

Currency Hedging Methodology

v1.0

This document applies to any index series where the guide is specifically referenced in the index methodology documents.

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Section 1

Introduction

1. Introduction

- 1.1 This document sets out the currency hedging methodology applied to FTSE Russell indices calculated by FTSE International Limited (FTSE). The currency hedging methodologies included in this document are designed to reflect the performance of index constituent companies by reducing the impact of foreign-exchange rate movements on index returns.
- 1.2 These Ground Rules should be read in conjunction with the Ground Rules for the construction and management of the underlying indices used as a basis for the currency hedged indices, which are available from FTSE Russell. This includes (although not limited to) the FTSE Global Equity Index Series, Russell US Indexes, FTSE UK Index Series, FTSE EPRA Nareit Real Estate Index Series.

A list of indices which use the currency hedging methodology can be found using the following link:

[FTSE Russell Currency Hedged Indices List](#)

1.3 FTSE Russell

- 1.3.1 FTSE Russell hereby notifies users of the index series that it is possible that circumstances, including external events beyond the control of FTSE Russell, may necessitate changes to, or the cessation, of the index series and therefore, any financial contracts or other financial instruments that reference the index series should be able to withstand, or otherwise address the possibility of changes to, or cessation of, the index series.
- 1.3.2 Index users who choose to follow this index series or to buy products that claim to follow this index series should assess the merits of the index's rules-based methodology and take independent investment advice before investing their own or client funds. No liability whether as a result of negligence or otherwise is accepted by FTSE Russell for any losses, damages, claims and expenses suffered by any person as a result of:
- any reliance on these Ground Rules, and/or
 - any inaccuracies in these Ground Rules, and/or
 - any non-application or misapplication of the policies or procedures described in these Ground Rules, and/or
 - any inaccuracies in the compilation of the index or any constituent data.

Section 2

FTSE Russell index policies

2. FTSE Russell index policies

This document should be read in conjunction with the following policy documents which can be accessed using the links below:

2.1 FTSE Global Equity Index Guide to Calculation Methods

The aim of the guide is to describe how the underlying unhedged indices are calculated, to facilitate users replication of the indices in order to support their investment and trading activities and to assist users in understanding the factors which influence the performance of the indices.

[FTSE_Global_Equity_Index_Series_Guide_to_Calc.pdf](#)

2.2 Corporate Actions and Events Guides

2.2.1 Full details of changes to constituent companies due to corporate actions and events can be accessed in the corporate actions and events guides using the following links:

[Corporate Actions and Events Guide.pdf](#)

[Corporate Actions and Events Guide for Non Market Cap Weighted Indices.pdf](#)

2.3 Statement of Principles for FTSE Russell Equity Indices (the Statement of Principles)

Indexes need to keep abreast of changing markets and the Ground Rules cannot anticipate every eventuality. Where the Rules do not fully cover a specific event or development, FTSE Russell will determine the appropriate treatment by reference to the statement of principles which summarises the ethos underlying FTSE Russell's approach to index construction. The Statement of Principles is reviewed annually and any changes proposed by FTSE Russell are presented to the FTSE Russell Policy Advisory Board for discussion before approval by FTSE Russell's Index Governance Board.

The statement of principles can be accessed using the following link:

[Statement of Principles.pdf](#)

2.4 Queries, Complaints and Appeals

A constituent or prospective constituent company (or professional advisor acting on behalf of the company), a national organisation or a group of no fewer than ten users of the Indexes from different organisations acting in their professional capacity may appeal against decisions taken by FTSE Russell.

FTSE Russell's complaints procedure can be accessed using the following link:

[Benchmark Determination Complaints Handling Policy.pdf](#)

FTSE Russell's appeal process can be accessed using the following link:

[Appeals Against Decisions.pdf](#)

2.5 Index Policy for Trading Halts and Market Closures

- 2.5.1 Guidance for the treatment of index changes in the event of trading halts or market closures can be found using the following link:

[Index Policy for Trading Halts and Market Closures.pdf](#)

2.6 Index Policy in the Event Clients are Unable to Trade a Market or a Security

- 2.6.1 Details of FTSE Russell's treatment can be accessed using the following link:

[Index Policy in the Event Clients are Unable to Trade a Market or a Security.pdf](#)

2.7 Recalculation Policy and Guidelines

- 2.7.1 The FTSE Russell Currency Hedged Indices are recalculated whenever inaccuracies occur that are deemed to be significant. Users of the FTSE Russell Currency Hedged Indices are notified through appropriate media.

For further information refer to the FTSE Russell recalculation policy and guidelines document which is available from the FTSE Russell website using the link below or by contacting info@ftserussell.com.

[Recalculation Policy and Guidelines Equity Indices.pdf](#)

2.8 Policy for Benchmark Methodology Changes

- 2.8.1 Details of FTSE Russell's policy for making benchmark methodology changes can be accessed using the following link:

[Policy for Benchmark Methodology Changes.pdf](#)

2.9 FTSE Russell Governance Framework

- 2.9.1 To oversee its indices, FTSE Russell employs a governance framework that encompasses product, service and technology governance. The framework incorporates the London Stock Exchange Group's three lines of defence risk management framework and is designed to ensure compliance with the IOSCO Principles for Financial Benchmarks¹ and the European benchmark regulation². The FTSE Russell Governance Framework can be accessed using the following link:

[FTSE Russell Governance Framework.pdf](#)

2.10 Real Time Status Definitions

- 2.10.1 For indices that are calculated in real time, please refer to the following guide for details of real time status definitions:

[Real Time Status Definitions.pdf](#)

¹ IOSCO Principles for Financial Benchmarks Final Report, FR07/13 July 2013.

² Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds.

Section 3

Eligible securities

3. Eligible securities

- 3.1 The eligible securities of each FTSE Russell Currency Hedged index are the underlying constituents of indices defined by their respective Ground Rules, which are available from FTSE Russell. This includes (although not limited to) the FTSE Global Equity Index Series, Russell US Indexes, FTSE UK Index Series, FTSE EPRA Nareit Real Estate Index Series.

