


Subject: Management

Production of Courseware



 -Content for Post Graduate Courses



Paper: 08, International Business Operations

Module: 16, Exchange Rate Determination



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Items	Description of Module
Subject Name	Management
Paper Name	International Business Operations
Module Title	Exchange Rate Determination
Module Id	Module no.- 16
Pre- Requisites	Foreign Exchange rate, SWIFT, spot rates, forward rates
Objectives	To understand the foreign exchange determination and its theories
Keywords	SWIFT, Trade, Spot market, Forward Market, theories, Arbitrage

QUADRANT-I

Module 8 : MODES OF ENTRY
1. Learning Outcome
2. Introduction
3. Foreign Exchange trading
4. Exchange rate mechanism
5. Exchange rate determination
6. Theories of Exchange rate determination
7. Arbitrage
8. Summary

Learning Outcome:

After completing this module the students will be able to learn :

- Foreign exchange Rates
- Foreign exchange trading
- Exchange rate mechanism
- Exchange rate determination
- Exchange rate theories

Introduction

In the previous module we have studied Foreign exchange market (forex, FX, or currency market) is a globalised platform or an institutional structure where the currency of one country is converted into that of another country. It is a market in which trade between currencies are made. In other words, it is a market in which national currencies are bought or sold against one another. A foreign exchange market refers to buying foreign currencies with domestic currencies and selling foreign currencies for domestic currencies. Thus it is a market in which the claims to foreign moneys are bought and sold for domestic currency. The foreign exchange market in terms value of transactions, is largest market in the world and works round the clock. BIS Triennial Central Bank Survey reports turnover of \$5.3 trillion per day in April 2013.

Foreign Exchange Rates and Quotations

A foreign exchange rate is the price of a foreign currency. A foreign exchange quotation or quote is a statement of willingness to buy or sell at an announced rate.

1. Inter bank Quotations:

The most common way that professional dealers and brokers state foreign exchange quotations, and the way they appear on all computer trading screens worldwide, is called **European terms**. The European terms quote shows the number of units of foreign currency needed to purchase one USD:

$$\text{CAD } 1.5770 / \text{USD}$$

An alternative method is called the **American terms**. The American terms quote shows the number of units of USD needed to purchase one unit of foreign currency:

$$\text{USD } 0.6341 / \text{CAD}$$

Clearly, those two quotations are highly related. Define the price of a USD in CAD to be

Also, define the price of a CAD in USD to be

$$S(\text{USD} / \text{CAD}) = \text{USD } 0.6341 / \text{CAD}$$

Then, it must be that

$$S(\text{CAD} / \text{USD}) = 1 / S(\text{USD} / \text{CAD})$$

Because $\text{CAD } 1.5770 / \text{USD} = 1 / \{\text{USD } 0.6341 / \text{CAD}\}$.

These rules also apply to forward rates as well. We will denote an outright forward quote using the following notation:

$$F(\text{CAD} / \text{USD})$$

2. Direct and Indirect Quotations:

A direct quote is a home currency price of a unit of foreign currency.

An indirect quote is a foreign currency price of a unit of home currency.

In the US, a direct quote for the CAD is

$$\text{USD } 0.6341 / \text{CAD}$$

This quote would be an indirect quote in Canada.

3. Bid and Ask Quotations:

Inter bank quotations are given as "bid" and "ask".

A bid is the exchange rate in one currency at which a dealer will buy another currency. An ask is the exchange rate at which a dealer will sell the other currency. Dealers buy at the bid price and sell at the ask price, profiting from the spread between the bid and ask prices: bid < ask.

Bid and ask quotations are complicated by the fact that the bid for one currency is the ask for another currency:

$$S^b(\text{USD}/\text{CAD}) = 1/S^a(\text{CAD}/\text{USD})$$

$$S^a(\text{USD}/\text{CAD}) = 1/S^b(\text{CAD}/\text{USD})$$

Foreign exchange trading and SWIFT

In an inter bank foreign exchange transaction, no real money changes hand. All transactions are done electronically through SWIFT. Banks undertaking foreign exchange transactions simply transfer bank deposits through SWIFT to settle a transaction. SWIFT is the **Society for Worldwide Interbank Financial Telecommunication** is a cooperative organization headquartered at Belgium. The Swift network connects around 8300 banks, financial institutions and companies operating 208 countries. Swift provides a standardized messaging service to these members. As and when two counterparties undertake a transaction, SWIFT transports the message to both financial parties in a standard form. As the foreign exchange market is mainly an OTC market, SWIFT message provides some kind of legitimacy to the transactions. The following line captures summarizes the activities at SWIFT.

