MSCI

Methodology Book For:

- MSCI USD IG Broad Corporate Bond with Reg S Index
- MSCI USD IG Sustainable SRI Corporate Bond Index
- MSCI USD IG Sustainable SRI Top 200 Select Corporate Bond Index
- MSCI USD IG Sustainable SRI Top 200 Select Corporate Bond Hedged to Euro Index

November 2022

Contents

1 Introduction

The MSCI USD IG Sustainable SRI Top 200 Select Corporate Bond Index (the "Index") aims to represent the performance of a strategy that seeks systematic integration of environmental, social and governance (ESG) norms while selecting the two largest bonds from each of the100 largest issuers in the MSCI USD IG Sustainable SRI Corporate Bond Index (the "Parent Index").

The Parent Index is constructed from the MSCI USD IG Broad Corporate Bond with Reg S Index (the "Starting Index") by incorporating business exclusion screens based on involvement in Controversial Weapons, Civilian Firearms, Nuclear Weapons, Tobacco, Adult Entertainment, Alcohol, Conventional Weapons, Gambling, Genetically Modified Organisms, Nuclear Power, Fossil Fuel Reserves, Fossil Fuel Extraction, Thermal Coal Based Power Generation, ESG Controversy Score and ESG Rating .

The Starting Index is constructed from the global credit universe by applying various selection criteria based on security type, credit rating, bond size, maturity and country of domicile.

The MSCI USD IG Sustainable SRI Top 200 Select Corporate Bond Hedged to Euro Index (the "Hedged Index") aims to represent the return resulting from hedging 100% of the MSCI USD IG Sustainable SRI Top 200 Select Corporate Bond Index (the "Unhedged Underlying Index") to EUR in the 1-month Forward currency market and contains both a bond and a currency component. The amount hedged is kept constant over the whole month and the currency P&L is assumed to be reinvested at month end only.

2 MSCI ESG Research

MSCI ESG Research provides in-depth research, ratings and analysis of the environmental, social and governance-related business practices of thousands of companies worldwide. It consists of an integrated suite of tools and products to efficiently manage research, analysis and compliance tasks across the spectrum of ESG factors.

The Index uses company ratings and research provided by MSCI ESG Research. In particular, this index uses the following MSCI ESG Research products: MSCI ESG Ratings, MSCI Climate Change Metrics, MSCI ESG Controversies and MSCI ESG Business Involvement Screening Research.

For details on MSCI ESG Research's full suite of ESG products, please refer to: https://www.msci.com/esg-investing

2.1 MSCI ESG Ratings

MSCI ESG Ratings provides research, analysis and ratings of how well companies manage environmental, social and governance risks and opportunities.

MSCI ESG Ratings provides an overall company ESG rating - a seven-point scale from 'AAA' to 'CCC'. In addition, the product provides scores and percentiles indicating how well a company manages each key issue relative to industry peers.

For more details on MSCI ESG Ratings, please refer to: https://www.msci.com/esg-ratings

2.2 MSCI ESG Controversies

MSCI ESG Controversies provides assessments of controversies concerning the negative environmental, social, and/or governance impact of company operations, products and services. The evaluation framework used in MSCI ESG Controversies is designed to be consistent with international norms represented by the UN Declaration of Human Rights, the ILO Declaration on Fundamental Principles and Rights at Work, and the UN Global Compact. MSCI ESG Controversies Score falls on a 0-10 scale, with "0" being the most severe controversy.

For more details on MSCI ESG Controversies, please refer to: https://www.msci.com/documents/10199/acbe7c8a-a4e4-49de-9cf8-5e957245b86b

2.3 MSCI ESG Business Involvement Screening Research

MSCI ESG Business Involvement Screening Research (BISR) aims to enable institutional investors to manage environmental, social and governance (ESG) standards and restrictions reliably and efficiently.

