

Bloomberg Turn of the Month Indices Methodology

August, 2024

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Change Log

Published Date	Publisher	Comments
27 th August 2024	Clarinda Tsang	Methodology update to include volatility factor adjustment and index adjustments.
23 rd July 2024	Clarinda Tsang	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 Turn of the Month 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 Turn of the Month Indices aim to reflect the performance of a strategy that seeks to exploit price movements of Constituents for each month. The Index takes long positions in the Constituents at certain days in a month, and then liquidates all positions at a specified date.

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"):

$$I_{(t,f)} = I_{(t-1,close)} + UnitsReturn_{(t,f)} + IndexAdjustment_{(t,f)} \quad (1)$$

Where:

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

close means the Closing Fixing;

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

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

$$UnitsReturn_{(t,f)} = UnitsReturn_{(t,f)}^{Funded} + UnitsReturn_{(t,f)}^{Unfunded} \quad (2)$$

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

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

Where:

$UnitsReturn_{(t,f)}^{Funded}$ and $UnitsReturn_{(t,f)}^{Unfunded}$ 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 ;

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

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

$FX_{(t,f)}^i$ 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

$FX_{(t-1,close)}^i$ 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 $t - 1$;

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

$$IndexAdjustment_{(t,f)} = \sum_{a \in Adjustments_{(t,f)}} a \quad (5)$$

Where:

$Adjustments_{(t,f)}$ 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:

$$U_t^i = U_{t-1}^i + IU_{t-1}^i \quad (6)$$

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 on the Index Base Date shall be 0 (zero). Thereafter, the Incremental Units with respect to each Constituent, i , and subsequent 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 a Entry Rebalance Day:

$$IU_t^i = TEU_d^i \times \frac{1}{BRL} \quad (7)$$

Else if Index Business Day t is a Exit Rebalance Day:

$$IU_t^i = -TEU_d^i \quad (8)$$

Else:

$$IU_t^i = 0 \quad (9)$$

Where:

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

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

BRL means the Entry Rebalance Length;

TEU_d^i means the Target Ending Units for Constituent i on Units Determination Date d for t , and shall be calculated in accordance with the following formula:

$$TEU_d^i = \frac{I_{(obs_t(I),close)} \times W_t^i}{P_{(obs_t(P^i),close)}^i \times FX_{(obs_t(FX^i),close)}^i} \times Leverage^i \times VF_t^i \quad (10)$$

Where:

close means the Closing Fixing;

$obs_t(I)$, $obs_t(P^i)$ 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 ;

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

$P^i_{(obs_t(P^i),close)}$ means the Price of Constituent i for the Closing Fixing on Observation Date $obs_t(P^i)$;

$FX^i_{(obs_t(FX^i),close)}$ 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 $obs_t(FX^i)$;

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

Leverage ^{i} means the Leverage of Constituent i ; and

VF_t^i means Volatility Factor of Constituent i on Index Business Day t .

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.

Volatility Factor

With respect to each Constituent, i , the Volatility Factor shall be calculated on the Units Determination Date for t in accordance with the following formulae:

$$VF_t^i = \max\left(\min\left(VF_{max}^i, \frac{VT}{V_t^i \times Leverage^i}\right), VF_{min}^i\right) \quad (11)$$

Where:

VF_t^i means Volatility Factor of Constituent i on Index Business Day t ;

VF_{max}^i means Maximum Volatility Factor of Constituent i ;

VF_{min}^i means Minimum Volatility Factor of Constituent i ;

VT means Volatility Target;

Leverage ^{i} means the Leverage of Constituent i ; and

V_t^i means the volatility of Constituent i on Index Business Day t .

Constituent Volatility Calculation

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

$$V_t^i = \max(V_t^{i,ST}, V_t^{i,MT}, V_t^{i,LT}) \quad (12)$$

$$V_t^{i,N} = \sqrt{\frac{252}{N-1} \times \sum_{n=0}^{N-1} \left(\ln \left(\frac{P_{t-n}^i}{P_{t-n-1}^i} \right) - \frac{1}{N} \times \sum_{m=0}^{N-1} \ln \left(\frac{P_{t-m}^i}{P_{t-m-1}^i} \right) \right)^2} \quad (13)$$

Where:

$t - n$ means the Index Business Day that is n Pricing Days immediately preceding Index Business Day t ;

$t - n - 1$ means the Index Business Day that is $n + 1$ Pricing Days immediately preceding Index Business Day t ;

$t - m$ means the Index Business Day that is m Pricing Days immediately preceding Index Business Day t ;

$t - m - 1$ means the Index Business Day that is $m + 1$ Pricing Days immediately preceding Index Business Day t ;

P_{t-m}^i means the Price of Constituent i on Pricing Day $t - m$;

P_{t-m-1}^i means the Price of Constituent i on Pricing Day $t - m - 1$;

P_{t-n}^i means the Price of Constituent i on Pricing Day $t - n$;

P_{t-n-1}^i means the Price of Constituent i on Pricing Day $t - n - 1$;

N means the number of Pricing Days that is the lookback window of volatility calculation;

LT means the number of Pricing Days for long-term volatility calculation;

ST means the number of Pricing Days for short-term volatility calculation;

V_t^i means the volatility of Constituent i on Index Business Day t ;

$V_t^{i,N}$ means the realized volatility of Constituent i with the lookback window of N Pricing Days on Index Business Day t ;

$V_t^{i,ST}$ means the short-term volatility of Constituent i on Index Business Day t when $N = ST$;

$V_t^{i,MT}$ means the medium-term volatility of Constituent i on Index Business Day t when $N = MT$; and

$V_t^{i,LT}$ means the long-term volatility of Constituent i on Index Business Day t when $N = LT$.

