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1. Learning Outcomes

After going through this module, one can gain insight to:

- Understand the concept of Exchange Rates
- Distinguish between spot and forward exchange rates
- Outline the factors causing a change in exchange rate determination
- Distinguish between fixed and flexible exchange rate systems
- Know about the participants in Foreign Exchange Markets
- Understand LERMS (Liberalized Exchange Rate Management System) in India
- Calculate exchange rate quotes.

2. Introduction

A defining trait of a globalized economy in the recent years has been increased flows of international investment and trade. Both these activities require the utilisation of foreign exchange, such as dollars, Euros and pounds. This is because sellers in various countries want to be paid in their domestic currency or in a currency considered strong and universally acceptable. For example an exporter based in India who exports to the USA will earn dollars for his goods but will have to transfer them into rupees for use in the domestic economy, and an Indian importer purchasing goods from Germany may have to change Indian rupees into Euros to pay his buyer. This requires a foreign exchange market where foreign currencies are traded.

The Foreign Exchange Market in any country is a cardinal constituent of the IMS – the institutional framework within which international payments are made, national currencies are exchanged and cross currency exchange rates are determined.

3. FOREIGN EXCHANGE MARKET

Cross border transactions of investment and trade occur through an exchange of currencies between buyers and sellers. A currency is an articulation of money and a unit of exchange. Foreign exchange is the money of a foreign country in the form of bank notes, drafts and checks. It is expressed as the foreign exchange rate which is the price of domestic currency in terms of a foreign currency – for ex. INR vs. the USD or INR vs. the Euro.

The exchange rate can be expressed as a ***direct quote*** which can be defined as the home currency price of a foreign currency unit or as an ***indirect quote*** which is the foreign currency price of a

home currency unit. For example Rs 40/ 1 USD is a direct quote; 1USD/ Rs 40 is an indirect quote.

Exchange rates are expressed as ***real exchange rates*** if they have been accommodated for inflation and as ***nominal exchange rates*** if they have not been accommodated for inflation.

A foreign exchange transaction is an arrangement between a buyer and a seller for the delivery of a certain amount of one currency at a specified rate in exchange for some other currency. This transaction takes place in the Foreign Exchange Market.

The foreign exchange market provides a platform for the settlement of international transactions between different players in the market. The Foreign Exchange Market is an "Over-the-Counter" market i.e. there is no physical market place where the currencies are traded. Instead it is a network of large commercial/investment banks, brokers and dealers spread across the globe connected through telephones, faxes and computers.

The global foreign exchange business is concentrated in four centers, where two thirds of total trading takes place. These are the major trading centers at London, New York, Singapore and Tokyo. Other important trading centers known as the secondary trading centers are at Zurich, Frankfurt, Paris, Hong Kong, San Francisco, Toronto, Brussels, Bahrain and Sydney. The dollar is the major trading currency followed by the deutche mark and the Japanese Yen. Due to differences in the world's time zones there are only three hours out of every 24 that the major centers - London, New York and Tokyo - are all shut down.

3.1. TYPES OF FOREIGN EXCHANGE MARKET

3.1.1 Spot Market – Spot market is that segment of foreign exchange market where currencies are traded for immediate delivery. Although the term "immediate" delivery is used, in practice delivery takes place two working days after the transaction is complete. The day on which delivery takes place is known as Value date or Settlement date. The rate applicable to "on the spot" trades are known as Spot Exchange Rates.

The spot exchange rate is the price at which one currency can be traded for another on the day of transaction.

3.1.2 Forward Market – Forward market is that segment of the foreign exchange market where currencies are traded not for immediate delivery, but for delivery on any future date, say, after fortnight, 30 days, 90 days and so on. The rate governing such future transactions is known as the forward exchange rate.

Forward Exchange Rate denotes the price at which one currency can be traded for another in future time period.

For most major currencies, forward exchange rates are quoted for 30 days, 90 days, and 120 days and so on. These rates can be at premium or discount compared to the spot exchange rate.

