

WM/REUTERS

# SPOT & FORWARD RATES GUIDE

SCOPE OF THE RATES  
AND METHODOLOGY OF  
THEIR CALCULATION

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# SECTION 1—INTRODUCTION

## 1.1 HISTORY

The Closing Spot Rates were introduced in 1994 to provide a standard set of currency rates so that portfolio valuations could be compared with each other and their performance measured against benchmarks without having any differences caused by exchange rates. These rates were rapidly adopted by index compilers, the Financial Times and other users and became the de facto standard for closing spot rates on a global basis.

In 1997, the Closing Forward Rates service was launched to complement the WM/Reuters Closing Spot Rates.

In 2001, the Intraday Spot Rates service was launched to extend the Spot rates product and meet clients growing requirements. This service has recently been expanded to provide hourly spot rates from Monday 7 a.m. in Sydney until Friday at 10 p.m. in the UK.

In March 2004, the coverage of the Closing Forwards was extended to cover 72 currencies and additional time periods for some currencies. In August 2004, Intraday Forwards were introduced to make the Forwards service compatible with the Intraday Spots.

## 1.2 USES OF THE RATES

The majority of the main equity and bond index compilers use the WM/Reuters exchange rates in their calculations and the original uses of the rates in portfolio valuations and performance measurement are still very relevant. However, other uses of the rates have developed and are becoming increasingly important. For example, many clients now use the rates as a benchmark for currencies in contracts of different kinds including the settlement of financial derivatives. Many banks will now provide a service to their clients whereby they will guarantee to trade at WM/Reuters rates—this is useful for investment clients if they are making changes to a portfolio benchmarked against an index which uses WM/Reuters rates, as using the rates to trade at will avoid any reconciliation differences. Corporate users will find that it is very useful to value currency holdings held globally at a common rate and if necessary swap or trade them at the same rate. Using WM/Reuters' rates in this way can avoid using expensive resources to check the market continually. Auditors accept the WM/Reuters rates as independently fixed.

# SECTION 2—WM/REUTERS SPOT RATES

## 2.1 COVERAGE

The Rates are intended to cover the currencies for those countries which are included in a global or regional stock market index or where there is sufficient liquidity in the currency market to provide accurate fixings. Addition of currencies not meeting these criteria will be at WM's discretion and in theory any world currency may be included.

In 2004, the currency coverage was increased by 49, taking the total number of spot rate currencies provided to 156.

The coverage of the WM/Reuters rates is shown under 2.6, page 6.

The European legacy currencies (ATS, BEF, CYP, DEM, FRF, FIM, GRD, IEP, ITL, LUF, MTL, NLG, PTE, ESP & SIT) are included, but these are derived from the fixed conversion factor and the USD/EUR quote. An example of this calculation is included under 6.2, page 12. The XEU (European Currency Unit—ECU) is also included, but this is equal to the Euro value.

In addition to publishing daily Rates at the hourly fixing times from Monday 7 a.m. in Sydney to Friday 10 p.m. in the UK, there are also 10 years of WM/Reuters Closing Spot Rate (4 p.m. fix) history available which are archived daily.

## 2.2 TIMING

The Rates are intended to be 'intraday and closing' rates. The normal calculation times are hourly from Monday 7 a.m. in Sydney until Friday 10 p.m. in the UK.

Different calculation times may be used for reasons which include the following:

- > An earlier time is chosen by WM according to the Policy on National Holidays (see 4.2, page 10).
- > An earlier or later time is chosen by WM due to technical difficulties in receiving or failure in supply of the source financial data.
- > An earlier or later time is chosen by WM for particular currencies due to special market conditions.
- > WM's target for completion of calculation and publication of the service is 15 minutes after the fix time.
- > The rates fixed at 4 p.m. UK time are the Closing Spot Rates.

## 2.3 SOURCING

The Reuters System is the primary source of the spot foreign exchange rates used in the calculation of the Rates. Other sources may be used by exception where the appropriate rates are not available on the Reuters System. Presently the Central Bank spot rate is used for a number of currencies where there is no accurate alternative. A list of these currencies is available on request.

As far as possible, the underlying rates used are those deemed to be the most appropriate for foreign investment transactions.

