

# Quantix Commodity Index Methodology

**An Index that is owned by Quantix Commodities Indices LLC & Calculated by Solactive AG**



**Index Objective & Philosophy.** This document provides a high-level description of the methodology used to compile the Quantix Commodity Index ("QCI").

The Quantix Commodity Index was developed by Quantix Commodities LP and is owned by Quantix Commodities Indices LLC ("Quantix"). The QCI was created with the objective of being a diversified inflation hedge for investors using commodity futures contracts, traded in the U.S. and the U.K., as part of their core investment. Commodity futures are unique in their relationship to inflation and are generally regarded as having the highest positive correlation to inflation of all the major asset classes.

The QCI is designed to provide a risk management framework to hedge inflation risk appropriately in connection with commodity investing, taking account of the relative inflation sensitivity of each commodity among a defined universe of commodities, the relative cost of holding a rolling, U.S. or U.K.-listed futures position in a given commodity and the relative impact of inflation on each particular commodity.

## Index Construction

### Index Eligibility

All component instruments in the Eligible Universe are denominated in USD and traded on either a US or UK exchange. Each contract must be approved by the Commodity Futures Trading Commission (the "CFTC") for investment by U.S. persons. Eligible components do not include "look-alike contracts," which are cash-settled futures contracts whose pricing is based on the settlement prices of exchange-traded, physically settled futures contracts. From the Eligible Universe, the 24 relatively most liquid commodity futures based on historical open interest are selected subject to the requirement that each contract must be one of the 40 most actively traded by volume. Please see Appendix A for a list of the commodities and eligible contracts as of January 14, 2022. Selection is fixed as of the date set forth for this Methodology summary but is subject to periodic review by the Index Review Committee of Quantix Commodities Indices, LLC (the "Index Review Committee") and will be updated accordingly.

### Index Construction

The index construction process starts by determining the Economic Significance of each commodity-based futures contract within the Eligible Universe. This test is designed to weight a particular contract based on its open interest (on regulated exchanges in the U.S. and the U.K.) as compared to the total available open interest in contracts comprising the Eligible Universe. After each commodity-based futures contract is assigned an Economic Significance, the contract will be over or underweighted in a grouping of similar contracts based on their Inflation Sensitivity and Roll Yield Return. The Eligible Universe of commodity futures contracts will then be organized into a diversified grouping, based on specified diversification criteria, as explained in more detail on the next page.

**This summarizes the methodology underlying the QCI. Please see important notes and disclaimers at the end of this document. This is not a recommendation of the QCI or of any instrument tracking the QCI.**



## This is accomplished via the following steps:

**Step 1: Calculate the Economic Significance Weight for each eligible commodity-based futures contract in the universe based on open interest on the exchanges on which the commodity futures contracts are traded as published daily by the exchanges.**

The Economic Significance Weight is calculated using a rolling average of the open interest in each commodity-related futures contract relative to the sum of the open interest of the Eligible Universe, based on information published by the applicable futures exchanges. Quantix will rely on the published data but will use reasonable efforts to re-confirm data with exchange personnel if the data appears to be erroneous.

**Step 2: Calculate the Quality Score of each commodity**

Quantix derives a Quality Score for each commodity based on Inflation Sensitivity and Roll Yield Return. The Quality Score is determined based on the sensitivity of a commodity futures contract to inflation. The Quality Scores rank higher those commodity futures contracts in the Eligible Universe that show a higher sensitivity to inflation or a lower cost of holding a rolling futures position using a proprietary Quality Score framework. The Quality Score framework is described below.