Forward exchanges provide a mechanism for eliminating exchange rate risk that may arise in future due to adverse movements in the exchange rate.

For instance, on January 1 an Indian Exporter sells goods to US Firm for $ 10 million on credit of three months. Exporter is certain of receiving $ 10 million after three months i.e. on 1st April but not of Dollar Rupee exchange rate on that date. Suppose on January 1, the three month forward rate is Rs. /$: 50 and exporter agrees to sell $ 10 million at this rate on April 1. By undertaking such forward exchange he has assured himself of $ 10 million x 50 = Rs. 500 million, irrespective of exchange rate on that date.

If the actual rate on April 1 is Rs. /$: 49, exporter has gained Rs.(50 – 49) x 10 million = Rs.10 million by entering into forward contract. However, there is always a possibility that real spot rate results out to be greater than Rs.50 /$ on transaction date resulting in potential loss to the exporter.

4. PARTICIPANTS IN FOREIGN EXCHANGE MARKET

The major participants in the foreign exchange market are as follows:

4.1 Non Banking Entities: Non Banking category of participants include individuals (importers, exporters, international investors) and multinational corporations. They are also called as retail clients. Retail clients exchange currencies to settle their international transactions (financial as well as non-financial).

4.2 Banking Entities

4.2.1 Commercial Banks – Commercial Banks deal in the market either on behalf of their customers or on their own account. They act as market makes in the foreign exchange market i.e. they stand ready to buy or sell various currencies at specific prices called “bid/ask” price. The spread or difference between bid (buying) and ask (selling) price determines the profit margins of the banks. On their own account, commercial banks participate in the Forex market for the purpose of speculation.

4.2.2 Central Bank – The role played by Central Bank in the foreign exchange market is “Regulatory” in nature. In order to regulate or curb the volatility of exchange rates, Central Bank makes interventions in the market. These interventions, in the forms of buying or selling foreign currencies, are aimed at preventing sudden sharp appreciation and depreciation of domestic currency. For e.g. if the value of rupee vis-à-vis US Dollar depreciates beyond acceptable limits, the Central Bank will sell US Dollars in the market. In the event of unwarranted appreciation it would buy US Dollars.

The extent and frequency of Central Bank’s intervention depends on the exchange rate regime (fixed or floating) adopted by the country which is discussed later.

4.3 Foreign Exchange Brokers- Brokers play the role of mediator in the Foreign Exchange Market. They hold the quotations for various pairs of currencies but do not

buy or sell on their account. Foreign Exchange Brokers simply bring buyers and sellers together.

5. EXCHANGE RATE

The foreign exchange rate is the price of domestic currency expressed in terms of a foreign currency.

The exchange rate can be expressed as a *direct quote* which is the home currency price of a foreign currency unit or as an *indirect quote* which is the foreign currency price of a home currency unit.

For e.g. Rs. /$: 55 is the direct quotation for USD in India which implies that one USD costs Rs. 55.

Direct quotations are also called as European quotations.

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Indirect Quote – It can be defined as the quote where exchange rate is expressed in terms of number of units of foreign currency per unit of domestic currency. E.g. - $/Rs. 0.0182 is an indirect quotation for USD in India which implies Re. 1 is worth US $ 0.0182.

Indirect quotes are also known as American quotations. However, the quotes are termed as American or European only when one of the currencies is the Dollar. Both direct and indirect quotes reflect the same exchange rate and are inverse of each other.
Since 1993 direct quotes are used in India to express exchange rates.

Exchange rates are expressed as ***real exchange rates*** if they have been adjusted for inflation and as ***nominal exchange rates*** if they have not been adjusted for inflation.

6. FOREIGN EXCHANGE REGIME

Foreign Exchange Rate Regime refers to set of policies, agreements, institutions, mechanisms and rules for establishing exchange rate at a given point of time, changes in exchange rate over time and factors inducing such changes. The type of exchange rate regime adopted by the country determines the involvement of Government in establishing and maintaining the exchange rate of its domestic currency against foreign currencies.

