Index Methodology

Bloomberg All Precious Metals Index

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Version Tracker

Date	Update
5/6/2022	Bloomberg All Precious Metals Index methodology written.
6/7/2024	Publication in new format

Section 1: Index Overview

The Bloomberg All Precious Metals Index aims to track the performance of holding a long position of precious metal commodities futures contracts. The Bloomberg All Precious Metals Index is derived from the following commodities: gold, silver, palladium, and palladium. The index rebalances on the close of the 4th business day each month, resetting each commodity to their target weight (as described in Section 2). 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.

Table 1: Bloomberg All Precious Metals Index

Index Names	Ticker	Currency	Index Commencement Date
Bloomberg All Precious Metals ER Index	BAPMER	USD	4/15/2022
Bloomberg All Precious Metals TR Index	BAPMTR	USD	4/15/2022

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 calculated.

The Bloomberg All Precious Metals Index is denominated in U.S. dollars. The All Precious Metals Index all have a **Base Date** of January 4th, 2010 with a **Base Index Level** of 100.

Section 2: Index 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 Bloomberg All Precious Metals Index aims to track the performance of holding a long position of precious metal commodities futures contracts. The Index 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.

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 All Precious Metals Index is 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.

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 All Precious Metals Index aims to track the performance of holding a long position of precious metals commodities. The index rebalances on the close of the 4th business day each month, resetting each commodity to their target weight. Target weights will be rounded to 8 decimal places.

Commodity	Ticker	Price Conversion	Target Weight
Gold	GC	1	2/3 or .66666667
Silver	SI	1	1/9 or .11111111
Platinum	PL	1	1/9 or .11111111
Palladium	PA	1	1/9 or .11111111

Index Rebalancing

The Indices are rebalanced annually after the close of business on the fourth business day in each month. The annual target weights are applied to the index by calculating index units call Commodity Index Multipliers (CIMs). The Index Base Date CIM and the ongoing CIMs are used maintain continuity in the Index.

CIM's are calculated using the following formulas:

Base Date CIM Calculation:

$$CIM = \frac{PMTW_i * 100}{NCSP_t}$$

Where:

CIM is the Commodity Index Multiplier used to apply the Target Weight of the individual commodity futures contract, rounded to 8 decimal places.

$PMTW_i$ is the All Precious Metals Annual Target Weight of commodity futures contract i.

$NCSP_t$ is the **Next Contract Settlement Price** on Business Day t, using price conversion.

Monthly CIM Calculation

$$CIM = \frac{PMTW_i * 100}{NCSP_t} * AF$$

Where:

CIM is the Commodity Index Multiplier used to apply the Target Weight of the individual commodity futures contract, rounded to 8 decimal places.

$PMTW_i$ is the All Precious Metals Target Weight of commodity futures contract i for each Rebalancing Day.

$NCSP_t$ is the Next Contract Settlement Price on Business Day t.

AF is the Adjustment Factor.

$$AF = \frac{\sum_i CIM_r * NCSP}{100}$$

Where:

CIM_r is the previous Commodity Index Multiplier.

$NCSP$ is the Next Contract Settlement Price on Business Day t.

Index Rolling

The Index 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 All Precious Metals Index follows 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
H	March
J	April
K	May
M	June
N	July
Q	August
U	September
V	October
X	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	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Gold	CME	GC	G	J	J	M	M	Q	Q	Z	Z	Z	Z	G*
Silver	CME	SI	H	H	K	K	N	N	U	U	Z	Z	Z	H*
Platinum	CME	PL	J	J	J	N	N	N	V	V	V	F*	F*	F*
Palladium	CME	PA	H	H	M	M	M	U	U	U	Z	Z	Z	H*

The Indices will roll from the Lead Contract to the Next Contract from 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 5 through 9), 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 during the March Roll Period of 2010.

