Ground Rules

FTSE Currency Hedging Methodology

v1.2

Contents

Section 1

Introduction

1.0 Introduction

1.1 These rules provide a detailed description of the standard FTSE currency hedging methodology, which is applied to create a wide range of currency hedged indexes.

1.2 The FTSE currency hedged indexes are constructed by adding a layer of currency forward contracts to the underlying unhedged indexes, such as FTSE All World Index. The forward rates are standard one month contracts that are rolled at each rebalance day. The amount of foreign currencies to sell is estimated once a month based on the unhedged index constituents, which stays unchanged for the remainder of the month until the next rebalance.

1.3 A list of key features in this methodology includes:

- Rolling of the forward contracts uses currency weights (adjusted for corporate events) from one day prior to each rebalance day. For example, on 31 January 2015, FTSE determine the currency weights to hedge based on the equity index close as of 30 January 2015 but adjust the weights for corporate events and constituent changes after the close of business on 31 January 2015. 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 with regard to the monthly roll is adjusted in the index performance calculation.

- 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.

- Global Depositary Receipts (GDRs) are included based on the currency quotation of the underlying security when determining the notional currency amounts.

- FTSE will use one-month forward rates to calculate odd-day forward contracts when valuing the hedge between rebalances to interpolate the relevant amount.

- Currency settlement dates are taken into account when valuing the forward contracts.

- Where applicable non-deliverable forwards (NDFs) based on WM Reuters 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 WM Reuters 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.

- Non-deliverable forwards (NDFs) using local market hours WM Reuters rates are used to roll the forward positions at the rebalance.

- A product suite has been created that includes inputs and intermediate results of the currency hedging calculation to assist clients to better understand and replicate the index calculation.

1.4 These Ground Rules should be read in conjunction with the Ground Rules of the underlying unhedged indexes.

1.5 The following indices will be calculated where currency positions are rolled at month end::

Index Code	Index Name
GPVAN036	FTSE Developed ex North America Hedged CAD Net Tax (US RIC) Index
GPVAN068	FTSE Developed All Cap ex North America Hedged to CAD Net Tax Index
GPVAN071	FTSE Developed ex UK 100% Hedged to GBP Net Tax Index
GPVAN073	FTSE Developed Europe ex UK 100% Hedged to GBP Net Tax Index
GPVAN075	FTSE Developed 100% Hedged to GBP Net Tax Index
GPVAN077	FTSE Developed 100% Hedged to EUR Net Tax Index
GPVAN084	FTSE Developed 100% Hedged to GBP Index
GPVAN094	FTSE Global All Cap 100% Hedged to USD Net Tax Index
GPVAN104	FTSE Developed Europe All Cap Hedged CAD Index
GPVAN105	FTSE Developed Asia Pacific All Cap Hedged CAD Index

1.6 The following indices will be calculated where currency positions are rolled at on a monthly basis on the third Friday of each month*:

Index Code	Index Name
TBC	FTSE Developed ex North America 100% Hedged to USD Net Tax (US RIC) Index
TBC	FTSE Developed Europe All Cap 100% Hedged to USD Net Tax (US RIC) Index

* Where the FTSE review cycle changes for market holidays in the underlying indexes, the roll date will be updated to accommodate the change.

1.7 Indexes rolled on a monthly basis on the third Friday of each month will follow the same calculations outlined in these ground rules but with a different rebalance schedule.:

Section 2

Currency Data

2.0 Currency Data

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

- Spot rates;
- Forward rates;
- Non-deliverable forward rates

2.2 The following WM Reuters hourly spot and non-deliverable forward rates will be used as part of the monthly roll process:

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 Paso	PHP	11:00	03:00 (GMT +8 hrs)
Taiwan Dollar	TWD	11:00	03:00 (GMT +8 hrs)

2.3 Where rates are not published by WM Reuters 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.

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 monthly rebalance day of the hedged index is selected as the common business day based on WM Reuters and the underlying index holiday calendar.