### **A. Inflation Sensitivity: The Inflation Sensitivity of each commodity futures contract is calculated using three metrics:**

1. *Pass-Through Cost* examines how much of a change in a commodity futures contract price is passed through to the actual commodity or to a commercial product that is created from the commodity (for example, Gasoline futures vs. retail Gasoline has a high Pass Through Cost while Cocoa futures vs. consumer chocolate products have a low Pass Through Cost);
  - a. This is calculated by comparing the average futures contract price for each commodity to the average retail price for the commodity itself or for a commodity-related product, selected by the Index Provider as part of a constant reference group of commodities and commodity-related products, expressed in the same units (e.g. US Dollars and cents per gallon of gasoline) and pricing published by third parties. The commodity futures contracts representing the Eligible Universe are then split into groups based on this ratio.
2. *Correlation to US CPI* is measured as the correlation of each commodity futures contract in the Eligible Universe to changes in the US CPI on a rolling basis since 1970. Return for the commodity futures contracts is measured on a rolling futures basis.
3. *Correlation with High US CPI* is measured on a rolling basis since 1970 where High CPI is defined as a time period, from 1970 through the present, during which the year-on-year CPI change is greater than the historical average.
  - a. Correlation is measured in the same manner as the Correlation to US CPI above.



**B. Roll Yield Return: The difference in the year-on-year performance of the spot price for each commodity futures contract in the Eligible Universe (defined as the prompt future) relative to the performance of rolling commodity futures contract positions.**

These two groups of measurements are then combined using a proprietary algorithmic calculation engine to derive a Quality Score (“QS”) for each commodity futures contract relative to the other commodity futures contracts in the Eligible Universe.

The QS is negative for commodity futures contracts that have relatively lower Inflation Sensitivity and/or Roll Yield Return, and positive for commodity futures contracts that have a relatively higher Inflation Sensitivity and/or Roll Yield Return.

### **Step 3: Adjust the Economic Significance weights according to the Quality Score**

The Quality Score of each commodity futures contract in the Eligible Universe is used to calculate an Adjusted Weight for each such commodity futures contract, with a relatively low QS resulting in a weight lower than the Economic Significance Weight (potentially 0% and a relatively high QS resulting in a weight higher than the Economic Significance Weight.

If the Adjusted Weight is negative, then it is set at 0% for that commodity futures contract and the residual negative amount is applied to the Economic Significance weight of the next least attractive commodity futures contract within the Eligible Universe.

This method is designed to increase the weights of the commodity futures contracts in the Eligible Universe that are most aligned with the QCI objectives.

### **Step 4: Ensure diversification within the QCI**

Diversification is achieved through application of specified maximum sector weights as well as maximum and minimum commodity weights. For a list of commodities underlying the commodity futures contracts in the Eligible Universe by sector, please see Appendix A.

The maximum weight for any sector is 50% although some sectors have lower maximum weights reflecting the relative liquidity of the commodity futures contracts within that sector. If the weight of any sector after Step 3 is greater than its maximum weight, it is reduced by decreasing the Adjusted Weight of each commodity futures contract within that sector (or sectors) having the lowest Quality Score(s) and adding to the weight of each commodity futures contract included in the sector having the highest weighted average Quality Score that is not at its sector cap based on its Quality Score.

The Maximum Weight for any group of commodity futures contracts referencing an individual commodity is 20% with the exception of gold (see Step 5 below). If the Adjusted Weight for any group of commodity futures contracts referencing an individual commodity is greater than 20%, its weight is reduced, with the remaining amount being added to the next most attractive commodity. The Minimum Weight for any individual commodity futures contract is 2%. For the purposes of clarity, weight constraints are only binding on rebalance dates; between rebalance dates weights may drift above the cap or below the floor as prices fluctuate.



The QCI may be composed of no less than 15 commodity futures contracts from the Eligible Universe. If the number of commodity futures contracts in the Eligible Universe having an Adjusted Weight equal to or greater than the Minimum Weight is less than 15, then the weight of the commodity futures contract having the next highest Adjusted Weight is increased to the Minimum Weight by reducing the Adjusted Weights of all other commodity related futures in the Eligible Universe having weights greater than the Minimum Weight equally while respecting the other diversification rules.

#### **Step 5: A proprietary Quantix Scarcity Debasement Indicator adjusts the Gold weight for the determined type of inflationary regime**

The proprietary Quantix Scarcity Debasement Indicator (“SDI”) signals environments when the source of inflation is more likely to be currency debasement rather than commodity scarcity. In such environments, Gold and, for purposes of the QCI, gold-linked futures contracts within the Eligible Universe are subject to adjustment. Debasement is defined as an environment where inflation is expected to come from a weakening currency and scarcity is defined as one where it is expected to result from a general shortage of commodities relative to demand.

