

**8.FOREX MARKET DEALS:****Unit Structure:**

8.1 Learning Objectives

8.2 Introduction

8.3 Types

8.4 Quotes

8.5 Ask/ Bid

**8.1 LEARNING OBJECTIVES:**

After studying this lesson you are able to:

- Understand various Deals in Forex Markets
- Understand Quotes
- Understand Ask/ Bid rates

**8.2. INTRODUCTION:****-FOREIGN EXCHANGE TRANSACTIONS:**

Foreign Exchange Transactions (FETs) A FET is a binding agreement between you and WUBS in which one currency is sold or bought against another currency at an agreed Exchange Rate on the current date or at a specified future date.

**8.3 TYPES OF FOREIGN EXCHANGE TRANSACTION:**

1. SPOT
2. FORWARD
3. FUTURE
4. OPTION
5. SWAPS 6. ARBITRAGE

**1. SPOT MARKET:**

- The term spot exchange refers to the class of foreign exchange transaction which requires the immediate delivery or exchange of currencies on the spot.
- In practice the settlement takes place within two days in most markets.
- The rate of exchange effective for the spot transaction is known as the spot rate and the market for such transactions is known as the spot market.

**2. FORWARD MARKET:**

- The forward transactions is an agreement between two parties, requiring the delivery at some specified future date of a specified amount of foreign currency by one of the parties, against payment in domestic currency by the other party, at the price agreed upon in the contract.
- The rate of exchange applicable to the forward contract is called the forward exchange rate and the market for forward transactions is known as the forward market.

- The foreign exchange regulations of various countries generally regulate the forward exchange transactions with a view to curbing speculation in the foreign exchanges market.
- In India, for example, commercial banks are permitted to offer forward cover only with respect to genuine export and import transactions.
- Forward exchange facilities, obviously, are of immense help to exporters and importers as they can cover the risks arising out of exchange rate fluctuations by entering into an appropriate forward exchange contract.
- With reference to its relationship with spot rate, the forward rate may be at **par, discount or premium**. If the forward exchange rate quoted is exact equivalent to the spot rate at the time of making the contract the forward exchange rate is said to be **at par**.
- The forward rate for a currency, say the dollar, is said to be **at premium** with respect to the spot rate when one dollar buys more units of another currency, say rupee, in the forward than in the spot rate on a per annum basis.
- The forward rate for a currency, say the dollar, is said to be **at discount** with respect to the spot rate when one dollar buys fewer rupees in the forward than in the spot market. The discount is also usually expressed as a percentage deviation from the spot rate on a per annum basis.
- The forward exchange rate is determined mostly by the demand for and supply of forward exchange. Naturally when the demand for forward exchange exceeds its supply, the forward rate will be quoted at a premium and conversely, when the supply of forward exchange exceeds the demand for it, the rate will be quoted at discount. When the supply is equivalent to the demand for forward exchange, the forward rate will tend to be at par.

### **3. FUTURES:**

- While a forward contract is similar to a forward contract, there are several differences between them.
- While a forward contract is tailor made for the client by his international bank, a future contract has standardized features the contract size and maturity dates are standardized. Futures can be traded only on an organized exchange and they are traded competitively.
- Margins are not required in respect of a forward contract but margins are required of all participants in the futures market an initial margin must be deposited into a collateral account to establish a futures position.

**4. OPTIONS:**

- While the forward or futures contract protects the purchaser of the contract from the adverse exchange rate movements, it eliminates the possibility of gaining a windfall profit from favorable exchange rate movement.
- An option is a contract or financial instrument that gives holder the right, but not the obligation, to sell or buy a given quantity of an asset at a specified price at a specified future date.
- An option to buy the underlying asset is known as a call option and an option to sell the underlying asset is known as a put option.
- Buying or selling the underlying asset via the option is known as exercising the option. The stated price paid (or received) is known as the exercise or striking price.
- The buyer of an option is known as the long and the seller of an option is known as the writer of the option, or the short. The price for the option is known as premium.
- **Types of options:** With reference to their exercise characteristics, there are two types of options, American and European. A European option can be exercised only at the maturity or expiration date of the contract, whereas an American option can be exercised at any time during the contract.

