Bloomberg Multi-Asset Basket of Indices Methodology

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Change Log

Published Date	Publisher	Comments
17th September 2024	Clarinda Tsang	Methodology update to include MDE logic for single-day rebalance and index adjustments.
21st March 2024	Clarinda Tsang	Methodology update for Observation Lag logic changes, removal of Weight Observation Lag. Methodology update for Observation Lag and Determination Lag default values. Methodology update for new logic around Spot Exchange Rate.
14th December 2023	Jack YP Wang	First publication.

Introduction

This methodology (the "Methodology") has been made available by Bloomberg Index Services Limited ("BISL") and sets out the rules, criteria, risk factors and other information application to the Bloomberg Multi-Asset Indices (the "Indices" and each, an "Index"). Capitalized terms used in this Methodology but not otherwise defined have the meanings set forth in Appendix I (Glossary).

Objectives and Key Features

The Bloomberg Multi-Asset Indices aim to reflect the performance of a weighted portfolio of instruments.

Section 1: Calculation

Index Value

With respect to each Index, the Closing Index Value on the Index Base Date shall be the Index Base Value. Thereafter, the Closing Index Value with respect to each subsequent Index Business Day, t, and Fixing, f, shall be calculated in accordance with the following formula, subject to Section 1 ("Rounding"):

$$I_{\langle t,f \rangle} = I_{\langle t-1,close \rangle} + UnitsReturn_{\langle t,f \rangle} + IndexAdjustment_{\langle t,f \rangle} \tag{1}$$

Where:

$t-1$ means the Index Business Day immediately preceding t;

$close$ means the Closing Fixing;

$I_{\langle t,f \rangle}$ and $I_{\langle t-1,close \rangle}$ mean the Index Values for Fixing f on Index Business Day t and the Closing Fixing on Index Business Day $t-1$ respectively;

$UnitsReturn_{\langle t,f \rangle}$ means the return attributed to the Units at Fixing f on Index Business Day t, calculated in accordance with the following formula:

$$UnitsReturn_{\langle t,f \rangle} = UnitsReturn_{\langle t,f \rangle}^{Funded} + UnitsReturn_{\langle t,f \rangle}^{Unfunded} \tag{2}$$

$$UnitsReturn_{\langle t,f \rangle}^{Funded} = \sum_{i \in FundedConstituents} U_t^i \times \left(P_{\langle t,f \rangle}^i \times FX_{\langle t,f \rangle}^i - P_{\langle t-1,close \rangle}^i \times FX_{\langle t-1,close \rangle}^i \right) \tag{3}$$

$$UnitsReturn_{\langle t,f \rangle}^{Unfunded} = \sum_{i \in UnfundedConstituents} U_t^i \times \left(P_{\langle t,f \rangle}^i - P_{\langle t-1,close \rangle}^i \right) \times FX_{\langle t,f \rangle}^i \tag{4}$$

Where:

$UnitsReturn_{\langle t,f \rangle}^{Funded}$ and $UnitsReturn_{\langle t,f \rangle}^{Unfunded}$ mean the return attributed to the Units at Fixing f on Index Business Day t for the Funded Constituents and Unfunded Constituents respectively;

$FundedConstituents$ and $UnfundedConstituents$ mean the sets of Funded Constituents and Unfunded Constituents respectively;

i means a Constituent;

U_t^i means the Units for Constituent i on Index Business Day t;

$P_{\langle t,f \rangle}^i$ means the Price of Constituent i at Fixing f on Index Business Day t;

$P_{\langle t-1,close \rangle}^i$ means the Price of Constituent i at the Closing Fixing on Index Business Day $t-1$;

$FX_{\langle t,f \rangle}^i$ means the Spot Exchange Rate to convert one unit of the Constituent Currency of Constituent i to the Index Currency at Fixing f on Index Business Day t; and

$FX_{\langle t-1,close \rangle}^i$ means the Spot Exchange Rate to convert one unit of the Constituent Currency of Constituent i to the Index Currency at the Closing Fixing on Index Business Day $t-1$.

