Calculation Reference Date (CRD),

BD the number of CMCI Business Days from and including the first day of the LRP, to and including the last day of the LRP (the CRD itself).

The Average Total Market Volume Quantity (ATVQ) is defined as:

$$ATVQ_d = \frac{1}{BD}\sum_{i=0}^{BD-1} DTVQ_{d-i} \tag{12}$$

where:

$DTVQ_{d-i}$ is, for a Calculation Reference Date d minus I days, the Daily Total Volume Quantity measured daily by the sponsor as the number of contracts exchanged between buyers and sellers,

d and BD are defined above.

The Component Open Interest Weight reflects a given commodity's ACOIV as a percentage of the aggregate ACOIV of all commodities in a given commodity sector. The Component Market Volume Weight reflects a given commodity's ACMVV as a percentage of the aggregate ACMVV of all commodities in a given commodity sector. Component Open Interest Weights (COIW) and Component Market Volume Weights (CMVW) are calculated as follows:

$$COIW_c = \frac{ACOIV_c}{\sum_{c\in Sector} ACOIV_c} \;\; and \;\; CMLW_c = \frac{ACMVV_c}{\sum_{c\in Sector} ACMVV_c} \tag{13}$$

Finally, the two notions are combined in one to the Combined Component Liquidity Weight (CCLW), using:

$$CCLW_c = \frac{1}{2}COIW_{Sector} + \frac{1}{2}CMLW_c \tag{14}$$

3.3.2.6 Calculate Tradable Market Value Weights (TMVW).

Liquidity, open interest and market value calculations are combined with Market Value Weight by using one third Market Value Weight and two third Combined Component Liquidity Weight to calculate Tradable Market Value Weights (TMVW), as
follows:

$$TMVW_c = \tfrac{2}{3}CCLW_c + \tfrac{1}{3}MVW_c \tag{15}$$

3.3.2.7 Calculate the Temporary Target Weights (TTW)

The Tradable Economic Weights with Tradable Market Value Weight (TMVW) are combined to form the Temporary Target Weights (TTW), as follows:

$$TTW_c = TEW_c \times TMVW_c \tag{16}$$

3.3.2.8 Introduce new Components and Maintenance Threshold Weight Requirement

New components not previously present in the CMCI are eligible for introduction if their TTWs have exceeded their Admission Threshold Weight requirement for at least two (2) consecutive scheduled CMCI Governance committee meetings. The Admission Threshold Weight is set at 0.60% and can change following a decision of the CMCI Governance Committee.

The CMCI Governance Committee can decide to override the rule and will determine, in their reasonable judgment, whether such action is necessary or advisable in order to protect or advance the goals of the Index.

TTW2 weights of all components excluded by this rule get reallocated to other components within the same commodity sector that haven't been previously capped.

Maintenance Threshold Weight requirement

We then exclude any components that fail to satisfy their Maintenance Threshold Weight requirement. The Maintenance Threshold Weight is set at 0.60% and can change following a decision of the CMCI Governance Committee. A component will be excluded from the CMCI when its TTW2 falls below its Maintenance Threshold Weight for three (3) consecutive scheduled CMCI Governance Committee meetings.

We then reallocate the TTW3 weights of all the excluded components to other components within the same commodity sector that have not been previously capped.

Both procedures in this section are performed in order to maintain the stability of the index composition over time and prevent unnecessary migration of components in the CMCI.
At this stage, TTW3 are also rounded to four decimal places and the excess (respectively the deficit) weight to 100% is attributed to the smallest (resp. highest) weighted component, provided such mechanism doesn't affect the regulatory weight compliance discussed above in which case such excess weight is attributed to the next smallest component, and so on.

3.3.2.9 Avoid Unnecessary Weight Dilution. Obtain Target Weights.

In order to avoid unnecessary dilution of the weights and the number of small components in the Index, components for which the commodity weighting is shared by more than one instrument are excluded if both of the following conditions are met:

- its target weight is less than 3%,
- its relative weight for the specific commodity is less than 33%.

From this procedure CMCI Target Weights (TW) are calculated, which are then subjected to Market Liquidity test, as per Section 3.3.2.10 below.

3.3.2.10 Amend Target Weights in line with Market Liquidity

The CMCI Target Weights obtained in 3.3.2.9 above are then applied to a hypothetical USD1bn investment to determine what dollar volume this would constitute.

This figure is then compared to the average daily market volume, as represented by the ACMVV figures, calculated earlier in Section 3.2.4.2, in order to determine what percentage of daily volume does CMCI TW in each specific commodity represents, given USD1bn investment into the Index.

In order to ensure that a significant investment into the Index does not upset the market, we cap all the CMCI TW at such a level that they do not breach a maximum of 10% of daily liquidity in that component, as represented by ACMVV, which the CMCI Governance and Advisory Committees consider to be a sufficient level in terms of market liquidity, as well as stable enough to be consistent over time. Any commodity that exceeds the 10% threshold would have its weight reduced to the level where it meets that threshold. Any excess weights that need to be redistributed would be allocated in the following way:

Admission Threshold Weight requirement

Components that were previously not part of the Index, are eligible for introduction if their TW obtained after market liquidity analysis have exceeded their Admission Threshold Weight (0.60%) requirement for at least two (2) consecutive scheduled CMCI Governance committee meetings.

The CMCI Governance Committee can decide to override the rule and will determine, in their reasonable judgment, whether such action is necessary or advisable in order to protect or advance the goals of the Index.

Target Weights of all components excluded by this rule get reallocated to other components within the same commodity sector that haven't been previously capped.

Maintenance Threshold Weight requirement

Similarly, components that previously were in the CMCI can only be excluded if they fail to satisfy to their Maintenance Threshold Weight (0.60%) requirement after the market liquidity analysis for three (3) consecutive periods.

Target weights of all the excluded components as a result of this rule get allocated to other components within the same commodity sector that have not been previously capped.

Both procedures this section are performed in order to maintain the stability of the index composition over time and prevent unnecessary migration of components in the CMCI.

3.3.2.11 Apply Regulatory Weight-caps

Components exceeding their regulatory weight Caps (based on UCITS guidance) are capped and the excess weight is reallocated the excess weights (i) equally to other components within the commodity group, or (ii) when the weight quota has been exceeded for such components, equally to the other components within all the other commodity groups and provided the procedure does not result in a new excess weight situation. The procedure used to calculate TTW4 is interactive and repeated as many times as appropriate.

3.4 THE CONSTANT MATURITY FORWARDS (CMF)

The CMCI is calculated on the basis of specified tenors or maturities that remain constant. For example, the three-month constant maturity forward is at all times based on a combination of contracts with the middle of their delivery periods approximately three months from the date of calculation.

Using Eligible Nearby Contracts (ENC), defined below as the most liquid contract expirations for each Standard Constant Maturity (SCM), the following terms are defined:

- Daily Constant Maturity Date (DCMD),
- Middle Delivery Period (MDP), and
- Daily Constant Maturity Forward Price (DCMFP), as a function of the two above notions.

The eligible SCM for each Commodity Component are determined by the CMCI Governance Committee, in conjunction with CMCI Advisory Committee.

3.4.1 Standard Constant Maturity (SCM) and Constant Maturity Boundaries (CMB)

A Standard Constant Maturity is a Tenor for which the CMCI is calculated. Each Tenor is calculated independently of the other tenors allowing for the benchmarking of specific segments of the forward curves, making the CMCI a family of commodity instruments calculated for designated maturities.

The CMCI, its sectors and its component indices are calculated for the following Standard Constant Maturities (SCM):

- 3 Months (3M),
- 6 Months (6M),
- 1 Year (12M),
- 2 Years (24M),
- 3 Years (36M).

Single component indices for the following Standard Constant Maturities are calculated for specific commodities only (please see Appendix I for a detailed list of Calculated CMCI Indices):

- 4 Years (48M),
- 5 Years (60M).

When, for a specific component, the Standard Constant Maturity extends to an illiquid region of the curve, as determined by the CMCI Governance Committee, in such a way that the CMCI cannot be calculated by means of simple price observation, a Constant Maturity boundary (CMB) replaces the SCM in the calculation and the particular SCM will have a tenor equal to the applicable CMB. In other words, if a particular commodity does not have listed futures that extend to a particular SCM, for example 3 Years, or if it has listed futures but they are deemed too illiquid to include, the contract at the CMB will be used instead for that tenor instead. Thus, all components of the CMCI will be calculated for all tenors up to 3 Years.

Table V.A. CMCI Benchmark Index Available Standard Constant Maturities

Component/Available SCM	Code	3M	6M	1Y	2Y	3Y
WTI Crude Oil 1	CL	Yes	Yes	Yes	Yes	Yes
Brent Crude Oil	CO	Yes	Yes	Yes	Yes	Yes
ULS Deisel	HO	Yes	Yes	Yes	-	-
Gasoil	QS	Yes	Yes	-	-	-
RBOB Gasoline	XB	Yes	Yes	-	-	-
Natural Gas	NG	Yes	Yes	Yes	-	-
LME Copper	LP	Yes	Yes	Yes	Yes	Yes
High Grade Copper	HG	Yes	Yes	-	-	-
LME Zinc	LX	Yes	Yes	Yes	-	-
LME Aluminium	LA	Yes	Yes	Yes	Yes	Yes
LME Nickel	LN	Yes	Yes	Yes	-	-
LME Lead	LL	Yes	Yes	Yes	-	-
Gold	GC	Yes	Yes	Yes	-	-
Silver	SI	Yes	Yes	Yes	-	-
SRW Wheat	W_(*)	Yes	Yes	Yes	-	-
HRW Wheat	KW	Yes	Yes	-	-	-
Milling Wheat	CA	Yes	Yes	-	-	-
Corn	C_(*)	Yes	Yes	Yes	-	-
Soybeans	S_(*)	Yes	Yes	Yes	-	-
Soybean Meal	SM	Yes	Yes	-	-	-
Soybean Oil	BO	Yes	Yes	-	-	-
Sugar #11	SB	Yes	Yes	Yes	-	-
Sugar #5	QW	Yes	Yes	-	-	-
Coffee "C" Arabica	KC	Yes	Yes	Yes	-	-
Cotton	CT	Yes	Yes	-	-	-
US Cocoa	CC	Yes	Yes	-	-	-
London Cocoa	QC	Yes	Yes	-	-	-
Live Cattle	LC	Yes	Yes	-	-	-
Lean Hogs	LH	Yes	Yes	-	-	-

(*): The underscore "_" denotes a space.

Constant Maturity Boundaries (CMB) are listed in Table V.B.1. and V.B.2. below (the sign "-" denotes that no boundary is applied to the component for an SCM).

Table V.B.1. Definition of CMCI Constant Maturity Boundaries

Contract/ SCM (or CMB)	BBG Code	3M	6M	1Y	2Y	3Y	4Y	5Y
WTI Crude Oil 1	CL	-	-	-	-	-	-	-
Brent Crude Oil	CO	-	-	-	-	-	-	-
ULS Diesel	HO	-	-	-	1Y	1Y	1Y	1Y
Low Sulfur Gasoil	QS	-		6M	6M	6M	6M	6M
RBOB Gasoline	XB	-	-	6M	6M	6M	6M	6M
Natural Gas	NG	-	-	-	1Y	1Y	1Y	1Y
LME Copper	LP	-	-	-	-	-	-	4Y
High Grade Copper	HG	-	-	6M	6M	6M	6M	6M
LME Zinc	LX	-	-	-	1Y	1Y	1Y	1Y
LME Aluminium	LA	-	-	-	-	-	-	4Y
LME Nickel	LN	-	-	-	1Y	1Y	1Y	1Y
LME Lead	LL	-	-	-	1Y	1Y	1Y	1Y
Gold*	GC	-	-	-	1Y	1Y	1Y	1Y
Silver*	SI	-	-	-	1Y	1Y	1Y	1Y
SRW Wheat	W	-	-	-	1Y	1Y	1Y	1Y
HRW Wheat	KW	-	-	-	1Y	1Y	1Y	1Y
Milling Wheat	CA	-	-	6M	6M	6M	6M	6M
Corn	C	-	-	-	1Y	1Y	1Y	1Y
Soybeans	S	-	-	-	1Y	1Y	1Y	1Y
Soybean Meal	SM	-	-	6M	6M	6M	6M	6M
Soybean Oil	BO	-	-	6M	6M	6M	6M	6M
Sugar No.11	SB	-	-	-	1Y	1Y	1Y	1Y
Sugar #5	QW	-	-	6M	6M	6M	6M	6M
Coffee “C”	KC	-	-	-	1Y	1Y	1Y	1Y
Cotton No.2	CT	-	-	6M	6M	6M	6M	6M
Live Cattle	LC	-	-	6M	6M	6M	6M	6M
Lean Hogs	LH	-	-	6M	6M	6M	6M	6M
Cocoa	CC	-	-	6M	6M	6M	6M	6M
LondonCocoa	QC	-	-	6M	6M	6M	6M	6M

*Note that 3Y Gold and Silver are not included in the CMCI Benchmark Index as of 28-Jul-2015, and the 2Y Gold and Silver are not included in the CMCI Benchmark Index as of 27-Jul-2016.
Legend: -: No boundary; NQ: Not Quoted.

Table V.B.2. Definition of Constant Maturity Boundaries for Non-CMCI Indices

Contract	BBG Code	3M	6M	1Y	2Y	3Y	4Y	5Y
WTI Crude Oil 2	EN	-	-	-	-	-	-	-
Barley	WA	-	3M	3M	3M	3M	3M	3M
Lumber (Random Length)	LB	-	3M	3M	3M	3M	3M	3M
Rough Rice	RR	-	3M	3M	3M	3M	3M	3M
Rapeseed (Colza)	IJ	-	3M	3M	3M	3M	3M	3M
Platinum	PL	-	3M	3M	3M	3M	3M	3M
F.C. Orange Juice (A)	JO	-	3M	3M	3M	3M	3M	3M
Feeder Cattle	FC	-	3M	3M	3M	3M	3M	3M

Legend: -: No boundary; NQ: Not Quoted

3.4.2 Determination of Daily Constant Maturity Dates (DCMD).

In order to calculate the CMCI with the appropriate SCM tenors, it is first necessary to identify the relevant forward date for which, on any given day and for each tenor, to identify the applicable futures contracts and price.
This date is referred to as the Daily Constant Maturity Date (DCMD) and is not necessarily a CMCI Business Day.

For example, on a given date on which the calculation is made, the appropriate forward date for the three-month constant maturity is exactly 91 days from the date of calculation, which is equivalent to approximately three months.

Please refer to Appendix B.1. for detailed calculations of DCMD.

3.4.3 Middle of Delivery Periods (MDP)

With respect to commodities futures contracts, the contract month name (i.e., JUN22 or M22) usually indicates the month in which the delivery period associated with that contract occurs. However, the exact time period in that month during which the commodity is to be delivered can vary significantly across contracts as each physical commodity market carries its own unique characteristics, delivery cycles and conventions.

To address this issue, a theoretical date within the delivery period, referred to as the Middle of Delivery Period (MDP), is designated. The date is sought to represent the mid-point between the first and last day of the delivery period for the relevant contract as defined by the rules of the applicable exchange. As delivery periods are well defined and enforced by exchanges on which futures contracts trade, the date is a direct function of the effective delivery period attached to each Futures contract. The MDP for each contract is then used to determine the Contract Proportions, discussed below, that are used to calculate the portion of the CMCI attributable to a given maturity along the curve for a given SCM.

Each futures contract is associated with a calendar day associated to the delivery month. For example, 15(m) indicates that delivery is deemed to take place on the 15th calendar day of the delivery month. 1(m+1) means that for the purpose of the calculation of the CMCI, physical deliveries are deemed to occur on or around the 1st calendar day of the month following the contract's delivery month.

On some financially settled commodities or where the delivery mechanism occurs via warrants (for example, on the London Metals Exchange), the determination of the MDP date is done by indicating a number of days following the expiry date of the futures contract. For example, E(c+5) means the physical delivery will occur on the 5th calendar day following the last trading date, and E(b+2) means that the delivery is meant to take place on the 2nd business day following the last trading date.

The MDPs are determined by the CMCI Governance Committee, which also reviews and approves all changes in methodology affecting such determination.

Table V.C.1. Definition of CMCI Non-Adjusted Middle of Delivery Periods (NAMDP)

Contract	Exch.	BBG Code	Delivery Period or Cash settlement date
WTI Crude Oil 1	NYMEX	CL	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
WTI Crude Oil 2	ICE	EN	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Brent Crude Oil	ICE	CO	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
ULS Diesel	NYM	HO	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Low Sulfur Gasoil	EX	QS	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
RBOB Gasoline	ICE	XB	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Natural Gas LME	NYM	NG	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Copper	EX	LP	2 trading days prior to last trade date
High Grade Copper	NYM	HG	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
LME Zinc	EX	LX	2 trading days prior to last trade date
LME Aluminum	LME	LA	2 trading days prior to last trade date
LME Nickel LME	COM	LN	2 trading days prior to last trade date
Lead	EX	LL	2 trading days prior to last trade date
Gold	LME	GC	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Silver	LME	SI	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
SRW Wheat	LME	W	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
HRW Wheat	LME	KW	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Milling Wheat	COM	CA	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Corn	CBOT	C	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Soybeans	CBOT	S	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Soybean Meal	CBOT	SM	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Soybean Oil	CBOT	BO	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Sugar No. 11	NYBOT	SB	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Sugar #5	EN	QW	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Coffee “C”	NYBOT	KC	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Cotton No. 2	INYBOT	CT	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Live Cattle	CME	LC	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Lean Hogs	CME	LH	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
US Cocoa	I	CC	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
London Cocoa	C	QC	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date

Table V.C.2. Definition of Non-Adjusted Middle of Delivery Periods (NAMDP) For Non-CMCI Indices

Contract	Exch.	BBG Code	Delivery Period or Cash settlement date
Canola	WCE	RS	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Barley	WCE	WA	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Lumber (Rand. Lgth.)	CME	LB	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Rough Rice	CME	RR	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Rapeseed (Colza)	EN	IJ	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Platinum	NYMEX	PL	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
Feeder Cattle	CME	FC	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
F.C. Orange Juice (A)	NYBOT	JO	Earlier of 1 trading day prior to last trade date or 2 trading days prior to first notice date
EUA	ICE	MO	Earlier of 30 trading day prior to last trade date

3.4.3.1 Adjustments to the MDP for the calculation of the CMCI-3M

In the case where a component instrument is composed of four Eligible Nearby Contacts (ENC) per calendar year, the calculation of the CMCI-3M can be problematic if two consecutive contracts are spaced by more than three months. In such cases the number of days between the DCMD and the reference calculation date is less than the difference in days between the two consecutive MDPs used in the calculation of the DCMFP. This technical issue is resolved by

adjusting the MDP backwards to prevent:

- an expired contract to continue to be referenced by the CMCI calculation engine,
- the CMCI referencing contracts in their Notice Period.

The only SCM for which an adjustment to the MDP is necessary is the 3M.

Table V.D.1. Adjustment of MDP for First Notice Days and Expiries, for the CMCI 3M

Contract	BBG Code	MDPa
WTI Crude Oil	CL	- , - , - ,.. -
WTI Crude Oil 2	EN	- , - , - ,.. -
Brent Crude Oil	CO	- , - , - ,.. -
ULS Diesel	HO	- , - , - ,.. -
Low Sulfur Gasoil	QS	- , - , - ,.. -
RBOB Gasoline	XB	- , - , - ,.. -
Natural Gas LME	NG	- , - , - ,.. -
LME Copper	LP	- , - , - ,.. -
High Grade Copper	HG	- , - , - ,.. -
LME Zinc	LX	- , - , - ,.. -
LME Aluminum	LA	- , - , - ,.. -
LME Nickel	LN	- , - , - ,.. -
LME Lead	LL	- , - , - ,.. -
Gold	GC	- , - , - , - , -1m
Silver	SI	- , - , - , - , -
SRW Wheat	W	- , - , - , - , -
HRW Wheat	HRW	- , - , - , - , -
Milling Wheat	CA	-1m , -1m ,-1m,-1m ,
Corn	C	- , - , - , - , -
Soybeans	S	- , - , - , - ,-2m
Soybean Meal	SM	- , - , - , - , - , - , -
Soybean Oil	BO	- , - , - , - , - , - , -
Sugar No. 11	SB	-3m, -2m, -1m, -1m
Sugar #5	QW	-2m,-2m,-2m,-2m,-2m
Coffee “C”	KC	-1m, - , - , - ,-1m
Cotton No. 2	CT	-1m, -1m, -, -2m
Live Cattle	LC	- , - , - , - , - , -
Lean Hogs	LH	- , - , - , - , - , -
Cocoa	CC	- , - , - , - , - , -
London Cocoa	QC	-1m, - , - , - , -

Legend: -: No adjustment

Table V.D.2. Adjustment of MDP for First Notice Days and Expiries, for the Non-CMCI 3M

Contract	BBG Code	MDPa
Canola	RS	-1m,-1m,-1m,..-1m
Barley	WA	-1m,-1m,-1m,..-1m
Lumber (Rand. Lgth.)	LB	-1m,-1m,-1m,..-1m
Rough Rice	RR	-1m,-1m,-1m,-1m,-1m,-1m
Rapeseed (Colza)	IJ	-1m,-1m,-1m,-1m
Platinum*	PL	- , - , - , - , - , -

Feeder Cattle	FC	- , - , - , - , -1m , - , -, -
F.C. Orange Juice (A)	JO	- , - , - , - , - , -
EUA	MO	-,-,-,-

Legend: -: No adjustment
*As of H1-2013 the Platinum MDP adjustment was removed for liquidity and open interest reasons.

The matrix above shows the adjustment that must be made to the MDP date to obtain the MDP used in the calculation of the Daily Contract Proportions (CP). For example, “-1m” means that the na MDP date is adjusted backwards by one calendar month.

