



Indira Gandhi National Open University  
School of Management Studies

**FTKMC**  
FINANCIAL TECHNOLOGIES KNOWLEDGE MANAGEMENT CO.

## MFP-4 CURRENCY AND DEBT MARKETS



Introduction to Currency Markets

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“शिक्षा मानव को बन्धनों से मुक्त करती है और आज के युग में तो यह लोकतंत्र की भावना का आधार भी है। जन्म तथा अन्य कारणों से उत्पन्न जाति एवं वर्गगत विषमताओं को दूर करते हुए मनुष्य को इन सबसे ऊपर उठाती है”

—इंदिरा गांधी

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*“Education is a liberating force, and in our age it is also a democratising force, cutting across the barriers of caste and class, smoothing out inequalities imposed by birth and other circumstance.”*

--Indira Gandhi

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Block

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## **BLOCK 1 INTRODUCTION TO CURRENCY MARKETS**

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Everyday millions of companies and individuals around the world do business with companies and individuals located in different countries. Often these transactions involve two or more currencies. With access to all the foreign exchange markets generally open to participants from all countries, and with vast amounts of market information transmitted simultaneously and almost instantly to dealers throughout the world, there is an enormous amount of cross-border foreign exchange trading among dealers as well as between dealers and their customers. This Block explains the structure, products and participants in the Indian Currency market. The Block is divided into four Units.

**Unit 1** traces the evolution of currency trading and explains the significance of currency markets in the financial system. It also covers the genesis and growth of currency futures and gives a brief overview about the various concepts of foreign exchange.

**Unit 2** focuses on the foreign exchange markets in India. It explains the various segments such as spot market and forward market. It also covers the major players of the foreign exchange market and briefly explain the role of regulators such as RBI, SEBI and FEDAI.

**Unit 3** explains the different rates in the foreign exchange markets and how they are calculated. It also distinguishes spot and forward rates and the role of premium and discount in deriving the forward rates. It also explains the factors which influence forward rates.

**Unit 4** provides a detailed analysis on the economic factors that impact the exchange rates. It explains concepts like nominal exchange rates, real exchange rates and real effective exchange rates etc. It also covers technical analysis of foreign exchange rates.

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# **UNIT 1 EVOLUTION AND SIGNIFICANCE OF CURRENCY MARKETS**

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## **Objectives**

After studying this unit, you should be able to:

- understand the meaning of foreign exchange;
- appreciate the significance of forex markets;
- identify the major currency pairs traded in the forex market; and
- explain the growth of currency derivatives markets.

## **Structure**

- 1.1 Introduction
- 1.2 Need for Foreign Exchange
- 1.3 Meaning of Foreign Exchange
- 1.4 Global Forex Markets
- 1.5 Forex Market Structure
- 1.6 Most Widely Traded Currencies
- 1.7 Features of Foreign Exchange Markets
- 1.8 Forex Markets vis a vis Other Segments of Financial Market
- 1.9 Currency Derivatives Markets
- 1.10 Basic Concepts in Foreign Exchange
- 1.11 Summary
- 1.12 Self Assessment Questions
- 1.13 Further Readings

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## **1.1 INTRODUCTION**

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The foreign exchange market is the largest and the most liquid market in the world. The roots of trading of foreign currencies can be traced back to the middle ages with the development of bills of exchange by international merchant bankers. These bills of exchange represented transferable third-party payments, which facilitated both flexibility and growth in the international trade that included foreign exchange. Between 1876 and World War I gold exchange standard ruled over the international economic system. Under the gold exchange, currencies experienced a new era of stability because they were supported by the price of gold. World War I temporarily discontinued trade flows and the free movement of gold. Subsequently, the Bretton Woods Agreement, established in 1944, fixed national currencies against the dollar, and set the dollar at a rate of USD 35 per ounce of gold. The great volume of forex trade led to massive movements of capital, which were generated by post-war construction during the 1950s, and this movement destabilized the foreign exchange rates established in Bretton Woods.

The year 1971 heralded the abandonment of the Bretton Woods Agreement in that the US dollar would no longer be exchangeable into gold. By 1973, the forces of supply and demand controlled major industrialized nations' currencies, which now floated more

freely across nations. The arrival of floating rate of exchange led to dramatic transformations in foreign exchange, with volumes, speed and price volatility all increasing throughout the 1970s, and new financial instruments, market deregulation and trade liberalization emerged.

The onset of computers and technology in the 1980s accelerated the pace of extending the market continuum for cross-border capital movements through Asian, European and American time zones. Transactions in foreign exchange increased intensively from nearly billion a day in the 1980s to more than \$ 3 trillion a day in 2009.

## **1.2 NEED FOR FOREIGN EXCHANGE**

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Every nation has its own national currency or monetary unit. As Indian Rupee is the currency or monetary unit for India. US Dollar and Japanese Yen are the monetary units for USA and Japan respectively and it is reported that there are as many as 176 currencies in the world which are used as legal tender within the country of issue for making and receiving payments within its own borders. But foreign currencies are needed for settlement of payment obligations across national borders. For example, if an Indian importer purchases machinery from an overseas supplier in Japan, the payment for the machinery can be made either in Japanese Yen or US Dollar. Thus, in any nation whose residents conduct business abroad or engage in financial transactions with persons in other countries, there must be a mechanism for settlement of payment by providing access to foreign currencies, so that payments can be made in a form acceptable to both parties to the transactions. In other words, there is a need for “foreign exchange” transactions.

## **1.3 MEANING OF FOREIGN EXCHANGE**

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“Foreign exchange” refers to the price of one currency against another currency. Any person who exchanges money denominated in his own nation’s currency for money denominated in another nation’s currency acquires foreign exchange.

The exchange rate is a price, the number of units of one nation’s currency that must be surrendered in order to acquire one unit of another nation’s currency. A market price is determined by the interaction of buyers and sellers in that market, and a market exchange rate between two currencies is determined by the interaction of the participants in the foreign exchange rate market.

According to the Foreign Exchange Management Act, 1999, foreign currency” is defined as any currency other than Indian currency and “foreign exchange” means foreign currency and includes, (i) deposits, credits and balances payable in any foreign currency, (ii) drafts, travellers cheques, letters of credit or bills of exchange, expressed or drawn in Indian currency but payable in any foreign currency, (iii) drafts, travellers cheques, letters of credit or bills of exchange drawn by banks, institutions or persons outside India, but payable in Indian currency.

## **1.4 GLOBAL FOREX MARKETS**

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Foreign Exchange Markets are dynamic round the clock markets. Owing to the different time zones in which the participating countries are located, the quotes are continuously available at all times. For instance, when Indian FX markets commence business, the Far-Eastern markets like, Australia, Japan, Hong Kong and Singapore would be in their post-lunch session. By the time, it is post-lunch session for Indian FX markets; the European markets commence their operations. When European markets are closing, US markets open up. Thus, the market quotes are available throughout.

The world currency markets are marked by the presence of currency majors like, US Dollar (USD), Great British Pound (GBP), Euro (EUR), Swiss Franc (CHF), Japanese Yen (JPY) etc, besides the other continental and exotic currencies. The daily recorded volumes in international FX markets run into the order of more than a trillion of US Dollars. The tradability of individual currencies is subject to the local exchange control regulations. Currencies of the countries that have taken to capital account convertibility are deemed to be freely tradable or they are said to float freely in FX markets. Examples of currencies which follow a free float are USD, EUR, CHF, JPY, Canadian Dollar (CAD), Australian Dollar (AUD) etc.

There are several countries whose economies are not fully open. These economies are open partially on the capital account and fully or partially on the current account. India is fully convertible on the current account but only partially convertible on the capital account. So while the Indian Rupee (INR) floats freely, due to the partial convertibility, its exchange rates can be managed more effectively than a full convertible currency. There are currencies which follow a managed float. i.e., the exchange rate of the currency is managed in a band by the relevant authority usually the central bank of that country. Also there are currencies which are pegged to another currency i.e., the exchange rate of that currency is fixed to another currency usually the USD. The Chinese Yuan (CNY) and the Malaysian Ringgit (MYR) were, till recently pegged to the USD. It must be mentioned that even for currencies which follow a free float regime central banks may still intervene in the market to try and adjust the exchange rate of a particular currency if they think it is required to do so.

In financial centres around the world, business hours overlap; as some centres close, others open and begin to trade. A true, 24-hour-a-day market, 5 days a week, it begins on Sunday at 5:00 p.m. Eastern standard time, and goes through Friday at 5:00 p.m. Eastern time. Forex trading opens in Sydney and moves across the globe through Tokyo, London, and New York time zones. The foreign exchange market follows the sun around the earth and the trading hours in some of the financial centres are as follows: New York market is open from 8:00 a.m. to 5:00 p.m. EST (Eastern Standard Time) and Tokyo market remains open from 7:00 p.m. to 4:00 a.m. EST. Sydney market is open from 5:00 p.m. to 2:00 a.m. EST and London market opens 3:00 a.m. to 12:00 noon EST.

Business is heavy when both the US markets and the major European markets are open; i.e., when it is morning in New York and afternoon in London. In the New York market, nearly two-thirds of the day's activity typically takes place in the morning hours. Activity normally becomes very slow in New York in the mid- to late afternoon, after European markets have closed and before the Tokyo, Hong Kong, and Singapore markets have opened.

Given this uneven flow of business around the clock, market participants often will respond less aggressively to an exchange rate development that occurs at a relatively inactive time of day and will wait to see whether the development is confirmed when the major markets open. Some institutions pay little attention to developments in less active markets. Nonetheless, the 24-hour market does provide a continuous 'real-time' market assessment of the ebb and flow of influences and attitudes with respect to the traded currencies, and an opportunity for a quick judgment of unexpected events. With many traders carrying pocket monitors, it has become relatively easy to stay in touch with market developments at all times.

### **Activity 1**

- 1) List down five important reasons for existence of foreign currency markets.

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- 2) Why global forex market is called a 24 hour market?
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## 1.5 FOREX MARKET STRUCTURE

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The forex market consists of a large number of major dealer institutions that are particularly active in foreign exchange, trading with customers and (more often) with each other. Most of these institutions, but not all, are commercial banks and investment banks. These institutions are geographically dispersed, located in numerous financial centres around the world. Wherever they are located, these institutions are in close communication with each other; linked to each other through telephones, computers, and other electronic means.

Each nation's market has its own infrastructure. For foreign exchange market operations as well as for other related matters, each country enforces its own laws, banking regulations, accounting rules, and tax code, and it operates its own payment and settlement systems. Thus, even in a global foreign exchange market with currencies traded on essentially the same terms simultaneously in many financial centres, there are different national financial systems and infrastructures through which transactions are executed, and within which currencies are held.

With access to all the foreign exchange markets generally open to participants from all countries, and with vast amounts of market information transmitted simultaneously and almost instantly to dealers throughout the world, there is an enormous amount of cross-border foreign exchange trading among dealers as well as between dealers and their customers.

At any moment, the exchange rates of major currencies tend to be virtually identical in all the financial centres where there is active trading. Rarely there are such substantial price differences among major centres as to provide major opportunities for arbitrage. In pricing, the various financial centres that are open for business and active at any one time are effectively integrated into a single market.

## 1.6 MOST WIDELY TRADED CURRENCIES

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The dollar is by far the most widely traded currency. In part, the widespread use of the dollar reflects its substantial international role as "investment" currency in many capital markets, "reserve" currency held by many central banks, "transaction" currency in many international commodity markets, "invoice" currency in many contracts, and "intervention" currency employed by monetary authorities in market operations to influence their own exchange rates.

In addition, the widespread trading of the dollar reflects its use as a "vehicle" currency in foreign exchange transactions, a use that reinforces, and is reinforced by, its international role in trade and finance. For most pairs of currencies, the market practice is to trade each of the two currencies against a common third currency as a vehicle, rather than to trade the two currencies directly against each other. The vehicle currency used most often is the dollar, although very recently euro also has become an important vehicle.

Thus, a trader who wants to shift funds from one currency to another, say from INR to Singapore Dollar, will probably sell INR for USD and then sell the USD for Singapore Dollar. Although this approach results in two transactions rather than one, it may be the preferred way since the USD/INR market and the USD/SGD market are much more active and liquid and have much better information than a bilateral market for the two currencies directly against each other. By using the dollar or some other currency as a vehicle, banks and other foreign exchange market participants can limit more of their working balances to the vehicle currency, rather than holding and managing many currencies, and can concentrate their research and information sources on the vehicle.

Use of a vehicle currency greatly reduces the number of exchange rates that must be dealt with in a multilateral system. In a system of 10 currencies, if one currency is selected as vehicle currency and used for all transactions, there would be a total of nine currency pairs or exchange rates to be dealt with (i.e., one exchange rate for the vehicle currency against each of the others), whereas if no vehicle currency were used, there would be 45 exchange rates to be dealt with. In a system of 100 currencies with no vehicle currencies, potentially there would be 4,950 currency pairs or exchange rates [the formula is:  $n(n-1)/2$ ]. Thus, using a vehicle currency can yield the advantages of fewer, larger, and more liquid markets with fewer currency balances, reduced informational needs, and simpler operations.

The US dollar took on a major vehicle currency role with the introduction of the Bretton Woods par value system, in which most nations met their IMF exchange rate obligations by buying and selling US dollars to maintain a par value relationship for their own currency against the US dollar. The dollar was a convenient vehicle because of its central role in the exchange rate system and its widespread use as a reserve currency. The dollar's vehicle currency role was also due to the presence of large and liquid dollar money and other financial markets, and, in time, the euro-dollar markets, where the dollars needed for (or resulting from) foreign exchange transactions could conveniently be borrowed (or placed).

**Table 1.1: Major currencies traded across the globe**

Symbol	Country	Currency	Nickname
USD	United States	Dollar	Buck
EUR	Euro members	Euro	Fiber
JPY	Japan	Yen	Yen
GBP	Great Britain	Pound	Cable
CHF	Switzerland	Franc	Swissy
CAD	Canada	Dollar	Loonie
AUD	Australia	Dollar	Aussie
NZD	New Zealand	Dollar	Kiwi

- 1) **Euro:** The euro was designed to become the premier currency in trading by simply being quoted in American terms. Like the US dollar, the euro has a strong international presence and over the years has emerged as a premier currency, second only to the US dollar.
- 2) **Japanese Yen:** The Japanese yen is the third most traded currency in the world. It has a much smaller international presence than the US dollar or the euro. The yen is very liquid around the world, practically around the clock.
- 3) **British Pound:** Until the end of World War II, the pound was the currency of reference. The nickname cable is derived from the telegrams used to update the GBP/USD rates across the Atlantic. The currency is heavily traded against the euro and the US dollar, but it has a spotty presence against other currencies. The two-year realignment

with the Exchange Rate Mechanism (ERM), between 1990 and 1992, had tremendous impact on the British pound, as it generally had to follow the Deutsche mark's fluctuations, but the crisis conditions that precipitated the pound's withdrawal from the ERM had a psychological effect on the currency.

4) **Swiss Franc:** The Swiss franc is the only currency of a major European country that belongs neither to the European Monetary Union nor to the G-7 countries. Although the Swiss economy is relatively small, the Swiss franc is one of the major currencies, closely resembling the strength and quality of the Swiss economy and finance. Switzerland has a very close economic relationship with Germany, and thus to the euro zone. Swiss franc is perceived to be a stable currency. Actually, from a foreign exchange point of view, the Swiss franc closely resembles the patterns of the euro, but lacks its liquidity.

### Activity 2

- 1) List down the major currency pairs traded on global forex markets.

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- 2) What is the EURUSD and USDINR rate today?

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## 1.7 FEATURES OF FOREIGN EXCHANGE MARKETS

The main Features of Foreign Exchange Markets are as following.

### 1) No Centralised Location

Foreign Exchange Market is not a market in the traditional sense where the buyers and sellers meet to conclude their deal, since there is no centralized location for trading activity. The market place for foreign exchange is a Communication System through which buyers and sellers remain in continuous contact with one another and trading takes place over telephone and/or computer terminals at thousands of locations worldwide. It is a global market and a bank in Mumbai can buy/sell Foreign Exchange in London, New York, Tokyo, Singapore or any other financial centre in the world.

### 2) Twenty Four Hour Market

Foreign Exchange market is a 24 hours market and trading take place at all times in some centres of the world. Even if the day's trading closes in Mumbai, the trading can be done in other places like Dubai and London which are open. A major implication of such 24 hours a day market is that the forex rate may change constantly.

### 3) Volatility

The foreign exchange rates fluctuate almost every second reacting to the economic and political developments domestically and globally.

#### 4) Major Players

The major players in this market are:

- a) Corporates
- b) Commercial Banks
- c) Exchange Brokers
- d) Central Banks etc.

#### 5) Market for Foreign Exchange

Depending upon the nature of transactions and the parties involved, the market is divided into three broad segments namely:

- i) Merchant Market
- ii) Inter-bank Market, and
- iii) International Market.

i) **Merchant Market:** All transactions between a bank who are authorized to deal in foreign exchange and the customers (i.e., merchants) are called merchant transactions and this segment of the foreign exchange market is called Merchant Market. The rates quoted for such transactions are called merchant rates. The merchant market is a retail market and the deals in the market are relatively for small amounts.

Examples of merchant transactions are:

- i) Issue/payment of travellers cheque/currency notes to/from public.
- ii) Purchase of export proceeds.
- iii) Sale of foreign exchange for import of goods.
- iv) Inward Remittance /Outward remittance on account of customers.

ii) **Inter-Bank Market:** The transactions relating to sale/purchase of foreign exchange by a bank with another bank are called Inter-bank transactions and this market is known as interbank market. Such deals in the Inter-bank market are relatively for bigger amounts, normally in millions, and are wholesale in nature.

iii) **International Market:** When a bank in India buys/sells foreign exchange from/to international banks in foreign centres such as London, New York and Singapore, such deals are called international transactions and the segment of the foreign exchange market is called International Market. This market is a wholesale market where deals are made for large sums and the rates in the market are finer (better) compared to that of inter-bank market. The banks transact in this market for getting a better base rate for high value merchant transactions or for currencies which are not active in the local interbank market.

#### 6) Scarcity

One of the main features of foreign exchange is its scarcity character. In almost all countries and particularly in underdeveloped countries the demand for foreign exchange outweighs its supply and therefore it is scarce. Therefore, almost all countries have placed controls or restrictions on their spending. The Foreign Exchange Management Act, 1999 serves the same purpose in India.

#### 7) Commodity

Another striking feature of foreign exchange is its commodity character. Foreign exchange can be construed as a commodity for the reason that it is not legal a tender other than the country of its issue and, like any other commodity, it has a value. Due to

exchange control restrictions in India, foreign exchange is not bought and sold freely and the law requires that the buying and selling can take place only between an authorized dealer (bank) and the customers who have foreign exchange or who are in need of them.

#### 8) Price of foreign exchange

The dealer of any commodity has to buy the commodity at a price or rate which should be less than its selling price. Therefore, there is always two rates for foreign exchange, i.e., a buying rate and a selling rate. The buying rate is lower than the selling rate. The buying price is also called Bid Price and selling price is called Offer Price. Bank A is quoting 1 USD= INR 47.8900 47.9100. In this case, bid rate per US dollar is INR 47.89 and offer rate is INR 47.91.

### **1.8 FOREX MARKET VIS-A-VIS OTHER SEGMENTS OF FINANCIAL MARKETS**

There are some significant differences between forex and other markets like, the equity, commodity or debt markets.

#### **24-Hour Trading**

The forex is the only market which can truly be viewed as a 24-hour market, which is one of the note worthy differences from equity, debt and commodity markets. There is trading activity in all time zones during the week, and sometimes even on the weekends as well. In other markets traders must wait until the market opens the following day in order to open a new position.