Section 4

Currency hedging methodologies

4. Currency hedging methodologies

4.1 Introduction

4.1.1 FTSE Russell calculates three currency hedging methodologies:

- FTSE monthly currency hedged indices – used mainly for FTSE currency hedged indices this methodology is less complex than alternative approaches, and marks forward rates to market on a daily basis using linear interpolation.
- FTSE Russell monthly currency hedged indices – used for the majority of Russell US indices and certain FTSE indices this enhanced methodology improves the ability for users to replicate the currency hedging calculation.
- FTSE Russell daily currency hedged indices – takes many features from the FTSE Russell monthly currency hedging methodology and applies it to daily currency hedging.

4.1.2 The currency hedged indices are calculated on a daily basis in line with the calendar of their underlying Index Series.

4.2 Currency data

4.2.1 The following WM Refinitiv 16:00 UK time service mid-rates will be used as part of the index calculation:

- spot rates;
- forward rates; and
- non-deliverable forward rates used in the FTSE Russell monthly currency hedged indices.

4.2.2 The following WMR hourly spot and non-deliverable forward rates will be used as part of the monthly roll process for the FTSE Russell monthly currency hedged indices:

Currency	Currency code	Fixing time (local time)	Fixing time (GMT)
Chinese Renminbi	CNY	11:00	03:00 (GMT +8 hrs)
Indonesia Rupiah	IDR	10:00	03:00 (GMT +7 hrs)
India Rupee	INR	13:30	08:00 (GMT +5.5 hrs)
South Korea Won	KRW	15:00	06:00 (GMT +9 hrs)
Malaysia Ringgit	MYR	15:00	07:00 (GMT +8 hrs)
Philippines Peso	PHP	11:00	03:00 (GMT +8 hrs)
Taiwan Dollar	TWD	11:00	03:00 (GMT +8 hrs)

- 4.2.3 Where rates are not published by WMR, the previous day's rates will be used in the index calculation. In the event of either the spot or forward rates being unavailable, both spot and forward rates of the previous day will be used.
- 4.2.4 The currency hedged index will be calculated at the end of each working day and follow the underlying unhedged index holiday calendar. The rebalance day of the monthly hedged index is selected as the common business day, based on WMR and the underlying index holiday calendar.
- 4.2.5 Availability of currency data due to an extraordinary market event
- 4.2.5.1 If an extraordinary market event occurs that causes WMR not to provide the relevant currency values used as part of the index calculation, based on market information FTSE Russell may suspend the hedging of the respective currency. Suspending the currency forward or NDF rate will change the way the forward/NDF rate is used in the index calculation.
- 4.2.5.2 The index calculation will adjust for the suspension depending on whether it is a rebalance date or not. When a currency forward or NDF rate is suspended from trading prior to a rebalance date, the index will continue to calculate until the rebalance date using the last available currency forward or NDF rate (at the suspension date) along with its associated spot price on that date. If the suspension remains or occurs at a rebalance date, then the currency will not be hedged.
- 4.2.5.3 If currency data becomes available from WMR following its suspension, FTSE Russell will use this data in the index calculation at the next rebalance date provided sufficient information is available that will ensure its continued supply.
- 4.2.5.3.1 Where a currency forward or NDF rate is suspended and WMR confirm that it will no longer be published, the currency will be unhedged in the index calculation.
- 4.2.5.4 If a currency is not suspended and data is not provided by WMR, the currency hedging calculation will use the previous day's spot and forward until both rates are available until the next rebalance. In the case of NDFs, the previous day's spot week or NDF rates will be used in pairs as well. Where no currency information is provided by WMR at the rebalance, the currency will not be hedged and where applicable the index may be discontinued.

4.3 FTSE monthly currency hedged indices

- 4.3.1 The FTSE monthly currency hedged methodology is mainly used for FTSE currency hedged indices and is calculated in two stages.

4.3.2 Calculation formula

The currency hedged index is calculated as a combination of the performance from the unhedged index performance and the impact of hedging:

$$HI_t = HI_{t-x} \times \left(\frac{UI_t}{UI_{t-x}} + IH_t \right) \quad (E.1)$$

Where:

- HI_t = Hedged index at the close of the value date t
- HI_{t-x} = Hedged index at the close of the previous hedging date
- UI_t = Unhedged index at the close of the value date t
- UI_{t-x} = Unhedged index at the close of the previous hedging date
- IH_t = Impact of hedging, which is defined as follows:

$$IH_t = \frac{\sum_{i=1}^n \{Mcap_{i,t-x} \times CIH_{i,t} \times HF_{i,t}\}}{\sum_{i=1}^n \{Mcap_{i,t-x}\}} \quad (E.2)$$

The impact of hedging weights each country currency by market capitalisation and calculates the hedged gain or loss at the current calculation date.

Where:

- $Mcap_{i,t-x}$ = Notional amount to hedge for each country currency i at the close of the previous hedging date.
- n = Number of currencies to hedge in the index
- HF_i = Hedging factor (0 or greater) – this is the proportion of the currency i to be hedged. Note that for FTSE's standard currency hedged indices the HF will be 1
- $CIH_{i,t}$ = Currency impact of hedge for currency i between the previous hedge date ($t-x$) and the value date t , which is defined as follows:

$$CIH_{i,t} = \frac{S_{i,t-x}}{FIR_{i,t}} - \frac{S_{i,t}}{S_{i,t-x}} \quad (E.3)$$

Where forward rates are not available at the rebalance day, the currency will not be hedged and the $CIH_{i,t} = 0$.

Where:

- $S_{i,t}$ = Spot exchange rate into the base currency at the close of the value date t
- $S_{i,t-x}$ = Spot exchange rate into the base currency at the close of the previous hedging date
- $FIR_{i,t}$ = Forward interpolated rate into the base currency for currency i , which is defined as follows

$$FIR_{i,t} = F_{i,t-x} + \left(\frac{(S_{i,t-x} - F_{i,t-x})(N_{d-t})}{N_d} \right) \quad (E.4)$$

Forward interpolated rates are calculated by taking the spot/forward discount/premium at the beginning of the contract period and then discounting this over the life of the contract.

Where:

- $F_{i,t-x}$ = One month forward/NDF rate at the close of the previous hedging date
- N_{d-t} = Number of days left of forward contract
- N_d = Number of days of forward contract using calendar days, i.e. January will have 31 days

4.3.3 Determination of notional values to hedge at rebalance day

For the FTSE monthly currency hedged Indices, each underlying country constituent is treated as having the same currency as its domestic index. For example, in the calculation a country that consists of constituents with multiple currencies will convert the constituent currencies into a common currency when determining the country (currency) weight to hedge. Index constituent prices, shares in issue and investability weights at the close of business on the last working day (Monday to Friday) of the previous calendar month is used.