Table 4: Rolling Example March 2010

					Yesterday Roll Weight		Today Roll Weight	
Date	**Ticker**	**Day Count**	**Lead Contract**	**Next Contract**	**% Lead**	**% Next**	**% Lead**	**% Next**
3/5/2010	GC	5	GCJ10	GCM10	100.00%	0.00%	80.00%	20.00%
3/5/2010	SI	5	SIK10	SIK10	100.00%	0.00%	80.00%	20.00%
3/5/2010	PL	5	PLJ10	PLN10	100.00%	0.00%	80.00%	20.00%
3/5/2010	PA	5	PAM10	PAM10	100.00%	0.00%	80.00%	20.00%
3/8/2010	GC	6	GCJ10	GCM10	80.00%	20.00%	60.00%	40.00%
3/8/2010	SI	6	SIK10	SIK10	80.00%	20.00%	60.00%	40.00%
3/8/2010	PL	6	PLJ10	PLN10	80.00%	20.00%	60.00%	40.00%
3/8/2010	PA	6	PAM10	PAM10	80.00%	20.00%	60.00%	40.00%
3/9/2010	GC	7	GCJ10	GCM10	60.00%	40.00%	40.00%	60.00%
3/9/2010	SI	7	SIK10	SIK10	60.00%	40.00%	40.00%	60.00%
3/9/2010	PL	7	PLJ10	PLN10	60.00%	40.00%	40.00%	60.00%
3/9/2010	PA	7	PAM10	PAM10	60.00%	40.00%	40.00%	60.00%
3/10/2010	GC	8	GCJ10	GCM10	40.00%	60.00%	20.00%	80.00%
3/10/2010	SI	8	SIK10	SIK10	40.00%	60.00%	20.00%	80.00%
3/10/2010	PL	8	PLJ10	PLN10	40.00%	60.00%	20.00%	80.00%
3/10/2010	PA	8	PAM10	PAM10	40.00%	60.00%	20.00%	80.00%
3/11/2010	GC	9	GCJ10	GCM10	20.00%	80.00%	0.00%	100.00%
3/11/2010	SI	9	SIK10	SIK10	20.00%	80.00%	0.00%	100.00%
3/11/2010	PL	9	PLJ10	PLN10	20.00%	80.00%	0.00%	100.00%
3/11/2010	PA	9	PAM10	PAM10	20.00%	80.00%	0.00%	100.00%
3/12/2010	GC	10	GCJ10	GCM10	0.00%	100.00%	0.00%	100.00%
3/12/2010	SI	10	SIK10	SIK10	0.00%	100.00%	0.00%	100.00%
3/12/2010	PL	10	PLJ10	PLN10	0.00%	100.00%	0.00%	100.00%
3/12/2010	PA	10	PAM10	PAM10	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:

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

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

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

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)

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.

$YLRW$ 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.

$YNRW$ 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 designates each individual commodity

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

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

Where:

$CIM1_{t-1}$ is the Commodity Index Multiplier for Lead Contract 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 using price conversion.

$CIM2_{t-1}$ is the Commodity Index Multiplier for Lead Contract 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	designates each individual commodity

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 All Precious Metals 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., April 15th, 2022.

"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.

"Lead Contract Settlement Price" means the official settlement prices provided by the exchange of the rolling out commodity futures contract 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 as 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

Bloomberg Terminal®	Bloomberg indices are the benchmarks of choice for capital markets investors. The Bloomberg Index Browser IN <GO> displays the latest performance results and statistics for the indices as well as history. IN presents the indices that make up Bloomberg's global, cross-asset Index families into a hierarchical view, facilitating navigation and comparisons. The "My Indices" tab allows a user to focus on a set of favorite indices. Bloomberg's Portfolio & Risk Analytics solution (PORT <GO>) includes tools to analyze the risk, return, and current structure of indices. PORT includes tools to analyze performance of a portfolio versus a benchmark as well as models for performance attribution, tracking error analysis, value-at-risk, scenario analysis, and optimization.
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