**5. SWAP:**

- Commercial banks who conduct forward exchange business may resort to a swap operation to adjust their fund position.
- The term swap means simultaneous sale of spot currency for the forward purchase of the same currency or the purchase of spot for the forward sale of the same currency.
- The spot is swapped against forward.
- Operations consisting of a simultaneous sale or purchase of spot currency accompanied by a purchase or sale, respectively of the same currency for forward delivery are technically known as swaps or double deals as the spot currency is swapped against forward.

**6. ARBITRAGE:**

Arbitrage is the simultaneous buying and selling of foreign currencies with intention of making profits from the difference between the exchange rate prevailing at the same time in different markets.

**8. 4. FOREIGN EXCHANGE QUOTES:**

Currency pairs and the rate of exchange Every foreign exchange transaction is an exchange between a pair of currencies. Each currency is denoted by a unique three-character International Standardization Organization (ISO) code (e.g. GBP represents sterling and USD the US dollar). Currency pairings are expressed as two ISO codes separated by a division symbol (e.g. GBP/USD), the first representing the "base

currency" and the other the "secondary currency" or "quoted currency". The rate of exchange is simply the price of one currency in terms of another. Base currency is the one you are buying or selling.

For example  $GBP/USD = 1.5545$  denotes that one unit of sterling (the base currency) can be exchanged for 1.5545 US dollars (the secondary currency). Exchange rates are usually written to four decimal places, with the exception of Japanese yen which is written to two decimal places. The rate to two (out of four) decimal places is known as the "big figure" while the third and fourth decimal places together measure the "points" or "pips". For instance, in  $GBP/USD = 1.5545$  the "big figure" is 1.55 while the 45 (i.e. the third and fourth decimal places) represents the points.

**-COMMON CURRENCY SYMBOL:**

- I. USD : US Dollar
- II. HKD : Hong Kong Dollar
- III. EUR: Euro
- IV. JPY: Japanese Yen
- V. GBP: British Pound
- VI. CHF: Swiss Franc
- VII. CAD: Canadian Dollar
- VIII. SGD: Singapore Dollar
- IX. AUD: Australian Dollar
- X. RMB: Chinese RMB
- XI. INR: Indian Rupee

**-Exchange Rates are quoted in following format:**

$USD/INR = 46.8000(\text{Bid Rate}) / 46.9000(\text{Ask Rate})$

Above represents amount of currency in denominator (here INR) to be paid for each unit of currency in numerator (here USD). Quotation is always in double numbers with minor difference between the two. First number is called the Bid Rate and second number is called Ask Rate. Bid rate is always lower than the Ask Rate.

**-DIRECT AND INDIRECT QUOTES:**

**\*DIRECT QUOTES:** Gives the units of currency of domestic country per unit of a foreign currency. Price of foreign currency is quoted in terms of home currency. In this system variable units of home currency equivalent to affixed unit of foreign currency are quoted. Domestic currency is quoted currency For Eg –  $USD/INR = 45.30 \text{ Rs.} / \$$ .

**\*INDIRECT QUOTES:** Gives the units of currency of foreign country per unit of the domestic currency. Price of home currency is quoted in terms of foreign currency. In this system variable units of foreign currency equivalent to affixed unit of home currency are quoted. Foreign currency is the quoted currency For Eg –  $INR/USD = 0.0220 \$ / \text{Rs.}$

**-AMERICAN TERMS / EUROPEAN TERMS / CROSS RATE**

Exchange rate quoted in American Terms

- USD becomes the quoted currency.
- **For Eg – INR/USD = 0.0220 \$ / Rs.**

Exchange rate quoted in European Terms

- USD becomes the base currency
- **For Eg – USD/INR = 45.30 Rs. / \$. Or USD/CHF = 1.4550 CHF/\$.**

Cross Rate

- Quotation between two non-dollar currencies
- **For Eg – GBP/INR = 90.4587 Rs. /pound**

**-CROSS RATES:**

USD is the most widely traded currency and is often used as the vehicle currency. This helps in reduction of no. of quotes in the market, as exchange rate between two currencies can be determined through their quotes against the USD. Any quote not against the USD is a Cross Quote. Availability of USD quote for all currencies can help in determining the exchange rate for any pair of currencies by using the cross rate. For eg. Cross quote for EUR-GBP = EUR/USD \* USD/GBP.