However, each hour of the day has a certain level of liquidity and each currency is associated with the trading session normally, corresponding to its time zone and business hours. The Yen, for example, may show a greater liquidity during the Asian session. In contrast, a currency outside of its normal business hours can display more erratic movements in a chart.

There are a number of major currencies involved, each of which is continuously interacting with all the others. Chances are, at any given time, there is movement in at least one of those exchange rates simply based on the offer-demand imbalance, or the number of global news events providing impetus to action.

#### **Superior Liquidity**

With such a tremendous daily trading volume, the forex market can absorb trading sizes that dwarf the capacity of any other market. This means a lot of trading liquidity and flexibility in forex markets. There are always participants willing to buy or sell currencies in the forex markets. Its liquidity, particularly in major currencies, helps ensure price stability and market efficiency. Traders can almost always open or close a position at a fair market price.

While it is true that currency markets have superior liquidity, it is also a fact that there are periods when liquidity dries up. This can happen during very volatile times or periods of market uncertainty. A volatile movement in price does not necessary mean a lot of volume, it can be just the opposite: fewer traders in the market means a thinner liquidity, which can lead to a big imbalance between buyers and sellers, resulting in a quick price movement in form of a spike or gap.

Because of the lower trade volume during the Asian session or even more during holiday seasons, investors in the Forex market are also vulnerable to liquidity risk, which results

in a wider dealing spread or larger price movements in response to any relatively large transaction happening during these times.

### Instantaneous Order Execution and Market Transparency

In the forex world, fast order execution and instant fill confirmation is usually routine because trading takes place via electronic trading platforms. Market transparency is highly desired in any trading environment. Given the multimillion-dollar exchange that takes place every day in the currency markets, manipulation of the price is rather nonexistent compared to other less liquid markets. However, combined actions may occur in which several of the major participants like central banks – force the market in a certain direction. During low liquidity times such as holiday times, the market is more vulnerable to erratic volatility or manipulation.

### Lower Transaction Costs

The currency market is active round-the-clock which ensures liquidity and the competition among market makers keeping the price and the spread competitive and low both intra-day and night.

### Profit Potential in both Rising and Falling Markets

Every open forex position has two sides because currencies are quoted in terms of their value against each other. This is because currencies are traded in “pairs” (for example, US Dollar vs INR, US Dollar vs. Yen or US Dollar vs. Swiss Franc), one side of every currency pair is constantly moving in relation to the other. When a trader is short in one currency he/she is simultaneously long on the other. A short position is one in which the trader sells a currency in anticipation that it will depreciate. This means that potential exists in a rising as well as in a falling market. This ability to sell currencies without any limitations can be seen as another distinct advantage of the forex market.

## 1.9 CURRENCY DERIVATIVES MARKETS

Currency Derivatives are products whose values are derived from the values of the underlying assets. Derivatives have the characteristics of high leverage and of being complex in their pricing and mechanism. Derivatives enable price discovery, improve the liquidity of the underlying asset, serve as effective hedge instruments and offer better ways of raising money. There has been a perceptible increase in derivatives transaction volumes, types, and users in recent years and growth has been robust in both exchange-traded and over-the-counter (OTC) derivatives. The two markets have their own benefits. Exchange-traded derivatives reduce counterparty and operational risk through centralized clearing mechanisms, and are considered more transparent, liquid, and accessible to a broader range of market participants. OTC derivatives, which are easier to develop, grow organically, do not require underlying cash markets, and are more customized. However; the risk and complexity vary among derivative products..

Recent years have witnessed a sharp increase in the development of currency futures exchanges and a consistent expansion of existing ones. In the year 2008, total number of Futures and Options contracts traded on the world's 69 leading Exchanges increased by only 13.7% over 2007. Volume in the U.S., increased 14.0% from 2007, and Europe and Asia did even better. Currency derivatives traded on exchange markets increased by 25% worldwide.

The Table 7.2 gives a broad overview about the growth in global currency markets as compared to the spot transactions in terms of volume and value.

**Table 7.2: Currency Derivatives Markets: Volume and Value:**

- US\$ 3.22 Trillion (Rs. 160 Lakh Crores) – Global daily foreign exchange trading turnover
- US\$ 1.02 Trillion (Rs. 55 Lakh Crores) – Global daily spot transactions turnover
- Global OTC derivatives trading turnover is at US\$ 2 Trillion + (Rs. 105 Lakh Crores)
- Exchange Traded Foreign Currency Derivatives in 2007 is 334.70 Million contracts – increase of 39.43% over 2006 – US\$ 100 Billion (Rs. 5 Lakh Crores) everyday across 54 exchanges
- In 2008, this has reached 577 million contracts in 69 exchanges worldwide (increase of 25%+)

## 1.10 BASIC CONCEPTS IN FOREIGN MARKETS

### Foreign Exchange market

The marketplace where currencies are bought and sold against each other is usually referred to as the foreign exchange market. It is also known as ‘Forex’ or ‘FX’ market. International forex markets are usually open 24 hours a day, five business days a week.

### One of the largest financial markets in the world

The currency market is one of the largest financial markets in the world. Average daily turnover in global currency markets is approximately USD 3.22 trillion (approx. INR 160 lakh crore). Out of this, over USD 1.02 trillion (approx. INR 50 lakh crore) transactions occur in the cash market. The remaining is constituted of the derivatives markets — both over-the-counter and exchange-traded derivatives.

### Currency markets in comparison with other asset classes

Global currency markets are the largest asset class to be traded. The total annual turnover (2007-08) in Indian currency markets, for example, is approximately INR 400 lakh crore. The Indian equity markets turnover is approximately INR 176 lakh crore, while the commodity markets turnover is approximately INR 40 lakh crore.

### Base currency and Quoted currency

The value of a currency is usually quoted with reference to values of other currencies, thus giving rise to currency pairs. The first currency in this currency pair is referred to as the base currency. The second currency is called the quoted currency. For example, in the USDINR currency pair, USD is the base currency and INR is the quote currency. We usually refer to the USDINR exchange rate in terms of number of INR per 1 USD.

### Market Practice for quoting exchange rates

There are two different ways of giving a foreign exchange quotation:

- a) **Price Quotation System (or Direct Quote):** When the exchange rate is quoted as the number of units of domestic currency per unit of foreign currency. For example, 1USD= INR47.11 is a direct quote which means INR 47.11 is the price per one USD.
- b) **Volume Quotation System (or Indirect Quote):** When the exchange rate is quoted as the number of units of foreign currency per unit of domestic currency. For example, Rs.100 = USD 2.1225 which means 1 USD= INR 47.11

## Pip

A pip is the smallest tradable price movement that an exchange rate can make. To illustrate mathematically,

1 pip = one hundredth of 1% = 0.0001

For example, if the EUR/USD rate increases from 1.3642 to 1.3643, this has resulted in an increase of the EUR/USD rate by 1 pip.

## Bid and Ask Price

Bid refers to the price at which the market is willing to buy a specific currency. Usually the best buy quote or bid price is the highest of all buy quotes. At this price, traders can sell the base currency. It is shown on the left side of the quotation.

Offer refers to the price at which the market is willing to sell a specific currency. Usually the best sell quote or ask (offer) price is the lowest of all sell quotes. At this price, traders can buy the base currency. It is shown on the right side of the quotation.

For example, consider the following USDCHF quote (US Dollars is the base currency and Swiss Francs is the quoted currency):

Bid Price	Ask Price
1.1424	1.1428

The bid price in the above example is 1.1424 and the ask price is 1.1428. This means that a trader can sell 1 USD (which is the base currency) for 1.1424 CHF and buy 1 USD for 1.1428 CHF.

## Bid-Ask Spread

The difference between the bid and offer price or in other words, the difference between the best buy price and best sell price is usually referred to as the bid-ask spread. The lower the bid-ask spread, more liquid is the market with lower transaction cost.

## Spot price in forex markets

Spot price or spot rate is the quote for buying or selling currency with settlement (delivery) on T+2 day basis, i.e., 2nd business day from date of transaction. Thus, when a forex trader enters into a spot transaction, the deal is fixed at a particular spot rate, whereby, a certain amount of one currency is received in exchange for the fixed amount of another currency. The deal is done on pre-determined rate as agreed between both the entities entering into the spot transaction. The only exception to the prior mentioned spot settlement period is the Canadian Dollar (CAD), which is settled on T+1 day basis.

## Cash Transaction/Ready Transaction

A cash transaction/ready transaction results in immediate delivery on the same date of the forex transaction. (T +0)

## “Tom Next” (TN) and “Spot Next” (SN) rate

Tom Next stands for “Tomorrow Next”. This transaction is settled one day prior to a regular spot deal, thus maturity is the next business day or T+1 day basis. On the other hand, “Spot Next” transaction is settled one business day past the spot date, i.e., 3 business days to maturity or T+3 day basis.

### Transaction

A forward transaction is one where the purchaser agrees to buy from the seller, and the seller agrees to sell to the purchaser, a specified amount of a specified currency on a specified date in the future - beyond the spot settlement date. For a three day forward transaction, the settlement date is T+3 and for a ninety day forward transaction, the settlement date is T+90.

### Exchange Rate

Exchange Rate refers to the price of one currency against another currency.

### Outright Transaction

An outright transaction is one in which a particular currency is bought against another currency that is being sold for a given value date at a mutually agreed exchange rate.

### Swap Transaction

Swap transaction refers to purchase and sale of a given pair of currencies against each other for different maturity/value dates. In effect, it is a combination of two outright deals of varying maturity dates.

### Cross Rate

Cross rate is the process of arriving at a value of a given currency through the medium of two different pairs of currencies, in which there is a common currency in both the pairs. For instance, in order to arrive at EUR/INR price, market uses EUR/USD price and USD/INR price.

### Direct Quotation and Indirect Quotation

Direct quotations refer to the quoting of a price wherein a given unit of Foreign Currency is kept constant and the home currency is expressed as a variable. Direct quotations are regarded as easy to understand, user-friendly and more transparent. Indirect quotations refer to the quoting of a price wherein the home currency is kept constant for a given unit and the foreign currency is expressed as variable.

### Premium and Discount

When the forward price of a currency is higher than the spot price of that currency, then the currency is said to be at a premium. When the forward price of a currency is lower than the spot price of that currency, then the currency is said to be at a discount.

### Proprietary Trading and Merchant Trading

Proprietary trading refers to the trading in FX markets on own account and Merchant trading, refers to the entering of a particular transaction on behalf of a client.

### Currency Trading

Each currency is given a three-letter code which is used in forex quotes. Currencies trade in pairs and that is how they are quoted. For instance, the Euro versus the U.S. dollar (EUR/USD). Or the U.S. Dollar versus the Japanese Yen (USD/JPY). A currency can never be traded by itself, it must be compared with another currency.

The pair is quoted in units of the counter currency needed to get one unit of the base currency. So, if the quote EUR/USD is 1.285, it means that 1.285 U.S. Dollars are needed to purchase one Euro. Currency rates are carried out 4 decimal places in most cases. The last decimal place is called a “pip” or a “point”.

In trading terms, currency pairs are often quoted as bid-ask spreads. This first part of the quote is the amount of the quote currency you will get in exchange for one unit of the base currency – the bid price. The second part of the quote is the amount of the quote currency you must spend for one unit of the base currency – the ask, or “offer” – price.

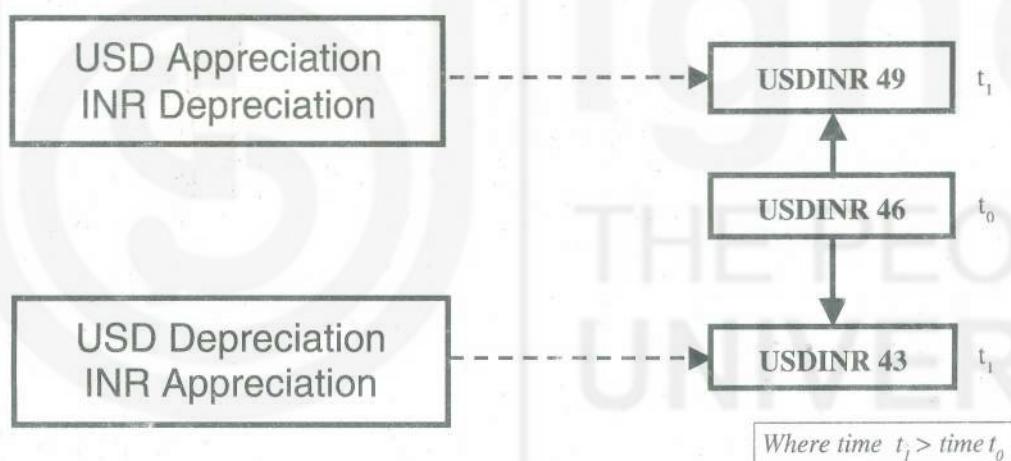
If the EUR/USD pair is quoted as 1.2850/1.2852, it means you can sell one Euro for \$1.2850 and buy one Euro for \$1.2852.

The full exchange rate might not be quoted for both sides of the spread – it would generally be quoted as 1.2850/52. The only number that is, not the same for both sides of the spread is the last number.

### Currency Appreciation and Depreciation

Appreciation of a particular currency means that the value of that currency has increased over the time period considered, as compared to another currency on relative basis. Depreciation is the opposite of appreciation. When the value of a currency has decreased as compared to another currency over a given time period, the former currency has depreciated.

For example, if the USD/INR rate changes from 46 to 43 over a period of 1 month, then the domestic currency INR is worth more than the foreign currency USD in this time period. This is because; less amount of domestic currency is required to buy one unit of foreign currency. Conversely, if the USD/INR rate increases from say, 46 to 49, then INR has depreciated and USD has appreciated. This is because, more INR is required for buying every USD.



### Activity 3

- What is the settlement date for a spot transaction?

.....  
.....  
.....  
.....

- The USD/INR rate which was 1USD=INR 47.51 as on 17/9/2009 has risen to 1 USD =INR 47.69 as on 6/10/2009. Has the dollar depreciated or appreciated against the INR?

.....  
.....  
.....

## 1.11 SUMMARY

- “Foreign exchange” refers to money denominated in the currency of another nation or a group of nations. Any person who exchanges money denominated in his own nation’s currency for money denominated in another nation’s currency acquires foreign exchange.
- Almost every nation has its own national currency or monetary unit – Mauritian Rupee, Dollar, Peso, etc. – used for making and receiving payments within its own borders. But foreign currencies are usually needed for payments across national borders. Thus, in any nation whose residents conduct business abroad or engage in financial transactions with persons in other countries, there must be a mechanism for providing access to foreign currencies, so that payments can be made in a form acceptable to foreigners. In other words, there is need for “foreign exchange” transactions: exchange of one currency for another.
- Currency markets operate for 24-hours. Major currency pairs include EUR/USD, USD/CHF, USD/JPY, GBP/USD, AUD/USD, USD/CAD, etc.

## 1.12 SELF ASSESSMENT QUESTIONS

- 1) What is the meaning of forex markets?
- 2) What is the significance of forex markets?
- 3) Which are the major currency pairs traded in the world?
- 4) What is meant by spot rate?
- 5) What is bid rate?
- 6) Choose the most appropriate one from the options given below: (Answer is given as \*\*\*\*)
  - 1) The foreign exchange market is the ..... and the most ..... market in the world.
    - a) Largest, liquid\*\*\*\*
    - b) Smallest, liquid
    - c) Largest, illiquid
    - d) Smallest, illiquid
  - 2) The Bretton Woods Agreement, established in ....., fixed national currencies against the dollar, and set the dollar at a rate of USD ..... per ounce of gold
    - a) 1956, 40
    - b) 1952.38
    - c) 1952,35
    - d) 1944,35\*\*\*\*\*
  - 3) In the forward currency market, currencies are traded at the prevailing rates and the settlement or value date is beyond .....
    - a) 1 day
    - b) 2 days
    - c) 3 days\*\*\*\*\*
    - d) Same day

4) The .....is the price at which the market is prepared to buy a specific currency pair in the forex market.

a) Bid\*\*\*\*\*

b) Offer

c) Ask

d) Quote

5) ..... is the rate for buying or selling currency with settlement (delivery) on T+2 day basis, i.e., second business day from the date of transaction.

a) Cash rate

b) Telerate

c) Tomrate

d) Spot rate\*\*\*\*

### 1.13 FURTHER READINGS

- 1) Bishop & Dixon, *Foreign Exchange Handbook*.
- 2) Adrian Buckley. *Multinational Finance*.
- 3) *An Introduction to Foreign Exchange & Money Markets – The Reuters Financial Training Series*.
- 4) Heinz Riehl & Rita M. Rodriguez, *Foreign Exchange & Money Markets - Managing Foreign and Domestic Currency Operations*.
- 5) Rudi Weisweiller, *Foreign Exchange & Money Market Operations-Managing a Foreign Exchange Department*.
- 6) A.V. Raj Wade, *Foreign Exchange International Finance & Risk Management*.
- 7) C. Jeevanandam, *Foreign Exchange & Risk Management*.

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## **UNIT 2    STRUCTURE OF CURRENCY MARKETS IN INDIA**

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### **Objectives**

After studying this unit, the student would be able to:

- understand the evolution and market structure of the foreign currency markets in India;
- differentiate between exchange traded and OTC derivatives markets;
- explain the major currency derivatives products traded in India; and
- discuss the details of products, participants, intermediaries and regulators.

### **Structure**

- 2.1    Introduction
- 2.2    Structure of Indian Foreign Exchange Market
- 2.3    Turnover in Indian Foreign Exchange Market
- 2.4    Regulatory Framework
- 2.5    Intermediaries
- 2.6    Participants
- 2.7    Products in the Indian Foreign Currency Market
- 2.8    OTC vs. Exchange Traded Currency Derivatives
- 2.9    Summary
- 2.10   Self Assessment Questions
- 2.11   Further Readings

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### **2.1    INTRODUCTION**

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#### **Evolution of Indian Foreign Currency Market**

With the breakdown of the Bretton Woods System in 1971 and the floatation of major currencies, currency fluctuations opened up tremendous opportunities for market players to trade in currencies in a borderless market around the world. In India, the rupee was linked with pound sterling in December, 1971. Since, sterling was fixed in terms of US dollar under the Smithsonian Agreement of 1971, the rupee also remained stable against dollar. In order to overcome the weaknesses associated with a single currency peg and to ensure stability of the exchange rate, the rupee was pegged to a basket of currencies, with effect from September, 1975. The currency selection and weights assigned were left to the discretion of the Reserve Bank. The currencies included in the basket as well as their relative weights were kept confidential in order to discourage speculation. It was around this time that banks in India became interested in trading in foreign exchange.

The origin of the foreign exchange market in India could be traced to the year 1978 when banks in India were permitted to undertake intra-day trade in foreign exchange. During the 1980s adoption of computer technology in Forex operations had a significant impact on the Forex market by increasing the speed with which international transactions could be put through.

The decade of the 1990s witnessed a rapid expansion of foreign exchange market in terms of participants, transactions, volumes, decline in transaction costs and more efficient mechanisms of risk transfer. The exchange rate of the rupee, which was pegged earlier, was floated partially in March, 1992 and fully in March, 1993. In 1993, exchange rates in India were deregulated and were allowed to be determined by markets. The unification of the exchange rate was instrumental in developing a market-determined exchange rate of the rupee and an important step in the progress towards current account convertibility, which was achieved in August, 1994.

The Forex market in India was given a boost by setting up of an Expert Group on Foreign Exchange Markets in India, which submitted its report in June 1995 with several recommendations for deepening and widening of the Indian foreign exchange market. Consequently, beginning from January, 1996, wide-ranging reforms have been undertaken in the Indian foreign exchange market.

