Chapter 3:

The Problem of Currency Exposure and its Management

3.1 Introduction

In this chapter an attempt is made to provide theoretical background of the present research. The chapter starts with an introduction about foreign exchange market followed by a brief profile of international monetary system and exchange rate regime. Subsequent part of the chapter deals with reasons for appreciation or depreciation of currency followed by exchange rate forecasting and exchange rate determination. The last and most important part of the chapter deals with discussion on nature and types of currency exposure and management of the same.

3.2 Foreign Exchange Market

The foreign exchange market is the market in which currencies are bought and sold against each other. The basic function of the foreign exchange market is to help international trade and investment. In a typical foreign exchange transaction a party purchases a given quantity of one currency by paying a quantity of another currency. The modern foreign exchange market started taking shape during the 1970s when countries gradually switched to floating exchange rates from the earlier Bretton Woods system of fixed exchange rate regime. The foreign exchange market is the largest and most liquid financial market in the world with a reported daily turnover of around $4 Trillion\(^1\). The following table indicates the average daily turnover in foreign exchange market from 1998 – 2010.

\(^1\) Triennial Central Bank Survey (December 2010), Bank for International Settlements.
Table 3.1: Average Daily turnover in foreign exchange market\(^2\) (Billion Dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>1527</td>
</tr>
<tr>
<td>2001</td>
<td>1239</td>
</tr>
<tr>
<td>2004</td>
<td>1934</td>
</tr>
<tr>
<td>2007</td>
<td>3324</td>
</tr>
<tr>
<td>2010</td>
<td>3981</td>
</tr>
</tbody>
</table>

As per April 2007 data on turnover in traditional foreign exchange markets, average daily turnover has grown by an unprecedented 72% since April 2004, to $3.3 trillion. This increase was much stronger than the one observed between 2001 and 2004. In 2010 the turnover reached almost 4 trillion dollar with an increase of around 20% as compared to 2007.

As shown in the table A1 of Appendix-A, Currencies like USD, EURO and Yen constitutes major chunk of turnover in foreign exchange market. As per BIS (Bank for International Settlements, Switzerland) study, the most heavily traded pair of currencies as shown in the table A2 of Appendix-A includes EUR/USD with 28% share distinctly followed by USD/JPY with 14% share and closely followed by GBP/USD with 9% share. Most of the large commercial banks and financial institutions take part in foreign exchange market. The major players in foreign exchange market as shown in the table A3 of Appendix-A includes Deutsche Bank with 18% share followed by UBS AG and Barclays Capital with 11% of total turnover in foreign exchange market.

Fluctuations are integral part of foreign exchange market. Fluctuations in exchange rates are usually caused by actual monetary flows as well as by expectations of changes in monetary flows caused by changes in GDP growth, inflation, interest rates, budget and trade deficits or surpluses, large cross-border M&A deals and other macroeconomic conditions.

\(^2\) Annual FX poll (May 2010), Euromoney
3.2.1 Quotation and types of transaction in Foreign exchange Market

A foreign exchange quotation is the price of the currency expressed in terms of another currency. The quotation can be either direct or indirect. A direct quote indicates how many units of local currency is required per unit of foreign currency where as indirect quote indicates how many units of foreign currency is required per unit of local currency. Most of the countries including India follow direct quotation in foreign exchange market.

Depending upon the time elapsed between the transaction date and the settlement date foreign exchange transaction can be categorized into spot and forward transactions. In Spot transaction (market) settlement of transactions takes place within two business days after the dates of transaction. In Forward transaction (market) settlement of transaction takes place after a period of three days and beyond from the date of entering into contract. Standard forward dates are 1,3,6 and 12 months. Banks usually offer forward contracts for a period which are not whole months which is called as “broken dates” or “odd dates” Forward rates are generally expressed by indicating premium/ discount on the spot rates.

3.2.2 Types of exchange rate

It is customary to distinguish nominal exchange rates from real exchange rates. Nominal exchange rates are established on foreign exchange markets. Rates are usually established in continuous quotation and in some cases central bank may also fix the nominal exchange rate. Real exchange rates are nominal rate adjusted with inflation measures. For instance, if a country A has an inflation rate of 10%, country B an inflation of 5%, and no changes in the nominal exchange rate took place, then country A has now a currency whose real value is 10%-5%=5% higher than before. In fact, higher prices mean an appreciation of the real exchange rate, other things equal.
The nominal exchange rate is indicated as $e$, the real exchange rate as $RER$, $P'$ is the foreign price level and $P$ the domestic price level.

### 3.3 Exchange Rate Regime

One of the significant aspects of the International Monetary system is exchange rate regime. The term exchange rate regime refers to the mechanism, procedure and institutional framework that countries implement to govern exchange rates. To understand how the exchange rate regime works, it is necessary to review its evolution. It begins with the gold standard and its break-up during the 1930s. Under this system exchange rate between any pair of currencies was determined by their respective exchange rates against gold. Then came, in 1944, Bretton Woods conference which called for fixed exchange rates against the USD. The conference resulted in the creation of IMF to maintain order in the international monetary system and the World Bank to promote development. After the collapse Bretton Wood system of fixed exchange rates system in 1973, the world has operated with a mixed system in which some currencies are allowed to float freely but many are either managed by government intervention or pegged to another currency. The following paragraphs indicate the exchange rate regime adopted by different countries at present.

#### 3.3.1 Current Exchange Rate Regime

IMF classify the exchange rate policies of its member countries in to 8 categories based on flexibility and commitment of monetary authority of the country in maintenance of exchange rate paths.

- **Monetary Union** is a zone where a single monetary policy prevails and inside which a single currency or currencies, which are perfect substitutes, circulate freely. The Monetary Union has common regional central bank, which is the sole issuer of currency.

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3 Adopted from IMF annual report
- **Dollarization/Euroization** A foreign currency acts as legal tender. Dollarization is a summary measure of the use of foreign currency in its capacity to produce all types of money services in the domestic economy. Monetary policy is delegated to the anchor country.

- **Currency Board** is monetary regime which combines three elements: an exchange rate that is fixed to an “anchor currency”; automatic convertibility or the right to exchange domestic currency at this fixed rate whenever desired; and a long-term commitment to the system. The time inconsistency problem is reduced and real exchange rate volatility is diminished.

- **Fixed peg** means fixed rate against a single currency or a currency basket. The time inconsistency problem is reduced through commitment to a verifiable target. Devaluation option provides potentially valuable policy tool in response to large shocks. It's potential drawbacks are: provides a target for speculative attacks, avoids real exchange rate volatility but not necessarily persistent misalignments, does not by itself place hard constrains on monetary and fiscal policy, the credibility effect depends on accompanying institutional measures and record of accomplishment.

- **Crawling peg** A rule based system for altering the par value, typically at a predetermined rate or as a function of inflation differentials. It is an attempt to combine flexibility and stability. Often used by (initially) high inflation countries pegging to low inflation countries in attempt to avoid trend of real appreciation.

- **Bands** Exchange rate is flexible within a present band; endpoints are defended through intervention, typically with some intra-band intervention. An attempt to mix market-determined rates with exchange rate stabilizing intervention in a rule based system.

- **Managed float** Exchange rates are determined in the foreign exchange market. Authorities can and do intervene, but are not bound by any intervention rule. Often accompanied by a separate nominal anchor, such as inflation target.
- **Pure float** The exchange rate is determined in the market without public sector intervention. Adjustments to shocks can take place through exchange rate movements. Eliminates the requirement to hold large reserves. This arrangement does not provide an expectations anchor.

