Index Methodology

Bloomberg Single Commodity, Leveraged, and Inverse Indices

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4/16/2024	Updated to include the launch of the Bloomberg Natural Gas Single 1.5X
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07/09/2021	Bloomberg Single Commodity, Leveraged, and Inverse Indices
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6/7/2024	Publication in new format

Section 1: Index Overview

The Bloomberg Single Commodity Indices aims to track the performance of holding a long position of single commodity futures contracts, and have a zero floor for index levels. The indices are calculated using the following individual commodity future contracts: Corn, Chicago Wheat, Soybeans, Copper (COMEX), LME Copper, Gold, Silver, WTI Crude Oil, and Natural Gas. The Total Return versions are calculated using the returns of the underlying excess return index and the return of cash collateral invested in the 3-Month T-Bill. The Indices will also be calculated in leveraged and inverse versions.

Table 1: Bloomberg Single Commodity, Leveraged and Inverse Indices

Energy Index Names (USD)	Ticker	Currency	Index Commencement Date
Bloomberg Natural Gas Single ER	BNGSE	USD	7/9/2021
Bloomberg Natural Gas Single TR	BNGST	USD	7/9/2021
Bloomberg Natural Gas Single Inverse ER	BNGSIE	USD	7/9/2021
Bloomberg Natural Gas Single Inverse TR	BNGSIT	USD	7/9/2021
Bloomberg Natural Gas Single 1.5X Leveraged ER	BNGS15LE	USD	4/16/2024
Bloomberg Natural Gas Single 1.5X Leveraged TR	BNGS15LT	USD	4/16/2024
Bloomberg Natural Gas Single 1.5X Inverse ER	BNGS15IE	USD	4/16/2024
Bloomberg Natural Gas Single 1.5X Inverse TR	BNGS15IT	USD	4/16/2024
Bloomberg Natural Gas Single 2X Leveraged ER	BNGS2LE	USD	8/26/2022
Bloomberg Natural Gas Single 2X Leveraged TR	BNGS2LT	USD	8/26/2022
Bloomberg Natural Gas Single 2X Inverse ER	BNGS2IE	USD	8/26/2022
Bloomberg Natural Gas Single 2X Inverse TR	BNGS2IT	USD	8/26/2022
Bloomberg WTI Crude Oil Single ER	BCLSE	USD	7/9/2021
Bloomberg WTI Crude Oil Single TR	BCLST	USD	7/9/2021
Bloomberg WTI Single 2X Leveraged ER	BCLS2LE	USD	7/9/2021
Bloomberg WTI Single 2X Leveraged TR	BCLS2LT	USD	7/9/2021
Bloomberg WTI Single Inverse ER	BCLSIE	USD	7/9/2021
Bloomberg WTI Single Inverse TR	BCLSIT	USD	7/9/2021
Bloomberg WTI Single 2X Inverse ER	BCLS2IE	USD	7/9/2021
Bloomberg WTI Single 2X Inverse TR	BCLS2IT	USD	7/9/2021

Grains Index Names (USD)	Ticker	Currency	Index Commencement Date
Bloomberg Wheat Single ER	BWHSE	USD	07/09/2021
Bloomberg Wheat Single TR	BWHST	USD	07/09/2021
Bloomberg Wheat Single 2X Leveraged ER	BWHS2LE	USD	07/09/2021
Bloomberg Wheat Single 2X Leveraged TR	BWHS2LT	USD	07/09/2021
Bloomberg Wheat Single 2X Inverse ER	BWHS2IE	USD	07/09/2021
Bloomberg Wheat Single 2X Inverse TR	BWHS2IT	USD	07/09/2021
Bloomberg Soybean Single ER	BSYSE	USD	07/09/2021
Bloomberg Soybean Single TR	BSYST	USD	07/09/2021
Bloomberg Soybean Single 2X Leveraged ER	BSYS2LE	USD	07/09/2021
Bloomberg Soybean Single 2X Leveraged TR	BSYS2LT	USD	07/09/2021
Bloomberg Soybean Single 2X Inverse ER	BSYS2IE	USD	07/09/2021
Bloomberg Soybean Single 2X Inverse TR	BSYS2IT	USD	07/09/2021
Bloomberg Corn Single ER	BCNSE	USD	07/09/2021
Bloomberg Corn Single TR	BCNST	USD	07/09/2021
Bloomberg Corn Single 2X Leveraged ER	BCNS2LE	USD	07/09/2021
Bloomberg Corn Single 2X Leveraged TR	BCNS2LT	USD	07/09/2021
Bloomberg Corn Single 2X Inverse ER	BCNS2IE	USD	07/09/2021
Bloomberg Corn Single 2X Inverse TR	BCNS2IT	USD	07/09/2021

