# Bloomberg Global Equity FX Hedging Methodology

November 2023

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### 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 Global Equity Index Hedging 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 indices aim to reflect the performance of entering 1M currency forwards with the intention of reducing exposure to currency risk in an underlying <u>Bloomberg Global Equity Index</u>.

With respect to a Hedging Roll Method, 1M forward positions are entered into monthly, either with the entry date in each quarter aligning with the rebalance of the underlying Bloomberg Global Equity Index, or on the last NYSE trading day of each month. The weighting and notional to each currency forward is determined on the preceding NYSE trading day and is based on the market value of the instruments in each currency expected to be held by the index (as a proportion of the total market value) at close on the day on which the forwards are entered. An adjustment factor is applied to account for the change in total market value between the determination and forward entry dates.

The return of a Bloomberg Global Equity FX Hedged Index may be considered as three components:

- The local returns on the assets held over the period in their denominated currencies
- The currency returns from the change in spot rate between the index and asset currencies
- The forward returns from the performance of entering each of the currency forwards

The local and currency returns are represented in the underlying Bloomberg Global Equity Index. In a Bloomberg Global Equity FX Hedged Index, the forward returns provide an approximate offset of the currency returns.

#### **Section 1: Calculation**

## **Hedged Index calculation**

With respect to each Hedged Index, the Index Value on the Index Base Date shall be the Index Base Value. Thereafter, the Index Value with respect to each Calculation Day, t, is calculated as:

$$HI_t^{HC} = HI_r^{HC} \times (1 + HR_t^{HC}) \tag{1}$$

Where:

r means, with respect to Calculation Day t, the immediately preceding Hedging Roll Date. For the avoidance of doubt if t is a Hedging Roll Date, r, is the immediately preceding Hedging Roll Date and on the Index Base Date the Hedging Roll Date r is the Index Base Date;

HC means the Hedge Currency;

 $HI_t^{HC}$  and  $HI_r^{HC}$  mean, with respect to the Hedge Currency, the value of the Hedged Index on Calculation Day t and Hedging Roll Date r, respectively;

 $HR_t^{HC}$  means, with respect to the Hedge Currency, the hedged return on Calculation Day t calculated in accordance with the following formula:

$$HR_t^{HC} = UR_t^{HC} + AF_r \times \left( \sum_{ccy \in CCY} w_r^{ccy} \times FR_t^{ccy} \right)$$
 (2)

Where:

 $UR_t^{HC}$  means, with respect to the Hedge Currency HC, the return on the Underlying Index calculated in accordance with the following formula:

$$UR_t^{HC} = \frac{UHI_t^{HC}}{UHI_r^{HC}} - 1 \tag{3}$$

Where:

 $UHI_t^{HC}$  and  $UHI_r^{HC}$  mean, with respect to the Hedge Currency HC, the Index Value of the Underlying Index on Calculation Day t and Hedging Roll Date r, respectively;

 $AF_r$  means, with respect to each Hedging Roll Date r, the respective adjustment factor calculated in accordance with the following formula:

$$AF_r = \frac{HI_d^{HC}}{HI_r^{HC}} \tag{4}$$

Where:

d means, with respect to Hedging Roll Date r, the Hedging Determination Date. For the avoidance of doubt, on the Index Base Date the Hedging Determination Date, d, is the Index Base Date.

 $HI_d^{HC}$  means, with respect to the Hedge Currency, the value of the Hedged Index on the Hedging Determination Date d;

CCY means the set of Member Currencies in the Underlying Index, excluding the Hedge Currency;

ccy means a Member Currency in the set of Member Currencies CCY;

 $w_r^{ccy}$  means, with respect to Hedging Roll Date r and Member Currency ccy, the total percentage weight of all Index Members of the Underlying Index that are denominated in Member Currency ccy (determined as the proportion in terms of the Hedge Currency of the total market value of the Underlying Index attributed to the Index Members denominated in such Member Currency) as determined on Hedging Determination Date d and calculated in accordance with the following formula:

$$w_r^{ccy} = \frac{MV_{d,adj}^{ccy}}{MV_{d,adj}} \tag{5}$$

Where:

 $MV_{d,adj}$  means the market value after implementation of all corporate actions effective on r, as estimated on Hedging Determination Date d and calculated in accordance with the following formula:

$$MV_{d,adj} = \sum_{i \in n_{d,r}} TF_{i,d} \times CAC_{i,d,post} \times N_{i,d,post} \times P_{i,d,post} \times FX_{i,d}^{HC}$$
(6)

