THEORIES OF EXCHANGE RATE DETERMINATION

1. *THE PURCHASING POWER PARITY*

The purchasing power parity theory was propounded by Professor Gustav Cassel of Sweden. According to this theory, rate of exchange between two countries depends upon the relative purchasing power of their respective currencies. Such will be the rate which equates the two purchasing powers. For example, if a certain assortment of goods can be had for £1 in Britain and a similar assortment with Rs. 80 in India, then it is clear that the purchasing power of £ 1 in Britain is equal to the purchasing power of Rs. 80 in India. Thus, the rate of exchange, according to purchasing power parity theory, will be £1 = Rs. 80.

Let us take another example. Suppose in the USA one $ purchases a given collection of commodities. In India, same collection of goods cost 60 rupees. Then rate of exchange will tend to be $ 1 = 60 rupees. Now, suppose the price levels in the two countries remain the same but somehow exchange rate moves to $1=61 rupees.

This means that one US$ can purchase commodities worth more than 46 rupees. It will pay people to convert dollars into rupees at this rate, ($1 = Rs. 61), purchase the given collection of commodities in India for 60 rupees and sell them in U.S.A. for one dollar again, making a profit of 1 rupee per dollar worth of transactions.

This will create a large demand for rupees in the USA while supply thereof will be less because very few people would export commodities from USA to India. The value of the rupee in terms of the dollar will move up until it will reach $1 = 60 rupees. At that point, imports from India will not give abnormal profits. $ 1 = 60 rupees and is called the purchasing power parity between the two countries.

Thus, while the value of the unit of one currency in terms of another currency is determined at any particular time by the market conditions of demand and supply, in the long run the exchange rate is determined by the relative values of the two currencies as indicated by their respective purchasing powers over goods and services.

In other words, the rate of exchange tends to rest at the point which expresses equality between the respective purchasing powers of the two currencies. This point is called the purchasing power parity. Thus, under a system of autonomous paper standards the external value of a currency is said to depend ultimately on the domestic purchasing power of that currency relative to that of another currency. In other words, exchange rates, under such a system, tend to be determined by the relative purchasing power parities of different currencies in different countries.

In the above example, if prices in India get doubled, prices in the USA remaining the same, the value of the rupee will be exactly halved. The new parity will be $ 1 = 120 rupees. This is because now 120 rupees will buy the same collection of commodities in India which 60 rupees did before. We suppose that prices in the USA remain as before. But if prices in both countries get doubled, there will be no change in the parity.

In actual practice, however, the parity will be modified by the cost of transporting goods (including duties etc.) from one country to another.

A Critique of Purchasing Power Parity Theory:

The purchasing power parity theory has been subject to the following criticisms:

The actual rates of exchange between the two countries very seldom reflect the relative purchasing powers of the two currencies. This may be due to the fact that governments have either controlled prices or controlled exchange rates or imposed restrictions on import and export of goods.

Moreover, the theory is true if we consider the purchasing power of the respective currencies in terms of goods which enter into international trade and not the purchasing power of goods in general. But we know that all articles produced in a country do not figure in international trade.

Therefore, the rate of exchange cannot reflect the purchasing power of goods in general. For example, in India we may be able to get a dozen shirts washed with Rs. 40, but only 2 shirts with one dollar in the USA. Obviously, the purchasing power of one dollar in the USA is much less than the purchasing power of Rs. 40 in India.

This is due to the fact that dhobis do not form an article of international trade. If dhobis entered into international trade and freely moved into the U.S.A., then in terms of clothes washed, the purchasing power of Rs. 40 may be equalized with the purchasing power of a dollar. Further, it is very difficult to measure purchasing power of a currency. It is usually done with the help of index numbers. But we know that the index numbers are not infallible.

Among the difficulties connected with index numbers are the following important ones:

(i) Different types of goods that enter into the calculation of index numbers;

(ii) Many goods which may enter into domestic trade may not figure in international trade;

(iii) Internationally traded goods also may not have the same prices in all the markets because of differences in transport costs.

Besides, the theory of purchasing power applies to a stationary world. Actually the world is not static but dynamic. Conditions relating to money and prices, tariffs, etc., constantly go on changing and prevent us from arriving at any stable conclusion about the rates of exchange.

The internal prices and the cost of production are constantly changing. Therefore, a new equilibrium between the two currencies is almost daily called for. As Cassel observes, "differences in two countries' economic situation, particularly in regard to transport and customs, may cause the normal exchange rate to deviate to a certain extent from the quotient

of the currencies intrinsic purchasing powers." If a country raises its tariffs, the exchange value of its currency will rise but its price level will remain the same.

Besides, many items of balance of payments like insurance and banking transactions and capital movements are very little affected by changes in general price levels. But these items do influence exchange rates by acting upon the supply of and the demand for foreign currencies.

The Purchasing Power Parity Theory ignores these influences altogether. Further, the theory, as propounded by Cassel, says that changes in price level bring about changes in exchange rates but changes in exchange rates do not cause any change in prices. This latter part is not true, for exchange movements do exercise some influence on internal prices.

The purchasing power parity theory compares the general price levels in two countries without making any provision for distinction being drawn between the price level of domestic goods and that of the internationally traded goods. The prices of internationally-traded goods will tend to be the same in all countries (transport costs are, of course omitted). Domestic prices on the other hand, will be different in the two countries, even between two areas of the same country.

The purchasing power parity theory assumes that there is a direct link between the purchasing power of currencies and the rate of exchange. But in fact there is no direct relation between the two. Exchange rate can be influenced by many other considerations such as tariffs, speculation and capital movements.