Depending on the involvement of Government or monetary authorities of a country in foreign exchange market, exchange rate regimes are classified as:

- Fixed Exchange Rate System
- Flexible (Floating) Exchange Rate System

6.1 Fixed Exchange Rate System: A Fixed Exchange Rate System is an exchange rate regime in which the Government of the country determines the value of its currency in terms of another currency (Exchange Rate) and also sets the range or band within which the determined Exchange Rate is allowed to move freely. Intervention is made as soon as exchange rate breaches the band limits.

How is intervention made?

Suppose the exchange rate between US dollar and Indian Rupee is fixed at (Rs/$: 55) by the Government of India. Exchange rate is allowed to move freely between (+/-) 1% of determined exchange rate.
Now, to prevent the exchange rate from appreciating beyond a limit, i.e. beyond (Rs/$: 54.45), the Government buys the foreign currency in exchange for domestic currency. This intervention by the Government enhances the supply of Rupees in the market leading to its depreciation and restoring the exchange rate parity.

Similarly to prevent exchange rate from depreciating beyond a permissible limit, i.e., beyond (Rs/$: 55.55), the Government will offload USD and purchase domestic currency from the forex market, thereby reducing the supply of domestic currency in the market and stemming up its value.

Types of Fixed Exchange Rate System:

6.1.1 Currency Board System- Under this system, Currency Board of the country uses foreign currency to peg the rate of its domestic currency. The foreign currency to which the domestic currency is pegged is known as "Anchor" currency or "Reference" currency. The exchange rate of domestic currency with other foreign currencies depends on the exchange rate between particular foreign currency and the anchor currency. A strong and internationally traded foreign currency is selected as "Anchor" currency by the currency board. In order to maintain the exchange rate at pegged level, currency board attempts to keep the monetary policy of country in line with monetary policy of reference country. It also ensures unrestricted conversion of domestic currency into the anchor currency at fixed rate, on both current and capital account. E.g. Argentina had currency board system until 2002. Argentina peso was pegged to US Dollar.

6.1.2 Dollarization – Dollarization is the system where the country abandons its domestic currency and instead use any other currency (Dollar or not) as the legal tender. E.g. Ecuador and El Salvador are using US Dollar as their legal tender since 2000 and 2001 respectively.

6.1.3 Target Zone Arrangement – Under this a group of countries agree to keep the exchange rate between their currencies within a certain range of fixed central exchange rate. Central Exchange Rate is the exchange rate between the member countries currency and a common currency. An example of target zone arrangement is "European Monetary System". Each currency in the EMS had a central rate expressed in terms of European currency unit (ECU). The exchange rate between member countries was determined on the basis of their share in the ECU.

Another variant of target zone arrangement is the "Monetary Union" where member countries agree to share a common currency instead of using their own currency. ECU has been substituted by common currency "Euro" shared by 12 European countries since 1999.

61.4 Currency Basket – Currency Basket is the system of pegging the currency or fixing the value of currency in terms of basket of foreign currencies instead of single foreign currency. The value of currency basket peg is more stable than pegging to single currency.

6.2 Flexible Exchange Rate System

Under Flexible Exchange Rate System, the exchange rate is determined by the market forces of demand and supply of a currency in respect of a particular foreign currency. The exchange rate is neither determined nor administered by the Government or the Central Bank. It moves freely and continuously in response to changes in demand and supply.

Types of Flexible (Floating) Exchange Rate System:

6.2.1 Free Float – In a free float, exchange rate is determined purely by the market forces: forces of demand and supply. There is no intervention either by the government or the central Bank in the foreign exchange market. Variations in exchange rate occur as a result of reaction of market participants to variety of factors including economic factors, social factors and political factors. Free float markets are characterized by highly volatile exchange rates.

6.2.2 Managed Float – In a managed float also, exchange rates are determined by the market forces of demand and supply. Unlike in free float here the Government or the Central Bank occasionally intervenes in the foreign exchange market with the aim of smoothing out excess volatility and reducing uncertainty.