A different type of rate may be selected by WM for reasons which include the following:

- > Commercial interbank bid and offer rates are not available for a particular currency.
- > An 'official' fixing is created which is more appropriate for foreign investment transactions.

Wherever possible, a multi-contributor source of rates is used in preference to a single contributor unless an 'official' fixing is being used.

The 'base' currency for quoted rates selected from the Reuters System is the US dollar or the Euro, depending on which base currency is predominant. Presently currencies which are predominantly based against the Euro are CHF, CZK, DKK, EEK, HUF, LTL, LVL, NOK, PLN, RON, SEK and SKK. All other currencies are based against the US Dollar. However, this may be changed for particular currencies if WM believes that 'better' quotations are available against a different base currency.

It is a convention in the FX markets that some currencies are quoted against the USD on an inverted basis. Normally a local currency is expressed per 1USD: for example, 1USD = x.xxxx CAD. An inverted currency is expressed per local currency: for example 1GBP = x.xxxx USD. Normally, a local currency amount would be divided by the exchange rate to get a USD amount, but for inverted currencies, the local currency amount is multiplied by the exchange rate to get a USD amount. This convention applies only to rates quoted against the USD, not rates quoted against any other currency. These inverted currencies are GBP, EUR, AUD, NZD, IEP, BWP, SBD, TOP, WST, XEU.

Rates from Reuters Dealing 3000 are used as the basis for specific currencies (AUD, CAD, CZK, DKK, GBP, HKD, HUF, ILS, MXN, NOK, NZD, PLN, RON, SEK, SGD, SKK, TRY and ZAR). Rates from EBS are used as the basis for other specific currencies (CHF, EUR, JPY). These currencies are referred to as 'Trade currencies'.

The choice of rates for any particular currency lies with WM. Other market sources may be used by WM for quality control purposes.

## 2.4 CALCULATION METHOD

The foreign exchange market is constantly monitored by capturing rates every 15 seconds and performing continuous and interactive validation. This dynamic system identifies currency issues and outliers in advance.

### 2.4.1 NON-TRADE CURRENCIES

On the hour, the snapshots of the quoted rates, taken from Reuters over a two-minute fix period, are extracted. The median rates are then selected from these individual snapshots for each currency. This is done independently for bid and offer quotes. Further quality checks are applied by WM to these median bid and offer rates (while every effort is made to ensure the quality of the service, no guarantee of accuracy can be given).

### 2.4.2 TRADE CURRENCIES

Over a one-minute fix period, bid and offer order rates from the order matching systems and actual trades executed are captured every second from 30 seconds before to 30 seconds after the time of the fix. Trades are identified as a bid or offer and a spread is applied to calculate the opposite bid or offer.

Using valid rates over the fix period, the median bid and offer are calculated independently and then the mid rate is calculated from these median bid and offer rates, resulting in a mid Trade rate and a mid Order rate. A spread is then applied to calculate a new Trade rate bid and offer and a new Order rate bid and offer. Subject to a minimum number of valid trades being captured over the fix period, these new Trade rates are used for the fix; if there are insufficient Trade rates, the new Order rates are used for the fix.

Further quality checks are then applied to ensure accurate fix rates are published.

If neither Trade rates nor Order rates are available, the quoted rates from Reuters are used, as they are for the non-trade currencies.

The method of fixing the rates is protected by a Patent pending, US serial 09/972,193.

Once the Rates have been validated, cross rates to GBP and EUR are calculated. An example of these calculations are included under 6.1, page 12. Cross-rates to further base currencies may be published and if so these will be calculated using the same principles. The validation process used is protected by a patent application.

Certain rates are calculated from other currencies or from proportions of other currencies, e.g., XDR (Special Drawing Rights).

All Rates are published using standard market quotation conventions. ISO codes are used.

Bid, Offer and Mid rates are derived. Mid rates are calculated as the arithmetic mean of rounded Bid and Offer rates. Bid and Offer rates are published to four decimal places; the Mid rates are published to five decimal places. Where a '5' is encountered, the convention is to round up.

Under exceptional circumstances, it may be necessary to amend the Rates for one or more currencies after publication. This will be determined by WM, after consultation with key users if appropriate. Under no circumstances will the WM/Reuters Spot Rates for one day be amended after the publication of the following (weekday's) Rates.