$IndexAdjustment_{\langle t,f \rangle}$ means the Index Adjustment at Fixing f on Index Business Day t calculated in accordance with the following formula:

$$IndexAdjustment_{\langle t,f \rangle} = \sum_{a \in Adjustments_{\langle t,f \rangle}} a \tag{5}$$

Where:

$Adjustments_{\langle t,f \rangle}$ means the set of Adjustment Values on Index Business Day t with Fixings up to and including Fixing f; and

a means an Adjustment Value.

Units

With respect to each Constituent, i, the Units on the Index Base Date shall be 0 (zero). Thereafter, the Units with respect to each Constituent, i, and subsequent Index Business Day, t, shall be calculated in accordance with the following formula:

$$U_t^i = U_{t-1}^i + IU_{t-1}^i \tag{6}$$

Where:

$t - 1$ means the Index Business Day immediately preceding t;

U_t^i and U_{t-1}^i mean the Units for Constituent i on Index Business Days t and $t - 1$ respectively; and

IU_{t-1}^i means the Incremental Units for Constituent i on Index Business Day $t - 1$.

Incremental Units

With respect to each Constituent, i, the Incremental Units for each Index Business Day, t, shall be calculated on the Units Determination Date for t in accordance with the following formulae:

If Index Business Day t is the Index Base Date:

$$IU_t^i = TU_t^i \tag{7}$$

If Index Business Day t is a Rebalance Day:

$$IU_t^i = TU_t^i - U_t^i \tag{8}$$

Else:

$$IU_t^i = 0 \tag{9}$$

Where:

IU_t^i means the Incremental Units for Constituent i on Index Business Day t;

TU_t^i means the Target Units for Constituent i on Index Business Day t; and

U_t^i means the Units for Constituent i on Index Business Day t.

Target Units

With respect to each Constituent, i, the Target Units for each Index Business Day, t, shall be calculated on the Units Determination Date for t in accordance with the following formulae:

If Index Business Day t is the Index Base Date or a Rebalance Day:

$$TU_t^i = \frac{I_{\langle obs_t(I),close \rangle} \times W_t^i}{P_{\langle obs_t(P^i),close \rangle}^i \times FX_{\langle obs_t(FX^i),close \rangle}^i} \tag{10}$$

Else:

$$TU_t^i = TU_{t-1}^i \qquad (11)$$

Where:

$t-1$ means the Index Business Day immediately preceding t;

$close$ means the Closing Fixing;

TU_t^i and TU_{t-1}^i mean the Target Units for Constituent i on Index Business Days t and $t-1$ respectively;

W_t^i means the Weight of Constituent i on Index Business Day t;

$obs_t(I)$, $obs_t(P^i)$ and $obs_t(FX^i)$ mean, with respect to Index Business Day t, the Observation Dates for Index, I, Price of Constituent i, P^i, and Spot Exchange Rate to convert one unit of the Price Currency of Constituent i to the Index Currency, FX^i;

$I_{\langle obs_t(I),close \rangle}$ means the Index Value for the Closing Fixing on Observation Date $obs_t(I)$;

$P_{\langle obs_t(P^i),close \rangle}^i$ means the Price of Constituent i for the Closing Fixing on Observation Date $obs_t(P^i)$; and

$FX_{\langle obs_t(FX^i),close \rangle}^i$ means the Spot Exchange Rate to convert one unit of the Price Currency of Constituent i to the Index Currency at Closing Fixing on Observation Date $obs_t(FX^i)$.