Keynes' Critique:

According to Keynes, there are two basic defects in the purchasing power parity theory, namely:

(i) It does not take into consideration the elasticity's of reciprocal demand.

(ii) It ignores the influences of capital movements.

In Keynes's view, foreign exchange rates are determined not only by the price movements but also by capital movements, the elasticity's of reciprocal demand and many other forces affecting the demand for and supply of foreign exchange.

"By elasticity of reciprocal demand is meant the responsiveness of one country's demand for another country's exports with respect to price or income." As for price elasticity, generally speaking, greater the proportion of luxuries and semi-luxuries in the exports demanded, the more elastic will be the country's demand for another country's exports.

It will also be more elastic, when there is a greater number of alternative markets in which to buy and greater the capacity to produce the effective substitutes for goods imported. As for the income elasticity of demand for imports, changes in demand for goods and services and in the derived demand for foreign exchange is functionally related to the changes in national income.

2. *INTEREST RATE PARITY (IRP)*

Interest Rate Parity (IRP) is a theory in which the differential between the interest rates of two countries remains equal to the differential calculated by using the forward exchange rate and the spot exchange rate techniques. Interest rate parity connects interest, spot exchange, and foreign exchange rates. It plays a crucial role in Forex markets.

IRP theory comes handy in analysing the relationship between the spot rate and a relevant forward (future) rate of currencies. According to this theory, there will be no arbitrage in interest rate differentials between two different currencies and the differential will be reflected in the discount or premium for the forward exchange rate on the foreign exchange.

The theory also stresses on the fact that the size of the forward premium or discount on a foreign currency is equal to the difference between the spot and forward interest rates of the countries in comparison.

Example

Let us consider investing € 1000 for 1 year. Now there are two options or cases-

Case I: Home Investment

In the US, let the spot exchange rate be $1.2245 / €1.

So, practically, we get an exchange for our €1000 @ $1.2245 = $1224.50

We can invest this money $1224.50 at the rate of 3% for 1 year which yields $1261.79 at the end of the year.

Case II: International Investment

We can also invest €1000 in an international market, where the rate of interest is 5.0% for 1 year.

So, €1000 @ of 5% for 1 year = €1051.27

Let the forward exchange rate be $1.20025 / €1.

So, we buy forward 1 year in the future exchange rate at $1.20025/€1 since we need to convert our €1000 back to the domestic currency, i.e., the U.S. Dollar.

Then, we can convert € 1051.27 @ $1.20025 = $1261.79

Thus, when there is no arbitrage, the Return on Investment (ROI) is equal in both cases, regardless the choice of investment method.

Arbitrage is the activity of purchasing shares or currency in one financial market and selling it at a premium (profit) in another.

Covered Interest Rate Parity (CIRP)

According to Covered Interest Rate theory, the exchange rate forward premiums (discounts) nullify the interest rate differentials between two sovereigns. In other words, covered interest

rate theory says that the difference between interest rates in two countries is nullified by the spot/forward currency premiums so that the investors could not earn an arbitrage profit.

Example

Assume Yahoo Inc., the U.S. based multinational, has to pay the European employees in Euro in a month's time. Yahoo Inc. can do this in many ways, one of which is given below −

Yahoo can buy Euro forward a month (30 days) to lock in the exchange rate. Then it can invest this money in dollars for 30 days after which it must convert the dollars to Euro. This is known as covering, as now Yahoo Inc. will have no exchange rate fluctuation risk.

Yahoo can also convert the dollars to Euro now at the spot exchange rate. Then it can invest the Euro money it has obtained in a European bond (in Euro) for 1 month (which will have an equivalently loan of Euro for 30 days). Then Yahoo can pay the obligation in Euro after one month.

Under this model, if Yahoo Inc. is sure that it will earn an interest, it may convert fewer dollars to Euro today. The reason for this being the Euro's growth via interest earned. It is also known as covering because by converting the dollars to Euro at the spot rate, Yahoo is eliminating the risk of exchange rate fluctuation.

Uncovered Interest Rate Parity (UIP)

Uncovered Interest Rate theory says that the expected appreciation (or depreciation) of a particular currency is nullified by lower (or higher) interest.

In the given example of covered interest rate, the other method that Yahoo Inc. can implement is to invest the money in dollars and change it for Euro at the time of payment after one month.

This method is known as uncovered, as the risk of exchange rate fluctuation is imminent in such transactions.

Covered Interest Rate and Uncovered Interest Rate

Contemporary empirical analysts confirm that the uncovered interest rate parity theory is not prevalent. However, the violations are not as huge as previously contemplated. The violations are in the currency domain rather than being time horizon dependent.

In contrast, the covered interest rate parity is an accepted theory in recent times amongst the OECD economies, mainly for short-term investments. The apparent deviations incurred in such models are actually credited to the transaction costs.

Implications of IRP Theory

If IRP theory holds, then it can negate the possibility of arbitrage. It means that even if investors invest in domestic or foreign currency, the ROI will be the same as if the investor had originally invested in the domestic currency.

When domestic interest rate is below foreign interest rates, the foreign currency must trade at a forward discount. This is applicable for prevention of foreign currency arbitrage.

If a foreign currency does not have a forward discount or when the forward discount is not large enough to offset the interest rate advantage, arbitrage opportunity is available for the domestic investors. So, domestic investors can sometimes benefit from foreign investment.

When domestic rates exceed foreign interest rates, the foreign currency must trade at a forward premium. This is again to offset prevention of domestic country arbitrage.

When the foreign currency does not have a forward premium or when the forward premium is not large enough to nullify the domestic country advantage, an arbitrage opportunity will be available for the foreign investors. So, the foreign investors can gain profit by investing in the domestic market.