Table V.E.1. Middle of Delivery Periods References

Contract	Exch.	BBG Ticker	Delivery Period or Cash settlement Date Reference
WTI Crude Oil 1	NYMEX	CL	https://www.cmegroup.com/markets/energy/crude-oil/light-sweet-crude.contractSpecs.html & https://www.cmegroup.com/content/dam/cmegroup/rulebook/NYMEX/2/200.pdf
WTI Crude Oil 2	ICE	EN	https://www.theice.com/products/213/specs
Brent Crude Oil	ICE	CO	https://www.theice.com/products/219/specs
ULS Diesel	NYMEX	HO	https://www.cmegroup.com/markets/energy/refined-products/heating-oil.contractSpecs.html & https://www.cmegroup.com/content/dam/cmegroup/rulebook/NYMEX/1a/150.pdf
Low Sulfur Gasoil	ICE	QS	https://www.theice.com/products/34361119/specs
RBOB Gasoline	NYMEX	XB	https://www.cmegroup.com/markets/energy/refined-products/rbob-gasoline.contractSpecs.html
Natural Gas	NYMEX	NG	https://www.cmegroup.com/markets/energy/natural-gas/natural-gas.contractSpecs.html & https://www.cmegroup.com/content/dam/cmegroup/rulebook/NYMEX/2/220.pdf
LME Copper	LME	LP	https://www.lme.com/Metals/Non-ferrous/LME-Copper/Contract-specifications
High Grade Copper	COMEX	HG	https://www.cmegroup.com/markets/metals/base/copper.contractSpecs.html
LME Zinc	LME	LX	https://www.lme.com/Metals/Non-ferrous/LME-Zinc/Contract-specifications
LME Aluminum	LME	LA	https://www.lme.com/en/Metals/Non-ferrous/LME-Aluminium/Contract-specifications
LME Nickel	LME	LN	https://www.lme.com/en/Metals/Non-ferrous/LME-Nickel/Contract-specifications
LME Lead	LME	LL	https://www.lme.com/Metals/Non-ferrous/LME-Lead/Contract-specifications
Gold	COMEX	GC	https://www.cmegroup.com/markets/metals/precious/gold.contractSpecs.html & https://www.cmegroup.com/content/dam/cmegroup/rulebook/COMEX/1a/113.pdf
Silver	COMEX		https://www.cmegroup.com/markets/metals/precious/silver.contractSpecs.html & https://www.cmegroup.com/content/dam/cmegroup/rulebook/COMEX/1a/112.pdf
SRW Wheat	CBOT	W	https://www.cmegroup.com/markets/agriculture/grains/wheat.contractSpecs.html
Corn	CBOT	C	https://www.cmegroup.com/markets/agriculture/grains/corn.contractSpecs.html
Soybeans	CBOT	S	https://www.cmegroup.com/markets/agriculture/oilseeds/soybean.contractSpecs.html
Soybean Meal	CBOT	SM	https://www.cmegroup.com/markets/agriculture/oilseeds/soybean-meal.contractSpecs.html
Soybean Oil	CBOT	BO	https://www.cmegroup.com/markets/agriculture/oilseeds/soybean-oil.contractSpecs.html
Sugar No.11	NYBOT	SB	https://www.theice.com/products/23/specs
Sugar #5	EN	QW	https://www.theice.com/products/37089080/White-Sugar-Futures
Cocoa	EN	QC	https://www.theice.com/products/37089076/London-Cocoa-Futures
Coffee “C”	NYBOT	KC	https://www.theice.com/products/15/specs
Cotton No.2	INYBOT	CT	https://www.theice.com/products/254/specs
Live Cattle	CME	LC	https://www.cmegroup.com/markets/agriculture/livestock/live-cattle.contractSpecs.html
Lean Hogs	CME	LH	https://www.cmegroup.com/markets/agriculture/livestock/lean-hogs.contractSpecs.html

Table V.E.2. Middle of Delivery Periods References

		BBG	

Contract	Exch.	Ticker	Delivery Period or Cash settlement Date Reference
Canola	WCE	RS	https://www.theice.com/products/251/specs
Barley	WCE	WA	https://www.theice.com/productguide/ProductDetails.shtml?specId=5
Lumber (Random Lgth.)	CME	LB	https://www.cmegroup.com/markets/agriculture/lumber-and-softs/random-length-lumber.contractSpecs.html
Rough Rice	CME	RR	https://www.cmegroup.com/markets/agriculture/grains/rough-rice.contractSpecs.html
Rapeseed (Colza)	EN	IJ	https://live.euronext.com/en/product/commodities-futures/ECO-DPAR/contract-specification
Platinum	NYMEX	PL	https://www.cmegroup.com/markets/metals/precious/platinum.contractSpecs.html
F.C. Orange Juice (FCOJ)	NYBOT	JO	https://www.theice.com/products/30/specs
HRW Wheat	KCBOT	KW	https://www.cmegroup.com/markets/agriculture/grains/kc-wheat.contractSpecs.options.html#optionProductId=7331
EUA	ICE	MO	https://www.theice.com/products/197/EUA-Futures

3.4.4 Definition of Eligible Nearby Contracts (ENC)

For the purpose of calculating Constant maturity forwards, Eligible Nearby Contracts (ENC) are defined for each Standard Constant Maturity (SCM). These are determined by the CMCI Governance Committee as the subset of listed futures for a given commodity that are economically significant and liquid futures contract expirations.

As with most asset classes, liquidity reduces as time to maturity increases. Therefore, with respect to commodity markets, exchanges limit the tenor of Futures expiries to prevent unnecessary dilution of liquidity.

When such long dated contracts are listed, market participants usually concentrate on the most liquid ones gradually taking positions on all segments of the forward curves. The CMCI methodology aims to reflect this practice while maintaining the objective of transparency and avoiding potential price manipulation to which less traded contracts are prone.

Eligible Nearby Contracts (ENC) are therefore defined, for each Standard Constant Maturity (SCM), as economically significant and liquid futures contract, as determined by the CMCI Governance Committee, and are set forth in Tables V.F.1. and Table V.F.2. below.

Table V.F.1. Definition of CMCI Eligible Nearby Contracts (ENC)

Contract/ SCM (or CMB)	BBG Code	3M	6M	1Y	2Y	3Y	4Y	5Y
WTI Crude Oil 1	CL	F,G,H,..Z	F,G,H,..Z	F,G,H,..Z	M,Z	Z	Z	Z
WTI Crude Oil 2	EN	F,G,H,..Z	F,G,H,..Z	F,G,H,..Z	M,Z	Z	Z	Z
Brent Crude Oil	CO	F,G,H,..Z	F,G,H,..Z	F,G,H,..Z	M,Z	Z	Z	Z
ULS Diesel	HO	F,G,H,..Z	F,G,H,..Z	F,G,H,..Z	-	-	-	-
Low Sulfur Gasoil	QS	F,G,H,..Z	F,G,H,..Z	-	-	-	-	-
RBOB Gasoline	XB	F,G,H,..Z	F,G,H,..Z	-	-	-	-	-
Natural Gas	NG	F,G,H,..Z	F,G,H,..Z	F,G,H,..Z	Z	Z	-	-
LME Copper	LP	F,G,H,..Z	F,G,H,..Z	F,G,H,..Z	M,Z	M,Z	M,Z	-
High Grade Copper	HG	H, K, N, U, Z	H, K, N, U, Z	-	-	-	-	-
LME Zinc	LX	F,G,H,..Z	F,G,H,..Z	F,G,H,..Z	-	-	-	-
LME Aluminum	LA	F,G,H,..Z	F,G,H,..Z	F,G,H,..Z	M,Z	M,Z	M,Z	-
LME Nickel	LN	F,G,H,..Z	F,G,H,..Z	M,Z	-	-	-	-
LME Lead	LL	F,G,H,..Z	F,G,H,..Z	F,G,H,..Z	-	-	-	-
Gold	GC	G,J,M,Q,Z	G,J,M,Q,Z	M,Z	Z	Z**	-	-
Silver	SI	H,K,N,U,Z	H,K,N,U,Z	N,Z	Z	Z**	-	-
SRW Wheat	W	H,K,N,U,Z	H,K,N,U,Z	H,K,N,U,Z	-	-	-	-
Milling Wheat	CA	H,K,U,Z*	H,K,U,Z*	-	-	-	-	-
HRW Wheat	KW	H,K,N,U,Z	H,K,N,U,Z	N,Z	-	-	-	-
Corn	C	H,K,N,U,Z	H,K,N,U,Z	H,K,N,U,Z	-	-	-	-
Soybeans	S	F,H,K,N,X	F,H,K,N,X	H,N,X	-	-	-	-
Soybean Meal	SM	F,H,K,N,Q,U,Z	F,K,N,Z	-	-	-	-	-
Soybean Oil	BO	F,H,K,N,Q,U,Z	F,K,N,Z	-	-	-	-	-
Sugar No.11	SB	H,K,N,V	H,K,N,V	H,K,N,V	-	-	-	-
Sugar #5	QW	H,K,Q,V,Z	H,K,Q,V,Z	-	-	-	-	-
Coffee “C”	KC	H,K,N,U,Z	H,K,N,U,Z	H,K,N,U,Z	-	-	-	-
Cotton No.2	CT	H,K,N,Z	H,K,N,Z	-	-	-	-	-
Live Cattle	LC	G,J,M,Q,V,Z	G,J,M,Q,V,Z	-	-	-	-	-
Lean Hogs	LH	G,J,M,Q,V,Z	G,J,M,Q,V,Z	-	-	-	-	-
Cocoa	CC	H,K,N,U,Z	H,K,N,U,Z	-	-	-	-	-
London Cocoa	QC	H,K,N,U,Z	H,K,N,U,Z	-	-	-	-	-

* Effective July 15, 2013, Delivery cycle changed to March, May, September and December such that 12 months are available for listing.
As of the November 10, 2014 CMCI Milling Wheat Tenors began rolling into the new delivery cycle contracts.
** Note that 3Y Gold and Silver are not included in the CMCI Benchmark Index as of 28-Jul-2015, and the 2Y Gold and Silver are not included in the CMCI Benchmark Index as of 27-Jul-2016

Table V.F.2. Definition of Eligible Nearby Contracts (ENC For Non-CMCI Indices)

Contract/ SCM (or CMB)	BBG Code	3M	6M	1Y	2Y	3Y	4Y	5Y
Canola	RS	F,H,K,N,X	-	-	-	-	-	-
Barley	WA	H,K,N,V,Z	-	-	-	-	-	-
Lumber (Random Lgth.)	LB	F,H,K,N,U,X	-	-	-	-	-	-
Rough Rice	RR	F,H,K,N,U,X	-	-	-	-	-	-
Rapeseed (Colza)	IJ	G,K,Q,X	-	-	-	-	-	-
Platinum*	PL	F,J,N,V	-	-	-	-	-	-
F.C. Orange Juice (A)	JO	F,H,K,N,U,X	-	-	-	-	-	-
Feeder Cattle	FC	F,H,J,K,Q,U,V,X	-	-	-	-	-	-
EUA	MO	-	-	Z	-	-	-	-

* As of H1-2013 the eligible contracts and rolling period for the Platinum 3M Index were adjusted for liquidity and open interest. The roll period was shortened from six months to four months. As a result, the contract roll is completed over the course of the first calendar month of the rolling period; during the following two months, the exposure remains unchanged. During the final month of the rolling period, the Platinum 3M Index rolls into the next eligible contract.
This change is equivalent to the introduction of the following months in the CMCI Platinum 3M rolling schedule: Liquidity Adjusted Contracts F,F,J,J,N,N,V,V; where each contract has two different MDPs. The first MDP corresponds to the non-adjusted CMCI MDP. The second MDP is equal to the first one + 2 calendar months.
Legend: -: Standard Constant Maturity (SCM) for which the Component is not quoted.
F: Jan, G: Feb, H: Mar, J: Apr, K: May, M: Jun, N: Jul, Q: Aug, U: Sep, V: Oct, X: Nov, Z: Dec.

3.4.5 The Calculation of Daily Constant Maturity Forward Prices (DCMFP)

3.4.5.1 Daily Contract Proportions (CP)

As noted above, it is necessary to determine the portion of the CMCI attributable to a given component that is allocated to contracts or maturities along the curve for a given SCM. This is accomplished through the use of contract proportions (CP), which are in turn based on the relevant MDPs and DCMDs. The contract proportions are obtained by simple linear interpolation on middle delivery period dates. For a specific component c and SCM are calculated as follows:

$$CP1_{c,SCM,d} = \frac{\left(MDP_{c,2,d} - DCMD_{SCM,d}\right)}{\left(MDP_{c,2,d} - MDP_{c,1,d}\right)} \tag{17a}$$

$$CP2_{c,SCM,d} = 1 - CP1_{c,SCM,d} = \frac{\left(DCMD_{SCM,d} - MDP_{c,1,d}\right)}{\left(MDP_{c,2,d} - MDP_{c,1,d}\right)} \tag{17b}$$

where:

$DCMD_{SCM,d}$ the Daily Constant Maturity Date, associated to a Standard Constant Maturity.

$MDP_{c,1,d}$ the MDP date for the futures contract, c, which MDP date is immediately preceding the Daily Constant Maturity Date for time t. If such contract doesn't exist, then CP1 is equal to 0.00 and by definition CP2 is equal 1.00.

$MDP_{c,2,d}$ the MDP date for the futures contract, c, which MDP date is equal or immediately following the Daily Constant Maturity Date for time t.

CP1 and CP2 depend explicitly on the date t chosen for the calculation. For the Price Index, $MDP_{c,1,d}$ and $MDP_{c,2,d}$ refer to the Middle Delivery Period corresponding to the calculation time t. For the Excess Return Index however, the $MDP_{c,1,d}$ and $MDP_{c,2,d}$ refer to the Middle Delivery Period corresponding to the calculation time t-1, explicit in the excess return index formulas. This notation is defined using date d, and not t.

When, for a specific component, the Standard Constant Maturity tenor is limited by a Constant Maturity boundary (CMB), the definition of Contract proportions uses the associated CMB and becomes:

$$CP1_{c,CMB,d} = \frac{\left(MDP_{c,2,d} - DCMD_{CMB,d}\right)}{\left(MDP_{c,2,d} - MDP_{c,1,d}\right)} \tag{17c}$$

$$CP2_{c,CMB,d} = 1 - CP1_{,CMB,d} = \frac{\left(DCMD_{CMB,d} - MDP_{c,1,d}\right)}{\left(MDP_{c,2,d} - MDP_{c,1,d}\right)} \tag{17d}$$

where:

$DCMD_{CMB,d}$	the Daily Constant Maturity Date, associated to a Constant Maturity Boundary,
$MDP_{c,1,d}$ and $MDP_{c,2,d}$	are defined the same as above.

When an exchange facility amends the delivery mechanism on a component, the CMCI Governance Committee decides if new MDPs have to be determined for the amended contracts. CMCI calculations, and in particular the transition to new MDPs, are then performed according to the procedure described in Appendix B.3.

3.4.5.2 Daily Constant Maturity Forward Price (DCMFP)

For a given SCM, the Daily Constant Maturity Forward Price of a specific component is the price used to calculate relevant components of the CMCI for that tenor. The Daily Constant Maturity Forward Price of a component c, takes the following expression:

$$DCMFP_{c,SCM,t,d} = DCNP1_{c.t,d} \times CP1_{c,SCM,d} + DCNP2_{c.t,d} \times CP2_{c,SCM,d} \tag{18a}$$

where:

c	denotes component commodity c,
t	is the calculation date (by definition, a CMCI Business Day),
d	is the reference date for which contract proportions are calculated (please refer to Appendix B.2 for further details); and, for a component c, a Standard Constant Maturity SCM and a calculation date t,
$DCNP1_{c.t,d}$	is the Daily Contract Nearby Price at date t, that is to say the Forward or Futures Contract price associated with the futures contract whose MDP date is equal or immediately preceding the Daily Constant Maturity Date associated with the reference date d, (related to the specified Standard Constant Maturity or Constant Maturity Boundary), as defined by the Eligible Nearby Contract table,
$DCNP2_{c.t,d}$	is the Daily Contract Nearby Price at date t, that is to say the Forward or Futures Contract price associated with the futures contract whose MDP date is immediately following the Daily Constant Maturity Date associated with the reference date d (related to the specified Standard Constant Maturity or Constant Maturity Boundary), as defined by the Eligible Nearby Contract table.

When, for a specific component, the Standard Constant Maturity tenor is limited by a Constant Maturity boundary (CMB), the definition of the Constant Maturity Forward Price is simply amended using CMB instead of SCM.

$$DCMFP_{c,CMB,t,d} = DCNP1_{c.t,d} \times CP1_{c,CMB,d} + DCNP2_{c.t,d} \times CP2_{c,CMB,d} \qquad (18b)$$

3.5 THE CMCI SCM INDEX LEVELS

For each Index, three indices are calculated and published:

- The Price Index (CMCI-PI),
- The Excess Return (CMCI-ER),
- The Total Return (CMCI-TR).

All three series are calculated for the following Standard Constant Maturities:

- 3 Months (3M),
- 6 Months (6M),
- 1 Year (12M),
- 2 Years (24M).
- 3 Years (36M).

Market Disruption Events are dealt with the procedures set forth in Section 2.4.

If a Market Disruption Event occurs during the rebalancing period, the percentage amount being rebalanced on such a day is deemed to be rebalanced on the following CMCI Business Day. If there is a disruption event on or beyond the last business day of the month, the amount to be rebalanced will be carried forward until the next CMCI Business Day.

3.5.1 The CMCI-Price Index (CMCI-PI)

The CMCI Price Index (CMCI-PI) is a representation of commodity price levels for a designated part of the forward curve and is calculated on the basis of the prices of the CMCI Constant Maturity Forwards on the relevant commodities for the appropriate tenors.

CMCI Price Indices are set equal to 1000 on January 29th, 2007.

3.5.1.1 Calculation of the Component Nominal Weights (CNW)

The CMCI calculations taking place during rebalancing periods, or Maintenance Periods, are different from those performed during non-rebalancing periods, or non-Maintenance Periods. These distinctions apply equally to the Price Index (PI), the Excess Return (ER) and Total Return (TR) indices.

- Rebalancing periods take place each month and are used to rebalance the components of the CMCI to their Target Weights, as discus in Section 3.3.
- Maintenance Periods, which occur once annually, involve rebalancing but also a re-weighting of the Index components to take into account new Target Weights.
- Non- rebalancing periods and non-Maintenance Periods refer to periods other than those in which a rebalancing or re- weighting takes place.

The new Component Nominal Weights (CNWs) are calculated monthly, at the close of business on the business day immediately preceding the first rebalancing day (i.e., the fourth to last business day of the month).

On that day, the new CNWs are calculated such that the effective weights match the Component Target Weights (TW), defined for the next period. At the close of business on the day prior to the first maintenance day, using known settlement prices, CNWs are calculated.

Without loss of generality, we define $CNW_{N,SCM,new} = x$ as an arbitrary constant. For all components in the composite Index, we then solve for:

$$\frac{CNW_{c,SCM,new} \times DCMFP_{c,SCM,t,t} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}}}{\sum_{c=1,N} CNW_{c,SCM,new} \times DCMFP_{c,SCM,t,t} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}}} - TW_{c,\%} = 0 \tag{19}$$

Also note that:

$$TW_1 + \cdots + TW_n = 1$$

For notation purposes, one introduces currency denominated quantities:

$$XDCMFP_{ICR,c,SCM,t,t} = DCMFP_{c,SCM,t,t} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}} \tag{20}$$

$$XDCMFP_c = XDCMFP_{ICR,c,SCM,t,t}$$

As shown in Appendix C, this system has the following analytic solution:

$$\begin{aligned} CNW_{ICR,1,SCM,new} &= \frac{TW_1\, XDCMFP_N}{TW_N\, XDCMFP_1} \cdot x \\ CNW_{ICR,2,SCM,new} &= \frac{TW_2\, XDCMFP_N}{TW_N\, XDCMFP_2} \cdot x \\ CNW_{ICR,3,SCM,new} &= \frac{TW_3\, XDCMFP_N}{TW_N\, XDCMFP_3} \cdot x \\ &\ldots \\ CNW_{ICR,N,SCM,new} &= x \end{aligned} \tag{21}$$

3.5.1.2 Calculation during Non-Maintenance Periods

During a non-Maintenance Period, the CMCI-PI calculated for a family of defined Standard Constant Maturities (SCM) is obtained by the multiplication of the Basket Value (BV) (which represents the value of a component or group of components of the CMCI) by the Maintenance Factor (MF). The Maintenance Factor is used to prevent any discontinuity of the price index associated with changes in nominal weights over time. For any non-maintenance days, BV is calculated for each component as the Sum of Daily Constant Maturity Forward Price (DCMFP) of each basket component multiplied by the respective Component Nominal Weight (CNW). The DCMFP are adjusted by price scalars reflecting reference foreign currency exchange rates versus, for example the U.S. Dollar, such that all DCMFP are expressed in the same currency.

For non-maintenance days and, for example, on the USD index, the calculation is performed as follows:

$$CMCI\text{-}PI_{USD,SCM,t} = MF_{SCM,USD} \times \sum_{c=1,N} DCV_{c,USD,SCM,t,t} = MF_{SCM,USD} \times BV_{USD,SCM,t,t} \tag{22}$$

and

$$DCV_{c,USD,SCM,t,t} = IsIn_{c,Index} \times DCMFP_{c,SCM,t,t} \times CNW_{c,SCM} \times \left[FX_{USD,c,t}\right]^{CCYScalar_{USD,ccy}} \tag{23}$$

where:

$BV_{USD,SCM,t,t}$	is the Basket Value (i.e for any given index, the sum of Daily Component Value),
$DCV_{c,USD,SCM,t,t}$	is the Daily Component Value calculated at time t,
$CNW_{c,SCM}$	is the Component Nominal Weight for a component c and for a specific Standard Constant Maturity (SCM),
$DCMFP_{c,SCM,t,t}$	is the Daily Constant Maturity Forward Price, for a component c and for a specific

	SCM, calculated at time t and with Contract Proportions taken at time t.
$FX_{USD,c,t}$	is the Currency spot rate between the quotation currency of the component instrument and the Index currency reference (ICR) in which the Index is expressed (here USD), as defined in Section 2.2 and Appendix A.
$IsIn_{c,Index}$	a scalar factor with positive value, which allows to control the component c's effective weight in the calculated index.
$CCYScalar_{USD,ccy}$	is +1 or −1 (please see Table I in Section 2.2).