## 2.5 SPOT RATE PRODUCTS

- > Closing Spot Rates
- > Historical Spot Rates
- > Intraday Spots

A currency converter using the Closing Spot Rates is available on the WM Company website ([WWW.WMCOMPANY.COM](http://WWW.WMCOMPANY.COM)) under 'Market Data'.

## 2.6 COVERAGE OF CLOSING AND INTRADAY SPOT RATES

COVERAGE IS CURRENTLY 158 CURRENCIES:

### EUROPE

Albania Lek	ALL	Austrian Schilling	ATS	Belarus Ruble	BYR
Belgian Franc	BEF	Bosnia Herzegovina Mark	BAM	Bulgarian Lev	BGN
Croatian Kuna	HRK	Cyprus Pound	CYP	Czech Koruna	CZK
Danish Krone	DKK	Estonian Kroon	EEK	Ecu	XEU
Euro	EUR	Finnish Markka	FIM	French Franc	FRF
Deutsche Mark	DEM	Greek Drachma	GRD	Hungarian Forint	HUF
Iceland Krona	ISK	Irish Punt	IEP	Italian Lira	ITL
Latvian Lat	LVL	Lithuanian Litas	LTL	Luxembourg Franc	LUF
Macedonia Denar	MKD	Maltese Lira	MTL	Moldova Leu	MDL
Dutch Guilder	NLG	Norwegian Krone	NOK	Polish Zloty	PLN
Portugese Escudo	PTE	Romanian Leu	RON	Russian Ruble	RUB
Slovakian Koruna	SKK	Slovenian Tolar	SIT	Spanish Peseta	ESP
British Pound	GBP	Swedish Krona	SEK	Swiss Franc	CHF
Turkish New Lira	TRY	Ukraine Hryvnia	UAH	Serbian Dinar	RSD
Special Drawing Rights	XDR				

### AFRICA & GULF

Algerian Dinar	DZD	Angola Kwanza	AOA	Bahrain Dinar	BHD
Botswana Pula	BWP	Burundi Franc	BIF	Central African Franc	XAF
Comoros Franc	KMF	Congo Dem. Rep. Franc	CDF	Cote D'Ivoire Franc	XOF
Egyptian Pound	EGP	Ethiopia Birr	ETB	Gambian Dalasi	GMD
Ghana Cedi	GHS	Guinea Franc	GNF	Iran Rial	IRR
Israeli Shekel	ILS	Jordanian Dinar	JOD	Kenyan Shilling	KES
Kuwaiti Dinar	KWD	Lebanese Pound	LBP	Lesotho Loti	LSL
Malagasy Ariary	MGA	Malawi Kwacha	MWK	Mauritanian Ouguiya	MRO
Mauritius Rupee	MUR	Moroccan Dirham	MAD	Mozambique Metical	MZN
Namibia Dollar	NAD	Nigerian Naira	NGN	Omani Rial	OMR
Qatar Rial	QAR	Rwanda Franc	RWF	Saudi Arabian Riyal	SAR
Seychelles Rupee	SCR	Sierra Leone Leone	SLL	South African Rand	ZAR
Sudan Pound	SDG	Swaziland Lilangeni	SZL	Tanzania Shilling	TZS
Tunisian Dinar	TND	UAE	AED	Ugandan Shilling	UGX
Yemen Rial	YER	Zambian Kwacha	ZMK	Zimbabwe Dollar	ZWD
Zim Dollar Notional	ZDN				

### ASIA PACIFIC

Australian Dollar	AUD	Azerbaijan Manat	AZN	Bangladesh Taka	BDT
Bhutan Ngultrum	BTN	Brunei Dollar	BND	Chinese R. Yuan	CNY
Fiji Islands Dollar	FJD	Georgia Lari	GEL	Hong Kong Dollar	HKD
Indian Rupee	INR	Indonesian Rupiah	IDR	Japanese Yen	JPY
Kazakhstan Tenge	KZT	Kyrgystan Som	KGS	Macao Pataca	MOP
Malaysian Ringgit	MYR	Maldives Rufiyaa	MVR	Mongolia Tugrik	MNT
Nepal Rupee	NPR	New Zealand Dollar	NZD	Pacificque Franc	XPF
Pakistani Rupee	PKR	Papua NG Kina	PGK	Philippine Peso	PHP
Samoa Tala	WST	Singapore Dollar	SGD	Solomon Islands Dollar	SBD
South Korean Won	KRW	Sri Lanka Rupee	LKR	Taiwan Dollar	TWD
Thai Baht	THB	Thai Baht Offshore	TOF	Tonga Pa'anga	TOP
Uzbekistan Som	UZS	Vanuatu Vatu	VUV	Vietnam Dong	VND