For more details on MSCI ESG Business Involvement Screening Research, please refer to: http://www.msci.com/resources/factsheets/MSCI_ESG_BISR.pdf

3 Index Construction Methodology

Constructing the MSCI USD IG Sustainable SRI Top 200 Select Corporate Bond Index involves the following steps:

- Defining the MSCI USD IG Broad Corporate Bond with Reg S Index
- Defining the MSCI USD IG Sustainable SRI Corporate Bond Index
- Defining the MSCI USD IG Sustainable SRI Top 200 Select Corporate Bond Index

3.1 Defining the MSCI USD IG Broad Corporate Bond with Reg S Index

The MSCI USD IG Broad Corporate Bond with Reg S Index (the "Starting Index") is constructed using the methodology defined for MSCI USD IG Corporate Bond Index in the MSCI Corporate Bond Indexes Methodology[1] except for the below changes:

- At rebalancing, each security included in the Starting Index will have a notional amount outstanding greater than or equal to USD 300 million. Issuer Size threshold is not applicable.
- Regulation S bonds are eligible for inclusion and 144a bonds are ineligible for inclusion in the Starting Index.

3.2 Defining the MSCI USD IG Sustainable SRI Corporate Bond Index

The MSCI USD IG Sustainable SRI Corporate Bond Index (the "Parent Index") is constructed from the Starting Index by applying the screening criteria defined in Appendix II. The exclusions are based on the data provided by MSCI ESG Research at the time of index rebalancing. The screened securities which are eligible for inclusion in the MSCI USD IG Sustainable SRI Corporate Bond Index are weighted in proportion of their weight in the Starting Index.

[1] Refer to MSCI Corporate Bond Indexes Methodology available at: https://www.msci.com/index-methodology

3.3 Defining the MSCI USD IG Sustainable SRI Top 200 Select Corporate Bond Index

The MSCI USD IG Sustainable SRI Top 200 Select Corporate Bond Index (the "Index") is constructed from the MSCI USD IG Sustainable SRI Corporate Bond Index by applying the following steps:

- **Issuer Selection:** Top 125 largest issuers are identified based on sum of bond amount outstanding for each issuer in the MSCI USD IG Sustainable SRI Corporate Bond Index. Selection Buffer[2] of 25% is applied to select the top 100 issuers[3].

- **Bond Selection:** Two largest bonds[4] are selected from each of the top 100 issuers based on bond amount outstanding.

- **Weighting:** Bonds are weighted in proportion of their weights in the MSCI USD IG Sustainable SRI Corporate Bond Index.

[2] Refer to Appendix III for details

[3] In case of a tie, the issuer with higher weight in Parent Index is preferred

[4] If case of a tie, the bond with longer time to maturity is preferred. If tie is not resolved, then the bond with larger coupon is preferred.

4 Index Rebalancing & Maintenance

4.1 Monthly Index Reviews of the MSCI USD IG Broad Corporate Bond with Reg S Index

- The composition of the MSCI USD IG Broad Corporate Bond with Reg S Index is reviewed monthly, with Rebalancing Date being first business date of the month.
- Change in the index composition is based on latest data available as of three days prior to the Rebalancing Date, which is defined as the Cut-Off Date
- MSCI will announce proforma index rebalancing results as of the Cut-Off Date.
- Bonds are added to or deleted from the index only on monthly rebalancing dates, except in case of an exchange event[5]. For the existing index components any changes to index eligibility will only be reflected in the next monthly rebalancing.
- Any inclusion or exclusion criteria satisfied for a given security in the universe, after the Cut-Off Date, will generally become effective at the following monthly rebalancing; should conditions remain unchanged.
- Any cash that accrues within the index in each month is re-invested on a pro-rata basis across the index constituents, on the Rebalancing Date. In essence, cash in the index is swept out on rebalancing and the opening index portfolio on the Rebalancing Date starts with zero accrued cash balance.
- Certain variants of total return calculation of the index on the Rebalancing Date may be adjusted for transaction cost[6] as securities are added to the index at the offer price.

For further information on index total return calculation and corporate events handling please refer to the MSCI Fixed Income Index Calculation Methodology. For the holiday calendar used in the indexes, please refer to the MSCI Fixed Income Data Methodology.[7].

[5] Refer to the MSCI Fixed Income Index Calculation Methodology for detail

[6] Refer to the MSCI Fixed Income Index Calculation Methodology for detail

[7] The methodologies are available at: https://www.msci.com/index-methodology

MSCI leverages the GICS®[8] sector classification framework for construction of the MSCI USD IG Broad Corporate Bond with Reg S Index. Please refer to MSCI GICS Methodology[9] for details.