Indices for each SCM are calculated in U.S. Dollars (USD) and Euro (EUR).

The generic expression for any Index Currency Reference (ICR) is below (see further detail in Appendix A):

$$CMCI\_PI_{ICR,SCM,t} = MF_{SCM,USD} \times \sum_{c=1,N} DCV_{c,ICR,SCM,t,t} = MF_{SCM,ICR} \times BV_{ICR,SCM,t,t} \tag{24}$$

$$DCV_{c,ICR,SCM,t,t} = IsIn_{c,Index} \times DCMFP_{c,SCM,t,t} \times CNW_{c,SCM,t} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}} \tag{25}$$

The standard specifications for the components included in the Index are provided in Appendix D.

3.5.1.3 Calculation during Maintenance Periods

On the day before the start of the rebalancing period, the CMCI is calculated based on the old CNWs (reflecting old TWs) and MFs used so far in the calculation.

The first part of the formula is then adjusted for the Maintenance Factor changes and multiplied by the Basket Value Ratio (BVR) which reflects the change in the Basket Value resulting from the shift from the Old to the New TWs and therefore also to the new CNWs.

The process applies to all monthly rebalancing, as well as the July Maintenance Period. During Maintenance Period, the calculation formula for BV is:

$$BV_{ICR,SCM,t,t} = \frac{MF_{ICR,old}}{MF_{ICR,new}} \times \left[\sum_{c=1,N} IsIn_{c,Index} \times CNW_{c,old} \times RP1_{c,t} \times DCMFP_{c,SCM,t,t} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}}\right]$$
$$+ \sum_{c=1,N} IsIn_{c,Index} \times CNW_{c,new} \times RP2_{c,t} \times DCMFP_{c,SCM,t,t} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}} \tag{26}$$

Where:

$RP1_{c,t}$ and $RP2_{c,t}$	are the rebalancing proportions for component c, at calculation date t, and can take the following values. $RP1_{c,t} = \left\{1, \frac{2}{3}, \frac{1}{3}, 0\right\}$ $RP2_{c,t} = 1 - RP1_{c,t} = \left\{0, \frac{1}{3}, \frac{2}{3}, 1\right\}$

New Maintenance Factors are calculated at the close of business on the CMCI Business Day immediately pre-ceding the first maintenance day, and their values used for subsequent calculations:

$$BVR_{ICR,SCM,t,t} = \frac{\sum_{c=1,N} IsIn_{c,Index} \times CNW_{c,SCM,new} \times DCMFP_{c,SCM,t,t} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}}}{\sum_{c=1,N} IsIn_{c,Index} \times CNW_{c,SCM,old} \times DCMFP_{c,SCM,t,t} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}}} \quad (27)$$

Where BVR is the Basket Value Ratio. This results in:

$$MF_{ICR,SCM,new} = \frac{MF_{ICR,SCM,old}}{BVR_{ICR,SCM,t,t}} \quad (28)$$

3.5.2 The CMCI Excess Return (CMCI-ER)

CMCI Excess Return Indices are set equal to 1000 on 29 January 2007.

3.5.2.1 Calculation during Non-Maintenance Periods

The CMCI Excess Return Index is calculated on each CMCI Business Day and represents the uncollateralized return of the CMCI basket over time, and for one specific SCM. The Index has the following expression:

$$CMCI\text{-}ER_{ICR,SCM,t} = CMCI\text{-}ER_{ICR,SCM,t-1} \times \left(1 + IDR_{ICR,SCM,t}\right) \quad (29)$$

With:

$$IDR_{ICR,SCM,t} = \frac{BVF}{BV1} - 1 = \frac{BV_{ICR,SCM,t,t-1}}{BV_{ICR,SCM,t-1,t-1}} - 1 \quad (30)$$

$$BVI = BV_{ICR,SCM,t-1,t-1} = \sum_{c=1,N} XDCMFP_{ICR,c,SCM,t-1,t-1} \times CNW_{c,SCM} \times IsIn_{c,Index}$$

$$BVF = BV_{ICR,SCM,t,t-1} = \sum_{c=1,N} XDCMFP_{ICR,c,SCM,t,t-1} \times CNW_{c,SCM} \times IsIn_{c,Index}$$

Where:

$IDR_{ICR,SCM,t}$	is the Index Daily Return, for a specified Currency Reference (ICR) and Standard Constant Maturity at time t.
BVF	is the Basket Value Final, calculated for an Index currency reference ICR, a Standard Constant Maturity SCM, and for a reference calculation date t, with Contract Proportions (CPs) taken at reference calculation time t-1,
$BV1$	is the Basket Value Initial, calculated for an Index currency reference ICR, a Standard Constant Maturity SCM, and for a reference calculation date t, with Contract Proportions (CPs) taken at reference calculation time t-1,
$XDCMFP_{ICR,c,SCM,t-1,t-1}$	is the Currency translated Daily Constant Maturity Forward Price, calculated for an Index currency reference ICR, a Standard Constant Maturity SCM, for a reference calculation date t, with Contract Proportions (CPs) taken at reference calculation time t-1,
$IsIn_{c,Index}$	a scalar factor with positive value, which allows to control the component c's effective weight in the calculated Index.

3.5.2.2 Calculation during Maintenance Periods

The Index Daily Return is defined as the percentage change in the BV of the CMCI from one CMCI Business Day to the next. It reflects the return that would have been realized by holding positions in the DCMF to reflect the CNWs (TWs), from the closing of the trading platform on the prior CMCI Business Day to the closing of the trading platform on the next CMCI Business Day.

The daily Rebalancing Proportions (RP) used to calculate BVI and BVF are identical to those used to calculate the CMCI Price Index on the CMCI Business Day immediately preceding the calculation date. During a standard rebalancing period from the first to the last CMCI Business Day of the rebalancing period the calculation is as follows:

$$BVI_{ICR,SCM,t-1,t-1} = \frac{MF_{ICR,SCM,old}}{MF_{ICR,SCM,new}} \times \left[\sum_{c=1,N} IsIn_{c,Index} \times CNW_{SCM,c,old} \times RPI_{c,t-1} \times XDCMFP_{ICR,SCM,c,t-1,t-1}\right] + \sum_{c=1,N} IsIn_{c,Index} \times CNW_{SCM,c,new} \times RP2_{c,t-1} \times XDCMFP_{ICR,SCM,c,t-1,t-1} \quad (31)$$

and

$$BVF_{ICR,SCM,t,t-1} = \frac{MF_{ICR,SCM,old}}{MF_{ICR,SCM,new}} \times \left[\sum_{c=1,N} IsIn_{c,Index} \times CNW_{SCM,c,old} \times RPI_{c,t-1} \times XDCMFP_{ICR,SCM,c,t,t-1}\right] + \sum_{c=1,N} IsIn_{c,Index} \times CNW_{SCM,c,new} \times RP2_{c,t-1} \times XDCMFP_{ICR,SCM,c,t,t-1} \quad (32)$$

$RP1_{c,t}$ and $RP2_{c,t}$ are the rebalancing proportions for component c, at calculation date t, and can take the following values.

$RP1_{c,t} = \left\{1, \frac{2}{3}, \frac{1}{3}, 0\right\}$

$RP2_{c,t} = 1 - RP1_{c,t} = \left\{0, \frac{1}{3}, \frac{2}{3}, 1\right\}$

3.5.3 The CMCI Total Return (CMCI-TR)

CMCI Total Return Indices are set equal to 1000 on 29 January 2007.

3.5.3.1 Calculation of the Total Return Index

CMCI-TR is derived from the CMCI Excess Return Index. In addition to uncollateralized returns generated from the CMCI basket, a daily fixed income return is added, and the Index value takes the following expression:

$$CMCI\text{-}TR_{ICR,SCM,t} = CMCI\text{-}TR_{ICR,SCM,t-1} \times DITRF_{ICR,SCM,t} \quad (33a)$$

where:

$$DITRF_{ICR,SCM,t} = \left(1 + IDR_{ICR,SCM,t} + IRR_{ICR,t}\right) \quad (33b)$$

IRR is the Interest Rate Return calculated for each Index Currency Reference (ICR),

$IDR_{ICR,SCM,t}$ is the Index Daily Return, for a specified Index Currency Reference (ICR) and Standard Constant Maturity at time t.

The fixed income return component of the Total Return Index reflects the interest earned on securities theoretically based on the notional for hypothetical positions in the contracts comprising the Index.

In order to determine the Interest Rate Return (IRR) component of the TR indices, Daily Reference Rate (DRR) for the currency in which the index is quotes (ICR) needs to be determined.

DRR is the Daily Reference Rate, a function of the rate available on the immediately preceding CMCI Business Day (ARR), the ARRA and ARRS. The form of the compounding expression is a function of the Index Currency Reference (ICR) defined below, and DRR takes the following form:

$$DRR_{ICR,t} = ARRS_{ICR,t} \times ARR_{ICR,t} + ARRA_{ICR,t} \qquad (16)$$

$ARRA$ & $ARRS$ are the Available Reference Rate Adjustment and Available Reference Rate Scalar, the rate adjustment and scalar factor respectively used - when applicable - to reflect any particular funding cost or rate differential applicable and associated to an ICR for an A+/A-1 (S&P) and/or Aa3/P-1 (Moodys) issuer. The ARRA and ARRS can change periodically to reflect market conditions. The ARRA may be amended to be lower than the specified rates below in the scenario whereby the ARR falls below the ARRA level.

$caldays$ is the integer number of Calendar days from the previous CMCI Business Day to the CMCI Business Day on which the calculation is made.

Available Reference Rates used for the calculation of the respective Total Return indices are defined below.

USD

ARR Secured Overnight Funding Rate (SOFR), published by the Federal Reserve Bank of New York, currently available on the website: https://www.newyorkfed.org/markets/reference-rates/sofr or Bloomberg SOFRRATE Index <GO> or Reuters .SOFR.

ARRA 0.0%

ARRS 1.0

IRR

$$IRR_{USD,t} = SOFR_{t-1} * \frac{Calendar\ Days_{(t-1,t)}}{360} \qquad (34a)$$

EUR

ARR The overnight Euro rate, represented by the euro short-term rate €STR + 8.5 bps (BBG Code: ESTRON Index <GO>), which reflects the wholesale euro unsecured overnight borrowing costs of banks located in the euro area.

Effective October 29, 2021, EONIA was replaced by the €STR rate plus 8.5bps.

ARRA -0.1%

ARRS 1.0

IRR

$$IRR_{EUR,t} = \left[\frac{1}{1 - \frac{90}{360} * DRR_{EUR,t-1}}\right]^{\frac{caldays}{90}} - 1 \qquad (34b)$$

CHF

ARR The overnight Swiss Franc rate represented by the Swiss Average Rate Overnight 'SARON' (BBG Code: SRFXON3 Index <GO>; Reuters: SARON.S) Source is SIX Swiss Exchange.

ARRA -0.1%

ARRS 1.0

IRR

$$IRR_{CHF,t} = \left[\frac{1}{1 - \frac{90}{360} \times DRR_{CHF,t-1}}\right]^{\frac{caldays}{90}} - 1 \qquad (34c)$$

JPY **ARR** The overnight Yen rate, derived from the Mutan Overnight Average Call Rate (BBG Code: MUTKCALM Index <GO>; Reuters:TANSHK, JPONMU=RR FOR HISTORICAL), as published daily by Bank of Japan

ARRA -0.15%

ARRS 1.0

IRR

$$IRR_{JPY,t} = \left[\frac{1}{1 - \frac{90}{360} \times DRR_{JPY,t-1}}\right]^{\frac{caldays}{90}} - 1 \qquad (34d)$$

GBP **ARR** The Sterling overnight rate, represented by SONIA (BBG Code: SONIO/N Index <GO>; Reuters: SONIA Page, SONIAOSR= for history), which is the weighted average of all unsecured Sterling overnight cash transactions brokered in London between Midnight and 4.15pm. (WMBA).
The rate is published daily 5:00 PM London time and effected on the CMCI Business Day immediately following.

ARRA -0.1%

ARRS 1.0

IRR

$$IRR_{GBP,t} = \left[\frac{1}{1 - \frac{91}{360} \times DRR_{GBP,t-1}}\right]^{\frac{caldays}{91}} - 1 \qquad (34e)$$

AUD **ARR** The overnight Australian Dollar rate (BBG Code: RBACOR Index <GO>; Reuters: RBA30 PAGE, AUCASH=RBAA), determined from the Reserve Bank of Australia Cash Rate Overnight. Source is Australian Bureau of Statistics.
The rate is published on any Australian business and banking days at approximately 8:30 PM Sydney time and effected on the CMCI Business Day immediately following.

ARRA -0.2%

ARRS 1.0

IRR

$$IRR_{AUD,t} = \left[\frac{1}{1 - \frac{91}{365} \times DRR_{AUD,t-1}}\right]^{\frac{caldays}{91}} - 1 \qquad (34f)$$

CAD **ARR** The Canadian Dollar overnight rate, represented by Canadian Overnight Repo Rate Average ("CORRA") (BBG Code: CAONREPO Index <GO>; Reuters: BOCWATCH, CORRA= FOR HISTORICAL), published by the Bank of Canada
The rate is published daily at 2:00 PM London time and effected on the CMCI Business Day immediately following.

ARRA -0.15%

ARRS 1.0

IRR

$$IRR_{CAD,t} = \left[\frac{1}{1 - \frac{91}{365} \times DRR_{CAD,t-1}}\right]^{\frac{caldays}{91}} - 1 \qquad (34g)$$

3.5.4 The CMCI Currency Hedged Indices (XMCI)

CMCI Currency Hedged indices aim to facilitate CMCI investment in currencies other than the US Dollar. All Currency Hedged indices described in this section are prefixed by the letter X. Monthly Currency Hedged Indices are described and listed in Appendix D 3.5

Currency Hedged indices are available in all major non-USD currencies in the traditional forms of Excess and Total Return indices.

3.5.4.1 Currency Hedged Excess Return Indices

XMCI Excess Return Indices are set equal to 1000 on 29 January 2007.

Currency Hedged Excess Return Indices are calculated as per the following formula:

$$XMCI\text{-}ER_{ICR,SCM,t} = XMCI\text{-}ER_{ICR,SCM,t-1} \times \left[1 + \left(\frac{CMCI\text{-}ER_{USD,SCM,t}}{CMCI\text{-}ER_{USD,SCM,t-1}} - 1\right) \times \left(\frac{FX_{ICR,t-1}}{FX_{ICR,t}}\right)^{CCYScalar_{ICR,USD}}\right] \qquad (35)$$

where:

$CMCI\text{-}ER$	the underlying USD CMCI Excess Return Index (or Sub Index) taken as a reference for the calculation of the uncollateralized commodity return,
t	is the CMCI Business Day on which the calculation is made.
$FX_{ICR,t}$	is the Currency exchange rate between the USD and the Index currency reference (ICR) for a given date t (please see Section 2.2).
$CCYScalar_{ICR,USD}$	is +1 or -1 (please see Table I in Section 2.2).

3.5.4.2 Currency Hedged Total Return Indices

XMCI Total Return Indices are set equal to 1000 on 29 January 2007.

Currency Hedged Total Return Indices are calculated as per the following formula:

$$XMCI_{TR_{ICR,SCM,t}} = XMCI_{TR_{ICR,SCM,t-1}} \times \left(1 + \left(\frac{CMCI\text{-}ER_{USD,SCM,t}}{CMCI\text{-}ER_{USD,SCM,t-1}} - 1\right) \times \left(\frac{FX_{ICR,t-1}}{FX_{ICR,t}}\right)^{CCYScalar_{ICR,USD}} + IRR_{ICR,t}\right) \qquad (36)$$

where:

IRR	Interest Rate Return is the compounding factor calculated for each Index Currency Reference as defined in Section 3.5.3.1 above.

3.6 THE CMCI INDIVIDUAL TENOR WEIGHTS

The CMCI Benchmark Index is built on the basis of the CMCI Index. As such, the benchmark index strictly respects the original CMCI component weight distribution and allocates, for each component, portions of the weights defined by the CMCI Weighting engine to eligible Standard Constant Maturities (SCM). Like the CMCI, the benchmark Index also rebalances on a monthly basis.

A notable addition to the technical framework is the curve rebalancing mechanism, a procedure designed to provide additional weight control over the fluctuations of the structures of forward curves.

3.6.1 Definition of Tenor Open Interest Value (TOIV)

The Tenor Open Interest Value (TOIV) reflects the U.S. Dollar value of the open interest on a given commodity trading instrument or component over the relevant period of time and is defined as the U.S. Dollar value of the average of the daily reference contract open interest value over a specified Liquidity Reference Period (LRP) and for a specific Standard Constant Maturity (SCM), as per the Allocation Methodology.

$$TOIV_{d,SCM} = \frac{1}{BD}\sum_{i=1}^{BD-1}\left(\alpha_{TD,d-i,SCM} \times DOIQ_{d-i} \times P_{1,CCY,d-i}\right) \times \left[FX_{USD,CCY,d-i}\right]^{CCYScalar_{USD,ccy}} \quad (37)$$

where

$$\alpha_{TD,d-i,SCM_1} = \frac{T_2 - TD}{T_2 - T_1} \quad and \quad \alpha_{TD,d-i,SCM_2} = \frac{TD - T_1}{T_2 - T_1}$$

$DOIQ$	for a Calculation Reference Date d, the Daily Open Interest Quantity associated to a specified Futures contract or forward prompt date (as appropriate) as reported by the exchange facility on which the component is traded and/or to which such component is associated. Such Open Interest is allocated linearly to immediately adjacent SCMs on the basis of time to delivery (such time to delivery being measured as the difference between the MDP[2] of the contract and the calculation date d-i). The obtained figure is then multiplied by the number of units of such commodity per contract,
$P_{1,CCY,d-i}$	is the component's first nearby price taken at date d minus i days. When i equals zero, the date is the CRD,
d	the Calculation Reference Date (CRD),
BD	the number of CMCI Business Days from and including the first day of the LRP, to and including the last day of the LRP (the CRD itself),
$T1$ and $T2$	The time boundaries measured in days, immediately adjacent to a Standard Constant Maturity SCM,
TD	The time to delivery measured in days, as the difference between the MDP of the designated contract and the calculation date d-i,
$SCM1$ and $SCM2$	The Standard Constant Maturities immediately adjacent to the delivery date TD.

Linear Allocation Methodology

In order to allocate Open interest and Market Volume data to each SCM, a linear allocation approach is used (the Allocation Methodology). This method prevents discontinuities while estimating liquidity conditions for a specific segment of the forward curve (denoted as SCM). By allocating the data (Open Interest, Market Volume data) across the two SCMs immediately adjacent to the Time to Delivery (TD) of the instrument at the time of calculation, we measure conditions of real liquidity and closely match the calculation methodology of the Daily Constant Maturity Forward Price

[2] Note we use the adjusted 3M MDP. Historical and Forward looking MDP dates for each commodity components are available on request from the Index Sponsors.

(DCMFP).

The time intervals used in the Linear Allocation methodology are featured in the Table VI. below.

Table VI. Definition of Constant Maturity Boundaries for Linear Allocation

SCM	O/N	3M	6M	1Y	2Y	3Y	4Y	5Y
T (Days)	0	91	182	365	730	1095	1460	1825

3.6.2 Average Tenor Open Interest Value (ATOIV)

The Average Tenor Open Interest Value (ATOIV) for a given SCM, is the weighted average of the four most recent calculated TOIV at the time of calculation, with the weights assigned to each of the four TOIVs, for purposes of averaging, being 35% for the most recent TOIV, and 30%, 25% and 10%, respectively, for each of the TOIVs calculated for the previous periods.

$$ATOIV_{c,SCM,d} = \frac{\sum_{i=1}^{4}\left(TOIV_{c,SCM,i} \times w_i\right)}{\sum_{i=1}^{4}\left(1_{TOIV_i<>0} \times w_i\right)} \tag{38}$$

where

$w_i = \{35\%, 30\%, 25\%, 10\%\}$ and $i = 1$ refers to the most recent period in the average.

3.6.3 Component Tenor Open Interest Weight (CTOIW)

For component c and a Standard Constant Maturity SCM, the Component Tenor Open Interest Weight (CTOIW) is calculated. CTOIW measures the relative importance of each segment of a commodity forward curve through Open Interest data, and is calculated as per the following formula:

$$CTOIW_{c,SCM,d} = \frac{ATOIV_{c,SCM,d}}{\sum_{i=1}^{AT} ATOIV_{c,i,d}} \tag{39}$$

where

AT refers to the number of Available Tenors for such commodity.

3.6.4 Liquidity: Market Volume Calculations

3.6.4.1 Definition of Tenor Market Volume Value (TMVV)

The Tenor Market Volume Value (TMVV), which reflects the U.S. Dollar value of the volume of a given commodity trading instrument or component that is traded over the relevant period, is calculated based on sources considered commercially reliable (such as reports by brokers or dealers in the relevant markets, market volume reports, official statistics, etc.) and on the basis of methodologies believed to be appropriate from time to time, in light of the purpose of the TMVV, in determining the composition of the Benchmark Index, and the objectives and purposes of the Index. The CMCI Governance Committee creates the methodology used to determine the TMVV with respect to each commodity publicly available.