The economic liberalization of the early nineties facilitated the introduction of derivatives based on interest rates and foreign exchange. However, derivative use is still a highly regulated area due to the partial convertibility of the rupee. After almost a decade, an Internal Technical Group on the Foreign Exchange Market (2005) was constituted to undertake a comprehensive review of the measures initiated by the Reserve Bank and identify areas for further liberalization or relaxation of restrictions in a medium-term framework. Since then, foreign exchange market has acquired immense participation, depth and liquidity.

#### Important Developments in Indian Foreign Exchange Market

Year	Type of Change.
1966	The rupee was devalued by 57.5% against the sterling on June 6th.
1967	Rupee-sterling parity changed as a result of devaluation of sterling.
1971	Bretton Woods system broke down in August. Rupee briefly pegged to the US dollar at rupee 7.5 before repegging to sterling at Rs.18.967 with a 2.25 % margin on either side.
1972	Sterling was floated on June 23rd. Rupee-sterling parity revalued at Rs.18.95 and then in October to Rs.18.80.
1975	Rupee pegged to an undisclosed currency basket with margins of 2.25% on either side. Intervention currency was sterling with a central rate of Rs.18.3084.
1979	Margins around basket parity widened to 5% on each side in January.
1991	Rupee devalued by 22% between July 1st and July 3rd. Rupee-Dollar rate depreciated from Rs.21.20 to Rs.25.80.
1992	LERMS (Liberalised Exchange Rate Management System) introduced with 40:60 dual rates for converting export proceeds, market determined rate for all specified imports and market rate for approved capital transactions.
1993	Unified market determined exchange rate introduced for all transactions. RBI would buy spot US dollar and sell US dollars for specified purposes. It will not buy or sell forward through it will enter into dollar swaps.

#### Formative Period: 1978-1992

The impetus to trading in the foreign exchange market in India came in 1978 when banks in India were allowed by the Reserve Bank to undertake intra-day trading in foreign exchange and were required to comply with the stipulation of maintaining 'square' or 'near square' position only at the close of business hours each day. The extent of position which could be left uncovered overnight (the open position) as well as the limits up to which dealers could trade during the day were to be decided by the management of banks. The exchange rate of the rupee during this period was officially determined by the Reserve Bank in terms of a weighted basket of currencies of India's major trading

partners and the exchange rate regime was characterised by daily announcement by the Reserve Bank of its buying and selling rates to the Authorised Dealers (ADs) for undertaking merchant transactions. The spread between the buying and the selling rates was 0.5 per cent and the market began to trade actively within this range. ADs were also permitted to trade in cross currencies (one convertible foreign currency vs. another). However, no 'position' in this regard could originate in overseas markets.

As opportunities to make profits began to emerge, major banks in India started quoting two-way prices against the rupee as well as in cross currencies and, gradually, trading volumes began to increase. This led to the adoption of widely different practices and the need was felt for a comprehensive set of guidelines for operation of banks engaged in foreign exchange business. Accordingly, the 'Guidelines for Internal Control over Foreign Exchange Business', were framed for adoption by the banks in 1981. The foreign exchange market in India till the early 1990s, however, remained highly regulated with restrictions on external transactions, barriers to entry, low liquidity and high transaction costs. The exchange rate during this period was managed mainly for facilitating India's imports. The strict control on foreign exchange transactions through the Foreign Exchange Regulations Act (FERA) had resulted in one of the largest and most efficient parallel markets for foreign exchange in the world, i.e., the hawala (unofficial) market.

### **Post-reform Period: 1992 onwards**

This phase was marked by wide ranging reform measures aimed at widening and deepening the foreign exchange market and liberalisation of exchange control regimes. As a stabilisation measure, a two step downward exchange rate adjustment by 9 per cent and 11 per cent between July 1 and 3, 1991 was resorted to counter the massive drawdown in the foreign exchange reserves, to instill confidence among investors and to improve domestic competitiveness. A two-step adjustment of exchange rate in July, 1991 effectively brought to close the regime of a pegged exchange rate. Following the recommendations of the Dr. C. Rangarajan Committee to move towards the market-determined exchange rate, the Liberalised Exchange Rate Management System (LERMS) was put in place in March, 1992 initially involving a dual exchange rate system. Under the LERMS, all foreign exchange receipts on current account transactions (exports, remittances, etc.) were required to be surrendered to the Authorised Dealers (ADs) in full.

The rate of exchange for conversion of 60 per cent of the proceeds of these transactions was the market rate quoted by the ADs, while the remaining 40 per cent of the proceeds were converted at the Reserve Bank's official rate. The ADs, in turn, were required to surrender these 40 per cent of their purchase of foreign currencies to the Reserve Bank. They were free to retain the balance 60 per cent of foreign exchange for selling in the free market for permissible transactions.

The LERMS was essentially a transitional mechanism and a downward adjustment in the official exchange rate took place in early December, 1992 and ultimate convergence of the dual rates was made effective from March 1, 1993, leading to the introduction of a market-determined exchange rate regime. The dual exchange rate system was replaced by a unified exchange rate system in March, 1993, whereby all foreign exchange receipts could be converted at market determined exchange rates. On unification of the exchange rates, the nominal exchange rate of the rupee against both the US dollar as also against a basket of currencies got adjusted lower, which almost nullified the impact of the previous inflation differential. The reform phase began with the Sodhani Committee (1994) which in its report submitted in 1995 made several recommendations to relax the regulations with a view to vitalising the foreign exchange market.

The Expert Group on Foreign Exchange Markets in India (Chairman: Shri O.P. Sodhani), which submitted its Report in 1995, identified various regulations inhibiting the growth of the foreign exchange market. The Group recommended that the corporates may be

permitted to take a hedge upon declaring the existence of an exposure. The Group recommended that banks should be permitted to fix their own exchange position limits such as intra-day and overnight limits, subject to ensuring that the capital is provided/earmarked to the extent of 5 per cent of this limit based on internationally accepted guidelines. The Group also favoured fixation of Aggregate Gap Limit (AGL), which would also include rupee transactions, by the managements of the banks based on capital, risk taking capacity, etc. It recommended that banks be allowed to initiate cross currency positions abroad and to lend or borrow short-term funds up to six months, subject to a specified ceiling. Another important suggestion related to allowing exporters to retain 100 per cent of their export earnings in any foreign currency with an Authorised Dealer (AD) in India, subject to liquidation of outstanding advances against export bills. The Group was also in favour of permitting ADs to determine the interest rates and maturity period in respect of FCNR (B) deposits. It recommended selective intervention by the Reserve Bank in the market so as to ensure greater orderliness in the market. In addition, the Group recommended various other short-term and long-term measures to activate and facilitate functioning of markets and promote the development of a vibrant derivative market. Short-term measures recommended included exemption of domestic interbank borrowings from SLR/CRR requirements to facilitate development of the term money market, cancellation and re-booking of currency options, permission to offer lower cost option strategies such as the ‘range forward’ and ‘ratio range forward’ and permitting ADs to offer any derivative products on a fully covered basis which can be freely used for their own asset liability management.

Most of the recommendations of the Sodhani Committee relating to the development of the foreign exchange market were implemented during the latter half of the 1990s. In addition, several initiatives aimed at dismantling controls and providing an enabling environment to all entities engaged in foreign exchange transactions have been undertaken since the mid-1990s. An Internal Technical Group on the Foreign Exchange Markets (2005) set up by the Reserve Bank made various recommendations for further liberalisation of the extant regulations. Some of the recommendations such as freedom to cancel and rebook forward contracts of any tenor, delegation of powers to ADs for grant of permission to corporates to hedge their exposure to commodity price risk in the international commodity exchanges/markets and extension of the trading hours of the inter-bank foreign exchange market have since been implemented.

Along with these specific measures aimed at developing the foreign exchange market, measures towards liberalising the capital account were also implemented during the last decade, guided to a large extent since 1997 by the Report of the Committee on Capital Account Convertibility (Chairman: Shri S.S. Tarapore). Various reform measures since the early 1990s have had a profound effect on the market structure, depth, liquidity and efficiency of the Indian foreign exchange market.

## 2.2 STRUCTURE OF INDIAN FOREIGN EXCHANGE MARKET

The Indian foreign exchange market is a decentralized multiple dealership market comprising two segments – the spot and the derivatives market. In the spot market, currencies are traded at the prevailing rates and the settlement or value date is two business days ahead. The two-day period gives adequate time for the parties to send instructions to debit and credit the appropriate bank accounts at home and abroad. The derivatives market encompasses forwards, swaps and options. Though forward contracts exist for maturities up to one year, majority of forward contracts are for one month, three months, or six months. Forward contracts for longer periods are not as common because of the uncertainties involved and related pricing issues. A swap transaction in the foreign exchange market is a combination of a spot and a forward in the opposite

direction. The spot market is the dominant segment of the Indian foreign exchange market. The derivative segment of the foreign exchange market is assuming significance and the activity in this segment is growing fast.

In India, foreign exchange markets can be broadly classified into over the counter market and exchange traded market.

**Over-the-counter markets.** Over-the-counter (OTC) markets are largely decentralized. There are multiple intermediaries such as authorized dealers, brokers, money changers, currency exchanges, electronic trading platforms that compete to connect buyers and sellers.

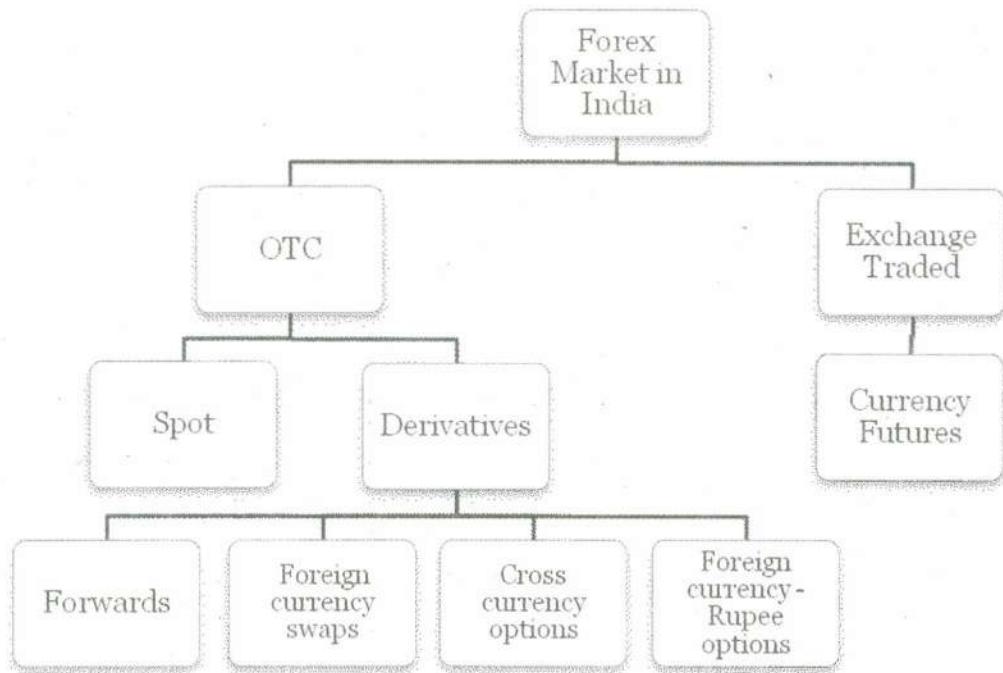
**Exchange-traded markets.** Exchange-traded markets are one in which all transactions are routed through a central source and currency futures are traded through exchanges such as MCX-SX,BSE,NSE etc.

Players in the Indian market include: (a) ADs, mostly banks who are authorised to deal in foreign exchange, (b) foreign exchange brokers who act as intermediaries, and (c) customers – individuals, corporates, who need foreign exchange for their transactions. Though customers are major players in the foreign exchange market, for all practical purposes they depend upon ADs and brokers. In the spot foreign exchange market, foreign exchange transactions were earlier dominated by brokers and the situation has changed with the evolving market conditions, as now the transactions are dominated by ADs. The Reserve Bank intervenes in the market essentially to ensure orderly market conditions. The Reserve Bank undertakes sales/purchases of foreign currency in periods of excess demand/supply in the market. Foreign Exchange Dealers' Association of India (FEDAI) plays a special role in the foreign exchange market for ensuring smooth and speedy growth of the foreign exchange market in all its aspects. All ADs are required to become members of the FEDAI and execute an undertaking to the effect that they would abide by the terms and conditions stipulated by the FEDAI for transacting foreign exchange business. The FEDAI is also the accrediting authority for the foreign exchange brokers in the interbank foreign exchange market. The licences for ADs are issued to banks and other institutions, on their request, under Section 10(1) of the Foreign Exchange Management Act, 1999. ADs have been divided into different categories. All scheduled commercial banks, which include public sector banks, private sector banks and foreign banks operating in India, belong to category I of ADs. All upgraded full fledged money changers (FFMCs) and select regional rural banks (RRBs) and co-operative banks belong to category II of ADs. Select financial institutions such as EXIM Bank belong to category III of ADs. All merchant transactions in the foreign exchange market have to be necessarily undertaken directly through ADs. However, to provide depth and liquidity to the inter-bank segment, ADs have been permitted to utilise the services of brokers for better price discovery in their inter-bank transactions.

The customer segment of the foreign exchange market comprises major public sector units, corporates and business entities with foreign exchange exposure. It is generally dominated by select large public sector units such as Indian Oil Corporation, ONGC, BHEL, SAIL, Maruti Udyog as also big private sector corporates like Reliance Group, Tata Group and Larsen and Toubro, among others. In recent years, foreign institutional investors (FIIs) have emerged as major players in the foreign exchange market.

### Activity 1

- 1) Explain with illustrations, the structure of Indian forex markets.
- 
- 
-



- 2) What is the difference between OTC and exchange traded derivatives?
- .....
- .....
- .....

### **2.3 TURNOVER IN INDIAN FOREIGN EXCHANGE MARKET**

Indian forex spot and derivative markets have developed significantly over the years. The spot market remains the most important segment, accounting for 50 per cent of total turnover in 2007-08. The daily average turnover has seen a substantial increase from about USD 5 billion during 1997-98 to USD 49 billion during 2007-08.

In the derivatives market, foreign exchange swaps account for the largest share of the total derivatives turnover, followed by forwards. As of September end, 2007, total forex contracts outstanding in the banks' balance sheet amounted to USD 1153 billion (Rs. 46,136 billion), of which almost 84% were forwards and the rest were options. As per the BIS Triennial Survey on the global foreign exchange and derivatives market activity (2007), the foreign exchange market in India has grown into the 16th largest market in the world in terms of total daily turnover. The OTC derivatives segment of the foreign exchange market has also increased significantly to register a daily average turnover of USD 24 billion, which is 17th largest among all countries.

The following table shows the exponential growth in turnover in the forex market during the last three years where more than 60% transactions take place between banks themselves and spot market accounts for roughly 50% of the total volume of transactions.

	April 2005-March 2006	April 2006-March 2007	April 2007-March 2008
Total annual turnover*	4,404	6,571	12,305
Inter-bank to Merchant ratio	2.6:1	2.7:1	2.5:1
Spot/Total Turnover (per cent)	50.5	51.9	49.7
Forward/Total Turnover (per cent)	19.0	17.9	19.3
Swap/Total Turnover (per cent)	30.5	30.1	31.1
Amount in US \$ billion			

Source: RBI

In the derivative segment also, India is able to turn out a better performance in percentage terms compared to the global performance during 2003-2008.

#### Derivative Market

	2004	2005	2006	2007	2008	Annual Growth
Global Volume Futures	880,530,976	1,021,997,174	1,446,336,902	2,343,545,773	3,344,860,210	39.61% in
India	67,787,415	116,286,968	170,571,964	324,166,172	430,479,068	58.75%
Global Volume in Options	5,014,372,444	5,514,350,237	5,935,863,710	7,474,393,095	8,444,963,072	13.92%
India	7,749,142	15,364,724	23,916,439	61,756,426	161,984,491	113.82%

Source: World Federation Exchange, MCX & Bloomberg

## 2.4 REGULATORY FRAMEWORK

The responsibility of regulating the various segments of the currency and debt market is shared by the following:

- Reserve Bank of India – There is a comprehensive legal framework which defines the role of RBI.
- Securities Exchange Board of India – As debt instruments are listed and traded on the stock exchanges, they also come under the regulatory purview of SEBI.
- Department of Economic Affairs.
- Department of company Affairs.

The Ministry of Finance and the Ministry of Corporate Affairs have some over arching powers over the debt market. An element of self regulation is in place through the Fixed Income Money market and Derivative association of India (FIMMDA) and the Primary Dealers Association of India (PDAI). The overall responsibility of ensuring smooth functioning of the currency and debt markets as well as ensuring financial stability rests with the RBI.

### 1) Reserve Bank of India

RBI is the central bank of the country. It was established in April 1935 based on the recommendations of the Hilton Young Commission. RBI was nationalized in the year 1949. The Reserve Bank monitors the foreign exchange markets under the various

provisions of the Foreign Exchange Management Act, 1999. RBI (Amendment) Act 2006 vests comprehensive powers in the RBI to regulate debt market. RBI licenses Authorized Dealers (ADs) including Full Fledged Money Changers (FFMCs) who deal in foreign exchange. In the debt market, RBI plays a crucial role inasmuch as it regulates the Government Securities market, as also a significant part of the participants, viz., banks and PDs.

The Reserve Bank plays a dual role in the debt market – as a debt manager and as a regulator of the government securities market. A comprehensive legal framework defines the role of the Reserve Bank in the government securities market. Its operations are governed by Sections 17(8), 20, 21 and 21A of the RBI Act 1934. The Reserve Bank derives its regulatory power from Section 16 of the Securities Contract (Regulation) Act 1956 and the newly inserted Chapter III D in the RBI Act.

An element of self-regulation is also in place through the Fixed Income, Money Market and Derivatives Association of India (FIMMDA) and Primary Dealers Association of India (PDAI). The Reserve Bank engages them in a consultative process as part of its developmental and regulatory functions. These two associations have served as an interface between the regulator and the market, and have contributed to developing new benchmarks and products in addition to providing training and development support to the market participants. They have developed standard practices and codes of conduct for market players. FIMMDA has been associated with the Reserve Bank in bringing about uniform accounting practices for repo/ready forward contracts and master repo agreements used by participants

## 2) Securities Exchange Board of India

On April 12, 1992, the Securities and Exchange Board of India was constituted. It was constituted in accordance with the provisions of the Securities and Exchange Board of India Act 1992 to protect the interests of investors in securities and to promote the development of, and to regulate the securities market.

### Functions of SEBI

- SEBI is responsible for securing the interests of investors in securities and to facilitate the growth of, and to monitor the securities market in an appropriate manner.
- To monitor and control the performance of stock exchange and derivative markets.
- Listing and monitoring the functioning of stock brokers, sub brokers, share transfer agents, bankers to an issue, trustees of trust deeds, registrars to an issue, merchant bankers, underwriters, portfolio managers, investment advisers and others associated with securities markets by any means.
- Monitoring and Controlling the functioning of venture capital funds and mutual funds.
- Forbid unjust and dishonest trade practices in the security markets and forbid insider trading in the security market.
- Undertake periodic audits of stock exchanges, mutual funds, individuals and self regulatory organizations associated with the security market.

SEBI has introduced comprehensive regulatory measures, prescribed registration norms, the eligibility criteria, the code of obligations and the code of conduct for different intermediaries, like bankers to issue, merchant bankers, brokers and sub-brokers, registrars, portfolio managers, credit rating agencies, underwriters and others. It has framed bye-laws, risk identification and risk management systems for clearing houses of stock exchanges, surveillance system etc. which has made dealing in securities both safe and

transparent to the investors. SEBI plays a pivotal role to integrate the securities market at the national level so that there is an increase in number of traders including banks, financial institutions, insurance companies, mutual funds, and primary dealers etc. to transact through the Exchanges.

