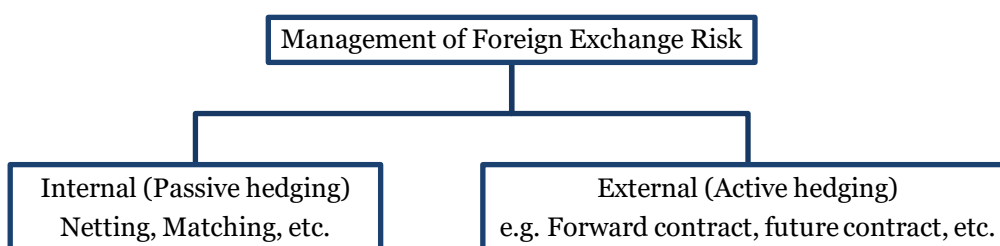


## Unit 2 : Instruments and Techniques of Risk Management

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### Introduction to Hedging Techniques :

Foreign exchange risk is managed through two means (a) internal i.e. use of tools which are internal to the firm such as netting, matching, etc. and (b) external techniques i.e. use of contractual means such as forward contracts, future, option, etc. to insure against potential exchange losses. The usage of internal techniques is also known as passive hedging, while the latter is known as active hedging. Usage of internal tools among the group companies may at times be difficult to practice owing to local exchange control regulations. Nevertheless, they are worth implementing for they do not involve extra payouts while being significantly effective in minimizing the forex exposure.



It is essential to understand the difference between forex exposure and forex risk. Foreign exchange exposure is the sensitivity to changes in the real domestic currency value of assets, liabilities or operating incomes to unanticipated change in exchange rates. Foreign exchange risk exposure is quite often used interchangeably with the term 'foreign exchange risk', although they are conceptually quite different. Foreign exchange risk is defined in terms of variance of unanticipated changes in exchange rates. It is measured by the variance of the domestic currency value of an asset, liability or operating income that is attributable to unanticipated changes in exchange rates.

### Difference between forex exposure and forex risk

No.	Basis	Forex Risk	Forex Exposure
1.	Meaning	Foreign exchange risk is the change of value in one currency relative to another which will reduce the value of investments denominated in a foreign currency.	Foreign exchange exposure is the degree to which a company is affected by changes in exchange rates.
2.	Control	Foreign exchange risks can usually be mitigated through the use of hedging techniques and using a less volatile currency to report results.	Foreign exchange exposure is difficult to manage.

3.	Types	Transaction, translation and economic risk are types of foreign exchange risks.	Risk exposure due to imports and exports are main types of foreign exchange exposure.
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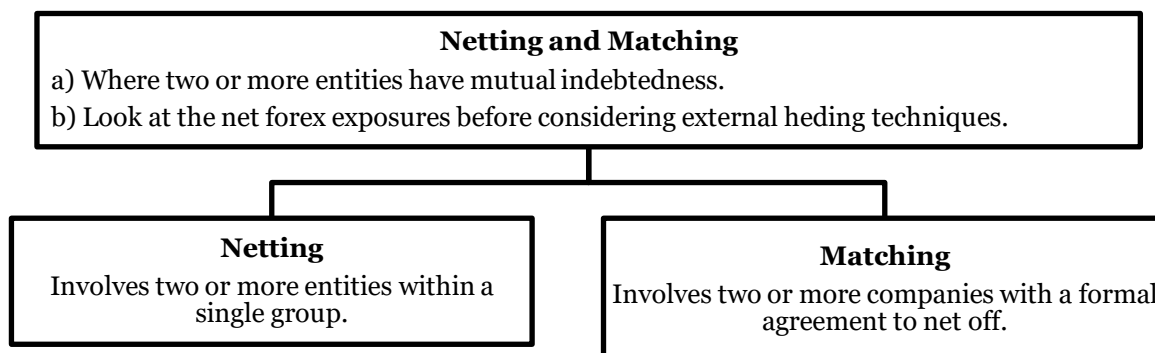
**Internal Hedging Techniques :**