Industrial Metals Names (USD)	Ticker	Currency	Index Commencement Date
Bloomberg Copper Single ER	BHGSE	USD	7/9/2021
Bloomberg Copper Single TR	BHGST	USD	7/9/2021
Bloomberg Copper Single 2X Leveraged ER	BHGS2LE	USD	7/9/2021
Bloomberg Copper Single 2X Leveraged TR	BHGS2LT	USD	7/9/2021
Bloomberg Copper Single 2X Inverse ER	BHGS2IE	USD	7/9/2021
Bloomberg Copper Single 2X Inverse TR	BHGS2IT	USD	7/9/2021
Bloomberg Copper Single Inverse ER	BHGSIE	USD	7/9/2021
Bloomberg Copper Single Inverse TR	BHGSIT	USD	7/9/2021
Bloomberg LME Copper Single ER	BLPSE	USD	4/29/2022
Bloomberg LME Copper Single TR	BLPST	USD	4/29/2022

Precious Metals Index Names (USD)	Ticker	Currency	Index Commencement Date
Bloomberg Gold Single ER	BGCSE	USD	07/09/2021
Bloomberg Gold Single TR	BGCST	USD	07/09/2021
Bloomberg Gold Single 2X Leveraged ER	BGCS2LE	USD	07/09/2021
Bloomberg Gold Single 2X Leveraged TR	BGCS2LT	USD	07/09/2021
Bloomberg Gold Single 2X Inverse ER	BGCS2IE	USD	07/09/2021
Bloomberg Gold Single 2X Inverse TR	BGCS2IT	USD	07/09/2021
Bloomberg Gold Single Inverse ER	BGCSIE	USD	07/09/2021
Bloomberg Gold Single Inverse TR	BGCSIT	USD	07/09/2021
Bloomberg Silver Single ER	BSISE	USD	07/09/2021
Bloomberg Silver Single TR	BSIST	USD	07/09/2021
Bloomberg Silver Single 2X Leveraged ER	BSIS2LE	USD	07/09/2021
Bloomberg Silver Single 2X Leveraged TR	BSIS2LT	USD	07/09/2021
Bloomberg Silver Single 2X Inverse ER	BSIS2IE	USD	07/09/2021
Bloomberg Silver Single 2X Inverse TR	BSIS2IT	USD	07/09/2021
Bloomberg Silver Single Inverse ER	BSISIE	USD	07/09/2021
Bloomberg Silver Single Inverse TR	BSISIT	USD	07/09/2021

To maintain the long position of the basket, contracts are 'rolled' from the expiring futures contract to a new contract farther down the futures curve with a longer expiry date. All commodities will roll on the sixth through the tenth **Business Day** of each calendar month. An **Index Level** or Business Day is determined on a day in which BCOM is open.

The Bloomberg Single Commodity Indices are denominated in U.S. dollars. The Single Commodity Indices all have a **Base Date** of January 4th, 2010 with a **Base Index Level** of 100, while the Inverse and Leveraged indices have a Base Index Level of 10,000.

Section 2: Index Risks & Limitations

Though the Indices are designed to be representative of the markets they measure or otherwise align with their stated objective, they may not be representative in every case or achieve their stated objective in all instances. They are designed and calculated strictly to follow the rules of this Methodology, and any Index Level or other output is limited in its usefulness to such design and calculation.

Markets can be volatile, including those commodity market interests which the Indices intend to measure or upon which the Indices are dependent in order to achieve their stated objective. For example, trading in futures contracts on physical commodities, including trading in the Index components, is speculative and can be extremely volatile. Market prices of the Index components and the underlying physical commodities may fluctuate rapidly based on numerous factors, including changes in supply and demand relationships (whether actual, perceived, anticipated, unanticipated or unrealized); weather; agriculture; trade; fiscal, monetary and exchange control programs; domestic and foreign political and economic events and policies; disease; pestilence; technological developments; changes in interest rates, whether through government action or market movements; and monetary and other government policies, action and inaction.