4.2 Monthly Index Reviews of the MSCI USD IG Sustainable SRI Corporate Bond Index

The MSCI USD IG Sustainable SRI Corporate Bond Index is reviewed on a monthly basis to coincide with the Monthly Index Review of the Starting Index. In general, the pro forma index is announced three business days before the effective date. In general, MSCI uses latest available MSCI ESG Research data on the announcement date for the rebalancing of the Indexes.

At each Monthly Index Review, the eligible universe is updated, and the composition of the index is reassessed based on the defined methodology.

4.3 Monthly Index Reviews of the MSCI USD IG Sustainable SRI Top 200 Select Corporate Bond Index

The MSCI USD IG Sustainable SRI Top 200 Select Corporate Bond Index is reviewed on a monthly basis to coincide with the Monthly Index Review of the Parent Index. In general, the pro forma index is announced three business days before the effective date. In general, MSCI uses latest available MSCI ESG Research data on the announcement date for the rebalancing of the Indexes.

At each Monthly Index Review, the eligible universe is updated, and the composition of the index is reassessed based on the defined methodology.

[8] GICS, the global industry classification standard, jointly developed by MSCI Inc. and S&P Global.

[9] The GICS methodology is available at: https://www.msci.com/gics

5 Hedged Index Construction Methodology

The Hedged Index[10] is designed to represent a close estimation of the return that can be achieved by hedging the currency exposures of the Unhedged Underlying Indexes in the one-month Forward market at each end of month. The Hedged Index hedges each foreign currency in the index back to the home currency of the index by selling each foreign currency forward at the one-month Forward rate. The amount of Forwards sold on the last weekday[11] of the month represents the market value of the index as of the close of two weekdays before the first calendar day of the following month with the aim of achieving better index replicability. The foreign currency weights, however, take into account any changes in the composition of the index implemented as of the close of last weekday of the month. No adjustment to the hedge is done during the month to account for changes in the indexes due to price movement of securities, corporate events, additions, deletions or any other changes. In other words, the amount hedged is kept constant over the whole month.

[10] Refer Appendix IV for common principles in the calculation of the Hedged Index

[11] The treatment of missing spot and forward rates on any weekday is defined in Appendix IV Section 3

5.1 Constructing the Hedged Index

Constructing the Hedged Index involves the following steps:

- Defining the home currency
- Identifying the currencies to be sold in the index
- Identifying the weight for each currency to be sold in the index
- Combining the Unhedged Underlying Index return with the Hedge Impact

5.1.1 Defining the Home Currency

The home currency is the home currency of an investor investing in international fixed income markets. Often, a cross-border investor would like to measure the performance impact of hedging the currency exposure of his holdings relative to his home currency. For construction of Hedged Index, the home currency is the EUR.

5.1.2 Identifying the Currencies to be Sold in the Index

The Unhedged Underlying Indexes have security constituents that can be quoted in different foreign currencies. Each foreign currency used to denote securities in the Unhedged Underlying Index is included in the calculation of the Hedged Index.

5.1.3 Identifying the Weight for Each Currency to be Sold in the Index

In the Hedged Index, the weight of each currency corresponds to the relative market cap weight of the securities quoted in that currency in the Unhedged Underlying Index. More precisely, the weights are derived from the weight of the securities quoted in the respective currencies in the Unhedged Underlying Index as of the close of two weekdays before the first calendar day of following month, but taking into account any month end changes in the index constituents due to rebalancing and corporate actions.

5.1.4 Combining the Unhedged Underlying Index Return with the Hedge Impact

The Hedged Index return is calculated as a sum of the Unhedged Underlying Index return expressed in the home currency, and the Hedge Impact. As currency weights and corresponding Forward notional amounts are determined two weekdays before the first day of the following month, an adjustment factor needs to be introduced in the calculation of the Hedge Impact to account for the performance of the Hedged Index on the last weekday of the month. This adjustment is described in detail in section 5.2.