Companies having subsidiaries in different countries or the parent company having subsidiaries across the globe can effectively practice internal techniques to minimize foreign exchange exposure and the eventual need for its active hedging. The important tolls of internal hedging techniques are –

**a) Netting :**

It is possible to net the payments and receipts among the associated companies which trade with one another. It involves mere settlement of inter-affiliate indebtedness for the net amount owing. One of the simplest ways of netting is bilateral netting. It involves pairs of companies. It basically reduces the number of inter-company payments and receipts that pass over the foreign exchanges.

However, it poses a problem, which currency is to be used for settlement? Multilateral netting is a little complex phenomenon though similar to bilateral netting. It involves more than two associated companies and their debt. Hence it calls for the services of a group’s centralized treasury. Multilateral netting results in considerable savings, since it eliminates exchange and transfer costs. Besides reducing costs, it enables the central office to exercise control over inter-company settlements.



**b) Matching :**

Netting or matching are frequently used interchangeably. But there is a slight difference i.e. netting refers to potential flows within the group companies, while matching extends from group companies to third party companies too. It basically matches a company’s foreign currency inflows with its foreign currency outflows in respect of both time and amount of flow. Receipts in a particular currency are used to make payments in that currency alone, and thereby eliminate the need to go through exchange markets for such conversions.

However, to practice this technique, there must be a two-way cash flow in the same foreign currency within the group companies. For all practical purposes matching is parallel to multilateral netting and hence calls for centralized group finance function. It is of course likely to pose problems, uncertain timings of third party receipts and payments can delay payments but the central treasury shall endeavor to streamline the collection of information and processing thereof.

**c) Leading and lagging:**

Leading means paying an obligation in advance of the due date and lagging means delaying payment of an obligation beyond its due date. It basically refers to credit terms and payment between associate companies within a group. In forex market where exchange rates are constantly fluctuating, the leading and lagging tactics come handy to take advantage of expected rise / fall in exchange rates.

For instance, Company 'A' is a subsidiary of company 'B' located in India, owes money to subsidiary 'C' in Canada. The bill is invoiced in US dollars and due for payment in three months time. Assume that rupee is likely to devalue in three months time by around 20%. In such a situation, it makes great sense to lead the payment to Canadian company in dollars, so that it needs to part with less units of rupees today than after three months. Thus, leading becomes pretty tempting and the converse holds good for lagging. However, it is quite essential for companies to factor the impact of relative interest rates, expected currency movements, and after tax effects into leading and laggings decisions.

While practicing leading and lagging the management must realize that the performance measurement of those subsidiaries which were asked to 'lead' payments may suffer as they incur losses on interest receivable and incurs interest charges on the funds 'led'. At times, lead and lag techniques may also be constrained by local exchange control regulations. Practicing of leading and lagging techniques indeed goes beyond the realm of risk minimization. It amounts to taking aggressive stances on financing viz-a-viz anticipated movements in exchange rates. For instance, an expected devaluation of host country's currency may make an international company borrow locally and repay the foreign currency denominated borrowings.

**d) Price Variation :**

It involves increasing selling prices to counter exchange rate fluctuations. But the question is whether a firm can raise its price in tandem with anticipated exchange rate movements. This is only possible when the selling company is a market leader. In some South American countries, price increase is the only legally tenable tactic of foreign exchange exposure management.

Inter company trade transfer price variations can also be effected as a foreign exposure risk management tool. There is of course a danger here, unless the firm maintains arm's length price, taxation and customs authorities may question such variations in transfer prices. Nevertheless, it is common knowledge that multinationals attempt to maximize after tax group cash flows by transfer pricing with the objective of minimizing tax liability and moving funds around the world.