The current or "spot" prices of the underlying physical commodities may also affect, in a volatile and inconsistent manner, the prices of futures contracts in respect to the relevant commodity. These factors may affect the value of the Indices in varying ways, and different factors may cause the prices of the Index components, and the volatilities of their prices, to move in inconsistent directions at inconsistent rates.

In addition, market trends and changes to market structure may render the objective of the Index unachievable or to become impractical to replicate by investors.

In particular, the Single Commodity Indices aims to track the performance of holding a long position of single commodity futures contracts of: Corn, Chicago Wheat, Soybeans, Copper (COMEX), LME Copper, Gold, Silver, WTI Crude Oil, and Natural Gas. The Indices are therefore subject to subject to risk of holding a commodity futures contract which may fluctuate rapidly and may be subject to temporary distortions or other market disruptions based on numerous factors, including changes in supply and demand relationships (whether actual, perceived, anticipated, unanticipated or unrealized), weather, agriculture, trade, fiscal, monetary and exchange control programmes, domestic and foreign political and economic events and policies, disease, pestilence, technological developments, changes in interest rates, whether through governmental action or market movements, and monetary and other governmental policies, action and inaction. The Inverse and Leveraged Indices are subject to increases (or decreases) of one and two times the Single Commodity Indices.

Historical Index Levels published prior to the Index launch date are considered hypothetical. Historical Index Levels should not be considered as an indication of future performance.

The Bloomberg Single Commodity Indices are comprised of liquid commodity future contracts. If any commodity future contract is terminated or replaced in accordance with the rules of the Index methodology, a comparable commodity futures contract may be selected by BISL. The replacement of a commodity future contract may cause the level of the Index to change or be

adjusted. Due to the leveraged nature of the indices, they are subject to higher volatility and potential gains or losses associated with the underlying market movements.

In the event the Bloomberg Single Commodity Indices level falls at or below zero due to an at any point intraday and/or end-of-day negative futures settlement price(s), the Index level will be closed at zero and terminated same day, in which case the Index may cease to accurately measure its underlying market interest (see Handling of Negative and or Zero Pricing). Index users should therefore consider such possibility in connection with any financial instrument or financial contract based on the index to the extent the index level diverges from exposure to the underlying market.

BISL may discontinue or suspend calculation or publication of the Indices defined in this methodology. If this happens, BISL shall use reasonable efforts to provide advance notice through an Index announcement made available via bloombergindices.com and on the Bloomberg Terminal via INP <GO>.

Section 3: Index Calculation

The Bloomberg Single Commodity Indices ("the Index" or "the Indices") aims to track the performance of holding a long position of single commodity futures contract, using a monthly roll schedule. The Index family consists of single commodity indices of Corn (ticker: C), Chicago Wheat (ticker: W), Soybeans (ticker: S), Copper (ticker: HG), Gold (ticker: GC), Silver (ticker: SI), Natural Gas (ticker: NG) and WTI Crude Oil (ticker: CL).

Index Rolling

The Indices hold a long positions in commodity futures. To maintain a long position, contracts are 'rolled' from the expiring futures contract to a new contract farther down the futures curve with a longer expiry date. The calculation of the Bloomberg Single Commodity Indices follow the roll schedule based on the commodity contract calendar listed in Table 3. The mapping for the contract letters and months are defined in Table 2.

Table 2: Contract Month Codes

Contract Code	Month
F	January
G	February
Н	March
J	April
K	May
M	June
N	July
Q	August
U	September
V	October
Х	November
Z	December

The Contract Calendar Table (Table 3) represents the **Lead Contract** on the first Business Day of each month.