7. FACTORS AFFECTING EXCHANGE RATE DETERMINATION

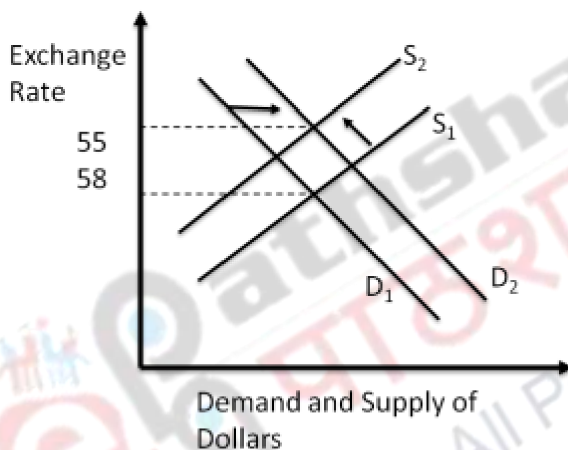
Exchange rate move in line with changes in demand and supply of currency. The various factors that cause changes in demand and supply of currency and hence exchange rate are discussed below.

7.1 Relative Price levels

Change in relative price level influences international trade pattern. Inflation in home country dampens the demand of domestically produced goods in foreign as well as home market. As a result, exports decline (i.e. demand for domestic currency falls or *the supply of foreign currency in home market falls*) and imports rise (*demand for foreign currency increases* because residents want to purchase cheap goods from abroad). The resulting demand and supply pressure causes foreign currency to appreciate against domestic currency. Hence, the change in international trade activity due to changes in relative price

level results in depreciation of currency of countries that experiences high rates of inflation.

IMPACT OF INFLATION ON EXCHANGE RATE BETWEEN USD AND INDIAN RUPEE



Initial Exchange Rate (Rs/$): 55

1. Inflation rises in India.

2. Exports decline (demand for domestic currency falls which implies fall in supply of US dollars in India). New Supply Curve-S_2

3. Imports rises (Demand for USD in India increases). New Demand Curve- D_2

4. Demand for USD increases, supply declines. Hence USD appreciates against Indian Rupee or Rupee depreciates against USD. Exchange Rate post inflation (Rs/$): 58.

7.2 Relative Income Level

Changes in Income level influences purchasing power and hence the demand for domestic as well as imported goods. Increase in income causes imports to increase which implies that demand for foreign currency rises as people need foreign currency to pay for imported goods. Increased demand for foreign currency leads to appreciation in its value against domestic currency.

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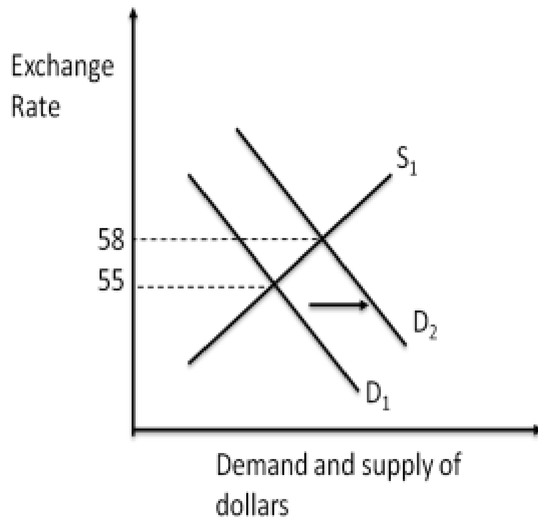

Initial Exchange Rate (Rs/$): 55

Supposing Income level in India rises.

1. Demand for US goods rises.

2. Demand for US Dollar rises.

3. Given the supply of USD, value of dollar appreciates against Indian Rupee (We assume demand for rupee stays constant as income level in US is constant).