Where:

 $n_{d,r}$  means, with respect to Hedging Determination Date d, the set of Index Members of the Underlying Index at close on Hedging Roll Date r;

 $TF_{i,d}$  means the Tilt Factor for stock i on Hedging Determination Date d;

 $CAC_{i,d,post}$  means the Corporate Action Coefficient of the stock i after implementation of all corporate actions with effective day r;

 $N_{i,d,post}$  means the number of shares of the stock i after implementation of all corporate actions with effective day r

 $P_{i,d,post}$  means, with respect to Hedging Determination Date d, the closing price of stock i after implementation of all corporate actions with effective day r;

 $FX_{i,d}^{HC}$  means, with respect to the Hedge Currency HC and the Member Currency of Index Member i, the FX Fixing Rate from the Member Currency to the Hedge Currency on Hedging Determination Date d;

 $MV_{d,adj}^{ccy}$  means the Market Value of stocks denominated in currency ccy after implementation of all corporate actions effective on r, as determined on Hedging Determination Date d, and calculated in accordance with the following formula:

$$MV_{d,adj}^{ccy} = \sum_{i \in n_{d,r,close}} CF_i^{ccy} \times TF_{i,d} \times CAC_{i,d,post} \times N_{i,d,post} \times P_{i,d,post} \times FX_{i,d}^{HC}$$

$$\tag{7}$$

Where:

 $CF_i^{ccy}$  means one (1) if the Member Currency of stock i is the same as ccy, otherwise zero (0);

 $FR_t^{ccy}$  means, with respect to Member Currency ccy, the forward return on Calculation Day t calculated in accordance with the following formula:

$$FR_t^{ccy} = \left(\frac{SFXFI_t^{ccy,HC}}{SFXFI_r^{ccy,HC}} - 1\right) \times HR_r^{ccy} \tag{8}$$

Where:

 $SFXFI_t^{ccy,HC}$  and  $SFXFI_r^{ccy,HC}$  means, with respect to the Member Currency ccy and Hedge Currency HC, the Index Value of the relevant Short FX Forward Index on Calculation Day t and Hedging Roll Date r, respectively;

 $HR_r^{ccy}$  means, with respect to each Member Currency ccy, the hedging ratio on each Hedging Roll Date r as calculated in accordance with the following formula:

$$HR_r^{ccy} = HPC^{ccy} \times (1 + ExpR_r^{ccy}) \tag{9}$$

Where:

*HPCccy* means, with respect to Member Currency *ccy*, the Hedge Percentage. For the avoidance of doubt, unless specified otherwise, the default value for the Hedge Percentage is 100% (one); and

 $ExpR_r^{ccy}$  means, with respect to Member Currency ccy, the Expected Return. For the avoidance of doubt, unless specified otherwise, the default value for the Expected Return is 0% (zero).

#### **Short FX Forward Index calculation**

With respect to each Short FX Forward Index, the Index Value on the Index Base Date shall be the Index Base Value. Thereafter, the Index Value with respect to each Calculation Day, *t*, is calculated as:

$$SFXFI_t^{ccy,HC} = SFXFI_r^{ccy,HC} \times \left(1 + \frac{P_r^{Fwd(r,ccy,HC)} - P_t^{Fwd(r,ccy,HC)}}{P_r^{Spot(ccy,HC)}}\right)$$
(10)

Where:

r means, with respect to Calculation Day t, the immediately preceding Hedging Roll Date. For the avoidance of doubt if t is a Hedging Roll Date, r, is the immediately preceding Hedging Roll Date and on the Index Base Date the Hedging Roll Date r is the Index Base Date;

ccy means the Member Currency;

HC means the Hedge Currency;

 $SFXFI_t^{ccy,HC}$  and  $SFXFI_r^{ccy,HC}$  mean the Index Values on Calculation Day t and Hedging Roll Date r, respectively;

Fwd(r, ccy, HC) means the Forward Position short the Member Currency ccy against the Hedge Currency HC, with Trade Date T;

 $P_r^{Fwd(r,ccy,HC)}$  and  $P_t^{Fwd(r,ccy,HC)}$  mean, with respect to Forward Position Fwd(r,ccy,HC), the FX Forward Price on Hedging Roll Date r and Calculation Day t, respectively; and

 $P_r^{Spot(ccy,HC)}$  means, the Spot Exchange Rate of the Member Currency ccy short against the Hedge Currency HC on Hedging Roll Date r;

### **FX Forward Price calculation**

The price of a Forward Position is the value, expressed as a forward rate, determined by considering the offsetting forward rate required to unwind the existing position.