**8.5 BID AND ASK RATE:****-Bid rate:**

- Price at which the Forex dealer is willing to buy a unit of the base currency
- As a customer this will be the price at which you will sell the currency.

**-Ask rate/offer rate:**

- Price at which the Forex dealer is willing to sell a unit of the base currency
- As a customer this will be the price at which the currency is offered to you or at which you buy. Eg – USD/CHF = 1.4550/1.4560 □

**-Spread** As stated earlier, there is always a positive difference between Ask Rate and Bid rate. This difference is called Spread and it is the profit margin that the dealer earns by trade.

**Spread = Ask Rate - Bid Rate**

**Spread % =  $\frac{AR - BR}{BR} \times 100$**

Forex market behaves like any other commodity market. Here too, there is whole sale and retail market.

**Whole sale market:** consists of Authorised Dealers and Big Corporate Houses like TCS, Infosys and Wipro who have high forex exposures. But spreads in whole sale market are lower.

**Retail Market:** is populated by money changers, ordinary citizens, small exporters and importers and small corporates.

**Positions:**

In any financial market, two positions can be taken (a) Long or overbought position and (b) Short or oversold position.

Positions are taken in anticipation of currency exchange rate movement in one direction.

If a position is taken and the trend appears to be reversing (currency depreciates against expectation of appreciation or vice-versa), the positions are liquidated by manipulating the

**-Bid and Ask rates: Example** If it is a long/overbought position, both Ask and Bid rates will be lowered. Similarly, if there is an oversold position, both Ask rate and Bid Rate will be hiked.

The quotations are normally in four decimal places. If a dollar is being quoted against Rupee, it will be quoted as follows: -

46.5230/46.5250

First figure of quote is Bid Rate and second figure is Ask Rate. Third and fourth decimal places are called PIPS. Thus, in the above case, 30 and 50 are pips.

In most cases, quotations are abbreviated to give only two or three digit pips in place of Ask Rate. Thus, above quote could also be represented as: -

46.5230/50

Inter dealer quotes are further abbreviated to only three digit pips on both sides since base rate of up to first decimal place is common across all dealers and therefore assumed to be known.

**PROBLEM:**

Identify the names of respective countries where the following is a direct quote. For each find indirect quote in that country.

Rs.75.31	= GBP 1
USD 1	= Rs. 48.30
Re 1	= Sw. Kr. 0.2055
Rs. 126.26	= Omani Riyal 1
GBP 1	= \$ 0.639

**Solution:**

	Quote		Country in which this is a Direct Quote	indirect Quote
(i)	Rs. 75.31	= GBP 1	India	£ 1.3278/100 Rs.
(ii)	USD 1	= Rs. 48.30	India	\$2.0704/100 Rs
(iii)	Re. 1	= Sw. Kr. 0.2055	Sweden	Rs. 4.8662/Sw. Kr.
(iv)	Rs. 126.26	=Omani Riyal 1	India	Omani Riyal 0.7920/100 Rs.
(v)	GBP 1	= \$0,639	USA	£1.5649/\$

**PROBLEM**

Quotation for Pound Sterling in Indian Rupees is GBP INR 68.87/70.24.  
Calculate percentage spread.

**Solution:**

The quote is 68.87 bid and 70.24 ask.

$$\text{Hence, Spread} = \frac{70.24 - 68.87}{70.24} \times 100$$

$$= 0.01950$$

i.e. 1.950%

**PROBLEM:**

The following quote is given.

USD 1 = CAD 1.1630/50.

Identify the country in which this is a direct quote.

Find the mid-rate, spread and the spread percentage.

Calculate the inverse quote.

**Solution:**

Given value is 1.1630/50 in CAD.

