

## **Methodology Book For:**

- **MSCI USD + EUR + GBP IG Corporate Bond ESG Climate Solutions Select Index**
- **MSCI GBP IG Corporate Bond ESG Climate Solutions Select Index**
- **MSCI USD + EUR + GBP IG Corporate Bond Index Hedged to GBP**
- **MSCI USD + EUR + GBP IG Corporate Bond ESG Climate Solutions Select Index Hedged to GBP**

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# 1 Introduction

The MSCI USD + EUR + GBP IG Corporate Bond ESG Climate Solutions Select Index and the MSCI GBP IG Corporate Bond ESG Climate Solutions Select Index (herein, the “MSCI ESG Climate Solutions Select Indexes”) aim to represent the performance of a strategy that seeks systematic integration of environmental, social and governance (ESG) norms and reflects the opportunities and risks associated with the transition to a lower carbon economy in investment grade corporate bonds.

The respective underlying eligible universes of MSCI USD + EUR + GBP IG Corporate Bond Index and MSCI GBP IG Corporate Bond Index (herein, the “Parent Indexes”) are first defined by applying various selection criteria based on security type, credit rating, bond size, maturity and country of domicile.

The MSCI ESG Climate Solutions Select Indexes are constructed from the respective Parent Indexes defined above by first incorporating business involvement exclusion screens based on Controversial Weapons, Nuclear Weapons, Tobacco, Fossil Fuels and ESG Controversy Score. Secondly, an ESG Climate Score is calculated which incorporates an ESG Rating based factor combined with a score based on MSCI Low Carbon Transition<sup>1</sup> (LCT) score and category. Finally, the securities are reweighted by using the ESG Climate Score and an issuer capping of 5% is applied to obtain the final MSCI ESG Climate Solutions Select Indexes.

The MSCI USD + EUR + GBP IG Corporate Bond Index hedged to GBP and the MSCI USD + EUR + GBP IG Corporate Bond ESG Climate Solutions Select Index hedged to GBP (herein, the “Hedged Indexes”) aim to represent the return resulting from hedging the MSCI USD + EUR + GBP IG Corporate Bond Index and the MSCI USD + EUR + GBP IG Corporate Bond ESG Climate Solutions Select Index (herein, the “Unhedged Underlying Indexes”) respectively in the 1-month Forward currency market and contain 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.

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<sup>1</sup> Please refer to Appendix IV: MSCI Low Carbon Transition Risk Assessment

## 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](http://www.msci.com/resources/factsheets/MSCI_ESG_BISR.pdf)

## 2.4 MSCI Climate Change Metrics

MSCI Climate Change Metrics is designed to support investors seeking to achieve a range of objectives, including measuring and reporting on climate risk exposure, implementing low carbon and fossil fuel-free strategies, and factoring climate change research into their risk management processes. It provides Carbon Emissions, Fossil Fuel exposure, environmental impact (i.e., clean technology) data and screens, as well as climate-related risk exposure and management assessment on companies such as Low Carbon Transition scores and categories.

For more details on MSCI Climate Change Metrics, please refer to: <https://www.msci.com/climate-change-solutions>

### 3 Index Construction Methodology

Constructing the MSCI ESG Climate Solutions Select Indexes involves the following steps:

- Defining the Parent Index
- Defining the Screening Criteria
- Determining the Index Weights

#### 3.1 Defining the Parent Index

The Parent Index is constructed from a universe of bonds denominated in USD, EUR and GBP issued by corporates. Index eligible bonds are selected from the corporate bond universe by applying the following criteria<sup>2</sup>.

Eligible Security types:

Eligible Security Types	Ineligible Security Types
<b>Corporate Debt only<sup>3</sup></b>	Floating Rate Coupon Bonds
<b>Senior and Subordinated Issues</b>	Zero Coupon Bonds
<b>Puttable and Callable Bonds</b>	Inflation Protected Bonds
<b>Bullet Bonds</b>	Perpetual Bonds
<b>Bonds with Step-up / Step-down Coupons</b>	Bonds with sinking fund provision
<b>144a bonds</b>	RegS bonds
<b>Fixed to Floating Rate Bonds are eligible for inclusion during their fixed rate term only. They are excluded 1 year prior to the conversion date as measured from the Rebalancing Date.</b>	Private Placements
	Dual Currency
	Strips (IO/PO)
	PIKs and Hybrids <sup>4</sup>

<sup>2</sup> MSCI leverages the GICS® sector classification framework for construction of the respective Parent Indexes of the MSCI ESG Climate Solutions Select Indexes and. Please refer to MSCI GICS Methodology for details. The GICS methodology is available at: <https://www.msci.com/gics>

<sup>3</sup> Corporate issuers classified as government owned as per MSCI data vendors are excluded from the index. Each corporate issuer eligible for index inclusion will have a GICS code assigned to it.