With respect to a Forward Position, Fwd(r), the FX Forward Price for each Calculation Day, t, shall be calculated in accordance with the following formula:

$$P_{t}^{Fwd(r,ccy,HC)} = FR_{r}^{Settle\left(Fwd(r,ccy,HC)\right)} + \left[ \left( FR_{t}^{Settle\left(Fwd(r,ccy,HC)\right)} - FR_{r}^{Settle\left(Fwd(r,ccy,HC)\right)} \right) \times PVF_{t}^{Settle\left(Fwd(r,ccy,HC)\right)} \right]$$

$$(11)$$

Where:

Settle(Fwd(r,ccy,HC)) means the Forward Position Settlement Date of Forward Position Fwd(r,ccy,HC);

 $FR_r^{Settleig(Fwd(r,ccy,HC)ig)}$  and  $FR_t^{Settleig(Fwd(r,ccy,HC)ig)}$  mean the Forward Rates to Forward Position Settlement Date Settleig(Fwd(r,ccy,HC)ig) on Hedging Roll Date r and Calculation Day t respectively; and

 $PVF_t^{Settle(Fwd(r,ccy,HC))}$  means, with respect to Forward Position Settlement Date Settle(Fwd(r,ccy,HC)), the Present Value Factor on Calculation Day t. For the avoidance of doubt, unless specified otherwise, the default value for the Present Value Factor is 1 (one).

#### **Forward Rate calculation**

Forward rates for a given settlement date are determined by interpolating between (or extrapolating from) the rates of certain quoted forward tenors.

With respect to a Forward Position Settlement Date, Settle(Fwd(r,ccy,HC)), the Forward Rate for each Calculation Day, t, shall be calculated in accordance with the following interpolation formula:

$$FR_{t}^{Settle(Fwd(r,ccy,HC))} = \frac{FR_{t}^{Settle(STFI_{t})} \times Days\left(Settle(Fwd(r,ccy,HC)),Settle(LTFI_{t})\right) + FR_{t}^{Settle(LTFI_{t})} \times Days\left(Settle(STFI_{t}),Settle(Fwd(r,ccy,HC))\right)}{Days\left(Settle(STFI_{t}),Settle(LTFI_{t})\right)}$$

$$(12)$$

Where:

 $STFR_t$  and  $LTFR_t$  mean, with respect to Calculation Day t, the Short Tenor FX Instrument and Long Tenor FX Instrument respectively;

 $Settle(STFI_t)$  and  $Settle(LTFI_t)$  mean, with respect to Calculation Day t, the Forward Instrument Settlement Dates of the Short Tenor FX Instrument and Long Tenor FX Instrument respectively;

 $FR_t^{Settle(STFI_t)}$  and  $FR_t^{Settle(LTFI_t)}$  mean, with respect to Calculation Day t, the Forward Rates to the Forward Instrument Settlement Dates of the Short Tenor FX Instrument and the Long Tenor FX Instrument respectively; and

 $Days(\alpha, \beta)$ , where  $\alpha$  and  $\beta$  can take dates Settle(Fwd(r, ccy, HC)),  $Settle(STFI_t)$  or  $Settle(LTFI_t)$ , means the number of Calendar Days from and including  $\alpha$  to and excluding  $\beta$ .

#### **Forward Position Settlement Date calculation**

The settlement date of each Forward Position is set such that it matches what would be the settlement date of a spot transaction entered into on the next Hedging Roll Date.

With respect to a Forward Position, Fwd(r, ccy, HC), the Forward Position Settlement Date of Forward Position Fwd(r, ccy, HC) shall be determined in accordance with the following method:

$$Settle(Fwd(r,ccy,HC)) = SpotSettle(R_{next}(r),ccy,HC)$$
(13)

Where:

 $R_{next}(r)$  means, with respect to Hedging Roll Date r, the immediately following Hedging Roll Date; and

 $SpotSettle(R_{next}(r), ccy, HC)$  means, with respect to Hedging Roll Date  $R_{next}(r)$ , the Spot Settlement Date.