Table 3: Contract Calendar

Commodity	Exchange	Bloomberg Code	Jan	Feb	Mar	Apr	Ma y	Jun	Jul	Au g	Sep	Oct	No v	Dec
Crude Oil (WTI)	CME	CL	G	Н	J	K	М	N	Q	U	V	Χ	Z	F*
Natural Gas	CME	NG	G	Н	J	K	М	N	Q	U	V	Χ	Z	F*
Chicago Wheat	CME	W	Н	Н	K	K	N	N	U	U	Z	Z	Z	H*
Corn	CME	С	Н	Н	K	K	N	N	U	U	Z	Z	Z	H*
Soybeans	CME	S	Н	Н	K	K	N	N	Χ	Χ	Х	Χ	F*	F*
Copper	CME	HG	Н	Н	K	K	N	N	U	U	Z	Z	Z	H*
LME Copper	LME	LP	G	Н	J	K	М	N	Q	U	V	Χ	Z	F*
Gold	СМЕ	GC	G	J	J	М	М	Q	Q	Z	Z	Z	Z	G*
Silver	CME	SI	Н	Н	K	K	N	N	U	U	Z	Z	Z	H*

The Indices will roll from the Lead Contract to the Next Contract over the sixth to tenth Business Day of each month, at 20% (1/5) each Business Day. If a Market Disruption Event ("MDE") occurs during the roll period (Business Days 6 through 10), the roll weight will be "held". The roll weight will catch up on the next Business Day when a MDE is not present. Table 3 is an example of the rolling process for Crude Oil (CL) during the February Roll Period of 2014.

Table 4: Rolling Example for Crude Oil (CL)

					Yesterday Ro	oll Weight	Today Roll \	Weight
Date	Ticker	Day Count	Lead Contract	Next Contract	% Lead	% Next	% Lead	% Next
2/5/2010	CL	5	CLH10	CLJ10	100.00%	0.00%	80.00%	20.00%
2/8/2010	CL	6	CLH10	CLJ10	80.00%	20.00%	60.00%	40.00%
2/9/2010	CL	7	CLH10	CLJ10	60.00%	40.00%	40.00%	60.00%
2/10/2010	CL	8	CLH10	CLJ10	40.00%	60.00%	20.00%	80.00%
2/11/2010	CL	9	CLH10	CLJ10	20.00%	80.00%	0.00%	100.00%
2/12/2010	CL	10	CLH10	CLJ10	0.00%	100.00%	0.00%	100.00%

Index Calculation

Index Levels are determined on a day on which BCOM is open for business. If a commodity futures contract **Settlement Price** is unavailable on a Business Day when BCOM is open, the last available official Settlement Price will be used for the calculation of the Index. The official Index Level precision is eight decimal places.

The ER Index Level is calculated as follows:

$$IndexER_t = IndexER_{t-1} * (1 + DER)$$

Where:

 $IndexER_t$ is the ER Index Level on Business Day t, rounded to 8 decimal places. $IndexER_{t-1}$ is the ER Index Level on the Business Day immediately preceding

Business Day t.

DER is the Daily ER of the commodity futures contracts.

The Daily ER is calculated as:

$$DER = \left(\frac{WAV}{PWAV} - 1\right)$$

Total Return Index Level (single, leveraged, and inverse indices) is calculated as follows:

$$IndexTR_t = IndexTR_{t-1} \times (\frac{IndexER_t}{IndexER_{t-1}} + IR_t)$$

Where:

 $IndexTR_t$ is the Total Return Index Level on Business Day t, rounded to 8 decimal

places.

 $IndexTR_{t-1}$ is the Total Return Index Level on the Business Day immediately preceding

Business Day t.

 $IndexER_t$ is the ER Index Level on Business Day t.

 $IndexER_{t-1}$ is the ER Index Level on the Business Day immediately preceding Business

Day t.

IR t is the Treasury Bill Daily Return, calculated as

$$IR_{t} = \left[\frac{1}{1 - \frac{91}{360} \times TBR_{t-1}}\right]^{\frac{D}{91}} - 1$$

Where:

 TBR_{t-1} is the 13-week (3 -month) US Treasury Bill ("T-Bill") Rate, the rate used is the

most recent weekly auctioned high discount rate (ticker: USB3MTA Index).

D is the number of calendar days between Business Day t, and the previous

Business Day (i.e. 3 for weekend)

Commodity Index Multiplier ("CIM")

The Commodity Index Multiplier will be set to one as these indices are not rebalance annually.