### 3.4 Reasons for Appreciation/depreciation of Currency

Especially in floating exchange rate regime the home currency appreciates or depreciates against foreign currency because of the following reasons.

**I. Capital Movement**

Capital movement is the most important factor that results in change in exchange rates. Whenever the inflow of foreign currency takes place, most importantly in form of foreign investment, it results in appreciation of domestic currency as the demand for domestic currency goes up and when capital moves out of the country as a result of withdrawal of investment, domestic currency depreciates.

**II. Strength of the economy**

The strength of the economy affects the demand and supply of foreign currency. A strong economy which is developing fast attracts more foreign currency, which results in appreciation of domestic currency similarly, if an economy is a net exporter the inflow of foreign currency will be more than outflow resulting in appreciation of domestic currency. On the other hand, weakness in the economy results in outflow of foreign exchange which in turn results in weakness of domestic currency.

**III. Inflation**

Higher rate of inflation reduces country’s competitiveness and reduces its ability to sell in international market. This situation, in turn will weaken the domestic currency by reducing the demand for it. The currency appreciates if the rate of inflation is low. Thus the exchange rate move in the direction required to compensate for relative inflation rate.
IV. Interest rate
Due to growing integration of financial markets across the countries, the change in the interest rates started impacting the exchange rates. Whenever the interest rate increases it results in inflow of foreign currency (in search of higher interest rate) which results in appreciation of domestic currency and vice versa.

V. Speculation
Especially in a weak exchange markets, speculation results in appreciation or depreciation of the currency. If a speculator enters market to buy domestic currency it results in appreciation of domestic currency and vice versa.

VI. Government’s Monetary and Fiscal policy
International trade, trade balance and demand and supply of currency are based on monetary and fiscal policies of the government. Monetary and fiscal policies will have an impact on Inflation rate and interest rate and thereby impacts exchange rate.

VII. Market intervention
In some countries central bank intervene in the foreign exchange market by buying or selling the foreign currency to increase or decrease its supply. Usually Central Banks intervenes to maintain stability. Market interventions also results in appreciation or depreciation of the currency.

VIII. Political factors
Political events in the country can have some impact on currency movement. Adverse political developments results in weakening of the currency. Wars and other factors also adversely affect the foreign exchange market.

IX. Tariffs and quotas
Tariffs and quotas along with high rate of custom duty discourages imports and there by reduces the demand for foreign exchange.
3.5 Exchange Rate Determination

Phenomenon of exchange rate movement is an important issue. It influences trade and capital flows across national boundaries, relative profitability of industries etc. With the advent of floating rates in 1973, focus is on determinants of exchange rates. Tremendous increase in cross border movement of capital and lesser restriction on international financial transaction has made the exchange rate determination more complicated. There are some fundamental questions like, are exchange rates predictable, how does interest rates and inflation related to exchange rates, what is the proper exchange rate in theory. Answer to these questions is in the form of different theories of exchange rate determination.

3.5.1 Major theories of exchange rate determination are

I. Purchasing Power Parity (PPP) theory
II. Interest Rate Parity (IRP) theory
III. International Fisher effect
IV. Balance of Payment approach

I. Purchasing Power Parity (PPP) theory

The purchasing power parity approach to the exchange rate was and continues to be an important theory of exchange rate determination. The PPP theory is based on the law of one price according to which, goods that are identical in nature should be sold at the same price. The implication of this law is that the exchange rates should change in response to the price differentials that exist between countries. For example, if product ‘A’ is sold in US at 1 Dollar, and in India at Rs 40 then the exchange rate has to be Rs 40 per Dollar.

Criticisms of ppp theory

- The law of one price might not hold in the short run.
- Does not consider govt intervention.
- Does not consider speculation in exchange market.
- Does not consider structural changes in economies of the countries.
II. Interest Rate Parity (IRP)

IRP theory suggests that forward rate differential is approximately equal to the interest rate differential. It thus helps to determine forward exchange rate. This theory states that premium or discount of one currency against another should reflect the interest differential between two currencies. In a perfect market situation and where there is no restriction on the flow of money, one should be able to gain same real value on monetary asset irrespective of country where it is held.

Studies by Officer and Willet (1970), Aliber (1973) and Frenkel and Levench (1975) shows that IRP theory does not hold good in the real world due to the following reasons

- Differential rate of interest is applicable on different set of securities and the rate of interest chosen for determining the exchange rate may not be definitive rate.
- Rate of interest applicable to lenders and borrowers also differs.
- Excessive speculation in the market may push the forward exchange rate beyond change in interest rate change.
- Even Covered interest arbitrage may not help achieve interest rate parity due to availability of transaction cost and government control on arbitrage process.

III. International Fisher effect

International Fisher effect (IFE) uses interest rates instead of inflation rate differential to explain the changes in exchange rates over time. IFE is closely related to the PPP because interest rate and inflation rate are highly correlated. The relationship between the percentage change in percentage change in spot exchange rate over a given period of time and the difference in interest rates of different markets is known as the IFE.
According to Fisher hypothesis, the real interest rate in a particular economy is independent of monetary variables. With the assumption that real interest rates are calculated across the countries, it can also be concluded that the country with lower interest rate would also have a lower inflation rate. This will make the real value of the country's currency rise over time.

IV. Balance of Payment approach

An increase in the domestic price level over the foreign price level makes the foreign goods and services cheaper. It lowers the export earnings and increases the imports. Lower exports reduce the supply of foreign exchange and demand for foreign exchange increases due to increased imports. As a result of this domestic currency depreciates. Similarly an increase in real national income causes large imports. As a result demand for foreign exchange increases which in turn lead to depreciation of local currency. Increase in the domestic interest rates results in larger capital inflows which results in excessive supply of foreign exchange which in turn results in appreciation of local currency. First two aspect influences current account of BOP and third factor influences capital account of BOP.

3.6 Exchange Rate Forecasting

A reliable forecast of exchange rate provides most valuable informational input for the management of currency exposure. Under a pegged exchange rate regime, the exchange rate is allowed to fluctuate only within narrow bands. Under an independent floating exchange rate regime, the exchange rate is free to adjust in response to changing relative macroeconomic conditions. Forecasting in such an environment is easier when the market is efficient. Forecasting under hybrid exchange rate systems (managed float) can reflect elements of both the pegged and floating process.
3.6.1 Need for forecasting of exchange rate

The most important aspect that necessitates the forecast of exchange rate is the hedging decision. Forecasting of exchange rate is required to decide whether to hedge the currency exposure or not. Suppose an Indian exporter forecasts appreciation of Indian rupee against foreign currency he resort to hedging mechanism (especially using derivative instruments) as appreciation of local currency reduces his export earnings on the other hand If he forecast depreciation of Indian rupee he keep his exposure unhedged as he is going to benefit from the depreciation of local currency. The various other activities where business enterprises can make use of exchange rate forecasting are

- Short-term financing decisions,
- Short-term investment decisions,
- Capital budgeting decisions,
- Long-term financing decisions, and
- Earnings assessment.

3.6.2 Forecasting Techniques:
Techniques involved in exchange rate forecasting can be classified in to

I. Technical forecasting
II. Fundamental forecasting
III. Market-based forecasting
IV. Mixed forecasting.

I. Technical forecasting
Technical forecasting involves the use of historical data to predict future values. It includes statistical analysis and time series models, and is similar to the technical forecasting of stock prices. Technical forecasting includes

1. Classical charting techniques in the form of line chart, bar chart, candlestick chart, and point-and-figure chart.
2. Statistical techniques like simple and weighted moving averages.
3. Mathematical techniques in search of trends through linear regression and cycles through spectral and Fourier analysis and Box-Jenkins autoregressive integrated moving average model forecasts.