## **Section 2: Back-test assumptions**

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

- For Indices whose Hedging Roll Method is 'Equity Rebalance Aligned': Prior to June 2021, the Hedging Roll Dates are determined by adding one month to the previous Hedging Roll Date and rolling forward until the condition that both the selected date and previous calendar day are both NYSE Trading Days is met. If the selected date is then within 15 calendar days of a Global Equity Index rebalance date, then such rebalance date is selected.
- For Indices that were launched on or prior to 11 October 2023, the set of Member Currencies in the Underlying Index excluded hedging for currencies such as KWD, PKR, QAR and SAR. For Indices that were launched after 11 October 2023, the set of Member Currencies in the Underlying Index did not exclude any currencies.
- Historically, the set of Member Currencies in the Underlying Index may not contain all Member Currencies, due to data unavailability. The effective dates, on which the Member Currency will be included in the Index, for the 9 Member Currencies that may not be available on an Index Base Date are listed as below:

Member Currency	Effective Date	Member Currency	Effective Date
EGP	27 February 2009	PKR	31 March 2023
HUF	27 February 2009	QAR	26 February 2021
ILS	28 February 2006	RUB	30 June 2005
KWD	30 January 2009	SAR	26 February 2021
MYR	30 November 2004		

#### **Section 3: 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, 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 Index measures global equity markets. As with all equity investing, the Index is exposed to market risk. The value of equities fluctuate with the changes in economic forecasts, interest rate policies established by central banks and perceived geopolitical risk. The Index does not take into account the cost of replication and as a result a tracking portfolio's returns will underperform the Index with all else equal. As the Index is designed to measure those markets, it could be materially impacted by market movements, thus significantly impacting the use or usefulness of the fixings for some or all users.

In addition, certain sub-indices may be designed to measure smaller subsets of the Index such as specific styles, size, and sector. Some of these sub-indices have very few qualifying constituents and may have none for a period of time. During such period, the sub-index will continue to be published at its last value, effectively reporting a 0% return, until new constituents qualify. If no constituents are expected to qualify (due to changes in market structure and other factors), the sub-index may be discontinued. In such an event, this discontinuation will be announced to index users.

## **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 <u>here</u>.

# **Appendix I: Glossary**

Available FX Instrument	The Spot Exchange Rate and the 1M Forward Outright
Calculation Day	As defined in the Bloomberg Global Equity Indices Methodology
Calendar Day	Any day
Corporate Action Coefficient	As defined in the Bloomberg Global Equity Indices Methodology
Expected Return	With respect to a Member Currency, the expected return on securities denominated in such currency between Hedging Roll Dates. For the avoidance of doubt, unless specified otherwise, the default value is zero (0%)
Forward Instrument Settlement Date	With respect to an FX Instrument and a Calculation Day, the settlement date provided by the FX Data Source
Forward Position	With respect to a Trade Date, the FX forward contract short the Member Currency against the Hedge Currency entered into on such Trade Date
Forward Position Settlement Date	With respect to a Forward Position, it's settlement date
Forward Rate	With respect to a Forward Position Settlement Date and a Calendar Day, the outright rate for an FX forward contract entered into on such Calendar day for settlement on the Forward Position Settlement Date as determined by interpolation using the Available FX Instruments
FX Data Source	BISL Derived FX Data as defined in the BISL Derived FX Data Methodology
FX Fixing Rate	As defined in the Bloomberg Global Equity Indices Methodology
FX Forward Price	The price of a Forward Position on a Calendar Day determined by considering the Forward Rate when entering the position and the rate to the same Forward Position Settlement Date on such Calendar Day
Hedge Currency	The currency that the Underlying Index is being hedged into
Hedge Percentage	With respect to a Member Currency, the percentage of the currency exposure to hedge. For the avoidance of doubt, the default value unless specified otherwise is one (100%)
Hedged Index	Index that aims to reflect the performance of using FX forward contracts to hedge the FX exposure of an Underlying Index
Hedging Determination Date	With respect to a Hedging Roll Date, the Calculation Day immediately prior to such Hedging Roll Date
Hedging Roll Date	With respect to a Hedging Roll Date, if Hedging Roll Method is 'Equity Rebalance Aligned', the first Calculation Day on or immediately following the second Wednesday of each month that satisfies the condition that both such Calculation Day and the immediately preceding Calculation Day are both NYSE Trading Days, else if Hedging Roll Method is 'End of Month', the first Calculation Day on or immediately preceding the last Calendar Day of each month that satisfies the condition that both such Calculation Day and the immediately preceding Calculation Day are both NYSE Trading Days
Hedging Roll Method	The set of rules by which the Hedging Roll Date is being determined. For avoidance of doubt, the Hedging Roll Methods are 'Equity Rebalance Aligned' or 'End of Month', and unless otherwise specified, the Hedging Roll Method is 'Equity Rebalance Aligned'
Index Base Date	The first date for which the Index has an Index Value
Index Base Value	The Index Value of the Index on the Index Base Date
Index Member	With respect to an Underlying Index, as defined in the Bloomberg Global Equity Indices Methodology
Index Value	As defined in the Bloomberg Global Equity Indices Methodology
Long Tenor FX Instrument	With respect to a Forward Position Settlement Date and a Calculation Day, the Available FX Instrument having an FX Instrument Settlement Date that is the same as the Forward Position Settlement Date, if one exists, otherwise, the Available FX Instrument with the earliest FX Instrument Settlement Date that is later than the FX Instrument Settlement Date of the Short FX Instrument
Market Value	The free float adjusted market capitalization, adjusted for the Tilt Factor and Corporate Action Coefficient
Member Currency	With respect to an Index Member, the currency in which such Index Member is denominated
NYSE Trading Day	Days on which the New York Stock Exchange is scheduled to be open for a full day of trading