Weighted Average Value ("WAV**")** on Business Day t is calculated as:

$$WAV = \sum_{i} [CIM1 * YLRW * \frac{LCSP_t}{L} + CIM2 * YNRW * \frac{NCSP_t}{L}]$$

Where:

CIM1	is the Commodity Index Multiplier for Lead Contract, which is equal to 1.
YLRW	is the Yesterday Lead Roll Weight, i.e., the roll weight of commodity
	futures contract i on the Business Day immediately preceding Business
	Day t.
$LCSP_t$	is the Lead Contract settlement price on Business Day t.
CIM2	is the Commodity Index Multiplier for Next Contract, which is equal to 1.
YNRW	is the Yesterday Next Roll Weight, i.e., the roll weight of commodity
	futures contract i on the Business Day immediately preceding Business
	Day t.
$NCSP_t$	is the Next Contract settlement price on Business Day t.
L	is the lot size of the futures contract.
i	individual commodity constituent.

Previous Weighted Average Value ("PWAV") on Business Day t is calculated as:

$$PWAV = \sum_{i} \left[CIM1_{t-1} * YLRW * \frac{LCSP_{t-1}}{L} + CIM2_{t-1} * YNRW * \frac{NCSP_{t-1}}{L} \right]$$

Where:

··	
$CIM1_{t-1}$	is the Commodity Index Multiplier for Lead Contract, which is equal to 1 on the Business Day immediately preceding Business Day t.
YLRW	is the Yesterday Lead Roll Weight, i.e., the roll weight of commodity futures contract i on the Business Day immediately preceding Business Day t.
$LCSP_{t-1}$	is the Lead Contract settlement price on the Business Day immediately preceding Business Day t.
$CIM2_{t-1}$	is the Commodity Index Multiplier for Lead Contract, which is equal to 1, on the Business Day immediately preceding Business Day t.
YNRW	is the Yesterday Next Roll Weight, i.e., the roll weight of commodity futures contract i on the Business Day immediately preceding Business Day t.
$NCSP_{t-1}$	is the Next Contract settlement price on the Business Day immediately preceding Business Day t.
L	is the lot size.
i	individual commodity constituent.
	$YLRW$ $LCSP_{t-1}$ $CIM2_{t-1}$ $YNRW$ $NCSP_{t-1}$

Index Calculation of ER Leveraged and Inverse Indices

The Leveraged and Inverse indices are calculated using a defined leverage or inverse factor. The Leveraged Indices aim to capture two times the daily return of underlying of the and the Inverse Indices aim to capture the inverse or two times inverse daily return.

The level of the $Index_t$ will be determined in accordance with the following formula each Business Day;

$$Index_t = Index_r \times \left[1 + (Factor \times \left(\frac{BCOM_UnderlyingIndex_t}{BCOM_UnderlyingIndex_r} - 1\right))\right]$$

Where:

r is the Rebalancing Date, if BCOM Index Business Day is t, then r is the Index Business Day immediately prior to Index Business Day t.

Factor is the leveraged or inverse ratio

- Factor = 2; leveraged is two times the return or 200%
- Factor = 1.5; leveraged is one and a half times the return or 150%
- Factor = -1; inverse daily return or -100%
- Factor = -1.5; one and a half times the inverse daily return or -150%
- Factor = -2; two times the inverse daily return or -200%

Underlying Index is the index level of the Bloomberg Single Commodity ER namesake index.

Total Return Leveraged and Inverse calculations refer to Section 3.

Leveraged and Inverse indices are rounded to 8 decimal places.

Handling of Negative and or Zero Pricing

In the event an Index level (Single Commodity, Leveraged, and or Inverse) falls at or below zero during real-time index market hours and or by a published exchange settlement price, the Index Level will close at zero and the Index will be terminated on the same day.

All Indices will be thoroughly reviewed before termination. If the negative official Index Level is calculated using an incorrect exchange price or as a result of a technical issue, the Index will be recalculated. If the recalculated Index Level is positive, the Index will not be terminated and will continue to calculate going forward.