Example

On 16th March 2026: to value a EUR/GBP one month forward (initiated on 27th February 2026). The next hedging date is 31 March 2026. Firstly, the spot and standard one-month tenor forward rate as of the previous hedging date are obtained:

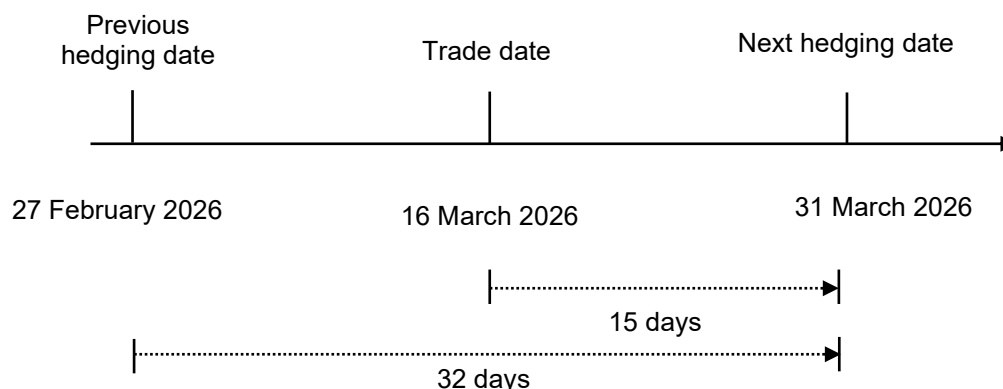
$$S_{Feb\ 27} = 0.878203$$

$$F_{Feb\ 27} = 0.879593$$

The number of calendar days between the previous hedging date and the next hedging date are counted, which is 32 days as shown in the chart one. Next the number of days left until the next hedging date is counted. In this example the answer is 15 days. Lastly, a linear interpolation is used to calculate the 15-day forward rate:

$$FIR_{Mar\ 16} = 0.879593 + \frac{(0.878203 - 0.879593) * 15}{32} = 0.878941$$

Chart one: timeline for calculating the number of days as part of the FIR



4.3.4 Hedged index level calculation example

We then calculate the currency impact of hedging for GBP on this date by using the FIR calculated as above and the spot rate on 16th March 2026 as inputs to E.3:

$$S_{Mar\ 16} = 0.863436$$

$$CIH_{Mar\ 16} = \frac{0.878203}{0.878941} - \frac{0.878203}{0.863436} = -0.017942$$

First, taking the notional amounts for USD, CAD, GBP and KRW in the FTSE Developed Index at the previous hedging date (27th February 2026), along with the currency impact of hedging for these currencies and assuming a hedging factor of 1 for these currencies and 0 for the remaining currencies, we can calculate the weighted sum of CIH and see how the hedged index level is adjusted when hedging to EUR:

Currency	Notional (EURbn)	Weight (%)	CIH (%)	Hedging Factor	Absolute hedge performance (EURbn)
CAD	2,553.296	0.034	-2.474	1	-63.169
GBP	2,946.466	0.040	-1.794	1	-52.860
KRW	1,858.937	0.025	1.200	1	22.307
USD	49,766.248	0.668	-2.893	1	-1,439.738

The sum of the FTSE Developed Index market caps in the base currency at the previous hedging date is EUR 74,490.331 billion, leading to an Impact of Hedging from these select 4 currencies of:

$$IH_{\text{Mar } 16} = \frac{-63.169 - 52.860 + 22.307 - 1439.738}{74,490.331} = -0.020586$$

Finally, we can calculate the hedged capital index level based on E.1:

$$UI_{\text{Mar } 16} = 594.283$$

$$UI_{\text{Feb } 27} = 605.279$$

$$HI_{\text{Feb } 27} = 101.360$$

$$HI_{\text{Mar } 16} = 101.360 \times \left(\frac{594.283}{605.279} - 0.020586 \right) = 97.432$$

4.4 FTSE Russell monthly currency hedged indices

4.4.1 The FTSE Russell monthly currency hedged indices are used for the majority of Russell US indices and certain FTSE indices. The calculation differs from the FTSE monthly currency hedged indices by providing the following enhancements:

- a) Rolling of the forward contracts uses currency weights (adjusted for corporate events) from one day prior to each rebalance day. For example, on 30 April 2026, FTSE Russell determine the currency weights to hedge based on the equity index close as of 29 April 2026 but adjust the weights for corporate events and constituent changes after the close of business on 30 April 2026. The purpose of doing this is to avoid having to wait until the equity markets close to trade the currencies and thus improve tradability and reduce operational costs. The mismatch this causes regarding the monthly roll is adjusted in the index performance calculation.
- b) Currency quotations of stocks within the country are used when determining the currency weights. For example, a Singapore-traded stock quoted in USD will be attributed to USD exposure rather than SGD exposure in the currency hedging calculation.
- c) Global depositary receipts (GDRs) are included based on the currency quotation of the underlying security when determining the notional currency amounts.
- d) FTSE Russell will use one-month forward rates to calculate odd-day forward contracts when valuing the hedge between rebalances to interpolate the relevant amount.
- e) Currency settlement dates are taken into account when valuing the forward contracts.
- f) Where applicable, non-deliverable forwards (NDFs) based on WMR 16:00 UK time service are used to value the forward positions intra rebalance. Furthermore, one week and one-month forwards are used to derive the forward points to avoid the mismatch of the spot and NDF rates. For example, the KRW spot rate in the WMR service stays unchanged after the local close around 12:00pm London time, whereas the KRW 1M NDF rate changes even after the local close. So there exists a mismatch between the spot and 1M NDF at the 16:00 fixing. To eliminate the mismatch, spot week (SW) (one week forward) and 1M NDF are used when calculating the forward points.
- g) Non-deliverable forwards (NDFs) using local market hours WMR rates are used to roll the forward positions at the rebalance.