Hence this is a direct quote in CAD i.e. in Canada.

$$\text{Mid-Rate} = \frac{(\text{Ask} + \text{Bid})}{2} = \frac{(1.1650 + 1.1630)}{2}$$

$$= 1.1640$$

So, Mid-Rate is USD1= CAD 1.1640

Spread = Ask- Bid = 1.1650-1.1630 = 0.0020

$$\% \text{ Spread} = \frac{\text{Spread}}{\text{Ask}} \times 100 = 0.17\%$$

To  $\frac{1}{\text{Ask}} = \frac{1}{1.1650}$  calculate inverse quote:

$$\frac{1}{\text{Bid}} = \frac{1}{1.1630} \quad \text{Bid} = 0.8584$$

$\frac{1}{\text{Bid}} = \frac{1}{1.1630}$  Ask = 0.8598 Hence, inverse quote is CAD 1 = USD 0.8584 / 0.8598

**PROBLEM:**

The following quote is given in New York:

EUR 1 = USD 1.2596 / 1.2620

Is it a direct or indirect quote?

Find the midrate, spread and the % spread. Calculate inverse quote.

**PROBLEM:**

The following quote is given in Mumbai.

1 USD = Rs. 44.7250 - Rs. 44.7300 Is it a direct or indirect quote? Find the mid-rate, spread and the spread percentage. Calculate the inverse quote.

**Spreads on Forward Currency Quotations:**

The spread on a forward currency quotation is calculated in the same manner as the spread for a spot currency quotation.

The reasons that spreads vary with forward foreign currency quotations are similar to the reasons for the variability of spreads with spot foreign currency quotations. The unique factor associated with spreads for forward foreign currency quotations is that spreads will widen as the length of time until settlement increases. Currency exchange rates would be expected to have a higher range of fluctuations over longer periods of time, which increases dealer risk. Also, as time increases, fewer dealers are willing to provide quotes, which will also tend to increase the spread.

**Calculating a Forward Discount or Premium, Expressed as an Annualized Rate:**

Forward currency exchange rates often differ from the spot exchange rate. If the forward exchange rate for a currency is higher than the spot rate, there is a premium on that currency. A discount exists when the forward exchange rate is lower than the spot rate. A negative premium is equivalent to a discount.

**PROBLEM:**

If the ninety day ¥ / \$ forward exchange rate is 109.50 and the spot rate is ¥ / \$ = 109.38, then the dollar is considered to be "strong" relative to the yen, as the dollar's forward value exceeds the spot value. The dollar has a premium of 0.12 yen per dollar. The yen would trade at a discount because its forward value in terms of dollars is less than its spot rate.

The annualized rate can be calculated by using the following formula:

**Formula:**

Annualized Forward Premium =  $\frac{\text{Forward Price} - \text{Spot Price}}{\text{Spot Price}} \times \frac{12}{\text{\# of months}} \times 100\%$

**Answer:**

So in the case listed above, the premium would be calculated as:

Annualized forward premium =

$$((109.50 - 109.38) \div 109.38) \times (12 \div 3) \times 100\% = 0.44\%$$

Similarly, to calculate the discount for the Japanese yen, we first want to calculate the forward and spot rates for the Japanese yen in terms of dollars per yen. Those numbers would be  $(1/109.50 = 0.0091324)$  and  $(1/109.38 = 0.0091424)$ , respectively.

So the annualized forward discount for the Japanese yen, in terms of U.S. dollars, would be:

$$((0.0091324 - 0.0091424) \div 0.0091424) \times (12 \div 3) \times 100\% = -0.44\%$$

**PROBLEM:****1. An Arbitrage between two Currencies.**

Suppose two traders A and B are quoting the following rates:

Trader A (Paris)    Trader B (New York)

FFr 5.5012/US\$    US \$ 0.1817/FFr

We assume that the buying and selling rates for these traders are the same. We find out the reciprocal rate of the quote given by the trader B, which is FFr 5.5036 / US \$ (= 1/0.1817). A combiste buys, say, US \$ 10,000 from the trader A by paying FFr 55,012. Then he sells these US \$ to trader B and receives FFr 55,036. in the process he gains FFr 24 (=55,036 - 55,012).

Since, in practice buying and selling rates are likely to be different, so the quotation is likely to be as follows:

Trader A    Trader B

FFr 5.4500/US \$ - FFr 5.5012    US \$ 0.1785/FFr - US \$ 0.1817/ FFr

These rates mean that trader A would be willing to buy one unit of US dollar by paying FFr 5.45 while he would sell one US dollar for FFr 5.501. The same holds true for the corresponding figures of trader B.

But this process would tend to increase the selling rate at the trader A because of the increase in demand of US dollars and the reverse would happen at the trader B because of increased supply of US dollars. This would lead to equilibrium after some time.