The TMVV, calculated for the purpose of regularly scheduled CMCI Governance Committees, is defined as the U.S. Dollar converted value of the average of the total daily component volume (measured as described above) over the specified Liquidity Reference Period (LRP), as per the Allocation Methodology

$$TMVV_{d,SCM} = \frac{1}{BD}\sum_{i=1}^{BD-1}\left(\alpha_{TD,d-i,SCM} \times DVQ_{d-i} \times P_{1,CCY,d-i}\right) \times \left[FX_{USD,CCY,d-i}\right]^{CCYScalar_{USD,ccy}} \tag{40}$$

where

$$\alpha_{TD,d-i,SCM_1} = \frac{T_2 - TD}{T_2 - T_1} \quad and \quad \alpha_{TD,d-i,SCM_2} = \frac{TD - T_1}{T_2 - T_1}$$

DVQ	for a Calculation Reference Date d, the Daily Volume Quantity associated to a specified Futures contract or forward prompt date (as appropriate) as reported by the exchange facility on which the component is traded and/or to which such component is associated. Such Volume is allocated linearly to immediately adjacent SCMs on the basis of time to delivery (such time to delivery being measured as the difference between the MDP of the contract and the calculation date d-i). The obtained figure is then multiplied by the number of units of such commodity per contract,
$P_{1,CCY,d-i}$	is the component's first nearby price taken at date d minus i days. When i equals zero, the date is the CRD,
d	the Calculation Reference Date (CRD),
BD	the number of CMCI Business Days from and including the first day of the LRP, to and including the last day of the LRP (the CRD itself),
$T1$ and $T2$	The time boundaries measured in days, immediately adjacent to a Standard Constant Maturity SCM,
TD	The time to delivery measured in days, as the difference between the MDP of the designated contract and the calculation date d-i,
$SCM1$ and $SCM2$	The Standard Constant Maturities immediately adjacent to the delivery date TD.

LME Allocation Methodology

For LME Metals, Market Volume data is not available in detailed form as it is for the Open Interest (i.e. by prompt date). Therefore, to avoid introducing subjective assumptions in the calculation of tenor liquidity weights Open Interest is used. To reproduce Open Interest data comparable with those of the other exchanges, a simple allocation approach based on the third Wednesday of the month prompt date is used. The aggregated data obtained is then treated like any other standard Futures Contract.

The CMCI Governance Committee, in consultation with the CMCI Advisory Committee, will use reasonable measures to promote consistency of approach across OTC and Exchange-traded markets.

3.6.4.2 Average Tenor Market Volume Value (ATMVV)

The Average Tenor Market Volume Value (ATMVV) for a given SCM, is the weighted average of the four most recent calculated TMVVs at the time of calculation, with the weights assigned to each of the four TMVVs for purposes of averaging being 35% for the most recent CMVV, and 30%, 25% and 10%, respectively, for each of the TMVVs calculated for the previous periods.

ATMVV is calculated based on the following formula:

$$ATMVV_{c,SCM,d} = \frac{\sum_{i=1}^{4}\left(TMVV_{c,SCM,i} \times w_i\right)}{\sum_{i=1}^{4}\left(1_{TOIV_i<>0} \times w_i\right)} \tag{41}$$

where

$w_i = \{35\%, 30\%, 25\%, 10\%\}$ and $i = 1$ refers to the most recent period in the average.

3.6.4.3 Component Tenor Market Volume Weight (CTMVW)

For a component c and a Standard Constant Maturity SCM, the Component Tenor Market volume Weight (CTMVW) is also defined. CTMVW measures the relative importance of each segment of a commodity forward curve through Market Volume data, and is calculated as per the following formula:

$$CTMVW_{c,SCM,d} = \frac{ATMVV_{c,SCM,d}}{\sum_{i=1}^{AT} ATMVV_{c,i,d}} \tag{42}$$

where

AT refers to the number of Available Tenors for such commodity.

3.6.5 CMCI Benchmark Index Individual Tenor Weights (ITWs)

3.6.5.1 The purpose of the Individual Tenor Weights and Tenor Weight Adjusting Factors

The purpose of the Individual Tenor Weights and related requirements is to enhance the tradability of the CMCI Benchmark Index by maximizing the extent to which it is comprised of liquid instruments.

3.6.5.2 Calculation of CMCI Benchmark Index Individual Tenor Weights (ITWs)

The eligible SCM for each Commodity Component are determined by the CMCI Governance Committee, in conjunction with CMCI Advisory Committee. Weight of each tenor is set to be

$$ETW_{c,SCM} = \frac{1}{n_c} \tag{43}$$

where n_c is the number of tenors for each component c.

Liquidity Tenor Weights are the result of a blend between the Component Tenor Market Volume Weights and The Component Tenor Open Interest Weights Calculated above, using the following formula.

$$LTW_{c,SCM} = \frac{1}{2} CTOIW_{c,SCM} + \frac{1}{2} CTMVW_{c,SCM} \tag{44}$$

Finally, the two notions are combined to obtain the Individual Tenor Weight (ITW), using the following formula.

$$ITW_{c,SCM} = \frac{1}{4} ETW_{c,SCM} + \frac{3}{4} LTW_{c,SCM} \tag{45}$$

3.6.5.3 CMCI Benchmark Index Target Tenor

For a given Basket of CMCI Components, Duration is defined as:

$$TargetDuration_{Basket} = \sum_{c=1}^{N} TW_c \times \left(\sum_{j=1}^{AT} IsIn_{c,j} \times TT_j \times ITW_{c,j} \right) \tag{46}$$

where:

$IsIn_{c,j}$	is a binary integer equal to 1 if the component c and an SCM j is a member of the quoted basket and equal to 0 otherwise,
TT_j	is the Target Tenor for an SCM j, as defined in Table VII. Below,
$ITW_{c,j}$	is the Individual Target Weight for a component c and an SCM j.

Table VII. Definition of Constant Maturity Boundaries for Non-CMCI Indices

SCM	3M	6M	1Y	2Y	3Y
Target Tenor (TT)	3	6	12	24	36

3.7 THE CMCI BENCHMARK INDEX LEVELS (HEADLINE INDEX)

The CMCI Benchmark Index is built on the basis of the CMCI Index. As such, the benchmark index strictly respects the original CMCI component weight distribution and allocates, for each component, portions of the weights defined by the CMCI Weighting engine to eligible Standard Constant Maturities (SCM). Like the CMCI, the benchmark Index also rebalances on a monthly basis.

A notable addition to the technical framework is the curve rebalancing mechanism, a procedure designed to provide additional weight control over the fluctuations of the structures of forward curves.

The following section provides a detailed explanation for the calculation of:

- The CMCI Benchmark Price Index (CMCIB-PI),
- The CMCI Benchmark Excess Return Index (CMCIB -ER),
- The CMCI Benchmark Total Return Index (CMCIB-TR).
- The CMCI Benchmark Net of Cost Indices (CMCIB-Ns)

Market Disruption Events are dealt with the procedures set forth in Section 2.4.

If a Market Disruption Event occurs during the rebalancing period, the percentage amount being rebalanced on such a day is deemed to be rebalanced on the following CMCI Business Day. If there is a disruption event on or beyond the last business day of the month, the amount to be rebalanced will be carried forward until the next CMCI Business Day.

3.7.1 The CMCI Benchmark – Price Index (CMCIB-PI)

For the purpose of the calculation of the CMCI Benchmark Index, the calculations taking place during rebalancing periods, or maintenance periods, are differentiated from those performed during non-rebalancing periods, or non-Maintenance Periods. These distinctions apply equally to the Benchmark Price Index (PI), the Excess Return (ER) and Total Return (TR) indices.

Rebalancing periods take place each month and are used to rebalance the components of the CMCI to their Target Weights, as discussed in Section 3.3 of this Technical Document. Curve Rebalancing periods take place each month and are used to rebalance the Benchmark's exposure to the respective segments of the forward curve on each component of the CMCI to their respective Individual Tenor Weights (ITW), as discussed in Section 4.1.

Maintenance Periods, which occur once annually, involve rebalancing but also a possible re-weighting of the CMCI Index components to take into account new CMCI Target Weights. Non-rebalancing periods and non-Maintenance Periods refer to periods other than those in which a rebalancing or reweighting takes place.

CMCI Benchmark Price Indices are set equal to 1000 on 29 January 2007.

3.7.1.1 The Index Curve Rebalancing Mechanism and the Calculation of TWAFs

The CMCI is rebalanced monthly in order to bring the components back into line with their Target Weights. This rebalancing is necessitated by the fact that the CMCI weightings are in part based on the prices of each of the constituent constant maturity forward prices and naturally over-weights the best performing assets and under-weights the worst performing ones. As market prices fluctuate, therefore, the effective weights of the constituent components "drift" from their initial Target Weights. As a result, it is necessary to re-balance the Index periodically to maintain its original weighting.

The same mechanism applies to CMCI Benchmark for the purpose of rebalancing the positions held on each of the respective Standard Constant Maturities or Tenors.

This is accomplished by rebalancing the Individual Tenor Weights (ITW) during each curve Maintenance Period. The process is automatic and is implemented via a pre-defined process. The calculation of the new TWAFs is effected monthly, at the close of business on the business day immediately preceding the first rebalancing day (i.e., the fourth to last business day of the month).

On that day, the new TWAFs are calculated such that the Effective Tenors Weights match the Individual Tenor Weights (ITW) defined for the next period (for curve rebalancing periods), or component Tenor Effective Weights (CTEW) for the current period (for non-curve rebalancing periods).

Calculation of TWAFs for Curve Rebalancing Periods

At the close of business on the day prior to the first maintenance day, using known settlement prices, TWAFs are calculated as the product of the Adjusting Factor (AF) and the Individual Tenor Weights (ITW).

$$TWAF_{ICR,c,j,new} = ITW_{ICR,c,j} \times AF_{ICR,c,j} \tag{47}$$

where:

$AF_{ICR,c,j}$	as per below in (8)
$TWAF_{ICR,c,j,new}$	the Individual Tenor Weights defined per component and Standard Constant Maturity.

Calculation of TWAFs for Non-curve Rebalancing Periods

In the case where the curve and price rebalancing frequencies do not remain identical (as a result of an adjustment made to either CMCI or CMCI Benchmark), the new TWAFs would be calculated as per the formula set forth below.

At the close of business on the day prior to the first maintenance day, using known settlement prices, TWAFs are calculated as the product of the Adjusting Factor (AF) and the Component Tenor Effective Weights (CTEW) for all eligible SCM and components in the CMCI Benchmark Composite Index. We have:

$$TWAF_{ICR,c,j,new} = CTEW_{ICR,c,j} \times AF_{ICR,c,j} \tag{48}$$

$$CTEW_{ICR,c,j} = \frac{CNW_{c,j,old} \times TWAF_{c,j,old} \times XDCMFP_{ICR,c,j,t,t}}{\sum_{j=1,AT} CNW_{c,j,old} \times TWAF_{c,j,old} \times XDCMFP_{ICR,c,j,t,t}} \tag{49}$$

$$AF_{ICR,c,j} = \frac{CNW_{c,1,new} \times XDCMFP_{ICR,c,1,t,t}}{CNW_{c,1,new} \times XDCMFP_{ICR,c,j,t,t}} \tag{50}$$

where:

$CTEW$	is the Component Tenor Effective Weight,
$AF_{ICR,c,j}$	the Adjusting Factor for a given commodity Component c and SCM j.

The new TWAFs are solved for all commodity components in the CMCI Benchmark Composite index.

3.7.1.2 Calculation during Non-Maintenance Periods

The CMCI Benchmark Price Index (CMCIB-PI) is a representation of commodity price levels for the eligible segment forward curve and is calculated based on the prices of the CMCI Constant Maturity Forwards on the relevant commodities.

During non-Maintenance Periods, the CMCIB-PI is obtained by the multiplication of the Curve Value (CV) (which represents the value of the tradable forward curve for a component or group of components of the CMCI Benchmark Index) by the Maintenance Factor (MF). The Maintenance Factor, unique to each Index (i.e., a function of each basket composition), is used to prevent any discontinuity of the price index associated with changes in nominal weights over time.

For any non-maintenance days, CV is calculated for each component as the sum of Curve Component Values, which, in turn, is equal to the sum, for each Standard Constant Maturity (SCM), of Daily Constant Maturity Forward Price (DCMFP) multiplied by the respective Component Nominal Weight (CNW) and by the respective Tenor Weight Adjustment Factors (TWAF). The DCMFP are adjusted by price scalars reflecting reference foreign currency exchange rates versus the Reference Currency (ICR), such that all DCMFP are expressed in the same currency.

For non-maintenance days the calculation is as follows:

$$CMCIBPI_{ICR,t} = MF_{ICR} \times CV_{ICR,t,t} = MF_{ICR} \times \sum_{c=1,N} CCV_{c,ICR,t,t} \tag{51}$$

and

$$CCV_{c,ICR,t,d} = \sum_{j=1,AT} IsIn_{c,j,Index} \times CNW_{c,j} \times TWAF_{c,j} \times DCMFP_{c,j,t,d} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}} \tag{52a}$$

where:

$CV_{ICR,t,t}$	is the Curve Value (i.e for any given Index, the sum of Curve Component Value),
$CCV_{c,ICR,t,t}$	is the Curve Component Value for a component c calculated at time t,
$CNW_{c,j}$	is the Component Nominal Weight for a component c and a Standard Constant Maturity j,
$TWAF_{c,j}$	is the Tenor Weight Adjusting Factor for a component c and a Standard Constant Maturity j,
$DCMFP_{c,j,t,d}$	is the Daily Constant Maturity Forward Price, for a component c and for a SCM j calculated at time t and with Contract Proportions taken at time t.
$FX_{ICR,c,t}$	is the Currency exchange rate between the quotation currency of the component instrument and the Index currency reference (ICR) in which the Index is expressed
$IsIn_{c,j,Index}$	is a Binary constant with value 1 or 0 to indicate if the component c and SCM j is a member of the CMCI Index being calculated (note if IsInc,Index=0 then all IsInc,j,Index=0),
AT	is the number of Available Tenors for a component c,
$CCYScalar_{ICR,ccy}$	is +1 or -1 (please see Table I in Section 2.2).

Further, notations are simplified by introducing XDCMFP as the currency converted DCMFP:

$$XDCMFP_{ICR,c,j,t,d} = DCMFP_{c,j,t,d} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}} \tag{52b}$$

3.7.1.3 Calculation during Maintenance Periods

The CMCI re-weights every year in July, and also rolls into new Target Weights (TWs). Maintenance events (reweighting, rebalancing) trigger each month the recalculation of new Component Nominal Weights (CNWs) for each Standard Constant Maturity. Such CNWs are used in the calculation of the CMCI Benchmark Index. CMCI Benchmark inherits its CNWs from this process and maintains the original integrity of the weights defined at the component level for each SCM in the CMCI.

The CMCI Benchmark also rebalances its forward curve exposure every month. The curve rebalancing mechanism is independent from the Component rebalancing mechanism introduced in the CMCI.

On the day before the start of the Maintenance Period, the CMCI is calculated based on the old CNWs (reflecting old TWs), old TWAFs and old MFs used so far in the calculation.

The first part of the formula is then adjusted for the Maintenance Factor changes and multiplied by the Curve Value Ratio (CVR) which reflects the change in the Curve Value resulting from the shift from the Old to the New CNWs and TWAFs.

The process also applies to all Maintenance Periods. During Maintenance Periods, the calculation formula for CV is:

$$CV_{ICR,SCM,t,t} = \frac{MF_{ICR,old}}{MF_{ICR,new}}\left[\sum_{c=1,N} RP1_{c,t}\left[\sum_{j=1,AT} IsIn_{c,j,Index,old} \times CNW_{c,j,old} \times TWAF_{c,j,old} \times XDCMFP_{ICR,c,j,t,t}\right]\right]$$
$$+\left[\sum_{c=1,N} RP2_{c,t}\left[\sum_{j=1,AT} IsIn_{c,j,Index,new} \times CNW_{c,j,new} \times TWAF_{c,j,new} \times XDCMFP_{ICR,c,j,t,t}\right]\right] \quad (53)$$

where:

$RP1_{c,t}$ and $RP2_{c,t}$ are the rebalancing proportions for component c, at calculation date t, and can take the following values.

$RP1_{c,t} = \left\{1, \frac{2}{3}, \frac{1}{3}, 0\right\}$

$RP2_{c,t} = 1 - RP1_{c,t} = \left\{0, \frac{1}{3}, \frac{2}{3}, 1\right\}$

New Maintenance Factors are calculated at the close of business on the CMCI Business Day immediately pre-ceding the first maintenance day, and their values used for subsequent calculations:

$$CVR_{ICR,t,t} = \frac{\sum_{c=1,N}\sum_{j=1,AT} IsIn_{c,j,Index,new} \times CNW_{c,j,new} \times TWAF_{c,j,new} \times XDCMFP_{ICR,c,SCM,t,t}}{\sum_{c=1,N}\sum_{j=1,AT} IsIn_{c,j,Index,old} \times CNW_{c,j,old} \times TWAF_{c,j,old} \times XDCMFP_{ICR,c,SCM,t,t}} \quad (54)$$

where:

CVR is the Curve Value Ratio. This results in:

$$MF_{ICR,new} = \frac{MF_{ICR,old}}{CVR_{ICR,t,t}} \quad (55)$$

3.7.2 The CMCI Benchmark – Excess Return Index (CMCIB-ER)

CMCI Benchmark Excess Return Indices are set equal to 1000 on 29 January 2007.

3.7.2.1 Calculation during Non-Maintenance Periods

The CMCI Benchmark Excess Return Index is calculated on each CMCI Business Day and represents the uncollateralized return of the CMCI Benchmark basket over time. The Index has the following expression:

$$CMCIBER_{ICR,t} = CMCIB\text{-}ER_{ICR,t-1} \times \left(1 + IDR_{ICR,t}\right) \quad (56)$$

with:

$$IDR_{ICR,t} = \frac{CVF}{CVI} - 1 = \frac{CV_{ICR,t,t-1}}{CV_{ICR,t-1,t-1}} - 1 \quad (57)$$

$$CVI = CV_{ICR,t-1,t-1} = \sum_{c=1,N}\left(\sum_{j=1,AT} IsIn_{c,j,Index} \times CNW_{c,j,SCM} \times TWAF_{c,j} \times XDCMFP_{ICR,c,j,t-1,t-1}\right) \quad (58)$$

$$CVF = CV_{ICR,t,t-1} = \sum_{c=1,N}\left(\sum_{j,1,AT} IsIn_{c,j,Index} \times CNW_{c,j,SCM} \times TWAF_{c,j} \times XDCMFP_{ICR,c,j,t,t-1}\right) \quad (59)$$

where:

$IDR_{ICR,t}$ is the Index Daily Return, for a specified Currency reference (ICR) at time t.

CVF is the Curve Value Final, calculated for an Index currency reference ICR, and for a

reference calculation date t, with Contract Proportions (CPs) taken at reference calculation time t-1,

CVI is the Curve Value Initial, calculated for an Index currency reference ICR, and for a reference calculation date t, with Contract Proportions (CPs) taken at reference calculation time t-1,

$XDCMFP_{ICR,c,j,t,t-1}$ is the Currency translated Daily Constant Maturity Forward Price, calculated for an Index currency reference ICR, for a reference calculation date t, with Contract Proportions (CPs) taken at reference calculation time t-1.

$IsIn_{c,j,Index}$ is a Binary constant with value 1 or 0 to indicate if the component c and the SCM j is a member of the Index being calculated.

3.7.2.2 Calculation during Maintenance Periods

The Index Daily Return is defined as the percentage change in the CV of the CMCI Benchmark from one CMCI Business Day to the next. It reflects the return that would have been realised by holding positions in the basket of Daily constant Maturity Forward Price (DCMFP) to reflect each CNWs and TWAFs (or TWs and ITWs), from the closing of the trading platform on the prior CMCI Business Day to the closing of the trading platform on the next CMCI Business Day.

The daily Rebalancing Proportions (RP) used to calculate CVI and CVF are identical to those used to calculate the CMCI Benchmark Price Index on the CMCI Business Day immediately preceding the calculation date.

During a standard rebalancing period from the first to the last CMCI Business Day of the rebalancing period the calculation is as follows:

$$CVI_{ICR,t-1,t-1} = \frac{MF_{ICR,old}}{MF_{ICR,new}}\left[\sum_{c=1,N} RP1_{c,t}\left[\sum_{j=1,AT} IsIn_{c,j,Index,old} \times CNW_{c,j,old} \times TWAF_{c,j,old} \times XDCMFP_{ICR,c,j,t-1,t-1}\right]\right] + \left[\sum_{c=1,N} RP2_{c,t}\left[\sum_{j=1,AT} IsIn_{c,j,Index,new} \times CNW_{c,j,new} \times TWAF_{c,j,new} \times XDCMFP_{ICR,c,j,t-1,t-1}\right]\right] \quad (60)$$

$$CVF_{ICR,t-1,t-1} = \frac{MF_{ICR,old}}{MF_{ICR,new}}\left[\sum_{c=1,N} RP1_{c,t}\left[\sum_{j=1,AT} IsIn_{c,j,Index,old} \times CNW_{c,j,old} \times TWAF_{c,j,old} \times XDCMFP_{ICR,c,j,t,t-1}\right]\right] + \left[\sum_{c=1,N} RP2_{c,t}\left[\sum_{j=1,AT} IsIn_{c,j,Index,new} \times CNW_{c,j,new} \times TWAF_{c,j,new} \times XDCMFP_{ICR,c,j,t,t-1}\right]\right] \quad (61)$$

where:

$RP1_{c,t}$ and $RP2_{c,t}$ are the rebalancing proportions for component c, at calculation date t, and can take the following values.

$RP1_{c,t} = \left\{1, \frac{2}{3}, \frac{1}{3}, 0\right\}$

$RP2_{c,t} = 1 - RP1_{c,t} = \left\{0, \frac{1}{3}, \frac{2}{3}, 1\right\}$

3.7.3 The CMCI Benchmark – Total Return Index (CMCIB-TR)

CMCI Benchmark Total Return Indices are set equal to 1000 on 29 January 2007.

3.7.3.1 Calculation of the Total Return Index

The CMCI Benchmark Total Return Index is derived from the CMCI Benchmark Excess Return Index. In addition to uncollateralized returns generated from the CMCI Benchmark basket, a daily fixed income return is added, and the Index value takes the following expression:

$$CMCIB\text{-}TR_{ICR,t} = CMCIB\text{-}TR_{ICR,t-1} \times DITRF_{ICR,t} \tag{62}$$

where:

$$DITRF_{ICR,t} = \left(1 + IDR_{ICR,t} + IRR_{ICR,t}\right) \tag{63}$$

$IDR_{ICR,SCM,t}$ is the Index Daily Return, for a specified Index Currency Reference (ICR) and Standard Constant Maturity at time t.