4.4.2 Calculation formula

The currency hedged index is calculated as a combination of the performance from the unhedged index performance and the impact of hedging:

$$HI_t = HI_{t-x} \times \frac{UI_t}{UI_{t-x}} + HI_{t-x-1} \times IH_t \quad (E.5)$$

Where:

- | | | |
|--------------|---|--|
| HI_t | = | Hedged index at the close of the value date t |
| HI_{t-x} | = | Hedged index at the close of the previous hedging date |
| HI_{t-x-1} | = | Hedged index one business day prior to the previous hedging date |
| UI_t | = | Unhedged index at the close of the value date t |
| UI_{t-x} | = | Unhedged index at the close of the previous hedging date |
| IH_t | = | Impact of hedging, which is defined as follows: |

$$IH_t = \frac{\sum_{i=1}^n \{Mcap_{i,t-x-1} \times CIH_{i,t} \times HF_{i,t}\}}{\sum_{i=1}^n \{Mcap_{i,t-x-1}\}} \quad (E.6)$$

Where:

- $Mcap_{i,t-x-1}$ = Notional amount to hedge for currency i as of one business day prior to the previous hedging date. A more detailed definition is provided in rule 4.4.4
- n = Number of currencies to hedge in the index
- $HF_{i,t}$ = Hedging factor (0 or greater) – this is the proportion of the currency i to be hedged. Note that for FTSE Russell's standard currency hedged indices the HF will be 1
- $CIH_{i,t}$ = Currency impact of hedge for currency i between the previous hedge date ($t-x$) and the value date t , which is defined as follows:

$$CIH_{i,t} = \frac{S_{i,t-x-1}}{F_{i,t-x}} - \frac{S_{i,t-x-1}}{FIR_{i,t}} \quad (E.7)$$

Where:

- $S_{i,t-x-1}$ = Spot exchange rate into the base currency at the close one business day prior to the previous hedging date
- $F_{i,t-x}$ = One month forward/NDF rate at the close of the previous hedging date
- $FIR_{i,t}$ = Forward interpolated rate into the base currency for currency i . A more detailed calculation of this odd day forward is provided in rule 4.5.5

Where forward/NDF rates are not available at the rebalance day, the currency will not be hedged and the $CIH_{i,t} = 0$.

4.4.3 Treatment of currency settlements

4.4.3.1 Rules to determine the spot value date

For USD-based currency pairs, a preliminary spot value date is first selected by adding the number of settlement convention days to the trade date, following the quoted currency's holiday calendar. If the preliminary spot value date is a non-business day according to the USD holiday calendar, then the spot value date is the first good business day on both the quoted currency and the USD calendar following the preliminary spot value date. The one-month maturity date is selected by adding one calendar month to the spot value date.

For non-USD based cross pairs, all three currency calendars (quoted currency, base currency and USD) are taken into account. Firstly, a preliminary spot value date is picked from the latter of the quoted/USD and base/USD. Then the spot value date is the first business day of the quoted currency, base currency and USD calendars following the preliminary spot value date.

4.4.3.2 Rules to determine the maturity date of a one-month contract

If the spot value date is on a month-end, then the maturity date is the next month-end. If such date is a non-business day according to the holiday calendar of the quoted currency, USD or base currency (if different from USD), the date is rolled backwards to the previous good business day.

The month-end of a currency pair is the last business day of a month, according to the holiday calendar of the two legs (plus USD calendar if it is a cross rate).

If the spot value date is not on a month-end, then the maturity date is selected by adding one calendar month to the spot value date. If such date is a non-business day according to the holiday calendars of the

quoted currency, USD or the base currency (if different from USD), the date is rolled forward to the next good business day.

4.4.4 Determination of notional values to hedge at rebalance day

4.4.4.1 Hedging quantity

Currency quotations of the index constituents are used when determining the notional amount of currencies to hedge. For example, a Hong Kong traded constituent quoted in USD will be attributed to USD exposure rather than HKD exposure.

Depository receipts (DRs) are included based on the currency of quotation of the underlying security when determining the notional currency amounts. For example, a Chinese CNY denominated security with a DR listed in New York would be treated as a CNH exposure rather than USD exposure. If the underlying security listing does not exist, the currency of the country of domicile will be hedged.

4.4.4.2 Hedging timing

The notional values to hedge at each rebalance day are determined based on the unhedged index as of one business day prior to the rebalance day. The purpose of this treatment is to avoid having to wait until the equity market closes to trade the currencies. Any index changes in the composition of the index due to index reviews or corporate actions effective on the first business day following the rebalance are taken into account.

Example

The following is an example of how the notional amount to hedge based on index changes is adjusted.

This shows how the notional and currency weights of: USD, CAD, GBP and KRW are evaluated to sell on 31 March 2026 for the index AWD. The index is being hedged to in EUR.

First the closing notional and currency weights are calculated as of the close of 30 March 2026, as follows.

Currency	Notional (EURbn)	Weight (%)
CAD	2,451.009	3.503
GBP	2,734.403	3.908
KRW	1,528.046	2.184
USD	47,471.726	67.855

The notional values are then adjusted (and currency weights accordingly) based on the composition changes effective at the open of 1 April 2026. In this instance, there were corporate events affecting some US constituents, causing a decrease in market capitalisation in USD. Therefore, the notional value to hedge from USD is adjusted lower, as shown in the table below.

Currency	Notional (EURbn)	Weight (%)
CAD	2,451.009	3.503
GBP	2,734.403	3.908
KRW	1,528.046	2.184
USD	47,469.800	67.851

Note: when a market is on holiday the market values used in the calculation will be based on the previously traded data updated for exchange rate movements.