2.5 The following table specifies whether a forward or NDF should be used for any country/currency as part of the currency hedging calculation. This table will be subject to change and FTSE will give advance notice of any changes.

Table 1: FTSE Countries using Forwards/NDFs, as of October 2017

Region	Country	Currency	ISO Currency Code	Forward / NDF
Europe/	Austria	Euro	EUR	Forward
Middle East/	Belgium	Euro	EUR	Forward
Africa	Czech Republic	Koruna	CZK	Forward
	Denmark	Krone	DKK	Forward
	Egypt	Pound	EGP	NDF*
	Finland	Euro	EUR	Forward
	France	Euro	EUR	Forward
	Germany	Euro	EUR	Forward
	Greece	Euro	EUR	Forward
	Hungary	Forint	HUF	Forward
	Ireland	Euro	EUR	Forward
	Israel	Shekel	ILS	Forward
	Italy	Euro	EUR	Forward
	Luxembourg	Euro	EUR	Forward
	Morocco	Dirham	MAD	Forward
	Netherlands	Euro	EUR	Forward
	Norway	Krone	NOK	Forward
	Poland	Zloty	PLN	Forward
	Portugal	Euro	EUR	Forward
	Russia	Rouble	RUB	NDF**
	Qatar	Rial	QAR	Forward
	Spain	Euro	EUR	Forward
	South Africa	Rand	ZAF	Forward
	Sweden	Krona	SEK	Forward
	Switzerland	Franc	CHF	Forward
	Turkey	Turkish Lira	TRY	Forward
	United Arab Emirates	Emirati Dirham	AED	Forward
	United Kingdom	Pound	GBP	Forward

Region	Country	Currency	ISO Currency Code	Forward / NDF
Americas	Brazil	Real	BRL	NDF*
	Chile	Peso	CLP	NDF*
	Colombia	Peso	COP	NDF*
	Canada	Dollar	CAD	Forward
	Mexico	Peso	MXN	Forward
	Peru	New Sol	PEN	NDF*
	United States	Dollar	USD	Forward

Region	Country	Currency	ISO Currency Code	Forward / NDF
Asia	Australia	Dollar	AUD	Forward
	China	Renminbi	CNY	NDF
	Hong Kong	Dollar	HKD	Forward
	India	Rupee	INR	NDF
	Indonesia	Rupiah	IDR	NDF
	Japan	Yen	JPY	Forward
	Malaysia	Ringgit	MYR	NDF
	New Zealand	Dollar	NZD	Forward
	Pakistan	Rupee	PKR	Forward
	Philippines	Peso	PHP	NDF
	Singapore	Dollar	SGD	Forward
	South Korea	Won	KRW	NDF
	Thailand	Baht	THB	Forward
	Taiwan	Dollar	TWD	NDF

Table 2: FTSE Countries with T+1 settlement period

Country	ISO Currency Code	Currency Name
Canada	CAD	Canadian dollars
Philippines	PHP	Philippine Peso
Russia	RUB	Russian Rouble
Turkey	TRY	Turkish Lira

* Please note that the NDFs highlighted are part of the WM Reuters Closing Forward Rate Service and will be treated as forward rates in the calculation of the FTSE Currency Hedged Indexes. Where NDF rates are made available as part of the WM Reuters NDF Service they will be used in the currency hedging calculation and treated as NDFs. See Section 3 for further information on the calculation treatment of forward rates and NDF rates.

** WM Reuters do not publish NDF spot week rates. Spot rate and one-month NDF rate will be used when calculating the FIR (see Rule 3.4 for its calculation).

2.6 Price, Net of Tax Total Return and Total Return Indexes are available as a standard offering in AUD, CAD, CHF, CNY, EUR, GBP, JPY and USD.

2.7 **Availability of currency data due to an extraordinary market event**

2.7.1 If an extraordinary market event occurs that causes WM Reuters to not provide the relevant currency values used as part of the index calculation, based on market information FTSE 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.

2.7.2 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.

