



Commodity Index Methodology

The ICE BofA Commodity Index eXtra Handbook

January 1, 2025

ICE BofA Commodity Index eXtra (MLCX) 3

Chapter 1: The ICE BofA Commodity index eXtra Overview 6

Section 1.1 Introduction 6

Section 1.2 MLCX Handbook 9

Section 1.3 Construction Philosophy 9

Section 1.4 Contract Roll Methodology 11

Section 1.5 Index Advisory Committee 11

Chapter 2: Construction 12

Section 2.1 Exchange Selection 12

Section 2.2 Contract Selection 12

 2.2.1 Eligibility 12

 2.2.2 Contract Liquidity Requirements and MLCX Contract Selection 13

Section 2.3 MLCX Contract Weighting 14

 2.3.1 Global Production Value 15

 2.3.2 Production Quantity Adjustments 16

 2.3.3 Market Sectors and Total Dollar Weight Adjustments 17

Chapter 3: Index Calculation 20

Section 3.1 Preliminary Definitions 20

Section 3.2 Contract Roll Methodology 21

Section 3.3 Total Dollar Weight Normalizing Constants and the Spot Index 24

Section 3.4 Excess and Total Return Indices 25

Section 3.5 Leveraged and Inverse Indices 27

 Section 3.6 Currency variants 28

 Section 3.7 Currency Hedged variants 28

Chapter 4: Special Index Rules 30

ICE BofA Commodity Index extra Biofuels Exchange Series 30

 General Description 30

 Definitions 30

 Weights 30

 Exchange Rates 31

 Roll Schedule 31

ICE BofA Commodity Index eXtra Grains 33

 General Description 33

 Definitions 33

 Weights 33

 Roll Schedule 33

ICE BofA Commodity Index eXtra 03 35

 General Description 35

 Definitions 35

 Contracts and Weights 35

Rolling Mechanism	36
Contract Production Weights Calculation	37
ICE BofA Commodity Index eXtra Precious Metals Plus	38
General Description.....	38
Definitions	38
Weights	38
Roll Schedule	39
ICE BofA Commodity Index eXtra CLA Index	40
General Description.....	40
Rolling Mechanism	40
Commodity Settlement Index Values	41
Appendix A: Selected Exchanges	42
Appendix B: Preliminary List of MLCX Constituent Contracts	43
Appendix C: Conversion Rates and Sources Used in the Calculation of MLCX Individual Contract Weights	45
Appendix D: Commodity Production Chains	47
Appendix E: Glossary of Terms.....	48



ICE BofA Commodity Index eXtra (MLCX)

The ICE BofA Commodity Index eXtra is designed to provide a liquid, consistent, representative and cost-efficient benchmark for measuring commodity market performance. MLCX constituent selection and weighting takes account of the liquidity of the constituent futures contracts and the value of the global production of each underlying commodity. These criteria ensure that the Index reflects the relative significance of these commodities in the global economy.

MLCX family of commodity indices

MLCX is supported by a comprehensive family of sector, single commodity and modified indices. Total return, excess return and spot versions of the indices are compiled.

Index oversight and the Index Advisory Committee

ICE Data Indices, LLC (“IDI”) is the Administrator of the Index (“Index Administrator”). To assist in the operation of the Index, IDI has established an advisory committee (“Index Advisory Committee”) comprised of members of IDI that has primary responsibility for review and maintenance of the MLCX and its methodologies. Ultimately, governance of the MLCX falls under the oversight of the Index Governance Committee of IDI.

Index rules and methodologies

This Handbook describes the rules and methodology used to select MLCX constituents and compute the index values. Supplemental rules and methodologies are published for the:

- ICE BofA Enhanced Carry Total Return Index (“MLCX3CRT”);
- ICE BofA Commodity Multi-Factor Total Return Index (“MLCX3MFT”);
- ICE Global Carbon Futures family of indices;
- ICE U.S. Carbon Neutral Power Index, ICE U.S. Power Index, and ICE U.S. Prompt Power Index;
- ICE Clean Energy Transition Metals Index; and
- ICE Murban Crude Oil Futures Index

Please refer to these documents for details on applicable selection, weighting and calculation methodologies.

The benchmarks in the Commodity Index Family do not take into account ESG factors.

It may be necessary, from time to time, for the Index Advisory Committee to make certain judgments with respect to the operation of the Index that are not provided for in this Handbook. In addition, upon the occurrence of extraordinary market events, the Index Advisory Committee may need to take various actions not specifically addressed in this Handbook.

“Expert Judgment” as defined in the IOSCO Principles for Financial Benchmarks (“IOSCO Principles”), refers to the exercise of discretion by an Administrator or Submitter with respect to the use of data in determining a Benchmark. Expert Judgment includes extrapolating values from prior or related transactions, adjusting values for factors that might influence the quality of data such as market events or impairment of a buyer or seller’s credit quality, or weighting firm bids or offers greater than a particular concluded transaction.

While IDI relies on the pricing data obtained from its regulated data sources, on certain occasions, where such judgments with respect to the operation of the index are required to maintain the integrity of the values and ensure that the Benchmark continues to operate in line with the methodology, IDI may apply Expert Judgment. Where it is required in a Benchmark determination, it may only be applied by suitably experienced and qualified staff Members on the IDI team. Using their expertise and knowledge, and the information available to them, they will make an assessment of what input data or constituent evaluation would be most appropriate to use to correctly reflect the Benchmark objective.

Ultimately any exercise of Expert Judgment is overseen by the Governance Committee of IDI, which ensures that the published Methodologies have been followed.

Periodic rules review

Rules and methodologies are reviewed periodically, in accordance with IDI’s policies and procedures, to ensure the Index continues to meet its objective. The Index Administrator shall announce changes in Rules and methodologies, along with their implementation dates, in accordance with its policies and procedures. As it relates to material changes, the Index Administrator will also consult on proposed material changes that affect the Index prior to making such changes, in accordance with IDI’s consultation policy:
https://www.theice.com/publicdocs/Consultation_Policy.pdf.

IDI, at its sole discretion, reserves the right to issue rule changes apart from this review cycle in the event that such changes are deemed necessary in order to deal with extraordinary circumstances including, but not limited to, changes in data availability.

Annual rebalancing

MLCX constituent futures contracts and the weights are set annually. This Handbook contains the rebalanced index constituents and weights effective as of January 1, 2025.

Limitations of the Indices

The Indices may be subject to potential limitations, such as a decline in the pool of qualifying constituents due to changes in market conditions and other factors that can affect the underlying market measured by an Index. Other limitations may include the ability of an Index to operate in illiquid or fragmented markets. IDI seeks to manage and mitigate these limitations through the Index design, review and oversight process.

Real time calculation and publication of Index levels may be impacted by price fluctuation tolerance thresholds. These tolerance thresholds, which are set in terms of the absolute percentage change versus the prior day Index close, can be adjusted for a given Index to take account of the volatility of its underlying constituents and exposure and prevailing market conditions. If an Index has breached its tolerance threshold, an alert is generated for the ICE Data Indices operations team to investigate and take appropriate action to resolve any discovered issue. During this time, Index values continue to be calculated and published.

IDI relies on data from third-party providers, and on their systems, controls and processes to provide data that is representative and accurate. IDI does not control the way in which those third-party data providers design their methodologies relating to the sourcing of the underlying data or determination of that data - whether that be through the use of models, estimations or directly from the source. Global production data for example that is provided by third parties is itself inherently subject to certain limitations and may not be representative of current levels due to the time lag in receiving and publicly reporting the data. Certain indices utilize the most recent period for which data is available for all sources, which may in certain instances be the period ending one or more years prior to the calculation of the index. Third-party data providers may also from time to time change their methodology or experience issues with the data which may impact on the quality of data provided to IDI. The index itself may then not remain representative or reliable if the underlying data is inaccurate or not available.

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Chapter 1: The ICE BofA Commodity index eXtra Overview

Section 1.1 Introduction

Initially introduced in 2006, The ICE BofA Commodity Index eXtra is designed to provide a liquid, consistent, representative and cost-efficient benchmark for measuring commodity market performance. MLCX constituent selection and weighting takes account of the liquidity of the constituent futures contracts (the “MLCX Contracts”) and the value of the global production of each underlying commodity. These criteria ensure that the Index provides a highly liquid benchmark and reflects the relative significance of these commodities in the global economy.

The material and information presented in this Handbook (the “Handbook”) regarding the ICE BofA Commodity index eXtraSM (the “MLCX” or the “Index”) sets forth the methodology for determining the composition and for calculating the value of the MLCX. The Handbook, the contents of the Handbook and the MLCX and its methodology are the exclusive property of IDI and its affiliates. ICE Data Indices, LLC is the Administrator of the Index.

The MLCX contains six market sectors: Energy, Base Metals, Precious Metals, Grains & Oil Seeds, Livestock and Soft Commodities & Others (each, a “Market Sector”). As a general rule, each Market Sector contains a minimum of two and a maximum of four MLCX Contracts. However, the MLCX was revised in 2014 to allow the Energy sector to expand to five commodities by including both WTI and Brent crude oil contracts (as opposed to only Brent in 2013). This change was adopted to reflect the development of two distinct oil markets: North America (WTI) and Rest of the World (Brent) crude production. The imposition of limits on the number of contracts per Market Sector allows market participants seeking to replicate the Index to reduce transaction costs without materially impacting the performance of the Index or the diversity of representation of commodities in the Index.

The selection and weighting of the MLCX Contracts is typically determined once a year, based on data as of June 30, and the annual rebalancing changes are applied beginning with the January 1 calculation. Each of the MLCX Contracts included in the Index is rolled into a later expiry over a fifteen day period in each month prior to the month in which a contract expires, in accordance with a prescribed schedule set forth in Section 3.2. The MLCX Total Return Index reflects the performance of a fully collateralized investment in commodity futures contracts, inclusive of interest earned on the collateral. Excess return, on the other hand, excludes the interest earned on the collateral and therefore represents the return attributed purely to price movement of the constituent MLCX Contracts. A spot index value is also calculated, which is a non-investable measure of commodity price changes that does not take into account the rolling of future contracts as in an investable portfolio. Therefore, the difference between excess return and spot return shows the return attributed to rolling constituent contracts to a new expiry. Table 1 below represents the list of indices in the MLCX family of indices as well as other IDI futures-based indices that leverage this methodology except where otherwise indicated in those specific futures-based index methodologies as indicated below.

Table 1: The MLCX Index Family

Index	Type	Reference Tickers		
		Total Return	Excess Return	Spot Return
ICE BofA Commodity index eXtra	Broad Market Index	MLCXTR	MLCXER	MLCXSP
ICE BofA Commodity index eXtra (AGriculture)	Sector 1	MLCXAGTR	MLCXAGER	MLCXAGSP
ICE BofA Commodity index eXtra (GRains)	Sector 2	MLCXGRTR	MLCXGRER	MLCXGRSP
ICE BofA Commodity index eXtra (LiveStock)	Sector 2	MLCXLSTR	MLCXLSEER	MLCXLSSP
ICE BofA Commodity index eXtra (Soft Commodities)	Sector 2	MLCXSCTR	MLCXSCER	MLCXSCSP
ICE BofA Commodity index eXtra (Coffee)	Single commodity	MLCXKCTR	MLCXKCER	MLCXKCSP
ICE BofA Commodity index eXtra (Sugar)	Single commodity	MLCXSBTR	MLCXSBER	MLCXSBSP
ICE BofA Commodity index eXtra (Cotton)	Single commodity	MLCXCTTR	MLCXCTER	MLCXCTSP
ICE BofA Commodity index eXtra (Cocoa)	Single commodity	MLCXCCTR	MLCXCCER	MLCXCCSP
ICE BofA Commodity index eXtra (ENergy)	Sector 1	MLCXENTR	MLCXENER	MLCXENSP
ICE BofA Commodity index eXtra (Gas Oil)	Single commodity	MLCXQSTR	MLCXQSER	MLCXQSP
ICE BofA Commodity index eXtra (Brent Crude Oil)	Single commodity	MLCXCOTR	MLCXCOER	MLCXCOSP
ICE BofA Commodity index eXtra (Industrial Metals)	Sector 1	MLCXIMTR	MLCXIMER	MLCXIMSP
ICE BofA Commodity index eXtra (Aluminum)	Single commodity	MLCXLATR	MLCXLAER	MLCXLASP
ICE BofA Commodity index eXtra (Copper)	Single commodity	MLCXLPTR	MLCXLPER	MLCXLPS
ICE BofA Commodity index eXtra (Nickel)	Single commodity	MLCXLNTR	MLCXLNER	MLCXLNSP
ICE BofA Commodity index eXtra (Zinc)	Single commodity	MLCXLXTR	MLCXLXER	MLCXLXSP
ICE BofA Commodity index eXtra (Precious Metals)	Sector 1	MLCXPMT	MLCXPMER	MLCXPMSP
ICE BofA Commodity index eXtra (Lead)	Single commodity	MLCXLLTR	MLCXLLER	MLCXLLSP
ICE BofA Commodity index eXtra Biofuels Exchange Series	See Chapter 4	MLCXBTR	MLCXBTER	MLCXBSP
ICE BofA Commodity index eXtra Precious Metals Plus	See Chapter 4	MLCXPMPT	MLCXPMPE	MLCXPMPS
ICE BofA Commodity index eXtra 03 Index	See Chapter 4	MLCX03TR	MLCX03ER	MLCX03SP
ICE BofA Commodity index eXtra CLA Index	See Chapter 4	na	MLCXCLAE	na
ICE BofA Commodity Enhanced Carry Index	See Separate methodology document	MLCX3CRT	MLCX3CRE	MLCX3CRS
ICE BofA Commodity Multi-Factor Index	See Separate methodology document	MLCX3MFT	MLCX3MFE	MLCX3MFS
ICE Global Carbon Index	See Separate methodology document	ICECRBNT	ICECRBN	ICECRBNS
ICE EUA Carbon Futures Index	See Separate methodology document	ICEEUAT	ICEEUA	ICEEUAS
ICE CCA Carbon Futures Index	See Separate methodology document	ICECCAT	ICECCA	ICECCAS
ICE RGGI Carbon Futures Index	See Separate methodology document	ICERGGIT	ICERGGI	ICERGGIS