“SWIFT is solely a carrier of messages. It does not hold funds nor does it manage accounts on behalf of customers, nor does it store financial information on an ongoing basis. As a data carrier, SWIFT transports messages between two financial institutions. This activity involves the secure exchange of proprietary data while ensuring its confidentiality and integrity”. For every participating member, SWIFT assigns a unique code. This code is used to transport messages.

Foreign exchange rate determination

Foreign exchange rate:

Exchange rate refers to the rate at which a country's currencies are exchanged for currencies of other country. In other words it is the price of one currency in terms of another currency. For E.g. If the value of 1 US dollar in Indian rupees is 45 then the exchange rate is 1 US \$ = 45. Thus foreign exchange rate indicates the external value of a country's currency. It also shows the purchasing power of a country's currency in terms of currency of another country

Determination of exchange rates:

The rate of exchange being a price of national currency in terms of another, is determined in foreign exchange market in accordance with general principle of the theory of value i.e., by the interaction of forces of demand and supply. Thus the rate of exchange in the foreign exchange market will be determined by interaction between demand for foreign exchange and supply of foreign exchange.

1. Demand for Foreign Exchange:

Foreign exchange is required by citizens or Government to make payments abroad. This results in demand for foreign exchange. These payments are recorded in payment side of BOP. The demand for foreign currency arises due to the following payments

- **Import of Goods**
Consumer as well as capital goods are imported from other countries. Foreign exchange is demanded by people who import these goods. Higher the value of Imports, higher is the demand for foreign currency.
- **Import of services**
Services rendered by other countries which include banking, insurance, transport, communication, educational services, etc. are required to be paid in foreign exchange.
- **Dividend, Interest and Profits**
In India, many foreign firms have invested in various sectors, which results in outflow of foreign exchange on account of dividend and profits. On other hand Government and Indian firms have also borrowed from foreign countries, which results in payment of Interest.
- **Unilateral Payments**

Donations, gifts etc. are 'one sided payments without corresponding returns. Such payments create demand for foreign exchange.

- **Export of Capital**

Repayment of debt, purchase of assets in foreign countries etc. all require foreign exchange. All the above categories of payments abroad result in aggregate demand for foreign exchange. The total demand for foreign currency is inversely related to foreign exchange rate. At a higher exchange rate, the demand for foreign currency may be low.

2. **Supply of Foreign Exchange:**

Supply of foreign exchange in a country comes from receipts of its exports. The receipts of foreign currency are recorded in the receipt side of BOP. The main sources of supply are:

- **Exports of Goods**

This constitutes a major source of supply of foreign exchange. Both size and price of exports depends on demand of elasticity for goods. In India, the manufactured items occupy the top position in exports.

- **Exports of Services**

In recent years this source is gaining importance. Export Services in various fields, tourists coming from other countries, transport, communication, insurance etc. are important services which earn and supply foreign exchange.

- **Dividend, Interest and profits**

Indian firms have invested in various sectors in foreign countries. Thus there is inflow of foreign exchange on account of dividend and profits. Indian institutions also have lent money abroad, which results in receipt of interest.

- **Unilateral Receipts**

Payments received in form of remittance from domestics working abroad, donations etc. form a part of foreign exchange supply.

- **Import of Capital**

Foreign investment - direct and portfolio - repayment of debts by foreigners, all increase the supply of foreign exchange. All the above categories of receipts from abroad result in aggregate supply of foreign exchange. The total supply, like the supply of any other commodity, is directly related to price i.e. the foreign exchange rate. At a higher exchange rate, the supply of foreign currency may be high.

Exchange rates:

Transactions in exchange market are carried out at what are termed as exchange rates. In foreign exchange market two types of exchange rate operations take place. They are spot exchange rate and forward exchange rate.

1) Spot Exchange Rate:

When foreign exchange is bought and sold for immediate delivery, it is called spot exchange. It refers to a day or two in which two currencies are involved. The basic principle of spot exchange rate is that it can be analyzed like any other price with the help of demand and supply forces. The exchange rate of dollar is determined by intersection of demand for and supply of dollars in foreign exchange. The demand for dollar is derived from country's demand for imports which are paid in dollars and supply is derived from country's exports which are sold in dollars. The exchange rate determined by market forces would change as these forces change in market. The primary price makers buy (Bid) or sell (ask) the currencies in the market and the rates continuously change in a free market depending on demand and supply. The primary dealer (bank) quotes two-way rates i.e., buy and sell rate.