IRR is defined in Section 3.5.3.

3.7.4 The CMCI Benchmark – Net of Cost Indices (CMCIB-Ns)

CMCI Benchmark Net of Cost Indices are a collection of indices. Their initial values and dates are set as below:

Table . CMCIB-Ns initialisation

CMCIB-N Index	Bloomberg Ticker	Initial Value	Initial Date
UBS CMCI Composite USD Net Excess Return Index	CMCINE	1000	29 January 2007
UBS Custom CMCI Composite USD Net Excess Return Index	CMCICNE	1000	03 March 2014

3.7.4.1 Calculation of the Net of Cost Indices (CMCIB-Ns)

The CMCIB-Ns are derived from the CMCIB-ER Index. A daily cost is subtracted from the uncollateralized returns generated from the CMCIB basket, and the Index value takes the following expression where CMCIB-N shall have the Initial Value on the Initial Date:

$$CMCIB\text{-}N_t = CMCIB\text{-}N_{t-1} * \left(\frac{CMCIB\text{-}ER_{ICR,SCM,t}}{CMCIB\text{-}ER_{ICR,SCM,t-1}} - cost * \frac{CD(t,t-1)}{360}\right) \tag{ }$$

Where:

$CMCIB\text{-}N_t$ is the index level for the Net of Cost index gross of cost on day t.

$CMCIB\text{-}ER_{ICR,SCM,t}$ is the unrounded closing price in USD on day t of the UBS CMCI Composite USD Excess Return Index (CMCIER Index).

$cost$ as provided for each respective CMCIB-N index in the Table below

Table . CMCIB-Ns cost value

CMCIB-N Index	Bloomberg Ticker	cost
UBS CMCI Composite USD Net Excess Return Index	CMCINE	0.29%
UBS Custom CMCI Composite USD Net Excess Return Index	CMCICNE	0.44%

$CD(t,t-1)$ is the number of calendar days between t and t-1, i.e. the immediately preceding day on which CMCIB-N is calculated.

3.8 THE CMCI SUSTAINABILITY TRANSITION INDEX LEVELS

The CMCI Sustainability Transition Index is built on the basis of the CMCI Sustainability Transition rules given in Appendix E. As such, the benchmark index strictly respects the component weight distribution and allocates, for each component, portions of the weights defined by the Appendix E to eligible Standard Constant Maturities (SCM).

A notable change to the technical framework is the migration of the Annual Maintenance Period to the end of January rebalancing. The Target Weights and the Tenor Weights are updated annually at the end of January, the new Annual Maintenance Period for CMCI Sustainability Transition Index. At each month end, the index rebalances back to the weights set at the prior Annual Maintenance Period. Like the CMCI, the Index also rebalances on a monthly basis on the last three CMCI Business Days of the month.

The following section provides an explanation for the calculation of:

- The CMCI Sustainability Transition Excess Return Index (CMCIS -ER),
- The CMCI Sustainability Transition Total Return Index (CMCIS-TR).

Market Disruption Events are dealt with the procedures set forth in Section 2.4.

If a Market Disruption Event occurs during the rebalancing period, the percentage amount being rebalanced on such a day is deemed to be rebalanced on the following CMCI Business Day. If there is a disruption event on or beyond the last business day of the month, the amount to be rebalanced will be carried forward until the next CMCI Business Day.

3.8.1 The CMCI Sustainability Transition Excess Return Index (CMCIS-ER)

CMCI Sustainability Transition Excess Return USD Index is set equal to 850.382747117438 on 04 January 2021.

The CMCIS-ER is calculated on each CMCI Business Day as per Section 3.7.2

3.8.2 The CMCI Sustainability Transition Total Return Index (CMCIS-TR)

CMCI Sustainability Transition Total Return USD Index is set equal to 960.050401933264 on 04 January 2021.

The CMCIS-TR is calculated on each CMCI Business Day as per Section 3.7.3

4 UBS BCOM Constant Maturity Index

The UBS BCOM Constant Maturity Index (CM-BCOM) is a diversified commodity index that uses the Bloomberg Commodity Index ("BCOM") commodity components and weights together with the UBS CMCI (CMCI) constant maturity methodology of daily rolling and the diversification beyond short term futures. This combination provides a unique balance between the BCOM and the benefits of diversification across maturities and rolling methodology provided by the CMCI.

The Index Administrator publishes a composite index and various sub-indices, each with identical component weights to the equivalent BCOM.

Table VIII. CM-BCOM Constituent

Sector	Commodity Name	Bloomberg Ticker
Agriculture	Coffee	KC
Agriculture	Corn	C
Agriculture	Cotton	CT
Agriculture	Soybeans	S
Agriculture	Soybean Oil	BO
Agriculture	Soybean Meal	SM
Agriculture	Sugar	SB
Agriculture	Wheat (Chicago)	W
Agriculture	Wheat (KC HRW)	KW
Energy	Brent Crude Oil	CO
Energy	Low Sulphur Gas Oil	QS
Energy	Natural Gas	NG
Energy	ULS Diesel	HO
Energy	Unleaded Gas	XB
Energy	WTI Crude Oil	CL
Industrial Metals	Aluminum	LA
Industrial Metals	Copper (COMEX)	LP
Industrial Metals	Nickel	LN
Industrial Metals	Zinc	LX
Livestock	Lean Hogs	LH
Livestock	Live Cattle	LC
Precious Metals	Gold	GC
Precious Metals	Silver	SI

4.1 THE CM-BCOM INDEX COMPOSITION

Commodity Weights (Target Weights and Effective Weights) and Individual Tenor weights used in CM-BCOM are a combination of BCOM commodity component weights (as they stand on the 4th BCOM Business Day of each month) and CMCI Individual Tenor Weights.

4.1.1 The CM-BCOM Component Selection

The CM-BCOM is designed to match the commodity components of the BCOM (as they stand on the 4th BCOM Business Day of each month). Where commodity components in the BCOM are identical to those in the CMCI Composite Index, the exact equivalent CMCI component is used in the CM-BCOM. Where a commodity component exists in the BCOM but not in the CMCI, then a new CMCI component Index will be created.

4.1.2 The CM-BCOM Target Weights

The CM-BCOM Target Weight for each commodity component is set in January of each calendar year to be equivalent to the BCOM weights defined on the 4th BCOM Business Day of January, consistent with BCOM methodology.

4.1.3 The CM-BCOM Effective Weights

The CM-BCOM commodity components are reset to their Effective Weights once a month during the Maintenance Period (defined as the period from the 5th to the 9th CM-BCOM Business Day).

The weight for each commodity component in the CM-BCOM (CM-BCOM Target Weights) is equal to the weight of the equivalent commodity component of the BCOM on the 4th BCOM Business Day of each month.

The Effective Weights are determined on that day using the Contract Production Weight (CPW) and the Daily Contract Reference Price of the Roll Contract Expiration (DCRP2). These terms as well as well other information in relation to BCOM index can be found in the index manual available for download on http://www.bloombergindexes.com/bloomberg-commodity-index-family/.

4.1.4 The CM-BCOM Individual Tenor Weights (ITWs)

The CM-BCOM Benchmark Index inherits its ITWs from the CMCI Benchmark Index. The CMCI ITWs are defined on an annual basis as part of the July CMCI Maintenance Period.

In relation to any commodity components created specifically for CM-BCOM or those commodity components that are no longer part of the CMCI Benchmark Index, the ITWs are set at 100% for the 3 months constant maturity.

The CM-BCOM re-balances its tenor weights to the CMCI ITWs on a monthly basis during the CM-BCOM Maintenance Period.

4.2 THE CM-BCOM INDEX LEVELS

For each Index, four indices are calculated and published:

- The “Price Index” (CM-BCOM-PI),
- The “Excess Return” (CM-BCOM-ER),
- The “Net of Cost Index” (CM-BCOM-N).
- The “Total Return” (CM-BCOM-TR).

Market Disruption Events are dealt with the procedures set forth in Section 2.4.

If a Market Disruption Event occurs during the rebalancing period, the percentage amount being rebalanced on such a day is deemed to be rebalanced on the following CM-BCOM Business Day. If there is a disruption event on or beyond the last business day of the month, the amount to be rebalanced will be carried forward until the next CM-BCOM Business Day.

4.2.1 The CM-BCOM – Standard Constant Maturities (SCM)

All four series can be calculated for the following Standard Constant Maturities (SCM) upon request:

- 3 Months (3M),
- 6 Months (6M),
- 1 Year (12M),
- 2 Years (24M).
- 3 Years (36M).

4.2.1.1 The CM-BCOM – Price Index (SCM)

The CM-BCOM SCM Price Indices are a representation of commodity price levels for a designated part of the forward curve and is calculated on the basis of the BCOM components and the prices of the CMCI Constant Maturity Forwards on the relevant commodities for the appropriate tenors.

The CM-BCOM SCM Price Indices are set equal to 1000 on January 2^{9t}h, 2007.

Indices for each SCM are calculated in U.S. Dollars (USD).

The SCM Indices is calculated on each CM-BCOM Business Day, as per Section 3.5.1, with the following specifics:

1. For the purpose of the calculation of the CM-BCOM, the calculations taking place during the CM- BCOM Maintenance Period are differentiated those performed during non-maintenance periods. These distinctions apply equally to the Price Index (PI), the Excess Return (ER) and Total Return (TR) indices.

   - Maintenance periods take place each month and are used to rebalance the components of the CM-BCOM to the new CM-BCOM Target or Effective Weight, as discussed below in Section 4.1.
   - Non-maintenance periods refer to periods other than those in which a re-weighting takes place.

2. The new Component Nominal Weights (CNWs) are calculated monthly, at the close of business on the CM-BCOM Business Day immediately preceding the first day of the CM-BCOM Maintenance Period (i.e., the fifth business day of the month). On that day, the new CNWs are calculated such that the Effective Weights match the component weight, defined in Section 4.1.2 and Section 4.1.3.

   For the purpose of calculating Basket Value, the rebalancing proportions for components are defined as

3.

   $RP1_{c,t}$ and $RP2_{c,t}$ are the rebalancing proportions for component c, at calculation date t, and can take the following values.
   $RP1_{c,t} = \{1.0, 0.8, 0.6, 0.4, 0.2, 0.0\}$
   $RP2_{c,t} = 1 - RP1_{c,t} = \{0.0, 0.2, 0.4, 0.6, 0.8, 1.0\}$

4.2.1.2 The CM-BCOM – Excess Return (SCM)

CM-BCOM SCM Excess Return Indices are set equal to 1000 on 29 January 2007.

CM-BCOM SCM Excess Return Indices are calculated on each CM-BCOM Business Day, as per Section 3.5.2, with the following specifics:

The daily Rebalancing Proportions (RP) used to calculate BVI and BVF are identical to those used to calculate the CM-BCOM Price Index on the CM-BCOM Business Day immediately preceding the calculation date, defined as

$RP1_{c,t}$ and $RP2_{c,t}$ are the rebalancing proportions for component c, at calculation date t, and can take the following values.
$RP1_{c,t} = \{1.0, 0.8, 0.6, 0.4, 0.2, 0.0\}$
$RP2_{c,t} = 1 - RP1_{c,t} = \{0.0, 0.2, 0.4, 0.6, 0.8, 1.0\}$

4.2.1.3 The CM-BCOM – Net of Cost Index (SCM)

The CM-BCOM Net of Cost SCM Indices are set to 1000 on 29 January 2007.

The CM-BCOM Net of Cost SCM Index is derived from the CM-BCOM SCM Excess Return Index. A daily cost is subtracted from the uncollateralized returns generated from the CM-BCOM SCM basket, and the Index value takes the following expression:

$$CM\text{-}BCOM\text{-}N_t = CM\text{-}BCOM\text{-}N_{t-1} * \left(\frac{CM\text{-}BCOM\text{-}ER_{ICR,SCM,t}}{CM\text{-}BCOM\text{-}ER_{ICR,SCM,t-1}} - cost * \frac{CD(t, t-1)}{360} \right) \quad (64)$$

Where:

$CM\text{-}BCOM\text{-}N_t$ is the index level for the Net of Cost index gross of cost on day t.

$CM\text{-}BCOM\text{-}ER_{ICR,SCM,t}$	is the unrounded closing price in USD on day t of the CM-BCOM SCM Excess Return Index.
$cost$	=0.29%.
$CD(t, t-1)$	is the number of calendar days between t and t-1 i.e. the immediately preceding day on which CM-BCOM-N is calculated.

4.2.1.4 The CM-BCOM – Total Return Index (SCM)

The CM-BCOM Total Return SCM Indices are set to 1000 on 29 January 2007.

The CM-BCOM Total Return SCM Indices are calculated as per Section 3.5.3.

4.2.2 The CM-BCOM – Headline Index Levels

This session explains the calculation of the four composite indices:

- The “Price Index” (CM-BCOM-PI),
- The “Excess Return” (CM-BCOM-ER),
- The “Net of Cost Index” (CM-BCOM-N).
- The “Total Return” (CM-BCOM-TR).

4.2.2.1 The CM-BCOM – Price Index (CM-BCOM -PI)

The CM-BCOM Price Indices (CM-BCOM-PI) are set equal to 1000 on 29 January 2007.

The CM-BCOM-PI is calculated on each CM-BCOM Business Day, as per Section 3.7.1, with the following specifics:

1. For the purpose of the calculation of the CM-BCOM Benchmark Indices, the calculations taking place during the CM- BCOM Maintenance Period are differentiated from those performed during non-maintenance periods. These distinctions apply equally to the Price Index (PI), the Excess Return (ER) and Total Return (TR) indices.

    - Maintenance periods take place each month and are used to rebalance the components of the CM-BCOM to the new CM-BCOM Target or Effective Weight, as discussed below in Section 4.1.
    - Non-maintenance periods refer to periods other than those in which a re-weighting takes place.

2. Components maintenance periods take place each month and are used to rebalance the CM-BCOM exposure to the effective weights of the BCOM, as discussed in Section 4.1.2 and 4.1.3. Curve rebalancing periods also take place each month during the CM-BCOM Maintenance Period and are used to rebalance the CM-BCOM exposure to the respective segments of the forward curve to their respective Individual Tenor Weights (ITW), as discussed in Section 4.1.4.

3. For the purpose of calculating the Curve Value Ratio (CVR), the rebalancing proportions for components are defined as

    $RP1_{c,t}$ and $RP2_{c,t}$ are the rebalancing proportions for component c, at calculation date t, and can take the following values.

    $$RP1_{c,t} = \{1.0, 0.8, 0.6, 0.4, 0.2, 0.0\}$$
    $$RP2_{c,t} = 1 - RP1_{c,t} = \{0.0, 0.2, 0.4, 0.6, 0.8, 1.0\}$$

4.2.2.2 The CM-BCOM – Excess Return Index (CM-BCOM-ER)

The CM-BCOM Excess Return Indices (CM-BCOM-ER) are set equal to 1000 on 29 January 2007.

The CM-BCOM-ER is calculated on each CM-BCOM Business Day as per Section 3.7.2, with the following specifics:

The daily Rebalancing Proportions (RP) used to calculate CVI and CVF are identical to those used to calculate the CMCI Benchmark Price Index on the CMCI Business Day immediately preceding the calculation date, defined as

$RP1_{c,t}$ and $RP2_{c,t}$	are the rebalancing proportions for component c, at calculation date t, and can take the following values. $RP1_{c,t} = \{1.0, 0.8, 0.6, 0.4, 0.2, 0.0\}$ $RP2_{c,t} = 1 - RP1_{c,t} = \{0.0, 0.2, 0.4, 0.6, 0.8, 1.0\}$

4.2.2.3 The CM-BCOM – Net of Cost Index (CM-BCOM-N)

The CM-BCOM Net of Cost Indices (CM-BCOM-N) are set to 1000 on 29 January 2007.

The CM-BCOM-N is derived from the CM-BCOM-ER. A daily cost is subtracted from the uncollateralized returns generated from the CM-BCOM basket, and the Index value takes the following expression:

$$CM\text{-}BCOM\text{-}N_t = CM\text{-}BCOM\text{-}N_{t-1} * \left(\frac{CM\text{-}BCOM\text{-}ER_{ICR,SCM,t}}{CM\text{-}BCOM\text{-}ER_{ICR,SCM,t-1}} - cost * \frac{CD(t, t-1)}{360} \right) \quad (65)$$

Where:

$CM\text{-}BCOM\text{-}N_t$	is the index level for the Net of Cost index gross of cost on day t.
$CM\text{-}BCOM\text{-}ER_{ICR,SCM,t}$	is the unrounded closing price in USD on day t of the CM-BCOM-ER.
$cost$	=0.29%.
$CD(t, t-1)$	is the number of calendar days between t and t-1 i.e. the immediately preceding day on which CM-BCOM-N is calculated.

4.2.2.4 The CM-BCOM – Total Return Index (CM-BCOM-TR)

The CM-BCOM Total Return Indices (CM-BCOM-TR) are set equal to 1000 on 29 January 2007.

The CM-BCOM-TR is calculated as per Section 3.7.3.

4.2.3 The CM-BCOM – Currency Hedged Indices (XMBCOM)

CM-BCOM Currency Hedged indices aim to facilitate CM-BCOM investment in currencies other than the US Dollar. All Currency Hedged indices are prefixed by the letter X.

Currency Hedged indices are available in all major non-USD currencies in the traditional forms of Excess and Total Return indices.

4.2.3.1 Currency Hedged Excess Return Indices

XMBCOM Excess Return Indices are set equal to 1000 on 29 January 2007.

The CM-BCOM Currency Hedged Excess Return Index is calculated as per Section 3.5.4.1.

4.2.3.2 Currency Hedged Total Return Indices

XMBCOM Total Return Indices are set equal to 1000 on 29 January 2007.

The CM-BCOM Currency Hedged Total Return Index is calculated as per Section 3.5.4.2.

4.2.4 The CM-BCOM Sector Indices

CM-BCOM Sector Indices use the exact commodity weights and monthly rebalancing methodology of the CM-BCOM, and components of each sector can be found in Table IV below. On a component basis, the sector indices use the same ITWs as are used under the CM-BCOM and also use the same forward tenors, daily rolling and constant maturity methodology of the CM-BCOM.

Table IX. CM-BCOM Sector Indices

Index Name	Price Index	Excess Return	Total Return
UBS BCOM Constant Maturity Agriculture	CMDJAGPI	CMDJAGER	CMDJAGTR
UBS BCOM Constant Maturity ex Agriculture USD	-	CMDJXAER	CMDJXATR
UBS CMCI BCOM Ex Precious Metals Ex Lean Hogs	CMBLHPMP	CMBXLHPM	CMBXHPMT
UBS CMCI BCOM Ex Precious Metals	CMBXPMP	CMBXPM	CMBXPMT
UBS BCOM Constant Maturity Ex Agriculture Ex Livestock USD	-	CMDJXALE	CMDJXALT

5 UBS SPGSCI Constant Maturity Index

The UBS SPGSCI Constant Maturity Index (CMSP) is a diversified commodity index that uses the S&P GSCI® ommodity components and weights together with the UBS CMCI (CMCI) constant maturity methodology of daily rolling and the diversification beyond short term futures. This combination provides a unique balance between the S&P GSCI® and the benefits of diversification across maturities and rolling methodology provided by the CMCI.

The Index Administrator publishes four composite indices and one sub-index per commodity sector. Each Index defined in Table V follows the CMSP composite Index calculation, while the effective weights are based on the relevant S&P GSCI constituents for each sector, as defined further in Section 6.1.

Table X. CMSP Tickers Construction

Sector	S&P GSCI Index	CMSP Price Index	CMSP Excess Return	CMSP Total Return
Composite	SPGCCI	CMSPCIPI	CMSPCIER	CMSPCITR
Light Energy	SPGCLE	CMSPLEPI	CMSPLEER	CMSPLETR
Ultra Light Energy	SPGCUE	CMSPULPI	CMSPULER	CMSPULTR
Reduced Energy	SPGCRE	CMSPREPI	CMSPREER	CMSPRETR
Energy	SPGCEN	CMSPENPI	CMSPENER	CMSPENTR
Industrial Metals	SPGCIN	CMSPIMPI	CMSPIMER	CMSPIMTR
Precious Metals	SPGCM	CMSPPMPI	CMSPPMER	CMSPPMTR
Agriculture	SPGCAG	CMSPAGPI	CMSPAGER	CMSPAGTR
Livestock	SPGCLV	CMSPLVPI	CMSPLVER	CMSPLVTR
Agriculture and Livestock	SPGCAL	CMSPALPI	CMSPALER	CMSPALTR

Table XI. CMSP Constituents

Sector	Commodity Name	Bloomberg Ticker
Agriculture	Cocoa	CC
Agriculture	Coffee	KC
Agriculture	Corn	C
Agriculture	Cotton	CT
Agriculture	Soybeans	S
Agriculture	Sugar	SB
Agriculture	Wheat (Chicago)	W
Agriculture	Wheat (KC HRW)	KW
Energy	Brent Crude Oil	CO
Energy	Low Sulphur Gas Oil	QS
Energy	Natural Gas	NG
Energy	ULS Diesel	HO
Energy	Unleaded Gas	XB
Energy	WTI Crude Oil	CL
Industrial Metals	Aluminum	LA
Industrial Metals	Copper (LME)	LP
Industrial Metals	Lead	LL
Industrial Metals	Nickel	LN
Industrial Metals	Zinc	LX
Livestock	Feeder Cattle	FC
Livestock	Lean Hogs	LH
Livestock	Live Cattle	LC
Precious Metals	Gold	GC
Precious Metals	Silver	SI

5.1 THE CMSP AND CMSP BENCHMARKE INDEX COMPOSITION

Commodity Weights (Target Weights and Effective Weights) and Individual Tenor weights used in CMSP are a combination of S&P GSCI® commodity component weights (as they stand on the 4th S&P GSCI® Business Day of each month) and CMCI Individual Tenor Weights.