4.4.5 Calculation of odd-day forwards

4.4.5.1 Treatments of standard forward contracts

The calculation of an odd-day forward rate is used to reflect the mark to market price of the forward that does not have a standard time to maturity (odd-day forward). A linear interpolation approach is used:

$$FIR_{i,t} = S_{i,t} + \frac{(F_{i,t} - S_{i,t}) * n}{T} \quad (E.8)$$

Where:

$S_{i,t}$ = Spot exchange rate into the base currency for currency i at time t

$F_{i,t}$ = One-month forward rate into the base currency for currency i at time t

n = Number of days left for the contract initiated at the previous hedging date

T = Number of days from spot value date to maturity date of the one-month forward at time t

Example

On 16th March 2026: to value a EUR/GBP one month forward (initiated on 27th February 2026). The maturity date of this forward is 7 April 2026. Firstly, the spot and standard one-month tenor forward rate as of the trade date are obtained:

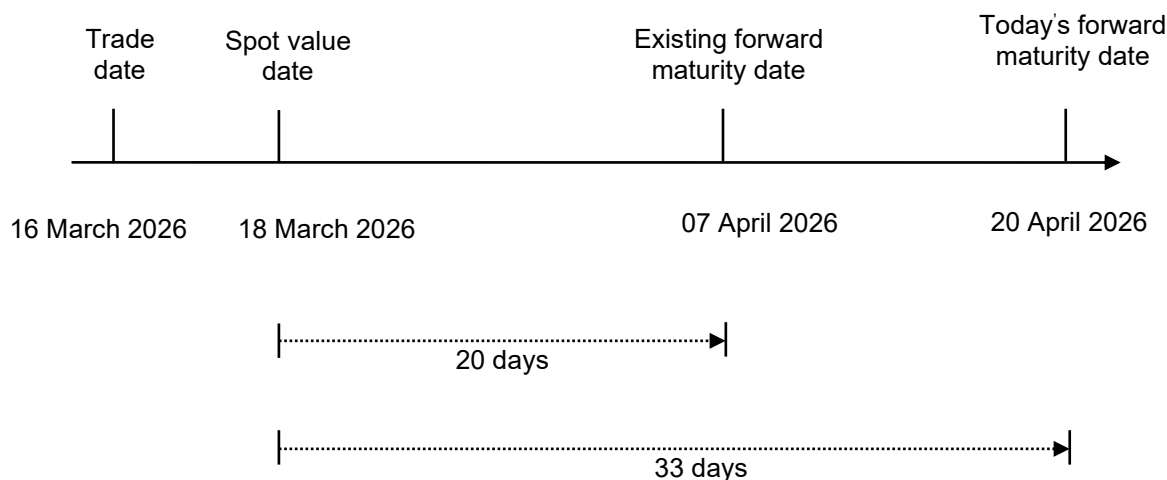
$$S_{Mar\ 16} = 0.863436$$

$$F_{Mar\ 16} = 0.864828$$

The number of calendar days between the spot value date and the forward maturity date are counted, which is 33 days as shown in the chart two. Next the number of days left until the maturity of the existing forward that is being priced is counted. In this example the answer is 20 days. Lastly, a linear interpolation is used to calculate the 20-day forward rate:

$$FIR_{Mar\ 16} = 0.863436 + \frac{(0.864828 - 0.863436) * 20}{33} = 0.864280$$

Chart two: timeline for calculating the number of days as part of the odd-day forward rate



4.4.5.2 Treatments of non-deliverable forward contracts for intra-rebalance valuation

The example in the previous section shows how to interpolate a forward rate, which can also be used to interpolate non-deliverable forward (NDF) rates, with a spot rate adjustment.

FTSE Russell uses WMR 16:00 London NDF rates for some of the currencies in the hedging calculation to value the currency positions intra-rebalance (see 4.2 for further details). As the corresponding spot rates are fixed at the local close, there exists a mismatch between the fixings of the spot and the NDFs, which may cause erroneous results when calculating the odd-day forward. To eliminate the mismatch, an implied spot rate is used to match the NDF rates.

Firstly, the points per day (PPD) are calculated for the currency using a spot week (SW) and a one-month NDF contract:

$$PPD_{i,t} = \frac{(NDF_{i,t} - SW_{i,t})}{(N_{NDF} - N_{SW})} \quad (E.9)$$

Where:

$NDF_{i,t}$ = one-month NDF rate for currency i at value date t

$SW_{i,t}$ = one-week NDF rate for currency i at value date t

N_{NDF} = number of days to maturity of the one-month NDF

N_{SW} = number of days to maturity of the one-week NDF

Then the implied spot (IS) rate is calculated as:

$$IS_{i,t} = SW_{i,t} - (PPD_{i,t} * N_{SW}) \quad (E.10)$$

Example

On 16th March 2026, to calculate the implied spot rate of Korean Won (KRW), given the following data:

Tenor	Start date	End date	Day count	Rate
SW	18 March 2026	25 March 2026	9	1492.645
One month	18 March 2026	20 April 2026	33	1491.63

The points per day and implied spot are calculated as follows:

$$PPD_{KRW} = \frac{(1491.63 - 1492.645)}{(33 - 7)} = -0.042291667$$

$$IS_{KRW} = 1492.645 - (-0.042291667 * 7) = 1492.918269$$

This implied spot will be used in the *FIR* calculations for all NDF contracts. In the scenario where the spot week rate is unavailable, the conventional spot rate will be used instead.

4.4.5.3 Treatment of non-deliverable forward contracts at the rebalance

At the rebalance, the relevant currency positions will be rolled using non-deliverable forward rates and spot rates at local market fixings as outlined in rule 4.2.2. This process will follow the treatment of standard forward contracts (see rule 4.4.5.15.1) as both spot and forward rates are available at the local fixing times.

These rates will be crossed (where applicable) with standard forward contracts using the WMR 16:00 UK time service. For example, a USD/KRW position will be taken at the local market fixing time and a EUR/USD position at 16:00 UK time.

4.4.6 Treatment of cross currency pairs with different settlement dates

The term cross rate is used to refer to a currency pair that does not involve the USD. For example, the exchange rate between the Euro and Yen is considered a cross rate and can be derived from the USD-based currency pairs USD/EUR and USD/JPY. When crossing through the USD, the two currencies may have different settlement dates due to different settlement conventions or local holidays. Therefore, it is necessary to align the settlement dates and thus adjust the rates before multiplying the two pairs. The adjustment is done by interpolating/extrapolating using the one month forward.

Similar to the implied spot rate calculation, points per day (PPD) between the spot value date and the one-month forward maturity date is firstly derived:

$$PPD_{i,t} = \frac{(1MRate_{i,t} - SpotRate_{i,t})}{(1MDate_{i,t} - SpotDate_{i,t})} \quad (E.11)$$

Then the adjusted spot or forward rate can be calculated as:

Adjusted spot rate

$$SAdj_{i,t} = S_{i,t} + PPD_{i,t} * (SpotDate_Adj - SpotDate) \quad (E.12)$$

Where the adjusted spot value date is the spot value date of the cross rate, which is selected as the latter of the two USD-based currency spot value dates, as described in rule 4.4.3.