Present Value Factor	The factor used to discount forward rates back to the calculation date. For the avoidance of doubt, the default value unless specified otherwise is one (1)
Short FX Forward Index	Index that aims to represent the performance of entering into a rolling short forward position in a Member Currency against a Hedge Currency
Short Tenor FX Instrument	with respect to a Forward Position Settlement Date and a Calculation Day, the Available FX Instrument that has the latest FX Instrument Settlement Date from the Available FX Instruments having an FX Instrument Settlement Date that is either on or before the Forward Position Settlement Date, if there is an Available FX Instrument having an FX Instrument Settlement Date that is either on or before the Forward Position Settlement Date, otherwise, the Available FX Instrument that has the earliest FX Instrument Settlement Date
Spot Exchange Rate	The spot rate for a Member Currency short against the Hedge Currency from the FX Data Source
Spot Settlement Date	The settlement date for the spot rate of a Member Currency against the Hedge Currency from the FX Data Source
Tilt Factor	As defined in the Bloomberg Global Equity Indices Methodology
Trade Date	The date on which an FX forward contract was entered into
Underlying Index	The Price Return, Total Return or Net Total Return version of a Bloomberg Global Equity Index

# **Appendix II: 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")	
<b>2</b> . Type of benchmark	Equities	
<b>3</b> . Name of the benchmark or family of benchmarks.	Bloomberg Global Equity Indices	
<b>4</b> . Does the benchmark methodology for the benchmark or family of benchmarks take into account ESG factors?	No	
<b>5</b> . Where the response to Item 4 is positive, please list below, for benchmark methodology, taking into account the ESG factors li	or each family of benchmarks, those ESG factors that are taken into account in the stated 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 a	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	
	or each benchmark, those ESG factors that are taken into account in the benchmark ex II to Delegated Regulation (EU) 2020/1816, depending on the relevant	
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 th the benchmark.	ne benchmark, but shall be disclosed at an aggregated weighted average value of	
	rm of a hyperlink to a website of the benchmark administrator included in this vailable and accessible. Benchmark administrators shall ensure that information	
a) List of environmental factors considered:	N/A	
b) List of social factors considered:	N/A	
c) List of governance factors considered:	N/A	
7. Data and standards used.		
a) Data input.	N/A	
b) Verification of data and guaranteeing the quality of those data.	N/A	
c) Reference standards	N/A	
Describe the international standards used in the benchmark methodology.		
Date on which information has been last updated and reason for the update:	October 2023, addition of the 4 new Member Currencies and a new Hedging Roll Method.	

# **Version History**

Version	Date	Notes
3.0	November 2023	Updated Section 2: Back-test assumptions with start dates of Member Currencies that may not
		exist on an Index Base Date.
2.0	October 2023	Updated to include KWD, PKR, QAR, SAR as Member Currencies, a new 'End of Month' Hedging
		Roll Method, and ESG disclosure.
1.0	May 2022	Initial release.

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