#### **The SDI is calculated using three metrics:**

- 1. Ratio of prices of gold-linked futures contracts to those for copper-linked futures contracts:** The ratio of the price of the front month gold-linked futures contracts to that of the front month copper-linked futures contracts.
- 2. Steepness of the US interest rate curve:** The 2 year vs. 10-year USD swap spread [as published by public sources].
- 3. Backwardation of the QCI Basket (excluding gold):** The level of backwardation for any commodity futures contract based on the annualized ratio of the first nearby to the second nearby futures contract.

In a Scarcity Regime the weight of Gold-linked futures contracts within the Eligible Universe to be included in the QCI is determined from the standard QCI process. In a Debasement regime, the weight of Gold-linked futures contracts within the Eligible Universe to be included in the QCI is increased depending on the strength of the Indicator to a maximum of 40%.

When moving from Scarcity to Debasement (Debasement to Scarcity) the weight of Gold-linked futures contracts within the Eligible Universe to be included in the QCI is increased (decreased) by proportionately reducing (increasing the weight of other commodity-linked futures contracts, subject to the diversification requirements from Step 4.



## Index Rebalancing

### Rebalancing Frequency

The QCI is rebalanced by Quantix once a quarter. The QCI weights are recalculated based on the data available on the close of the last business day of each calendar quarter and the reweighting takes place during the 5-9th business day of the subsequent month (the “Rebalance Period”). At the close of each business day during the Rebalance Period, one fifth of the prior quarter’s weights are replaced by one fifth of the next quarter’s weights.

### Contract Roll

Each commodity futures contract within the Eligible Universe will be deemed to be rolled, for purposes of the calculation, according to the following contract schedule. These commodity futures contracts will be rolled equally weighted on the 5th – 9th business day of each month (the “Roll Period”) such that the contract in the table below will be present on the 1st day of that calendar month. For example, on 1st January, the CL weight will be in the March (H) contract.

	Commodity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CL	WTI Crude Oil	H0	K0	K0	N0	N0	U0	U0	X0	X0	F1	F1	H1
CO	Brent Crude Oil	K0	K0	N0	N0	U0	U0	X0	X0	F1	F1	H1	H1
HO	Heating Oil	H0	K0	K0	N0	N0	U0	U0	X0	X0	F1	F1	H1
QS	GasOil	H0	K0	K0	N0	N0	U0	U0	X0	X0	F1	F1	H1
XB	RBOB Gasoline	H0	K0	K0	N0	N0	U0	U0	X0	X0	F1	F1	H1
NG	Natural Gas	H0	K0	K0	N0	N0	U0	U0	X0	X0	F1	F1	H1
C	Corn	H0	K0	K0	N0	N0	U0	U0	Z0	Z0	Z0	H1	H1
W	Wheat	H0	K0	K0	N0	N0	U0	U0	Z0	Z0	Z0	H1	H1
KW	KC Wheat	H0	K0	K0	N0	N0	U0	U0	Z0	Z0	Z0	H1	H1
S	Soybeans	H0	K0	K0	N0	N0	X0	X0	X0	X0	F1	F1	H1
SM	Soymeal	H0	K0	K0	N0	N0	Z0	Z0	Z0	Z0	F1	F1	H1
BO	Soybean Oil	H0	K0	K0	N0	N0	Z0	Z0	Z0	Z0	F1	F1	H1
CC	Cocoa	H0	K0	K0	N0	N0	U0	U0	Z0	Z0	Z0	H1	H1
CT	Cotton	H0	K0	K0	N0	N0	Z0	Z0	Z0	Z0	Z0	H1	H1
KC	Coffee	H0	K0	K0	N0	N0	U0	U0	Z0	Z0	Z0	H1	H1
SB	Sugar	H0	K0	K0	N0	N0	V0	V0	V0	H1	H1	H1	H1
LC	Live Cattle	J0	J0	M0	M0	Q0	Q0	V0	V0	Z0	Z0	G1	G1
LH	Lean Hogs	J0	J0	M0	M0	N0	Q0	V0	V0	Z0	Z0	G1	G1
HG	Copper	H0	K0	K0	N0	N0	U0	U0	Z0	Z0	Z0	H1	H1
LA	Aluminum	H0	K0	K0	N0	N0	U0	U0	X0	X0	F1	F1	H1
LN	Nickel	H0	K0	K0	N0	N0	U0	U0	X0	X0	F1	F1	H1
LX	Zinc	H0	K0	K0	N0	N0	U0	U0	X0	X0	F1	F1	H1
GC	Gold	J0	J0	M0	M0	Q0	Q0	Z0	Z0	Z0	Z0	G1	G1
SI	Silver	H0	K0	K0	N0	N0	U0	U0	X0	X0	F1	F1	H1