**e) Invoicing in foreign currency :**

Exporters and importers of goods always face a dilemma in deciding the currency in which the goods are to be involved. It is obvious that sellers always prefer to invoice in their domestic currency or the currency in which they incur cost, so that it avoids foreign exchange exposure. On the other hand, buyers will have their own preferences for a particular currency. In the buyer's market, a seller hardly has any choice to invoice in his desired currency. At least, in such situations, one should choose only the major currency in which forward markets are pretty active. Currencies that are of limited convertibility and with a weak forward market must be shunned.

**f) Asset Liability Management :**

It is used to manage balance sheet, income statement or cash flow exposures by aggressively shifting cash inflows into currencies expected to be strong or increase exposed cash outflows denominated in weak currencies. Alternatively, a firm may practice defensive approach, matching of cash inflows and outflows according to currency denomination, irrespective of whether they are in strong or weak currencies.

As a part of aggressive financing policy, companies may prefer to increase their exposure under cash flows, debts and receivables in strong currencies and increase borrowings and trade creditors in weak currencies. Simultaneously, they reduce exposed borrowing and trade creditors in strong currencies.

**External Hedging Techniques :**

External techniques which are also known as **active hedging techniques**, essentially involve contractual relationship with outside agency. Hedging is a method whereby one can reduce the financial exposure faced in an underlying asset due to volatility in prices by taking an opposite position in the derivatives market in order to offset the losses in the cash market by a corresponding gain in the derivatives market. Constructing a hedge essentially involves –

- a) Identification of the exposure one is facing
- b) Measurement of that exposure , and
- c) Construction of another position with the opposite exposure.

Construction of an exact opposite position to the existing risk exposure results in a perfect hedge. Such opposing position, which they come together, automatically offset each other. But, there is always a problem, how to strike a balance between uncertainty and the risk of opportunity loss.

The problem of setting an effective hedge ratio has two dimensions –

**a) Uncertainty :** If a firm does not hedge the transaction, it cannot know with certainty at what rate of exchange it can exchange its dollar export proceeds for rupees, it could be at a better rate or a worse rate.

**b) Opportunity :** If firms enter into a hedge transaction such as a forward contract they would, of course, be certain of the rate at which they would be exchanging the export proceeds. But now they have taken an infinite risk of ‘opportunity loss’.

During 1984, Lufthansa, a German airline, signed a contract to buy \$3 billion – worth of aircraft from an American Company – Boeing. At that time, dollar was strong and market held an opinion that it was sure to get even stronger. In that context the CFO of Lufthansa hedged the company’s exposure to dollar by buying a forward contract for \$1.5 billion. The central ideal behind this hedging is, if the dollar strengthens, it would lose on its aircraft contract but gain on the forward contract. There is another interesting dimension to this hedge. Lufthansa’s cash flow was also in effect dollar denominated and thus had a fair level of ‘natural hedge’. In this episode, dollar weakened by around 30% during 1985 and thus the forward contract inflicted heavy losses on the company. The moral is, deciding to hedge is one thing, and getting it right in quite another.

There is yet another dimension to hedging, hedging has a cost. If a depreciation / devaluation of it is unlikely, hedging will prove an ineffective way of doing business. All these

complexities associated with hedging through derivatives pose a great challenge to arrive at a right hedge ratio.

The true purpose of hedging is to reduce the volatility of earnings and cash flows by setting pre-defined limits on any losses. The first step under hedging through derivatives is to estimate the size of the short position that must be held in the derivatives market – say, future market, as a proportion of the long position held in the spot market that maximizes the firm's expected utility, defined over the risk and expected return of the hedge portfolio. This is the problem of estimating the Optimal Hedge Ratio. OHR is the hedge ratio that equates the agent's marginal rate of substitution between the expected return and the standard deviation of the hedged portfolio with the slope of this feasible set.