Section 4: Market Disruption Events

Market Disruption Events (MDE) can occur to commodity futures for several reasons:

- a) The termination or suspension of, or material limitation or disruption in, the trading of any future contract used in the calculation of the Index on that day
- b) The settlement price of any such contract reflect the maximum permitted price change from the previous day's settlement price, based on limits set by commodity exchanges
- c) The failure of an exchange to publish settlement prices.

If a MDE occurs with respect to the Bloomberg Single Commodity Index family during the "Roll Period" for either the lead or next contract, the daily roll of the relevant futures contract will be held for that Business Day. On the following Business Day on which a Market Disruption Event does not occur, the roll weight will account for the current days roll weight and the previous Business Day (MDE's) roll weight.

If a MDE persists for four consecutive Index Business Days immediately following the original Index Business Day on which a MDE occurs, then the Index Administrator shall determine what further actions it may reasonably take.

If, on any Index Business Day, a MDE occurs or is occurring that the Index Administrator determines, in its sole discretion, materially affects the Index, the Index Administrator may defer or suspend the calculation and publication of the Index Value and any other information relating to the Index until the next Index Business Day on which such disruption event is not continuing.

Section 5: Benchmark Governance and Review

Data Providers and Data Extrapolation

Please refer to the BISL Benchmark Procedures Handbook available here.

Benchmark Governance, Audit and Review Structure

Please refer to the BISL Benchmark Procedures Handbook available here.

Internal and External Reviews

Please refer to the BISL Benchmark Procedures Handbook available here.

Index and Data Reviews

Please refer to the BISL Benchmark Procedures Handbook available here.

Exchange Settlement Price Delays

In the event an exchange delays the pricing of future settlements pertaining to the Bloomberg Representative Agriculture Index Indices, BISL will delay the publication of Index Levels to vendors and delivery of index data files.

Error Corrections/Restatement Policy

Please refer to the BISL Benchmark Procedures Handbook available here.

Exchange Settlement Price Amendments

On the occasion when an exchange amends the Settlement Price of a contract used in the Bloomberg Representative Agriculture Index Indices prior to 7 PM EST, BISL will send an index announcement following the discovery to inform all clients of the correction. BISL will then recalculate, republish, and redistribute end-of day files.

Real-time Distribution

BISL strives to provide accurate real-time calculation of its indices, however the following circumstances may occur during real-time dissemination hours.

- Incorrect index levels can be disseminated.
- Indices may stop disseminating.
- Indices may disseminate stale prices.

Expert Judgment

Please refer to the BISL Benchmark Procedures Handbook available here.

Reinvestment of Dividends and Coupons

Dividends and coupon payments play no direct role in this Index Methodology Handbook, and are therefore not accounted for by the Index.

Section 6: Index Terms

"Base Index Level" means the starting Index Level of 100 for each of the Indices.

"BISL" means Bloomberg Index Services Limited.

"BOC" means the Benchmark Oversight Committee.

"Business Day" means any day on which BCOM is open for business.

"Commodity Index Multiplier (CIM)" means the value of one as described in Section 3.

"Index Administrator" means BISL.

"Index Base Date" means the first date of the Index history as described in Section 1.

"Index Commencement Date" means the date each of the Indices is first made available on the relevant Bloomberg Page, i.e., June xxth, 2021.

"Index Level" means, in respect of the Index and a Business Day, the value of the Index on such Business Day, calculated in accordance with the methodology described in Section 3.

"PROC" means the Product, Risk and Operations Committee.

"Lead Contract" means the rolling out commodity futures contract as defined in Table 5.

"Market Disruption Event (MDE)" has the meaning given to such term in Section 4.

"Next Contract" means the rolling in commodity futures contract as defined in Table 5.

"Next Contract Settlement Price" means the official settlement prices provided by the exchange of the rolling in commodity futures contract defined in Table 5.

"Rolling" means the commodity futures contracts are 'rolled' during the Roll Period from the expiring futures contract (Lead Contract) to a new contract farther down the futures curve with a longer expiry date (Next Contract). After the Roll Period, the former Next Contract becomes the new Lead Contract.

"Roll Period" means the sixth to tenth Business Day of each month, at 20% (1/5) each Business Day

"Settlement Price" means the official settlement prices provided by an exchange.

"Treasury Bill Daily Return" means the return of cash collateral invested in the 3-Month T-Bill.

Accessing Index Data

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