Adjusted one-month forward rate

$$1MRate_Adj = S_{i,t} + PPD_{i,t} * (1MDate_Adj - SpotDate) \quad (E.13)$$

Where the adjusted maturity date is the maturity date of the cross rate, which is selected as the latter of the two USD-based currency maturity dates, as described in rule 4.4.3.

If the cross rate involves NDFs in either of the legs, the PPD will be calculated using one-month and spot-week contracts, as demonstrated in rule 4.4.5.2, and the adjusted spot or forward rate will be calculated based on the implied spot rate.

Example

On 16th March 2026, to calculate the cross rate of EUR/CAD spot and one-month forward rate, given the following data:

Currency	Trade date	Spot date	Spot rate	Maturity date	1M forward rate
CAD	16 March 2026	17 March 2026	1.3685	17 April 2026	1.366633
EUR	16 March 2026	18 March 2026	0.870701	20 April 2026	0.869321

First, the spot and maturity date of the cross pair are determined. The spot date is the latter of the CAD spot date 2026-03-17 and the EUR spot date 2026-03-18, which gives us 2026-03-18 (there are no holidays in EUR or CAD calendars so no business day adjustments are required). Similarly, the maturity date is the

latter of 2026-04-17 and 2026-04-20, which is 2026-04-20 (again this is a valid business day in both calendars so no further adjustment).

Next the cross spot and maturity date are calculated. Before multiplying the pair, the rates are adjusted so that the spot or maturity date of either leg aligns with that of the cross pair. For CAD, the spot date needs to be adjusted from 2026-03-17 to 2026-03-18 due to the difference in settlement dates. The adjusted spot rate is calculated in the following steps:

$$PPD^{CAD} = \frac{(1.366633 - 1.3685)}{(2026 - 04 - 17) - (2026 - 03 - 17)} = -0.000060$$

Days between the original spot date and the cross-spot date:

$$(2026 - 03 - 18) - (2026 - 03 - 17) = 1$$

The adjusted CAD spot rate is:

$$1.3685 + (-0.000060) * 1 = 1.368440$$

For EUR, the spot date is the same as for the cross-pair so no adjustment to the rate is required.

Similarly, the maturity date of the one-month EUR contract is the same as the maturity date of the cross rate and therefore, there is no adjustment to the one-month EUR forward rate.

For the CAD one-month forward, the maturity date needs to be adjusted from 2026-04-17 to 2026-04-20 due to the difference in settlement dates. The adjusted forward rate is calculated as:

Days between the original spot date and the cross one-month maturity date:

$$(2026 - 04 - 20) - (2026 - 03 - 17) = 34$$

The adjusted CAD one-month forward rate is:

$$1.3685 + (-0.000060) * 34 = 1.366452$$

Currency	Trade date	Adjusted spot date	Adjusted spot rate	Adjusted maturity date	Adjusted 1M forward rate
CAD	16 March 2026	18 March 2026	1.368440	20 April 2026	1.366452
EUR	16 March 2026	18 March 2026	0.870701	20 April 2026	0.869321

Now the rates are crossed by multiplying the two:

EUR/CAD spot rate = CAD adjusted spot rate * (1/EUR adjusted spot rate)

$$= 1.368440 * (1/0.870701)$$

$$= 1.571653081$$

EUR/CAD 1M rate = CAD adjusted one-month rate * (1/EUR adjusted one-month rate)

$$= 1.366452 * (1/0.869321)$$

$$= 1.571862$$

4.4.7 Hedged index level calculation example

For the currency impact of hedging calculation:

We can calculate the currency impact of hedging for GBP on this date by using the FIR calculated as above, the spot rate from the business day before the previous hedging date (26th February 2026) and the forward rate from the previous hedging date (27th February 2026):

$$S_{Feb\ 26} = 0.873154$$

$$F_{Feb\ 27} = 0.879593$$

$$CIH_{Mar\ 16} = \frac{0.873154}{0.879593} - \frac{0.873154}{0.864280} = -0.017588$$

And for the impact of hedging calculation:

Currency	Notional (EURbn)	Weight (%)	CIH (%)	Hedging Factor	Absolute hedge performance (EURbn)
CAD	2,451.009	3.503	-2.473	1	-60.613
GBP	2,734.403	3.908	-1.759	1	-48.098
KRW	1,528.046	2.184	1.182	1	18.062
USD	47,469.800	67.851	-2.871	1	-1362.858

The sum of the FTSE Developed Index market caps in the base currency, at the day before previous hedging date is EUR 74,687.079 bn, leading to an Impact of Hedging from these select 4 currencies of:

$$IH_{Mar\ 16} = \frac{-60.613 - 48.098 + 18.062 - 1362.858}{74,687.079} = -0.019461$$

Finally, we can calculate the hedged capital index level based on E.5:

$$UI_{Mar\ 16} = 594.283$$

$$UI_{Feb\ 27} = 605.279$$

$$HI_{Feb\ 26} = 101.360$$

$$HI_{Feb\ 26} = 101.561$$

$$HI_{Mar\ 16} = 101.360 \times \left(\frac{594.283}{605.279} \right) + 101.561 \times -0.019461 = 97.542$$

4.5 FTSE Russell daily currency hedged indices

4.5.1 The FTSE Russell daily currency hedged indices take many features from the FTSE Russell monthly currency hedging methodology and applies it to daily currency hedging.