**a) Hedging through forward contract :**

Forward contracts obligate one party to buy the underlying at a fixed price at a certain time in the future from a counter party who is obligated to sell the underlying at that fixed price. These are one of the oldest and commonest hedging tools of the forex market. Consider an Indian exporter who expects to receive US \$1 million in six months. Suppose that the price of the dollar is Rs. 74.60 now. If the price of the dollar falls by 10%, the exporter loses Rs. 74 lakhs. But by selling dollars forward the exporter locks in the current forward rate of Rs. 74.65 which means even after dollar depreciating by 10% in the next 6 months, the exporter would still get Rs. 74.65 per dollar. Thus, the exporter has fully hedged himself i.e. he took a financial position to reduce his exposure to exchange rates.

**b) Hedging through future contract :**

Futures contract is an agreement to buy and sell a standard quantity of specific financial instrument at a future date and at a price agreed between the parties through open outcry on the floor of an organized financial futures exchange. The terms under the contract such as amount, maturity date, range of price movement are all standardized. A buyer of the futures contract has the right and obligation under the contract. Under a futures contract, there will always be a buyer and seller, whose obligation is not to each other but to a clearing house. After a transaction is eliminated, financial futures provide a means of hedging for those who wish to lock in exchange rates on future transactions.

Hedging through futures contract is almost akin to hedging with forward contract. An exporter having a receivable can hedge by selling futures while a payable is hedged by buying a futures contract. However, as the amounts and delivery dates for futures are standardized, a perfect hedge through futures is not possible. There is another difference between hedging through futures and forward contract, there are intermediate cash flows under futures contract owing to 'mark-to-market' mechanism. Such cash flows could be positive or negative.

**c) Hedging through options :**

Options provide hedging characteristics different from forward or futures contracts. Option contract allows the buyer to participate in the good side of the risk, while insuring against the bad side of the risk. An option has a right but no obligation to perform. Thus, an importer who purchased a call option will have a right to buy the underlying i.e. dollar at the agreed price, even if the current spot price is par above the price under option. On the other hand, if the spot price is

much less than the price under option, the option holder can ignore the option and acquire dollars from the spot market.

Options are more suited to hedge uncertain cash flows. For instance, assume that an Indian company is bidding for a project in a foreign country. Its forex flows will materialize only if the bid is successful. Similarly, if an Indian investor who invested in foreign stock market and assumes that due to falling dollar its portfolio value may decline. In all such cash flows that are contingent upon happening or even better be hedged through options.

**d) Hedging through swaps :**

Swap is a contract to exchange cash flows over the life of the contract. Swap is simply a portfolio of forward contracts. As in the case of forward contracts, the market's assessment of the present value of the cash flows of a swap is zero at the initiation of the contract. Swaps could involve currencies or interest rates. They help the corporate treasurer to manage his portfolio of liabilities. Swaps also help businesses to arbitrage on market imperfections and thereby raise finance at rates below market rates, otherwise available.

Whilst on hedging one should always remember that forward hedging of contractual exposures does not remove a firm's forex exposure. It merely, removes the uncertainty regarding the home currency value of that particular cash flow and nothing beyond. In other words such hedging only stabilizes the firm's cash flows or profits.

**e) Hedging through Money Market :**

In imperfect markets there is always room for covered interest arbitrage opportunities. Similarly, absence of covered interest arbitrage opportunities does not necessarily imply that forward cover and money market cover would be the same. In fact, money market hedge may sometimes prove to be a better alternative to hedge foreign exchange risk. However, this is only possible to firms, which have access to international money markets / Euro markets for short-term borrowings or investments where forward premiums and interest rates are strikingly low.

For instance, assume an Indian exporter is having a receivable in dollar due for payments three months henceforth. If the exporter had access to Euro market, he / she can borrow dollars equivalent to the receivable amount and convert them into Indian rupees at the current Re / \$ spot rate 74.49 / 48.5 and use it for domestic payments or for lending in the domestic market. Subsequently, the amount due under the export bill / receivable can be used to pay off the Euro loan. Such money market coverage can at times result in gain, particularly when the differences in interest rates / forward premiums are high.

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