COMMODITY INDEX METHODOLOGY

ICE UKA Carbon Futures Index	See Separate methodology document	ICEUKAT	ICEUKA	ICEUKAS
ICE U.S. Carbon Futures Index	See Separate methodology document	ICEUCBNT	ICEUCBN	ICEUCBNS
ICE EUA Carbon Futures Custom Roll Index	See Separate methodology document	ICEUACNT	ICEUACN	ICEUACNS
ICE Clean Energy Transition Metals Index	See Separate methodology document	ICECETMT	ICECETME	ICECETMS
ICE U.S. Carbon Neutral Power Index	See Separate methodology document	ICECNPIT	ICECNPIE	ICECNPIS
ICE U.S. Power Index	See Separate methodology document	ICEUPWRT	ICEUPWRE	ICEUPWRS
ICE U.S. Prompt Power Index	See Separate methodology document	ICEPPWRT	ICEPPWRE	ICEPPWRS
ICE Murban Crude Oil Futures Index	See Separate methodology document	ICEADMT	ICEADME	ICEADMS

Section 1.2 MLCX Handbook

This Handbook describes the rules and methodology used to select MLCX constituents and compute the index values. However, it should be noted that neither this Handbook nor any set of procedures are capable of anticipating all possible circumstances and events that may occur with respect to the MLCX and the application of its rules and methodologies. Accordingly, this Handbook does not purport to be complete or to address all of the situations or issues that may arise in connection with the Index. It may be necessary, from time to time, for IDI and/or the Index Advisory Committee to make certain judgments with respect to the operation of the Index that are not provided for in this Handbook. In addition, upon the occurrence of extraordinary market events, the Index Advisory Committee may need to take various actions not specifically addressed in this Handbook. The Index Advisory Committee reserves the right to take any such actions that it believes are necessary or appropriate, in its sole discretion, in order to preserve or enhance the ability of the Index to achieve its objectives. For more information please see the section 'Index Rules and Methodologies' above. Finally, IDI reserves the right to modify the principles underlying the Index, as set forth in this Handbook, from time to time, if it believes such modifications to be necessary or appropriate. In taking any of the foregoing actions, IDI will consider its effect on the Index and the interests of market participants generally. However, IDI has no obligation to take into account, at any time or in any manner, the interests of any particular market participant when taking any actions described in this Handbook or any other actions. Any modifications to this Handbook, and any changes made or actions taken in connection with the Index (including any changes made by IDI to the methodology for determining the composition or value of the MLCX) will be made available to market participants in the manner described in Section 1.5. Any general changes in Index rules and methodologies are also subject to review by the Index Governance Committee of IDI.

All questions of interpretation with respect to the application of the provisions in this Handbook, including any determinations that need to be made in the event of a market emergency or any other extraordinary circumstance, will be resolved or determined by the Index Advisory Committee, where appropriate.

For a complete list of the definitions used in this Handbook, please refer to Appendix E.

Section 1.3 Construction Philosophy

The MLCX is designed to provide a vehicle for investment in the commodity markets through a transparent benchmark. The general principles upon which the MLCX is constructed include:

1. **Liquidity** – The futures contracts included in the Index should be sufficiently liquid to accommodate the level of trading needed to support trading in the Index. The selection mechanism is therefore based primarily on liquidity.
2. **Weighting** – The weight of each futures contract in the Index should reflect the value of the global production of each commodity underlying the contract, as a measure of the significance of the commodity in the global economy, with appropriate adjustments to avoid “double counting”.
3. **Sectors** – Each Market Sector should be adequately represented in the Index in relation to its share of the global market, adjusted to avoid excessive exposure to any one Market Sector.

4. **Rolling** – constituent MLCX Contracts that are near their expiration are rolled to a later expiry over a fifteen day period to limit the market impact that such contract rolls could have.

While liquidity is the primary driver of the MLCX Contract selection methodology, various other criteria are also used to enhance diversification and representation. The MLCX is designed to reflect the significance of the underlying commodities in the global economy. However, in order to manage the risk of excessive concentrations the weight of any given Market Sector is limited to 60% of the overall Index, with a minimum allocation of 3% per Market Sector. Also, the MLCX differentiates between “intermediate” and “final” commodities (e.g., those that are used in the production of other commodities, versus those that are not), adjusting for double counting to assign proportional weights to “upstream” commodities. For example, the MLCX avoids double counting the input of grain in the agricultural side of the commodity markets by extracting the amount of corn and soybean meal used for livestock feeding purposes. Table 2 below represents the weight of each MLCX Contract as of January 1, 2025. Table 3 below represents the weight of each MLCX Market Sector as of January 1, 2025.

Table 2: Weights of MLCX contracts

Contract	Ticker	Exchange	12/31/2024
Brent Crude Oil	B	ICE Futures Europe	26.643284%
Gasoil	G	ICE Futures Europe	12.746635%
Gasoline (RBOB)	N	NYMEX	10.578644%
Crude Oil (WTI)	T	ICE Futures Europe	8.077252%
Gold	GC	COMEX	5.789149%
Copper	LP	LME	5.783561%
Corn	C	CBOT	5.065753%
Wheat	W	CBOT	4.468079%
Aluminum	LA	LME	3.915905%
Sugar	SB	ICE Futures U.S.	2.418012%
Soybean Meal	SM	CBOT	2.385104%
Live Cattle	LC	CME	2.170914%
Natural Gas	NG	NYMEX	1.954185%
Soybean	S	CBOT	1.453740%
Cotton	CT	ICE Futures U.S.	1.250465%
Coffee	KC	ICE Futures U.S.	1.150141%
Nickel	LN	LME	1.074654%
Zinc	LX	LME	0.934303%
Lean Hogs	LH	CME	0.829086%
Cocoa	CC	ICE Futures U.S.	0.767678%
Silver	SI	COMEX	0.543456%

Table 3: MLCX Market Sector Target Weights, 2025

Sector	2025
Energy	60.000000%
Grains	13.372676%
Base	11.708423%
Precious	6.332605%
Softs	5.586296%
Livestock	3.000000%

The weight of each MLCX Contract is based on the global production of the commodity underlying the contract, provided that the contract reflects global prices for the underlying commodity. However, in some cases MLCX Contracts only have pricing links to a limited number of markets around the world. For instance, the NYMEX natural gas contract primarily represents the US market and the surrounding North American markets in Canada and Mexico. In addition, some European gas markets, such as the UK, are developing an increasing link to US natural gas prices through the liquefied natural gas market. As a result, rather than using production of natural gas in the world or in the US to assign a weight to the natural gas contract, the natural gas production of the US, Canada, Mexico and the UK have been aggregated. Similarly, as US livestock prices can be affected by local issues such as disease and trade restrictions, the livestock component of MLCX has been limited to production of cattle and hogs in the United States, instead of using global production weights. In addition, for the WTI contract only North American production (US, Canada, and Mexico) is considered, while for the Brent contract global production excluding North America is included.

Section 1.4 Contract Roll Methodology

Each of the futures contracts included in the Index is rolled into the next available (or later) contract month in advance of the month in which expiration of the contract occurs in accordance with the procedures outlined in Section 3.2. The rolling process takes place over a fifteen day period during each month prior to the relevant expiration month for each contract, which reduces the impact that the roll might have on the market. While these principles will be the primary basis for implementing any future modifications to the MLCX, the Index Advisory Committee may choose to only partially apply the principles as it deems necessary in order to address any unforeseen or exceptional circumstances.

Section 1.5 Index Advisory Committee

The Index Advisory Committee is comprised of members from IDI, the Index Administrator. The Index Administrator can add additional members to the Index Advisory Committee as it deems appropriate. The Index Advisory Committee will discuss any necessary action required in connection with the MLCX, including but not limited to: (i) adjustments relating to the calculation or publication of the MLCX; (ii) determination of the occurrence or continuation of circumstances that have a material impact upon the operation, maintenance, management or performance of the MLCX; and (iii) modification of the MLCX methodology.

The Index Advisory Committee is scheduled to meet at least annually and on additional occasions as may be warranted in the judgment of the Index Advisory Committee or upon request by an Index Advisory Committee Member. The Index Advisory Committee may determine, among other things, the inclusion/exclusion of any of the contracts/exchanges in the Index, any changes to the composition of the MLCX or in the weights of the MLCX Contracts, and any changes to the calculation procedures applicable to the MLCX. Any general changes in Index rules and methodologies are also subject to review by the Index Governance Committee of IDI.

Any modifications to this Handbook, and any changes made or actions taken in connection with the Index (including any changes made by the Index Advisory Committee to the rules and methodologies for determining the composition or value of the MLCX) will be made available to market participants in a published report. Wherever practicable, any such changes or actions will be made available at least 30 days prior to the effective date, subject to a determination by the Index Advisory Committee that it is not feasible or appropriate to provide at least 30 days' notice. As it relates to material changes, the Index Administrator will consult on proposed material changes that affect the Index prior to making such changes, in accordance with IDI's consultation policy: <https://www.theice.com/market-data/indices/regulation> .

Chapter 2: Construction

Section 2.1 Exchange Selection

As part of its annual review, the Index Advisory Committee determines the set of exchanges from which MLCX constituent futures contracts will be selected (the "Selected Exchanges"). The Index Advisory Committee reserves the right to modify the list of Selected Exchanges at any time during the year, including the addition or removal of an exchange from the list, as it deems such changes to be necessary or appropriate in its discretion. To be considered for inclusion in this list, an exchange must be located in a country that is a member of the Organization for Economic Co-operation and Development (OECD). In addition, the exchange must be one of the principal trading forums, based on relative liquidity, for US dollar-denominated futures contracts on major physical commodities. Of those exchanges that meet these two criteria, selections are made on the basis of liquidity, geographical location and commodity type. Currently, there are four Selected Exchanges: the New York Mercantile Exchange (NYMEX and COMEX Divisions), the Chicago Mercantile Exchange (CME) (CME and the Chicago Board of Trade (CBOT) Divisions), the London Metal Exchange (LME) and ICE Futures (ICE) (ICE Futures Europe and ICE Futures US Divisions).

Changes to the list of Selected Exchanges may be made for a variety of reasons. For example, provided it meets the two established criteria, the Index Advisory Committee may add an exchange to the list of Selected Exchanges in order to include new contracts that are not currently represented in the Index or to capture a more liquid contract on a commodity that is already represented in the MLCX. In general, changes to the list of Selected Exchanges will be made for purposes of enhancing the ability of the Index to achieve its objectives as a benchmark for commodity market performance and investment in commodities as an asset class.