Adjustments

With respect to each Index, the set of Adjustment Values on Index Business Day t with Fixings up to and including Fixing f, shall be calculated in accordance with the following formula:

$$Adjustments_{\langle t,f \rangle} = \{hc_t^i, tc_t^i \mid i \in Constituents\} \qquad (12)$$

Where:

i means a Constituent;

$Constituents$ is the set of Funded and Unfunded Constituents;

hc_t^i means the Holding Cost of Constituent i on Index Business Day t, calculated in accordance with the following formula:

$$hc_t^i = -U_t^i \times P_{\langle t,f \rangle}^i \times HC\ Factor^i \qquad (13)$$

Where:

U_t^i means the Units for Constituent i on Index Business Day t;

$P_{\langle t,f \rangle}^i$ means the Price of Constituent i at Fixing f on Index Business Day t;

$HC\ Factor^i$ means the Holding Cost Factor for Constituent i.

tc_t^i means the Transaction Cost of Constituent i on Index Business Day t, calculated in accordance with the following formula:

$$tc_t^i = -\left(abs(IU_t^i) \times TC\ Factor^i\right) \qquad (14)$$

Where:

$TC\ Factor^i$ means the Transaction Cost Factor for Constituent i.

Weights

With respect to each Constituent i and its Price Currency, the Weights for each Index Business Day, t, shall be determined on the Units Determination Date in accordance with the Weighting Scheme.

If the Weighting Scheme is 'Fixed Weight', the Weight of each Constituent shall be its Fixed Weight.

Rounding

The Index Values shall be calculated without rounding and published to 4 decimal places.

Section 2: Backtest assumptions

The rules outlined above are applied historically, however the following assumptions have been made:

Unless otherwise specified, the calendars and pricing used at the time of calculating the backtest are assumed to reflect those available at the time. Also, where a price is not available on an historic Pricing Day, the price from the immediately preceding Pricing Day is used.

Section 3: Stakeholder engagement, risk, and limitations

Limitations of the index

Though the Index is designed to be representative of the markets it measures or otherwise aligns with its stated objective, it may not be representative in every case or achieve its stated objective in all instances. It is 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 market interests that the Index measures or upon which the Index is dependent to achieve its stated objective. For example, illiquidity can have an impact on the quality or amount of data available to the administrator for calculation and may cause the Index to produce unpredictable or unanticipated results.

In addition, changes to the availability and/or accuracy of trade, liquidity or forward rates data, may render the objective of the Index unachievable or to become impractical to replicate by investors. They are for the indicative purpose.

In particular, the Index measures the performance of a weighted portfolio of instruments. The Indices are therefore subject to the effectiveness of such investment strategy.

Section 4: Benchmark oversight and governance

Benchmark governance, audit, and review structure

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Index and Methodology Changes

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Expert judgement and Discretion