(Bid) Buy Rate 1 US \$ = ` 45.50

(Ask) Sell Rate 1 US \$ = ` 45.75

The bank is ready to buy 1 US \$ at Rs. 45.50 and sell at Rs. 45.75. The difference of Rs.0.25 is the profit margin of dealer.

2) Forward Exchange Rate:

Here foreign exchange is bought or sold for future delivery i.e., for the period of 30, 60 or 90 days: There are transactions for 180 and 360 days also. Thus, forward market deals in contract for future delivery. The price for such transactions is fixed at the time of contract; it is called a forward rate. Forward exchange rate differs from spot exchange rate as the former may either be at a premium or discount. If the forward rate is above the present spot rate, the foreign exchange rate is said to be at a premium. If the forward rate is below the present spot rate, the foreign exchange rate is said to be at a discount. Thus foreign exchange rate may be at forward premium or at forward discount. For e.g. an Indian importer may enter into an agreement to purchase US \$ 10,000 sixty days from today at 1 US \$ = Rs. 48. No amount is paid at the time of agreement, except for usual security margin money of about 10% of the total amount. 60 days from today, the importer will get 10,000 US \$ in exchange for Rs. 4,80,000 irrespective of the Spot exchange rate prevailing on that date.

Factors Influencing Forward Exchange Rate:

- i)** Interest rates.
- ii)** Degree of speculation in foreign exchange market.
- iii)** Inflation rate.
- iv)** Foreign investor's confidence in domestic country.
- v)** Economic situation in the country.
- vi)** Political situation in the country.
- vii)** Balance of payments position.

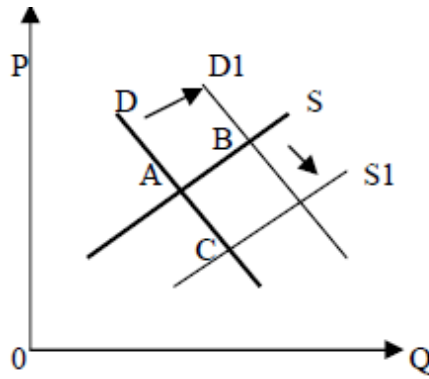
Theories to determine exchange rates:

Many theories there have been written in respect to the main determinant of future exchange rates. Although the majority of these theories give adequate reasons in order to explain what actually determines the rates between the currencies. Here below, we will refer to the main theories regarding the determinants of the exchange rates:

1. Supply and Demand

The exchange rate, just like commodities, determines its price responding to the forces of supply and demand. Therefore, if for some reason people increase their demand (shift of the curve from D to D1) for a specific currency, then the price will rise from A to B, provided the supply remains stable. On the contrary, if the supply is increased (shift of the curve from S to S1), the price will decline from A to C, provided the demand remains stable (figure A). Any excess supply (above the equilibrium point) or excess demand (below the equilibrium point) will increase or decrease temporarily foreign currency reserves accordingly. Finally, such disequilibrium situations will be eliminated through the pricing, e.g. the market itself.

Figure A : Supply and Demand for foreign currency



P: shows the exchange rate, Q: shows the amount of currency demanded and supplied

A, B, C: Show the equilibrium exchange rate

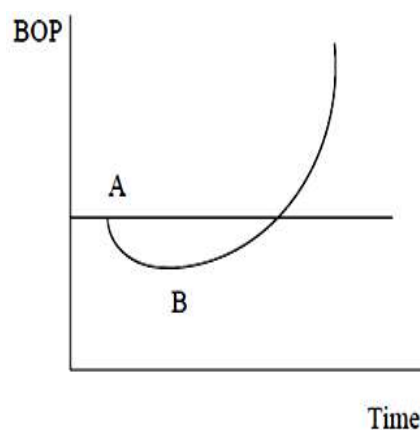
2. Purchasing Power Parity (PPP):

By definition the PPP states that using a unit of a currency, let us say one euro, which is the purchasing power that can purchase the same goods worldwide. The theory is based on the 'law of one price', which argues that should a euro price of a good be multiplied by the exchange rate (€ /US\$) then it will result in an equal price of the good in US dollars. In other words, if we assume that the exchange rate between the € and US \$ states at 1/1.2, then goods that cost € 10 in the EU should cost US\$ 12 in the United States. Otherwise, arbitrage profits will occur. However, it is finally the market that through supply and demand will force accordingly the euro and US dollar prices to the equilibrium point. Thus, the law of one price will be reinstated, as well as the purchase power parity between the euro and US dollar. Inflation differentials between countries will also be eliminated in terms of their effect on the prices of the goods because the PPP will adjust to equal the ratio of their price levels. More specifically, as stated in their book (Lumby S. & Jones C. 1999) "the currency of the country with the higher rate of inflation will depreciate against the other country's currency by approximately the inflation differential". In conclusion, it can be argued that the theory, although it describes in a sufficient way the determination of the exchange rates, is not of good value, mainly because of the following two disadvantages. Firstly, not all goods are traded internationally (for example, buildings) and secondly, the transportation cost should represent a small amount of the good's worth.