The technical forecasting is used for short-term forecasting of currency movement and their coverage is usually not very broad. Technical forecasting is used mainly by speculators to make short term profits and may not be useful to business enterprises for long term forecasting keeping in mind hedging decision. Moreover, business enterprises do not rely on this technique since the technical forecasts fail to estimate future exchange rates in accurate terms.

II. Fundamental forecasting
Fundamental forecasting is based on the fundamental relationships between economic variables and exchange rates. A forecast may arise simply from a subjective assessment, or it can be based on quantitative measurements. In fundamental forecasting future exchange rates are forecasted based on the changes in the macro economic variables.

Many variables are taken into account and forecasting is done with the help of a regression analysis. In a regression model, the coefficients are estimated using historical data. Forecasts can then be made using the appropriate variable values. If the values are uncertain, sensitivity analysis can be applied.

III. Market based Forecasting

Market-based forecasting involves developing forecasts from market indicators. Usually, either the spot rate or the forward rate is used, since they should reflect the market expectation of the future rates. For long-term forecasting, the quoted interest rates on risk-free instruments can be used to determine what the forward rates should be under conditions of interest rate parity. But the use of forward rates has been criticized because they are driven by another market force - the interest rate differential.
IV. Mixed forecasting

Mixed forecasting refers to the use of a combination of forecasting techniques. The actual forecast is a weighted average of the various forecasts developed. The reason for using mixed technique is to minimize the limitations associated with different forecasting techniques. Each technique is assigned weights by the forecaster and weighted average of various forecasts developed is the actual forecast of the currency.

Important aspect in selecting a forecasting technique is the forecast horizon. Empirical studies indicates that market participants place greater reliance on technical models for their very short-run forecasts. As the forecast horizon lengthens, they turn to fundamentals. In the middle range of horizons, composite forecasts may be used.

3.7 Currency Exposure / Foreign Exchange Exposure

It is widely recognized that the volatility in exchange rates has increased dramatically after the breakdown of the Bretton Woods system of fixed exchange rate regime. In the words of Smith, Smithson and Wilford (1990), business enterprises have become increasingly vulnerable to exchange risk since the short term movements in exchange rates are often not accompanied by offsetting changes in prices in the corresponding countries.

Since the advent of floating exchange rates in 1973, enterprises around the world have become acutely aware of the fact that fluctuation in exchange rates exposes their revenues, costs, operating cash flows and hence their market value to substantial fluctuations. This exposure, typically called currency exposure, is something business enterprises which are into international business, should learn to effectively deal with, to their advantage. In the case of exchange rate risks, the increased awareness is firstly due to the tremendous increase in the volume of cross border financial transactions and secondly due to significant increases in the degree of volatility in exchange rates.
Unfavourable movement in the exchange rates results in foreign exchange risk or currency risk. When a business enterprise has assets or liabilities denominated in a foreign currency, or there are receivables or payables denominated in a foreign currency, it has an exposure to that currency. An adverse movement in the exchange rate can affect the business enterprise by:

- increasing its cash expenditures
- reducing its cash income
- reducing its reported profits
- increasing the value of its foreign currency liabilities
- reducing the reported value of its foreign assets
- damaging its competitive position in its domestic and foreign markets

Currency risk is directly affects business enterprises involved in overseas operations. It also exists for any business that depends on foreign suppliers for materials, equipment and services and competes against foreign producers in its domestic market.

Foreign exchange/ currency exposure is the sensitivity of changes in the real domestic currency value of operating income, assets or liabilities to unanticipated changes in exchange rates. Currency risk is the likely or probable loss from such currency exposure owing to adverse fluctuations in exchange rates. It is the risk posed by adverse movements in exchange rates. When a company has assets or liabilities denominated in a foreign currency, or contracts to receive or pay in a foreign currency, it has an exposure to that currency.

As defined by Apte (2006) ‘exposure of an enterprise to a risk factor is the sensitivity of the real value of its assets, liabilities or operating income, expressed in its functional currency, to unanticipated changes in the said risk factor’. By real value we mean the inflation-adjusted value, as against the nominal value. Naturally, enterprises have become increasingly concerned about exposure and
risk. Similar definition given by Adler and Dumas (1984) says “foreign exchange exposure is the sensitivity of changes in the real domestic currency value of assets, liabilities or operating income to unanticipated changes in exchange rates”.

Ankrom (1974) classified foreign exchange exposures into translation, transaction and economic exposures. Transaction exposure is the foreign exchange exposure associated with sales or transactions that have already been made. A business enterprise is exposed to transaction exposure if it sells products where payment is going to be made at some future date. Translation exposure is the accountant's record of profit and loss in translating balance sheet accounts into the home currency. Lastly, economic exposure is the combination of translation and transaction exposures. He argued that economic exposure is a comprehensive measure for the company's foreign exchange exposures. However, economic exposure is usually very complex as it involves not only known cash flows but also unknown future cash flows.

**Currency exposure and Currency risk**

In practice the term currency risk and currency exposure is used interchangeably. The question is whether the two terms are different or can the terms be used interchangeably. There are different opinions among scholars. According to some experts 'exposure' refers to the size or scope of a potential loss, whereas 'risk' is the probability that the loss is incurred. According to Levi (1996), foreign exchange risk is related to the variability of domestic-currency values of assets, liabilities or operating incomes due to unanticipated changes in exchange rates, whereas foreign exchange exposure is what is at risk.

But, Shapiro (1991) and Winstone (1995) make no explicit distinction between currency exposure and currency risk. According to Winstone, currency exposure and currency risk are alternative terms which mean the unexpected losses (or gains) made over a given period of time due to the chance that the foreign currency will change its value in relation to domestic currency.
3.7.1 Types of Currency Exposure

Currency exposure is categorised depending upon which aspect of the operations of an enterprise the said exposure affects.

**Transaction exposure** is related with foreign exchange loss or gain on transactions which are already entered into and which are denominated in foreign currency when exchange rate changes. Transaction exposure is concerned with changes in the present cash flows of the firm where as economic/operating exposure is concerned with future cash flows. **Economic exposure** measures the change in the present value of the firm resulting from any change in the future cash flows of the firm caused by an unexpected change in the exchange rates. On the other hand **translation exposure** does not relate with cash flows. Translation exposure arises from converting financial statements expressed in foreign currencies into the home currency for the purpose of preparation of consolidated financial statement of the parent company.
The following paragraphs furnish a detailed discussion on three kinds of currency exposure.

3.7.1.A Transactions Exposure:
Transaction exposure occurs when a company trades, borrows or lends in a foreign currency, or sells fixed assets to its subsidiaries in a foreign country. All these operations involve time decay between the commitment of the transaction (sale of goods for example) and the receipt or payment. During this time interval exchange rates may change and the business enterprise is exposed to a risk that could be positive or negative.

Transaction exposure is a measure of the sensitivity of the home currency value of assets and liabilities which are denominated in a foreign currency to unanticipated changes in exchange rates, when the said assets or liabilities are liquidated. The foreign-currency values of these items are contractually fixed, i.e., they do not vary with the exchange rate. It is also known as contractual exposure.

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Heywood (1978) to define transaction exposure quotes a simple case where company has ‘one export order: if the currency in which the goods are invoiced appreciates, the company will make a gain, if it depreciates it will suffer a loss’. He adds however that ‘the exposure arises as soon as the order is taken, but it will not show in the financial accounts until it becomes a receivable’.

Transaction exposure can be defined as a measure of variability in the value of assets and liabilities when they are liquidated. Transaction exposure affects operating cash flows and they have short time horizon. Transaction exposure measures changes in the value of financial obligations incurred before a change in exchange rates but to be settled after the change.