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Conflicts of interest

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Restatement policy

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Cessation Policy

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Appendix I: Glossary

Adjustment Value	The Holding Cost or Transaction Cost.
Closing Fixing	The Fixing corresponding to the end of day valuation.
Closing Index Value	The value of the Index on any given Index Business Day at the Closing Fixing.
Constituents	The Funded and Unfunded Constituents.
Data Field	The type of field used for input calculation.
Fixed Weight	For each Constituent, its specified weight.
Fixing	A given time specified with respect to a location or time zone.
Funded Constituent	An Underlying Index for which it is considered that the notional value is exchanged.
FX Data Source	The source of FX data for a Fixing.
Holding Cost	The cost of holding the constituents in the Index.
Holding Cost Factor	The factor applied to Holding Cost.
Incremental Units	The difference in Units attributed to an action or activity on a Fixing.
Index	Has the meaning set forth in the Introduction.
Index Base Date	The first date on which an Index publishes a value.
Index Base Value	The value of an Index on and prior to the Index Base Date.
Index Business Day	The days on which the Index is calculated.
Index Commencement Date	The date on which an index is first published.
Index Currency	The currency in which an index is published.
Index Value	The value of the Index at a given Fixing on an Index Business Day.
Market Disruption Cut-off Date	The date on which an ongoing Market Disruption Event shall be deemed to have ended for the purpose of applying the Rebalance Disruption Rule. Unless specified otherwise, such date will be the Rebalance Business Day immediately preceding the next Units Determination Date.
Market Disruption Event	A situation wherein markets cease to function in a regular manner. See Appendix II: Market Disruptions.
Observation Business Days	With respect to a Data Field, the days from which data used for making determinations may be taken.
Observation Date	With respect to an Index Business Day and a Data Field, it is the Observation Business Day occurring the Observation Lag number of Observation Business Days prior to its Units Determination Date. If such day is not an Observation Business Day, then the immediately preceding Observation Day.
Observation Lag	With respect to a Data Field, the number of Observation Business Days for which inputs used for any calculation may be lagged. Unless specified for a given Data Field, the Observation Lag is zero.
Price	If the Constituent is not a Timezone Lagged Constituent and the the date for which the Price is with respect to is a Pricing Day, the value of a Constituent as determined from the Price Source with respect to the Fixing. Otherwise, the value of such Constituent as determined from the Price Source with respect to the Closing Fixing on the immediately preceding Pricing Day.
Price Currency	The currency in which the Prices of the Constituents are quoted.
Price Source	The source of pricing to be used for each Constituent and Fixing.
Pricing Day	The days on which Prices for a Constituent are considered to be available.
Rebalance Business Days	The days on which a rebalancing action may be performed.
Rebalance Day	Each day within a Rebalance Period that is a Rebalance Business Day.
Rebalance Disruption Rule	The set of rules by which a rebalance will be adjusted in the event of certain Market Disruption Events. See Appendix II.
Rebalance End Date	The Rebalance Business Day occurring the number of Realised Rebalance Length minus one (1) Rebalance Business Days after the Rebalance Start Date. If such date is after the Market Disruption Cut-off Date, then it is the Market Disruption Cut-off Date. For the avoidance of doubt, if the Realised Rebalance Length is one (1), then the Rebalance End Date is the Rebalance Start Date.
Rebalance Period	The set of Rebalance Business Days from, and including, each Rebalance Start Date to, and including, the corresponding Rebalance End Date.
Rebalance Start Date	The Rebalance Business Day on which a Rebalance Period is scheduled to begin.

Spot Exchange Rate	The rate used to convert one unit of a Price Currency into the Index Currency at a given Fixing on an Index Business Day as determined from the FX Data Source. Otherwise, the rate as determined from the FX Data Source with respect to the Closing Fixing on the immediately preceding Index Business Day.
Target Units	The Units of a Constituent that an index intends to hold after trading activities are performed.
Trading Day	The days on which an index considers that a Constituent can be traded.
Trade Disruption Handling	The way the Index handles a rebalance in the event of certain Market Disruption Events. See Appendix II.
Transaction Cost	The cost of trading the Constituents in the Index.
Transaction Cost Factor	The factor applied to Transaction Cost.
Timezone Lagged Constituent	A Constituent for which a lag is applied to account for the notional location of the Constituent relative to that of the Index.
Underlying Index	An index that is a Constituent of the Index.
Unfunded Constituent	An Underlying Index for which it is considered that the notional value is not exchanged.
Units	The number of units of each Constituent held on opening of an Index Business Day.
Units Determination Business Days	The days on which an index may make determinations with respect to changing units.
Units Determination Date	For an Index Business Day, the Units Determination Business Day occurring the Units Determination Lag number of Units Determination Business Days prior. If such day is not an Index Business Day, then the immediately preceding Units Determination Business Day. Such day will not change in the event of a Market Disruption Event.
Units Determination Lag	The number of Units Determination Business Days before any units determinations made by an index should become effective. Unless specified otherwise, the Units Determination Lag is zero.
Weight	The intended weight of a Constituent that an Index uses to determine the Target Units.
Weighting Scheme	The method used to allocate Weights to the Constituents.

Appendix II: Market Disruptions

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Market Disruption Events during a Rebalance Period

A Market Disruption Event during a Rebalance Period means that any of the Index's Constituents are deemed not able to be traded. This could be due to Constituents not having their Rebalance Days as Trading Days.