Section 2.2 Contract Selection

2.2.1 Eligibility

An "**Eligible Contract**" is a futures contract representing a qualifying Market Sector that is traded on a Selected Exchange and that satisfies the requirements specified below for inclusion in the

MLCX. An MLCX Contract is an Eligible Contract that is selected for inclusion in the MLCX. An Eligible Contract must satisfy all of the following requirements; provided, however, that the Index Advisory Committee may, in its discretion, determine that a contract that does not satisfy one or more of the requirements set forth below will nevertheless be included in the MLCX, if the inclusion of a contract is, in the judgment of the Index Advisory Committee (with ultimate approval by the Index Governance Committee of IDI), necessary or appropriate for the maintenance of the integrity of the Index and/or the realization of its objectives:

- It must be denominated in U.S. Dollars.
- It must be based on the price of a physical commodity in one of the Market Sectors represented in the index and provide for cash settlement or physical delivery at a specified time, or during a specified period, in the future.
- Detailed trading volume data regarding the contract must be available for at least two years prior to the initial inclusion of the contract in the MLCX.
- The contract must have a Total Trading Volume (as defined in Section 2.2.2) of at least 500,000 contracts for each annual period, as discussed below.
- Reference Prices must be publicly available on a daily basis either directly from the Selected Exchange or through an external data vendor, provided the Reference Prices are available from the data vendor on every day on which the relevant exchange is open for business. For purposes of calculating the MLCX, “**Reference Prices**” means the official settlement or similar prices posted by the relevant Selected Exchange or its clearing house with respect to a contract and against which positions in such contract are margined or settled.

A list of all futures contracts traded on the Selected Exchanges, with an indication of those that are Eligible Contracts, is assembled as part of the annual review. This list is used by the Index Advisory Committee in the determination of the MLCX Contracts to be included in the Index.

2.2.2 Contract Liquidity Requirements and MLCX Contract Selection

The principal criterion for the selection of Eligible Contracts is “Liquidity”, measured in terms of a contract’s notional value of traded contracts. The notional value of traded contracts is derived from the Total Trading Volume during the most recent twelve month period from July 1 through June 30, and the value of that trading volume, based on the Average Reference Price of the contract as explained in more detail below.

Eligible contracts are ranked on the basis of their Liquidity measure. A preliminary set of contracts are selected for the index in ranked order, subject to the minimum and maximum requirements for each Market Sector. The preliminary contract list is then reviewed and any non-Intercontinental Exchange (“ICE”) contracts are replaced with the comparable ICE contract provided the ICE contract: (i) has the same closing settlement price and substantially similar characteristics as the contract it is replacing, and (ii) in the opinion of the Index Advisory Committee, where a proposed replacement contract may not meet the established quantitative criteria, it has sufficient trading volume for inclusion. Finally, certain contracts on the preliminary list may be excluded by the Index Advisory Committee in order to preserve the integrity and advance the objectives of the Index. For example, and without limitation, if the Index Advisory Committee determines that an Eligible Contract that would otherwise be included in the MLCX is

not sufficiently tradable, either because of unusual terms or market conditions, the Index Advisory Committee may decide to exclude that contract. Additionally, a contract may be excluded to avoid double counting or overrepresentation. The most recent preliminary list of contracts, with an indication of those that are currently included in MLCX, appears in Appendix B.

The **Total Trading Volume (TTV)** is equal to the sum of the daily trading volumes in all expiration months of the contract on each day during the most recent twelve-month period beginning on July 1 and ending on June 30. As noted, the TTV of an Eligible Contract must be at least 500,000.

The **Average Reference Price (ARP)** is the average of the Reference Price of the Front Month Contract for an MLCX Contract on each Trading Day during the twelve month period beginning on July 1 and ending on June 30 of each year.

The **“Front Month Contract” (FMC)** on any given day is the first available contract expiration month after the date on which the determination is made

“Trading Day” means any day on which the relevant Selected Exchange is open for trading.

Liquidity (LIQ), for purposes of determining the order by which Eligible Contracts are selected for inclusion in the index, is equal to the Total Trading Volume multiplied by the Contract Size with respect to each contract, and multiplied by the Average Reference Price for each contract. The **“Contract Size” (CS)** with respect to a contract is the number of standard physical units of the underlying commodity represented by one contract. For example, the Contract Size of a crude oil futures contract is 1,000 barrels.

For each contract:

$$LIQ = TTV \times CS \times ARP$$

Once the LIQ is determined, each of the Eligible Contracts is then listed in order of LIQ, from highest to lowest. In the Eligible Contract preliminary selection process, all six core MLCX Market Sectors must be represented by a minimum of two and a maximum of four (five for Energy) Eligible Contracts. The contract with the highest LIQ is selected for inclusion in the index and the selection process continues, in order, until every Market Sector has at least two and no more than four (five for Energy) constituent contracts. Based on this selection process, MLCX can have a minimum of 12 and a maximum of 25 MLCX Contracts.

The determination of Eligible Contracts and selection of MLCX Contracts included in the Index occurs once a year, following review and approval by the Index Governance Committee of IDI. The results for the following calendar year are announced in December and take effect on the first business day of the next year.

Section 2.3 MLCX Contract Weighting

The weight of each MLCX Contract in the Index is determined on the basis of the Global Production Value (as defined in Section 2.3.1) of each MLCX Commodity, which is a measure that is designed to provide a non-biased reflection of the relative economic importance of each MLCX Contract in the global economy. An **“MLCX Commodity”** is any commodity or group of commodities that essentially function as a single commodity based on their production,

consumption or delivery characteristics, the nature of their trading markets or other features that make them substitutes for each other for various purposes, as determined by the Index Advisory Committee in its sole discretion.

2.3.1 Global Production Value

The **Global Production Value** ($GPV_{c,y}$) of each MLCX Commodity during each year will be calculated in U.S. Dollars based on the Average Global Production Quantity (as defined below) of the relevant MLCX Commodity multiplied by the number of units in which those quantities are quoted (see Appendix C) times the Average Reference Price of the applicable MLCX Contract over the preceding one-year period from July 1 to June 30, where “c” is the MLCX Commodity and “y” is the active year.

For each year y, for each MLCX Commodity underlying the MLCX Contract c:

$$GPV = AGPQ \times ARP$$

The **Average Global Production Quantity (AGPQ)** is the annual average of the three most recent available years of global production quantity (GPQ) with respect to all MLCX Commodities underlying the MLCX Contracts, expressed in the same units as the specifications of the MLCX Contract. In order to calculate the AGPQ using homogeneous average global production quantities over the same time period, the most recent three year period for which data is available for all MLCX Commodities is identified. For instance, in calculating the weights for the 2008 calendar year, an MLCX Commodity might not have available data beyond 2005 while all others have data through 2006. As a result, the AGPQ for the MLCX Commodities for 2008 would be based on the average of 2003 through 2005 production data. For 2025, the average of the years 2018 through 2020 is used.

For each MLCX Commodity underlying the MLCX Contract:

$$AGPQ_{current} = \frac{(GPQ_y + GPQ_{y-1} + GPQ_{y-2})}{3}$$

where y = the most recent year for which data is available for all MLCX Commodities

The sources used by the Index Advisory Committee in calculating the GPQ of each MLCX Commodity are identified in Appendix C. The GPV calculated for each MLCX Commodity is based on sources that the Index Advisory Committee believes to be reliable, but the Index Advisory Committee makes no warranty regarding the reliability or accuracy of such data, and reserves the right to change any or all of the sources at any time.

The AGPQs are generally based on worldwide production data for each MLCX Commodity. However, in some cases the pricing of an MLCX Commodity might be based solely on a limited number of regional markets and determinations in such cases might be made on the basis of regional or national production as specified in Appendix C contract parameters.

2.3.2 Production Quantity Adjustments

Certain commodities are derived from other commodities in various forms. For example, gasoline and heating oil are produced from crude oil, and, because livestock feed on corn and other grains, they are to an extent derived from agricultural commodities. As a result, if all of these commodities are represented in the MLCX, and their weights are based on the production levels of each MLCX Commodity without adjustment, the Index will reflect a “double counting” of certain commodities. In order to avoid this result, the GPQs of MLCX Commodities that are derived from other MLCX Commodities represented in the Index are subtracted from the GPQs of the MLCX Commodities from which they are derived.

This section has a new parameter, $cons(c)$, which is defined as the set of MLCX Commodities that are inputs into the production process of one or more other MLCX Commodities c , and therefore, in the judgment of the Index Advisory Committee, should be adjusted to avoid double-counting. Appendix D identifies the commodity production chains involving MLCX Commodities produced through the use of other MLCX Commodities and the manner in which the production quantity of each MLCX Commodity should be reduced to take the derivative MLCX Commodity into account. These measures are necessarily approximations determined in good faith by the Index Advisory Committee, but will be used consistently for the purposes of calculating the MLCX, unless and until the Index Advisory Committee, in its discretion, determines that a change to such measures is necessary or appropriate.

A **Conversion Measure ($CM_{c:n}$)** is the conversion factor used to convert the units in which a derived MLCX Commodity is expressed into the units of the MLCX Commodity from which it is derived. The Conversion Measures used in calculating the GPQ adjustments are set forth in Appendix D.

The **Adjusted Average Global Production Quantity (AAGPQ)** is the global quantity of an MLCX Commodity that is used for purposes of calculating the weight of each MLCX Contract in the Index, after adjustment for quantities attributable to inputs into derivatives of the MLCX Commodity that are also included in the Index, in accordance with Appendix D.

For each year y :

$$AAGPQ_c = AGPQ_c - \sum_{n \in cons(c)} AGPQ_n \times CM_{c:n}$$

The Adjusted Average Global Production Value (AAGPV) is the Adjusted Average Global Production Quantity multiplied by the Average Reference Price.

For each MLCX Commodity c :

$$AAGPV_c = AAGPQ_c \times ARP_c$$

The **Percentage Dollar Weight (PDW)** of an MLCX Commodity c is therefore:

$$PDW_c = \frac{AAGPQ_c \times ARP_c}{\sum_j AAGPQ_j \times ARP_j}$$

and the PDW of a Market Sector i is

$$PDW_S = \frac{\sum_{i \in S} AAGPQ_i \times ARP_i}{\sum_j AAGPQ_j \times ARP_j}$$

2.3.3 Market Sectors and Total Dollar Weight Adjustments

Application of Market Sector limits

There is a 60% maximum and a 3% minimum PDW for each Market Sector represented in the Index. In the event one or more of the unadjusted Market Sector PDWs f_i^{unadj} for each Market Sector i fall outside that range, the PDWs are adjusted first by reducing any Market Sector PDWs f_i^{unadj} over 60% to the 60% maximum and adjusting the remaining Market Sector PDWs on a pro rata basis. Next, any Market Sector PDWs that are below 3% are raised to the 3% minimum, with Market Sector PDWs adjusted on a pro rata basis, subject to not violating the 60% maximum.

This adjustment is affected such that the adjusted Market Sector PDWs f_i^{adj} satisfy the following conditions:

$$3\% \leq f_i^{adj} \leq 60\%$$

$$\sum_i f_i^{adj} = 1$$

Procedures for calculating the adjustments to the Total Dollar Weight in each Market sector are set forth in the following case examples.

Case 1: No Market Sector over 60%, n Market Sectors below 3%

1) Let h^0 denote the sum of the initial weights between 3% and 60%, and let $h^1 = 1 - n \cdot 3\%$.

2) If $f_i^{unadj} < 3\%$ set $f_i^{adj} = 3\%$, else set $f_i^{adj} = \frac{h_1}{h_0} \times f_i^{unadj}$.

Note that all new weights other than the ones set to 3% are reduced. Hence some of the reduced weights may fall below 3%. If this is the case, then all such weights are set to 3% and all other weights are reduced (other than the ones which have been set to 3% previously) proportionally so that the sum of all weights equals one. If necessary, this procedure is repeated until all weights are greater than or equal to 3%.

Case 2: One Market Sector over 60%, no Market Sectors below 3%

Suppose that $f_j^{unadj} > 60\%$.

- 1) Let h^0 denote the sum of the initial weights between 3% and 60%, and let $h^1 = 40\%$.
- 2) Set $f_i^{adj} = 60\%$
- 3) Set $f_i^{adj} = \frac{h_1}{h_0} \times f_i^{unadj}, i \neq j$.

Note that all new weights other than f_i^{adj} are increased, hence all new weights will satisfy the constraints.

Case 3: One Market Sector over 60%, n Market Sectors below 3%

Suppose that $f_j^{unadj} > 60\%$ and let R be the net increase/decrease of the new weights, i.e.

$$R = f_j^{unadj} - 60\% - (3\%n - S),$$

where S is the sum of all weights less than 3%. We now distinguish between two different cases.