**PROBLEM:****2.An Arbitrage between three currencies:**

Suppose two traders, both located at New York are quoting as follows:

Trader A	Trader B
\$ 0.60/SF	\$ 0.60/SFr
\$ 0.51 DM	\$ 0.52 DM

Since three currencies are involved here, we find the cross rates between SFr and DM as well. These are:

SFr 0.85/DM (= 0.51/0.60) at the trader A and SFr 0.867/DM (= 0.52/0.60) at the trader B. Thus, the situation looks like as follows:

Trader A	Trader B
\$ 0.60/SFr	\$ 0.60/SFr
\$ 0.51/DM	\$ 0.52/DM
SFr 0.85/DM	SFr 0.867/ DM

Hence what are the arbitrage possibilities?

There is no arbitrage gain possible between the US \$ and the Swiss franc.

The following two arbitrages are, however possible.

- Deutschmarks against the US \$ is being quoted at the trader B. So buy DM's from the trader A and sell them to trader B.
- Buy DM's against SFr's from the trader A and sell them to the trader B.

**PROBLEM:**

Find Spot 1-month 3-months 6-months

(FFr/US\$) 5.2321/2340 25/20 40/32 20/26

**Solution:**

In outright terms these quotes would be expressed as below:

Maturity Bid/Buy Sell/Offer/Ask Spread

Spot FFr 5.2321 per US \$ FFr 5.2340 per US \$ 0.0019

1-month FFr 5.2296 per US \$ FFr 5.2320 per US \$ 0.0024

3-months FFr 5.2281 per US \$ FFr 5.2308 per US \$ 0.0027 6-months FFr  
5.2341 per US \$ FFr 5.2366 per US \$ 0.0025

It may be noted that in the forward deals of one month and 3 months, US \$ is at discount against the French franc while 6 months forward is at a premium. The first figure is greater than the second both in one month and three months forward quotes. Therefore, these quotes are at a discount and accordingly these points have been subtracted from the spot rates to arrive at outright rates. The reverse is the case for 6 months forward.

**PROBLEM:**

Spot USD/INR Spot = 46.8000/46.9000

1 month FP = 50/80

3 months FP = 100/200 6 months FP = 200/300

Find forward rates for 1 month 15 days and also for 3 months 25 days.

**Solution:**

$$\begin{aligned}
 \text{For 1 month 15 days} &= \left( \frac{100-50}{60 \text{ days}} \times 15 \text{ days} \right) / \left( \frac{200-80}{60 \text{ days}} \times 15 \text{ days} \right) \text{ months minus 1} \\
 \text{("60" because 3 month = 60 days)} &= (13/30) \\
 &= \left( \frac{200-100}{90 \text{ days}} \times 25 \text{ days} \right) / \left( \frac{300-200}{90 \text{ days}} \times 25 \text{ days} \right) \\
 46.8050 + .0013 &+ 0.0030 / 46.9080 \\
 &= 46.8063 / 46.9110
 \end{aligned}$$

For 3 month 25 days =

$$\begin{aligned}
 &= (27.7 / 27.70) \\
 &\quad (28/ 28) \\
 &= 46.8100 + .0028 / 46.9200 + 0.0028 = 46.8128 / 46.9228
 \end{aligned}$$

**PROBLEM:**

Exchange rate for USD in India is

Spot: 45.0020

6 month forward: 45.9010

Interest rate (annual) in the money market is as follows:

USA: 7%

India: 12%

Work out the arbitrage opportunity.

**Solution:**

Given Spot USD/INR = 45.0020

6 Months Forward = 45.9010

Interest Rate USA = 7% and India = 12%

$$= 45.0020 \left( \frac{1 + \left[ \left( \frac{12}{100} \right) \times \frac{6}{12} \right]}{1 + \left[ \left( \frac{7}{100} \right) \times \frac{6}{12} \right]} \right) \text{SpotRate} \left( \frac{1 + I_{RD}}{1 + I_{RF}} \right)$$

Forward Rate =

$$= 45.0020 \times (1.0241)$$

$$= 46.0890$$

& the Forward Market Rate = 45.9010. Thus, there is an opportunity for arbitrage.