5.2 Hedged Index Calculation Formula

5.2.1 Calculation Formula

There are two components to the Hedged Index return[12]:

1. The performance of the unhedged index in the home currency
2. The Hedge Impact (aimed to represent the gain or loss on the Forward contracts) in the home currency

The Hedge Impact, expressed in percent, is calculated as follows (all exchange rates are expressed as amount of foreign currency for 1 unit of hedged currency):

$$HI(t) = NAF \times \sum_{i=1}^{n} \left\{ Weight_{i,M-2} \times FXRate_{i,M-2} \times \left(\frac{1}{FFRate_{i,M-1}} - \frac{1}{FFRate_{i,odd-days_t}} \right) \right\}$$

where

t	= Index calculation date
NAF	= Notional Adjustment Factor that accounts for the fact that the total value of the currency notional amount is not the same as the value of the Unhedged Underlying Index due to the fact that the first is determined on M-2 whereas the second on M-1. It is defined as the ratio of the Hedged Index level on M-2 and the Hedged Index level on M-1 $= \frac{HedgedIndex_{M-2}}{HedgedIndex_{M-1}}$
M	= First calendar day of the month
$HI(t)$	= Index Hedge Impact at time t
$Weight_{i,M-2}$	= Weight of the currency i in the Unhedged Underlying Index two weekdays before the start of the current calendar month, but reflecting changes in the composition of the index to be implemented as of the close of the last weekday of the previous month
$FXRate_{i,M-2}$	= Spot rate of the currency i two weekdays before the start of the current calendar month. This term determines the notional amount of the foreign currency to be sold corresponding to its weight in the index

[12] Refer Appendix V Section 1 for an example of hedged index return calculation

$FFRate_{i,M-1}$ = 1-month Forward (ask quote) for the currency i one weekday before the start of the current calendar month (or last weekday of the previous calendar month)

$FFRate_{i,odd-days_t}$ = Interpolated odd-days Forward rate of the currency i on day t. This term is used to mark to market the currency position intra month and is equal to the Spot rate of currency i on the last day of the month. Its calculation is defined in Section 5.4.1.

The Hedged Index performance is the combination of the unhedged performance (in hedged currency terms) and the Hedge Impact:

Performance of the Hedged Index =

$$\frac{UnhedgedUnderlyingIndex_t}{UnhedgedUnderlyingIndex_{\ M-1}} - 1 + HI(t)$$

where

$UnhedgedUnderlyingIndex_t$ = Value of the Unhedged Underlying Index on the calculation date

$UnhedgedUnderlyingIndex_{M-1}$ = Value of the Unhedged Underlying Index on the last weekday of the previous calendar month

$HI(t)$ = Hedge Impact on the index calculation date defined above

5.3 Calculation of Daily Returns

5.3.1 Marking to Market the Forward Contracts on a Daily Basis

The daily calculation of Hedged Index marks to market the one-month Forward contracts on a daily basis by using an equal and offsetting Forward position. For instance, after 8 days, the Forward would be marked to market using a 22-days offsetting Forward in the case of a month when the last weekday of the month is the 30th (i.e. 30 – 8 = 22).

5.3.2 Pricing the Offsetting Forward

Typically, only a limited number of standard duration of Forwards is available in the market. These rates are called “tenors”, and represent one day, one week, one month, etc. This means that other durations for Forwards (called odd-days Forwards) are generally not available but must be calculated. For the sake of simplicity, when calculating Hedged Index, MSCI uses a linear interpolation based solely on the 1-month Forwards to estimate the value of odd-days Forwards every day during the whole month. Odd-days Forwards are computed simply as the Spot rate plus the 1-month Forward premium or discount pro-rated for the number of days until the last weekday of the month.

5.4 Odd-Days Forwards Calculation Using a Linear Interpolation

5.4.1 Calculation Formula

MSCI uses a linear interpolation formula to compute odd-days Forwards[13]. The general formula is as follows:

$$FFRate_{odd-days_t} = FXRate_t + \left(\left(FFRate_{1-month_t} - FXRate_t \right) \times \frac{Odd - days_t}{TotNbOfCalDaysDuringMonth} \right)$$

where

$FXRate_t$	= Spot rate at time *t*
$FFRate_{1-month_t}$	= 1-Month Forward rate (ask quote) at time *t*
$Odd - days_t$	= Number of days until the last weekday of the current month (not counting *t*)

[13] Refer Appendix V Section 2 for an example of interpolated odd-days forward rate calculation

6 Maintaining the Hedged Index

The Hedged Index is maintained with an objective of reflecting the evolution of the underlying currency exposures in the Unhedged Underlying Indexes on a timely basis. In particular, the hedged index maintenance involves:

- Resetting the weights of the currencies to be sold in the index
- Rolling the Forward contracts over to the next month

The Hedged Index are rebalanced monthly on the last trading day of the month, when the Hedged Index will take into account the effect of rolling into new 1-month Forward contracts based on the newly determined weights of currency to be sold for the next month's Hedged Index calculation. The currency weights corresponding foreign currency notional amounts are determined as of the close of two weekdays before the first calendar day of following month and remain constant intra month. This means that no changes in the weights are made during the month to account for changes in the Unhedged Underlying Indexes due to price movement of securities, corporate events, additions, deletions or any other changes.