4.5.2 Calculation formula

The currency hedged index hedges local currencies in the underlying index to the base currency by selling local forward contracts and rebalancing on a daily basis, any proceeds from the currency positions are kept in a cash account overnight for reinvesting the next trading day. It is calculated as follows:

$$HI_t = (HI_{t-1} - IH_{t-1}) \times \left(\frac{UI_t}{UI_{t-1}} \right) + IH_t + IH_{t-1} \times (1 + D_{t,t-1} \times Int_{t-1}) \quad (E.14)$$

Where:

- HI_t = Hedged index at the close of the value date t
- HI_{t-1} = Hedged index one business day prior to the value date at time t-1
- UI_t = Unhedged index at the close of the value date t
- UI_{t-1} = Unhedged index one business day prior to the value date at time t-1
- Int_{t-1} = Overnight interest rate in the base currency one business day prior to the value date at time t-1
- $D_{t,t-1}$ = Calendar days between the value date at time t and one business day prior to the value date at time t-1
- IH_{t-1} = Impact of hedging one business day prior to the value date at time t-1
- IH_t = Impact of hedging at the close of the value date t, which is defined as follows:

$$IH_t = \frac{\sum_{i=1}^n (Mcap_{i,t-2} \times CIH_{i,t} \times HF_{i,t-2})}{\sum_{i=1}^n (Mcap_{i,t-2})} \text{ for } t \geq 2 \quad (E.15)$$

$$IH_0 = 0 \quad IH_1 = \frac{\sum_{i=1}^n (Mcap_{i,0} \times CIH_{i,1} \times HF_{i,0})}{\sum_{i=1}^n (Mcap_{i,0})}$$

Where:

- $Mcap_{i,t-2}$ = Notional amount to hedge for currency i as of two business day prior to the value date t. A more detailed definition is provided in rule 4.5.6
- $HF_{i,t-2}$ = Hedging factor (0 or greater) for currency i as of two business day prior to the value date t. This is the proportion of the currency i to be hedged. Note that for FTSE Russell's standard currency hedged indices the HF will be 1
- $CIH_{i,t}$ = Currency impact of hedge for currency i between the previous hedge date (t-1) and the value date t, which is defined as follows:

$$CIH_{i,t} = S_{i,t-2} \times \left(\frac{1}{TN_Adj_{i,t-1}} - \frac{1}{S_Adj_{i,t}} \right) \text{ for } t \geq 2 \quad (E.16)$$

$$CIH_{i,0} = 0 \text{ for } i \in n \quad CIH_{i,1} = S_{i,0} \times \left(\frac{1}{TN_Adj_{i,0}} - \frac{1}{S_Adj_{i,1}} \right)$$

Where:

- $S_{i,t-2}$ = Spot exchange rate into the base currency for currency i at time $t-2$
- $S_Adj_{i,t}$ = Adjusted spot exchange rate into the base currency for currency i at time t . A more detailed definition is provided in rule 5.5.5
- $TN_Adj_{i,t-1}$ = Adjusted tomorrow next forward rate into the base currency or currency i at time $t-1$. A more detailed definition is provided in rule 5.5.5

The above formulas simulate a currency hedging process that is described in the following:

Day 1: Initiate the hedge

- Sell the tomorrow next forward for local currency i , with a notional of previous day's (Day 0) hedged index value.

Day 2: Rebalance the hedge

- Buy back the forward and realize the P&L. The proceeds are kept in a cash account for reinvestment the next day.
- Sell the forward based on an updated notional corresponding to the closing hedged index on the previous day (Day 1).

Day 3: Reinvest and rebalance

- Reinvest the realized P&L from the previous day (Day 2).
- Buy back the forward and realize the P&L. The proceeds are kept in a cash account for reinvestment the next day.
- Sell the forward based on an updated notional corresponding to the closing hedged index on the previous day (Day 2).

Day 4 and beyond: Reinvest and rebalance

- Repeat the actions of Day 3.

4.5.3 Currency data

The following WMR 16:00 UK time service mid-rates will be used as part of the index calculation:

- spot rates;
- tomorrow next forward rates; and
- spot week forward rates used when adjusting for day count conventions and settlement holidays.

In the event of either the spot or forward rates being unavailable, both spot and forward rates of the previous day will be used. For forward rates that are not supported by WMR the currency impact of hedge will be zero for those currencies.

The currency hedged index will be calculated and follow the underlying unhedged index holiday calendar.

4.5.4 Overnight interest rates

FTSE Russell uses overnight interest rates in the base currency for daily currency hedging calculation. For example, indices denominated of the base currency of USD it will use the Secured Overnight Financing Rate (SOFR), for EUR it will use Euro Short-Term Rate (€STR), for GBP it will use Sterling Overnight Interbank Average Rate (SONIA) and for JPY it will use Tokyo Overnight Average Rate (TONAR). The conventions for SOFR and €STR is to quote an annualized rate with a day count basis of actual/360, and for SONIA and TONAR is to quote an annualized rate with a day count basis of actual/365.

4.5.5 Treatment of currency settlements

4.5.5.1 Rules to determine the spot value date

For USD-based currency pairs, a preliminary spot value date is first selected by adding the number of settlement convention days to the trade date (either t+1 or t+2), following the quoted currency's holiday calendar. If the preliminary spot value date is a non-business day according to the USD holiday calendar, then the spot value date is the first good business day on both the quoted currency and the USD calendar following the preliminary spot value date.

For non-USD based cross pairs, all three currency calendars (quoted currency, base currency and USD) are taken into account. Firstly, a preliminary spot value date is picked from the latter of the quoted/USD and base/USD. Then the spot value date is the first business day of the quoted currency, base currency and USD calendars following the preliminary spot value date.

The spot value date is used to ensure that the correct adjustment is made to the tomorrow next forward contract when market holidays occur.

The maturity date for a tomorrow next rate is t+2, which is the same as the spot value date for t+2 currencies.

To update the tomorrow next forward rates, and spot rates that have different settlement dates, the points per day (PPD) is initially calculated, which is then used to adjust the original rates so that their maturity and spot value dates are aligned.

4.5.5.2 Points per Day (PPD)

Points per Day (PPD) between Spot Value Date and Spot Week Forward Maturity Date

$$PPD_{i,t} = \frac{(SW_{i,t} - S_{i,t})}{(SWDate_i - SpotDate_i)} \quad (E.17)$$

Where:

$S_{i,t}$	=	Spot exchange rate into the base currency for currency i at time t
$SW_{i,t}$	=	One-week forward rate for currency i at value date t
$SWDate_i$	=	One-week forward value date for currency i
$SpotDate_i$	=	Spot value date for currency i

Settlement Days Adjustment

Day count between the original Spot Value Date and the adjusted Spot Value Date

$$SpotDate_Adj_{i,t} - SpotDate_{i,t} \quad (E.18)$$

Where the adjusted spot value date is the spot value date of the cross rate, which is selected as the latter of the two USD based currency spot value dates.