<sup>4</sup> Equity linked hybrid bonds are ineligible (e.g. - convertible bonds, warrants, preferred shares etc.)

**Credit Rating:** Eligible index constituents must be rated by either by S&P or Moody's. For bonds that are rated by both S&P and Moody's, the lower rating will be used to determine the index inclusion criteria. The Parent Index only considers investment grade (IG) bonds as eligible for inclusion.

**Size:** At rebalancing, eligible index constituents must have notional amount outstanding greater than or equal to the thresholds tabulated below.

Currency	MSCI USD + EUR + GBP IG CORPORATE BOND SELECT INDEX	MSCI GBP IG CORPORATE BOND SELECT INDEX
USD	USD 300 million	-
EUR	EUR 300 million	-
GBP	GBP 200 million	GBP 200 million

**Issuer Country of Domicile:** Eligible index constituents must belong to issuers that are domiciled in countries listed in Appendix I

**Maturity:** Eligible index constituents must have maturity greater than or equal to 1 year as measured from the Rebalancing Date. New additions to the index must have a maturity greater than or equal to 1 ½ years as measured from the effective date of rebalancing.

**Corporate Event:** Eligible index constituents must not have any known corporate events which will result in notional amount outstanding of the bond falling below the minimum bond size criteria over the next 1 month as measured from the rebalancing Date.



## 3.2 Defining the ESG Climate Solutions Select Index

The MSCI ESG Climate Solutions Select Index (herein, “the Index”) is constructed by applying the following steps on the universe defined by the Parent Index –

- Defining the ESG Screening Criteria
- Defining the Custom ESG Climate Score
- Determining the Index Weights by tilting using Custom ESG Climate Score
- Applying an Issuer Capping at 5%

### 3.2.1 Defining the ESG Screening Criteria

The eligible universe is constructed by excluding securities based on the following criteria. MSCI applies these exclusions based on the data provided by MSCI ESG Research at the time of index rebalancing.

#### Unrated Companies

- Missing Controversy Score – Companies not assessed by MSCI ESG Research on MSCI ESG Controversies.
- Missing ESG Rating – Companies not rated by MSCI ESG Research for an ESG assessment.
- Missing Low Carbon Transition (LCT) Category/Score – Companies not rated by MSCI ESG Research for Low Carbon Transition Assessment.

#### Companies having faced very severe ESG controversies

- Companies having faced very severe controversies pertaining to ESG issues in the last three years– Defined as companies with an ESG Controversy Score of 0.

#### Companies involved in controversial weapons businesses

- Companies involved in Controversial Weapons (i.e., cluster munitions, landmines, depleted uranium weapons, biological/chemical weapons, blinding lasers, non-detectable fragments, and incendiary weapons). For more details on the controversial weapons exclusion, please refer to Appendix II.

#### Companies involved in nuclear weapons businesses

- Companies involved in Nuclear Weapons businesses. For more details on the nuclear weapons exclusion, please refer to Appendix III.

#### Companies involved in tobacco business

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

#### Companies involved in Fossil-Fuel based businesses

- Companies deriving 5% or more revenue (either reported or estimated) from the thermal coal-based power generation.
- Companies deriving 5% or more aggregated revenue (either reported or estimated) from the mining of thermal coal (including lignite, bituminous, anthracite and steam coal) and its sale to external parties or from unconventional oil and gas involvement, which includes revenues from oil sands, oil shale (kerogen-rich deposits), shale gas, shale oil, coal seam gas, and coal bed methane.

Securities from issuers that become eligible for index inclusion owing to change in ESG data will only be included in the index if they have greater than 1 ½ years to mature.