### AMERICAS

Argentine Peso	ARS	Aruba Guilder	AWG	Bahamas Dollar	BSD
Barbados Dollar	BBD	Belize Dollar	BZD	Bermudan Dollar	BMD
Bolivian Boliviano	BOB	Brazilian Real	BRL	Canadian Dollar	CAD
Cayman Islands Dollar	KYD	Chilean Peso	CLP	Colombian Peso	COP
Costa Rica Colon	CRC	Cuba Peso	CUP	Dominican Republic Peso	DOP
East Caribbean Dollar	XCD	Ecuadorian Sucre	ECS	El Salvador Colon	SVC
Guatemala Quetzal	GTQ	Haiti Gourde	HTG	Honduras Lempira	HNL
Jamaica Dollar	JMD	Mexican Peso	MXN	Netherlands Antilles Guilder	ANG
Nicaragua Gold Cordoba	NIO	Panama Balboa	PAB	Paraguay Guarano	PYG
Peru New Sol	PEN	Surinam Dollar	SRD	Trinidad & Tobago Dollar	TTD
Uruguay Peso	UYU	US Dollar	USD	Venezuelan Bolivar Fuerte	VEF

## SECTION 3—THE WM/REUTERS CLOSING FORWARD RATES

### 3.1 COVERAGE

The Rates are intended to cover the currencies for those countries where a significant level of forward trading exists in the country's currency and where forward quotes are reliably available on Reuters.

The coverage is presently 72 currencies, which is periodically reviewed as more information is made available in the market. Bid, Offer and Mid rates against the USD, GBP and EUR are provided. A list of currencies covered is under 3.6, page 9.

The time periods covered for the Forward rates are:

ON—Overnight  
TN—Tomorrow Next  
SW—One Week (Spot Week)  
1M—One Month  
2M—Two Months  
3M—Three Months  
6M—Six Months  
9M—Nine Months  
1Y—One Year  
2Y—Two Years (some currencies only)  
5Y—Five Years (some currencies only)

### 3.2 TIMING

The Closing Rates are published only once per day. The normal calculation time is as at 4 p.m. UK time, consistent with the Closing Spot rates.

A different calculation time may be used for reasons, which include the following:

- > An earlier time is chosen by WM according to the Policy on National Holidays (see below).
- > An earlier or later time is chosen by WM due to technical difficulties in receiving or failure in supply of the source financial data.
- > An earlier or later time is chosen by WM for particular currencies due to special market conditions.

WM's target time for the publication of the service is 4.30 p.m. UK time.

Intraday Forwards are produced hourly from 7 a.m. to 9 p.m. UK time.

### 3.3 SOURCING

The Reuters System is the primary source of the forward foreign exchange rates used in the calculation of the Rates. Other sources may be used by exception where the appropriate rates are not available on the Reuters System.

As far as possible the underlying rates used are those deemed to be the most appropriate for foreign investment transactions. These will normally be commercial interbank bid and offer premiums or discounts.

A different type of rate may be selected by WM if commercial interbank bid and offer rates are not available for a particular currency. Some rates are calculated from interest rates.

The 'base' currency for rates selected from the Reuters System will normally be the US dollar. However this may be changed for particular currencies if WM believes that 'better' quotations are available against a different base currency.

The choice of rates for any particular currency lies with WM and other market sources are used by WM for quality control purposes.

Some currencies are 'NDF', non-deliverable forwards. These currencies are ARS, BRL, CLP, CNY, COP, PEN and TWD. Also, due to there being a distinct 'Onshore' and 'Offshore' forward rates for SGD and THB, we provide Offshore rates.