### 3) FEDAI

Foreign Exchange Dealer's Association of India (FEDAI) was set up in 1958 as an Association of banks dealing in foreign exchange in India (known as Authorised Dealers - ADs) as a self regulatory body and is incorporated under Section 25 of The Companies Act, 1956. It's major activities include framing of rules governing the conduct of inter-bank foreign exchange business among banks vis-a-vis public and liaison with RBI for reforms and development of forex market.

Presently some of the functions are as follows:

- Guidelines and Rules for Forex Business.
- Training of Bank Personnel in the areas of Foreign Exchange Business.
- Accreditation of Forex Brokers
- Advising/Assisting member banks in settling issues/matters in their dealings.
- Represent member banks on Government/Reserve Bank of India/Other Bodies.
- Announcement of daily and periodical rates to member banks.

Due to continuing integration of the global financial markets and increased pace of de-regulation, the role of self-regulatory organizations like FEDAI has also transformed. In such an environment, FEDAI plays a catalytic role for smooth functioning of the markets through closer co-ordination with the RBI, other organizations like FIMMDA, the Forex Association of India and various market participants. FEDAI also maximizes the benefits derived from synergies of member banks through innovation in areas like new customized products, bench marking against international standards on accounting, market practices, risk management systems, etc.

It's major activities include framing of rules governing the conduct of inter-bank foreign exchange business among banks vis-a-vis public and liaison with RBI for reforms and development of forex market.

The Foreign Exchange Dealer's Association of India (FEDAI) is a self regulatory body whose major functions are framing of rules governing the conduct of inter-bank foreign exchange business among banks vis-a-vis public and liaison with the Reserve Bank for reforms and development of the foreign exchange market. With greater liberalization, the scope of FEDAI's operations has been transformed and it has been focusing more on current developments and international best practices. Recognizing the systemic impact of foreign exchange settlement risk, Reserve Bank has set up the Clearing Corporation of India Limited (CCIL) in 2001 to minimize risks in the Indian foreign exchange settlement. It undertakes settlement of foreign exchange transactions on a multilateral net basis through a process of novation.

FEDAI plays a catalytic role for smooth functioning of the markets through closer co-ordination with the RBI, other organizations like FIMMDA, the Forex Association of India and various market participants. FEDAI also maximizes the benefits derived from synergies of member banks through innovation in areas like new customized products, bench marking against international standards on accounting, market practices, risk management systems, etc. FEDAI plays a supportive role in the foreign exchange market for ensuring smooth and speedy growth of the foreign exchange market in all its aspects. All Banks which are Authorized Dealers in foreign exchange are required to become members of the FEDAI and execute an undertaking to the effect that they would abide by the terms and conditions stipulated by the FEDAI for transacting foreign exchange

#### 4) FIMMDA

The Fixed Income Money Market and Derivatives Association of India (FIMMDA), an association of Scheduled Commercial Banks, Public Financial Institutions, Primary Dealers and Insurance Companies was incorporated as a Company under section 25 of the Companies Act, 1956 on June 3rd, 1998. FIMMDA is a voluntary market body for the bond, money and derivatives markets.

FIMMDA has members representing all major institutional segments of the market. The membership includes Nationalized Banks such as State Bank of India, its associate banks and other nationalized banks; Private sector banks such as ICICI Bank, HDFC Bank, IDBI Bank; Foreign Banks such as Bank of America, ABN Amro, Citibank, Financial institutions such as IDFC, EXIM Bank, NABARD, Insurance Companies like Life Insurance Corporation of India (LIC), ICICI Prudential Life Insurance Company, BirFIMMDA's represents Market Players and aids the development of the bond, money and derivatives markets. Dovetailed with this mission are specific objectives such as:

- To function as the principal interface with the regulators on various issues that impact the functioning of these markets.
- To undertake developmental activities, such as, introduction of benchmark rates and new derivatives instruments, etc.
- To provide training and development support to dealers and support personnel at member institutions.
- To adopt/develop international standard practices and a code of conduct in the above fields of activity.
- To devise standardized best market practices.
- To function as an arbitrator for disputes, if any, between member institutions.
- To develop standardized sets of documentation.
- To assume any other relevant role facilitating smooth and orderly functioning of the said markets.

FIMMDA seeks to achieve these objectives by establishing specific working groups. FIMMDA is represented in the Technical Advisory Committee (TAC) of the Reserve Bank of India on Government Securities and Money Market and also that on the Foreign Exchange Markets. The TAC provides FIMMDA an ideal platform to air market views to the central bank of the country. FIMMDA also conducts seminars, training programs and symposia to facilitate the achievement of its stated objectives.

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## 2.5 INTERMEDIARIES

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Though customers are major players in the foreign exchange market, for all practical purposes they depend on intermediaries such as ADs, brokers, money changers and currency exchanges.

Intermediaries in the Indian foreign exchange market include:

- a) ADs (Authorized Dealers), mostly banks who are authorized to deal in foreign exchange,
- b) Foreign exchange brokers who act as intermediaries,
- c) Money Changers who provide easier conversion facilities for travelers and tourists, including NRIs, and
- d) Recognised Exchanges that handle currency futures transactions.

## 2.6 PARTICIPANTS

The Forex market in India is made up of Authorized Dealers (generally banks) and end users viz., individuals, corporate, institutional investors and NRIs. Banks generally account for a significant percentage of the overall turnover in the market.

### Banks

Banks play a significant role in the forex market and they play the role of a market maker. Their basic responsibility is to provide two-way quotes and act as market makers for foreign exchange for their customers. They buy and sell foreign exchange from/to their customers and also take active part in interbank forex market. The role of banks in the Indian FX market comes into focus on account of the fact that customers cannot deal in foreign exchange markets on their own without the banking medium. Customers need to buy or sell their foreign currency arising out of their export, import and remittances transactions. Their trade finance and personal remittances dealings involve inflow or outflow of foreign exchange which, in turn, are governed by the extant foreign exchange regulations. Banks, even as they are catering to the FX requirements of the clients, also ensure that the transactions are well within the ambit of the provisions of the Exchange Control Regulations currently in force. Another demanding segment is the personal segment comprising Non Resident Indians (NRIs).

The Foreign Exchange Management is the law which regulates the FX market. The regulatory authority for the Indian FX market is the Reserve Bank of India (RBI). Only Authorised Dealers (ADs) licensed by the RBI can participate directly in the FX market. These are usually Scheduled Commercial Banks. In addition, there are institutions that have been granted a limited/restrictive AD license which permits them to undertake certain FX activities. A set of participants who are the Full Fledged Money Changers (FFMCs) have been granted license to undertake certain currency transactions with the general public. However, the FFMCs also need to cover their FX positions with the ADs.

Customers approach ADs to get the best value for their FX requirements. Usually, the AD quoting the best FX rate will get the deal from the customer. Factors like, customer relationship, execution capability and post trade service quality will also have a bearing on which AD gets the deal. To offer a competitive quote to a customer an AD has to have the ability to get the best quotes from the market. This in turn would depend on how active that AD is in the inter-bank FX market.

An exporter would sell foreign currency to an AD while an importer would purchase foreign currency. Apart from trade transactions there are remittances which could be inward remittances, involving the sale of foreign currency to an AD, and outward remittances involving purchase of foreign currency. Customer's requirements for purchase or sale of foreign currency also arise from capital account transactions such as Foreign Currency Borrowings or their repayment, issue of ADRs/GDRs, acquisition of domestic companies by an overseas entity or *vice-versa* etc.

Having concluded an FX transaction with the customer, the AD may have an overbought or oversold position in a foreign currency vis-à-vis INR. The exchange rate quoted to the customer would usually be at a spread to the prevailing inter-bank exchange rate. To realize this spread the AD would look to offload its position in the inter-bank market. Depending on the actual rate at which the AD manages to square its position in the market, the spread earned would be higher, lower or same as the earlier envisaged spread.

Apart from merchant transactions ADs also take proprietary positions i.e., positions on their own account. These positions could be taken by the AD on the back of a customer

transaction or could be initiated in the inter-bank market. These positions are subject to daylight and overnight limits. The net overnight position which is termed as the Net Overnight Open Position Limit (NOOPL) is approved by the RBI for each AD after the latter's Board of Directors have approved the same.

Trading activities act like a backbone in providing depth to the markets. Unless two-way prices are offered on an on-going basis, market making will be rendered difficult. Even in the case of merchant cover operations, unless the FX markets are active, customers may not get the best of exchange rates. Active trading desks cause the narrowing of buy-sell differential margins driven by high volume - low spread concept. Thus, ADs acting as market makers have an important role to play in the FX market.

Banks, as foreign exchange Authorised Dealers, provide support to the international trade, comprising of exports and imports and remittances. Banks maintain foreign currency positions in different convertible currencies. The banks offer variety of foreign exchange rates like, spot, forwards, swaps, cross currency rates etc. which facilitates the clients in conducting their transactions in various foreign currencies from time to time. Through swaps and forward contracts, banks facilitate exchange risk management of their clients. Foreign exchange market is an organised one and banks are the important players.

### **Reserve Bank of India**

RBI plays an active role in stabilizing the Indian forex market by monitoring the daily foreign exchange price movement in the market and initiate appropriate corrective measures, whenever warranted. RBI intervenes in the market essentially to ensure orderly market conditions and buy/sell foreign currencies in periods of excess demand/supply in the market.

### **Investment Firms**

Investment management firms commonly manage huge accounts on behalf of their clients such as FIIs. Sometimes, these investments require the exchange of foreign currencies and so they have to facilitate these transactions through the use of the foreign exchange market.

### **Forex Brokers**

Until recently, foreign exchange brokers were doing large amounts of business, facilitating interbank trading and matching anonymous counterparties for comparatively small fees. With the increased use of the internet and electronic trading platforms, a lot of this business is moving onto more efficient electronic systems that are functioning as a closed circuit for banks only. Forex brokers match buyers and sellers in the interbank forex market.

### **Corporates**

Corporates with international trade exposure is the backbone of the foreign exchange markets. One of the decisive factors determining the long-term direction of a currency's exchange rate is the overall trade flow. Corporates involved in exports and imports make use of foreign currency markets on a daily basis and account for a lions share of the foreign currency turnover in the merchant segment of the forex market.

### **Foreign Institutional Investors (FII)**

FIIs are foreign-based funds authorized by Capital Market Regulator to invest in India's equity and debt market through stock exchanges. They are allowed to repatriate sale proceeds of their holdings, provided sales have been made through an authorized stock exchange and taxes have been paid. FIIs enjoy de-facto capital account convertibility.

FII operations not only provide depth to equity and debt markets but also make use of foreign exchange markets very frequently for conversion of foreign currency into domestic currency and *vice versa*.

### Residents and Non-residents

Residents and non-residents Indians who are in receipt of foreign inward remittances or who need foreign outward remittances make use of the foreign exchange market to meet their currency needs subject to the exchange control regulations of RBI.

## 2.7 PRODUCTS IN THE INDIAN FOREIGN CURRENCY MARKET

### Spot Market

The spot market comprises inter-bank and retail/merchant segments. It is the inter-bank transactions that dominate the spot segment. In the spot market, currencies are traded at the prevailing rates and the settlement or value date is two business days ahead. The two-day period gives adequate time for the parties to send instructions to debit and credit the appropriate bank accounts at home and abroad. The merchant segment of the spot market is generally dominated by the Government of India, select large public sector units, such as Indian Oil Corporation (IOC), and the FIIs. As the foreign exchange demand on account of public sector units and the Government tends to be lumpy and uneven, resultant demand-supply mismatches entail occasional pressures on the foreign exchange market, warranting market interventions by the Reserve Bank.

Trading in Indian foreign exchange market is largely concentrated in the spot segment even as volumes in the derivatives segment are on the rise. In the Indian foreign exchange market, spot trading takes place on four platforms, *viz.*, FX CLEAR of the CCIL set up in August 2003, FX Direct i.e., a foreign exchange trading platform launched by IBS Forex (P) Ltd. in 2002 in collaboration with Financial Technologies (India) Ltd., and two other platforms by the Reuters – D2 platform and the Reuters Market Data System (RMDS) trading platform that have a minimum trading amount limit of US \$ 1 million. FX-CLEAR and FX Direct offer both real time order matching and negotiation modes for dealing. The Real Time Matching system enables real time matching of currency pairs for immediate and auto execution in both the spot and forward segments. In the Negotiated Dealing System, participant is free to choose and negotiate with his counter-party on all aspects of the transaction, thereby offering him flexibility to select the underlying currency as well as the terms of trade. These trading platforms cover the US dollar-Indian Rupee (USD-INR) transactions and transactions in major cross currencies (EUR/USD, USD/JPY, GBP/USD *etc.*), though USD-INR constitutes the most of the foreign exchange transactions in terms of value. It is the FX CLEAR of the CCIL that remains the most widely used trading platform in India. The main advantage of this platform is its offer of straight-through processing (STP) capabilities as it is linked to CCIL's settlement platform.

### Derivative products in the OTC segment of the Indian Forex market

In India, the formal introduction of a variety of instruments in the foreign exchange derivatives market started since the mid-1990s. In the derivatives market, foreign exchange swaps account for the largest share of the total derivatives turnover in India, followed by forwards and options. Till 1998, conventional forward contracts in foreign exchange were the only derivative product available in Indian markets – although cross currency products, without involving Rupee payments, were freely allowed for hedging purpose.

The interest rate swaps (IRS) and forward rate agreements (FRA) were first allowed by RBI in 1998. Banks and counterparties (other banks / clients) need to execute ISDA Master Agreement before entering into any derivative contracts. ISDA Master Agreement is standardized by the International Swap and Derivatives Association, which lays down various terms of the contract, including jurisdiction, valuation norms, netting out, credit enhancement, cross-default etc. The Agreement has been cleared for use by Indian banks by FIMMDA and FEDAI, with the concurrence of RBI. The Master Agreement covers all the transactions between two counterparties globally, and there is no need for any other transaction-wise agreement, except for the exchange of usual deal confirmation, specifying the terms of the transaction.

USD Rupee options were allowed in Indian market only from June, 2003. Banks and Corporates can use Rupee / USD options, as also cross currency options only as a hedge for underlying transactions. RBI guidelines for use of options are on the same lines as their earlier guidelines for use of forward contracts. Exporters and importers can book, cancel and rebook options and forward contracts for their trade transactions. They are also permitted to book the contracts with the bank on declaration basis (without underlying) subject to a ceiling. However, options and forwards booked to hedge loans and other term liabilities, once cancelled, cannot be rebooked.

All trading positions in forwards, options and interest rate swaps must be marked to market daily and those hedging trading positions must be marked to market at the same frequency as the underlying position. Use of all derivatives is subject to internal policies of the bank approved at Board level.

### **Foreign Exchange Forwards**

Forward contracts are entered into between persons resident in India with crystallized foreign currency/foreign interest rate exposure and Authorized Dealers (Banks). In the forward segment of the Indian foreign exchange market, trading takes place both over the counter (OTC) with brokers playing an important role. The trading platforms available include FX CLEAR of the CCIL, RMDS from Reuters and FX Direct of the IBS.

### **Foreign Currency Rupee Swap**

A person resident in India who has a long-term foreign currency or rupee liability is permitted to enter into such a swap transaction with ADs to hedge or transform exposure in foreign currency/foreign interest rate to rupee/rupee interest rate.

### **Foreign Currency Rupee Options**

These options are used by customers who have genuine foreign currency exposures, as permitted by the Reserve Bank and by ADs for the purpose of hedging trading books and balance sheet exposures.

### **Cross-Currency Options**

ADs are permitted to issue cross-currency options to a person resident in India with crystallized foreign currency exposure, as permitted by the Reserve Bank. The clients use this instrument to hedge or transform foreign currency exposure arising out of current account transactions.

### **Cross-Currency Swaps**

Entities with borrowings in foreign currency under external commercial borrowing (ECB) are permitted to use cross currency swaps for transformation of and/or hedging foreign currency and interest rate risks.

### Non-deliverable Forward Contracts

The NDF market in Indian rupee (INR NDF) has been in existence for over the last 10 years. NDFs are synthetic foreign currency forward contracts on non-convertible or restricted currencies traded over the counter outside the direct jurisdiction of RBI. The demand for NDFs arises principally out of regulatory and liquidity constraint issues of the underlying currencies. These derivatives allow multinational corporations, portfolio investors, hedge funds and proprietary foreign exchange accounts of commercial and investment banks to hedge or take speculative positions in local currencies. The pricing is influenced by a combination of factors such as interest rate differential between the two currencies, supply and demand, future spot expectations, foreign exchange regime and central bank policies. The settlement of the transaction is not by delivering the underlying pair of currencies, but by making a net payment in a convertible currency equal to the difference between the agreed forward exchange rate and the subsequent spot rate. These are generally settled in US dollar.

### Exchange Traded Currency Products

Some of the recognized stock exchanges are approved by SEBI to undertake trading and settlement in currency futures segment. MCX-SX, NSE and BSE have commenced operations in 2008 in the currency futures segment.

### Activity 2

- 1) What is the meaning of currency futures?
- .....  
.....  
.....

- 2) Which are the major products traded in currency markets?
- .....  
.....  
.....

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## 2.8 OTC Vs. EXCHANGE TRADED CURRENCY DERIVATIVES

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The derivatives markets globally have been among the most dynamic of all financial markets for more than a generation. Derivatives are generally defined as instruments or contracts whose value depend on, or are derived from, something else, such as a commodity, reference rate, or index. Derivatives can be traded on stock exchanges, called exchange-traded derivatives, or over-the-counter, called over-the-counter (OTC) derivatives. Exchange-traded currency derivatives are traded through the Stock Exchanges. These exchanges act as intermediaries, servicing standardized exchange contracts with the exchange being counterparty to the contract. The exchanges also fulfill a regulatory role with respect to their markets. OTC currency derivatives markets in India are largely regulated by RBI.

The significant differences between Exchange-traded derivatives market and Over the counter derivative market are listed below:

<i>Exchange-traded derivatives market</i>	<i>Over the counter derivative market</i>
The organized futures and options exchanges are anonymous. Here, contracts traded are standardized. It is easy to buy and sell contracts (to reverse positions) and no negotiation is required.	The over-the-counter market is largely a direct market between two parties who know and trust each other. Contracts are directly negotiated, tailor-made for the needs of the parties, and are often not easily reversed.
The most common form of organized trading of futures and options, the open-outcry system with its shouting and hand waving by traders on the exchange trading-floor, is highly transparent. The transactions are, at least in theory, highly competitive; the market reacts very fast and prices and transactions are monitored every second. Prices on the open-outcry market are almost instantly distributed worldwide.	In contrast, public price quotations for the over-the-counter market are only just being introduced, and the quotations are only for the more heavily traded instruments. Even these quotations are not instantaneous, only indicative (as opposed to futures market quotations, which represent prices at which deals actually took place). To get a fair deal on the over-the-counter market, good information gathering and negotiation skills are required.
A clearinghouse guarantees transactions on organized exchanges; a default by an intermediary is unlikely to lead to losses for market users.	Transactions on the over-the-counter market are guaranteed only by the reputation of the counterparty; if the counterparty goes broke (and some very large trading houses and banks have gone broke in recent years), large losses may ensue.
The organized futures and options markets are highly regulated, contrary to the over-the-counter market. Regulation provides protection, not only against a possible default of the market, but also against fraud, manipulation, and abuse.	The main protection on the over-the-counter market is the fact that the big, powerful players who are the main users of this market police each other and effectively have the power to sanction abuse. Nevertheless, those who decide to use the over-the-counter market, instead of the organized exchanges, take on some risks of falling victim to market abuse.
Use of organized futures and options market may require daily cash-flow transactions (except in the case of the purchase of options). This is difficult to handle administratively and financially.	In contrast, on the over-the-counter market, one can negotiate the frequency of cash-flow transactions (for instance, a monthly settlement of positions instead of a daily one).
Any market participant, who is able to raise the cash flow necessary for initial margin deposits and margin calls, has access to the organized futures market.	Access to the over-the-counter market is mainly linked to reputation. With a good reputation, even small companies that are unable to pay daily margin calls (for instance, because of currency controls) can have access to this market.
Futures and options contracts are available on exchange platforms. While the futures price and spot price may run parallel most of the time, the difference is not always the same, since there may be a residual price risk, known as the “basis risk”.	On the over-the-counter market, it is possible to reduce basis risk by “tailoring” the contract to the specific commodities that a company exports. Contracts can be customized for longer duration. It may be possible to get risk coverage specific to the specific requirements of a company or country. Against the advantage of a larger choice of instruments on the over-the-counter market and a better tailoring to one's needs, stand the disadvantages of a reduced transparency and more difficulties in reversing a transaction.