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## Collateral Calculation

The QCI is a Total Return index, meaning that its returns include a daily accrual based on the most recent 13-week US T-Bill auction in addition to the returns of the commodity futures contracts comprising the Index. This is calculated as follows:

$$\text{QCI Total Return Index} = \text{QCI Total Return Index for the prior business day} * (1 + [\text{Commodity Return}] + ((1 + [\text{T-Bill daily accrual rate}])^{**} [\text{Days}] - 1))$$

Note: Days is the number of days between the calculation date and the prior business day for the strategy, which is commonly 1 for Tuesday to Friday and 3 on Monday, but may be larger in the event of holidays.

Note: \*\* represents exponentiation (i.e., raising the quantity by the power of another measure).

$$\text{T-Bill daily accrual rate} = (1 / (1 - ([\text{T-Bill auction discount rate}] / 100) * 91 / 360))^{**} (1 / 91) - 1$$

T-Bill auction discount rate = The "High Rate" of the most recent 13-Week US Treasury Bill as published by the US Department of the Treasury on its official website <https://treasurydirect.gov/instit/annceresult/annceresult.htm>. The number is in percentage terms, and the most recent T-Bill referenced must have an auction date that is at least one day prior to the calculation date.

## Amendments to this Methodology

The Index Review Committee is responsible for approving changes to this methodology. This information will be updated to reflect changes approved by the Index Review Committee.





## APPENDIX A

### List of the commodities and eligible contracts as of January 14, 2022.

Selection is fixed as of the date set forth for this Methodology summary but is subject to periodic review by the Index Review Committee of Quantix Commodities Indices, LLC (the “Index Review Committee”) and will be updated accordingly.

Commodity	Trading Facility	Ticker	Sector
WTI Crude Oil	NYM	CL	Petroleum
Brent Crude Oil	ICE – UK	CO	Petroleum
Heating Oil	NYM	HO	Petroleum
GasOil	ICE – UK	QS	Petroleum
RBOB Gasoline	NYM	XB	Petroleum
Natural Gas	NYM	NG	Natural Gas
Corn	CBT	C	Grains
Wheat	CBT	W	Grains
KC Wheat	KBT	KW	Grains
Soybeans	CBT	S	Grains
Soymeal	CBT	SM	Grains
Soybean Oil	CBT	BO	Grains
Cocoa	ICE – US	CC	Softs
Cotton	ICE – US	CT	Softs
Coffee	ICE – US	KC	Softs
Sugar	ICE – US	SB	Softs
Live Cattle	CME	LC	Livestock
Lean Hogs	CME	LH	Livestock
Copper	CMX	HG	Base Metals
Aluminum	LME	LA	Base Metals
Nickel	LME	LN	Base Metals
Zinc	LME	LX	Base Metals
Gold	CMX	GC	Precious Metals
Silver	CMX	SI	Precious Metals



## Important Information

The QCI is maintained by Quantix Commodities Indices LLC ("Quantix"). Nothing in this Methodology is intended to be or should be interpreted as a recommendation or investment advice. The QCI is a rules-based index that is calculated based on a specified set of rules with the intention of producing a grouping of commodity futures contracts that is investible for U.S. persons and that should address specified goals. No assurance is given by Harbor Capital Advisors, Inc. ("Harbor") nor Quantix and its affiliates that the QCI will achieve the goals it is designed to address, that its construction or calculation will not include errors or that use of the QCI will be suitable for any person.

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