$R > 0$:

- 1) Set $f_j^{adj} = 60\%$ and increase all other weights proportionally so that the sum of all new weights equals one
- 2) If some weights are still below 3%, then they are set to be equal to 3%, and while maintaining $f_j^{adj} = 60\%$, rescale all other weights proportionally so that the sum of all new weights equals one
- 3) Repeat 2) if necessary without reducing weights that were previously set to 3%

$R < 0$:

- 1) All weights that are less than 3% are set to be equal to 3%, and all other weights are reduced proportionally so that the sum of all new weights equals one
- 2) We have now four different sub cases:

- i) If all new weights satisfy the constraints then no further adjustments are needed
- ii) If $f_j^{adj} \leq 60\%$ and at least one weight is below 3%, then continue the adjustment process at Case 1
- iii) If $f_j^{adj} > 60\%$ and no weights are below 3% then continue the adjustment process at Case 2
- iv) If $f_j^{adj} > 60\%$ and at least one weight is below 3%, then continue the adjustment process at Case 3 but leave the weights set to 3% in 1) out of the analysis

Calculation of contract weights after applying sector limits

The **Contract Production Value (CPV)** is the modified commodity production value for each MLCX Commodity, after applying the requirements and limits for aggregate Market Sector weights.

$$CPV_i = AAGPV_i \times \left(\frac{f_S^{adj}}{f_S^{unadj}} \right),$$

where S is the Market Sector containing MLCX Commodity i.

Each MLCX Contract is assigned a **Contract Production Weight (CPW)**, which constitutes the weight of the relevant MLCX Contract in the Index. The Contract Production Weight is equal to the Contract Production Value divided by the Last available Contract Price for a particular MLCX Contract applied in an Index Period. The “**Last available Contract Price (LCP)**” is the most recent available Reference Price for each MLCX Contract on the last day of the Index Period that the MLCX is rolling out of. See Appendix C for a list of the sources of production data and the conversions used in making this determination.

For each year y, for each MLCX Commodity c:

$$CPW = \frac{CPV}{LCP} = \frac{AAGPV_i \times \left(\frac{f_j^1}{f_j^0} \right)}{LCP}$$

Chapter 3: Index Calculation

The MLCX is calculated on the basis of the respective weights of the MLCX Contracts and the applicable Reference Prices, and in accordance with the formulas set forth in this section. However, because futures contracts, by their terms, have stated expirations (typically on a monthly basis), an index of futures contracts can only be calculated by reference to contracts with specific expirations. Moreover, as the contract that is used to calculate the value of the index at a particular time approaches expiration, it is necessary to transfer, or “roll” the exposure from that contract into the next (or another) available contract expiration. Accordingly, this section addresses not only the methodology for calculating the MLCX but also the process of “rolling” contracts from one expiry to another

Section 3.1 Preliminary Definitions

A **Market Sector** S is any category of the MLCX Contracts in the Index that constitutes either the full Index or the components of the Index included in any of the identified Market Sectors.

A **Business Day** is any New York Mercantile Exchange Trading Day, with the Trading Day being defined for this purpose in accordance with New York Mercantile Exchange rules (which may define a “trading day” as beginning with the opening of electronic trading during the preceding evening).

An **Index Period** P is a period of time during which there are no changes in the list of MLCX Contracts or in the CPWs assigned to the MLCX Contracts. The purpose of the Index Period is to identify each time period within which a particular Index composition and set of CPWs remains in effect. Typically, an Index Period is a calendar year. However, if the composition of the Index, or the CPWs, change during a given year, such as due to extraordinary market events or other special circumstances, the calendar year in which such changes occur will include two or more Index Periods.

For any given day t , or any given month m , $p(t)$ and $p(m)$ are the Index Period, into which day t or month p , respectively, fall. Therefore, whenever there is a change in the composition of the Index or in any CPW, a new Index Period begins. If t^* is the last Business Day of the present Period P , then the following Period is denoted by $p(t^*) + 1$. Once the new Period has begun, it is denoted by $p(t)$, and the previous period is then referred to as $p(t) - 1$.

The **Calendar Month** in which t falls is denoted by $m = m(t)$, and the subsequent Calendar Month is denoted by $m(t) + 1$.

The **Underlying Contract Table** in Table 3 in Section 3.2 lists which MLCX Contract expirations are to be included in the Index. For each MLCX Contract C and a given Business Day t , the Underlying Contract Table gives the Month Code of the MLCX Contract expiration that will be included in the Index at the beginning of the Calendar Month, and that will need to be rolled out of, during that Calendar Month, $m(t)$, if the particular MLCX Contract rolls in such month (see Section 3.2 for more information).

Market Disruption Event means the occurrence on any Business Day of any one or more of the following circumstances:

- A Selected Exchange is not open for trading due to an exchange holiday.
- A material limitation, suspension, or disruption of trading in one or more MLCX Contracts which results in a failure by the exchange on which each applicable MLCX Contract is traded to report an exchange published settlement price for such contract on the day on which such event occurs or any succeeding day on which it continues.
- The exchange published settlement price for any MLCX Contract included a "limit price", which means that the exchange published settlement price for such contract for a day has increased or decreased from the previous day's exchange published settlement price by the maximum amount permitted under applicable exchange rules.
- Failure by the applicable exchange or other price source to announce or publish the exchange published settlement price for any MLCX Contract.
- A suspension of trading in one or more MLCX Contracts for which trading does not resume at least ten (10) minutes prior to the scheduled or rescheduled closing time.

Section 3.2 Contract Roll Methodology

The expiration months of all MLCX Contracts potentially included in the Index, and the months in which each such contract is rolled into the next available expiration, are set forth in Table 4. For example, the index holds the July (N) Aluminum contract on April 30 and then on the first business day of May the index begins to roll into the August (Q) contract. This list is reviewed annually by the Index Advisory Committee and amended as needed.

Table 4: Rolling schedule of MLCX contracts (reflects the expiry held at the beginning of the month prior to the start of any applicable roll)

Contract	Code	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Aluminum	LA	H	J	K	M	N	Q	U	V	X	Z	F+	G+
Brent Crude	B	H	J	K	M	N	Q	U	V	X	Z	F+	G+
Cocoa	CC	H	K	K	N	N	U	U	Z	Z	Z	H+	H+
Coffee	KC	H	K	K	N	N	U	U	Z	Z	Z	H+	H+
Copper	LP	H	J	K	M	N	Q	U	V	X	Z	F+	G+
Corn	C	H	K	K	N	N	U	U	Z	Z	Z	H+	H+
Cotton	CT	H	K	K	N	N	Z	Z	Z	Z	Z	H+	H+
Crude Oil (WTI)	T	H	J	K	M	N	Q	U	V	X	Z	F+	G+
Gasoil	G	H	J	K	M	N	Q	U	V	X	Z	F+	G+
Gasoline (RBOB)	N	H	J	K	M	N	Q	U	V	X	Z	F+	G+
Gold	GC	J	J	M	M	Q	Q	Z	Z	Z	Z	G+	G+
Lead	LL	H	J	K	M	N	Q	U	V	X	Z	F+	G+
Lean Hogs	LH	J	J	M	M	N	Q	V	V	Z	Z	G+	G+
Live Cattle	LC	J	J	M	M	Q	Q	V	V	Z	Z	G+	G+
Natural Gas	NG	H	J	K	M	N	Q	U	V	X	Z	F+	G+
Nickel	LN	H	J	K	M	N	Q	U	V	X	Z	F+	G+
Silver	SI	H	K	K	N	N	U	U	Z	Z	Z	H+	H+
Soybean	S	H	K	K	N	N	X	X	X	X	F+	F+	H+

COMMODITY INDEX METHODOLOGY

Soybean Meal	SM	H	K	K	N	N	Z	Z	Z	Z	Z	F+	H+
Sugar	SB	H	K	K	N	N	V	V	V	H+	H+	H+	H+
Wheat	W	H	K	K	N	N	U	U	Z	Z	Z	H+	H+
Zinc	LX	H	J	K	M	N	Q	U	V	X	Z	F+	G+

Month Letter Code: January F, February G, March H, April J, May K, June M, July N, August Q, September U, October V, November X and December Z. A '+' following the letter code indicates a contract of the following year.

The **Roll Period** is the first 15 Business Days of the month. A **Roll Day** means (a) a day within the Roll Period or (b) a day beyond the 15th Business Day in which rolling will occur due to a Market Disruption Event which caused a delay in the roll. A **Non-Roll Day**, consequently, is any Business Day that is not a Roll-Day.

In the event that a Selected Exchange is not open for trading on a Roll Day, the Reference Price used for purposes of calculating the MLCX, and effecting the relevant portion of the roll, will be the most recent available Reference Price for the relevant MLCX Contract. If no Reference Price is published as a result of a Market Disruption Event or other unscheduled closure of the relevant Selected Exchange, and the Index Advisory Committee determines that the use of the most recent available Reference Price would have a material adverse effect on the Index, the rolling of the MLCX Contracts or market participants using the Index, the Index Advisory Committee retains the discretion (but is not obligated) to delay the rolling of the relevant portion of the MLCX attributable to that MLCX Contract or to use a different Reference Price in order to effect that portion of the roll. It is anticipated, however, that the Index Advisory Committee will exercise this discretion only under extraordinary circumstances.

The Roll-Out and Roll-In Contracts are determined by the Underlying Contract Table and the rolling of MLCX Contracts during a Roll Period is affected through the use of Roll Weights. (Note that not all contracts roll in every Roll Period.) On each Business Day during a Roll Period, the CPW of each Eligible Contract is divided between the contract expiration it is being rolled out of (the "**Roll-Out Contract**") and the contract expiration it is being rolled into (the "**Roll-In**

Contract"). The weight allocated to the Roll-Out Contract for commodity C on day t of the Roll Period is referred to as the **Roll Weight** (W_t^C) (and the weight allocated to the Roll-In Contract will therefore be equal to 1 minus the Roll Weight).

On the first day of the Roll Period, 14/15 of the Contract Production Weight of each Eligible Contract is allocated to the Roll-Out Contract and 1/15 of the Contract Production Weight is allocated to the Roll-In Contract. These proportions are changed by 1/15 on each day of the Roll Period until, at the end of the Period, 100% of the exposure of the Index to the Eligible Contract is in the Roll-In Contract.

If a roll occurs at the start of an Index Period, and the Index is therefore rolling into new Contract Production Weights, then on the first day of the Roll Period, 14/15 of the old Index basket of each Eligible Contract is allocated to the **Roll-Out Contract** (ROC) and 1/15 of the new Index basket is allocated to the **Roll-In Contract** (RIC). These proportions are changed by 1/15 on each day of the Roll Period. Table 5 below illustrates the Roll Weights during a roll period containing no market disruption events.

Table 5: Roll weights with no market disruption event

Roll day	Market Disruption Event	ROC	RIC
-1	None	15/15	0
1	None	14/15	1/15
2	None	13/15	2/15
3	None	12/15	3/15
4	None	11/15	4/15
5	None	10/15	5/15
6	None	9/15	6/15
7	None	8/15	7/15
8	None	7/15	8/15
9	None	6/15	9/15
10	None	5/15	10/15
11	None	4/15	11/15
12	None	3/15	12/15
13	None	2/15	13/15
14	None	1/15	14/15
15	None	0	15/15

If a Market Disruption Event occurs on a Roll Day, then each contract in the affected commodity will have its rolling postponed, while contracts in the unaffected commodities will roll as previously defined. The postponed portion will roll on the first Business Day not affected by Market Disrupted Events. In the event of a Market Disruption Event index calculations are adjusted to reflect the postponed roll. Table 6 below illustrates the Roll Weights during a roll period containing one market disruption event.

Table 6: Roll weights with market disruption event

Roll day	Market Disruption Event	ROC	RIC
-1	None	15/15	0
1	None	14/15	1/15
2	None	13/15	2/15
3	None	12/15	3/15
4	Settle Limit Price	12/15	3/15
5	None	10/15	5/15
6	None	9/15	6/15
7	None	8/15	7/15
8	None	7/15	8/15
9	None	6/15	9/15
10	None	5/15	10/15
11	None	4/15	11/15
12	None	3/15	12/15
13	None	2/15	13/15
14	None	1/15	14/15
15	None	0	15/15

In the event that the Roll Period ends without the Roll Weight being fully redistributed into the Roll-In Contract, then the Roll Period is extended until there is no Market Disruption Event. If the

Roll Period is extended 5 days, then the Index Advisory Committee retains the discretion (but is not obligated) to delay the rolling of the relevant portion of the MLCX attributable to that MLCX Contract or to use a different Reference Price in order to affect that portion of the roll. It is anticipated, however, that the Index Advisory Committee will exercise this discretion only under extraordinary circumstances.

In Calendar Month m , the price in dollars and Roll Weight on day t of the Roll-Out Contract for commodity C is denoted by $F_{m(t),t}^c$ and W_t^c , respectively. Similarly, the price of the Roll-In Contract is denoted by $F_{m(t)+1,t}^c$, which is the settlement price of the futures contract on commodity c in the Calendar Month $m(t)+1$ on the Business Day t .