Annualised Forward Premium USD premium of 3.995%.

$$= \frac{FR_{MR} - SR_{MR}}{SR_{MR}} \times \frac{12}{n} \times 100$$

is going at a

As per the interest rate differential, be quoted at INR 46.0890. Also, Differential between two countries where as, USD is being quoted at a premium of only 3.995%. Thus,

$$= \frac{45.9010 - 45.0020}{45.0020} \times \frac{12}{6} \times 100$$

$$= 3.995\%$$

USD should

Interest Rate

= 12 - 7 = 5%,

forward

there is an

opportunity to borrow USD from USA @ 7%, convert to INR and invest in treasury bond at 12% while simultaneously buying USD 6 months Forward @ 45.9010 and earn an arbitrage of 1.005% on investment.

**Scenario II:**

If forward rate was 46.9010

$$= \frac{46.9010 - 45.0020}{45.0020} \times \frac{12}{6} \times 100$$

$$= 8.44\%$$

Then premium

Thus, if you invest in INR, you would make a loss of 8.44% in forward deal where as your earning from interest would be 12 - 7 = 5%. Thus, you be in net loss of 8.44 - 5 = 3.44%.

This kind of transaction is possible only when Govt gives freedom to buy and sell INR or USD in both countries.

Now in this case, borrow INR 45.0020 in India @ 12% and convert to 1 USD at spot rate.

Invest this USD in moneymarket in USD at 7% for sixmonths.

Simultaneously, sell USD

1.035 in 6 months forward for INR 48.5425. Your liability against borrowing in India =

$$45.0020 \left( 1 + \left( 1 \times \frac{12}{100} \times \frac{6}{12} \right) \right)$$

$$= 47.702$$

Thus, there would be gain of INR 48.5425 - 47.702 = INR 0.8405 per INR 45.0020 invested or 3.44%.

### PROBLEM:

In April 2005, USD/ INR quotes were 43.70/44.05.

6 months Swap points were 40/70

Annual Interest Rate in USA and Indian were 2% and 8% respectively.

Work out the scope for arbitrage, if any

Solution

Spot Rate USD/INR : 43.70/44.05

Fwd Rate (Six Months) : 43.70+0.40/44.05+0.70

$$= 44.10/44.75$$

Annual Interest Rates in USA and India are 2% and 8%.

For buying USD fwd., Premium

$$\begin{aligned} &= \frac{\text{Ask Rate}_{\text{Fwd}} - \text{Bid Rate}_{\text{Spot}}}{\text{Bid Rate}_{\text{Spot}}} \times \frac{12}{6} \times 100 \\ &= \frac{44.75 - 43.70}{43.70} \times \frac{12}{6} \times 100 \\ &= 4.80\% \end{aligned}$$

(Method for deriving above formula : Proceed as per following logic. Start with buying forward for currency of country where interest rate is low. You want to buy forward because you need to pay in future in that currency. You need to pay in future in that currency because you borrowed today in that currency. Once you have borrowed that currency, you will sell that currency in spot market and buy other currency. That gives the base, either Bid Rate spot or Ask Ratespot. Put this at denominator. Put same figure as “value to be subtracted” in numerator. Put complementary value of subtracted value as first figure, like, for Bid Rate Fwd -Ask RateFwd and for Ask RateFwd - Bid RateFwd. That completes the formula. In case you want to work out formula for forward of other currency, simply inverse all the Ask for Bid and Bid for Ask).

So, Formula for buying INRFwd, Premium

$$= \frac{\text{Bid Rate}_{\text{Fwd}} - \text{Ask Rate}_{\text{Spot}}}{\text{Ask Rate}_{\text{Spot}}} \times \frac{12}{6} \times 100$$

Interest Rate Differential =  $8 - 2 = 6\%$  Thus, while we lose 4.8% in forward market, we earn 6% in money market. Thus, net gain is  $6 - 4.8 = 1.2\%$ . Start with USD 100 borrowed from US market @ 2% and convert to INR @ 43.70 to INR 4370. Invest this money in Indian market @ 8% and get  $4370 \times 1.04 = \text{INR } 4544.80$ . Buy USD forward @ 44.7 for INR 4544.80 and get USD 101.56. Pay USD 101 to US market.