New Exchange Rate (Rs/$):58

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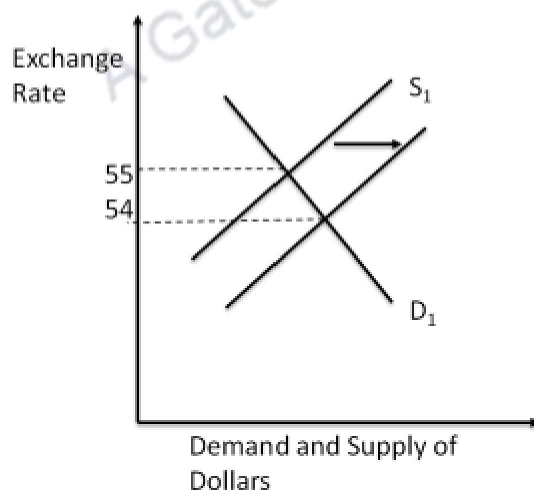
7.3 Interest Rates

Changes in relative interest rates influence international investment activity. Investors flock to the countries where interest rates are higher than their home country. The countries offering higher rate of interest would expect to see their currencies appreciate against the currencies of countries having lower interest rate.

IMPACT OF INTEREST RATE CHANGES ON EXCHANGE RATE



Suppose Interest rates in India rises from 6% to 8%, while interest rates in US are constant. Initial Exchange Rate (Rs/$:55)
1. Demand for Indian Rupee increases in the market because foreign investors need Indian currency to make investments in India.

2. Foreign Investors (US here) purchase Indian Rupees in exchange for US dollars. Hence, supply of USD in India increases. New Supply curve is S2. Demand for USD is unchanged.

3. Increased supply of dollars in Indian Forex Market leads to depreciation of USD against Rupee. In other words, Currency of country with higher interest rate (India) appreciates. New Exchange Rate (Rs/$: 54).

7.4 Market Expectations

Market expectations of future exchange rates also have implications for current exchange rate. This variability in exchange rate occurs when market reacts to various factors including economic factors, social factors, political factors etc. For Instance: If market expects US dollar to depreciate on future due to expected fall in interest rates (Monetary Expansion), they would start selling off their current US dollar holdings which depresses USD value today

8. LIBERALIZED EXCHANGE RATE MANAGEMENT SYSTEM

On the recommendation of Rangarajan Committee on Balance of Payments, India introduced the Liberalized Exchange Rate Management System in March 1992.

LERMS was a dual exchange rate system, where both official and market determined exchange rate coexisted. The Reserve Bank of India announced an official exchange rate at which 40% of all current exchange receipts were to be converted and the remaining 60% could be converted at market determined rates. Official Exchange Rates used to be lower than market determined exchange rates. All the foreign exchange receipts were to be routed through the RBI via authorised dealers. For Instance: If an exporter received US $ 1 Million, he had to convert US $ 4, 00,000 at official exchange rate announced by RBI and remaining US $ 6, 00,000 at market determined exchange rates.

LERMS lasted till February 1993, when it was replaced by “Unified Exchange Rate System” or the market determined exchange rate system. Hence, Liberalized Exchange Rate Management System was a transitory period reform as India moved from fixed to floating rate regime.

9. CALCULATING EXCHANGE RATES

In practice foreign exchange dealers and banks quote two way rates for a pair of currency: Bid rate and ask rate. Bid Rate is the rate at which banks and dealers will buy the foreign currency. Ask Rate is the rate at which they are willing to sell the foreign currency.

E.g.: A dealer quotes Rs/$: 52/54. This is direct quote for USD in India. Here (Rs/$:52) is the bid rate. If a person has a dollar and wants to convert it into Indian Rupee, he gets Rs 52 for one dollar that he sells to the dealer. Rs/$: 54 is the ask rate, which implies that if a person wants to buy US dollar, he has to pay dealer Rs. 54 for one USD.

Calculating Direct and Indirect quotes

As mentioned above, direct and indirect quotes for a pair of currency are inverse or reciprocal of each other, indirect quotes can be computed from direct quotes and vice versa:

Example1: Suppose direct quote for USD in India is given to be Rs/$: 55.0856/56.0325. What is the indirect quote for USD?