4.5.5.3 Adjusted Spot Rate

$$S_Adj_{i,t} = S_{i,t} + PPD_{i,t} \times (SpotDate_Adj_{i,t} - SpotDate_{i,t}) \quad (E.19)$$

4.5.5.4 Adjusted Tomorrow Next Forward Rate

$$TN_Adj_{i,t} = S_{i,t} + PPD \times (TNDate_Adj_{i,t} - SpotDate_{i,t}) \quad (E.20)$$

Where the adjusted maturity date is the maturity date of the cross rate, which is selected as the first common business day of all three calendars after and including the latter of the two USD based currency maturity dates.

Example

On 16th March 2026, to calculate the cross rate of EUR/CAD spot and one-month forward rate, given the following data:

Currency	Trade date	Spot date	Spot rate	SW date	SW rate	Maturity date	TN forward rate
CAD	16 March 2026	17 March 2026	1.3685	24 March 2026	1.368074	18 March 2026	1.3685
EUR	16 March 2026	18 March 2026	0.870701	25 March 2026	0.870411	18 March 2026	0.870742

First, the spot and maturity date of the cross pair are determined. The spot date is the latter of the CAD spot date 2026-03-17 and the EUR spot date 2026-03-18, which gives us 2026-03-18 (there are no holidays in EUR or CAD calendars so no business day adjustments are required).

Next the cross spot rate is calculated. Before multiplying the pair, the rates are adjusted so that the spot or maturity date of either leg aligns with that of the cross pair. For CAD, the spot date needs to be adjusted from 2026-03-17 to 2026-03-18 due to differences in settlement dates. The adjusted spot rate is calculated in the following steps:

$$PPD^{CAD} = \frac{(1.368074 - 1.3685)}{(2026 - 03 - 24) - (2026 - 03 - 17)} = -0.000061$$

Days between the original spot date and the cross-spot date:

$$(2026 - 03 - 18) - (2026 - 03 - 17) = 1$$

The adjusted CAD spot rate is:

$$1.3685 + (-0.000061) * 1 = 1.368439$$

For the tomorrow next cross rate adjustment, days between the original spot date and the adjusted forward date:

$$(2026 - 03 - 18) - (2026 - 03 - 17) = 1$$

The adjusted CAD forward rate, using the same PPD as before, is:

$$1.3685 + (-0.000061) * 1 = 1.368439$$

For EUR, the spot and tomorrow next dates are the same as for the cross-pairs so no adjustment to the rates are required.

Currency	Trade date	Adjusted spot date	Adjusted spot rate	Adjusted maturity date	Adjusted TN forward rate
CAD	16 March 2026	18 March 2026	1.368439	18 April 2026	1.368439
EUR	16 March 2026	18 March 2026	0.870701	18 April 2026	0.870742

Now the rates are crossed by multiplying the two:

EUR/CAD spot rate = CAD adjusted spot rate * (1/EUR adjusted spot rate)

$$= 1.368439 * (1/0.870701)$$

$$= 1.571652$$

EUR/CAD 1M rate = CAD adjusted tomorrow next rate * (1/EUR adjusted tomorrow next rate)

$$= 1.3685 * (1/0.869321)$$

$$= 1.571578$$

4.5.6 Determination of notional values to hedge

4.5.6.1 Hedging quantity

Currency quotations of the index constituents are used when determining the notional amount of currencies to hedge. For example, a Hong Kong traded constituent quoted in USD will be attributed to USD exposure rather than HKD exposure.

Depository receipts (DRs) are included based on the currency of quotation of the underlying security when determining the notional currency amounts. For example, a Chinese CNY denominated security with a DR listed in New York would be treated as a CNH (offshore rate used by international investors) exposure rather than USD exposure. If the underlying security listing does not exist, the currency of the country of domicile will be hedged.

4.5.6.2 Hedging timing

The notional values to hedge for each day are determined based on the unhedged index as of one business day prior to the rebalance (trade) day. The purpose of this treatment is to avoid having to wait until the equity market closes to trade the currencies. Any index changes in the composition of the index due to index reviews or corporate actions effective on the first business day following the rebalance (trade) day are taken into account.

4.5.7 Hedged index level calculation example

For the currency impact of hedging calculation:

We can calculate the currency impact of hedging for GBP on this date by using the FIR calculated as above, the spot rate from the business day before the previous hedging date (12th March 2026) and the forward rate from the previous hedging date (13th March 2026):

$$S_{Mar\ 12} = 0.863206$$

$$F_{Mar\ 13} = 0.864406$$

$$S_{Mar\ 16} = 0.863436$$

$$CIH_{Mar\ 16} = \frac{0.863206}{0.864406} - \frac{0.863206}{0.863436} = -0.001121$$

And for the impact of hedging calculation:

Currency	Notional (EURbn)	Weight (%)	CIH (%)	Hedging Factor	Absolute hedge performance (EURbn)
CAD	2,539.233	3.444	-0.013172	1	-0.334
GBP	2,818.323	3.868	-0.112080	1	-3.159
USD	50,160.382	68.036	0.364275	1	182.722

The sum of the FTSE Developed Index market caps in the base currency, at the day before previous hedging date is EUR 73,537.349bn, leading to an Impact of Hedging from these select 3 currencies of:

$$IH_{Mar\ 16} = \frac{-0.334 - 3.159 + 182.722}{73537.349} = 0.002437$$

Finally, we can calculate the hedged capital index level based on E. 14:

Calendar days between the trade date and previous hedge date:

$$(2026 - 03 - 16) - (2026 - 03 - 13) = 3$$

$$UI_{Mar\ 16} = 594.283$$

$$UI_{Mar\ 13} = 591.105$$

$$HI_{Mar\ 13} = 96.525$$

$$IH_{Mar\ 13} = -0.004463$$

$$ESTR_{Mar\ 13} = 1.93\%$$

$$HI_{Mar\ 16} = (96.525 + 0.004463) \times \left(\frac{594.283}{591.105}\right) + 0.002437 - 0.004463 \times \left(1 + \frac{3}{360} \times 0.0193\right) = 97.046415$$

Appendix A

Further information

A glossary of terms used in FTSE Russell's methodology documents can be found using the following link:

[Glossary.pdf](#)

Further information on the Currency Hedging Methodology is available from FTSE Russell.

For contact details please visit the FTSE Russell website or contact FTSE Russell client services at info@ftserussell.com.

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