Appendix I: MSCI Developed Market Universe

List of Developed Market Countries
Australia
Austria
Belgium
Canada
Denmark
Finland
France
Germany
Hong Kong
Ireland
Israel
Italy
Japan
Luxembourg[14]
Netherlands
New Zealand
Norway
Portugal
Singapore
Spain

[14] Luxembourg is considered a part of the developed markets universe for both fixed income and equity asset classes. In MSCI Equity Indexes, (e.g. MSCI World Index) Luxembourg is not included, because its equity market size fails to clear the minimum inclusion criteria as per MSCI Global Investable Market Indexes (GIMI) methodology.

Sweden
Switzerland
United Kingdom
United States of America

Appendix II: ESG-based Exclusion Criteria

Controversial Weapons:

- All companies with any tie to Controversial Weapons as defined below:
  - Cluster Bombs
    - MSCI ESG Research's cluster bomb research identifies public companies that are involved in the production of cluster bombs and munitions, or the essential components of these products.
  - Landmines
    - MSCI ESG Research's landmines research identifies public companies that are involved in the production of anti-personnel landmines, anti-vehicle landmines, or the essential components of these products.
  - Depleted Uranium Weapons
    - MSCI ESG Research's depleted uranium weapons research identifies public companies involved in the production of depleted uranium weapons and armor.
  - Chemical and Biological Weapons
    - MSCI ESG Research's chemical and biological weapons research identifies public companies that are involved in the production of chemical and biological weapons, or the essential components of these products.
  - Blinding Laser Weapons
    - MSCI ESG Research's blinding laser weapons research identifies public companies that are involved in the production of weapons utilizing laser technology to cause permanent blindness.
  - Non-Detectable Fragments
    - MSCI ESG Research's non-detectable fragments research identifies public companies that are involved in the production of weapons that use non-detectable fragments to inflict injury.
  - Incendiary Weapons (White Phosphorus)
    - MSCI ESG Research's incendiary weapons research identifies companies that are involved in the production of weapons using white phosphorus.

Involvement criteria:

- Producers of the weapons
- Producers of key components of the weapons (only applies to cluster bombs, landmines, depleted uranium weapons as well as chemical and biological weapons)
- Ownership of 20% or more of a weapons or components producer

The minimum limit is raised to 50% for financial companies having an ownership in a company that manufactures controversial weapons or key components of controversial weapons

- Owned 50% or more by a company involved in weapons or components production

Revenue limits:

- Any identifiable revenues, i.e., zero tolerance

Civilian Firearms:

- All companies classified as "Producer" of firearms and small arms ammunitions for civilian markets. It does not include companies that cater to the military, government, and law enforcement markets
- All companies deriving 5% or more aggregate revenue from the production and distribution (wholesale or retail) of firearms or small arms ammunition intended for civilian use.

Nuclear weapons:

- All companies that manufacture nuclear warheads and/or whole nuclear missiles
- All companies that manufacture components that were developed or are significantly modified for exclusive use in nuclear weapons (warheads and missiles)
- All companies that manufacture or assemble delivery platforms that were developed or significantly modified for the exclusive delivery of nuclear weapons
- All companies that provide auxiliary services related to nuclear weapons

- All companies that manufacture components that were not developed or not significantly modified for exclusive use in nuclear weapons (warheads and missiles) but can be used in nuclear weapons
- All companies that manufacture or assemble delivery platforms that were not developed or not significantly modified for the exclusive delivery of nuclear weapons but have the capability to deliver nuclear weapons
- All companies that manufacture components for nuclear-exclusive delivery platforms

Tobacco:

- All companies classified as a "Producer".
- All companies deriving 5% or more aggregate revenue from the production, distribution, retail, supply and licensing of tobacco-related products.