5.1.1 The CMSP Component Selection

The CMSP is designed to match the commodity components of the S&P GSCI®. Where commodity components in the S&P GSCI® are identical to those in the CMCI Composite Index, the exact equivalent CMCI component is used in the CMSP. Where a commodity component exists in the S&P GSCI® but not in the CMCI, then a new CMCI component Index will be created.

5.1.2 The CMSP Target Weights

The CMSP Target Weight for each commodity component is set in January of each calendar year to be equivalent to the S&P GSCI® weights defined on the 4th S&P GSCI® Business Day of January, consistent with S&P GSCI® methodology.

5.1.3 The CMSP Effective Weights

The CMSP commodity components are reset to their Effective Weights once a month during the Maintenance Period (defined as the period from the 5th to the 9th CMSP Business Day).

The weight for each commodity component in the CMSP (CMSP Target Weights) is equal to the weight of the equivalent commodity component of the S&P GSCI® on the 4th S&P GSCI® Business Day of each month.

The Effective Weights are determined on that day using the Contract Production Weight (CPW) and the Daily Contract Reference Price of the Roll Contract Expiration (DCRP2). These terms as well as well other information in relation to S&P GSCI® index can be found in the index manual available for download on http://www.spindices.com/commodities.

5.1.4 The CMSP Individual Tenor Weights (ITWs)

The CMSP Benchmark Index inherits its ITWs from the CMCI Benchmark Index. The CMCI ITWs are defined on an annual basis as part of the July CMCI Maintenance Period.

In relation to any commodity components created specifically for CMSP or those commodity components that are no longer part of the CMCI Benchmark Index, the ITWs are set at 100% for the 3 months constant maturity.

The CMSP re-balances its tenor weights to the CMCI ITWs on a monthly basis during the CMSP Maintenance Period.

5.2 THE CMSP INDEX LEVELS

For each Index, four indices are calculated and published:

- The “Price Index” (CMSP-PI),
- The “Excess Return” (CMSP-ER),
- The “Net of Cost Index” (CMSP-N).
- The “Total Return” (CMSP-TR).

Market Disruption Events are dealt with the procedures set forth in Section 2.4.

If a Market Disruption Event occurs during the rebalancing period, the percentage amount being rebalanced on such a day is deemed to be rebalanced on the following CMSP Business Day. If there is a disruption event on or beyond the last business day of the month, the amount to be rebalanced will be carried forward until the next CMSP Business Day.

5.2.1 The CMSP – Standard Constant Maturities (SCM)

All four series can be calculated for the following Standard Constant Maturities (SCM) upon request:

- 3 Months (3M),
- 6 Months (6M),
- 1 Year (12M),
- 2 Years (24M).
- 3 Years (36M).

5.2.1.1 The CMSP – Price Index (SCM)

The CMSP SCM Price Indices are a representation of commodity price levels for a designated part of the forward curve and is calculated on the basis of the BCOM components and the prices of the CMCI Constant Maturity Forwards on the relevant commodities for the appropriate tenors.

The CMSP SCM Price Indices are set equal to 1000 on January 29th, 2007.

Indices for each SCM are calculated in U.S. Dollars (USD).

The SCM Indices is calculated on each CMSP Business Day, as per Section 3.5.1, with the following specifics:

1. For the purpose of the calculation of the CMSP, the calculations taking place during the CM- BCOM Maintenance Period are differentiated from those performed during non-maintenance periods. These distinctions apply equally to the Price Index (PI), the Excess Return (ER) and Total Return (TR) indices.

   - Maintenance periods take place each month and are used to rebalance the components of the CMSP to the new CMSP Target or Effective Weight, as discussed below in Section 5.1.
   - Non-maintenance periods refer to periods other than those in which a re-weighting takes place.

2. The new Component Nominal Weights (CNWs) are calculated monthly, at the close of business on the CMSP Business Day immediately preceding the first day of the CMSP Maintenance Period (i.e., the fifth business day of the month). On that day, the new CNWs are calculated such that the Effective Weights match the component weight, defined in Section 5.1.2 and Section 5.1.3.

3. For the purpose of calculating Basket Value, the rebalancing proportions for components are defined as

   $RP1_{c,t}$ and $RP2_{c,t}$ are the rebalancing proportions for component c, at calculation date t, and can take the following values.
   $RP1_{c,t} = \{1.0, 0.8, 0.6, 0.4, 0.2, 0.0\}$
   $RP2_{c,t} = 1 - RP1_{c,t} = \{0.0, 0.2, 0.4, 0.6, 0.8, 1.0\}$

5.2.1.2 The CMSP – Excess Return (SCM)

CMSP SCM Excess Return Indices are set equal to 1000 on 29 January 2007.

CMSP SCM Excess Return Indices are calculated on each CMSP Business Day, as per Section 3.5.2, with the following specifics:

The daily Rebalancing Proportions (RP) used to calculate BVI and BVF are identical to those used to calculate the CMSP Price Index on the CMSP Business Day immediately preceding the calculation date, defined as

$RP1_{c,t}$ and $RP2_{c,t}$ are the rebalancing proportions for component c, at calculation date t, and can take the following values.
$RP1_{c,t} = \{1.0, 0.8, 0.6, 0.4, 0.2, 0.0\}$

$$RP2_{c,t} = 1 - RP1_{c,t} = \{0.0, 0.2, 0.4, 0.6, 0.8, 1.0\}$$

5.2.1.3 The CMSP – Net of Cost Index (SCM)

The CMSP Net of Cost SCM Indices are set to 1000 on 29 January 2007.

The CMSP Net of Cost SCM Index is derived from the CMSP SCM Excess Return Index. A daily cost is subtracted from the uncollateralized returns generated from the CMSP SCM basket, and the Index value takes the following expression:

$$CMSP\text{-}N_t = CMSP\text{-}N_{t-1} * \left(\frac{CMSP\text{-}ER_{ICR,SCM,t}}{CMSP\text{-}ER_{ICR,SCM,t-1}} - cost * \frac{CD(t, t-1)}{360} \right) \quad (66)$$

Where:

$CMSP\text{-}N_t$	is the index level for the Net of Cost index gross of cost on day t.
$CMSP\text{-}ER_{ICR,SCM,t}$	is the unrounded closing price in USD on day t of the CMSP SCM Excess Return Index
$cost$	=0.29%.
$CD(t, t-1)$	is the number of calendar days between t and t-1 i.e. the immediately preceding day on which CMSP-N is calculated.

5.2.1.4 The CMSP – Total Return Index (SCM)

The CMSP Total Return SCM Indices are set to 1000 on 29 January 2007.

The CMSP Total Return SCM Indices are calculated as per Section 3.5.3.

5.2.2 The CMSP – Headline Index Levels

This session explains the calculation of the four composite indices:

- The “Price Index” (CMSP-PI),
- The “Excess Return” (CMSP-ER),
- The “Net of Cost Index” (CMSP-N).
- The “Total Return” (CMSP-TR).

5.2.2.1 The CMSP – Price Index (CMSP -PI)

The CMSP Price Indices (CMSP-PI) are set equal to 1000 on 29 January 2007.

The CMSP-PI is calculated on each CMSP Business Day, as per Section 3.7.1, with the following specifics:

1. For the purpose of the calculation of the CMSP Benchmark Indices, the calculations taking place during the CM- BCOM Maintenance Period are differentiated from those performed during non-maintenance periods. These distinctions apply equally to the Price Index (PI), the Excess Return (ER) and Total Return (TR) indices.

    - Maintenance periods take place each month and are used to rebalance the components of the CMSP to the new CMSP Target or Effective Weight, as discussed below in Section 5.1.
    - Non-maintenance periods refer to periods other than those in which a re-weighting takes place.

2. Components maintenance periods take place each month and are used to rebalance the CMSP exposure to the effective weights of the BCOM, as discussed in Section 5.1.2 and 5.1.3. Curve rebalancing periods also

take place each month during the CMSP Maintenance Period and are used to rebalance the CMSP exposure to the respective segments of the forward curve to their respective Individual Tenor Weights (ITW), as discussed in Section 5.1.4.

3. For the purpose of calculating the Curve Value Ratio (CVR), the rebalancing proportions for components are defined as

$RP1_{c,t}$ and $RP2_{c,t}$ are the rebalancing proportions for component c, at calculation date t, and can take the following values.
$RP1_{c,t} = \{1.0, 0.8, 0.6, 0.4, 0.2, 0.0\}$
$RP2_{c,t} = 1 - RP1_{c,t} = \{0.0, 0.2, 0.4, 0.6, 0.8, 1.0\}$

5.2.2.2 The CMSP – Excess Return Index (CMSP-ER)

The CMSP Excess Return Indices (CMSP-ER) are set equal to 1000 on 29 January 2007.

The CMSP-ER is calculated on each CMSP Business Day as per Section 3.7.2, with the following specifics:

The daily Rebalancing Proportions (RP) used to calculate CVI and CVF are identical to those used to calculate the CMCI Benchmark Price Index on the CMCI Business Day immediately preceding the calculation date, defined as

$RP1_{c,t}$ and $RP2_{c,t}$ are the rebalancing proportions for component c, at calculation date t, and can take the following values.
$RP1_{c,t} = \{1.0, 0.8, 0.6, 0.4, 0.2, 0.0\}$
$RP2_{c,t} = 1 - RP1_{c,t} = \{0.0, 0.2, 0.4, 0.6, 0.8, 1.0\}$

5.2.2.3 The CMSP – Net of Cost Index (CMSP-N)

The CMSP Net of Cost Indices (CMSP-N) are set to 1000 on 29 January 2007.

The CMSP-N is derived from the CMSP-ER. A daily cost is subtracted from the uncollateralized returns generated from the CMSP basket, and the Index value takes the following expression:

$$CMSP\text{-}N_t = CMSP\text{-}N_{t-1} * \left(\frac{CMSP\text{-}ER_{ICR,SCM,t}}{CMSP\text{-}ER_{ICR,SCM,t-1}} - cost * \frac{CD(t, t-1)}{360} \right) \quad (67)$$

Where:

$CMSP\text{-}N_t$	is the index level for the Net of Cost index gross of cost on day t.
$CMSP\text{-}ER_{ICR,SCM,t}$	is the unrounded closing price in USD on day t of the CMSP-ER.
$cost$	=0.29%.
$CD(t, t-1)$	is the number of calendar days between t and t-1 i.e. the immediately preceding day on which CMSP-N is calculated.

5.2.2.4 The CMSP – Total Return Index (CMSP-TR)

The CMSP Total Return Indices (CMSP-TR) are set equal to 1000 on 29 January 2007.

The CMSP-TR is calculated as per Section 3.7.3.

5.2.3 The CMSP – Currency Hedged Indices (XMBCOM)

CMSP Currency Hedged indices aim to facilitate CMSP investment in currencies other than the US Dollar. All Currency Hedged indices are prefixed by the letter X.

Currency Hedged indices are available in all major non-USD currencies in the traditional forms of Excess and Total Return indices.

5.2.3.1 Currency Hedged Excess Return Indices

XMBCOM Excess Return Indices are set equal to 1000 on 29 January 2007.

The CMSP Currency Hedged Excess Return Index is calculated as per Section 3.5.4.1.

5.2.3.2 Currency Hedged Total Return Indices

XMBCOM Total Return Indices are set equal to 1000 on 29 January 2007.

The CMSP Currency Hedged Total Return Index is calculated as per Section 3.5.4.2.

6 Index Governance

The Indices are overseen by the CMCI Index Committee. The Index Committee will review and have final approval on any additional Indices added to this family.

The Committee will review this Methodology document at a minimum of once in any twelve-month period, make changes to this document as necessary and administer any consultations for any potential material methodology changes.

In the case of any scenario occurring which is not explicitly covered in this methodology, the Index Committee will use its discretion to determine the action to be taken. Any such determination will be announced to clients in advance.

6.1 SUPPORTING DOCUMENTS

Additional information regarding policies around Index Governance and related topics can be found in the MerQube Methodology, Complaints Handling, Index Recalculation, and Index Termination policy documents.

Appendix

A. FOREIGN EXCHANGE CONVERSION METHODOLOGY

Table A below provides the CMCI Foreign Exchange price/rate sources as well as cross rate reference calculations. The CCY Exchange Rate source is set to WM/Refinitiv 4:00 London Closing Mid Prices.

Table A. Definition CCY Exchange Rates, CCY Scalars Definitions, and Cross Rates Calculations

ICR	CCY	CCY Pair	Quotation	CCY Scalar ICR, CCY	Rate Source
USD	USD			1	
	AUD	AUD-USD	USD per AUD	1	WM/Refinitiv 4:00 London Closing AUD Mid price
	EUR	EUR-USD	USD per EUR	1	WM/Refinitiv 4:00 London Closing EUR Mid price
	CAD	USD-CAD	CAD per USD	-1	WM/Refinitiv 4:00 London Closing CAD Mid price
	CHF	USD-CHF	CHF per USD	-1	WM/Refinitiv 4:00 London Closing CHF Mid price
	GBP	GBP-USD	USD per GBP	1	WM/Refinitiv 4:00 London Closing GBP Mid price
	JPY	USD-JPY	JPY per USD	-1	WM/Refinitiv 4:00 London Closing JPY Mid price
EUR	EUR			1	
	AUD	AUD-EUR	AUD per EUR	-1	EUR-USD / AUD-USD
	USD	EUR-USD	USD per EUR	-1	WM/Refinitiv 4:00 London Closing EUR Mid price
	CAD	EUR-CAD	CAD per EUR	-1	USD-CAD x EUR-USD
	CHF	EUR-CHF	CHF per EUR	-1	USD-CHF x EUR-USD
	GBP	GBP-EUR	EUR per GBP	1	GBP-USD / EUR-USD
	JPY	EUR-JPY	JPY per EUR	1	USD-JPY x EUR-USD
GBP	GBP			1	
	AUD	AUD-GBP	AUD per GBP	-1	GBP-USD / AUD-USD
	USD	GBP-USD	USD per GBP	-1	WM/Refinitiv 4:00 London Closing GBP Mid price
	CAD	GBP-CAD	CAD per GBP	-1	USD-CAD x GBP-USD
	CHF	GBP-CHF	CHF per GBP	-1	USD-CHF x GBP-USD
	EUR	GBP-EUR	EUR per GBP	1	GBP-USD / EUR-USD

	JPY	GBP-JPY	JPY per GBP	1	GBP-USD x USD-JPY
CHF	CHF			1	
	USD	USD-CHF	CHF per USD	1	WM/Refinitiv 4:00 London Closing CHF Mid price
	AUD	AUD-CHF	CHF per AUD	1	USD-CHF x AUD-USD
	EUR	EUR-CHF	CHF per EUR	1	USD-CHF x EUR-USD
	CAD	CAD-CHF	CHF per CAD	1	USD-CHF / USD-CAD
	GBP	GBP-CHF	CHF per GBP	1	GBP-USD x USD-CHF
	JPY	CHF-JPY	JPY per CHF	1	USD-JPY / USD-CHF
CAD	CAD			1	
	USD	USD-CAD	CAD per USD	1	WM/Refinitiv 4:00 London Closing CAD Mid price
	EUR	EUR-CAD	CAD per EUR	1	USD-CAD x EUR-USD
	CHF	CAD-CHF	CHF per CAD	-1	USD-CHF / USD-CAD
	GBP	GBP-CAD	CAD per GBP	1	GBP-USD x USD-CAD
	JPY	CAD-JPY	JPY per CAD	1	USD-JPY / USD-CAD
AUD	AUD			1	
	USD	AUD-USD	USD per AUD	- 1	WM/Refinitiv 4:00 London Closing AUD Mid price
	CHF	AUD-CHF	CHF per AUD	- 1	USD-CHF x AUD-USD
	EUR	AUD-EUR	EUR per AUD	- 1	AUD-USD / EUR-USD
	GBP	GBP-AUD	AUD per GBP	1	GBP-USD / AUD-USD
	JPY	AUD-JPY	JPY per AUD	1	USD-JPY x AUD-USD
JPY	JPY				
	USD	USD-JPY	JPY per USD	1	WM/Refinitiv 4:00 London Closing JPY Mid price
	AUD	AUD-JPY	JPY per AUD	1	USD-JPY x AUD-USD
	EUR	EUR-JPY	JPY per EUR	1	USD-JPY x EUR-USD
	CAD	CAD-JPY	JPY per CAD	1	USD-JPY / USD-CAD
	CHF	CHF-JPY	JPY per CHF	1	USD-JPY / USD-CHF
	GBP	GBP-EUR	EUR per GBP	1	GBP-USD / EUR-USD

From Section 3.5.1.2, formula (26), the generic expression for any Index Currency Reference (ICR) is:

$$CMCI\_PI_{ICR,SCM,t} = MF_{SCM,USD} \times \sum_{c=1,N} DCV_{c,ICR,SCM,t,t} = MF_{SCM,ICR} \times BV_{ICR,SCM,t,t} \tag{26}$$

$$DCV_{c,ICR,SCM,t,t} = IsIn_{c,Index} \times DCMFP_{c,SCM,t,t} \times CNW_{c,SCM,t} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}} \tag{27}$$

If ICR is EUR, a JPY component will be using the following conversion:

$$DCV_{c,EUR,SCM,t,t} = IsIn_{c,Index} \times DCMFP_{c,SCM,t,t} \times CNW_{c,SCM} \times [(USD - JPY \times EUR - USD)_t]^{(-1)} \tag{A.1}$$

B. DETAILS OF CALCULATIONS AND ASSUMPTIONS

B.1 Calculation of the Daily Constant Maturity Date

For the determination of the exact forward date, the calculation is follows:

$$DCMD_{SCM_t} = t + pd$$

Where:

t is a CMCI Business Day (as defined in section 1.3.1) pd denotes the tenor period in days:

Table B.1. Definition of Forward Date

SCM	O/N	3M	6M	1Y	2Y	3Y	4Y	5Y
pd (Days)	0	91	182	365	730	1095	1460	1825

B.2 Further details on the calculation of the Daily Constant Maturity Forward Price (DCMFP)

For a given SCM, the Daily Constant Maturity Forward Price of a specific component c, takes the following expression:

$$DCMFP_{c,SCM,t,d} = DCNP1_{c,t} \times CP1_{c,SCM,d} + DCNP2_{c,t} \times CP2_{c,SCM,d}$$

where:

c denotes component commodity c,

t is the calculation date (by definition, a CMCI Business Day),

d is the reference date for which contract proportions are calculated. For the Price Index, d is equal to t. For the Excess return Index, d is equal to $t-1$

and, for a component c, a Standard Constant Maturity SCM and a calculation date t:

$DCNP1_{c,t}$ is the Daily Contract Nearby Price, which is to say the Forward or Futures Contract price associated with the futures contract whose MDP date is equal or immediately preceding the Daily Constant Maturity Date (related to the specified Standard Constant Maturity or Constant Maturity Boundary), as defined by the Eligible Nearby Contract table

$DCNP2_{c,t}$ is the Daily Contract Nearby Price, which is to say the Forward or Futures Contract price associated with the futures contract whose MDP date is immediately following the Daily Constant Maturity Date (related to the specified Standard Constant Maturity or Constant Maturity Boundary), as defined by the Eligible Nearby Contract table.

When, for a specific component, the Standard Constant Maturity tenor is limited by a Constant Maturity boundary (CMB), the definition of the Constant Maturity Forward Price is simply amended using CMB instead of SCM.

B.3 Calculation of the CMCI SCM in the particular case of a changes in MDPs

Should any parameter of a futures contract be changed by the relevant exchange or should the Index Administrator change the MDP rule (by changing the naMDP, introducing a new MDPa or changing/removing an existing MDPa) a discontinuity in the Index could arise.

In any of the above cases the Index mechanism avoids such discontinuity by allowing the new parameter or parameters to be introduced over the course of a designated appropriate Maintenance Period. Substituting form (28) results in a calculation for Basket Value as per the following formula (28b) below:

$$BV_{ICR,SCM,t,t} = \frac{MF_{ICR,old,OLD-MDP}}{MF_{ICR,new,New-MDP}} \times \left[\sum_{c=1,N} IsIn_{c,Index} \times CNW_{c,old,OLD-MDP} \times RP1_{c,t} \times DCMFP_{c,SCM,t,t,OLD-MDP} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}} \right]$$
$$+ \sum_{c=1,N} IsIn_{c,Index} \times CNW_{c,new,New-MDP} \times RP2_{c,t} \times DCMFP_{c,SCM,t,t,New-MDP} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}} \qquad (28b)$$

Where:

$RP1_{c,t}$ and $RP2_{c,t}$ are the rebalancing proportions for component c, at calculation date t.

New Maintenance Factors are calculated at the close of business on the CMCI Business Day immediately preceding the first maintenance day, and their values used for subsequent calculations:

$$BVR_{ICR,t} = \frac{\sum_{c=1,N} IsIn_{c,Index} \times CNW_{c,SCM,new,NEW-MDP} \times DCMFP_{c,SCM,t,t,NEW-MDP} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}}}{\sum_{c=1,N} IsIn_{c,Index} \times CNW_{c,SCM,old,OLD-MDP} \times DCMFP_{c,SCM,t,t,OLD-MDP} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}}} \qquad (29b)$$

Where BVR is the Basket Value Ratio. This results in:

$$MF_{ICR,SCM,new} = \frac{MF_{ICR,old}}{BVR_{ICR,t}} \tag{30b}$$

The procedure described above is theoretically valid for any change of parameters affecting the level of the DCMFP.

B.4 Calculation of the CMCI Benchmark in the particular case of a change in MDPs

Should any parameter of a futures contract be changed by the relevant exchange or should the Index Administrator change the MDP rule (by changing the naMDP, introducing a new MDPa or changing/removing an existing MDPa) a discontinuity in the Index could arise.