2.7.3 If currency data becomes available from WM Reuters following its suspension, FTSE will use this data in the index calculation at the next rebalance date provided sufficient information is available that will ensure its continued supply.

2.7.4 Where a currency forward or NDF rate is suspended and WM Reuters confirm that it will no longer be published, the currency will be unhedged in the index calculation.

2.7.5 If a currency is not suspended and data is not provided by WM Reuters the currency hedging calculation will use the previous days spot and forward until both rates are available until the next rebalance. In the case of NDFs, the previous days spot week or NDF rates will be used in pairs as well. Where no currency information is provided by WM Reuters at the rebalance the currency will not be hedged.

Section 3

Currency Hedged Index Calculation

3.0 Currency Hedged Index Calculation

This section highlights the major components required to calculate the FTSE Currency Hedged Indexes.

3.1 Calculation formula

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

$$HI_t = HI_{t-x} \times \frac{UI_t}{UI_{t-x}} + HI_{t-x-1} \times IH_t$$

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:

$$IH_t = \frac{\sum_{i=1}^{n}\{Mcap_{i,t-x-1} \times CIH_{i,t} \times HF_{i,t}\}}{\sum_{i=1}^{n}\{Mcap_{i,t-x-1}\}}$$

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 3.2

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 ind*ex*es 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:

$$\boldsymbol{CIH_{i,t}} = \frac{\boldsymbol{S_{i,t-x-1}}}{\boldsymbol{F_{i,t-1}}} - \frac{\boldsymbol{S_{i,t-x-1}}}{\boldsymbol{FIR_{i,t}}}$$

Where:

$\boldsymbol{S_{i,t-x-1}}$ = Spot exchange rate into the base currency at the close one business day prior to the previous hedging date

$\boldsymbol{F_{i,t-x}}$ = One month Forward/NDF rate at the close of the previous hedging date

$\boldsymbol{FIR_{i,t}}$ = Forward interpolated rate into the base currency for currency *i*. A more detailed calculation of this odd day forward is provided in Rule 3.4

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

3.2 Treatment of currency settlements

3.2.1 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.

3.2.2 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.

3.3 Determination of notional values to hedge at rebalance day

3.3.1 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.

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

3.3.2 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.

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

This example shows how the notional and currency weights are evaluated to sell on 28 February 2013 for an index consisting of four currencies: USD, CAD, GBP and KRW. The index is quoted in EUR.

First the closing notional and currency weights are calculated as of the close of 27 February 2013, as follows.

Currency	Notional (EURbn)	Weight
USD	11,122.59	76.8299%
CAD	882.09	6.0931%
GBP	1,940.53	13.4043%
KRW	531.70	3.6727%

Then on 28 February 2013 when the hedge is implemented, the notional values are adjusted (and currency weights accordingly) based on the composition changes effective at the open of 1 March 2013. In this instance, two US constituents had corporate events causing an increase in market capitalisation in USD. Therefore, the notional value to hedge from USD is adjusted higher, as shown in the table below.

Currency	Notional (EURbn)	Weight
USD	11,124.27	76.8326%
CAD	882.09	6.0924%
GBP	1,940.53	13.4028%
KRW	531.70	3.6723%

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.

3.4 Calculation of odd day forwards

3.4.1 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:

$$\boldsymbol{FIR_{i,t} = S_{i,t} + \frac{(F_{i,t} - S_{i,t}) * n}{T}}$$

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

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

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

Example

On 12 February 2013: to value a EUR/USD one month forward (initiated on 31 January 2013). The maturity date of this forward is 4 March 2013. Firstly, the spot and standard one month tenor forward rate as of the trade date are obtained:

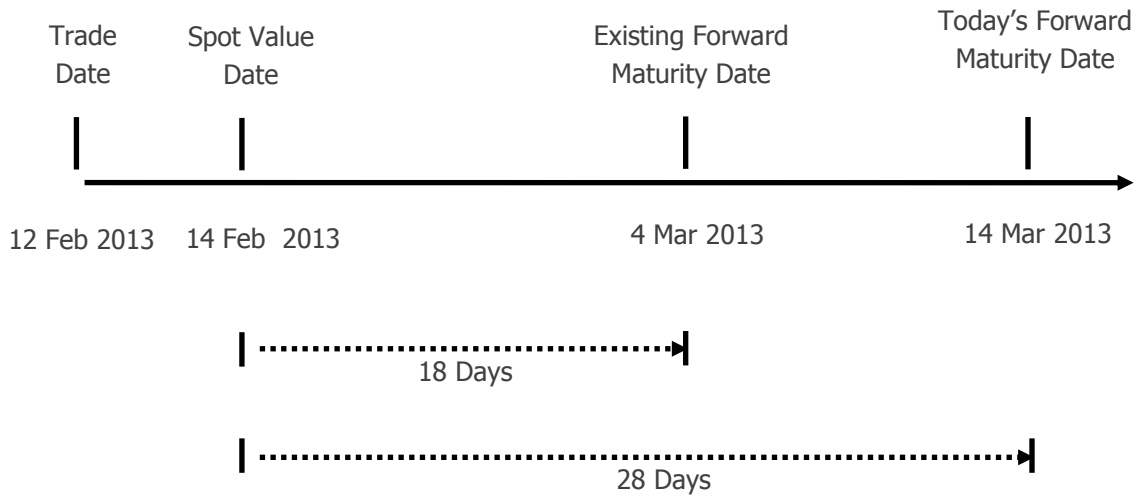
$S_{Feb\ 12}$ = 1.3465

$F_{Feb\ 12}$ = 1.3467

The number of calendar days between the spot value date and the forward maturity date are counted, which is 28 days as shown in the Chart One. 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 18 days. Lastly, a linear interpolation is used to calculate the 18 day forward rate:

$$FIR_{Feb\ 12} = 1.3465 + \frac{(1.3467 - 1.3465) * 18}{28} = 1.3466$$

Chart One: Timeline for calculating the number of days as part of the odd-day forward rate



3.4.2 Treatment 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 uses WM Reuters 16:00 London NDF rates for some of the currencies in the hedging calculation to value the currency positions intra-rebalance (see Section 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:

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

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:

$$IS_{i,t} = SW_{i,t} - (PPD_{i,t} * N_{SW})$$

Here is an example demonstrating how the implied spot is calculated.

On 12 February 2013 to calculate the implied spot rate of Korean Won (KRW), given the following data:

Tenor	Start Date	End Date	Day Count	Rate
SW	2013-02-14	2013-02-21	7	1093
One Month	2013-02-14	2013-03-14	28	1090

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

$$PPD_{KRW,2013-02-12} = \frac{(1090 - 1093)}{(28 - 7)} = -0.14286$$

$$IS_{KRW,2013-02-12} = 1090 - (-0.14286 * 7) = 1094$$

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.

3.4.3 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 2.2. This process will follow the treatment of standard forward contacts (see Rule 3.4.1) 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 WM Reuters 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.

3.5 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:

$$PPD = \frac{(1MRate \quad - SpotRate \quad)}{(1MDate \quad - SpotDate \quad)}$$

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

Adjusted Spot Rate

$$SpotRate\_Adj \quad = SpotRate \quad + PPD * (SpotDate\_Adj \quad - SpotDate \quad)$$

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 3.2.

Adjusted One Month Forward Rate

$$1MRate\_Adj \quad = SpotRate \quad + PPD * (1MDate\_Adj \quad - SpotDate \quad)$$

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 3.2.

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 3.4.2, and the adjusted spot or forward rate will be calculated based on the implied spot rate.

For example, on 2 July 2013: 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	2013-07-02	2013-07-03	1.0529	2013-08-06	1.05375
EUR	2013-07-02	2013-07-05	0.768256	2013-08-05	0.768167

First, the spot and maturity date of the cross pair are determined. The spot date is the latter of the CAD spot date 2013-07-03 and the EUR spot date 2013-07-05, which gives us 2013-07-05. Similarly, the maturity date is the latter of 2013-08-06 and 2013-08-05, which is 2013-08-06.