### **3.4 CALCULATION METHOD**

A capture of the current premium/discounts is taken from multi-contributor sources on the Reuters System at or around the time of the fix.

A range of quality control checks is applied by WM (while every effort is made to ensure the quality of the service, no guarantee of accuracy can be given).

Once the Rates have been validated, premiums and discounts to GBP and EUR are calculated using the outright forward rates, an example of this is under 6.3, page 13. Legacy currency premium/discounts are calculated using the fixed Euro conversion rates—an example is shown under 6.4, page 13. Further base currencies may be published, and if so, these will be calculated using the same principles.

All forward rates are published using premiums or discounts that can be directly added to the spot rate to provide an outright forward rate. Note that ON and TN premiums/discounts should be subtracted from the spot rate to calculate an outright forward rate. ISO codes are used.

All forward rates (Bid, Offer and Mid) are rounded to five decimal places after the decimal point. Where a '5' is encountered, the convention is to round up.

The method of fixing the rates is protected by a Patent pending, US serial 2002-0042765.

Under exceptional circumstances, it may be necessary to amend the Rates for one or more currencies after publication. This will be determined by WM, after consultation with key users if appropriate. Under no circumstances will the Rates for one day be amended after the publication of the following (weekday's) Rates.

WM reserve the right to correct missing or incorrect rates by substituting them with previous quotes, forward premiums or discounts derived from interest rate differentials, forward premiums or discounts derived by interpolation between adjacent quoted rates, or by any other means.

### **3.5 FORWARD RATE PRODUCTS**

- > Closing Forward rates
- > Historical Forward rates
- > Intraday Forwards rates

### 3.6 COVERAGE OF FORWARD RATES

#### EUROPE

Austrian Schilling	ATS	Belgian Franc	BEF	Bulgarian Lev	BGN
Croatian Kuna	HRK	Cyprus Pound	CYP	Czech Koruna	CZK
Danish Krone	DKK	Estonian Kroon	EEK	Ecu	XEU
Euro	EUR	Finnish Markka	FIM	French Franc	FRF
Deutsche Mark	DEM	Greek Drachma	GRD	Hungarian Forint	HUF
Iceland Krona	ISK	Irish Punt	IEP	Italian Lira	ITL
Latvian Lat	LVL	Lithuanian Litas	LTL	Maltese Lira	MTL
Dutch Guilder	NLG	Norwegian Krone	NOK	Polish Zloty	PLN
Portuguese Escudo	PTE	Romanian Leu	RON	Russian Ruble	RUB
Slovakian Koruna	SKK	Slovenian Tolar	SIT	Spanish Peseta	ESP
British Pound	GBP	Swedish Krone	SEK	Swiss Franc	CHF
Turkish New Lira	TRY	Ukraine Hryvnia	UAH		

#### AFRICA & GULF

Bahrain Dinar	BHD	Egyptian Pound	EGP	Israeli Shekel	ILS
Jordanian Dinar	JOD	Kenyan Shilling	KES	Kuwaiti Dinar	KWD
Moroccan Dirham	MAD	Omani Rial	OMR	Qatar Rial	QAR
Saudi Arabian Riyal	SAR	South African Rand	ZAR	Tunisian Dinar	TND
UAE Dirham	AED				

#### ASIA PACIFIC

Australian Dollar	AUD	Chinese R. Yuan	CNY	Hong Kong Dollar	HKD
Indian Rupee	INR	Indonesian Rupiah	IDR	Japanese Yen	JPY
Kazakhstan Tenge	KZT	Malaysian Ringgit	MYR	New Zealand Dollar	NZD
Pakistani Rupee	PKR	Philippine Peso	PHP	Singapore Dollar	SGD
South Korean Won	KRW	Taiwan Dollar	TWD	Thai Baht	THB
Thai Baht Offshore	TOF				

#### AMERICAS

Argentine Peso	ARS	Brazilian Dollar	BRL	Canadian Dollar	CAD
Chilean Peso	CLP	Colombian Peso	COP	Mexican Peso	MXN
Peru New Sol	PEN	US Dollar	USD	Venezuelan Bolivar Fuerte	VEF