Section 3.3 Total Dollar Weight Normalizing Constants and the Spot Index

On a Non-Roll Day, the Total Dollar Weight (TDW) for a Market Sector S , TDW_t^S , is the sum of the Dollar Weights for all MLCX Contracts included in S . On such day, the Dollar Weight (DW) of an MLCX Contract is the product of its Contract Production Weight and the underlying futures price.

On a Non-Roll Day the Total Dollar Weight is calculated as:

$$TDW_t^S = \sum_{c \in S} CPW_{p(t)}^c \times F_{m(t)+1,t}^c.$$

On a Non-Roll Day, the Spot Index (SP) of Market Sector S is defined by:

$$SP_t^S = \frac{TDW_t^S}{NC_{p(t)}^S},$$

where $NC_{p(t)}^S$ is the Normalizing Constant for period $p(t)$ for Market Sector S . Spot Index values are rounded to 2 decimal places.

The purpose of the Normalizing Constant is to assure continuity of the Spot Index whenever there is a change in the CPWs, and it is recalculated for each new period as:

$$NC_{p(t^*)+1}^S = NC_{p(t^*)}^S \times \frac{\sum_{c \in S} CPW_{p(t^*)+1}^c \times F_{m(t^*)+1,t^*}^c}{\sum_{c \in S} CPW_{p(t^*)}^c \times F_{m(t^*)+1,t^*}^c},$$

where t^* is the last Business Day of Period P and $CPW_{p(t^*)+1}^c$ are the new CPWs for the following period. Initially, the Normalizing Constant is set so that the Spot Index for the Market Sector S starts at 100:

$$NC_1^S = \frac{TDW_{m(t_0),t_0}^S}{100}.$$

On a Roll Day t , the Total Dollar Weight for a Market Sector S is calculated as:

$$TDW_t^S = TDW_{m(t),t}^S + TDW_{m(t)+1,t}^S,$$

where

$$TDW_{m(t),t}^S = \sum_{c \in S} W_t^c \times CPW_{p(m(t)-1)}^c \times F_{m(t),t}^c$$

and

$$TDW_{m(t)+1,t}^S = \sum_{c \in S} (1 - W_t^c) \times CPW_{p(m(t))}^c \times F_{m(t)+1,t}^c$$

If there are changes in the composition of the Index, i.e. changes in any of the CPWs, then the calculation of the Total Dollar Weight requires additional components to account for the change in the Normalizing Constant and the shift from the old to the new CPWs. These changes are implemented as follows:

$$TDW_t^S = \frac{NC_{p(t)}^S}{NC_{p(t)-1}^S} \times TDW_{m(t),t}^S + TDW_{m(t)+1,t}^S$$

On a Roll Day or any Business Day t where there have been changes in the composition of the Index, the Spot Index of Market Sector S is again calculated as

$$SP_t^S = \frac{TDW_t^S}{NC_{p(t)}^S}.$$

Section 3.4 Excess and Total Return Indices

If Business Day t is a Non-Roll Day, then define the Daily Commodity Return of a Market Sector S by

$$DCR_t^S = \frac{TDW_t^S}{TDW_{t-1}^S} - 1.$$

The Daily Commodity Return of a Market Sector S represents the return of a portfolio of commodity futures contracts from $t-1$ to t .

On a Roll-Day t , the Daily Commodity Return is calculated by:

$$DCR_t^S = \frac{TDWP_{m(t),t}^S + TDWP_{m(t)+1,t}^S}{TDW_{m(t),t-1}^S + TDW_{m(t)+1,t-1}^S} - 1,$$

where

$$TDWP_{m(t),t}^S = \sum_{c \in S} W_{t-1}^c \times CPW_{p(m(t)-1)}^c \times F_{m(t),t}^c$$

$$TDWP_{m(t)+1,t}^S = \sum_{c \in S} (1 - W_{t-1}^c) \times CPW_{p(m(t))}^c \times F_{m(t)+1,t}^c$$

and

$$TDW_{m(t),t-1}^S = \sum_{c \in S} W_{t-1}^c \times CPW_{p(m(t)-1)}^c \times F_{m(t),t-1}^c$$

$$TDW_{m(t)+1,t-1}^S = \sum_{c \in S} (1 - W_{t-1}^c) \times CPW_{p(m(t))}^c \times F_{m(t)+1,t-1}^c.$$

Note that the only difference between $TDWP_{m(t),t}^S$ and $TDW_{m(t),t}^S$ is that in $TDWP_{m(t),t}^S$, the weights of individual commodities are from previous day W_{t-1}^c and not W_t^c as in the latter. In the special case when there are changes to any of the CPWs it is given by:

$$DCR_t^S = \frac{\frac{NC_{p(t)}^S}{NC_{p(t)-1}^S} \times TDWP_{m(t),t}^S + TDWP_{m(t)+1,t}^S}{\frac{NC_{p(t)}^S}{NC_{p(t)-1}^S} \times TDW_{m(t),t-1}^S + TDW_{m(t)+1,t-1}^S} - 1.$$

If t is the first Business Day of the month, we define $W_{t-1}^c = 1$ for all c and the TDWs are calculated as described in Section 3.3 above.

The Excess Return Index of Market Sector S is defined as:

$$ER_t^S = ER_{t-1}^S (1 + DCR_t^S)$$

where $ER_{t_0}^S = 100$. Excess Return Index values are rounded to 2 decimal places.

The SOFR rate ($rate_t$) is the most recently published Secured Overnight Financing Rate (SOFR) published by the Federal Reserve Bank of New York prior to the calendar day t .

The Interest Rate Return ($IRR(t)$) is the daily return on calendar day t of the SOFR rate using a 360 day per year convention and a period of 1 day. The $IRR(t)$ is calculated as:

$$IRR_t = \left[\frac{1}{1 - \left(\frac{1}{360}\right) rate_t} \right] - 1$$

The Total Return Index of Market Sector S is defined as:

$$TR_t^S = TR_{t-1}^S \left(1 + DCR_t^S + IRR_t \right) \prod_{t-1 < \tau < t} (1 + IRR_\tau)$$

where $TR_{t_0}^S = 100$. The Total Return Index reflects the Excess Return Index plus the Interest Rate Return.

Section 3.5 Leveraged and Inverse Indices

Versions of indices reflecting daily resetting leveraged or inverse returns will be made available for select indices. The leveraged or inverse indices are calculated as per the below:

$$LevInvIdx_t = LevInvIdx_{t-1} \times \left[1 + LF \times \left(\frac{Idx_t}{Idx_{t-1}} - 1 \right) + ((1 - LF) \times IR_{t-1}) \times \frac{D}{360} \right]$$

t is the current index business day.

$t - 1$ is the prior index business day.

$LevInvIdx$ is the leveraged / inverse index level.

LF is the leverage or inverse factor

Idx is the underlying index level

IR is the interest rate, equal to 0.

D is the number of calendar days between t and $t - 1$.

Section 3.6 Currency variants

The following formula is utilized to calculate additional **Currency Variants** of an Index:

$$\text{Index}(C)_t = \text{Index}(C)_b \times \frac{\text{Index}(B)_t}{\text{Index}(B)_b} \times \frac{FX_t}{FX_b}$$

Where:

$\text{Index}(C)_t$ = Index Level (Currency Variant) on Index Business Day t

$\text{Index}(C)_b$ = Index Level (Currency Variant) on Index Base Date b

$\text{Index}(B)_t$ = Index Level (Base Currency) on Index Business Day t

$\text{Index}(B)_b$ = Index Level (Base Currency) on Index Base Date b

FX_t = FX rate between Base Currency and Variant Currency on Index Business Day t

FX_b = FX rate between Base Currency and Variant Currency on Index Base Date b

Section 3.7 Currency Hedged variants

The following formulas are utilized to calculate **Currency Hedged Variants** of an Index:

$$\text{HedgedIndex}_t = \text{HedgedIndex}_m \times \left(\frac{\text{UnhedgedIndex}_t}{\text{UnhedgedIndex}_m} + HI_t \right)$$

Where:

HedgedIndex_t = Hedged Index Level on Index Business Day t

HedgedIndex_m = Hedged Index Level on last Index Business Day m of the prior month

UnhedgedIndex_t = Underlying Unhedged Index Level on Index Business Day t

UnhedgedIndex_m = Underlying Unhedged Index Level on last Index Business Day m of the prior month

HI_t = Hedge Impact (gain or loss) for the currenc(ies) in the Index (see below)

Please note that the *UnhedgedIndex* is the relevant Currency Variant of the Index, as defined in Section 3.6 above, that is calculated in the same currency being hedged to:

$$HI_t = \sum_{i=1}^n \left\{ \text{Weight}_{i,m} \times HR \times \left(\frac{SR_{i,m}}{FR_{i,m}} - \frac{SR_{i,m}}{FIR_{i,t}} \right) \right\}$$

Where:

HI_t = Hedge Impact (gain or loss) for currenc(ies) i on Index Business Day t

$\text{Weight}_{i,m}$ = Weight of currency i in the *UnhedgedIndex* at the close of the last Index Business Day of the prior month

HR = Hedge Ratio for currency i (by default, 100%, unless otherwise indicated in specific Index methodology)

$SR_{i,m}$ = Spot Rate for currency i in terms of the Index hedged currency as of the last Index Business Day of the prior month

$FR_{i,m}$ = 1-month Forward Rate for currency i in terms of the Index hedged currency as of the last Index Business Day of the prior month

$FIR_{i,t}$ = 1-month Forward Interpolated Rate for currency i in terms of the Index hedged currency as of Index Business Day t

$$FIR_{i,t} = SR_{i,t} + \left[(FR_{i,t} - SR_{i,t}) \times \left(\frac{DaysRemaining_{i,t}}{DaysinMonth} \right) \right]$$

Where:

$SR_{i,t}$ = Spot Rate of currency i on Index Business Day t

$FR_{i,t}$ = Forward Rate of currency i on Index Business Day t

$DaysRemaining_{i,t}$ = Number of calendar days from Index Business Day t until the last Index Business Day of the month, not inclusive of Index Business Day t

$DaysinMonth$ = Number of calendar days in month from the first calendar day to last Index Business Day of the month

By default, London 4:00 PM WMR Spot and Forward FX rates are used in the calculation of the Currency Hedged variants of the Index.

Chapter 4: Special Index Rules

ICE BofA Commodity Index extra Biofuels Exchange Series

General Description

The ICE BofA Commodity index eXtra Biofuels Exchange Series (MLCXBX) is a modified version of the ICE BofA Commodity index eXtra (MLCX). The modifications consist of different set of underlying commodities (some of which are MLCX commodities and some of which are not) and different Percentage Target Weights from the MLCX at the beginning of each year (Table 7). MLCXBX is calculated using the same methodologies as MLCX modified as described below.

Definitions

The **MLCX Biofuels Exchange Series Contracts** are the futures contracts included in the Index, which is currently comprised of six commodities - soybeans, soybean oil, corn, sugar, rapeseed, and canola.

The **Percentage Target Weights** are the weights of the relevant MLCX Biofuels Exchange Series Contracts in the Index, for purposes of Index calculation. They are given in Table 6 below. The Percentage Target Weights are chosen such that the non-US exchange traded contracts in total account for at most 10%. See Table 9 for a list of the sources of production data used for determining weights.

The **Contract Production Weights (CPWs)** are the weights of the relevant MLCXBX Contracts in the Index, for purposes of Index calculation.

The **Exchange rates** are the currency prices used to convert an MLCX Biofuels Exchange Series Contract price from its original currency to US dollars which is the currency in which the index is quoted as described below.

As described in the handbook, MLCXBX index rolls in the first fifteen Business Days of the month.

Weights

Note: Barley was one of the MLCX Biofuels Exchange Series Contracts prior to May 2010. Due to lack of sufficient liquidity for Barley contracts in the markets, it was removed from the Index and ceased to be in the Index after the May 2010 roll period.

The list of MLCX Biofuels Exchange Series Contracts and their respective Percentage Target Weights for 2025 are given in Table 7 below:

Table 7: MLCX Biofuels Exchange Series Target Weights, 2025

Contract	Ticker	Exchange	Percentage Target Weights
Soybean	S	CBOT	36.405065%
Sugar #11	SB	ICE Futures U.S.	21.543159%
Corn	C	CBOT	19.712482%
Soybean Oil	BO	CBOT	14.641058%
Rapeseed	ECO	Euronext	5.354124%

Canola	RS	ICE Futures U.S.	2.344112%
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Exchange Rates

For Canola and Rapeseed contracts, the Reference Price used for the purpose of index calculation will be as described by the MLCX Handbook converted to USD at the WMR London 4:00 PM mid exchange rates for CAD and EUR, respectively.