## 2.9 SUMMARY

- The Indian foreign exchange market is a decentralized multiple dealership market comprising two segments – the spot and the derivatives market. In the spot market, currencies are traded at the prevailing rates and the settlement or value date is two business days ahead.
- Derivatives are financial instruments that derive their value from an underlying asset. Examples of derivatives include forward contracts, futures, options, swaps and other exotics. Derivative contracts are traded either in the over the counter (OTC) market or in the derivatives exchange. All derivative transactions that are executed outside the derivatives exchange trading platform are usually referred to as over-the-counter (OTC as is popularly known) derivatives. OTC derivatives are customized by mutual agreement and the prices or rates are negotiated. Examples of OTC derivative contracts include forward contracts, barrier options, constant maturity range accruals, etc. Due to the customized nature of bilateral transactions in the OTC market, the counterparty default risk and liquidity risk is high.
- RBI is the regulator of the OTC currency markets in India. Both RBI and SEBI jointly regulate the currency futures markets in India.

## 2.10 SELF ASSESSMENT QUESTIONS

- 1) Briefly explain the structure of the currency markets in India.
- 2) What is the meaning of derivatives?
- 3) What is the difference between exchange traded and OTC derivatives markets?
- 4) Which are the major currency derivatives products traded?
- 5) Who regulates the currency derivatives markets in India? (both OTC and exchange platform)
- 6) Which are the major types of intermediaries that participate in the currency markets in India?
  - 7) Choose the appropriate answer (correct answer marked as \*\*\*\*\*)
    - 1) Intermediaries in the Indian foreign exchange market DOES NOT include
      - a) ADs (Authorized Dealers),
      - b) foreign exchange brokers
      - c) Money Changers
      - d) NRIs\*\*\*\*\*
    - 2) Which of the following does not offer an electronic trading platform for the foreign exchange transactions in India?
      - a) CCIL
      - b) IBX
      - c) Reuters
      - d) RBI\*\*\*\*
    - 3) The exponential growth in turnover in the Indian forex market during the last three years shows that more than ..... transactions take place between banks themselves and spot market accounts for roughly ..... of the total volume of transactions
      - a) 60% & 50%

- b) 50% & 60%
  - c) 40% & 60%
  - d) 60% & 40%
- 4) Entities with borrowings in foreign currency under external commercial borrowing (ECB) are permitted to use .....s for transformation of and/or hedging foreign currency and interest rate risks.
- a) Cross currency swaps\*\*\*\*
  - b) Swaption
  - c) Interest rate Forwards
  - d) Euro Futures
- 5) In .....the settlement of the transaction is not by delivering the underlying pair of currencies, but by making a net payment in a convertible currency equal to the difference between the agreed forward exchange rate and the subsequent spot rate and are generally settled in US dollar.
- a) Non Deliverable forward contract\*\*\*\*\*
  - b) Currency futures
  - c) Options
  - d) All the above
- 6) ..... frames rules governing the conduct of inter-bank foreign exchange business among banks vis-à-vis the public.
- a) FEDAI\*\*\*\*\*
  - b) RBI
  - c) FIMMDA
  - d) All the above

## 2.11 FURTHER READINGS

- David Dubofsky and Thomas, 2008, *Derivatives: Valuations and Risk Management*. Miller, Oxford University Press
- HP Bhardwaj, *Foreign Exchange Handbook*.
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## **UNIT 3 CURRENCY QUOTATION CONVENTIONS: EXCHANGE ARITHMETIC**

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### **Objectives**

After studying this unit, you should be able to:

- understand the meaning and significance of bid and ask rates;
- appreciate Direct Quote, Indirect Quote;
- explain the Meaning of forward rate premium and discount;
- calculate spot and forward rates; and
- theoretical value of forward and future rates.

### **Structure**

- 3.1 Introduction
- 3.2 Forex Spot Markets: Conventions for Quotation
- 3.3 Spot Rates
- 3.4 Forward Rates
- 3.5 Merchant Rates
- 3.6 Buying Rates and Selling Rates
- 3.7 Outright Forwards
- 3.8 Relationship of Forward to Spot: Covered Interest Rate Parity
- 3.9 Calculating Forward Premium/Discount Points
- 3.10 How do Traders Quote Forward Points?
- 3.11 Summary
- 3.12 Self Assessment Questions
- 3.13 Further Readings

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### **3.1 INTRODUCTION**

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#### **Exchange Rate Mechanism**

Foreign exchange trading is a business in which foreign currency is the commodity. Foreign currency is not a legal tender. The US dollar cannot be used for settlement of debts in India; nevertheless, it has a value. The value of US dollar is like the value of any other commodity. Therefore, foreign currency can also be considered as the commodity in foreign exchange trade.

#### **Purchase and Sale Transactions**

Any trading has two aspects: (i) Purchase, and (ii) Sale. A trader has to purchase goods from his suppliers which he sells to his customers. Two most important points while dealing in foreign exchange are:

- i) The transaction is always talked from the market's point of view; and
- ii) The item referred to is the commodity, i.e., foreign currency.

Therefore, when we talk about purchase, it means the market has purchased foreign currency, and while we say sale, it means the market bank has sold foreign currency. In a purchase transaction, the market acquires foreign currency and parts with home currency. In a sale transaction, the market parts with foreign currency and acquires home currency.

### Bid Price and Ask Price

In the foreign exchange market, there are always two prices for every currency, one price at which sellers of that currency want to sell and another price at which buyers want to buy. A market maker is expected to quote simultaneously for his customers a price at which he is willing to sell and a price at which he is willing to buy standard amounts of any currency for which he is making a market.

Traders always think in terms of how much it costs to buy or sell the base currency. A market maker's quotes are always presented from the market maker's point of view, so the bid price is the amount of terms currency that the market maker will pay for a unit of the base currency; the offer price is the amount of terms currency the market maker will charge for a unit of the base currency. A market maker, when asked for a quote on 'dollar-rupee', might respond '43.5125-50', indicating a bid price of INR 43.5125 per dollar and an offer price of INR 43.5150 per dollar. Usually, the market maker will simply give the quote as '25-50', and assume that the counterparty knows that the 'big figure' is 43.51. The bid price always is offered first (the number on the left) and is lower (a smaller amount of terms currency) than the offer price (the larger number on the right). This difference is the dealer's spread.

## 3.2 FOREX SPOT MARKETS: CONVENTIONS FOR QUOTATION

In foreign exchange markets, the base currency is the first currency in a currency pair. The second currency is called as the terms currency. Exchange rates are quoted in per unit of the base currency, e.g., the expression US Dollar-Rupee, tells you that the US Dollar is being quoted in terms of the Rupee. The US Dollar is the base currency and the Rupee is the terms currency. Exchange rates are constantly changing, which means that the value of one currency in terms of the other is constantly in flux. Changes in rates are expressed as strengthening or weakening of one currency vis-à-vis the other currency. Changes are also expressed as appreciation or depreciation of one currency in terms of the other currency. Whenever the base currency buys more of the terms currency, the base currency has strengthened / appreciated and the terms currency has weakened / depreciated, e.g., if US Dollar-Rupee moved from 43.00 to 43.25, the US Dollar has appreciated and the Rupee has depreciated.

### Exchange Quotation

There are two methods of quoting exchange rates. Exchange rate, expressed as the price per unit of foreign currency in terms of the home currency is known as the "Home currency quotation" or "Direct Quotation". Exchange rate expressed as the price per unit of home currency in terms of the foreign currency is known as the "Foreign Currency Quotation" or "Indirect Quotation". Direct Quotation is used in New York and other foreign exchange markets, and Indirect Quotation is used in London foreign exchange market. In India, till 1966 direct quotation was prevalent. After the devaluation of the rupee in 1966, indirect quotation was adopted. Effective from August 2, 1993, India has switched over to direct method of quotation. This switch over from indirect to direct method is to establish transparency in exchange rates in India.

### ● Direct Quotation: Buy Low, Sell High

The prime motive of any trader is to make profit. By purchasing the commodity at lower price and selling it at a higher price, a trader earns profit. In foreign exchange, the banker buys the foreign currency at a lesser price and sells it at a higher price.

### ● Indirect Quotation: Buy High, Sell Low

A trader for a fixed amount of investment would acquire more units of the commodity when he purchases, and, for the same amount he/she would part with lesser units of the commodity when he/she sells. The buying rate is also known as the bid rate and the selling rate as the offer rate, the difference between the two is known as spread, which is profit.

### Exchange Margin

If the dealer quotes the base rate to the customer, he/she makes no profit. On the other hand, there are administrative costs involved. Further, the deal with the customer takes place first. Only after acquiring or selling the foreign exchange from/to the customer, the dealer goes to the inter-bank market to sell or acquire the foreign exchange required to cover the deal with the customer. An hour or two might have lapsed by this time. The exchange rates are fluctuating constantly and by the time the deal with the market is concluded, the exchange rate might have turned adverse to the dealer. Therefore, sufficient margin is built into the rate to cover the administrative cost, cover the possible exchange rate fluctuation and provide some profit on the transaction to the bank. This is done by loading exchange margin to the base rate. The quantum of margin i.e., built into the rate is determined by the dealer concerned, keeping with the market trend. Upto 1995, the exchange margin included in the merchant rates were prescribed by FEDAI.

### Fineness of Quotation

In the Indian foreign exchange market, the exchange rate is quoted up to 4 decimals in multiples of 0.0025. The quotation is for one unit of foreign currency except in the case of Japanese yen, Belgian franc and Italian lira, Indonesian rupiah, Kenyan shilling, Spanish peseta and currencies of Asian Clearing Union Countries (Bangladesh taka, Myanmar kyat, Iranian riyal, Pakistani rupee and Sri Lankan rupee) where the quotation is per 100 units of the foreign currency concerned.

### Quotes in Basis Points

For most currencies, bid and offer quotes are presented to the fourth decimal place, i.e., to one-hundredth of one per cent or  $1/10,000^{\text{th}}$  of the terms currency unit, usually called a ‘pip’. However, for a few currency units that are relatively small in absolute value, such as Indonesian Rupiah and Japanese Yen, quotes may be carried to two decimal places and a ‘pip’ is  $1/100$  of the terms currency unit. In any market, a ‘pip’ or a ‘tick’ is the smallest amount by which a price can move in that market and in the foreign exchange market ‘pip’ is the term commonly used.

## 3.3 SPOT RATES

A spot transaction is a ‘straightforward’ (outright) exchange of one currency for another. The spot rate is the current market price, the benchmark price.

Spot transactions do not require immediate settlement or payment ‘on the spot’. By convention, the ‘settlement date’ (value date), is the second business day after the ‘deal date’ (trade date) on which the transaction is agreed to by the two traders. The two-day period provides ample time for the two parties to confirm the agreement and arrange

the clearing and necessary debiting and crediting of bank accounts in various international locations. Exceptionally, spot transactions between the Canadian dollar and the US dollar are settled conventionally one business day after the deal, rather than two business days later, since Canada is in the same time zone as the US and an earlier value date is feasible.

A spot transaction represents a direct exchange of one currency for another and, when executed, leads to transfers through the payment systems of the two countries whose currencies are involved. For example, in a typical spot transaction, Bank A in New York will agree on June 1 to sell USD 1 million for INR to Bank B in Mumbai at the rate of, say, INR 43.50 per dollar for value June 3. On June 3, Bank B will pay INR 43.50 million for credit to Bank A's account at a bank in Mumbai, and Bank A will pay \$1 million for credit to Bank B's account at a bank in the US. The execution of the two payments completes the transaction.

Bank 'A' agrees to buy USD 100000 from Bank 'B'. The actual exchange of currencies i.e., payment of rupees and receipt of US dollars, under the contract may take place :

- a) on the same day, or
- b) two days later, or
- c) some day later, say after a month.

Where the agreement to buy and sell is agreed upon and executed on the same date, the transaction is known as **cash transaction or value today** transaction.

This procedure involves some time; For example if the contract is made on Monday, the delivery should take place on Wednesday. If Wednesday is holiday, the delivery will take place on the next day, i.e., Thursday. Rupee payment is also made on the same day the foreign currency is received. The transaction where the exchange of currencies takes place two days after the date of the contract is known as the spot transaction.

### 3.4 FORWARD RATES

#### Forward Margin/Swap Points

Forward rate may be the same as the spot rate for the currency. Then it is said to be at par with the spot rate. But this rarely happens. More often the forward rate for a currency may be costlier or cheaper than its spot rate. The difference between the forward rate and the spot rate is known as the forward margin or swap points. The forward margin may be either at a premium or at a discount. If the forward margin is at a premium, the foreign currency will be costlier under forward rate than under the spot rate. If the forward margin is at discount, the foreign currency will be cheaper for forward delivery than for spot delivery.

#### Forward Outright

A foreign exchange outright forward is a contract between two counterparties to exchange one currency for another on any day after spot. In this transaction, money does not actually change hands until some agreed upon future date. The duration of the trade can be a few days, months or years. For most major currencies, three business days or more after deal date would constitute a forward transaction.

The delivery of foreign currency and payment in rupees take place after one month. The transaction in which the exchange of currencies takes place at a specified future date is known as a forward transaction. The forward transaction can be for delivery one or two or three months, etc. A forward contract for delivery one month means the exchange of currencies will take place after one month from the date of contract.

A forward contract for delivery two months means the exchange of currencies will take place after two months and so on.

### Direct Quotation

Premium is added to spot rate to arrive at the forward rate. This is done for both types of transactions, i.e., either sale or purchase transaction. Discount is deducted from the spot rate to arrive at the forward rate.

### Interpretation of Inter-bank Quotations

The market quotation for a currency consists of the spot rate and the forward margin. The outright forward rate has to be calculated by loading the forward margin into the spot rate. For example US dollar is quoted in the inter-bank market on a given day as under:

Spot	1 USD = Rs.44.1000/1300
Spot/November	0200/0500
Spot/December	1500/1800

The following points should be noted in interpreting the above quotation:

- i) The first statement is the spot rate for dollar. The quoting bank's buying rate is Rs. 44.1000 and selling rate is Rs. 44.1300.
- ii) The second and third statements are forward margins for forward delivery during the months of November and December respectively. Spot/November rate is valid for delivery end November. Spot/December rate is valid for delivery end December.
- iii) The margin is expressed in points, i.e., 0.0003 of the currency. Therefore, the forward margin for November is 2 paise and 5 paise.
- iv) We have seen that under direct quotation, the first rate in the spot quotation is for buying and second for selling the foreign currency. Correspondingly, in the forward margin, the first rate relates to buying and second to the selling.

Taking Spot/November as an example, the margin of 2 paise is for purchase and 5 paise is for sale of foreign currency.

Where the forward margin for a month is given in ascending order, as in the quotation above, it indicates that the forward currency is at premium. The outright forward rates are arrived at by adding the forward margin to the spot rates.

The outright forward rates of dollar can be derived from the above quotation as follows:

	Buying Rate		Selling Rate	
	November	December	November	December
Spot Rate	44.1000	44.1000	44.1300	44.1300
Add : Premium	0.0200	0.1500	0.0500	0.1800
Forward Rate	44.1200	44.2500	44.1800	44.3100

From the above calculations, we arrive at the following outright rates :

	Buying	Selling
Spot Delivery	USD 1 = Rs.44.1000	44.1500
Forward Delivery November	44.1200	44.1800
Forward Delivery December	44.2500	44.3100

If the forward margin is in at discount, it would be indicated by quoting the forward margin in the descending order. The conclusion is that :

- If Forward margin is in the ascending order, the Premium is to be added to the spot rate.
- If Forward margin is in the descending order, the Discount is to be deducted from the spot rate.

### Factors determining the forward margin

As the difference between the spot rate and forward rate of a currency make the forward currency cheaper or costly as compared to the spot currency. The difference in the rate of interest prevailing at different financial centers is a dominant factor determining forward margin. Other factors that affect forward margin are demand and supply of currency, speculation about spot rates and exchange control regulations.

### Rate of Interest

The difference in the rate of interest prevailing at the home center and the concerned foreign center determines the forward margin. If the rate of interest at the foreign center is higher than that prevailing at the home center, the forward margin would be at discount. Conversely, if the rate of interest at the foreign center is lower than that at the home center, the forward margin would be at premium. This can be explained as follows:

- When the bank enters into a forward sale contract with the customer, it arranges for delivery of the foreign currency on the due date by keeping the funds in deposit at the foreign center concerned.
- If the interest rate is higher at the foreign center, forward rate is at a discount.
- If the interest rate is lower at the foreign center, the bank suffers a net loss and the loss is passed on to the customer by quoting the forward rate at a premium.
- If suitable conditions prevail in the market, the rate of interest would exert a greater influence than any other factor and the forward margin would tend to be compensated by the forward margin. But, in practice, it is hard to find this and the forward margin at any particular time is determined by many other factors given below:
  - a) **Demand and Supply:** Forward margin is also determined by the demand for and the supply of foreign currency. If the demand for foreign currency is more than its supply, forward rate would be at premium. If the supply exceeds the demand, the forward rate would be at discount.
  - b) **Speculation about Spot Rates:** Since, the forward rates are based on spot rates any speculation about the movement of spot rates would influence forward rates also. If the exchange dealers anticipate the spot rate to appreciate, the forward rate would be quoted at premium. If they expect the spot rate to depreciate, the forward rates would be quoted at a discount.
  - c) **Exchange Regulations:** Exchange control regulations may put some conditions on the forward dealings and obstruct the influence of the above factors on the forward margin. Such restrictions may be with respect to keeping of balances abroad, borrowing overseas, etc. Intervention in the forward market by the central bank may also be done to influence the forward margin.

### Activity 1

- 1) List the factors impacting forward margin.

- 2) Explain with illustration how forward rate is derived from spot rate.
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### 3.5 MERCHANT RATES

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The foreign exchange dealing of a bank with its customer is known as ‘merchant businesses’ and the exchange rate at which the transaction takes place is the ‘merchant rate’. The merchant business in which the contract with the customer to buy or sell foreign exchange is agreed to and executed on the same day is known as ready transactions or cash transactions. As in the case of inter-bank transactions, a value next day contract is deliverable on the next business day and a spot contract is deliverable on the second succeeding business day following the date of the contract. Most of the transactions with customers are on ready basis. In practice, the terms ready and spot are used synonymously to refer to transactions concluded and executed on the same day.

#### Basis for Merchant Rates

When the bank buys foreign exchange from the customer, it sells the same in the inter-bank market at a better rate and thus makes a profit out of the deal. In the inter-bank market, the bank will accept the rate as dictated by the market. It can therefore sell foreign exchange in the market at the market buying rate for the currency concerned. Thus, the inter-bank buying rate forms the basis for quotation of buying rate by the bank to its customer. Similarly, when the bank sells foreign exchange to the customers, it meets the commitment by purchasing the required foreign exchange from the inter-bank market. It can acquire foreign exchange from the market at the market selling rate. Therefore, the inter-bank selling rate forms, the basis for quotation of selling rate to the customer by the bank. The inter-bank rate on the basis of which the bank quotes its merchant rate is known as base rate.