## SECTION 4—THE SPOT & FORWARD RATES

### 4.1 INDEX COMPILERS

The following index compilers use WM/Reuters rates in the calculation of their indices:

#### **EQUITY:**

Morgan Stanley Capital International Inc

FTSE International Ltd

Citigroup Global Markets Ltd (formerly Salomon Smith Barney)

Standard & Poor's

STOXX Ltd

#### **BOND:**

International Index Co.,

Lehman Brothers Ltd,

Merrill Lynch, Pierce, Fenner & Smith Inc

Morgan Stanley Capital International Inc,

JP Morgan Securities Ltd,

Citigroup Global Markets Ltd (formerly Salomon Smith Barney Inc)

### 4.2 POLICY ON NATIONAL HOLIDAYS

The fixings will be produced on all weekdays of the year, subject to the policy detailed below. For further information there is a schedule available that covers the Service Alterations up to 2013—please contact us if you would like a copy.

On National Holiday dates, the principle is that the Rates should be fixed at the normal times up to the latest fix time possible without compromising the quality of the Rates.

In practice, National Holidays in the following four financial centres will be monitored in advance: USA, UK, Germany, and Japan. WM/Reuters Closing Spot and Forward Rates will be produced as normal if two or more of these centres are open. WM/Reuters Intraday Spot and Forward Rates may not be produced for all fixings in any day if one or more of these financial centres are closed.

If only one centre is open, the normal policy will be that no fixings will be produced and the Rates from the previous fixing would be used. However, if such a situation occurs on a month-end, then further analysis will be carried out as to other markets that are open and a decision taken as to whether or not to produce fixings.

Special circumstances may arise on the last weekdays prior to Christmas Day and New Years Day where although markets are open, they may close early and therefore be illiquid at some normal fixing times. Under these circumstances, WM may take a decision to revert to an earlier fixing to ensure the integrity of the Rates.

### 4.3 DELIVERY METHODS

All services are available directly from the WM Company on an hourly, daily or monthly basis utilising web-based technology. These delivery methods range from e-mail to faster methods for time-critical applications.

Also, the services are available via a range of data distributors including (in alphabetical order):

- > Bloomberg
- > Fininfo
- > GL Trade
- > Global Insight
- > IDC
- > Linedata
- > Markit
- > Morningstar
- > Nomura Research Institute
- > NTT Data Financial
- > Proquote
- > QED
- > Rimes
- > Six Telekurs
- > Thomson Financial (Including Datastream)
- > Thomson Reuters
- > Valuelink Information Services
- > WM Company website

## SECTION 5—OTHER INFORMATION

Whether subscribing directly or via a data vendor, WM will keep you informed of any changes to the WM/Reuters Services or currency issues. You can contact us by telephone or e-mail — a service representative will be available 24 hours from Monday 7 a.m. in Sydney until Friday 10 p.m. in the UK.

**WM/REUTERS SERVICES TEL +(44)131-315-5515 E-MAIL: FX.RATES@WMCOMPANY.COM**

## SECTION 6—CROSS CALCULATIONS

### 6.1 CROSSED SPOT RATES

#### 6.1.1 FOR CURRENCIES QUOTED IN UNITS TO USD (E.G., CANADIAN DOLLAR):

*Sterling Cross Calculation*

$$\begin{aligned}\text{GBP/CAD Bid} &= (\text{USD/CAD Bid}) * (\text{GBP/USD Bid}) \\ \text{GBP/CAD Offer} &= (\text{USD/CAD Offer}) * (\text{GBP/USD Offer})\end{aligned}$$

*Euro Cross Calculation*

$$\begin{aligned}\text{EUR/CAD Bid} &= (\text{USD/CAD Bid}) * (\text{EUR/USD Bid}) \\ \text{EUR/CAD Offer} &= (\text{USD/CAD Offer}) * (\text{EUR/USD Offer})\end{aligned}$$

#### 6.1.2 FOR CURRENCIES QUOTED IN USD PER UNIT (E.G., AUSTRALIAN DOLLAR):

*Sterling Cross Calculation*

$$\begin{aligned}\text{GBP/AUD Bid} &= (\text{GBP/USD Bid}) / (\text{AUD/USD Offer}) \\ \text{GBP/AUD Offer} &= (\text{GBP/USD Offer}) / (\text{AUD/USD Bid})\end{aligned}$$