Roll Schedule

The expiration months of all MLCX Contracts potentially included in the Index, and the months in which each such contract is rolled into the next available expiration, are set forth in Table 8. For example, the index holds the July (N) Canola contract on April 30 and then on the first business day of May the index begins to roll into the November (X) contract. This list is reviewed annually by the Index Advisory Committee and amended as needed. A full explanation of the roll mechanism can be found in Section 3.2.

Table 8: Underlying Contract Table (reflects the expiry held at the beginning of the month prior to the start of any applicable roll)

Contract	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Canola	H	K	K	N	N	X	X	X	X	F+	F+	H+
Corn	H	K	K	N	N	U	U	Z	Z	Z	H+	H+
Rapeseed	G	K	K	Q	Q	Q	X	X	X	X	G+	G+
Soybean	H	K	K	N	N	X	X	X	X	F+	F+	F+
Soybean Oil	H	K	K	N	N	Q	U	Z	Z	Z	F+	H+
Sugar	H	K	K	N	N	V	V	V	H+	H+	H+	H+

Month Letter Code: January F, February G, March H, April J, May K, June M, July N, August Q, September U, October V, November X and December Z. A '+' following the letter code indicates a contract of the following year.

Table 9: Sources used to calculate world production weights for MLCX Biofuels contracts

Commodity	Parameter	Unit	Source
Corn	PSD: World Total Summary: FSI Consumption of Corn	1000 MT	USDA
Sugar	PSD: World Total Summary: Production of Cane Sugar	1000 MT	USDA
Soybeans	PSD: World Total Summary: Production of Soybean Oilseed	1000 MT	USDA
Soybean Oil	PSD: World Total Summary: Production of Soybean Oil	1000 MT	USDA

Table 9: Sources used to calculate world production weights for MLCX Biofuels contracts

Commodity	Parameter	Unit	Source
Canola	PSD: North American Total Summary: Production of Rapeseed Oilseed	1000 MT	USDA
Rapeseed	PSD: World Total Summary: Production of Rapeseed Oilseed minus Canola production	1000 MT	USDA

USDA Foreign Agricultural Service:

<https://apps.fas.usda.gov/psdonline/app/index.html#/app/home>

ICE BofA Commodity Index eXtra Grains

General Description

The ICE BofA Commodity index eXtra Grains (MLCXGR) is a sub-index of the ICE BofA Commodity index eXtra (MLCX) that includes all commodities from the Grains & Oil Seeds sector. MLCXGR is calculated using the same methodologies as MLCX modified as described below.

Definitions

The **MLCX Grains Contracts** are the futures contracts included in the Index, which is currently comprised of four commodities from the Grains & Oil Seeds sector – corn, wheat, soybeans, and soybean meal.

The **Percentage Target Weights** are the target weights of the relevant MLCX Grains Contracts in the Index, used to determine the Contract Production Weights (CPW) for purposes of Index calculation.

As described in the handbook, MLCXGR contracts roll in the first fifteen Business Days of the month.

Weights

The Percentage Target Weights for 2025 are given in Table 10 below.

Table 10: MLCX Grains weights, 2025

Contract	Ticker	Exchange	Percentage Target Weights
Corn	C	CBOT	37.881371%
Chicago Soft Red Winter Wheat	W	CBOT	33.412004%
Soybean Meal	SM	CBOT	17.835652%
Soybean	S	CBOT	10.870973%

Roll Schedule

The expiration months of all MLCX Contracts potentially included in the Index, and the months in which each such contract is rolled into the next available expiration, are set forth in Table 11. For example, the index holds the July (N) Wheat contract on April 30 and then on the first business day of May the index begins to roll into the September (U) contract. This list is reviewed annually by the Index Advisory Committee and amended as needed. A full explanation of the roll mechanism can be found in Section 3.2.

Table 11: Underlying Contract Table (reflects the expiry held at the beginning of the month prior to the start of any applicable roll)

Contract	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chicago Soft Red Winter Wheat	H	K	K	N	N	U	U	Z	Z	Z	H+	H+
Corn	H	K	K	N	N	U	U	Z	Z	Z	H+	H+
Soybean	H	K	K	N	N	X	X	X	X	F+	F+	H+
Soybean Meal	H	K	K	N	N	Z	Z	Z	Z	Z	F+	H+

Month Letter Code: January F, February G, March H, April J, May K, June M, July N, August Q, September U, October V, November X and December Z. A “+” following the letter indicates the contract is for the following year.

ICE BofA Commodity Index eXtra 03

General Description

The ICE BofA Commodity index eXtra 03 (MLCX03) is a modified version of the ICE BofA Commodity index eXtra (MLCX). MLCX03 uses the same commodities as MLCX but with different Percentage Target Weights at the beginning of each year (Table 12), a monthly rebalancing and a different Roll Schedule. In addition, Contract Production Weights are recalculated monthly. Other than these modifications, described in more detail below, MLCX03 is calculated using the same methodologies as MLCX.

Definitions

The **Contract Production Weights (CPWs)** are the weights of the relevant MLCX03 Contracts in the Index, for purposes of Index calculation. They are recalculated every month according to the methodology described below.

The **Percentage Target Weights (PTWs)** are the weights of the relevant MLCX03 Contracts in the Index, for purposes of Index calculation.

The **MLCX03 Contracts** are the futures contracts included in the Index.

Contracts and Weights

The target weights for MLCX03 are computed by considering MLCX target weights and applying caps on the sector weights. The maximum allowed weight for the largest sector is 35% and 20% all other sectors. The methodology of the redistribution of weights to satisfy the caps is explained in detail in Section 2.3.3 of the Handbook. The list of MLCX03 Contracts along with their sectors and their respective Percentage Target Weights for 2025 are given in Table 12 below.

Table 12: MLCX03 Percentage Target Weights, 2025

MLCX 03 Contracts	Ticker	Exchange	MLCX 03 Sectors	Percentage Target Weights
Brent	B	ICE Futures Europe	Energy	15.541916%
Gold	GC	COMEX	Precious Metals	9.804865%
Copper	LP	LME	Base Metals	9.795403%
Corn	C	CBOT	Grains & Oilseeds	7.576273%
Gas Oil	G	ICE Futures Europe	Energy	7.435537%
Wheat	W	CBOT	Grains & Oilseeds	6.682401%
Aluminum	LA	LME	Base Metals	6.632223%
Gasoline (RBOB)	N	NYMEX	Energy	6.170876%
Crude Oil (WTI)	T	NYMEX	Energy	4.711730%
Sugar	SB	ICE Futures U.S.	Soft Commodities	4.095297%
Live Cattle	LC	CME	Livestock	3.606088%
Soybean Meal	SM	CBOT	Grains & Oilseeds	3.567131%
Soybean	S	CBOT	Grains & Oilseeds	2.174195%
Cotton	CT	ICE Futures U.S.	Soft Commodities	2.117866%
Coffee	KC	ICE Futures U.S.	Soft Commodities	1.947952%
Nickel	LN	LME	Base Metals	1.820102%
Zinc	LX	LME	Base Metals	1.582395%

Lean Hogs	LH	CME	Livestock	1.377189%
Cocoa	CC	ICE Futures U.S.	Soft Commodities	1.300189%
Natural Gas	NG	NYMEX	Energy	1.139941%
Silver	SI	COMEX	Precious Metals	0.920431%

The resulting sector level weights are given in Table 13 below:

Table 13: MLCX03 Sector Target Weights, 2025

MLCX 03 Sectors	Percentage Target Weights
Energy	35.000000%
Grains & Oilseeds	20.000000%
Base Metals	19.830123%
Precious Metals	10.725296%
Soft Commodities	9.461304%
Livestock	4.983277%

Rolling Mechanism

The expiration months of all MLCX Contracts potentially included in the Index, and the months in which each such contract is rolled into the next available expiration, are set forth in Table 14. For example, the index holds the August (Q) Aluminum contract on April 30 and then on the first business day of May the index begins to roll into the September (U) contract. This list is reviewed annually by the Index Advisory Committee and amended as needed. A full explanation of the roll mechanism can be found in Section 3.2.

Table 14: Underlying Contract Table (reflects the expiry held at the beginning of the month prior to the start of any applicable roll)

Contract	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Aluminum	J	K	M	N	Q	U	V	X	Z	F+	G+	H+
Brent	J	K	M	N	Q	U	V	X	Z	F+	G+	H+
Cocoa	H	K	K	N	N	U	U	Z	Z	Z	H+	H+
Coffee	N	N	N	N	N+	N+	N+	N+	N+	N+	N+	N+
Copper	J	K	M	N	Q	U	V	X	Z	F+	G+	H+
Corn	U	U	U	U	U	U	U+	U+	U+	U+	U+	U+
Cotton	H	K	K	N	N	Z	Z	Z	Z	Z	H+	H+
Crude Oil (WTI)	J	K	M	N	Q	U	V	X	Z	F+	G+	H+
Gasoil	J	K	M	N	Q	U	V	X	Z	F+	G+	H+
Gasoline (RBOB)	J	K	M	N	Q	U	V	X	Z	F+	G+	H+

COMMODITY INDEX METHODOLOGY

Gold	J	M	M	Q	Q	Z	Z	Z	Z	G+	G+	J+
Lean Hogs	J	M	M	N	Q	V	V	Z	Z	G+	G+	J+
Live Cattle	J	M	M	Q	Q	V	V	Z	Z	G+	G+	J+
Natural Gas	M	M	M	M	Z	Z	Z	Z	Z	Z	M+	M+
Nickel	J	K	M	N	Q	U	V	X	Z	F+	G+	H+
Silver	K	K	N	N	U	U	Z	Z	Z	H+	H+	H+
Soybean	N	N	N	N	N+	N+	N+	N+	N+	N+	N+	N+
Soybean Meal	H	K	K	N	N	Z	Z	Z	Z	Z	F+	H+
Sugar	K	K	K	K+	K+	K+	K+	K+	K+	K+	K+	K+
Wheat	K	K	K	K	K+	K+	K+	K+	K+	K+	K+	K+
Zinc	J	K	M	N	Q	U	V	X	Z	F+	G+	H+

Month Letter Code: January F, February G, March H, April J, May K, June M, July N, August Q, September U, October V, November X and December Z. A “+” following the letter indicates a contract of the following year.

Contract Production Weights Calculation

According to Section 3.3 of the MLCX Handbook, we calculate the index Total Dollar Weights (TDW) on the first business day preceding the start of the roll period of month j . Based on this TDW, the Contract Production Weight for commodity i on month j is calculated according to the formula:

$$CPW_{ij} = \frac{TDW \times PTW_{ij}}{P_{ij}}$$

where P_{ij} denotes the price of the contract described in Table 12 for commodity i , on the first business day preceding the start of the roll period of month j .

ICE BofA Commodity Index eXtra Precious Metals Plus

General Description

The ICE BofA Commodity index eXtra Precious Metals Plus (MLCXPMP) tracks four Precious Metals commodities. MLCXPMP rebalances at the beginning of each year to a specified set of Percentage Target Weights (Table 15). Other than these criteria, described in more detail below, MLCXPMP is calculated using the same methodologies as MLCX.

Definitions

The **MLCX Precious Metals Plus Contracts** are the futures contracts included in the Index, which is currently comprised of four commodities – gold, silver, platinum and palladium.

The **Percentage Target Weights** are the target weights of the relevant MLCXPMP Contracts in the Index, used to determine the Contract Production Weights (CPW) for purposes of Index calculation. See Table 17 for a list of the sources of production data used for determining weights.

As described in the handbook, MLCXPMP index rolls in the first fifteen Business Days of the month.

Weights

The weight of each MLCX Contract in MLCXPMP is determined on the basis of the Global Production Value of each Commodity. The exact procedure will follow the general rules and principles described in Section 3.3 of the MLCX Handbook, aiming to provide a non-biased reflection of the relative economic importance of each MLCXPMP Commodity in the global economy. The index is composed of two Market Sectors: the MLCX Precious Metals - Core Market Sector, consisting of gold and silver; and the MLCX Precious Metals - Platinum Group Metals Market Sector, consisting of platinum and palladium. The Production Dollar Weights for each Market Sector represented in the Index are limited to a maximum of 60% and a minimum of 3%. The Percentage Target Weights for 2025 are given in Table 15 below.