### 3.6 BUYING RATES AND SELLING RATES

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In a purchase transaction, the bank acquires foreign exchange from the customer and pays him in Indian rupees. Some of the purchase transactions result in the bank acquiring foreign exchange immediately, while some involve delay in the acquisition of foreign exchange. For instance, if the bank pays a demand draft drawn on it by its correspondent bank, there is no delay because the foreign correspondent bank would already have credited the nostro account of the paying bank while issuing the demand draft. On the other hand, if the bank purchases an ‘on demand bill from the customer, it has first to be sent to the drawee’s place for collection. The bill will be sent to the correspondent bank for collection. The correspondent bank will present the bill to the drawee. The nostro account of the bank with its correspondent bank will be credited only when the drawee makes payment against the bill. Suppose this takes 20 days. The bank will acquire foreign exchange only after 20 days.

Depending upon the time of realization of foreign exchange by the bank, two types of buying rates are quoted in India, they are: (i) TT Buying Rate, and (ii) Bill Buying Rate.

#### TT Buying Rate (TT stands for Telegraphic Transfer)

This is the rate applied when the transaction does not involve any delay in realization of the foreign exchange by the bank. In other words, the nostro account of the bank would

already have been credited. The rate is calculated by deducting from the inter-bank buying rate the exchange margin as determined by the bank. Though the name implies telegraphic transfer, it is not necessary that proceeds of the transaction are received by telegram. Any transaction where no delay is involved in the bank acquiring the foreign exchange will be done at the TT rate.

Transactions where TT rate is applied are:

- i) Payment of demand drafts, mail transfers, telegraphic transfers etc., drawn on the bank where bank's nostro account is already credited.
- ii) Foreign bills collected. When a foreign bill is taken for collection, the bank pays the exporter only when the importer pays for the bill and the bank's nostro abroad is credited.
- iii) Cancellation of foreign exchange sold earlier. For instance the purchaser of a bank draft drawn on New York may later request the bank to cancel the draft and refund the money to him. In such case, the bank will apply the TT buying rate to determine the rupee amount payable to the customer.

### TT Buying Rate

Dollar/Rupee market spot buying rate = Rs.

Less: Exchange Margin = Rs.

TT Buying Rate = Rs.

Rounded off to nearest multiple of 0.0025

### Bill Buying Rate

This is the rate to be applied when a foreign bill is purchased by a bank. When a bill is purchased, the proceeds will be realized by the bank after the bill is presented to the drawee at the overseas center. In the case of a usance bill, the proceeds will be realized on the due date of the bill which includes the transit period and the usance period of the bill.

If a sight bill on London is purchased, the realization will be after a period of about 20 days (transit period). The bank would be able to dispose of the foreign exchange only after this period. Therefore, the rate quoted to the customer would be based not on the spot rate in the inter-bank market, but on the interbank rate for 20 days forward. Likewise, if the bill purchased is 30 days usance bill, then the bill will be realized after about 50 days (20 days transit plus 30 days usance bill, period). Therefore, The bank would be able to dispose of foreign exchange only after 50 days; the rate to the customer would be based on the inter-bank rate for 50 days forward.

Two points need noting in loading the bills buying rate with forward margin. First, forward margin is normally available for periods of a calendar month and not for 20 days, etc. Secondly, forward margin may be at a premium or discount. Premium is to be added to the spot rate and discount should be deducted from it. While making calculations, the bank will see that the period for which forward margin is loaded is beneficial to the bank.

Thus, where the foreign currency is at premium, while calculating the bill buying rate, the bank will round off the transit and usance periods to the lower month. Where the foreign currency is at discount, while calculating the bill buying rate, the bank will round off the transit and usance periods to a higher month.

The above process is reversed in quoting selling rates, i.e., TT selling rates and bill selling rates.

## Travellers Cheque and Foreign Currency Rates

The buying and selling rates for travelers cheques and foreign currencies are computed by banks in the following manner. When a bank purchases travelers cheques, it sends the same to the correspondent outside India for collection and credit the proceeds to its **nostro account** (**Nostro Account** is a foreign currency account maintained in foreign currency by an Indian bank with a overseas bank abroad). Threfore, the TC buying rate quoted is bills buying rate where the forward period is assumed to be one month. Similarly, TC Selling rate is calculated by adding a margin of .5% to TT selling rate.

In the case of purchase of foreign currency notes, the bank derives the currency buying rate from the travellers cheque buying rate by deducting 0.5% from its margin. Likewise,currency selling rate is arrived by adding 0.5% to the TC selling rate.

### a) Illustration: (Rate Calculation)

ABC Company wants to remit CHF 2,00,000 to a customer when spot rates are USD/CHF 5.9028/48 and USD/INR 35.3555/3650 in the inter-bank market. It approaches Popular Bank for foreign remittance. Popular Bank is willing to sell CHF to ABC Co subject to (i) Exchange margin 0.15%, (ii) Out of pocket expenses (telex etc.) Rs. 200/- (iii) Rounding off as per FEDAI Rules. Show the steps involved in calculation of CHF rates by Popular Bank and the rupee amount payable by ABC Co.

### Solution

The bank will proceed as follows to calculate the rate:

#### Step 1

- 1) Sell USD IS International market and acquire CHF 200,000. The rate at which USD can be sold is the International Market is the Market Buying Rate i.e., USD 1 = 5,9028 (A).

#### Step 2

- 2) The bank has to purchase this USD from inter-bank market at market selling rate USD 1 = Rs. 35.3650 (B).

#### Step3

- 3) Then the cross rate for Spot Selling between CHF and INR CHF = B / A  
(Note: USD 1 = CHF 5.9028 = Rs. 35.3650) =  $35.3650 / 5.9028 = \text{Rs. } 5.9912$ .

#### Step 4

- 4) Add exchange margin 0.15% on the cross rate of Rs.5,9912 = Rs. 0.0090.

#### Step 5

- 5) TT Selling Rate ( Cross Rate plus Exchange Margin) = 6.0002.

#### Step 6

- 6) Rate to be quoted is = Rs. 6.

#### Step 7

- 7) Rupee amount payable by ABC is=CHF 2, 00,000X Rs. 6 = Rs. 1200000  
Add out of pocket Exp. = Rs. 200

#### Step 8

- 8) Total amount payable by the customer = Rs. 1200200

b) **Illustration**

Raj is working as a dealer for Popular Bank and had entered into a cross currency deal and had sold USD 5,00,000 against EUR at USD 1 = EUR 1.4400 for spot delivery. However, later during the day, the market became volatile and the dealer in compliance with his management's guideline, he had to square up the position by purchasing USD 5,00,000 against EUR at the on-going rate. Assuming the spot rates as under:

USD 1 = INR 31.4300/4500

and USD 1 = EUR 1.4400/4450

What will be the gain or loss in the transaction? Your answer should be in rupees. Ignore brokerage, telex charges etc.

**Solution:**

**Step 1**

- 1) The amount of EUR bought by the Forex Dealer by selling USD 5,00,000 =  
 $500000 \times 1.4400 = \text{EUR } 7,20,000.$

**Step 2**

- 2) He again bought same amount of USD at market selling rate USD 1 = 1.4450.  
Which is equal to  $500,000 \times 1.4450 = \text{EUR } 7,22,500.$

**Step 3**

- 3) Net loss in the transaction is EUR (722500 - 720000) = EUR 2500.

**Step 4**

- 4) He has to therefore buy EUR 2500 at Cross Buying Rate. Calculation of Cross.

**Step 5**

Buying Rate is to be arrived as follows:

- a) To acquire EUR 2500, he has to sell USD at market buying rate of USD 1 = EUR 1.4400.
- b) This USD, he has to buy from interbank market at market selling rate of USD 1 = INR 31.4500.

**Step 6**

The cross buying rate of EUR/INR is therefore  $\text{Rs. } 31.4500 / 1.4400 = \text{Rs. } 21.78.$

**Step 7**

The rupee amount to be paid for buying EUR 2500 =  $2500 \times \text{Rs. } 21.78 = \text{Rs. } 54,450$

Ans: The loss in the transaction is Rs. 54,450/-

**Activity 2**

- 1) Explain with illustration the calculation of cross rate.

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- 2) Explain with illustration calculation of bills buying rate.

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### 3.7 OUTRIGHT FORWARDS

An outright forward transaction, like a spot transaction, is a straightforward single purchase/ sale of one currency for another. The only difference is that spot is settled, or delivered, on a value date no later than two business days after the deal date, while outright forward is settled on any pre-agreed date three or more business days after the deal date. Dealers use the term ‘outright forward’ to make clear that it is a single purchase or sale on a future date, and not part of a ‘Swap’ (described later). There is a specific exchange rate for each forward maturity of a currency, almost always different from the spot rate. The exchange rate at which the outright forward transaction is executed is fixed at the outset. No money necessarily changes hands until the transaction actually takes place, although dealers may require some customers to provide collateral in advance.

Outright forwards can be used for a variety of purposes – covering a known future expenditure, hedging, speculating, or any number of commercial, financial, or investment purposes. The instrument is very flexible, and forward transactions can be tailored and customized to meet the particular needs of a customer with respect to currency, amount, and maturity date. Of course, customized forward contracts for non-standard dates or amounts are generally more costly and less liquid, and more difficult to reverse or modify in the event of need than are standard forward contracts. Also, forward contracts for minor currencies and exotic currencies can be more difficult to arrange and more costly.

Outright forwards in major currencies are available over-the-counter from dealers for standard contract periods or ‘straight dates’ (one, two, three, six, and twelve months); dealers tend to deal with each other on straight dates. However, customers can obtain ‘odd-date’ or ‘broken-date’ contracts for deals falling between standard dates, and traders will determine the rates through a process of interpolation. The agreed-upon maturity can range from a few days to months or even two or three years ahead, although, very long-dated forwards are rare because they tend to have a large bid-asked spread and are relatively expensive.

### 3.8 RELATIONSHIP OF FORWARD TO SPOT: COVERED INTEREST RATE PARITY

The forward rate for any two currencies is a function of their spot rate and the interest rate differential between them. For major currencies, the interest rate differential is determined in the euro currency deposit market. Under the covered interest rate parity principle, and with the opportunity of arbitrage, the forward rate will tend toward an equilibrium point at which any difference in euro currency interest rates between the two currencies would be exactly offset, or neutralized, by a premium or discount in the forward rate.

For example, If six-month euro-dollar deposits pay interest of 5 per cent per annum, and six-month euro-yen deposits pay interest of 3 per cent per annum, and if there is no premium or discount on the forward yen against the forward dollar, there would be an opportunity for ‘round-tripping’ and an arbitrage profit with no exchange risk. Thus, it would pay to borrow yen at 3 per cent, sell the yen spot for dollars and simultaneously resell dollars forward for yen six months hence, meanwhile investing the dollars at the higher interest rate of 5 per cent for the six-month period. This arbitrage opportunity would tend to drive up the forward exchange rate of the yen relative to the dollar (or force some other adjustment) until there were an equal return on the two investments after taking into account the cost of covering the forward exchange risk.

Similarly, if short-term dollar investments and short-term yen investments both paid the same interest rate, and if there were a premium on the forward yen against the forward

dollar, there would once again be an opportunity for an arbitrage profit with no exchange risk, which again would tend to reduce the premium on the forward yen (or force some other adjustment) until there were an equal return on the two investments after covering the cost of the forward exchange risk.

In this state of equilibrium, or condition of covered interest rate parity, an investor (or a borrower) who operates in the forward exchange market will realize the same domestic return (or pay the same domestic cost) whether investing (borrowing) in his domestic currency or in a foreign currency, net of the costs of forward exchange rate cover. The forward exchange rate should offset, or neutralize, the interest rate differential between the two currencies.

The forward rate in the market can deviate from this theoretical, or implied, equilibrium rate derived from the interest rate differential to the extent that there are significant costs, restrictions, or market inefficiencies that prevent arbitrage from taking place in a timely manner. Such constraints could take the form of transaction costs, information gaps, government regulations, taxes, unavailability of comparable investments (in terms of risk, maturity, amount, etc.) and other impediments or imperfections in the capital markets. However, today's large and deregulated foreign exchange markets and euro currency deposit markets for the dollar and other heavily traded currencies are generally free of major impediments.

### 3.9 CALCULATING FORWARD PREMIUM/DISCOUNT POINTS

Formulas for calculating forward premiums and discounts, expressed as points of the spot rate, equate the two cash flows so that the forward premium or discount neutralizes the differential between interest rates in the two currencies. A generalized formula is:

$$\text{Points} = \text{Spot Rate} \left\{ \frac{1 + [\text{Quoted Currency Interest Rate} \times (\text{Forward Days} / \text{Interest Rate Year})]}{1 + [\text{Base Currency Interest Rate} \times (\text{Forward Days} / \text{Interest Rate Year})]} \right\} - 1$$

Thus, if the dollar is the base currency, with a euro-dollar (offshore) interest rate of 5 per cent, and the INR is the terms currency, with 6 per cent interest in the offshore market, and spot rate is INR 43.50 per dollar, then the points for a six-month (181-day) forward rate would be 33. (Most currencies use a 360-day interest rate year, except the pound sterling and a few others, which use a 365-day year)

$$\text{Points} = 43.5000 \{ 1 + [0.06 * (181/360)] \} - 1 = 43.71 \text{ (and not 33 as given below)}$$

$$\{ 1 + [0.05 * (181/360)] \}$$

$$\text{Points} = (43.5000 \{ \frac{1 + [0.06 \times 9181 / 3600]}{1 + [0.05 \times (181 / 360)]} \}) - 1 = 33$$

$$= 43.50 \{ 1 + 0.0301 \}$$

$$\{ 1 + 0.0251 \}$$

$$= 43.50(1.0048)$$

$$= 43.71$$

The six month outright forward rate would be INR 43.71 per dollar.

The above generalized formula takes no account of the differences between borrowing and lending rates in the offshore deposit market. In pricing possible forward transactions, a trader would take into account those differences, calculate the costs of putting together the deal, determine the 'boundary' rates, and perhaps shade the price to reflect competitive quotes, perspectives on market performance, the trader's own portfolio of existing contracts, and other factors.

### Valuation based on Continuous Compounding

Following is the formula for calculation of the theoretical price of currency futures contracts:

$$F(0,T) = S_0 e^{(r_d - r_f)T}$$

Where:

- $F(0,T)$  is the futures contract price with expiry period  $T$  as assessed at Time  $t = 0$
- $S_0$  is the spot rate at Time  $t = 0$
- $e$  is exponential with value 2.718281828
- $r_f$  is the foreign currency risk free rate of return
- $r_d$  is the domestic currency risk free rate of return
- $T$  is tenor or time to maturity of the currency futures contract

Spot	47.5
US Interest Rate	3%
Indian Interest Rate	7%
Time (Days)	90
Basis	360

$$\text{Points} = \text{Spot} \times \frac{1 + \text{terms } i * \frac{\text{days}}{\text{basis}}}{1 + \text{base } i * \frac{\text{days}}{\text{basis}}} - 1$$

$$\begin{aligned}\text{Point} &= 47.5 [(1+(0.07 * 90/360)) / (1+(0.03 * 90/360))) - 1] \\ &= 47.5 [(1+(0.07*0.25)) / (1+(0.03*0.25))) - 1] \\ &= 47.5 [(1+0.0175) / (1+0.0075)) - 1] \\ &= 47.5 [(1.0175 / 1.0075) - 1] \\ &= 47.5 [ 1.0099 - 1] \\ &= 0.4715\end{aligned}$$

**Forward Rate = Spot + Point**

Forward Rate = 47.5 + 0.4715

**Forward Rate = 47.9715**

In the case of USDINR futures contracts, the domestic currency interest rate is calculated from the OTC market as the INR implied MIFOR rate. The foreign currency interest rate is the USD LIBOR rates as provided by British Bankers Association every business day at 11:30 a.m. (GMT). Since, these rates are not continuously compounded rates and are in Actual / 360 basis format. Hence, for continuous compounding and to convert the rate into Actual / 365, the following formula needs to be used for USD LIBOR rates:

$$rf = (365 / D) \times (\ln(1 + r(D / 360)))$$

Where:

- $r$  is the USD LIBOR rate in the Actual / 360 day basis format
- $D$  is the day count (for the specific LIBOR rate)
- $\ln$  is Log Normal
- $rf$  is the continuously compounded rate of return in the Actual / 365 basis format

INR Implied MIFOR rates are also not continuously compounded, but they are already in the Actual / 365 days format. Hence, the following formula is required to be used for conversion:

$$rd = (365 / D) \times (\ln(1 + r(D / 365)))$$

Where:

- r is the INR implied MIFOR rate
- D is the day count (for the specific MIFOR rate)
- LN is Log Normal
- rd is the continuously compounded rate of return in the Actual / 365 basis format

Note:

LIBOR (London Interbank Offer Rate) is the rate at which large banks in London are willing to lend money. This rate is polled and released by the British Bankers Association (BBA) at approximately 11:30 a.m. (GMT).

MIFOR (Mumbai Interbank Forward Offer Rate) is the rate used by Indian banks and other derivative market participants as a benchmark for setting price on forward rate agreements and interest rate derivatives. MIFOR is the implied forward rupee rate for a period greater than 1 day and it is a mix of LIBOR and a forward premium derived from Indian OTC forex market. Hence MIFOR is calculated as follows:

$$(1 + LD / 360) \times (1 + FD / 365) - 1 \times (365 / D)$$

L - Libor Rate

D - Day count

F - USDINR Forward Rate (annualized in percentage)

### **3.10 HOW DO TRADERS QUOTE FORWARD POINTS?**

Although spot rates are quoted in absolute terms – for example, say, X INR per dollar – forward rates, as a matter of convenience are quoted among dealers in differentials; i.e., in premiums or discounts from the spot rate. The premium or discount is measured in ‘points’, which represent the interest rate differential between the two currencies for the period of the forward, converted into foreign exchange. Specifically, points are the amount of foreign exchange (or basis points) that will neutralize the interest rate differential between two currencies for the applicable period. Thus, if interest rates are higher for currency A than currency B, the points will be the number of basis points to subtract from currency A’s spot exchange rate to yield a forward exchange rate that neutralizes or offsets the interest rate differential. Most forward contracts are arranged so that, at the outset, the present value of the contract is zero.

Traders in the market thus know that for any currency pair, if the base currency earns a higher interest rate than the terms currency, the base currency will trade at a forward discount, or below the spot rate; and if the base currency earns a lower interest rate than the terms currency, the base currency will trade at a forward premium, or above the spot rate.

Whichever side of the transaction the trader is on, the trader won’t gain (or lose) from both the interest rate differential and the forward premium/discount. A trader who loses on the interest rate will earn the forward premium, and *vice versa*.

Traders have long used rules of thumb and shortcuts for calculating whether to add or subtract the points. Points are subtracted from the spot rate when the interest rate of

the base currency is the higher one, since the base currency should trade at a forward discount; points are added when the interest rate of the base currency is the lower one, since the base currency should trade at a forward premium. Another rule of thumb is that the points must be added when the small number comes first in the quote of the differential, but subtracted when the larger number comes first. For example, the spot INR might be quoted at ‘43.20-30’, and the 3-month forward at ‘40-60’ (to be added) or ‘60-40’ (to be subtracted). Also, the spread will always grow larger when shifting from the spot quote to the forward quote. Screens now show positive and negative signs in front of points, making the process easier still.