Adult Entertainment:

- All companies deriving 5% or more revenue from the production of adult entertainment materials
- All companies deriving 15% or more aggregate revenue from the production, distribution and retail of adult entertainment materials

Alcohol:

- All companies deriving 5% or more revenue from the production of alcohol related products
- All companies deriving 15% or more aggregate revenue from the production, distribution, retail and supply of alcohol-related products

Conventional Weapons:

- All companies deriving 5% or more revenue from the production of conventional weapons and components
- All companies deriving 15% or more aggregate revenue from weapons systems, components, and support systems and services

Gambling:

- All companies deriving 5% or more revenue from ownership of operation of gambling-related business activities

- All companies deriving 15% or more aggregate revenue from gambling related business activities

Genetically Modified Organisms (GMO)

- All companies deriving 5% or more revenue from activities like genetically modifying plants, such as seeds and crops, and other organisms intended for agricultural use or human consumption

Nuclear Power:

- All companies generating 5% or more of their total electricity from nuclear power in a given year
- All companies that have 5% or more of installed capacity attributed to nuclear sources in a given fiscal year
- All companies deriving 15% or more aggregate revenue from nuclear power activities

Fossil Fuel Reserves Ownership:

- All companies with evidence of owning proven & probable coal reserves and/or proven oil and natural gas reserves used for energy purposes, as defined by the methodology of the MSCI Global Ex Fossil Fuels Indexes available at https://www.msci.com/index-methodology

Fossil Fuel Extraction:

- All companies deriving any revenue (either reported or estimated) from thermal coal mining and unconventional oil and gas extraction
  - Thermal Coal Mining: Revenue from the mining of thermal coal (including lignite, bituminous, anthracite and steam coal) and its sale to external parties. It does not cover revenue from metallurgical coal; coal mined for internal power generation (e.g. in the case of vertically integrated power producers); intra-company sales of mined thermal coal; and revenue from coal trading
  - Unconventional Oil & Gas Extraction: Revenue from oil sands, oil shale (kerogen-rich deposits), shale gas, shale oil, coal seam gas, and coal bed methane. It does not cover all types of conventional oil and gas

production including Arctic onshore/offshore, deep water, shallow water and other onshore/offshore.

Thermal Coal Power:

- All companies deriving 5% or more revenue (either reported or estimated) from thermal coal-based power generation.

ESG Controversies:

- All companies having faced very severe controversies pertaining to ESG issues – defined as companies with an ESG Controversy Score of 0.

ESG Rating:

- Securities of companies having an MSCI ESG Rating of “BB”, “B”, “CCC” or unrated.

Appendix III: Issuer Selection Buffer Rule

Assuming 100 issuers must be selected, issuers in the eligible universe ranked at or above 75 will be added to the Index on a priority basis. Buffers are applied between selection ranks 76 and 125. The existing constituents (from previous rebalance) that have a selection rank between 76 and 125 are then successively added until the number of issuers in the Index reaches 100. If the number of issuers is below 100 after this step, the remaining issuers in the eligible universe with the highest selection rank are added until the number of issuers in the Index reaches 100.

Appendix IV: Common Principles in the Calculation of the Hedged Index

1. Closing Spot Rates

For constructing the Hedged Index, MSCI uses the WM/Reuters closing Spot rates (the mid-point of closing bid and ask rates to five decimal places), taken at 4 p.m. UK time in the daily index calculation and also in the determination of the notional amount of currencies to be sold forward on the roll date.

The WM/Reuters closing Spot rates are provided by Refinitiv. MSCI may elect to use alternative sources of exchange rates if the WM/Reuters rates are not available, or if MSCI determines that the WM/Reuters rates may not reflect market conditions.

2. Closing Forward Rates

For constructing the Hedged Index, MSCI uses the bid and ask values of the 1-month WM/Reuters Forward rates published by Refinitiv at 4 p.m. UK time.

3. Missing Spot or Forward Rates

In the case Refinitiv does not provide Spot rates for specific markets on given days (for example, Christmas Day and New Year Day), the Spot rates on the last weekday for which they are available will be used. If a Forward rate is missing, the Forward premium/discount on the last weekday for which it is available is applied to the current day's Spot rate.

4. Currency Crisis

Disruptions in the currency Spot and/or Forward market may potentially result in a currency being excluded from the Hedged Index even though the currency may be still included in the Unhedged Underlying Indexes. In this case, the resulting currency weights may be different from the currency weights in the Unhedged Underlying Indexes.