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:

$$Adjustments_{(t,f)} = \{tc_t^i \mid i \in Constituents\} \quad (14)$$

Where:

i means a Constituent;

Constituents is the set of Funded and Unfunded Constituents;

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

$$tc_t^i = -(abs(IU_t^i) \times TC Factor^i) \quad (15)$$

Where:

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

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.

For the Constituent Volatility calculation, if the lookback window is greater than the number of Pricing Days from and including Index Base Date to and excluding the Units Determination Date, the Prices used for this calculation that is prior to the Index Base Date, will be the Prices of the Selected Futures Contract on each Index Business Day prior to the Index Base Date.

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.
Eligible Futures Contracts	The set of Future Contracts that the index may hold.
Entry Rebalance Length	With respect to a Constituent, the number of Rebalance Business Days over which a rebalance is performed.
Entry Rebalance Day	Each day within a Entry Rebalance Period that is a Rebalance Business Day.
Entry Rebalance End Date	The Rebalance Business Day occurring the number of Entry Rebalance Length minus one (1) Rebalance Business Days after the Entry Rebalance Start Date. For the avoidance of doubt, if the Entry Rebalance Length is one (1), then the Entry Rebalance End Date is the Entry Rebalance Start Date.
Entry Rebalance Period	The set of Rebalance Business Days from, and including, each Entry Rebalance Start Date to, and including, the corresponding Entry Rebalance End Date.
Entry Rebalance Start Date	The Rebalance Business Day on which a Entry Rebalance Period is scheduled to begin.
Exchange	The primary exchange or quotation system on which the Futures Contracts are traded.
Exit Rebalance Day	The Rebalance Business Day on which the Index fully liquidates its position in the Selected Futures Contract.
Fixed Weight	For each Constituent, its specified weight.
Fixing	A given time specified with respect to a location or time zone.
Funded Constituent	An instrument or Index for which it is considered that the notional value is exchanged.
Futures Contract	The derivative financial contract in an Underlying Instrument.
Futures Contract Ticker Prefix	The unique set of characters at the start of each Bloomberg ticker used for Futures Contracts on an Underlying Instrument listed on a given Exchange.
FX Data Source	The source of FX data for a Fixing.
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. Such date should be after the Exit Rebalance Day and before the immediately following Unit Determination Date.
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.
Leverage	The factor that is used to multiply the Target Ending Units.
Market Disruption Event	A situation wherein markets cease to function in a regular manner. See Appendix II: Market Disruptions.
Maximum Volatility Factor	The maximum Volatility Factor of a Constituent.
Minimum Volatility Factor	The minimum Volatility Factor of a Constituent.
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 or Weights 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.
Price	If 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	An Entry or Exit Rebalance Day.
Selected Futures Contract	For each Index Business Day, the Futures Contract selected for the index to hold.
Specification Date	The date from which the Entry Rebalance Start Date is determined.
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 Ending Units	The Units of a Constituent that an index intends to hold after all trading activities in a Entry Rebalance Period are performed.
Target Units	For a Rebalance Day, the Units of a Constituent that an index intends to hold after trading activities are performed.
Transaction Cost	The cost of trading the Constituents in the Index.
Transaction Cost Factor	The factor applied to Transaction Cost.
Underlying Instrument	The asset referenced by the Futures Contract.
Unfunded Constituent	An instrument or 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	The Units Determination Business Day when the Incremental Units determinations are made by an index.
Volatility Factor	The factor that is used to scale the Target Ending Units to meet the Volatility Target.
Volatility Target	The percentage target of volatility of a Constituent.
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](#).

Appendix IV: 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 Turn of the Month Indices
4. Does the benchmark methodology for the benchmark or family of benchmarks take into account ESG factors?	No
<p>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.</p> <p>Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets.</p> <p>The ESG factors shall be disclosed at an aggregated weighted average value at the level of the family of benchmarks.</p>	
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
<p>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.</p> <p>Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets.</p> <p>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.</p> <p>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</p>	
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>(i) Describe whether the data are reported, modelled or, sourced internally or externally.</i> <i>(ii) Where the data are reported, modelled or sourced externally, please name the third party data provider.</i>	N/A
b) Verification of data and guaranteeing the quality of those data. <i>Describe how data are verified and how the quality of those data is ensured.</i>	N/A
c) Reference standards <i>Describe the international standards used in the benchmark methodology.</i>	N/A
Date on which information has been last updated and reason for the update:	27 August 2024

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