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### 3.11 SUMMARY

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- Bid refers to the price at which the market is willing to buy a specific currency. Usually, the best buy quote or bid price is the highest of all buy quotes. At this price, traders can sell the base currency. It is shown on the left side of the quotation.
- Offer refers to the price at which the market is willing to sell a specific currency. Usually, the best sell quote or ask (offer) price is the lowest of all sell quotes. At this price, traders can buy the base currency. It is shown on the right side of the quotation.
- The difference between the bid and offer price or in other words, the difference between the best buy price and best sell price is usually referred to as the bid-ask spread. The lower the bid-ask spread, more liquid is the market with lower transaction cost.
- Spot price or spot rate is the quote for buying or selling currency with settlement (delivery) on T+2 day basis, i.e., 2nd business day from date of transaction. Thus, when a forex trader enters into a spot transaction, the deal is fixed at a particular spot rate, whereby, a certain amount of one currency is received in exchange for the fixed amount of another currency. The deal is done on pre-determined rate as agreed between both the entities entering into the spot transaction. The only exception to the prior mentioned spot settlement period is the Canadian Dollar (CAD), which is settled on T+1 day basis.
- A cash transaction results in immediate delivery on the same date of the forex transaction.
- Tom Next stands for “Tomorrow Next”. This transaction is settled one day prior to a regular spot deal, thus maturity is the next business day or T+1 day basis. On the other hand, “Spot Next” transaction is settled one business day past the spot date, i.e., 3 business days to maturity or T+3 day basis.

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### 3.12 SELF ASSESSMENT QUESTIONS

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- 1) What is the meaning of bid?
- 2) What is the meaning of ask?
- 3) What is the bid-ask spread?
- 4) What is a direct quote?
- 5) How is a direct quote different from an indirect quote?
- 6) How do you calculate forward points?
- 7) What is the meaning of forward rate premium and discount?
- 8) Why are some currency pairs at premium and some at discount?

- a) Choose the appropriate answer (answer marked \*\*\*\*)
- 1) Every foreign currency transaction involves exchange of \_\_\_\_\_
- Two Currencies\*\*\*
  - Three Currencies
  - One Currency
  - Four Currencies
- 2) A quotation for 'dollar-rupee' means the rupee is the \_\_\_\_\_.
- Fixed Currency
  - Term Currency or Quoted Currency\*\*\*\*
  - Base Currency
  - All the above
- 3) If the EURUSD rate has changed from 1.2701 to 1.2711, then the EURUSD rate is usually referred to as having moved up by 100 pips. Is this statement True or False?
- TRUE
  - FALSE\*\*\*
- 4) The forward rate for any two currencies is a function of their spot rate and \_\_\_\_\_.
- Trade difference
  - Difference in the exchange rate
  - Interest rate differential between them\*\*\*
  - Difference in inflation rates
- 5) ABC Ltd is planning to buy an asset from UK for £1M, after a month. To hedge the currency risk it can enter into a forward contract to buy £ at a predetermined one month future price. Current exchange rate is Rs 79.20/£ and one month forward rate is Rs 80.15/ £. If exchange rate increases to Rs 81.50/£ after a month, would ABC be making a Notional Profit/Loss on the forward contract?
- Profit\*\*\*\*
  - Loss
  - No change
  - Profit & Loss
- 6) ABC Ltd is planning to buy an asset from UK for £1M, after a month. To hedge the currency risk it can enter into a forward contract to buy £ at a predetermined one month forward price. Current exchange rate is Rs 79.20/£ and one month forward rate is Rs 80.15/ £. If exchange rate increases to Rs 81.50/£ after a month. The notional profit or loss (in INR) would be \_\_\_\_\_?
- Profit of 0.95M
  - Profit of 1.35M\*\*\*
  - Loss of 0.95M
  - Loss of 1.35M

### 3.13 FURTHER READINGS

- David Dubofsky and Thomas, 2008, *Derivatives: Valuations and Risk Management*, Miller, Oxford University Press.
- Prakash G. Apte, *International Financial Management*.
- Rudi Weisweiller, Foreign Exchange & Money Market Operations-Managing a Foreign Exchange Department.
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# **UNIT 4 ECONOMIC VARIABLES IMPACTING EXCHANGE RATES**

## **Objectives**

After studying this unit, you should be able to:

- understand the major economic factors that influence currency volatility;
- analyse the impact of Dollarisation of the economy; and
- explain the implication of spot price on currency futures price.

## **Structure**

- 4.1 Introduction
- 4.2 Theories of Exchange Rate Determination
- 4.3 Nominal and Effective Exchange Rates
- 4.4 Real Effective Exchange Rates
- 4.5 Economic Factors Impacting Exchange Rates
- 4.6 Economic News
- 4.7 Market Psychology
- 4.8 Dollarisation of Economy
- 4.9 Advantages and Disadvantages of Dollarization
- 4.10 Exchange Rate Volatility
- 4.11 Impact of Futures Prices on Spot and Forward Markets
- 4.12 Application of Technical Analysis
- 4.13 Summary
- 4.14 Self Assessment Questions
- 4.15 Further Readings

### **4.1 INTRODUCTION**

Everyday millions of companies and individuals around the world do business with companies and individuals located in different countries. Often these transactions involve two or more currencies. The standard for how many units of one currency (e.g., US dollars) must be surrendered to obtain one unit of another currency (e.g., Indian Rupees) is commonly known as the exchange rate between two currencies. The value of the currency has huge implications for a nation's economy. If the value of the domestic currency appreciates, i.e., more units of the foreign currency are needed in order to buy one unit of the domestic currency, then this country will be able to buy foreign products more cheaply. On the other hand, the products of this country are going to be more expensive in foreign markets and, as a result, the stronger currency may hurt local exporters as foreign demand decreases. It can be argued that not only the value of a currency, but also its predictability can affect international businesses. If one company is going to have operations in a country whose currency has an uncertain future value then there may be uncertainty about this company's future revenues, operational costs, and therefore profits. As it is well known, risk averse companies prefer to decrease the risk and uncertainty of future revenues and costs.

In the past, particularly in the period from the Second World War to the end of the Bretton Woods era, it was common for many countries around the world to have fixed exchange rates, i.e., the value of the currency was pegged to the value of some other currency. This arrangement was adopted by different countries with the hope that it would avoid uncertainty about the value of their currency and the economic consequences of such uncertainty. Nowadays, most major currencies are flexible and their values are determined by demand and supply in the foreign exchange market.

Two types of analysis are used for the market movements forecasting: fundamental and technical (the chart study of past behaviour of exchange rate). The fundamental analysis focuses on the theoretical models of exchange rate determination and on the major economic factors and their likelihood of affecting the foreign exchange rates. Economic factors differ from the other three factors in terms of the certainty of their release. The dates and times of economic data release are known well in advance, at least among the industrialized nations.

## 4.2 THEORIES OF EXCHANGE RATES DETERMINATION

Several known theories of exchange rate determination are briefly explained below:

### a) Purchasing Power Parity Approach

The purchasing power parity approach to the exchange rate was, and continues to be, a very influential way of understanding the exchange rate determination. The PPP derives from the assumption that 'law of one price' exists in the world. The law of one price states that the price of a product in one country should equal the price of the same product in another country, exchanged at the current price of currencies. For instance, if a 'Lee' trouser sells for \$45 in New York, it must sell for Rs 1948.50 ( $\$45 \times 43.30$ , the current exchange rate of USD/INR) in India. In competitive markets, free of transportation costs and official barriers to trade, identical goods must cost the same, wherever they are sold.

$$e_t = p_t / p_t^*$$

This is the absolute PPP approach. Where  $p$  represent domestic prices,  $p^*$  are foreign prices and  $e$  is the exchange rate.

### b) Balance of Payments Approach

This model holds that a foreign exchange rate must be at its equilibrium level, i.e., the rate that produces a stable current account balance. For example, a nation with a trade deficit will experience a reduction in its foreign exchange reserves, which ultimately lowers (depreciates) the value of its currency. The cheaper currency renders the nation's exports more affordable in the global marketplace while making imports more expensive. After an intermediate period, imports are forced down and exports rise, thus stabilizing the trade balance and the currency towards equilibrium.

### Components of Balance of Payments

Balance of Payments is generally grouped under the following heads:

- i) Current Account
- ii) Capital Account
- iii) Unilateral Transfers Account
- iv) Official Settlement Account

- i) **Current Account:** Current Account includes all transactions that give rise to national income. The Current Account consists of two major items:
  - a) Merchandise exports and imports
  - b) Invisible exports and imports
- ii) **Capital Account:** capital account consists of short-term and long-term capital transactions. A capital outflow represents a debit and a capital inflow represents a credit. For instance, if an American firm invests Rs 100 million in India, this transaction will be represented as a debit in the US balance of payments and a credit in the balance of payments of India.
- iii) **Unilateral Transfers Account:** Unilateral transfer is another term for gifts. Unilateral transfers include private remittances, government grants, disaster relief, etc. Unilateral payments received from abroad are credits and those remitted to other overseas countries are debits.
- iv) **Official Settlements Account:** Represents the holdings by the government or official agencies of the means of payment that are generally accepted for the settlement of international claims.

#### c) Interest Rate Parity

This states that an appreciation or depreciation of one currency against another currency must be neutralized by a change in the interest rate differential. For example, if American interest rates exceed Japanese interest rates, then the American dollar should depreciate against the Japanese yen by an amount that prevents riskless arbitrage.

#### d) Asset Market Model

Economic variables such as growth, inflation, and productivity are no longer the only drivers of foreign exchange movements. The proportion of foreign exchange transactions stemming from cross-border trading of financial assets has dwarfed the extent of currency transactions generated from trading in goods and services.

The asset market approach views currencies as asset prices traded in an efficient financial market. As a result, currencies are increasingly demonstrating a strong correlation with asset markets, particularly equities.

### **4.3 NOMINAL AND EFFECTIVE EXCHANGE RATES**

#### **Nominal Exchange Rate**

Nominal exchange rate is the price of one currency in terms of another. It's usually expressed as the domestic price of the foreign currency. So if it costs Rs.50 to buy one USD , from a rupee holder point of view the nominal rate of dollar is Rs. 50.

#### **Real Exchange rate**

Real Exchange Rate seeks to measure the value of a country's goods against those of another country, a group of countries, or the rest of the world, at the prevailing nominal exchange rate. One can measure the real exchange rate between two countries in terms of a single representative good-say, the computer disc (CD) of which a virtually identical version is sold in many countries. If the real exchange rate is 1, the CD would cost the same in the United States as in, say, India, when the price is expressed in a common currency. That would be the case if the CD costs \$1 in the United States and Rs. 50 in India. But suppose the CD sells for Rs. 40 in India. That would mean it costs 20 per cent more in USA, suggesting that the Rupee is 20 per cent overvalued relative to the dollar. It would make economic sense to buy dollars, use them to buy CDs in India at the equivalent of Rs. 40, and sell them in USA India for USD 1. Taking advantage of

such price differentials is called arbitrage. As arbitrageurs buy CDs to sell in USA, demand for dollars will raise, as will its nominal exchange rate, until the price in India and the United States is the same—the RER returns to 1.

In the real world, there are many costs that get in the way of a straight price comparison—such as transportation costs and trade barriers. But the fundamental notion is that when RERs diverge, the currencies face pressure to change. For overvalued currencies, the pressure is to depreciate; for undervalued currencies, to appreciate.

### Floating and Fixed Rates

a) **Fixed Rate System:** For most of the 20<sup>th</sup> century, the exchange rates were **fixed**, or kept constant, according to the amount of gold for which they could be exchanged. This was called the gold-exchange standard. Under Gold-Exchange Standard, the value of all currencies was fixed in terms of how much gold for which they could be exchanged. For example, if one ounce of gold were worth 12 British pounds or 35 U.S. dollars, the exchange rate between dollars and pounds would remain constant at just under three to one. There were many advantages of the gold-exchange system:

- It served as a common measure of value.
- It helped keep inflation in check by keeping money supply in the gold-exchange standard economies fairly stable.
- Long-term planning was easier as rate changes were infrequent.

This system was put in place in 1944, when the leaders of allied nations met at Bretton Woods, New Hampshire, to set up a stable economic structure out of the chaos of World War II. The U.S. dollar was fixed at \$35 per ounce of gold and all other currencies were expressed in terms of dollars. The Bretton Woods system began to weaken in the 1960s, when foreigners accumulated large amounts of U.S. dollars from post World War II aid and sales of their exports in the United States. There were concerns as the U.S. had enough gold to redeem all the dollars. With reserves of gold falling steadily, the situation could not be sustained and the U.S. decided to abandon this system. In 1971, President Nixon announced that U.S. dollars would no longer be convertible into gold. By 1973, this action led to the system of floating exchange rates that exist today.

b) **Floating Rate System:** A floating exchange rate or fluctuating exchange rate is a type of exchange rate regime wherein a currency's value is allowed to fluctuate according to the demand and supply in the foreign exchange market. A currency that uses a floating exchange rate is known as a floating currency. It is not possible for a developing country to maintain the stability in the rate of exchange for its currency in the exchange market. There are two options open for them: (i) to let the exchange rate to fluctuate in the open market according to the market conditions, and (ii) to fix an equilibrium rate and attempts should be made to maintain it as far as possible. In cases of extreme appreciation or depreciation, a central bank will normally intervene to stabilize the currency. Thus, the exchange rate regimes of floating currencies may more technically be known as a managed float. A central bank might, for instance, allow a currency price to float freely between an upper and lower bound, a price “ceiling” and “floor”. Management by the central bank may take the form of buying or selling large lots in order to provide price support or resistance,

## 4.4 REAL EFFECTIVE EXCHANGE RATE (REER)

REER refers to the weighted average of a country's currency relative to an index or basket of other major currencies adjusted for the effects of inflation. The weights are determined by comparing the relative trade balances, in terms of one country's currency, with each other country within the basket. Because the price of such a basket normally

takes the form of an index number—such as the consumer price index (CPI), which includes both goods and services—the RER is also typically expressed as an index that can be benchmarked to any chosen time period. Going back to the dollar rupee example, if an RER index is 1.2, the average consumer prices in India are 20 per cent lower than in the United States, relative to the chosen benchmark. Indexes don't measure absolute prices (such as the price of the CD), but changes in overall prices relative to a base year (if, say, the index is 100 in the year 2000 and 120 in 2009, average prices are 20 per cent higher than in 2000). In this case, if RER indexes between countries don't change over time, we say that relative PPP holds. RER indexes between two countries can be important. But, for the most part, economists and policymakers are more interested in the real effective exchange rate (REER) when measuring a currency's overall alignment. The REER is an average of the bilateral RERs between the country and each of its trading partners, weighted by the respective trade shares of each partner. Being an average, a country's REER may be in "equilibrium" (display no overall misalignment) when its currency is overvalued relative of one or more trading partners so long as it is undervalued relative to others. To establish when a currency is misvalued, and, if so, by how much, a rough assessment can be obtained by the REER series over time. Under either absolute or relative PPP, there should be no change in REERs over time if currencies are in equilibrium. But because consumption patterns can change faster than the market baskets statisticians construct—as can trade policies and tariffs and transportation costs—deviations in REERs don't necessarily indicate fundamental misalignment. Yet, even though transportation costs and tariffs have declined sharply over the past century and national consumption baskets have grown more uniform, fluctuations of REERs have intensified. But not all large REER fluctuations should be interpreted as indications of misalignment. Some large REER adjustments are remarkably smooth, suggesting that there may be factors besides transportation costs, tastes, and tariffs that play a key role in moving about the REER of a currency i.e., not misaligned. Technological progress leading to productivity increases in goods commonly traded, called tradables, is thought to be one of those factors. Higher productivity lowers production costs, thus lowering prices of such tradable goods in the higher-productivity country, which then translates into lower tradable goods prices elsewhere through international competition. But not all goods are tradables. Non-tradable sectors, such as housing and many personal services, face minimal international price competition. So the prices of tradable goods will tend to fall relative to those of nontradable goods.

To the extent that nontradable goods have a large weight in the country's consumption basket, the country's consumer price index will rise relative to the international consumer basket; hence, its REER will tend to appreciate. This mechanism is often referred to as the "Balassa-Samuelson effect." Both theory and data support that much of the REER variations across countries are accounted for by fluctuations in the prices of nontradables relative to those of tradables, and particularly so among developing countries. Persistent changes in terms of trade (such as oil producers usually experience) and differences in fiscal policies, tariffs, and even financial development can also help explain why REERs can differ across countries.

## 4.5 ECONOMIC FACTORS IMPACTING EXCHANGE RATES

The following economic factors have to be taken into consideration while determining a currency's direction:

### The Gross National Product (GNP)

The Gross National Product measures the economic performance of the whole economy. At macro level, this indicator consists of the sum of consumption spending, investment

spending, government spending, and net trade. The gross national product refers to the sum of all goods and services produced by the country's residents, either domestically or abroad.

### Gross Domestic Product

GDP is the broadest measure of aggregate economic activity available. Reported quarterly, GDP growth is widely followed as the primary indicator of the strength of economic activity. It represents the total value of a country's production during the period and consists of the purchases of domestically produced goods and services by individuals, businesses, other countries, and the government. A high GDP figure is often associated with the expectations of higher interest rates, which is frequently positive for the currency, at least in the short term, unless expectations of increased inflation pressure is undermining confidence in the currency at the same time. Higher GDP Growth favours currency.

### Wholesale Price Index

Wholesale Price Index (WPI) is a measure of the average level of prices of a fixed basket of goods received in primary markets by producers. The inflation reports are widely followed as an indication of commodity inflation. The WPI often excludes the food and energy components as these items are normally much more volatile than the rest of the WPI and can thus obscure the more important underlying trend. A rising WPI is normally expected to lead to higher consumer price inflation and thereby to potentially higher short-term interest rates, which in effect will have a short-term positive impact on the currency. However, significant inflationary pressure will often lead to an undermining of the confidence in the currency involved.

### Trade Balance

Trade balance is a measure of the difference between imports and exports of tangible goods and services, and is a major indicator of foreign exchange trends. Seen in isolation, measures of imports and exports are important indicators of overall economic activity in the economy. Typically, a nation that runs a substantial trade balance deficit has a weak currency due to the continued commercial selling of the currency. This can, however, be offset by financial investment flows for extended periods of time.

### Money Market

A tight monetary policy is favourable for the exchange rate because high interest rates will cool the economy and drive down inflation attracting funds into the currency. Prospective falls in bond yields also support the currency.

### Fiscal Policy

The budgetary position of the government indicates the soundness of fiscal management. A lax fiscal policy weakens the currency.

### Attractiveness of Country for Investment

Sound economic fundamentals, stable government and policies and an international orientation attract foreign investment, strengthening the currency.

### Forex Reserves

Reserves are the ammunition that can be deployed to ward off speculative attacks on a currency. A healthy reserves position enables the central bank to manage the exchange rate in line with its goals and domestic economic considerations.

## Forex Debt

Debt is in absolute terms, in relation to GDP and short-term debt as a percentage of reserves (liquidity ratio). High forex debt ratio is bad for the currency.

## Agricultural Production/Food Stocks (important in emerging markets)

Threat of high inflation is less if the country is comfortably positioned as far as availability of items of mass consumption is concerned. Low inflation risk is good for the currency.

## Commodity Prices

Important for commodity intensive exporting countries, e.g., Australia and South Africa. High commodity prices (for oil, gold, base metals, coffee, etc.) favour the exchange rates of major producers of these products.

## Political

Stability of government is the confluence and interplay of all the above factors – past and prospective – which determines currency movements. Different factors predominate at different times, creating uncertainty and volatility which characterize currency markets.

### Activity 1

- 1) List five economic variables impacting forex rates.

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- 2) What is the difference between real and nominal exchange rate.