3. The Balance of Payments (BOP) Approach:

The balance of payments approach is another method that explains what the factors are that determine the supply and demand curves of a country's currency. As it is known from macroeconomics, the balance of payments is a method of recording all the international monetary transactions of a country during a specific period of time. The transactions recorded are divided into three categories: the current account transactions, the capital account transactions, and the central bank transactions. The aforementioned categories can show a deficit or a surplus, but theoretically the overall payments (the BOP as a whole) should be zero – which rarely happens. As stated earlier, a currency's price depreciation or appreciation (the change in the value of money), directly affects the volume of a country's imports and exports and, consequently, a likely fluctuation in the exchange rates can add to BOP discrepancies. For example, a likely depreciation will increase the value of exports in home currency terms (the larger the exports demand elasticity the greater the increase). Conversely, the imports will become 'more expensive' and their value will be reduced in home currency (the larger the imports demand elasticity the greater the decrease). The **J curve effect** illustrates that in the short-term a depreciation of the currency can initially worsen (from A to B) the current account balance before it improves its position (figure B). This is due to the low price elasticity of demand for imports and exports in the immediate outcome of an exchange rate change.

Figure B: The J curve effect



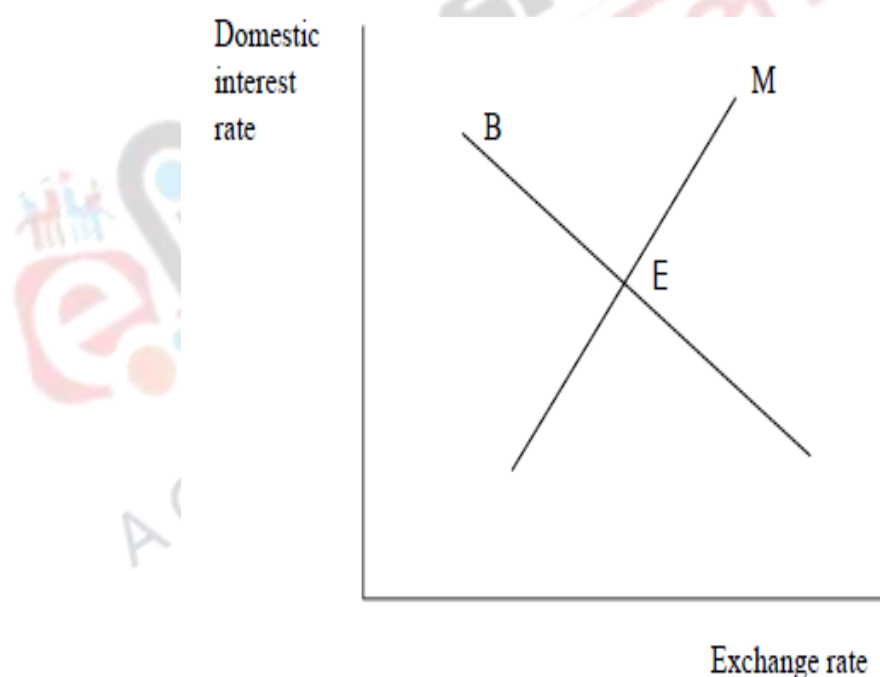
4. The Monetary Approach:

In this approach attention is given to the stock of currencies in comparison to the willingness of people to hold these stocks. According to the monetary theory, exchange rates adjust to ensure that the quantity of money in each currency supplied is equal to the quantity demanded. Both Quantity Theory of Money (QTM) and Purchasing Power Parity (PPP) have been used in support of the aforementioned theory. The QTM states that there is a direct relationship between the quantity of money and the level of prices of goods and services sold. In other words, more money equals more inflation.

5. The Portfolio Balance Approach:

The portfolio balance approach takes into consideration the diversification of investors' portfolio assets. Diversification is a technique that attempts to reduce risk by investing both among various financial instruments and across national borders, to mention just a few. For example, here below we consider a combination of domestic and foreign money and domestic and foreign bonds, the implications of which are illustrated in the following figure C.