**Reasons for emergence of transaction exposure**

The transaction exposure arises mainly on account of the following

- Export and Import of goods or services where transaction is invoiced in foreign currency.
- Borrowing and lending in a foreign currency
- Intra-firm flow in a multinational company

Most often transaction exposure arises due to exporting or importing of goods or services. For Example, an Indian firm sells merchandise on open account to an American buyer for $ 100,000, payment to be made in 60 days. Current exchange rate is Rs 40/$. Seller expects to receive $ 100,000 * Rs 40/$ = Rs 40,00,000. Transaction exposure arises because of the possibility that the Indian exporter will receive something other than Rs 40,00,000. If Indian rupee appreciate against USD by 10% during the period the seller is expected to receive Rs 100,000 * Rs 36/$ = Rs 36,00,000 i.e., Rs 4,00,000 less than originally anticipated. On the other hand if the Indian rupee depreciates against USD by 10% the Indian exporter will receive Rs 44,00,000 (100,000 * Rs 44/$) an increase of Rs 4,00,000 over the amount expected.
Transaction exposure can also arise when foreign currency denominated funds is borrowed or loaned. For example, An Indian Company borrows $ 1 Million from an American bank. With the present exchange rate of Rs 40/$ the debt in terms of Indian Rupee is Rs 40 Million. Over a period of one year Indian rupee depreciates against USD and reaches Rs 45/$. Now the debt in terms of Indian rupee is Rs 45 Million and Indian company need to repay Rs 5 Million more than what they have borrowed apart from interest payable on the loan. This increase in debt is the result of transaction exposure.

In case of multinational companies, when funds flow between parent and subsidiary, any fluctuations in exchange rate alter the cash flow. For example, an Indian subsidiary of US multinational company declares dividend of Rs 10 Million and the same need to be repatriated to the parent company. At the prevailing exchange rate of Rs 40/$ parent company expected to receive $ 2,50,000 (Rs 10 Million/ Rs 40/$). In the mean time if Indian rupee depreciate by 10% to Rs 44/$, the amount of dividend to be received by parent company in dollar terms will be 2,27,273 (Rs 10 Million/ Rs 44/$). This results in loss to the parent company. If the exchange rate appreciates, the parent company gains.

Transaction exposure measures gain or loss arising from financial obligation which is stated in terms of foreign currency. For the purpose of determining the transaction exposure projected inflow or outflow in each foreign currency need to be determined and then determine the overall exposure to such currency. Each currency inflows and outflows need to be combined to determine the net position in that currency and then possible exchange rates are used to arrive at net exposure.
For example, an Indian company’s inflow and out flows in different currencies are as follows.\(^5\)

<table>
<thead>
<tr>
<th>Currency</th>
<th>Net Inflow or Outflow</th>
<th>Expected range of exchange rates (in INR)</th>
<th>Range of possible inflow or outflow in INR</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD</td>
<td>50,000 (Inflow)</td>
<td>Rs 44 to Rs 46</td>
<td>Rs 22,00,000 to Rs 23,00,000</td>
</tr>
<tr>
<td>Euro</td>
<td>80,000 (Outflow)</td>
<td>Rs 56 to Rs 59</td>
<td>Rs 44,80,000 to Rs 47,20,000</td>
</tr>
<tr>
<td>GBP</td>
<td>40,000 (inflow)</td>
<td>Rs 84 to Rs 88</td>
<td>Rs 33,60,000 to Rs 35,20,000</td>
</tr>
<tr>
<td>JPY</td>
<td>200,000 (out flow)</td>
<td>Rs 0.40 to Rs 0.44</td>
<td>Rs 80,000 to Rs 88,000</td>
</tr>
</tbody>
</table>

The key aspect in the above exhibit is that transaction exposure in any currency is not only based on size of its open position but also on the range of expected exchange rates for each currency. In the above example the net Inflow or outflows were assumed to be certain where as exchange rates were assumed to be uncertain. In reality both could be uncertain. In such cases the measurement of exposure would be more complicated. In such cases set of possible estimates for exposure in each currency can be generated by techniques like simulation or sensitivity analysis.

### 3.7.1.B Economic Exposure/ Operating Exposure:

Also called economic or competitive or strategic exposure, it measures any change in the present value of a business enterprise resulting from future operating cash flows changes caused by any unforeseen change in exchange rates.

In the words of Eiteman et al (2004) both transaction and operating exposure deal with changes in expected cash flows. Transaction exposure deals with changes in near-term cash flows that have already been contracted for (such as foreign currency accounts receivable, accounts payable, and other debts).

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Operating exposure deals with changes in long-term cash flows that have not been contracted for but would be expected in the normal course of future business. One might view operating exposure as “anticipated future transactions exposure,” although the concept is broader because the impact of the exposure might be through sales volume or operating cost changes. Given a known exchange rate change, the cash flow impact of transaction exposure can be measured precisely whereas the cash flow impact of operating exposure remains a conjecture about the future.

Operating exposure analyses and assesses the impact of changing exchange rates on the enterprise’s own operations over the coming months and years and on its competitive position vis-à-vis other firms. In words of Prindl (1976) economic exposure takes in ‘the whole range of the future effects of parity changes which have occurred or may possibly occur in future’.

**Major difference between transaction and operating exposure**

<table>
<thead>
<tr>
<th>Transaction exposure</th>
<th>Operating exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract specific</td>
<td>General; relates to entire investment</td>
</tr>
<tr>
<td>The period of exposure is same as period of the business contract.</td>
<td>Duration of operating exposure is time required to make structural changes to manage the operating exposure.</td>
</tr>
<tr>
<td>Loss from transaction exposure is easy to calculate</td>
<td>Opportunity losses arising out of operating exposure is extremely difficult to compute.</td>
</tr>
<tr>
<td>Some policies are generally adopted by the enterprises to manage transaction exposure</td>
<td>Firms generally do not have policies to manage operating exposure</td>
</tr>
<tr>
<td>The only source of uncertainty is the future exchange rate.</td>
<td>The source of uncertainty is the future exchange rate and its impact on sales, price and costs.</td>
</tr>
</tbody>
</table>

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Unanticipated changes in exchange rates can have a serious and sustained impact on a firm’s revenues and costs which may threaten the existence of the business enterprises. **An important point to note is that a firm is subject to operating exposure even when it has no or little direct involvement in international operations.** For instance, consider a firm which deals exclusively in domestic market. It produces exclusively for the domestic market and sources all its inputs from domestic suppliers. Changes in exchange rates can affect such a firm in various ways:

- The firm’s competitors may be importing a competing product and an appreciation of the home currency may permit them to cut the prices of imported products which adversely affects the business enterprise dealing exclusively in domestic market.
- Even though the firm sources all its inputs from domestic suppliers, they in turn may have been imported. Changes in exchange rate affect their costs and hence the prices they offer to the domestic firm. Thus the firm has indirect operating exposure.
- Consumers of the firm’s output may have direct exposure to exchange rates. A change in their fortunes has an impact on the domestic firm. For instance, a manufacturer of chemicals used in leather industry, faces indirect exposure because many of its customers are exporters of finished leather goods.

The analysis and management of operating exposure are at the same time more important and considerably more difficult than contractual transactions exposure. More important because operating exposure can have significant long-term impact on future business of the firm and its strategic posture; more difficult because it involves too many imponderables and no simple hedges like forward contracts are available. Hedging such exposures is often highly impractical if not impossible.
3.7.1.C Translation Exposure:

Translation exposure also called as Accounting exposure, arises because of financial statements of foreign subsidiaries of multinational companies must be restated in the domestic reporting currency of parent company to prepare consolidated financial statements. This process is called as translation.