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## 4.6 ECONOMIC NEWS

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### News announcements matter-immediately

The economic news exerts an influence on exchange rates, particularly U.S. related news which have a generally statistically significant effect on exchange rates. The general pattern is that news announcements resulted in an immediate initial jump in exchange rates, with little subsequent movement. Favourable U.S. “growth news” tends to promote dollar appreciation, with negative news driving depreciation.

### Announcement timing matters

Exchange rates adjust to news immediately where as exchange-rate volatility adjusts to news gradually with complete adjustment occurring after some time. It is also true that the mere presence of an announcement, regardless of how surprising it is, boosts volatility.

### Effects vary with the sign of the news

News effects vary with the sign of the surprise i.e., whether it is a positive or negative announcement. Negative surprises often have greater impact than positive surprises on

exchange rates. The sign effect is more pronounced for the dollar's exchange rate with the yen, euro and swiss franc than with other currencies.

Examples of economic news impacting USD/EUR forex markets

News items on May 12,2009

#### US NEWS

Trade balance is down, but not as bad as the consensus expected it to be. A total deficit of 27.6 Billion.

Federal Open Market Committee member Dennis Lockhart said although things are starting to improve, do not start thinking that "The recession is over" but keep vigilant until we are out of the situation.

#### CANADA:

Trade balance is up by 1.1 Billion.

#### NEWS FROM EUROPE:

England: Unemployment rises to 7.1 per cent over the previous 6.7 per cent rate. 6.9% was expected but the situation was way worse than originally thought of.

GDP estimate is down 1.5% according to NIESR. Average earnings are down .4% but not as bad as original consensus estimates, which were in the neighborhood of .9%. Still, the economy is headed downward, it's not over yet!

England's Trade Balance took a hit at -6.6 Billion. Industrial and Manufacturing production is in the red, and a staggering 13.6% decline from last year in house prices have been documented. OUCH!

#### EUROPE:

Germany kept on an even keel with Consumer Price Indexes and Wholesale Price Indexes.

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## 4.7 MARKET PSYCHOLOGY

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Market psychology and trader perceptions influence the foreign exchange market in a variety of ways. Flights to quality: Unsettling international events can lead to a 'flight to quality', with investors seeking a 'safe haven'. There will be a greater demand, thus a higher price, for currencies perceived as stronger over their relatively weaker counterparts.

Although exchange rates are affected by many factors, in the end, currency prices are a result of supply and demand forces. Supply and demand for any given currency, and thus its value, are not influenced by any single element, but rather by several elements.

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## 4.8 DOLLARISATION OF ECONOMY

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Dollarisation refers to broad use of foreign currency as a substitute for domestic currency for transaction or other purposes. One of the risks inherent in the currency futures is the possibility of currency substitution of the domestic economy i.e., if the residents get induced to seek holding of foreign currency or assets to a significant extent by economising holdings of domestic currency and assets. Historically, dollar or foreign currency holdings have been a very small proportion of asset portfolio of different economic agents in India and even their current appetite for such holdings is not large.

Almost all the countries in the world issue their own currencies as it enables them to conduct their own monetary policy and provides them the seigniorage benefits. However,

given a choice, many residents might prefer to hold assets denominated in foreign currencies (US dollar or any other hard currency) in the interest of preserving the value of their holdings. Such a preference of the economic agents could potentially lead to dollarisation of an economy. There are countries which are officially dollarised. Official dollarisation occurs when a country eliminates its own currency and adopts the U.S. dollar (or any other foreign currency) as legal tender. Economic contracts, such as payment of wages and settlement of financial contracts could then be made in US dollar or other foreign currency. Consumers could make their purchases in foreign currencies as well. Even the government accepts foreign currency for payment of taxes and debts, as also use it for making payments. Countries which are officially dollarised include Andorra (dollarised in Euro), Kosovo (Euro), Lichtenstein (Swiss Franc), Monaco (Euro), Montenegro (Euro), Nauru (Australian Dollar), San Marino (Euro), Tuvalu (Australian Dollar) and Vatican (Euro). Certain dependencies also are officially dollarised, such as the Cocoa Island (Australian Dollar), the Cooks Island (New Zealand Dollar), the Norfolk Islands (Australian Dollar), St. Helena (British pound) and Tokelau (New Zealand dollar). While in the above mentioned countries domestic currency is completely eliminated, there are countries where the foreign currency co-exists with domestic currency as a legal tender and such countries are termed as semi-dollarised economies. These officially semi-dollarised economies include the Bahamas, Cambodia, Laos, Haiti and Liberia in all of which US dollar is also a legal tender, in addition to the respective domestic currencies. Other such countries include Bhutan (Indian rupee), Brunei (Singapore dollar), Canary Island (British pound), Isle of Man (British pound), Lesotho (South African Rand), Namibia (South African Rand) and Tajikistan (any other currency).

#### **4.9 ADVANTAGES AND DISADVANTAGES OF DOLLARISATION**

Some countries prefer to officially dollarise their economies because of high inflation which reduces public confidence in the domestic currency. Dollarisation is generally expected to lower the level of inflation as the domestic monetary policy gets determined by monetary authorities of the low inflation country whose currency is permitted as a legal tender. This also helps deepen the financial markets, lower the interest rates, and leads to fiscal discipline, all of which together could lead to faster economic growth.

However, the dollarisation of an economy could also occur even if a foreign currency is not officially recognised as a legal tender. This could arise from the liberalisation of the current and, even more so, of the capital account, if the residents prefer to hold foreign currency. It is important to understand that dollarisation can pose serious risks to an economy, especially if it takes place in an unplanned manner. The serious risk emanating from the process of dollarisation is that it makes it very difficult for the domestic monetary authority to conduct an independent monetary policy. If the shocks facing the economy are asymmetric vis-à-vis the country of the currency of dollarisation (i.e., they are not coinciding or are of a similar nature to that of the country whose currency is permitted as a legal tender), they could pose serious policy dilemmas. Thus, it could be extremely damaging to the domestic economy if, for instance, the domestic demand shock warrants a monetary policy compression in the domestic economy at a time when the external monetary authority is pursuing an expansionary monetary policy on the basis of its own macroeconomic situation, or *vice-versa*. Since in a dollarized economy, the domestic monetary authority would also find it difficult to perform the lender-of-the-last resort (LOLR) function, on account of its inability to print additional money to provide emergency funding to the banks, it could potentially lead to financial stability problems with an accelerator effect. In addition, dollarisation also leads to loss of seigniorage for the dollarised economy, (seigniorage is the profit a country earns when it issues a currency

as the difference between the products the currency can buy and the cost of printing that currency).

### Activity 2

- 1) Give two reasons for and against dollarization.

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- 2) Explain purchasing power parity with an example.

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## 4.10 EXCHANGE RATE VOLATILITY

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Volatility in exchange rate refers to the statistical measure of its dispersion of returns or change. In the financial world, volatility adds to risks. Typically it is seen in terms of standard deviation or coefficient of variation (the latter has the advantage that it is unit free). However, there are wide arrays of other measures, specially the conditional volatility measures which provide better insights into exchange rate volatility which is marked by clustering and symmetric dependencies in variances. The exchange rates could display higher volatility because of several factors such as deviation from fundamentals, excessive speculative activity, macro-economic shocks or other news. Excessive fluctuations and volatility in exchange rates could spill over to other segments of financial markets, can blur monetary policy signals and lead to financial stability problems. Excessive exchange rate fluctuations also have a detrimental impact on foreign trade and at times even on genuine investments. Investments could then be potentially guided by a view or a bet on exchange rate movements rather than by the underlying returns, especially if the umbilical cord between the cash-futures arbitrage is snapped.

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## 4.11 IMPACT OF FUTURES PRICES ON SPOT AND FORWARD MARKETS

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There are concerns about impact of currency futures price on the spot price or *vice versa*. There is no clear evidence to suggest that currency futures result in enhancement of volatility in the spot exchange rates in a causal sense. Empirical evidence is ambiguous as to whether currency futures afford distinctly higher speculation than is possible without them. In theory, futures price would largely operate on a premise similar to forward markets i.e., it should largely reflect interest rate differentials. In India, as in most countries, even the forward prices do not stick to that script most of the time but are susceptible to the influence of sentiments. An appropriate term structure of forward premia is yet to develop in India. As such, while theoretically futures prices should reflect similar interest rate expectations, the real effect on prices remains to be seen.

Worldwide, the currency futures market remains small, though rapidly growing market, in relation to the size of OTC spot as well as forward market. According to the Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity in 2004 (BIS, 2005), the average daily turnover in exchange traded currency contracts was

USD 23 billion in a total foreign exchange turnover of USD 1,880 billion which included the USD 621 billion in the spot foreign exchange market. According to the preliminary results of the just released Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity in 2007, the average daily turnover in exchange traded currency contracts has trebled since then to USD 72 billion in 2007. However, it is still small in relation to USD 3,220 billion total foreign exchange turnover, which includes USD 1,005 billion daily spot turnover in 2007. The exchange traded currency contracts comprise futures as well as options and options on futures. As such, currency futures still comprise less than 2 per cent of the foreign exchange market. Therefore, the currency futures market is far from becoming a significant segment of the foreign exchange market and can be seen merely as an add-on to risk management kit and a tool for furthering transparent price discovery.

The low turnover of currency futures in the world foreign exchange markets could mean that price discovery in foreign exchange occurs primarily in the OTC spot and derivative market segments. It is likely that the spot segment may be a major driver of price discovery in the foreign exchange market, inspite of it being half of the OTC forwards and swaps where daily turnover slightly exceeded USD 2 trillion in 2007. Interest parity condition may ordinarily act as an error correction mechanism forcing forwards to converge with spot price changes. However, at times significant deviations in interest parity are observed and the role of forward market in exchange rate determination cannot be ignored.

The futures prices, however, are less likely to have significant information content and the role played by it in exchange rate determination is likely to be limited in view of the low volumes. It may, nevertheless be stated that the importance of futures market in price discovery might actually be larger than its share in turnover would indicate. This is so, because typical players such as hedgers could have considerable private information.

Also, for individuals, SMEs, small exporters, etc. currency futures could bring in transparency and coupled with anonymity, accompanying the order matching trading format can help reduce information asymmetry in the foreign exchange market, bringing in better price discovery. Empirical research on market microstructure of foreign exchange markets suggests that often future prices do lead the spot price changes by couple of minutes. Over longer horizons, however, the futures prices are found to have a more significant influence on foreign exchange price discovery, which is not commensurate with its relative market share. While exchanges bring together rational as well as noise traders, it is important to recognize that informed traders could prefer trading in currency futures which afford anonymity. On the whole, however, the inter-dealer trades through direct market or through electronically brokered market can be expected to have a more pronounced impact on spot and forward foreign exchange market than the trades in futures markets.

#### **4.12 APPLICATION OF TECHNICAL ANALYSIS**

Technical analysis is a method of forecasting price movements by looking at purely market-generated data. Price data from a particular market is most commonly the type of information analyzed by a technician, though most will also keep a close watch on volume and open interest in futures contracts. The bottom line when utilizing any type of analytical method, technical or otherwise, is to stick to the basics, which are methodologies with a proven track record over a long period. After finding a trading system that works for you, the more esoteric fields of study can then be incorporated into your trading toolbox.

Almost every trader uses some form of technical analysis. Even the most reverent follower of market fundamentals is likely to glance at price charts before executing a trade. At their most basic level, these charts help traders determine ideal entry and exit points for a trade. They provide a visual representation of the historical price action of whatever is being studied. As such, traders can look at a chart and know if they are buying at a fair price (based on the price history of a particular market), selling at a cyclical top or perhaps throwing their capital into a choppy, sideways market. These are just a few market conditions that charts identify for a trader. Depending on their level of sophistication, charts can also help much more advanced studies of the markets.

On the surface, it might appear that technicians ignore the fundamentals of the market while surrounding themselves with charts and data tables. However, a technical trader will tell you that all of the fundamentals are already represented in the price. They are not so much concerned that a natural disaster or an awful inflation number caused a recent spike in prices as much as how that price action fits into a pattern or trend. And much more to the point, how that pattern can be used to predict future prices. Technical analysis assumes that:

- All market fundamentals are depicted in the actual market data. So the actual market fundamentals and various factors, such as the differing opinions, hopes, fears, and moods of market participants, need not be studied.
- History repeats itself and therefore markets move in fairly predictable, or at least quantifiable, patterns. These patterns, generated by price movement, are called signals. The goal in technical analysis is to uncover the signals given off in a current market by examining past market signals.
- Prices move in trends. Technicians typically do not believe that price fluctuations are random and unpredictable. Prices can move in one of three directions, up, down, or sideways. Once a trend in any of these directions is established, it usually will continue for some period.

The building blocks of any technical analysis system include price charts, volume charts, and a host of other mathematical representations of market patterns and behaviours.

### What to Look For

- ***Find the trend.*** Finding the prevailing trend will assist in becoming aware of the overall market direction and offer better visibility, especially when shorter term movements tend to clutter the picture. Weekly and monthly charts are most ideally suited for identifying that longer term trend. Once the overall trend has been identified, buy on the dips during rising trends, and sell the rallies during downward trends.
- ***Support and resistance.*** These levels are points where a chart experiences recurring upward or downward pressure. A support level is usually the low point in any chart pattern, whereas a resistance level is the high or the peak of the pattern. The points show a tendency to reappear. It is best to buy near support levels and sell near resistance levels that are unlikely to be broken. Once these levels are broken, they tend to become the opposite obstacle. For example, in a rising market, a resistance level that is broken, could serve as a support for the upward trend, while, in a falling market, once a support level is broken, it could turn into a resistance.
- ***Lines and channels.*** Trend lines are helpful tools in confirming the direction of a market trend. An upward straight line is drawn by connecting at least two successive lows, with the second point higher than the first. The continuation of the line helps to determine the path along which the market will move. An upward trend is a

concrete method by which to identify support lines/levels. Conversely, downward lines are charted by connecting two points or more. A channel is defined as the price path drawn by two parallel trend lines. The lines serve as an upward, downward or straight corridor for the price. A familiar property of a channel for a connecting point of a trend line is to lie between the two connecting points of its opposite line.

- **Averages.** Moving averages tell the average price in a given point of time over a defined period of time. However, a weakness of moving averages is that they lag the market, so they do not necessarily signal a change in trends. To address this problem, the use of a shorter period, such as a 5-day or 10-day moving average, would be more reflective of the recent price action than a 40-day or 200-day moving average.

### Types of Charts

- **Chart Patterns:** There are a variety of charts that show price action. The most common are bar charts. Each bar will represent one period of time and that period can be anything from one minute to one month to several years. These charts will show distinct price patterns that develop over time.
- **Candlestick Patterns:** Like, bar charts patterns, candlestick patterns can be used to forecast the market. Because of their colored bodies, candlesticks provide greater visual detail in their chart patterns than bar charts.
- **Point and Figure Patterns:** Point and figure patterns are essentially the same patterns found in bar charts but Xs and Os are used to mark changes in price direction. In addition, point and figure charts make no use of time scales to indicate the particular day associated with certain price action.

### Technical Indicators

Some of the most popular technical indicators used in the analysis of charts in the foreign exchange market are given below.

- **Relative Strength Index:** RSI is a momentum indicator, which measures a currency's price relative to itself. It is past performance and is also front weighted. This means it gives a better velocity reading than other indicators. RSI is also less affected by sharp rises or drops in a currency pair's performance. The RSI absolute levels are 1 and 100. Traditionally, buy signals are triggered at 30 and sell signals are triggered at 70. However, many seasoned traders are using 20 and 80 as the relevant buy and sell signals. In effect, the RSI is like a rubber band, in that it can be stretched just so far. After a certain point, unless it breaks, the band is forced to contract. It is also an indicator, which lends itself to trend lines, support and resistance lines and divergence.
- **Moving Average:** In its simplest form, a moving average is the average price of a currency at a specific point in time. Hence, it shows a trend and the purpose is to show the trend in a smoothed fashion. A user will specify the time span, with the most common time period being 10, 30, 50, 100 and 200 day moving averages. There really is not just one 'right' time frame. Each technician will have his or her own favourite. It should be noted that moving averages with different time spans will tell a different story. Shorter the time span, the more sensitive the moving average will be to price changes. The longer the time span, the less sensitive or the more smoothed the moving average will be.
- **Bollinger Bands:** These are envelopes that surround the price bars on a chart. They are plotted two standard deviations away from a simple moving average. The envelopes are plotted at a fixed percentage above and below a moving average. Because the standard deviation is a measure of volatility, the Bollinger Bands adjust

themselves to the market conditions. In fact, they widen during volatile market periods and contract during less volatile periods. Sometimes, Bollinger Bands are displayed with a third line, which is the simple moving average line. The time period for this moving average can vary, but it is recognized in the market as 10 days for short-term trading, 20 days for intermediate term trading, and 50 days for longer term trading. However, that Bollinger Bands do not generate buy and sell signals alone. In theory, they should be used in conjunction with RSI or MACD.

- **Moving Average Convergence Divergence:** MACD is an oscillator, which is derived by dividing one moving average by another. With the capabilities of modern computers, the moving averages are usually exponentially weighted, thus giving more weight to the more recent data. The MACD is plotted in a chart with a horizontal equilibrium line. This line is quite important, because when the two moving averages cross below the equilibrium line, it implies that the shorter MA is at a value less than the longer MA. This is a bearish signal. When the MAs are above the equilibrium line, it implies that the shorter MA has a value greater than the longer MA, and is thus a bullish signal.
- **Stochastics:** This oscillator compares where a currency's price has closed relative to its price range over a specifically identified period of time. The theory is that in an upward-trending market, prices tend to close near their high, while in a downward trending market, prices tend to close near their low. Also, as an upward trend matures, price tends to close further away from its high, and as a downward trend matures, price tends to close away from its low. This indicator attempts to determine when prices start to cluster around their low of the day for an up-trending market and when the trend to cluster around their high in a down-trending market. Thus, these are the conditions that indicate a trend reversal is starting to occur.

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### 4.13 SUMMARY

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- The forces of supply and demand determine the value of currencies and there are, as mentioned before, two radically different methods of predicting where the forces of supply and demand are heading. The first method, fundamental analysis, focuses on macroeconomics. By studying economic reports and/or political developments, fundamental analysts interpret changes in the underlying factors that cause foreign exchange rates to fluctuate. The other type of analysis, practiced by technicians, primarily makes judgments based upon price data displayed on charts.
- Technical analysis is an art in which quasi-statistical techniques and formal statistics are used to determine the existence and strength of trends in financial time series and to identify turning points in these trends. It is concerned with the 'when' and the 'how' of trading foreign exchange. It determines the optimal timing for a position, and its conclusions about how long to stay in a particular trade have significant importance. The market loves to announce, "the trend is your friend", but timing is everything.

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### 4.14 SELF ASSESSMENT QUESTIONS

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- 1) Elaborate on the major factors that influence currency volatility.
- 2) What is the impact of dollarisation of the economy?
- 3) Write an essay on how the functioning of OTC markets can be improved further?
- 4) What is the implication of currency futures on Indian economy in general and market participants in particular?
- 5) How do you think the currency futures can enable market participants to mitigate risk?

## **4.15 FURTHER READINGS**

- *Currency Primer*, by MCX Stock Exchange.
- *SEBI-RBI Working Group Report on launch of Exchange Traded Currency Futures*, April 2008.
- Bishop & Dixon *Foreign Exchange Handbook Author*.
- Adrian Buckley, *Multinational Finance*.
- An Introduction to Foreign Exchange & Money Markets -The Reuters Financial Training Series.
- Heinz Riehl & Rita M. Rodriguez, *Foreign Exchange & Money Markets - Managing Foreign and Domestic Currency Operations*.

Economic Variables  
Impacting  
Exchange Rates



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