Table 15: MLCX Precious Metals Plus weights, 2025

MLCXPMP Contract	Ticker	Exchange	Percentage Target Weights
Gold (GC)	GC	COMEX	54.850881%
Platinum	PL	NYMEX	23.677591%
Palladium	PA	NYMEX	16.322409%
Silver (5,000 oz) (SI)	SI	COMEX	5.149119%

Roll Schedule

The expiration months of all MLCX Contracts potentially included in the Index, and the months in which each such contract is rolled into the next available expiration, are set forth in Table 16. For example, the index holds the August (Q) Gold contract on May 31 and then on the first business day of June the index begins to roll into the December (Z) contract. This list is reviewed annually by the Index Advisory Committee and amended as needed. A full explanation of the roll mechanism can be found in Section 3.2.

Table 16: Underlying Contract Table (reflects the expiry held at the beginning of the month prior to the start of any applicable roll)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Gold	J	J	M	M	Q	Q	Z	Z	Z	Z	G+	G+
Silver	H	K	K	N	N	U	U	Z	Z	Z	H+	H+
Platinum	J	J	N	N	N	V	V	V	F+	F+	F+	J+
Palladium	H	M	M	M	U	U	U	Z	Z	Z	H+	H+

Month Letter Code: January F, February G, March H, April J, May K, June M, July N, August Q, September U, October V, November X and December Z. A “+” following the letter indicates the contract is for the following year.

Table 17: Sources used to calculate world production weights for MLCXPMP contracts

Commodity	Parameter	Unit	Source
Gold	Minerals yearbook: World Mine Production of Gold	Kg	USGS
Silver	Minerals yearbook: World Mine Production of Silver	MT	USGS
Platinum	Minerals yearbook: World Production of Platinum	Kg	USGS
Palladium	Minerals yearbook: World Production of Palladium	Kg	USGS

United States Geological Survey (USGS), Minerals Yearbook: <https://www.usgs.gov/centers/national-minerals-information-center/minerals-yearbook-metals-and-minerals>

ICE BofA Commodity Index eXtra CLA Index

General Description

The ICE BofA Commodity index eXtra CLA Index (MLCXCLAE) is a modified excess return version of the ICE BofA Commodity index eXtra (MLCX). The modifications consist of the inclusion of only one commodity (WTI Light Sweet Crude Oil traded on the ICE Futures Europe exchange) and a different roll schedule (Table 18). Other than these modifications, described in more detail below, MLCXCLAE is calculated using the same methodologies as MLCX.

Rolling Mechanism

The expiration months of all MLCX Contracts potentially included in the Index, and the months in which each such contract is rolled into the next available expiration, are set forth in Table 18. For example, the index holds the current year December (Z) WTI contract on September 30 and then on the first business day of October the index begins to roll into the next year December (Z+) contract. This list is reviewed annually by the Index Advisory Committee and amended as needed. A full explanation of the roll mechanism can be found in Section 3.2.

Table 18: Underlying contract table (reflects the expiry held at the beginning of the month prior to the start of any applicable roll)

Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Crude Oil (WTI)	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z+	Z+

Month Letter Code: December Z. A "+" following the letter indicates a contract of the following year.

Commodity Settlement Index Values

The Commodity Settlement Index Values are variations on the Total Return Indices where the prices used in the index calculation are adjusted for contracts not closing in a normal trading condition. Typical situations leading to contracts not closing in a normal trading condition are exchange holidays, or market disruption events (e.g., limit up/down). The Settlement Index Value is not initially published on any business day where any index contract does not close in a normal trading condition the Settlement Index will not calculate on that day. Later, on the first subsequent business day that the impacted contract closes in a normal trading condition, that settlement price is applied to the prior days during which the contract did not close in a normal trading condition. Once a prior business day has all contracts priced using normal-condition settlement prices then the Settlement Index is calculated and disseminated for that day.

Appendix A: Selected Exchanges

On the basis of the criteria listed on Section 2.1, exchanges were considered for inclusion in the MLCX. The Exchanges that were selected and that have contracts included in the MLCX, according to criteria described in Section 2.2, are:

The Chicago Mercantile Exchange (CME), the Chicago Board of Trade (CBOT), the New York Mercantile Exchange (NYMEX), and the Commodity Exchange (COMEX) are subsidiaries of the CME Group, Inc.

20 South Wacker Drive, Chicago Illinois 60606, USA, Tel: +1 (312) 930 1000
www.cmegroup.com

London Metal Exchange (LME): 10 Finsbury Square, London EC2A 1AJ, United Kingdom
Phone: +44 20 7113 8888
www.lme.com

ICE Futures Europe
5th Floor , Milton Gate, 60 Chiswell Street, London, UK EC1Y 4SA, Tel: +44 (0) 20 7065 7700
www.theice.com/homepage.jhtml

ICE Futures US
55 East 52nd Street 40th Floor New York, NY 10055 United States
<https://www.ice.com/futures-us>

Appendix B: Preliminary List of MLCX Constituent Contracts

The following Table lists the preliminary set of contracts, in ranked order, selected for the index in accordance with Section 2.2.2. The final list of selected contracts and their weights are presented in Table 2 of this Handbook.

Table 19: Preliminary List of MLCX Contracts

	Contract Ticker	Exchange	Total Trading Volume	ARP in USD	Contract Size in units	LIQ in USD	Included in MLCX	Reason for exclusion	
1	Brent Crude Oil	CO	ICE Futures Europe	281,899,059	84	1,000	23,673,274,957,242	Yes	
2	WTI Light Sweet Crude Oil (CL)	T	NYMEX	209,618,700	80	1,000	16,694,176,381,169	Yes	
3	Gold (GC)	GC	COMEX	58,116,147	2,078	100	12,077,174,857,615	Yes	
4	Copper Grade A	LP	LME	37,154,449	8,701	25	8,081,819,361,368	Yes	
5	Gas Oil	QS	ICE Futures Europe	84,005,271	833	100	6,995,711,894,554	Yes	
	WTI Light Sweet Crude Oil		ICE Futures Europe	73,860,471	80	1,000	5,879,099,426,833	No	Redundant
6	NY Harbor ULSD (HO)		NYMEX	43,233,672	3	42,000	5,045,088,138,911	No	Redundant
7	RBOB Gasoline Physical (RB)	N	NYMEX	44,396,250	2	42,000	4,602,017,817,208	Yes	
8	Soybean	S	CBOT	65,061,291	13	5,000	4,144,250,728,634	Yes	
	Aluminium		LME	63,913,026	2,277	25	3,638,940,416,165	Yes	
9	Copper (HG)		COMEX	29,110,941	4	25,000	2,895,612,106,579	No	Redundant
10	Henry Hub Natural Gas (NG)	NG	NYMEX	114,219,789	3	10,000	2,857,118,572,603	Yes	
	Silver (5,000 oz) (SI)		COMEX	20,609,341	25	5,000	2,551,278,328,084	Yes	
	Corn		CBOT	87,956,910	5	5,000	2,035,597,541,968	Yes	
11	Special High Grade Zinc	LX	LME	26,344,261	2,561	25	1,686,856,752,484	Yes	
12	Soybean Meal	SM	CBOT	41,332,159	387	100	1,599,265,726,165	Yes	
13	Primary Nickel	LN	LME	13,608,060	18,216	6	1,487,284,882,413	Yes	
14	Brent Crude Oil Last Day Financial (BZ)		NYMEX	17,703,390	84	1,000	1,486,946,118,994	No	Redundant
	Soybean Oil		CBOT	39,470,651	1	60,000	1,238,356,959,974	No	Redundant
	Live Cattle		CME	16,088,110	2	40,000	1,159,243,949,608	Yes	
15	Chicago Soft Red Winter Wheat	W	CBOT	32,564,185	6	5,000	971,872,543,181	Yes	
	Standard Lead		LME	17,771,677	2,138	25	949,805,517,869	No	Sector at max
16	Sugar #11	SB	ICE Futures U.S.	34,930,784	0	112,000	905,796,921,606	Yes	
17	Coffee C	KC	ICE Futures U.S.	12,492,360	2	37,500	867,267,041,964	Yes	
18	Cocoa	CC	ICE Futures U.S.	12,781,026	5,767	10	737,038,139,412	Yes	
	Feeder Cattle		CME	4,292,187	2	50,000	521,271,890,048	No	Redundant

COMMODITY INDEX METHODOLOGY

	KC Hard Red Winter Wheat		CBOT	14,811,201	7	5,000	491,630,009,016	No	Sector at max
19	Cotton #2	CT	ICE Futures U.S.	10,992,603	1	50,000	459,425,688,575	Yes	
19	Lean Hog	LH	CME	13,570,197	1	40,000	453,590,102,085	Yes	

Appendix C: Conversion Rates and Sources Used in the Calculation of MLCX Individual Contract Weights

Table 20: Sources used to calculate world production weights for the MLCX contracts

Commodity	Parameter	Unit	Source
Crude oil	Total oil production (Total World Supply), yearly	1000 barrels/day	IEA
Gas oil	Refinery Gross Output (jet fuel types, other kerosenes, gasoil and diesel oil), OECD total, yearly	1000 barrels/day	IEA
Gasoline	Refinery Gross Output (naphtha, mogas, aviation gas), OECD total, yearly	1000 barrels/day	IEA
Natural gas	Nat Gas Balance: Indigenous production ; US, UK, CA, MX combined, yearly	billion cubic meters/yr	IEA
Aluminum	Minerals yearbook: World Production of Primary Aluminum	1000 MT	USGS
Copper	Minerals yearbook: World Production of Refined Copper	1000 MT	USGS
Nickel	Minerals yearbook: World Nickel Plant Production	1000 MT	USGS
Zinc	Minerals yearbook: World Smelter Production of Zinc	1000 MT	USGS
Gold	Minerals yearbook: World Mine Production of Gold	Kg	USGS
Silver	Minerals yearbook: World Mine Production of Silver	MT	USGS
Corn	PSD: World Total Summary: World Production of Corn	1000 MT	USDA
Wheat	PSD: World Total Summary: World Production of Wheat	1000 MT	USDA
Soybeans	PSD: World Total Summary: World Production of Soybeans	1000 MT	USDA
Soybean Meal	PSD: World Total Summary: World Production of Soybean Meal	1000 MT	USDA
Coffee	PSD: World Total Summary: World Production of Green Coffee	1000 60 kg bags	USDA
Sugar	PSD: World Total Summary: Production of Centrifugal Sugar	1000 MT	USDA
Live Cattle	PSD: US Production, Calf Crop	1000 head	USDA
Lean Hogs	PSD: US Production, Pig Crop	1000 head	USDA
Cocoa	International Cocoa Organization: World Production quantity of Cocoa beans	MT	ICCO
Cotton	PSD: World Total Summary: World Production of Cotton	1000 480 lb bales	USDA

United States Geological Survey (USGS), Minerals Yearbook: <https://www.usgs.gov/centers/national-minerals-information-center/minerals-yearbook-metals-and-minerals>

USDA Foreign Agricultural Service PSD: <https://apps.fas.usda.gov/psdonline/app/index.html#/app/home>