### 3.2.2 Defining the Custom ESG Climate Score

#### ESG Rating Score

Using the MSCI ESG Rating, companies are grouped to assign an ESG Rating score to each security in the eligible universe as illustrated in the table below –

Rating Group	ESG Rating	ESG Category	USD + EUR + GBP IG Corporate Bond ESG Climate Solutions Select Index	GBP IG Corporate Bond ESG Climate Solutions Select Index
1	AAA	Leaders	1.25	2
2	AA		1.25	2
3	A	Neutral	1	1
4	BBB		1	1
5	BB		1	1
6	B	Laggards	0.75	0.5
7	CCC		0.75	0.5

## Low Carbon Transition (LCT) Category Tilt Score

Using the MSCI LCT Category, companies are grouped to assign a Category Tilt Score to each security in the eligible universe as illustrated in the table below –

LCT Category	USD + EUR + GBP IG Corporate Bond ESG Climate Solutions Select Index	GBP IG Corporate Bond ESG Climate Solutions Select Index
<b>Solutions</b>	3	2
<b>Neutral</b>	1	1
<b>Operational Transition</b>	0.75	0.667
<b>Product Transition</b>	0.30	0.333
<b>Asset Stranding</b>	0.15	0.167

## Relative Tilt Score

Using the MSCI LCT Score the ‘Relative Tilt Score’ is calculated. It differentiates securities within a LCT Category as companies with higher LCT Score are determined by MSCI ESG Research to be relatively better at managing their climate related risk compared to their peers with worse LCT Score.

The Relative Tilt Score is calculated by normalizing security level LCT score relative to the maximum<sup>5</sup> LCT Score of the LCT Category within the Parent Index. The ‘Relative Tilt Score’ is floored at 0.5 to balance its effect on the final weight of index constituents.

$$Relative\ Tilt\ Score = \frac{LCT\ Score}{Maximum^4\ LCT\ Score\ in\ LCT\ Category}$$

## Combined Score

Custom ESG Climate Score = ESG Rating Score \* LCT Category Tilt Score \* Relative Tilt Score

<sup>5</sup> To account for potential outliers within each LCT Category, the category maximum LCT Score is calculated after winsorizing the security level LCT Score at 90<sup>th</sup> percentile of the LCT Category.

### 3.2.3 Determining the Index Weights

At each rebalancing, all the securities from the eligible universe are weighted by the product of their market value weight in the Parent Index and the Custom ESG Climate Score.

Security Weight = Custom ESG Climate Score \* Market Value Weight in Parent Index

The above weights are then re-normalized to 100%.

Additionally, constituent weights are capped at 5% at the issuer level to mitigate concentration risk.

Note that the capping of the issuer weight is done for the pro forma index as of the effective date, based on the closing prices as of the index review announcement date. In cases where the issuer weight breaches the cap because of market price movements or corporate events between the announcement date and the effective date, then the capping is not applied again. Similarly, even if any issuer weight breaches the cap because of market price movements or corporate events between the two monthly reviews, no capping is reapplied.

## 4 Index Rebalancing & Maintenance

### 4.1 Monthly Index Reviews

The Index is rebalanced monthly, coinciding with the monthly index rebalancing of the Parent Index. The pro-forma index is in general announced three business days before the effective date of rebalancing (first business day of the month).

In general, MSCI uses the latest available MSCI ESG Research data (including MSCI ESG Ratings, MSCI ESG Controversies Scores, MSCI Climate Change Metrics and MSCI Business Involvement Screening Research) for the rebalancing of the MSCI Corporate Bond ESG Climate Solutions Select Index.

Any inclusion or exclusion criteria satisfied for a given security in the universe, after the cut-off date (T-3), 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 effective date of rebalancing. 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.

For further information on index total return calculation and corporate events handling please refer to the MSCI Fixed Income Index Calculation Methodology<sup>6</sup>. For the holiday calendar used in the index, please refer to the MSCI Fixed Income Data Methodology<sup>7</sup>.

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<sup>6</sup> Refer to the MSCI Fixed Income Index Calculation Methodology for detail. Available at <https://www.msci.com/index-methodology>

<sup>7</sup> Refer to the MSCI Fixed Income Data Methodology for detail. Available at <https://www.msci.com/index-methodology>

## 5 Hedged Index Construction Methodology

The Hedged Indexes are 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 Indexes hedge 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<sup>8</sup> 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.

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<sup>8</sup> The treatment of missing spot and forward rates on any weekday is defined in Section 5.1.3

## 5.1 Common Principles in the Calculation of the Hedged Indexes

### 5.1.1 Closing Spot Rates

For constructing the Hedged Indexes, 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.