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 to 2013-07-05 from 2013-07-03. The adjusted spot rate is calculated in the following steps:

$$PPD^{CAD} = \frac{(1.05375 - 1.0529)}{(2013 - 08 - 06) - (2013 - 07 - 03)} = 0.000025$$

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

$$(2013 - 07 - 05) - (2013 - 07 - 03) = 2$$

The adjusted CAD spot rate is:

$$1.0529 + 0.000025 * 2 = 1.05295$$

The maturity date of the one month CAD contract is the same as the maturity date of the cross rate and therefore there is no adjustment to the one month CAD forward rate.

For EUR, the spot date is unchanged compared to the cross pair but the one month forward maturity date needs to be adjusted from 2013-08-05 to 2013-08-06. The adjusted forward rate is calculated as:

$$PPD^{EUR} = \frac{(0.768167 - 0.768256)}{(2013 - 08 - 05) - (2013 - 07 - 05)} = -0.000003$$

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

$$(2013 - 08 - 06) - (2013 - 07 - 05) = 32$$

The adjusted EUR one month forward rate is:

$$0.7683 + (-0.000003) * 32 = 0.768164$$

Currency	Trade Date	Adjusted Spot Date	Adjusted Spot Rate	Adjusted Maturity Date	Adjusted 1M Forward Rate
CAD	2013-07-02	2013-07-05	1.05295	2013-08-06	1.05375
EUR	2013-07-02	2013-07-05	0.768256	2013-08-06	0.768164

Now the rates are crossed by multiplying the two:

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

= 1.05295 * (1/0.768256)

= 1.370572

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

= 1.05375*(1/0.768164)

= 1.371777

Section 4

Currency Hedged Index Product Calculation

4.0 Currency Hedged Index Product Calculation

As part of the currency hedged index offering, FTSE provides a comprehensive product suite which includes a currency weightings product, FX data product and an index valuation product. This product offering will include the key data used to calculate the hedged indexes and assist clients to better understand and replicate the index calculation. This section highlights some of the calculations in the index products provided as part of the currency hedging calculation.

4.1 Currency weightings product

4.1.1 Indicative market capitalisation at the next roll date in base currency (millions)

On any trade date the indicative market capitalisation is calculated based on a constituent's market capitalisation using current market close prices in base currency adjusted for any corporate actions, additions, deletions, shares and free float changes scheduled to be in effect after the next roll date. It is a forward looking measurement and will be the same as the constituent's current closing market capitalisation values if there are no scheduled changes.

4.2 FX data product

4.2.1 Currency performance since previous roll date (%)

Currency performance since previous roll date measures the spot rate changes in percentage terms for each currency. The currencies are assumed to be quoted as a number of quotation/local currency per base/hedged currency. For example, the currency performance of a EUR/USD pair is calculated as follows:

Spot Trade Date	2013-02-22
Previous Roll Date	2013-01-31
Spot at Trade Date	1.3162
Spot at Previous Roll Date	1.3574
Currency Performance	(1.3162/1.3574-1)*100=-3.035214

4.3 Index valuation product

4.3.1 Unhedged/hedged capital and total return index performance since the previous roll date (%)

Unhedged/hedged index performance since the previous roll date measures the index change in percentage terms over a period of time. The following demonstrates how the hedged capital index performance is calculated.

Spot Trade Date	2013-02-22
Previous Roll Date	2013-01-31
Hedged Capital Index at Trade Date	1058.84
Hedged Capital Index at Previous Roll Date	1046.69
Hedged Capital Index Performance	(1058.45/1046.69-1)*100= 1.160802

The unhedged and the total return index performance are calculated in the same manner.

Section 5

Further Information

5.0 Further Information

A Glossary of Terms used in FTSE Russell's Ground Rule documents can be found using the following link:

Glossary.pdf

For further information visit www.ftserussell.com or e-mail info@ftserussell.com . Contact details can also be found on this website.

FTSE Russell

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