IEA: <https://www.iea.org/analysis?type=report>

ICCO: <https://www.icco.org/statistics/>

Table 21: Standard units and conversion measures

Commodity	Formulae	Source
Crude	$\$/\text{bbl} * 1000\text{bbl}/\text{day} * 365 \text{ days}/\text{year} = \$/\text{year}$	United States Department of Energy
Gas oil	$\$/\text{MT} * 1000 \text{ bbl}/\text{day} * 0.1342 \text{ MT}/\text{bbl} * 365 \text{ days}/\text{yr} = \$/\text{year}$ Since 1 MT of distillate fuel = 7.45 bbls	International Energy Agency
RBOB gasoline	$\text{Cents}/\text{gallon} * 1000 \text{ bbl}/\text{day} * 42 \text{ gallons}/\text{bbl} * 365 \text{ days}/\text{yr} * 1/100 = \$/\text{year}$	International Energy Agency
Natural Gas	$\$/\text{trillion Btu} * \text{bn m}^3/\text{year} * 37.08 \text{ trillion BTU}/\text{bn m}^3 = \$/\text{year}$ 1bn m ³ = 37.08 trillion BTU	International Energy Agency
Aluminium	$\$/\text{MT}$	United States Geological Survey
Copper	$\$/\text{MT}$	United States Geological Survey
Zinc	$\$/\text{MT}$	United States Geological Survey
Nickel	$\$/\text{MT}$	United States Geological Survey
Lead	$\$/\text{MT}$	United States Geological Survey
Gold	$\$/\text{oz} * \text{kg}/\text{year} * 32.1507 \text{ oz}/\text{kg} = \$/\text{year}$	United States Geological Survey
Silver	$\$/\text{oz} * \text{kg}/\text{year} * 32.1507 \text{ oz}/\text{kg} = \$/\text{year}$	United States Geological Survey
Soybeans	$\text{Cents}/\text{bushel} * \text{k tons}/\text{year} * 36.7430923 \text{ bushels}/\text{tons} * 1/100 = \$/\text{year}$ Since 1 soybean bushel = 27.21554 kg (60 pounds) = 0.027216 tons	US Department of Agriculture
Soybean meal	$1\text{MT}/\text{year} * (1/0.90718474) \text{ short ton}/\text{MT} * \$ / \text{short ton} = \$/\text{year}$	US Department of Agriculture
Wheat	$\text{Cents}/\text{bushel} * \text{KMT}/\text{year} * 36.68244012 \text{ bushels}/\text{tons} * 1/100 = \$/\text{year}$ Since 1 wheat bushel = 27.21554 kg (60 pounds) = 0.027216 tons	US Department of Agriculture
Corn	$\text{Cents}/\text{bushel} * \text{KMT}/\text{year} * 39.3675989 \text{ bushels}/\text{tons} * 1/100 = \$/\text{year}$ Since 1 corn bushel = 25.401 kg (56 pounds) = 0.0254016tons	US Department of Agriculture US Department of Agriculture
Coffee	$\text{Cents}/\text{pound} * 60\text{k kg}/\text{year} * 2.20462 \text{ pound}/\text{kg} * 1/100 = \$/\text{year}$	US Department of Agriculture
Cotton	$\text{Cents}/\text{pound} * 480\text{k lb}/\text{year} * 1/100 = \$/\text{MT}$	US Department of Agriculture
Sugar	$\text{Cents}/\text{pound} * 2204.62 \text{ pounds}/\text{MT} * 1/100 = \$/\text{MT}$	US Department of Agriculture
Live Cattle	$\text{Cents}/\text{pound} * 1222 \text{ pounds}/\text{head} * 1/100 = \$/\text{head}$	US Department of Agriculture, CME
Lean Hogs	$\text{Cents}/\text{pound} * 262 \text{ pounds}/\text{head} * 1/100 = \$/\text{head}$	US Department of Agriculture, CME
Cocoa	$\$/\text{MT}$	International Cocoa Organization

USDA, Economic Research Service, Agricultural Handbook Number 697, Weights, Measures, and Conversion Factors for Agricultural Commodities and Their Products. <https://www.ers.usda.gov/publications/pub-details/?pubid=41881>

USDOE, Energy Information Administration, Thermal Conversion Factors, Approximate Heat Content of Natural Gas, BTU per cubic foot, Marketed Production average of 2000-04. http://www.eia.doe.gov/emeu/aer/append_a.html

IEA: iea.org

ICCO: <https://www.icco.org/statistics/>

Appendix D: Commodity Production Chains

Table 22: Commodity production chains

Commodity Family	Conversion units applied	Source
<p>Intermediate commodity (c): crude oil (WTI)</p> <p>Final commodity (n): heating oil, gasoline</p> <p>CMc:n= WTI production / (WTI + Brent production)</p>	<p>A fraction of OECD gasoline and heating oil production (in barrels) is subtracted from North American crude oil production (in barrels). The resulting number is the production weight assigned to crude oil (WTI). An equivalency of one-to-one in the crude oil-to-product relationship is assumed for simplicity, although it is acknowledged that actual refinery yields could be lower. Only a percentage equal to the production share of North American crude oil of total world production is assumed to be used in refined products and the number is adjusted appropriately.</p>	<p>International Energy Agency</p>
<p>Intermediate commodity (c): Brent</p> <p>Final commodity (n): heating oil, gasoline</p> <p>CMc:n= Brent production / (WTI + Brent production)</p>	<p>A fraction of OECD gasoline and heating oil production (in barrels) is subtracted from the World (ex North America) crude oil production (in barrels). The resulting number is the production weight assigned to Brent. An equivalency of one-to-one in the crude oil-to-product relationship is assumed for simplicity, although it is acknowledged that actual refinery yields could be lower. Only a percentage equal to the production share of World (ex North America) crude oil production of total world production is assumed to be used in refined products and the number is adjusted appropriately.</p>	<p>International Energy Agency</p>
<p>Intermediate commodity (c): soybeans</p> <p>Final commodity (n): soybean oil</p> <p>CMc:n= 1</p>	<p>World soybean oil production is subtracted from world soybean production. The resulting number is the production weight assigned to soybeans. An equivalency of one-to-one in the soybean to soybean oil relationship is assumed for simplicity, although it is acknowledged that actual crush yields are lower.</p>	<p>USDA and various sources</p>
<p>Intermediate commodity (c): corn, soymeal</p> <p>Final commodity (n): live cattle, lean hogs</p> <p>CMc:n= 1 (soybean meal)</p> <p>CMc:n= 2.8 (corn)</p>	<p>It is assumed that the average animal eats 2.8 times its weight in corn and 1 time its weight in soybean meal. It is acknowledged that many other inputs are used in livestock production, and that the production process is very complex, particularly in the case of live cattle.</p>	<p>USDA, CME and various sources</p>

Source: USDA, IEA

Note: These measures are necessarily approximations, but these will remain fixed for the purpose of calculating the MLCX

Appendix E: Glossary of Terms

Adjusted Average Global Production Quantity (AAGPQ): the global quantity of an MLCX Commodity that is used for purposes of calculating the weight of each MLCX Contract in the Index, after adjustment for quantities attributable to inputs into or derivatives of the MLCX Commodity that are also included in the Index, in accordance with Appendix D.

Adjusted Average Global Production Value (AAGPV): the Adjusted Average Global Production Quantity multiplied by the Average Reference Price.

Average Global Production Quantity (AGPQ): the annual average of the three most recent available years of GPV data with respect to all MLCX Commodities underlying the MLCX Contracts, expressed in the same units as the specifications of the MLCX Contract.

Average Reference Price (ARP): the average of the Reference Price of the Front Month Contract for an MLCX Commodity on each Trading Day of such contract in the period beginning on July 1 and ending on June 30 of each year.

Business Day: any New York Mercantile Exchange Trading Day, with the Trading Day being defined for this purpose in accordance with New York Mercantile Exchange rules (which may define a “trading day” as beginning with the opening of electronic trading during the preceding evening).

Calendar Month (m(t)): the month during which a Business Day t falls.

Contract Production Value (CPV): the modified commodity production values for each MLCX Commodity, after applying the requirements and limits for aggregate Market Sector weights.

Contract Production Weight (CPW): the weight of the relevant MLCX Contract in the Index, for purposes of Index calculation. The Contract Production Weight is equal to the CPV divided by the LCP for a particular MLCX Contract applied in an Index Period.

Contract Size (CS): with respect to a contract is the number of standard physical units of the commodity represented by one contract. For example, a crude oil futures contract size is 1,000 barrels.

Conversion Measure (CMc:n): the conversion factor used to convert the units in which an MLCX Commodity is expressed, and which constitutes an input into another MLCX Commodity, or from which another MLCX Commodity is derived, into the units of the MLCX Commodity derived from the first MLCX Commodity. The Conversion Measures used in calculating the GPQ adjustments are set forth in Appendix D.

Daily Commodity Return (DCRt): represents the return of a commodity portfolio from $t-1$ to t with respect to the Index and each Market Sector.

Day Count (DCt): the order of the Business Days in a Roll Period t of the MLCX (which will therefore be between 1 and 15).

Dollar Weight (DW): the product of the Contract Production Weight and the underlying futures price for any given MLCX Commodity.

Eligible Contract (EC): a futures contract traded on a Selected Exchange that satisfies the requirements specified in the Handbook for inclusion in the MLCX, before taking into account the effect of the Market Sector limits.

Excess Return Index: reflects the Daily Commodity Return on the Spot Index excluding the effect of rolling the MLCX Contracts.

Front Month Contract (FMC): the first available contract expiration month after the date on which the determination is made.

Global Production Value (GPV_{c,y}): the value of the global production for each MLCX Commodity during Index Period y in U.S. Dollars. The GPV is calculated by multiplying the AGPQ of the relevant MLCX Commodity by the ARP of the MLCX Contract over the preceding one year period from July 1 to June 30.

Handbook: the document that describes the philosophy behind the composition of, and the methodology for computing value of, the MLCX.

Index: the ICE BofA Commodity index eXtra or, the MLCX.

Index Administrator: ICE Data Indices, LLC

Index Period: a period of time during which there are no changes in the list of MLCX Contracts or in the Contract Production Weights of the MLCX Contracts. The purpose of the Index Period is to identify each time period within which a particular Index composition and set of Contract Production Weights remains in effect.

Interest Rate Return (IRR(t)): is the daily return on calendar day t of the Treasury Bill Rate using a 360 day per year convention and a period of 91 days.

Last available Contract Price (LCP): the last available closing price for each MLCX Contract on the last day of the Index Period that the MLCX is rolling out of.

Liquidity (LIQ): for purposes of determining the selection of Eligible Contracts, LIQ is equal to the Total Trading Volume (TTV), multiplied by the Contract Size with respect to each contract, and multiplied by the Average Reference Price (ARP) for each contract.

Market Sectors: the six economic sectors that constitute the MLCX, which can also serve as separately calculated sub-indices of the MLCX. The six Market Sectors currently included in MLCX are: Energy, Base Metals, Precious Metals, Grains & Oil Seeds, Livestock and Soft Commodities & Others.

MLCX: the ICE BofA Commodity index eXtra or, the Index.

MLCX Commodity: any commodity or group of commodities that essentially function as a single commodity, based on their production, consumption or delivery characteristics, the nature of their trading markets or other features that make them substitutes for each other for various purposes, as determined by the Index Advisory Committee in its sole discretion.

MLCX Contract: an Eligible Contract that is selected for inclusion in the MLCX, after application of the requirements for a minimum and maximum number of contracts from each Market Sector.

Non-Roll Day: any Business Day that is not a Roll-Day.

Normalizing Constant: the divisor that assures continuity of the Spot Index whenever there is a change in the CPWs and is recalculated for each new period p(t) for the Index and each Market Sector. Initially, the Normalizing Constant is set so that the Spot Index for the Market Sector S starts at 100.

Percentage Dollar Weight (PDW): the percentage dollar weight of an MLCX Commodity, or Market Sector, in the MLCX, calculated on the basis of the AAGPQ of the MLCX Commodity multiplied by the ARP of such Commodity, with the product divided by the aggregate AAGPQ multiplied by the ARP of all MLCX Commodities (with the PDW of a Market Sector calculated as the aggregate of the PDWs of the MLCX Commodities included in that Market Sector).

Redundant Contracts: less liquid contracts on the same MLCX Commodity. For instance, the list of MLCX Contracts includes an Eligible Contract on Wheat but excludes Kansas as a Redundant Contract.

Reference Prices: the official settlement or similar prices posted by the relevant Selected Exchange or its clearing house with respect to a contract and against which positions in such contract are margined or settled.

Roll Day: a Business Day within the Roll Period.

Roll Period: the first 15 Business Days of the month.

Roll Weight (Wt): the weight allocated to the Roll-Out Contract on each day of the Roll Period. On each Business Day during a Roll Period, the CPW of each Eligible Contract is divided between the contract expiration it is being rolled out of (the Roll-Out Contract) and the contract expiration it is being rolled into (the Roll-In Contract).

Selected Exchanges: the group of exchanges from which contracts included in the MLCX will be selected. To be considered for inclusion in this list, the exchange must be located in a country that is a member of the Organization for Economic Co-operation and Development (OECD). Also, the exchange must be one of the principal trading forums, based on relative liquidity, for US dollar-denominated futures contracts on major physical commodities.

Spot Index: the TDW for the Index and each Market Sector divided by the Normalizing Constant for that particular Market Sector for period $P(t)$.

Total Dollar Weight (TDW): the sum of the Dollar Weights for all MLCX Contracts included in a Market Sector.

Total Return Index: reflects the Excess Return Index plus the Interest Rate Return.

Total Trading Volume (TTV): the sum of the daily trading volume in all expiration months of the contract with respect to each commodity contract traded on a Selected Exchange, on each day during the most recent twelve month period beginning on July 1 and ending on June 30.

Trading Day: any day on which the relevant Selected Exchange is open for trading.

Treasury Bill Rate (TBR(t)): is the 91-day auction high rate for U.S. Treasury Bills as reported by the Department of the Treasury on the most recent of the weekly auction dates prior to the calendar day t.

Underlying Contract Table: a table that lists which futures contract expirations are to be included in the Index (see Section 3.2, Table 3).

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