For the Index

If a Market Disruption Event occurs on a Rebalance Day, the Index will handle the rebalance according to one of the following Trade Disruption Handling:

If the Trade Disruption Handling is 'Trade any non-disrupted', the Index will proceed with the rebalance of the Constituents that do not have their Rebalance Day disrupted. As for the Constituents that have their Rebalance Day disrupted, their respective rebalances will be postponed according to how it is described under 'For a Constituent'.

If the Trade Disruption Handling is 'Trade nothing', the Index will postpone the rebalance of all Constituents. The rebalance for all Constituents will be postponed according to how it is described under 'For a Constituent'.

If the Trade Disruption Handling is 'Ignore', the Index will proceed with the rebalance of all of the Constituents.

For a Constituent

With respect to a Constituent, if a Market Disruption Event occurs on a Rebalance Day, then the rebalance may be postponed according to one of the following Rebalance Disruption Rules:

If the Rebalance Disruption Rule is 'Window Extension':

On a disrupted Rebalance Day that is not also a Market Disruption Cut-off Date, t:

- The Incremental Units for each Constituent i are zero:

$$IU_t^i = 0$$

- The Rebalance End Date is updated to be the earliest of the Rebalance Business Day immediately following the current Rebalance End Date and the Market Disruption Cut-off Date.

On a Market Disruption Cut-off Date, t:

- If such date is disrupted, the current rebalance will be considered to have finished, unless BISL determines otherwise.

Other situations during Market Disruption Event

Outside of these aforementioned situations, if on any Index Business Day, a Market Disruption Event occurs or is occurring that BISL determines, in its sole discretion, materially affects the Index, the impact of the market disruption will be assessed, and actions are determined as per the rules stated in Section 4: Benchmark oversight and governance.

Appendix III: ESG Disclosures

EXPLANATION OF HOW ESG FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY	
1. Name of the benchmark administrator.	Bloomberg Index Services Limited ("BISL")
2. Type of benchmark	Other Benchmark
3. Name of the benchmark or family of benchmarks.	Bloomberg Multi-Asset Indices
4. Does the benchmark methodology for the benchmark or family of benchmarks take into account ESG factors?	No

5. Where the response to Item 4 is positive, please list below, for each family of benchmarks, those ESG factors that are taken into account in the benchmark methodology, taking into account the ESG factors listed in Annex II to Delegated Regulation (EU) 2020/1816.

Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets.

The ESG factors shall be disclosed at an aggregated weighted average value at the level of the family of benchmarks.

a) List of environmental factors considered:	Selection, weighting or exclusion: N/A
b) List of social factors considered:	Selection, weighting or exclusion: N/A
c) List of governance factors considered:	Selection, weighting or exclusion: N/A

6. Where the response to Item 4 is positive, please list below, for each benchmark, those ESG factors that are taken into account in the benchmark methodology, taking into account the ESG factors listed in Annex II to Delegated Regulation (EU) 2020/1816, depending on the relevant underlying asset concerned.

Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets.

The ESG factors shall not be disclosed for each constituent of the benchmark, but shall be disclosed at an aggregated weighted average value of the benchmark.

Alternatively, all of this information may be provided in the form of a hyperlink to a website of the benchmark administrator included in this explanation. The information on the website shall be easily available and accessible. Benchmark administrators shall ensure that information published on their website remains available for five years

a) List of environmental factors considered:	Selection, weighting or exclusion: N/A
b) List of social factors considered:	Selection, weighting or exclusion: N/A
c) List of governance factors considered:	Selection, weighting or exclusion: N/A

7. Data and standards used.	
a) Data input. *(i) Describe whether the data are reported, modelled or, sourced internally or externally.* *(ii) Where the data are reported, modelled or sourced externally, please name the third party data provider.*	N/A
b) Verification of data and guaranteeing the quality of those data. *Describe how data are verified and how the quality of those data is ensured.*	N/A
c) Reference standards *Describe the international standards used in the benchmark methodology.*	N/A
Date on which information has been last updated and reason for the update:	21 March 2024

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