For example, An American subsidiary of Indian MNC need to restate its financial statements which are in terms of USD to Indian rupee to prepare the consolidated financial statements of Indian MNC.

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Assets</th>
<th>Exchange Rate</th>
<th>Rupee equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>$10,00,000</td>
<td>Rs 46/$</td>
<td>Rs 4,60,00,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>$10,00,000</td>
<td>Rs 43/$</td>
<td>Rs 4,30,00,000</td>
</tr>
<tr>
<td>Year 3</td>
<td>$10,00,000</td>
<td>Rs 40/$</td>
<td>Rs 4,00,00,000</td>
</tr>
</tbody>
</table>

Although the net asset value of US subsidiary shown in the above table remains same in terms of USD, when it is translated into Rupee at the prevailing exchange rate on the balance sheet date it produces a period to period difference in rupee value of net assets of US subsidiary. In the above example as Indian rupee appreciated against USD, the net asset value in terms of Indian rupee has come down resulting in an exchange loss.

Translation exposure is the potential for an increase or decrease in the parent company’s net worth and reported net income caused by change in exchange rates since the last translation. Prindl (1976) define accounting exposure as the possibility ‘that publicly stated value of company’s assets, equity and income may be adversely affected by the movement of currencies in which it has a dealings’.

The basic purpose of translation of financial statements of subsidiary into currency of parent company is for preparation of consolidated financial statement. It can also be used to gauge the performance of foreign subsidiaries.
3.8 Management of Currency Exposure

Several objectives need to be kept in mind while managing the currency exposure. The most common ones being: to minimize foreign exchange losses, reduce the volatility of cash flows, protect earnings fluctuations and hedge the risk. In the words of Milan (1996), currency exposure management refers to activities undertaken by a firm in order to mitigate the impact of uncertainties on the value of the firm. In other words, curbing or eliminating uncertainty caused by currency fluctuations is the basic objective of currency exposure management. Hedging is the centre piece of currency exposure management. To quote Fone and Young (2003), "a hedging is a financial transaction in which gains on one contract are used to offset losses on another transaction. Usually hedging involves two bets whose outcomes are opposite in sign." Similarly Prindl (1976) define hedging as "all action taken to change the exposed positions of a company in one currency or in multiple currencies."

Many authors use the word “Currency Exposure Management” and “Hedging” interchangeably. But, managing currency exposure is much broader term as compared to hedging. Hedging basically refers to managing the currency exposure by using derivative instruments or any sort of financial transaction where as currency exposure management includes all activities involved in managing the adverse effect of currency fluctuation including hedging.
3.8.1 Need for managing the currency exposure

Whether the firm should manage the currency exposure especially using the derivative instruments has been the subject of debate in the financial literature. **One school of thought which is against hedging base their argument on the basis of the following.**

- Change in exchange rate causes both gains and losses and in the long run gains and losses even out.
- In case if shareholders are risk averse and not interested to accept currency risk of any company, they can diversify their portfolio to reduce the currency risk.
- Managing currency exposure takes away scarce resources of the business enterprise instead of adding value to the firm.
- As per PPP theory movement in exchange rate offsets the change in the price level and hence there is no need to hedge.

**On the other hand arguments in favor of hedging are as follows.**

- Management of currency exposure not only eliminates volatility in cash flows but also increases future cash flows which may result in increase in value of firm.
- Business enterprises can manage currency risk more effectively than shareholders.
- Hedging is required because PPP theory does not work in the short run and there will be a time delay between changes in the exchange rate and changes in the price level.

According to theories of finance, the value of a firm is the NPV of all expected future cash flows. **Currency risk** creates the variance in expected cash flows resulting from unexpected movement in exchange rate. Therefore a firm that manages or hedges currency exposure reduces some of the variance in the value of its future expected cash flows.
As shown in the above chart, hedging reduces the variability of expected cash flows about the mean of the distribution. This reduction of distribution variance is a reduction of risk.

Out of three types of exposures considered above, transaction exposure is considered to be most important from the point of view of the business enterprises and it is being managed more seriously as compared to other two exposures. Many literatures suggest the same. Dufey (1972) argues that firms should not actively manage their accounting exposure as it does not result in actual cash loss. What should concern management is cash flow exposure. The transaction exposure concept concentrates on contractual commitments which involve the actual conversion of currencies. Glaum and Roth (1999) and Aabo (1999) have shown that the management of transaction exposure is the centerpiece of corporate exchange risk management. However Taylor (1995) argues that an exchange risk management approach which limits itself to transaction exposure, i.e. to those foreign currency cash flows which are contracted at any given point in time, ignores these fundamental, longer-term effects of exchange rate changes.

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Study conducted by Marshall (1999), Batten, Mellor and Wan (1993), Loderer and Pichler (2000) and Glaum’s (2000) reveals that transaction exposure is perceived by companies across the globe to be the most important exposure to manage. Studies such as Shapiro (1998), Froot, Sharfstein and Stein (1993), Loderer and Pichler (2000), Popov and Stutzmann (2003), Rodriguez (1981), and Buckley (1998) prove certain points like

- Most of the business enterprises finds its very difficult to measure the long term exposure of their business to currency fluctuations.
- Managing and quantifying economic exposure appears difficult and there is no general framework for managing economic exposure.
- Translation and economic exposures appear to be less important from their perspective.
- Translation exposure should not be managed because it is purely an accounting concept
- Translation and economic exposures are not well identified and managed mainly because firms believe it is unnecessary or too complex.

3.8.2 Techniques of Managing currency Exposure

Currency exposure can be managed by using Internal or external techniques or a combination of both. The former include all those techniques where business enterprise undertake some operational changes and such changes do not require assistance of an external party such as banks of financial institutions. On the other hand external techniques of managing currency exposure necessarily involves assistance of an external party in the form of banks or financial institutions. Netting the exposure, leading or lagging the payment or receipts, changing the currency of invoicing are some of the examples of internal techniques where as buying or selling of derivative products such as futures, forwards, options with the assistance of a bank or financial institution are some of the examples of external techniques. When choosing between different types of hedging the business enterprise must compare costs, taxes, effects on
accounting conventions (important for translation) and regulation (which may limit some transactions). Before using the external techniques, business enterprises should consider which internal hedging method is open to it and at what cost.

3.8.2. A Techniques of Managing Transaction Exposure

It was empirically proved that transaction exposure is perceived by business enterprises across the globe to be the most important exposure to manage. Accordingly it is managed by using both internal and external techniques.

Internal techniques of managing transaction exposure:

Internal techniques of managing transaction exposure calls for making some changes in business operations or entering into some form of agreement with business partner to offset adverse effect of exchange rate fluctuations. Some of the internal techniques of managing transaction exposure are as follows.

I. Exposure Netting (Natural Hedge)

Netting is probably one of the most widely used methods. It is also known as a natural hedge. It involves offsetting exposure arising out of receivables with exposure arising out of payables. A business enterprise having imports and exports in USD need not have to cover each exposure separately but hedge only net exposure. If the timings of receivables and payables do not match, firm can lead or lag to achieve the match. Using this technique requires the firm to have a centralized organization of its cash management. Centralization means that the company collects foreign currency cash flows between subsidiaries and groups them together so an inflow offsets an outflow in the same currency. Two types of netting exist: bilateral, where two currencies are involved and multilateral, which involves more than two currencies. In many instances natural hedge arises automatically in international trade and in some instances firms may deliberately create natural hedge to manage currency exposure.
II. Leading and lagging

In this technique exposure is managed by shifting the time of exposure by accelerating or delaying the receivables or payables. This is done to adjust inter-company positions. It means that payments in currencies that are expected to strengthen or collection of receivables denominated in currencies expected to weaken are accelerated. If the expectation is reversed the alternative will occur. This technique may reduce the exposure in one party to the trade but increases the exposure to another party.