In any of the above cases the Index mechanism avoids such discontinuity by allowing the new parameter or parameters to be introduced over the course of a designated appropriate Maintenance Period. Substituting from (54) results in a calculation for Curve Value as per the following formula (54b) below:

$$CV_{ICR,t,t} = \frac{MF_{ICR,old,MDP,old}}{MF_{ICR,new,MDP,new}} \times \sum_{c=1,N} RP1_{c,t} \left[\sum_{j=1,AT} IsIn_{c,j,Index,old} \times CNW_{c,j,old,MDP_{old}} \times TWAF_{c,j,old,MDP_{old}} \times XDCMFP_{c,j,t,t,MDP_{old}} \right]$$
$$+ \sum_{c=1,N} RP2_{c,t} \left[\sum_{j=1,AT} IsIn_{c,j,Index,new} \times CNW_{c,j,old,MDP_{new}} \times TWAF_{c,j,old,MDP_{new}} \times XDCMFP_{c,j,t,t,MDP_{new0}} \right] \tag{54b}$$

where:

$RP1_{c,t}$ and $RP2_{c,t}$ are the rebalancing proportions for component c, at calculation date t.

New Maintenance Factors are calculated at the close of business on the CMCI Business Day immediately preceding the first maintenance day, and their values used for subsequent calculations. Deriving from (55) results in (55b) as follows:

$$CVR_{ICR,t} = \frac{\sum_{c=1,N} \sum_{j=1,AT} IsIn_{c,j,Index,new} \times CNW_{c,j,new,MDP_{new}} \times TWAF_{c,j,new,MDP_{new}} \times XDCMFP_{c,j,t,t,MDP_{new}}}{\sum_{c=1,N} \sum_{j=1,AT} IsIn_{c,j,Index,old} \times CNW_{c,j,new,MDP_{old}} \times TWAF_{c,j,new,MDP_{old}} \times XDCMFP_{c,j,t,t,MDP_{old}}} \tag{55b}$$

where:

CVR is the Curve Value Ratio. This results in:

$$MF_{ICR,new} = \frac{MF_{ICR,old}}{CVR_{ICR,t}} \tag{56b}$$

The procedure described above is theoretically valid for any change of parameters affecting the level of the XDCMFP and not only the MDP date.

C. INDEX REBALANCING MECHANISM: DETAILED CALCULATIONS

For each commodity in the CMCI composite index ("c" being the mute counter index), the following requirement must hold:

$$\frac{CNW_{c,SCM,new} \times DCMFP_{c,SCM,t,t} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}}}{\sum_{c=1,N} CNW_{c,SCM,new} \times DCMFP_{c,SCM,t,t} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}}} - TW_{c,\%} = 0 \tag{C.1}$$

For notation purposes, one introduces currency denominated quantities:

$$DCMFP_{c,SCM,t,t} \times \left[FX_{ICR,c,t}\right]^{CCYScalar_{ICR,ccy}} = XDCMFP_{ICR,c,SCM,t,t} = XDCMFP_c$$

Then for each of the N commodities in the Index, one can rewrite the previous equation as:

$$\begin{gathered}(1 - TW_c)XDCMFP_c \cdot CNW_{c,SCM,new} \\ - \left(TW_1 \cdot XDCMFP_1 \cdot CNW_{1,SCM,new} + \cdots + TW_{c-1}XDCNMFP_{c-1} \cdot CNW_{c-1,SCM,new}\right) \\ -\left(TW_{c+1} \cdot XDCMFP_{c+1} \cdot CNW_{c+1,SCM,new} + \cdots + TW_N XDCNMFP_N \cdot CNW_{N,SCM,new}\right) = 0 \qquad (C.2)\end{gathered}$$

This results in a system

- of N linear equations
- with N unknowns

$$\left(CNW_{c,SCM,new}\right)_{1 \le c \le N}$$

This system can be expressed as the following matrix equation:

$$\begin{bmatrix} (1 - TW_1) & -TW_1 & \dots & -TW_1 \\ -TW_2 & (1 - TW_2) & \dots & -TW_2 \\ & & & \\ -TW_N & & -TW_2 & (1 - TW_2) \end{bmatrix} \begin{pmatrix} XDCMFP_1 \times CNW_{1,SCM,new} \\ \vdots \\ \vdots \\ XDCMFP_N \times CNW_{N,SCM,new} \end{pmatrix} = 0 \qquad (C.3)$$

If one further defines:
the matrix M:

$$M = \begin{bmatrix} TW_1 & TW_1 & \dots & TW_1 \\ TW_2 & TW_2 & \dots & TW_2 \\ \vdots & \vdots & & \vdots \\ TW_N & \dots & TW_N & TW_N \end{bmatrix}$$

and the vector z:

$$z = \begin{pmatrix} XDCMFP_1 \times CNW_{1,SCM,new} \\ \vdots \\ \vdots \\ XDCMFP_N \times CNW_{N,SCM,new} \end{pmatrix}$$

Then the system is:

$$Mz = z \qquad (C.3)$$

which amounts to finding an eigenvector associated to eigenvalue 1 for M. Note M obviously has rank 1 and is a projection on the line generated by z (in the vector space sense).

Any component zi belonging to any such given eigenvector z would then satisfy:

$$TW_i \left(\sum_{k=1}^{N} z_k\right) = z_i$$

implying that:

$$\left(\sum_{k=1}^{N} z_k\right) = \frac{z_i}{TW_i} = \frac{z_j}{TW_j}, \forall i,j \;\; 1 \le i,j \le N$$

Note the left-hand side of the equation doesn't depend on i or j.

On the other hand, the vector from the initial equation has to satisfy this relationship since all eigenvectors do. This reads:

$$\frac{XDCMFP_i}{TW_i} CNW_{i,SCM,new} = \frac{XDCMFP_j}{TW_j} CNW_{j,SCM,new}, \forall i,j \;\; 1 \leq i,j \leq N \qquad (C.4)$$

To find a unique solution (as opposed to a line of solutions) one has to fix one end of the inputs, hence the use of x. If one decides (without loss of generality) to set:

$$CNW_{N,SCM,new} = x$$

Then the corresponding unique solution satisfying the previous constraint is given by formula C.4.

D. LIST OF CALCULATED INDICES IN THE CMCI INDEX FAMILY

D.1 Core CMCI Indices

The CMCI, its sectors and its component indices are calculated for the following Standard Constant Maturities (SCM):

- Months (3M),
- Months (6M),
- 1 Year (1Y),
- Years (2Y)),
- Years (3Y),

Single component indices are also provided for the following Standard Constant Maturities for specific commodities only:

- Years (4Y),
- Years (5Y).

All of the Core CMCI Indices can be made available in currency-hedged format.

The list of CMCI indices is provided in Table D.1.I, while the Index composition is provided in Table C.1.II.

Table D.1.I. CMCI INDICES

CMCI Index	Code	Index Ticker	3M	6M	1Y	2Y	3Y	4Y	5Y
CMCI Composite	CI	CMCI	Yes	Yes	Yes	Yes	Yes	-	-
CMCI High Energy	HE	CMHE	Yes	Yes	Yes	Yes	Yes	-	-
CMCI ex-Lean Hogs	XL	CMXL	Yes	Yes	Yes	Yes	Yes	-	-
CMCI Food Index	FO	CMFO	Yes	Yes	Yes	-	-	-	-
CMCI Energy	EN	CMEN	Yes	Yes	Yes	Yes	Yes	-	-
CMCI Industrial Metals	IM	CMIM	Yes	Yes	Yes	Yes	Yes	-	-
CMCI Precious Metals	PM	CMPM	Yes	Yes	Yes	Yes	Yes	-	-
CMCI Agriculture	AG	CMAG	Yes	Yes	Yes	-	-	-	-
CMCI Livestock	LV	CMLV	Yes	Yes	-	-	-	-	-
CMCI WTI Crude Oil	WC	CTWC	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CMCI Brent Crude Oil	CO	CTCO	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CMCI ULS Diesel	HO	CTHO	Yes	Yes	Yes	-	-	-	-
CMCI Gasoil	QS	CTQS	Yes	Yes	Yes	-	-	-	-
CMCI RBOB Gasoline	XB	CTXB	Yes	Yes	-	-	-	-	-
CMCI Natural Gas	NG	CTNG	Yes	Yes	Yes	Yes	Yes	-	-
CMCI LME Copper	LP	CTLP	Yes	Yes	Yes	Yes	Yes	Yes	-
CMCI High Grade Copper	HG	CTHG	Yes	Yes	-	-	-	-	-
CMCI LME Zinc	LX	CTLX	Yes	Yes	Yes	-	-	-	-
CMCI LME Aluminum	LA	CTLA	Yes	Yes	Yes	Yes	Yes	Yes	-
CMCI LME Nickel	LN	CTLN	Yes	Yes	Yes	-	-	-	-
CMCI LME Lead	LL	CTLL	Yes	Yes	Yes	-	-	-	-
CMCI Gold	GC	CTGC	Yes	Yes	Yes	Yes	-	-	-
CMCI Silver	SI	CTSI	Yes	Yes	Yes	Yes	-	-	-
CMCI Wheat	WW	CTWW	Yes	Yes	Yes	-	-	-	-

CMCI HRW Wheat	KW	CTKW	Yes						
CMCI Corn	CN	CTCN	Yes	Yes	Yes	-	-	-	-
CMCI Soybeans	SY	CTSY	Yes	Yes	Yes	-	-	-	-
CMCI Soybean Meal	SM	CTSM	Yes	Yes	-	-	-	-	-
CMCI Soybean Oil	BO	CTBO	Yes	Yes	-	-	-	-	-
CMCI Sugar No.11	SB	CTSB	Yes	Yes	Yes	-	-	-	-
CMCI Sugar #5	QW	CTQW	Yes	Yes	-	-	-	-	-
CMCI Coffee “C”	KC	CTKC	Yes	Yes	Yes	-	-	-	-
CMCI Cotton No.2	CT	CTCT	Yes	Yes	-	-	-	-	-
CMCI Live Cattle	LC	CTLC	Yes	Yes	-	-	-	-	-
CMCI Lean Hogs	LH	CTLH	Yes	Yes	-	-	-	-	-

Legend: Yes: Index is quoted

Table D.1.II. CMCI INDICES COMPOSITION

CMCI Index Composition	Index Ticker	CL	EN	CO	HO	QS	RB	NG	LP	HG	LX	LA	LN	LX	GC	SI	W	C	S	SM	BO	SB	QW	QC	KC	CT	LC	LH
CMCI Composite	CMCI	Y	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CMCI High Energy	CMHE	Y	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CMCI ex-Lean Hogs	CMXL	Y	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-
CMCI Food index	CMFO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	Y	Y
CMCI Grains Index	CMFO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	-	-	-	-	-	Y	-	-	-
Sub Indices																												
CMCI Energy	CMEN	Y	-	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI Industrial Metals	CMIM	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI Precious Metals	CMPM	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
CMCI Agriculture	CMAG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-
CMCI Livestock	CMLV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	Y
Single Component Indices																												
CMCI WTI Crude Oil	CTWC	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI Brent Crude Oil	CTCO	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI ULS Diesel	CTHO	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI Low Sulfur Gasoil	CTQS	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MCI RBOB Gasoline	CTXB	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI Natural Gas	CTNG	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI LME Copper	CTLP	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI High Grade Copper	CTHG	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI LME Zinc	CTLX	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI LME Aluminium	CTLA	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI LME Nickel	CTLN	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI LME Lead	CTLL	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI Gold	CTGC	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-
CMCI Silver	CTSI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-
CMCI Wheat	CTWW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-
CMCI Corn	CTCN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-
CMCI Soybeans	CTSY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-
CMCI Soybean Meal	CTSM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	-
CMCI Soybean Oil	CTBO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-
CMCI Sugar No.11	CTSB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-
CMCI Sugar #5	CTQW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-
CMCI Cocoa	CTQC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-
CMCI Coffee “C”	CTKC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-
CMCI Cotton No.2	CTCT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-
CMCI Live Cattle	CTLC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-
CMCI Lean Hogs	CTLH	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y

Legend: Y: Component is included, -: Component is not included.

In addition to above CMCI Indices, the Index Administrator and UBS have created a number of additional CMCI Component Indices for commodities for which there is significant demand, but which do not pass Index membership criteria. These are listed in the Table D.1.III. below.

Table D.1.III. INTRODUCING NEW COMPONENT INDICES

Contract	Code Reuters	Code Bloomberg	Index Ticker	3M	6M	1Y	2Y	3Y	4Y	5Y
Canola	RS	RS	CTRS	Yes	-	-	-	-	-	-
Barley	AB	WA	CTWA	Yes	-	-	-	-	-	-
Lumber (Random Length)	LB	LB	CTLB	Yes	-	-	-	-	-	-
Rough Rice	RR	RR	CTRR	Yes	-	-	-	-	-	-
Rapeseed	COM	IJ	CTCZ	Yes	-	-	-	-	-	-
Platinum	PL	PL	CTPL	Yes	-	-	-	-	-	-
F.C . Orange Juice (FCOJ)	OJ	JO	CTJO	Yes	-	-	-	-	-	-
Feeder Cattle	FC	FC	CTFC	Yes	-	-	-	-	-	-
Cocoa	-	QC	CTQC	Yes	-	-	-	-	-	-
EUA	-	MO	CTMO	-	-	Yes	-	-	-	-

Legend: Yes: Index is Quoted

CMCI Benchmark indices combine all the available Tenors for composite, sector or individual commodity component.

D.2 CMCI Strategy Indices

In addition to the CMCI Core Indices, the Index Administrator and UBS created a number of additional CMCI Strategy Indices that fall within the categories of CMCI Active, CMCI Flex and CMCI Essence.

All of the CMCI Strategy Indices can be made available in currency-hedged format.

The Total Return version of the CMCI Strategy indices will use the same Available Reference Rates as the CMCI Core indices.

D.3 CMCI Flex Indices

While the UBS CMCI is an innovative index that has introduced two unique concepts to commodity index investment – constant maturity and diversification across the commodity futures curve, the S&P GSCI® (further referred to as SPGSCI) and the Bloomberg Commodity IndexSM (further referred to as BCOM) have historically been the most widely used commodity indices.

CMCI Flex indices combine features from both indices. It uses the exact commodity weights and rebalancing methodology of the SPGSCI or BCOM, but instead of rolling front month futures, CMCI Flex indices use the forward tenors, daily rolling and constant maturity methodology of the CMCI. This combination provides a unique balance between the widely followed, SPGSCI or BCOM indices and the benefits of diversification across maturities and rolling methodology provided by the UBS CMCI. The constant maturity approach and longer maturities that the UBS CMCI brings to the CMCI Flex indices may lead to lower volatility and mitigation of negative roll yield while still keeping pace during periods of backwardation.

CMCI Flex indices combining CMCI methodology with BCOM weights are called UBS BCOM Constant Maturity Index (see Schedule 1 section for further information).

CMCI Flex indices combining CMCI methodology with SPGSCI weights are called UBS SPGSCI Constant Maturity Index (see Schedule 2 section for further information).

CMCI Flex indices can be made available on any composite, sector or commodity component.

D.3.1 CMCI Adjusted Energy Indices

The CMCI Indices and CMCI Flex Indices are also available with over or under-weight allocations applied to energy sector commodities. The adjusted weighting scheme is implemented by applying an Energy Multiplier to the CNWs of the energy sector commodities, WTI Crude Oil, Brent Crude Oil, ULS Diesel, RBOB Gasoline, Gasoil and Natural Gas. A Non-Energy Multiplier is applied to the CNWs of all other commodities but the TWAFs remain unadjusted for all commodities. The calculation of the indices otherwise follows the methodology laid out in sections 3 and 4.

Currently 9 such indices are offered, for which the applicable Energy and Non-Energy Multipliers are listed below:

Table D.3.1.I. Energy and Non-Energy Multiplier

Index Name	Energy Multiplier	Non-Energy Multiplier
UBS CMCI High Energy Index	2	0.5
UBS CMCI 3 Month High Energy Index	2	0.5
UBS CMCI 6 Month High Energy Index	2	0.5
UBS CMCI 1 Year High Energy Index	2	0.5
UBS CMCI 2 Year High Energy Index	2	0.5
UBS CMCI 3 Year High Energy Index	2	0.5
UBS SPGSCI CMCI Reduced Energy Index	0.5	1
UBS SPGSCI CMCI Light Energy Index	0.25	1
UBS SPGSCI CMCI Ultra Light Energy Index	0.125	1

D.3.2 CMCI Essence

CMCI Essence indices are diversified market neutral commodity strategies, aiming to generate alpha from commodity markets by benefiting from the different investment methodologies of the CMCI and the traditional commodity indices. The long leg of the strategy will typically be the CMCI Flex Index, and the short leg of the strategy will be the traditional Index that the CMCI Flex Index is derived from. CMCI Essence indices are rebalanced quarterly.

CMCI Essence indices can be made available on any composite, sector or commodity component.

CMCI Essence T10 is one of the indices in the CMCI Essence family.

D.3.3 UCITS Compliant CMCI Agriculture Index (CMAGU)

The UCITS Compliant CMCI Agriculture Index is composed only of commodities within the agriculture sector of and applies the 35/20 allocation capping rules detailed below.

The Target weight of each relevant component in the Index will be subject to weight capping specified by the 35/20 rules. To provide a buffer for weight changes during the course of the month and decrease the likelihood of a breach of the 35/20 rules allocation limits, the Target weight caps will be set to 30/18. It uses the exact commodity weights and monthly rebalancing methodology of the CMCI. For each component, it uses the same forward tenors, daily rolling and constant maturity methodology of the CMCI.

The CMCI Agriculture UCITS Index is composed solely of agricultural commodities. Commodities with enough similarity and historical correlation must be treated as a single component during the capping process. The Soybean component group consists of Soybeans, Soybean Oil, and Soybean Meal; the Wheat component group consists of Wheat, Hard Red Winter Wheat, and Milling Wheat, the Cocoa component group includes Cocoa (US) and London Cocoa; and the Sugar component consists of Sugar No.11 and White Sugar. The procedure and mechanism to apply the 35/20 rule follows these steps:

Step 1: On the annual Target weight rebalance days, the new Target weights are extracted for each commodity from the CMCI Index.

Step 2: All components are reviewed. If any component group (Soybean, Wheat, Cocoa, or Sugar) has a weight above 30%, the individual components are reduced proportionally such that the group is exactly 30%. If an individual component has a weight above 30%, then it is reduced to exactly 30%. The total weight reduced is distributed proportionally among the remaining components.

Step 3: No remaining component's weight can exceed 20%.
If the weight of any component not reviewed in Step 2 is above 20%, it is capped at 18% with the excess weight redistributed proportionally among all remaining components that have not already been reviewed in Step2 or capped. This process is iterative until the weights of all remaining components is less than or equal to 20%

Rounding: Final Target weights are rounded to 4 decimal point precision. If the sum of the Target weights due to the rounding is slightly in excess of 100%, the largest single component weight is reduced by the excess weight. If the sum of the weights due to the rounding is slightly below 100%, the difference is added to the smallest weighted component.

D.3.4 CMCI Ex-Agriculture Ex-Livestock Indices (CMCI xAL)

CMCI Ex-Agriculture Ex-Livestock Indices (CMCI xAL) use the exact commodity weights and monthly rebalancing methodology of the CMCI but exclude all components from the agriculture sector and the livestock sector. On a component basis, it uses the same ITWs as are used under the CMCI and also uses the same forward tenors, daily rolling and constant maturity methodology of the CMCI.

For each of the CMCI Ex-Agriculture Ex-Livestock Indices, the Index Administrator calculates and publishes an Excess Return version and a Total Return version. The calculation follows the same methodology and uses the same formulae as the CMCI Excess Return and Total Return as detailed in Sections 3.3 The CMCI Excess Return (CMCI-ER) and 3.4 The CMCI Total Return (CMCI-TR) of this manual.

CMCI Currency Hedged indices aim to facilitate CMCI investment in currencies other than the US Dollar. Currency Hedged Excess Return and Total Return versions of the CMCI xAL Indices are calculated using the same formula as detailed in Section 3.5. The CMCI Currency Hedged Indices (XMCI) of this manual.

D.3.4.2 CMCI Ex-Agriculture Ex-Livestock Capped Index

The CMCI Ex-Agriculture Ex-Livestock Capped Index is based on the CMCI Ex-Agriculture Ex-Livestock Index except that it applies the 35/20 allocation capping rules detailed below (the “35/20 Rules”), such that no single component comprises more than 35% of the Index and only one component may comprise more than 20% of the Index. To provide a buffer for weight changes during the course of the month and decrease the likelihood of a breach of the 35/20 Rules, the Target weight caps will be set to 30%/18%.

The CMCI Ex-Agriculture Ex-Livestock Capped Index consists of energy and metals commodities. Five of these commodities form the petroleum component (“Petroleum Component”) which due to their similarity (derived from crude oil) and historical correlation must be treated as subcategories of a single component during the capping process. Correlation tests are performed for all commodities annually prior to the July annual rebalance. The five petroleum commodities are WTI Crude Oil (CL), , Brent Crude Oil (CO), RBOB Gasoline (XB) and ULS Diesel (HO), and Low Sulphur Gas Oil (QS).

The procedure and mechanism to apply the 35/20 Rules follows these steps:

Step 1: On the annual Target weight rebalance days, the new Target weights are extracted for each commodity from the CMCI Index.

Step 2: The Petroleum Component is reviewed. If its Target weight is above 30% of the Index, the individual components are reduced proportionally such that the Petroleum Component is exactly 30%. The total Target weight reduced is distributed proportionally among the remaining non-Petroleum components.

Step 3: No remaining component's weight can exceed 18% of the Index.
If the weight of any component not reviewed in Step 2 is above 18%, it is capped at 18% with the excess weight redistributed proportionally among all remaining components that have not already been reviewed. This process is iterative until the weights of all remaining components is less than or equal to 18%

Rounding: Final Target weights are rounded to 6 decimal point precision. If the sum of the Target weights due to the rounding is slightly in excess of 100%, the largest single component weight is reduced by the excess weight. If the sum of the weights due to the rounding is slightly below 100%, the difference is added to the smallest weighted component.