### 5.1.2 Closing Forward Rates

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

### 5.1.3 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.

### 5.1.4 Currency Crisis

Disruptions in the currency Spot and/or Forward market may potentially result in a currency being excluded from the Hedged Indexes 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).

### 5.1.5 Calculation Time and Frequency

The Hedged Indexes are 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 Indexes are calculated on the last weekday of the month.

## 5.2 Constructing the Hedged Indexes

Constructing the Hedged Indexes 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

### 5.2.1 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 Indexes the home currency is the GBP.

### 5.2.2 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 Indexes.

### 5.2.3 Identifying the Weight for Each Currency to be Sold in the Index

In the Hedged Indexes, 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.

### 5.2.4 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 details in section 5.3.



## 5.3 Hedged Index Calculation Formula

### 5.3.1 Calculation Formula

There are two components to the Hedged Index return:

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
$FFRate_{i,M-1}$	= 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 5.5.1.

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

### 5.3.2 Calculation Example

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

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

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

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

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

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

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

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

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

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

## 5.4 Calculation of Daily Returns

### 5.4.1 Marking to Market the Forward Contracts on a Daily Basis

The daily calculation of Hedged Indexes 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.  $30 - 8 = 22$ ).

### 5.4.2 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 Indexes, 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.

## 5.5 Odd-Days Forwards Calculation Using a Linear Interpolation

### 5.5.1 Calculation Formula

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

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

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  $t$ )

### 5.5.2 Calculation Example

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

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

$$= 1.3770 + 0.0003 * (14/30)$$

$$= 1.3770 + 0.00014$$

$$= 1.37714$$

## 6 Maintaining the Hedged Indexes

The Hedged Indexes are 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 Indexes 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: List of Eligible Countries

<b>Australia</b>	Japan
<b>Austria</b>	Luxembourg
<b>Belgium</b>	Netherlands
<b>Canada</b>	New Zealand
<b>Denmark</b>	Norway
<b>Finland</b>	Portugal
<b>France</b>	Singapore
<b>Germany</b>	Spain
<b>Hong Kong</b>	Sweden
<b>Ireland</b>	Switzerland
<b>Israel</b>	United Kingdom
<b>Italy</b>	United States of America
<b>Cayman Islands</b>	British Virgin Islands
<b>Isle of Man</b>	Guernsey
<b>Jersey</b>	Gibraltar
<b>Faroe Islands</b>	

## Appendix II: Companies Involved in Controversial Weapons Business

Companies which meet the following Controversial Weapons criteria are excluded from the Index

- 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



## Appendix III: Companies Involved in Nuclear Weapons Business

- Nuclear Warheads & Missiles

MSCI ESG Research identifies issuers involved in the manufacturing of nuclear warheads and/or whole nuclear missiles

- Nuclear Weapons Support Services

MSCI ESG Research identifies issuers that provide auxiliary services related to nuclear weapons, such as repairing and maintaining nuclear weapons, providing overhaul and upgrade services (including engineering), stockpiling and stewardship, R&D work, testing and simulations, etc.

- Nuclear Exclusive Delivery Platforms

MSCI ESG Research identifies issuers that manufacture or assemble delivery platforms that were developed or significantly modified for the exclusive delivery of nuclear weapons.

- Components of Nuclear Exclusive Delivery Platforms

MSCI ESG Research identifies issuers that manufacture components for nuclear-exclusive delivery platforms.

- Nuclear Intended-Use Components

MSCI ESG Research identifies issuers manufacture components that were developed or are significantly modified for exclusive use in nuclear weapons (warheads and missiles).

- Nuclear Dual-Use Delivery Platforms

MSCI ESG Research identifies issuers manufacture or assemble delivery platforms that were not developed or not significantly modified for the exclusive delivery of nuclear weapons i.e., these platforms can deliver conventional weapons.

- Nuclear Dual-Use Components

MSCI ESG Research identifies issuers manufacture components that were not developed or not significantly modified for exclusive use in nuclear weapons (warheads and missiles) i.e., these components can be used in both nuclear and conventional weapons.

## Appendix IV: MSCI Low Carbon Transition Risk Assessment

MSCI ESG Research's Low Carbon Transition Risk assessment<sup>9</sup> is designed to identify potential leaders and laggards by holistically measuring companies' exposure to and management of risks and opportunities related to the low carbon transition.