However, the firm should not only take into account the gain or loss from the currency but also the cost from increasing/decreasing the liquidity. This tool is used for hedging transaction exposure since it allows for liquidity and risk management at the same time. But Bishop & Dixon (1992) are of the opinion that “leading and lagging ignore a basic principle in cash management which is to collect receivables as quickly as possible and to delay payment of payables as long as possible after due consideration of discounts and interest penalties.”

III. Domestic Currency Invoicing

A firm having better bargaining power could transfer exposure fully to the counter-party by invoicing in one’s own currency (domestic reporting currency). This technique can also be called risk shifting hedge. Companies may need to pay a hidden cost if they would like to transfer the exposure, in the form of higher cost for imports or lower price for exports. Same opinion is upheld by Verrier (1985) who opines that ‘invoicing in own currency is conservative attitude towards risk, however, gives rise to hidden costs, because of the fact that counter-party often add a premium to compensate for the exchange risk they are taking on’.

IV. Split currency invoicing

As an improvement over the last technique, split currency invoicing may be adopted. Here, the total value of the trade is split into two portions and invoiced in the currency of both the parties. For example, an Indian exporter may invoice
50 percent of the exports in Indian rupee and the balance in USD; thereby both the parties will have the same amount of exposure to manage. Some companies in US and Europe are following this technique.

V. Price adjustments

Price adjustments can be made by increasing the prices of exports if the local currency is expected to appreciate against the currency of invoicing. In case of imports price adjustment can be made by asking the suppliers to reduce the price if the local currency is depreciating. But prices cannot be raised without considering competitors because if the price increases too much, the customer will choose an equivalent and cheaper product from a competitor. As an improvement over price adjustment, parties to the international trade can have a risk sharing agreement.

VI. Risk sharing agreement

Both the parties to the bilateral trade may enter into a risk sharing agreement where an exchange loss of one party beyond a particular point is to be compensated by the other party. This kind of risk sharing agreement is possible only when there is regular trade between the parties and firms are interested in long term relationships based on product quality and supplier reliability. Risk sharing agreements are more useful in managing long term operating exposure, but in some cases it can be used to manage transaction exposure also.

External techniques of managing transaction exposure:

External techniques of managing transaction exposure mainly consist of using foreign exchange derivative contracts such as forwards, futures, options or swaps. Some of these instruments such as currency Forwards and currency Futures fix the exchange rate; the firm can mitigate the risk if the currency moves in an unfavourable way, but cannot benefit from favourable movement of currency. But instrument such as currency options protect the company from an
unfavourable movement of the exchange rate and at the same time confer the possibility of benefiting from a favourable movement of exchange rates. In the following paragraphs, brief description of these instruments is given.

I. Currency Forward contract

A currency forward contract represents an obligation to buy or sell a pre-determined quantity of one currency for another at a specified price on a specified future date. Many empirical studies such as one by Jesswein, Kwok and Floks (1995) prove that this derivative instrument is a widely used tool for managing transaction exposure.

For example, an Indian exporter has exported software to a U.S. company for which it is to receive $1 million 90-days from now. The exporter can mitigate his transaction exposure by entering into a forward contract with a banker to sell $1 million at the 90-day forward rate of say INR 44.00 per dollar. In this way, the company is assured of converting its receivable of $1 million into INR 44 million no matter what happens to the spot exchange rate. Similarly an importer can eliminate his currency exposure by entering into a forward contract with a bank to buy foreign currency at the forward rates. Foreign exchange forward contracts are usually traded with banks or other financial institutions in the over-the-counter market. Forward contracts are available in most major currencies but not in less traded or very volatile currencies. Hedging against exchange rate movements with forwards is not possible in all countries especially in those that have no advanced money markets.

By covering in the forward exchange market, a firm is indifferent to the movements of exchange rates. It avoids the risk of losing as a result of unfavourable movements in the exchange rate but at the same time it gives up the chance of gaining in the case of a favourable movement.
II. Currency Futures Contract

In principle, hedging with currency futures is similar to forward contract hedging. Like forward contracts, futures contracts also represent a commitment to exchange a specific quantity of one currency for another, at a specified price and on a specified future date. However, while forward contracts are one-to-one contracts customized to meet the unique hedging needs of each client, futures are standardized contracts that are traded on organized futures exchanges.

A major disadvantage of futures contracts is that they are available in only a limited number of currencies, transaction amounts (contract sizes) and expiration dates are standardized unlike in case of forward contract. As a result, hedging through futures rarely matches the unique needs of each hedger. Futures hedges are mostly imperfect. Also, the marked-to-market margin system can create liquidity problems particularly for the smaller companies. In spite of these limitations, futures have become a major instrument of hedging in several countries with developed currency markets. They reduce transaction costs as well as default risk. They might be more cost-effective for hedging smaller size transactions. Bank commission on small-size forward contracts may at times work out relatively high and therefore, smaller users of foreign exchange market may prefer hedging through futures contracts if they are available.

III. Currency Options

Like futures, Options contract can also be used for hedging transaction exposure. The currency Option holder has the right, but not the obligation, to buy (or sell) a specific quantity of a currency at a specified exchange rate on or before a specified date. In option contracts, the seller of the option writes the option in favour of the buyer (holder) who pays a certain premium to the seller as a price for the option. There are two types of currency options: a ‘call’ option gives the holder a right to buy a currency at an agreed exchange rate, while a ‘put’ option gives the holder a right to sell a currency at an agreed exchange rate on or
before a specified date. The option holder will exercise the option only if it is beneficial to him; otherwise he will let the option lapse.

For example, suppose an Indian importer buys a call option for $10,000 at Rupees 44.00 per dollar and pays a ‘premium’ of rupee 0.5 per dollar (or a total of rupees 5,000). If the exchange rate increases to rupees 46.00 before expiry, the option holder will exercise his option and buy the dollars at rupees 44.00 per dollar, his total cost being rupees 440,000 plus the premium paid rupees 5,000 or a total of rupees 445,000. However, if the rupee appreciates to say, rupees 42.00 per dollar, it would be cheaper for the importer to buy dollars directly from the open market at the spot rate, rather than exercise his option and buy at rupees 44.00 per dollar. Currency Options have the distinct advantage of hedging against the risk of adverse movements in exchange rates while allowing the holder to benefit from favourable changes in the exchange rates.

Currency options become attractive when the exchange rates can move in either direction and the firm wants to avoid the downside risk but wants to keep the gains if the exchange rates move favourably. Options can be traded both on an organized exchange trade and the over-the-counter market with banks.

IV. Money Market Hedge

Where forward or futures contracts are either unavailable or too expensive business enterprises can participate in money market to manage transaction exposure. Business enterprises can hedge by resorting to short-term borrowing or lending and then exchanging the currencies at spot rates. Suppose an Indian exporter expects to receive $50,000 from a US customer in two months' time. To avoid the uncertainty of exchange rates, he can borrow an equivalent amount of funds from a US bank and convert the same into INR at the prevailing spot rate. The bank loan would be repaid when the US customer pays after two months.
3.8.2. Techniques of Managing Operating Exposure

Economic exposure certainly be more significant than either transaction or translation exposure for the long term well-being of the business enterprise. In spite of this, most of the business enterprises are not considering operating exposure seriously. Studies by Shapiro (1998), Froot, Sharfstein and Stein (1993), Loderer and Pichler (2000), Popov and Stutzmann (2003), Rodriguez (1981), and Buckley (1998) proves that most of the business enterprises finds its very difficult to measure the long term exposure of their business to currency fluctuations and quantifying and managing economic exposure appears difficult and there is no general framework for managing economic exposure. Some of the techniques that can be used to manage operating exposure are as follows.