Solution: Indirect quote for *USD in India* is the reciprocal of its direct quote. It can be computed as follows:

Bid ($/Rs): 1/ $(Rs/\$)_{bid}$ = 1/55.0856 = 0.0181

Indirect Bid rate for USD is ($/Rs): 0.0181, read as $ 0.0181 per Rupee.

Similarly, Ask ($/Rs): 1/ $(Rs/\$)_{ask}$ = 1/56.0325 = 0.0178, read as $ 0.0178 per Rupee.

Hence *Indirect Quote for USD in India* is $/Rs: 0.0181/0.0178.

CROSS RATES

Cross rates are calculated for those pair of currencies for which quotes are not available directly in the foreign exchange market. They are calculated using direct quote of currencies with a common currency.

Example2: A newspaper quotes following exchange rates:

- Exchange rate between USD and Rupee (Rs/$): 55.0586/56.0325
- Exchange rate between USD and Australian Dollar (AUD/USD): 1.1385/1.1401.

(Note that: AUD/USD: 1.1385/1.1401 is the direct quote for USD in Australia, number of units of domestic currency per unit of foreign currency).

Assuming that exchange rate between AUD and INR is not available directly. Exchange rate between this pair of currency can be computed using their quotation with a common currency, USD.

For a complete exchange rate quotation we need both the bid and ask rate.

The computation of bid rate can be understood from the point of view of an Indian exporter who has export receipts in AUD. Steps for calculating Bid rate (buying rate of bank) between AUD and INR:

I. Exporter will purchase USD using his AUD export receipts. The rate applicable to this transaction is the (AUD/USD: 1.1401), which is the rate at which bank is selling USD. By paying 1.1401 AUD, exporter gets 1 USD.
II. He sells this USD to the bank in exchange for INR. Applicable rate is (Rs/$:55.0586), bank's buying rate for USD.

Hence exporter gets Rs. 55.0586 in exchange for AUD 1.1401.

Exchange rate (Bid Rate) between AUD and INR, therefore, is: 55.0586/1.1401 = 48.2928

Formula: Rs/AUD_{bid}: $(Rs/USD)_{bid}$ * [1/ $(AUD/USD)_{ask}$].

Steps for calculating Ask rate: Computation of ask rate can be understood from the point of view of Indian importer who needs AUD to pay for imports from Australia.

I. Purchase USD from the market.1 USD can be purchased for Rs. 56.0325 (the ask rate between USD and INR).
II. Sell this USD to purchase AUD from the market. Applicable rate is AUD/USD: 1.1385(read as AUD 1.1385 per USD) which is the rate at which banks are ready to buy USD in exchange AUD. Hence by selling 1 USD, Indian importer gets 1.1385 AUD.

It follows from these transactions that the importer buys 1.1385 AUD in exchange for INR 56.0325.

Therefore Exchange rate (Ask rate) between AUD and INR is

(Rs/AUD) = 56.0325/1.1385 = 49.2161

Formula: Rs/AUD_{ask}: $(Rs/USD)_{ask}$ * [1/ $(AUD/USD)_{bid}$]

5. Summary

In this module you have learnt about the foreign exchange markets and exchange rates.

- Foreign exchange rate is the price of domestic currency in terms of a foreign currency – for ex. INR vs. the USD or INR vs. the Euro.
- A foreign exchange transaction is an agreement between a buyer and a seller for the delivery of a certain amount of one currency at a specified rate in exchange for some other currency.
- The foreign exchange market provides a platform for the settlement of international transactions between different players in the market.
- Foreign exchange market, which is an “over the counter” market has two segments: Spot and Forward. The distinction between the two markets is made on the basis of the time gap between the transaction date and value date.
- The foreign exchange market has numerous players in the form of banking and non-banking entities.
- The exchange rate regime adopted by the country varies along a spectrum, with the fixed and flexible as two extremes and a number of combinations in between these two.
- India moved to a market based exchange rate system with the LERMS in 1991 followed by a unified exchange rate mechanism in March 1993.