D.3.5 Monthly Currency Hedged CMCI Indices

CMCI Currency Hedged indices aim to facilitate CMCI investment in currencies (each a "Hedged Currency") other than the US Dollar. Currency Hedged Excess Return and Total Return are calculated using the formulae detailed below. As these indices are currency hedged each month, the returns of the indices are exposed to the movements of the Hedged Currency spot rate relative to the US dollar between Rebalance Days.

On 31 January 2011 (the "Inception Date"), the Index level is 1000.000. On any CMCI Business Day (t), the Index is

$$I_t = I_n \frac{FX_t}{FX_n}\frac{S_t}{S_n} - I_{n-1}\left[\frac{FwdFX_t}{FwdFX_n} - 1\right]$$

Where

I_t Is the level of the Currency Hedged CMCI Index on CMCI Business Day (*t).*

is the level of the Currency Hedged CMCI Index on the previous Rebalance Day *(n).*

I_{n-1} is the level of the Currency Hedged index on the Business Day immediately before the previous Rebalance Day *(n)* or Inception Date as applicable. Between the Inception Date and first Rebalance Day shall be the level of the Index on Inception Date.

FX_t is the value of one unit of USD in Hedged Currency (CCY) on CMCI Business Day (*t)* determined using as follows:

$FXRate_t$

$$FX_t = (FXRate_t)^{CCYScalar}$$

FX_n is the value of one unit of USD in Hedged Currency (CCY) on the previous Rebalance Day *(n)* determined using as follows:

$FXRate_n$

$$FX_n = (FXRate_n)^{CCYScalar}$$

$FXRate_n$ means the mid-rate determined from Currency Spot Page for the relevant Currency (CCY) around the Valuation Time for CMCI Business Day (t).

S_t is the value of the CMCI Index at time (*t).*

S_n is the value of the CMCI USD Index on the previous Rebalance Day *(n).*

$FwdFX_t$ is equal to FXt if (*t)* is a Rebalance Date, otherwise, the Interpolated FX Forward Rate at time (*t)*. is the Interpolated FX Forward Rate on the previous Rebalance Day (*n).*

$FwdFX_n$

$CCYScalar$ is equal to -1 or 1 as determined from the table below for the relevant Hedged Currency (CCY).

Interpolated FX Forward Rate ($IFXFwd_t$) is

$$IFXFWD_t = (FXRate_t + DayScalar_t \times FwdPoints_t)^{CCYScalar}$$

$DayScalar_t$ means in relation to any Business Day (*t),* the quotient of (x) number of calendar days from and excluding such Business Day *t* up to and including the immediately following Rebalance Date and (y) the total number of calendar days from and excluding such Business Day t up to and including the Expiry Date.

$FwdPoints_t$ for the relevant Currency (CCY) means in relation to any Business Day (*t*), the forward points for a one-month forward contract displayed as the mid-rate on Currency Fwd Points Page, on such Business Day (*t*) around the Valuation Time.

Valuation Time is 4pm London time. All spot and forward rates are WM/Refinitiv 4:00 London Closing Mid Prices.

Expiry Date is the day that is 2 CCY Business Days before the settlement date for the 1-month forward contract.

Rebalance Day will be the last CMCI Business Day ofeach month.
The following forwards are used

Table D.3.5.I. Definition CCY Forward Exchange Points, CCY Scalars Definitions

ICR	CCY	CCY Pair	Quotation	CCY Scalar ICR, CCY	Rate Source
USD	USD			1	
	CHF	AUD-USD	USD per AUD	1	WM/Refinitiv 4:00 London Closing AUD FWD Points Mid price
	EUR	EUR-USD	USD per EUR	-1	WM/Refinitiv 4:00 London Closing EUR FWD Points Mid price
	GBP	USD-CAD	CAD per USD	-1	WM/Refinitiv 4:00 London Closing CAD FWD Points Mid price

The CMCI Monthly Hedged Index family is listed in the table below with their corresponding underlying indices.

Table D.3.5.II. CMCI Monthly Hedged Index family

Underlying Index Name	Underlying	EUR	CHF	GBP
UBS CMCI Agriculture USOTR	CMAGTR	CMAGEMT	CMAGCMT	CMAGGMT
UBS CMCI Composite USOTR	CMCITR	CMCIEMT	CMCICMT	CMCIGMT
UBS CMCI Composite USOTR 1Vc.71r	CMCITR1Y	CMCIEMTA	CMCICMTA	CMCIGMTA
UBS CMCI Composite USOTR·3 Month	CMCITR3M	CMCIEMT3	CMCICMT3	CMCIGMT3
UBS CMCI Composite USOTR ·6 Month	CMCITR6M	CMCIEMT6	CMCICMT6	CMCIGMT6
UBS BCOM Constant Maturity Composite TR	CMOJCITR	CMOJEMT	CMOJCMT	CMOJGMT
UBS CMCI Energy USOTR	CMENTR	CMENEMT	CMENCMT	CMENGMT
UBS CMCI Food USOTR	CMFOTR	CMFOEMT	CMFOCMT	CMFOGMT
UBS CMCI Industrial Metals USOTR	CMIMTR	CMIMEMT	CMIMCMT	CMIMGMT
UBS CMCI Livestock USOTR	CMLVTR	CMLVEMT	CMLVCMT	CMLVGMT
UBS CMCI Precious Metals USOTR	CMPMTR	CMPMEMT	CMPMCMT	CMPMGMT
UBS SPGSCI Constant Maturity Composite TR	CMSPCITR	CMSPEMT	CMSPCMT	CMSPGMT
UBS CMCI Components USOTR Soybean Oil	CTBOTR	CTBOEMT	CTBOCMT	CTBOGMT
UBS CMCI Components USOTR Corn	CTCNTR	CTCNEMT	CTCNCMT	CTCNGMT
UBS CMCI Components USOTR Brent Crude	CTCOTR	CTCOEMT	CTCOCMT	CTCOGMT
UBS CMCI Components Brent Crude Oil ICE	CTCOTR1Y	CTCOEMTA	CTCOCMTA	CTCOGMTA
UBS CMCI Components Brent Crude Oil ICE	CTCOTR3M	CTCOEMT3	CTCOCMT3	CTCOGMT3
UBS CMCI Components Brent Crude Oil ICE	CTCOTR6M	CTCOEMT6	CTCOCMT6	CTCOGMT6
UBS CMCI Components USOTR Cotton	CTCTTR	CTCTEMT	CTCTCMT	CTCTGMT
UBS CMCI Components USOTR Gold	CTGCTR	CTGCEMT	CTGCCMT	CTGCGMT
UBS CMCI Components High Grade Copper	CTHGTR	CTHGEMT	CTHGCMT	CTHGGMT
UBS CMCI Components USOTR ULS Diesel	CTHOTR	CTHOEMT	CTHOCMT	CTHOGMT
UBS CMCI Components USOTR Coffee	CTKCTR	CTKCEMT	CTKCCMT	CTKCGMT
UBS CMCI Components USOTR HRW Wheat	CTKWTR	CTKWEMT	CTKWCMT	CTKWGMT
UBS CMCI Components Aluminium LME	CTLATR	CTLAEMT	CTLACMT	CTLAGMT
UBS CMCI Components USOTR Live Cattle	CTLCTR	CTLCEMT	CTLCCMT	CTLCGMT
UBS CMCI Components USOTR Lean Hogs	CTLHTR	CTLHEMT	CTLHCMT	CTLHGMT
UBS CMCI Components USOTR Lead	CTLLTR	CTLLEMT	CTLLCMT	CTLLGMT
UBS CMCI Components USOTR Nickel	CTLNTR	CTLNEMT	CTLNCMT	CTLNGMT
UBS CMCI Components USOTR Copper	CTLPTR	CTLPEMT	CTLPCMT	CTLPGMT
UBS CMCI Components USOTR Zinc	CTLXTR	CTLXEMT	CTLXCMT	CTLXGMT
UBS CMCI Components USOTR Natural Gas	CTNGTR	CTNGEMT	CTNGCMT	CTNGGMT
UBS CMCI Components USOTR Platinum	CTPLTR	CTPLEMT	CTPLCMT	CTPLGMT
UBS CMCI Components USOTR Cocoa	CTQCTR	CTQCEMT	CTQCCMT	CTQCGMT
UBS CMCI Components USOTR ICE Gasoil	CTQSTR	CTQSEMT	CTQSCMT	CTQSGMT
UBS CMCI Components USOTR EN Sugar	CTQWTR	CTQWEMT	CTQWCMT	CTQWGMT
UBS CMCI Components USOTR NY Sugar	CTSBTR	CTSBEMT	CTSBCMT	CTSBGMT
UBS CMCI Components USOTR Silver	CTSITR	CTSIEMT	CTSICMT	CTSIGMT
UBS CMCI Components USOTR Soymeal	CTSMTR	CTSMEMT	CTSMCMT	CTSMGMT
UBS CMCI Components USOTR Soybeans	CTSYTR	CTSYEMT	CTSYCMT	CTSYGMT
UBS CMCI Components USOTR WTI Crude	CTWCTR	CTWCEMT	CTWCCMT	CTWCGMT
UBS CMCI Components WTI Crude Oil USOTR	CTWCTR1Y	CTWCEMTA	CTWCCMTA	CTWCGMTA
UBS CMCI Components WTI Crude Oil USOTR	CTWCTR3M	CTWCEMT3	CTWCCMT3	CTWCGMT3
UBS CMCI Components WTI Crude Oil USO TR	CTWCTR6M	CTWCEMT6	CTWCCMT6	CTWCGMT6
UBS CMCI Components USOTR Wheat	CTWWTR	CTWWEMT	CTWWCMT	CTWWGMT
UBS CMCI Components USOTR RBOB	CTXBTR	CTXBEMT	CTXBCMT	CTXBGMT
UBS CMCI ex Agriculture & Livestock Capped	CMXALCTR	XMXA LCET	XMXA LCCT	XMXA LCGT

E. CMCI SUSTAINABILITY TRANSITION

E.1 Overview

UBS CMCI Sustainability Transition (the "**CMCI Sustainability**") aims to incorporate ecological and social criteria to UBS CMCI (the "**CMCI**") and achieve an improvement in the portfolio level Ecological-Social Score (the "**ES Score**") over time. The composition of CMCI Sustainability is rebalanced on an annual basis and the allocation to each Commodity (each a "**Commodity**" and together the "**Commodity Universe**" (as defined in Table E.1.II)) is determined via the aid of optimization (as defined in Section E.3.2).

Table E.1.I: Index Details

Underlying Name	Short Name	Base Year
UBS CMCI Sustainability Transition USD ER	CMCI Sustainability ER	2021
UBS CMCI Sustainability Transition USD TR	CMCI Sustainability TR	2021

Table E.1.II: Commodity Universe

Sector	Complex	UCITS IV	Commodity	Code	rfu Name
Energy	Oil	Crude Oil	WTI Crude Oil	CL	CRUDE OIL WTI
Energy	Oil	Crude Oil	Brent Crude Oil	CO	CRUDE OIL BRENT
Energy	Oil	Crude Oil	ULS Diesel	HO	HEATING OIL
Energy	Oil	Crude Oil	RBOB Gasoline	XB	UNLEADED PETROL
Energy	Oil	Crude Oil	Gasoil	QS	GAS OIL
Energy	Natural Gas	Natural Gas	Natural Gas	NG	NATURAL GAS
Industrial Metals	Copper	Copper	LME Copper	LP	COPPER
Industrial Metals	LME Aluminium	Aluminium	LME Aluminium	LA	ALUMINIUM
Industrial Metals	Copper	Copper	High Grade Copper	HG	COPPER
Industrial Metals	LME Zinc	Zinc	LME Zinc	LX	ZINC
Industrial Metals	LME Nickel	Nickel	LME Nickel	LN	NICKEL
Industrial Metals	LME Lead	Lead	LME Lead	LL	LEAD
Precious Metals	Gold	Gold	Gold	GC	GOLD
Precious Metals	Silver	Silver	Silver	SI	SILVER
Agriculture	Wheat	Wheat	SRW Wheat	W	WHEAT
Agriculture	Wheat	Wheat	HRW Wheat	KW	KANSAS WHEAT
Agriculture	Wheat	Wheat	Milling Wheat	CA	WHEAT
Agriculture	Corn	Corn	Corn	C	CORN
Agriculture	Soybean	Soybean	Soybeans	S	SOYBEAN
Agriculture	Soybean	Soybean	Soybean Meal	SM	SOYBEAN MEAL
Agriculture	Soybean	Soybean	Soybean Oil	BO	SOYBEAN OIL
Agriculture	Sugar	Sugar	Sugar #11	SB	SUGAR
Agriculture	Sugar	Sugar	Sugar #5	QW	SUGAR

Agriculture	Cotton	Cotton	Cotton	CT	COTTON
Agriculture	Coffee “C” Arabica	Coffee	Coffee “C” Arabica	KC	COFFEE
Agriculture	Cocoa	Cocoa	London Cocoa	QC	COCOA
Agriculture	Cocoa	Cocoa	Cocoa	CC	COCOA
Live Stock	Live Cattle	Live	Live Cattle	LC	LIVE CATTLE
Live Stock	Lean Hogs	Lean	Lean Hogs	LH	LEAN HOGS

E.2 Commodity Universe Review

The Commodity Universe for CMCI Sustainability will be reviewed from time to time by the CMCI Index Committee, in consultation with the CMCI Advisory Committee. New commodities that satisfy the below criteria (the “**Initial Criteria**”) shall be considered for inclusion in the Commodity Universe:

a) The commodity is included in the CMCI Universe

b) The ACOIV (defined in Section 3.2.3.3) for such commodity is greater than or equal to USD 100 million.

c) The ES Provider has delivered the rfu Data for such commodity in its most recent data publication.

The final decision for inclusion will be made by the CMCI Index Committee after a detailed analysis of the various Eligible Criteria, such as those in Sections 3.1, 3.2 and E.3. The committee will ensure that the inclusion of the new commodity will continue to fulfil the objective behind CMCI Sustainability, as described in Section E.1.

E.3 Ecological and Social Criteria

Ecological and social criteria are sourced from an external provider, namely rfu (the “**ES Provider**”). The supplied data from the ES Provider (the “**rfu Data**”) is used to calculate an ES Score for each commodity in the Commodity Universe.

E.3.1 The ES Provider

The ES Provider will deliver the rfu Data in accordance with the standard and frequency described below:

E.3.1.1 rfu Data Categorization

a) Score (the “**rfu Score**”) is a continues variable that assesses the sustainability of commodities from a production/utilization as well as ecological/social perspective

b) Rating (the “**rfu Trend**”) is a categorical variable on the sustainability outlook of commodities

E.3.1.2 rfu Data Frequency

The rfu Data will be update every two years, every November. Updates may only be available for a subset of the Commodity universe. CMCI Sustainability uses the most recently available rfu Data for each Commodity.

E.3.2 The ES Score

The rfu Score and rfu Trend for commodities in the Commodity Universe is used to compute an ES Score. The ES Score is computed as follows:

$$ess_i = rfuScore_i + NrfuTrend_i$$

Where:

$\boldsymbol{ess_i}$ is the ES Score for Commodity i, rounded to 9 decimal places;

$\boldsymbol{rfuScore_i}$ is the rfu Score for Commodity i;

$\boldsymbol{NrfuTrend_i}$ is a numerical version of rfu Trend for Commodity i, where the numerical transformation is defined as follows:

rfu Trend	Numerical rfu Trend
🡻	-2.50
🡾	-1.25
🡺	0.00
🡿	1.25
🡹	2.50

E.4 CMCI Sustainability Composition

The composition of CMCI Sustainability, that is the Target Weights and the Tenor Weights, are updated annually at the end of January and the Index rebalances to these new weights on the last three CMCI Business Days of January (the "**CMCI Sustainability Rebalancing Schedule**").

In addition, the Index also rebalances on a monthly basis to these weights set in the prior January, on the last three CMCI Business Days of the month.

E.4.1 CMCI Sustainability Target Weights

The CMCI Sustainability Target Weights are determined any day prior to the CMCI Sustainability Rebalancing Schedule and in respect of the ith Commodity on year t are calculated according to the following formula:

$$tw_{i,t} = rotw_{i,t}$$

Where:

$\boldsymbol{tw_{i,t}}$ is the CMCI Sustainability Target Weight in respect of the ith Commodity on year t;

$\boldsymbol{rotw_{i,t}}$ is the Optimized CMCI Sustainability Target Weight for the ith Commodity on year t ($otw_{i,t}$), rounded to 6 decimal places;

Rounding: CMCI Sustainability Target Weights are rounded to 6 decimal point precision. If the sum of the Target Weights due to the rounding is slightly in excess of 100%, the largest single component weight is reduced by the excess weight. If the sum of the Target Weights due to the rounding is slightly below 100%, the difference is added to the smallest weighted component.

E.4.2 CMCI Sustainability Optimization Framework

The optimization objective is to minimize deviations from the CMCI subject to: (i) liquidity, (ii) two diversification constraints and (iii) targeting at least a portfolio level ES Score, subject to successful weight calculations and solutions being found to all associated optimization problems. The optimizer used is SLSQP, which is a sequential least squares programming algorithm within the Scipy

Python Library, details on which can be found at https://docs.scipy.org/doc/scipy/reference/optimize.minimize-slsqp.html. The tolerance (tol) for the optimization is set to 1e-15.

Objective Function:

	$Minimize \sum (OTW_t^{Sustainability} - TW_t^{CMCI})^2$	Minimize the sum of squared deviations from CMCI

Constraints:

Target portfolio level ES Score	$OTW_t^{Sustainability\,T} EES_t \geq ess_t^{Target}$	The portfolio level ES Score should be at least equal to a target
Liquidity	$otw_{i,t} \leq \frac{5\%\ liquidity_{i,t}}{1\ billion\ USD}$	The Optimized CMCI Sustainability Target Weight for the ith Commodity should not exceed the ith Commodity's liquidity cap
Diversification (UCITS)	$OTW_{k,t}^{Sustainability} \begin{cases} \leq 35\%, if\ k = k_t^* \\ \leq 20\%, otherwise \end{cases}$	The commodity Complex with the highest average ES Score, is capped at 35% and the rest are capped at 20%
Diversification (Concentration)	$e^T (OTW_t^{Sustainability})^2 \leq 0.1$	The portfolio concentration level, as measured by Herfindahl-Hirschman Index, is capped at 10%
Fully Invested	$e^T OTW_t^{Sustainability} = 1$	
Bounds	$0 \leq otw_{i,t} \leq 1$	

Where:

$\boldsymbol{OTW_t^{Sustainability}}$ is the vector of Optimized CMCI Sustainability Target Weights to the Commodity Universe on year t. Prior to solving the optimization on any year, $OTW_t^{Sustainability}$ consist of an equal allocation in each Commodity in the Commodity Universe;

$\boldsymbol{TW_t^{CMCI}}$ is the vector of CMCI Target Weights to the Commodity Universe on year t;

$\boldsymbol{EES_t}$ is the vector of ES Scores to the Commodity Universe on year t;

$\boldsymbol{ess_t^{Target}}$ is the portfolio level ES Score rounded to 3 decimal places and defined based on the following formula:

For the CMCI Sustainability Base Year:

$$ess_t^{Target} = -3.110$$

Otherwise and subject to the following criteria:

(i):

$$ess_t^{Target} = max\left\{ ess_t^{CMCI}, ess_{t-1}^{\text{Sustainability}} \right\} + 0.245$$

(ii) In the event that a solution is also not found, subject to targeting a non-feasible portfolio level ES score as per (i):

$$ess_t^{Target} = max\left\{ ess_t^{CMCI}, ess_{t-1}^{\text{Sustainability}} \right\} + 0.245 - (0.001 \times \min\{multi, 245\})$$

Where:

$\boldsymbol{ess_t^{CMCI}}$ is the portfolio level ES Score of CMCI on year t;

$\boldsymbol{ess_{t-1}^{\text{Sustainability}}}$ is the portfolio level ES Score of CMCI Sustainability one year preceding year t;

$\boldsymbol{mult}$ is equal to 1 and increases at increments of 1 until a solution to the optimization is found;

$\boldsymbol{otw_{i,t}}$ is the Optimized CMCI Sustainability Target Weight for the ith Commodity on year t;

$\boldsymbol{liquidity_{i,t}}$ is the average of market volume and open interests at the 3 month tenor used in calculate the composition of CMCI on year t;

$\boldsymbol{OTW_{k,t}^{Sustainability}}$ is the vector of Optimized CMCI Sustainability Target Weights to the kth commodity Complex (as defined in Table E.1.II) on year t;

$\boldsymbol{k_t^*}$ is the commodity Complex with the highest average ES Score from the set of commodity complexes (as defined in Table E.1.II) that can achieve >20% allocation post-liquidity constraint on year t;

$\boldsymbol{e}$ is an all-ones vector;

E.5 Tenor Weights

The allocation to the jth tenor in respect of the ith Commodity on year t is calculated according to the following formula:

If Commodity i has a lower or equal allocation in CMCI Sustainability versus CMCI on year t:

$$tenorw_{i,j,t}^{\text{Sustainability}} = tenorw_{i,j,t}^{\text{CMCI}}$$

Otherwise:

$$tenorw_{i,j,t}^{\text{Sustainability}} = \left(tenorw_{i,j,t}^{\text{CMCI}} - \left(0.25 \times \frac{1}{N_t}\right)\right) + \left(0.25 \times \frac{j}{\frac{N_t(N_t+1)}{2}}\right)$$

Where:

$\boldsymbol{tenorw_{i,j,t}^{\text{Sustainability}}}$ is allocation to the jth tenor of the ith commodity in CMCI Sustainability on year t rounded to 6 decimal places;

$\boldsymbol{tenorw_{i,j,t}^{\text{CMCI}}}$ is allocation to the jth tenor of the ith commodity in CMCI on year t;

$\boldsymbol{N_t}$ is number of tenors with a non-zero allocation in respect of the ith commodity in CMCI on year t;

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