Out of different techniques discusses below, debt financing, back to back loans, swaps can be categorised as external techniques as they require assistance of an external agency in the form of a bank, whereas long term structural changes can be put under the category of internal technique of currency exposure management.

I. Matching currency cash flows by debt financing

One easier way of managing the long term continued exposure to any one currency is to borrow in that currency. As shown in the exhibit 3, continued export to USA results in long term exposure to Indian exporter provided such export is invoiced in USD. If his export is a result of long term contract he can offsets his continuous exposure to USD by borrowing part of his debt from US market in terms of USD. The continuous inflow of USD resulting from exports can be used to pay interest and principal of the debt. This result in matching of USD inflow with USD outflow and thus eliminates currency exposure to Indian firm.
But the successful implementation of this technique depends on various factors like ability of the firm to borrow from foreign country and in other currency, interest rate differential, government regulations etc.

II. Back to Back loans

This technique is also called as parallel loan or credit swap loan. This technique helps the MNC’s to manage exposure arising out of lending and repayment of loan to its subsidiaries. For example, an Indian MNC need to lend a given amount of loan to its subsidiary in UK and an UK MNC need to lend same amount of loan with same maturity to its subsidiary in India. Lending to subsidiaries creates exposure to both MNC’s. To manage this exposure as shown in the chart 3.4, Indian MNC lends a given amount to UK subsidiary in India in terms of INR where as UK MNC lend same amount of loan in terms of GBP to subsidiary of Indian MNC in UK. At the expiry of the given period the amount will be repaid to the respective lenders. This eliminates exposure to Indian and UK firm resulting out of lending to their respective subsidiaries and repayment of loan by subsidiaries.

As a part of this technique, lending and repayment happens within the country but serves the purpose of overseas loan. These loans are not exposed to currency fluctuations as loans do not move out of the country. This technique can be used by only MNCs having foreign subsidiary. If the loan is on shorter
duration it helps to cover transaction exposure and if it is of longer duration MNC’s can use it to cover their operating exposure.

**Chart 3.4. Back-to-Back Loan in Currency exposure management**

In reality it is very difficult for business enterprises to find the counter party and there may be a possibility that the borrower may default or delay the payment which results in counter party risk.

**III. Long term structural changes**

Long term restructuring is a more complex task than hedging the exposure using derivatives. However, once the restructuring is completed, the benefit will be there for a long-time. Bradley (1996) is of the opinion that "long term structural changes are an attractive alternative to financial derivatives for the management of foreign exchange risk. Plant location, input sourcing policies and diversification of markets are examples of strategic risk management techniques which may be used to protect the firm from adverse effects of exchange rate movements." In the words of Shapiro (2003) structural changes that can be used to manage the long term exposure of business enterprise to currency risk are as follows.

<table>
<thead>
<tr>
<th>Marketing Strategies</th>
<th>Production Management Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Selection</td>
<td>Input sourcing</td>
</tr>
<tr>
<td>Pricing Strategy</td>
<td>Plant Management</td>
</tr>
<tr>
<td>Product strategy</td>
<td>Raising Productivity</td>
</tr>
</tbody>
</table>
Marketing Strategies:

Marketing strategies of managing long term exposure generally include Changing the market to sell, Changing the market to source the raw material, changing the product strategy etc.

- **Market Selection:** By changing the market to sell or market to source its inputs a business enterprise can mitigate the long term exposure to currency risk. Consider an example of Indian exporter exporting to US market. If Indian rupee appreciates continuously against USD Indian exports would turn uncompetitive. In such case Indian exporter can pull out of US market and can think of exporting to any market where he need not have to invoice his exports in terms of USD or try to lookout for a market where price elasticity of demand is more. Same way an importer can change the market to source his inputs if domestic currency is continuously depreciating.

- **Pricing Strategy:** Pricing strategy calls for increasing or decreasing the price of the product based upon the changes in the exchange rate. Consider an example of Indian exporter exporting to US market. If Indian rupee appreciates continuously against USD, to preserve profit margins in rupee terms exporter need to increase his prices. Similarly if rupee depreciates he can reduce the prices keeping in mind market expansion. While taking any decision on pricing the business enterprises need to take into consideration the competition in the international market.

- **Product strategy:** An exporter can respond to appreciation of local currency by his product strategy. Product strategy may be in the form of product innovation and product modification. These changes will result in higher sales and in turn fill the profit gap created out of local currency appreciation.
**Production Management Strategies:** Production management strategies of managing long term exposure generally includes changing the input sourcing, changing the product, changing the location of foreign production factories and most importantly Improving the productivity.

- **Input sourcing:** If the domestic currency appreciates it is advisable for the exporter to source its inputs from a country to which it export its final products. On the other hand if the currency of the country supplying inputs appreciates firm can source inputs from some other source of supply. Business enterprises can also think of mixing the local inputs if it is not able to source cheaper inputs from foreign sources. While taking any inputs related decisions quality should not be compromised.

- **Plant Management:** A multinational company having production plants worldwide can allocate production among different plants in such a way that exchange risk is minimized. Suppose an Indian MNC is exporting products to USA and there is a continuous appreciation of INR against USD. Now Indian MNC can shift production from Indian plant to plant in a country whose currency has depreciated or at least stable.

- A business enterprise without foreign production plants may need to set up new plants abroad to protect them from continuous appreciation of local currency against the currency which is used to invoice its exports. The classic example of this strategy is Japanese companies exporting products to USA in 1970’s and late 1980’s. Many Japanese companies in response to a stronger yen shifted their production to developing countries like South Korea, Taiwan, Singapore and even to USA.

- **Raising Productivity:** The most ideal way of coping up with long term exchange exposure is improving the productivity. Productivity can be improved by closing inefficient plants, automating, outsourcing, right sizing the employee strength etc. with the increasing in the productivity cost of production comes down resulting in better margins which in turn helps the business to cope up with exchange rate losses.
The idea of the above structural changes is to change the relationship between cash inflows and outflows. Restructuring is a very attractive technique to manage economic exposure. However, a main disadvantage is that this tool is quite difficult to apply and cannot be reversed immediately. Empirical research proves that there was a limited usage of long term structural changes to manage operating exposure. While making long term structural changes business enterprises need to consider many factors and exchange rate is one among them. Just because of exchange rate changes strategic decisions cannot be taken.

IV. Swaps

In a swaps, business enterprises exchange given amount of a currency for another and, after a given period, give back the original amount exchanged. In a currency swap, a business enterprise and a Swap dealer or Swap banker agrees to exchange an equal amount of two different currencies for a specified period of time. A typical currency Swap requires participating business enterprises to borrow in their local market and in local currency. For example an Indian business enterprises having debt denominated in Indian rupee and exporting to USA and earning USD can participate in a cross-currency swap. Indian firm swap its INR denominated debt service payments with another firm that has USD denominated debt service payment. This results in Indian firm paying USD and Receiving Indian rupee. Indian firm can periodically settle interest on USD denominated debt by export proceeds which it earns. Simultaneously, a US firm enter into cross-currency swap in opposite direction by Paying INR and receiving USD. The swap dealer takes the role of a middleman. The above example can be easily explained in the form of a Chart.
Swaps are currently very popular and provide a long-term flexible hedge with low transaction costs. Moreover, they are off-balance sheet instruments and do not show up on the financial statements of a company.