The final output of this assessment is two company-level factors as described below:

- (1) **Low Carbon Transition Category:** This factor groups companies in five categories that highlight the predominant risks and opportunities they are most likely to face in the transition (Exhibit 1).
- (2) **Low Carbon Transition Score:** This score is based on a multi-dimensional risks and opportunities assessment and considers both predominant and secondary risks a company faces. It is industry agnostic and represents an absolute assessment of a company's position vis-à-vis the transition.

LOW CARBON TRANSITION SCORE	LOW CARBON TRANSITION CATEGORY		LOW CARBON TRANSITION RISK / OPPORTUNITY	
Score = 0	ASSET STRANDING		Potential to experience “stranding” of physical / natural assets due to regulatory, market, or technological forces arising from low carbon transition.	Coal mining & coal based power generation; Oil sands exploration/production
	TRANSITION	PRODUCT	Reduced demand for carbon-intensive products and services. Leaders and laggards are defined by the ability to shift product portfolio to low-carbon products.	Oil & gas exploration & production; Petrol/diesel based automobile manufacturers, thermal power plant turbine manufacturers etc.
		OPERATIONAL	Increased operational and/or capital cost due to carbon taxes and/or investment in carbon emission mitigation measures leading to lower profitability of the companies.	Fossil fuel based power generation, cement, steel etc.
	NEUTRAL		Limited exposure to low carbon transition carbon risk. Though companies in this category could have exposure to physical risk and/or indirect exposure to low carbon transition risk via lending, investment etc.	Consumer staples, healthcare, etc.
	SOLUTIONS		Potential to benefit through the growth of low-carbon products and services.	Renewable electricity, electric vehicles, solar cell manufacturers etc.
Score = 10				

### Exhibit 1: Low Carbon Transition Categories and Scores

<sup>9</sup> For more details on MSCI Climate Change Metrics, please refer to <https://www.msci.com/climate-change-solutions>

## Calculation methodology

The Low Carbon Transition Categories and Scores are determined by a combination of each company's current risk exposure and its efforts to manage the risks and opportunities presented by the low carbon transition. The 3-step process followed by MSCI ESG Research is explained below.

### Step 1: Measure Low Carbon Transition Risk Exposure

The first step towards measuring the Low Carbon Transition Risk Exposure for a company is the computation of its Carbon Intensity profile – which is informed by its Product Carbon Intensity, Operational Carbon Intensity and Total Carbon Intensity. In the next step, we compute Low Carbon Transition Risk Exposure Category and Score based on Total Carbon Intensity.

### Step 2: Assess Low Carbon Transition Risk Management

In the second step, we assess a company's management of risks and opportunities presented by the low carbon transition. This assessment is based on policies and commitments to mitigate transition risk, governance structures, risk management programs and initiatives, targets and performance, and involvement in any controversies.

### Step 3: Calculate Low Carbon Transition Category and Score

In the final step, the Low Carbon Transition Risk Exposure Category and Score that was calculated in Step 1 are adjusted for the strength of management efforts. Following this adjustment, Low Carbon Transition Risk Exposure Score of companies with top or second quartile risk management improves and some top and second quartile companies may move up one category.

**THE FOLLOWING SECTIONS HAVE BEEN MODIFIED SINCE JANUARY 2022:**

- Section 1 has been updated and Sections 5, 6 have been added to reflect the hedged index construction methodology

## Contact us

clientservice@msci.com

### AMERICAS

Americas	1 888 588 4567 *
Atlanta	+ 1 404 551 3212
Boston	+ 1 617 532 0920
Chicago	+ 1 312 675 0545
Monterrey	+ 52 81 1253 4020
New York	+ 1 212 804 3901
San Francisco	+ 1 415 836 8800
São Paulo	+ 55 11 3706 1360
Toronto	+ 1 416 628 1007

### EUROPE, MIDDLE EAST & AFRICA

Cape Town	+ 27 21 673 0100
Frankfurt	+ 49 69 133 859 00
Geneva	+ 41 22 817 9777
London	+ 44 20 7618 2222
Milan	+ 39 02 5849 0415
Paris	0800 91 59 17 *

### ASIA PACIFIC

China North	10800 852 1032 *
China South	10800 152 1032 *
Hong Kong	+ 852 2844 9333
Mumbai	+ 91 22 6784 9160
Seoul	00798 8521 3392 *
Singapore	800 852 3749 *
Sydney	+ 61 2 9033 9333
Taipei	008 0112 7513 *
Thailand	0018 0015 6207 7181 *
Tokyo	+ 81 3 5290 1555

\* = toll free

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