In such circumstances, MSCI would send an announcement to clients with the related information and with sufficient advance notice. All such determinations are made by the MSCI Fixed Income Index Committee (FIIC).

5. Calculation Time and Frequency

The Hedged Index is calculated after the calculation of the Unhedged Underlying Indexes.

Similar to the Unhedged Underlying Index calculation schedule, the official month-end index levels for the Hedged Index is calculated on the last weekday of the month.

Appendix V: Calculation Examples

1. Calculation Example – Hedged Index Return

We consider a simple example of calculation of a two-currency index hedged to GBP. We describe the hypothetical calculation of the hedged index level for August 31, 2021. The data relevant for this calculation is displayed below.

	(M-2)	(M-1)	(t)
	29-Jul-21	30-Jul-21	31-Aug-21
Proforma EUR Weight (effective 02-Aug-21)	19.61%		
Proforma USD Weight (effective 02-Aug-21)	80.39%		
GBPEUR spot (Mid Quote)	1.1759		1.1659
GBPUSD spot (Mid Quote)	1.3976		1.3763
GBPEUR 1M forward (Ask Quote)		1.1722	
GBPUSD 1M forward (Ask Quote)		1.3906	
GBPEUR odd-days forward			1.1659
GBPUSD odd-days forward			1.3763
Hedged Index Level (GBP)	1016.64	1017.02	
Parent index Level (GBP)		1920.75	1947.63

where

$$\text{GBPEUR spot (Mid Quote)}_{M-2} = \frac{\text{USDEUR spot (Mid Quote)}}{\text{USDGBP spot (Mid Quote)}} = \frac{0.8414}{0.7155} = 1.1759$$

$$\text{GBPUSD spot (Mid Quote)}_{M-2} = \frac{1}{\text{USDGBP spot (Mid Quote)}} = \frac{1}{0.7155} = 1.3976$$

$$\text{GBPEUR 1M forward (Ask Quote)}_{M-1} = \frac{\text{USDEUR 1M forward (Ask Quote)}}{\text{USDGBP 1M forward (Bid Quote)}} = \frac{0.8429}{0.7191}$$
$$= 1.1722$$

$$\text{GBPUSD 1M forward (Ask Quote)}_{M-1} = \frac{1}{\text{USDGBP 1M forward (Bid Quote)}} = \frac{1}{0.7191}$$
$$= 1.3906$$

The Notional Adjustment Factor is 1016.64/1017.02 = 0.9996 and the Hedge Impact is calculated as follows:

$$HI(Aug31) = 0.9996 \times \left[19.61\% \times 1.1759 \times \left(\frac{1}{1.1722} - \frac{1}{1.1659}\right) + 80.39\% \times 1.3976 \times \left(\frac{1}{1.3906} - \frac{1}{1.3763}\right)\right]$$
$$= -0.9454\%$$

The Hedged Index performance (month-to-date) for August 31 is

$$Perf(Aug31) = \frac{1947.63}{1920.75} - 1 + (-0.9454\%) = 0.4541\%$$

Leading to a Hedged Index level of 1017.02 × (1+ 0.4541%) = 1021.63

2. Calculation Example - Interpolated Odd-days Forward Rate

To compute a linear interpolation, the following process is used, using as an example data as of September 16, 2021:

a) Obtain the date of the last weekday of the month, in our example September 30, 2021.

b) Check if today is the last weekday of the month, in which case, the Spot exchange rate is used and there is no need to compute a linear interpolation.

c) Obtain the 1-month Forward rate as of today, i.e. September 16, 2021, for example 1.3773 GBP / USD. This Forward settles in one month.

d) Compute the price difference between the Spot and the 1-month Forward, as of today, September 16, 2021, called the premium (or discount). In this example, the Spot is at 1.3770, so the premium is 0.0003.

e) Using a linear interpolation, compute the value, as of today, September 16, 2021, of a Forward with a duration equal to the number of days until the last weekday of the month. In our example, the last weekday of the month is the 30th, so the duration of the Forward is 30-16 = 14 days.

The value of a 14 day Forward is estimated as the Spot rate plus the discount pro rated for the period. The total number of days taken into account is the number of days in the month, in our example 30, as there are 30 days in September 2021.

Interpolated value of a Forward for 14 days

= 1.3770 + 0.0003 * (14/30)

= 1.3770 + 0.00014

= 1.37714

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