### 3.8.2.C Techniques of Managing Translation Exposure

The following are some of the techniques that can be used to manage the translation exposure.

#### I. Asset/liability management

Asset liability management (ALM) which is also called as funds adjustment has the same rationale as leading/lagging. This method calls for increasing the assets and reducing the liabilities in the currency likely to appreciate and for currencies likely to depreciate do the reverse. To illustrate, suppose USD is expected to appreciate against INR, firm will then increase its assets in USD by increasing investment and reduce its liabilities in USD by reducing the short-term debt. The long-term assets/liabilities are more difficult to change.

#### II. Balance Sheet Hedge

Balance hedge as a technique of managing translation exposure tries to eliminate the mismatch between exposed assets and exposed liabilities of a MNC. This mismatch is the root cause of translation exposure. A balance sheet hedge requires maintaining on a firm's consolidated balance sheet an equal

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amount of exposed foreign currency assets and liabilities. By maintaining equal amount of exposed assets and liabilities net translation exposure will be zero. Any change in rate of exchange will change the value of exposed assets in an equal amount but in a direction opposite to the change in value of exposed liabilities. Borrowing cost of MNCs determines the cost of a balance sheet hedge. Balance sheet hedge is beneficial only if foreign currency borrowing cost is cheaper than borrowing cost in parent currency after adjusting risk arising out of translation exposure.

To conclude the discussion on techniques of managing currency exposure, Usage of different technique/s varies directly and proportionately with the complexity and international penetration of the business enterprise. Concurrently with the analysis of external techniques the business enterprise should examine the wide range of internal techniques available to it. Banking policy, exchange control regulations, developments in the financial markets may constrain or prohibit the usage of various external techniques of managing currency exposure. Not all methods will always be available to any business enterprise, nor will all be equally advantageous. A business enterprise which is into just export / imports has limited techniques available at its disposal to manage currency exposure, while a much fuller range of techniques are open to the multinationals enterprises. Most business enterprises do not use only one technique but rather use combination of different techniques after determining which technique is the most suitable for a particular case. Some of above discussed techniques of managing currency exposure may be used to manage only one type of exposure (Transaction, economic or translation exposure) where as some techniques can be used to manage more than one type of exposure. As already discussed using these techniques vary from one business enterprises to another based on nature of their overseas operation, severity of exposure, volume of international operations etc.
3.8.3 Policy framework for currency exposure management

The appropriate strategy for dealing with the foreign exchange risk is derived from the overall corporate objectives of the company. For most of the business enterprises, the primary objective will be the maximisation of earnings expressed in terms of domestic reporting currency. The approach of a business enterprise to the management of currency exposure is eventually based on the costs and benefits of alternative strategies. Some enterprises may adopt a comprehensive system of risk management, particularly where management has a defensive attitude to risk or where the extent of exposure is large. On the other hand if exposure is small the costs of a comprehensive risk management strategy may outweigh the benefits. In some cases business enterprise may chooses to adopt a speculative approach to exchange rate movements.

3.9 Currency Exposure Management / Hedging Strategies

Exposure management strategies vary from organization to organization. Adoption of different strategies by business enterprises depends upon various factors. These factors relate to the nature and type of the exposures faced and the resources available for managing them. As these factors vary from one business enterprises to another, hedging strategies should be developed to meet the particular requirements of the individual business enterprise.

Exposure management strategy of any business enterprise is based on its attitude to risk. The exposure management policy document of business enterprise should clearly set out the attitude to currency risk and how it is to be managed. If a business enterprise is risk averse it must hedge all its exposure. In less risk adverse organizations, the policies may allow the treasury greater freedom to determine the strategy and decide which instrument is the most appropriate for a particular exposure. Overall, exposure management strategies/hedging strategies tend to fall into the following three broad categories:
**Hedge everything:** This is part of a typically risk-averse treasury which acts as a cost centre. By hedging everything, the enterprise foregoes the possible gain arising out of favourable movement when exposure is un-hedged.

**Hedge selectively:** Here only those exposures are hedged whose perceived risk of loss exceeds the opportunity for gain.

**Hedge Nothing:** This is part of a typically pro risk treasury which acts as a profit centre. By this policy, enterprises are accepting a very high degree of risk in the process of gaining from currency movements. Most of the enterprises adopting this type of policy believe that in the long run gains and losses from currency movement will offset each other.

3.9.1 **Factors determining the adoption of hedging strategy.**

Different strategies to manage currency exposure are adopted depending upon the following factors.

**I. The type of exposure**

The needs to hedge a particular type of exposures differ from organization to organization. A transaction exposure may be seen more seriously and managed, but same seriousness may not be shown for other two types of exposure.

**II. The size of the Exposure**

A large net exposure in a currency or array of currencies often considered necessary to hedge than a small exposure. Where an organization has exposure in a range of currencies but significant exposures in only a few of them, it is likely to concentrate on hedging the main positions and leave the rest un-hedged.

**III. The maturity period of the exposure**

More serious hedging is done where maturity of such receivable/payable is nearer than more distant maturity period exposure. This is partly because there is greater uncertainty about the accuracy of exposure forecasts in more distant
periods, partly because there is greater uncertainty about exchange rate movements and partly because the cost of such hedging will be high.

IV. Stability of the currencies

If the current and expected exchange rate of domestic currency vis-à-vis foreign currency is very stable the business enterprise can afford not to hedge the same exposure. If exchange rate is expected to be volatile, need for managing such exposure is more.

V. The ability to forecast exposure

If the business enterprise can forecast the exposure then there is a possibility that such exposure can be hedged. On the other hand if an organization cannot forecast exposures, due to lack of resources or uncertain nature of its overseas activities, then the business enterprise is handicapped in its ability to hedge currency exposure.

VI. Access to hedging instruments

The facilities with bank and financial institutions are required for using derivative instruments for managing currency exposure. In considering whether to grant such facilities to a business enterprise, a bank is concerned with financial stability, creditworthiness of business enterprise and potential size of the foreign exchange business that its customer can offer. A particular bank may decline to offer facilities or offer only a basic spot and forward facility if it has concerns about creditworthiness of the business or the volume of business offered is small. If an business enterprise does not have access to a wide range of foreign exchange instruments, its hedging strategies gets handicapped.

VII. The treasury management expertise of the business enterprise

Usage of derivative instruments for hedging currency exposure requires expertise not only in understanding their use but also in monitoring, reporting and accounting for them. Many small business enterprises may not have treasury
management skills to use sophisticated hedging instruments and techniques. In such cases a fairly basic approach of hedging is likely to be adopted and hedging strategies are unlikely to involve the use of options or other derivative instruments.

VIII. **The attitude of shareholders to currency risk**

The views of their major shareholders are taken into account with regard to managing currency exposure. Risk averse set of shareholders may expect the business enterprise to hedge their currency exposures.

**3.10 Conclusion**

At one end, one might find a business enterprise that uses only forward foreign exchange contract to manage relatively small currency exposures of smaller duration. At the other extreme, a large MNC may be using a combination of sophisticated derivative instruments to manage significant exposures over a time frame of several years. In between these ends, there are organizations that use a range of instruments to follow a variety of hedging strategies.

Whatever approach is adopted, it is absolutely necessary that the basic philosophy, policies, objectives and organization structure of the enterprise concerning the management of foreign currency exposure and risk are set at the highest level, formally recorded and communicated, as well as regularly reviewed and modified.