Figure C : Portfolio balance approach



Both the M and the B lines show combinations of domestic interest rates and exchange rates. The upward line M is in agreement with the equilibrium in the money market and the downward line B is in agreement with the equilibrium in the bond market. Point E, which is the intersection of M with B, represents the combination of interest rate with the exchange rate that gives equilibrium to both the money and bond markets. What the theory argues is that an increase in the money supply will lead to a depreciation of the exchange rate. The extent of the depreciation depends upon the slope

of the curves M and B. For example, if we consider an increase in the domestic money supply, we will anticipate that a lower interest rate and /or a higher exchange rate can only absorb the excess supply, which in turn will result in the reduction of bonds. To this end, line M will move to the right and line B will move to the left.

Arbitrage

Arbitrage is the act of simultaneously buying a currency in one market and selling it in another to make a profit by taking advantage of exchange rate differences in two markets. If the arbitrage is confined to two markets only it is said "two-point" arbitrage. If they extend to three or more markets they are known as "three-point" or "multi-point" arbitrage. Those who deal with arbitrage are called arbitrageurs. A Spot sale of a currency when combined with a forward repurchase in a single transaction is called "Currency Swap". The Swap rate is the difference between spot and forward exchange rates in currency swap. Arbitrage opportunities may exist in a foreign exchange market. Suppose the rate of exchange is 1 US \$ = ₹. 50 in US market and 1 US \$ = ₹. 55 in Indian Markets, then an arbitrageur can buy dollars in US market and sell it in Indian market and get a profit of 5 per dollar. In today's modern well connected and advanced markets, arbitrageurs (which are mainly banks) can spot it quickly and exploit the opportunity. Such opportunities vanish over a period of time and equilibrium is again maintained.

For e.g.

Bank A ₹ / \$ = 50.50 / 50.55

Bank B ₹ / \$ = 50.40 / 50.45

The above rates are very close. The arbitrageur may take advantage and he can purchase \$ 1,00,000 from Bank B at ₹ 50.45 / a dollar and sell it to Bank A at ₹ 50.50, thus making a profit of 0.05. The total profit would be $(1,00,000 \times 0.05) = ₹ 5,000$. The profit is earned without any risk and blocking of capital.

Arbitrage and Interest rate:

Interest arbitrage refers to differences in interest rates in domestic market and in overseas markets. If interest rates are higher in overseas market than in domestic market, an investor may invest in overseas market to take the advantage of interest differential. Interest arbitrage may be covered and uncovered.

1) Uncovered Arbitrage

In this system, arbitrageurs would take a risk to earn profit by investing in a high interest bearing risk free securities in a foreign market. His earnings would be according to his calculations if the currency of foreign market where he invested does not depreciate. If depreciation is equal to the difference in interest rate, the investor would not incur loss. However, if depreciation is more than interest rate, then the arbitrageur will incur loss.

2) Covered Arbitrage

International investors would like to avoid the foreign exchange risk, thus interest arbitrage is usually covered. The investor converts the domestic currency for foreign currency at the current spot rate for the purpose of investment. At the same time, investor sells forward the amount of foreign currency which he is investing plus the interest that he will earn so as to coincide with maturity of foreign investment. The covered interest arbitrage refers to spot purchase of foreign currency to make investment and offsetting simultaneous forward sale of foreign currency to cover foreign exchange risk. When treasury bills mature, the investor will get the domestic currency equivalent of foreign investment plus interest without a foreign exchange risk.

Summary

The foreign exchange market is the mechanism, by which a person of firm transfers purchasing power from one country to another, obtains or provides credit for international trade transactions, and minimizes exposure to foreign exchange risk. A foreign exchange transaction is an agreement between a buyer and a seller that a given amount of one currency is to be delivered at a specified rate for some other currency. A foreign exchange rate is the price of a foreign currency. A foreign exchange quotation or quote is a statement of willingness to buy or sell at an announced rate. The foreign exchange market consists of two tiers: the inter bank or wholesale market, and the client or retail market. Participants include banks and non bank foreign exchange dealers, individuals and firms conducting commercial and investment transactions, speculators and arbitragers, central banks and treasuries, and foreign exchange brokers. Transactions are effectuated either on a spot basis or on a forward or swap basis. A spot transaction is for an (almost) immediate value date while a forward transaction is for a value date somewhere in the future. Quotations can be classified either as European and American terms or as direct and indirect quotes. A cross rate is an exchange rate between two currencies, calculated from their common relationship with a third currency. Arbitrage is the act

of simultaneously buying a currency in one market and selling it in another to make a profit by taking advantage of exchange rate differences in two markets.