*Euro Cross Calculation*

$$\begin{aligned}\text{EUR/AUD Bid} &= (\text{EUR/USD Bid}) / (\text{AUD/USD Offer}) \\ \text{EUR/AUD Offer} &= (\text{EUR/USD Offer}) / (\text{AUD/USD Bid})\end{aligned}$$

#### 6.1.3 FOR CURRENCIES QUOTED IN UNITS TO EUR (E.G., SWISS FRANC):

*USD Cross Calculation*

$$\begin{aligned}\text{USD/CHF Bid} &= (\text{EUR/CHF Bid}) / (\text{EUR/USD Offer}) \\ \text{USD/CHF Offer} &= (\text{EUR/CHF Offer}) / (\text{EUR/USD Bid})\end{aligned}$$

*Sterling Cross Calculation*

$$\begin{aligned}\text{GBP/CHF Bid} &= (\text{USD/CHF Bid}) * (\text{GBP/USD Bid}) \\ \text{GBP/CHF Offer} &= (\text{USD/CHF Offer}) * (\text{GBP/USD Offer})\end{aligned}$$

### 6.2 EMU LEGACY SPOT RATES

The same principle applies for all Legacy currencies. DEM is used in the formula below.

#### TO CALCULATE THE USD/DEM BID RATE:

Invert the EUR/USD Offer rate this now becomes USD/EUR Bid

*Then:*

$$\text{USD/DEM Bid} = \text{USD/EUR Bid} * \text{EUR Fixed Conversion Rate}$$

#### TO CALCULATE THE USD/DEM OFFER RATE:

Invert the EUR/USD Bid rate, this now becomes the USD/EUR Offer rate.

*Then:*

$$\text{USD/DEM Offer} = \text{USD/EUR Offer} * \text{EUR Fixed Conversion Rate}$$

### 6.3 CROSSED FORWARD RATES

#### FOR EXAMPLE, TO CALCULATE GBP/CAD 1 MONTH BID PREMIUM/DISCOUNT

Use the Bid rate for all following calculations.

Add the USD/CAD 1 month premium/discount to the USD/CAD spot rate.

= the USD/CAD 1 month outright forward rate

Add the GBP/USD 1 month premium/discount to the GBP/USD spot rate

= the GBP/USD 1 month outright forward rate

Multiply these two outright forward rates together

= the GBP/CAD 1 month outright rate

GBP/CAD 1 month outright forward rate – GBP/CAD spot rate

= GBP/CAD 1 month premium/discount

Therefore:

USD/CAD 1M prem/disc Bid + USD/CAD spot Bid = USD/CAD 1M outright rate Bid

GBP/USD 1M prem/disc Bid + GBP/USD spot Bid = GBP/USD 1M outright rate Bid

USD/CAD 1M outright rate Bid \* GBP/USD 1M outright rate Bid = GBP/CAD 1M outright rate Bid

GBP/CAD 1M outright rate Bid – GBP/CAD spot Bid = GBP/CAD 1M prem/disc Bid

## 6.4 EMU LEGACY FORWARD RATES

### FOR EXAMPLE TO CALCULATE USD/DEM 1 MONTH BID PREMIUM/DISCOUNT

*Add the EUR/USD 1 month Ask premium/discount to the EUR/USD Ask spot rate.*

= the EUR/USD 1 month outright Ask forward rate

Invert EUR/USD this Ask figure now becomes the Bid

= USD/EUR 1 month outright Bid forward rate

Multiply the newly created USD/EUR Bid rate and the EUR/DEM fixed conversion rate

= the USD/DEM 1 month outright Bid rate

USD/DEM 1 month outright Bid rate – USD/DEM spot Bid rate

= USD/DEM 1 month Bid premium/discount rate

*Therefore:*

EUR/USD 1M prem/disc Ask + EUR/USD spot Ask = EUR/USD 1M outright rate Ask

USD/EUR \*EUR/DEM conversion rate = USD/DEM 1M outright Bid

USD/DEM 1M outright rate Bid – USD/DEM spot bid rate = USD/DEM 1M Bid prem/disc forward rate





**STATE STREET**

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