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1. Learning Outcomes

After studying this module, you shall be able to

- Learn the concept of Foreign Exchange Risk and Exposure.
- Understand the relevance of exposure.
- Know the nature and different types of exposure.
- Shows how the size of the different types of exposures can be assessed.

2. Introduction

In this module, we will consider the elements that comprise foreign exchange risk/ exposure, and how they can be identified and quantified. Initially, the chapter begins with the concept of foreign exchange risk which implies the exposure of a company to the potential impact of movements in foreign exchange rates. In next subsequent discussion, chapter explains the concept of exposure, its measurement and different types of exposures. At the end of the chapter, it has been shown that how the size of the different types of exposures can be assessed.

3. Learn the Concept of Foreign Exchange Risk and Exposure

3.1 Foreign Exchange Risk

Every company that has exposure to foreign exchange risk must prudently manage & control its exposure together with management of other risks. Foreign exchange risk implies the exposure of a company to the potential impact of movements in foreign exchange rates. The risk that is caused by adverse fluctuations in exchange rates may result in a loss to the company. Foreign exchange risk arises mainly due to currency differences in a company's assets & liabilities and cash flow differences. Such risk continues till the foreign exchange position is settled. This risk arises because of foreign currency cash transactions, foreign exchange trading, investments denominated in foreign currencies and investments in foreign companies. The quantum of risk is derived out by multiplying the magnitude of exchange rate changes with the size and duration of the foreign currency exposure.

3.2 Exposure

Michael Adler and Bernard Dumas define exposure as the sensitivity of changes in the real domestic currency value of assets, liabilities or operating incomes due to unanticipated change in exchange rates. Thus as per the definition:

a. It measures the extent to which the value of something in term of domestic currency is changed due to the unanticipated change in exchange rate.
b. It takes into account inflation adjusted value.

c. It also takes a change in both stock items such as balance sheet as well as flow item such as operating incomes.
d. It exists on both domestic as well foreign assets because unanticipated change in exchange rate can affect the value of both the domestic and foreign assets and liabilities, and.
e. It concerns only for unanticipated changes rather than anticipated changes as such changes are already incorporated in the prices of assets and liabilities.

3.3 Measurement of Exposure

The value of foreign currencies denominated assets and liabilities change their values because of fluctuations in foreign currencies.
These changes are primarily unanticipated and it may cause by variations in short-term interest rates, inflation, tax, equity market return, expectation etc.

- Change in the real domestic-currency value of an item: ΔV
- Spot Exchange rate, expressed as number of rupee per US$: S
- Unanticipated change (appreciation or depreciation of rupee) in the value of the risk factor: ΔSU

Any appreciation or depreciation of rupee has its impact on the domestic currency value of the item (V). In other words, there is a functional relationship between ΔV and ΔSU. Let us estimate a regression equation, considering change in domestic value of the item as dependent variable and change in the rupee-dollar exchange rates as independent variable. The estimated equation may take the following form:
$\Delta V = \beta 0 + \beta 1\ \Delta SU$
$\beta 1$ is the slope co-efficient, indicating the sensitivity of change in the value of V to change in S.
The slope or co-efficient measures the exposure with respect to the corresponding exchange rate.
Generally companies are exposed to three types of foreign exchange risk: translation (accounting) exposure, transaction (commitment) exposure and economic (operational, competitive or cash flow) exposure. Here we briefly present each type of exposure and later we will discuss different techniques to manage these risks.

4. Understand the Relevance/Irrelevance of Exposure

4.1 Irrelevance of Exposure

This argument is based on the PPP theory which explains that the movement in exchange rate is matched by the movement in price, and therefore, any talk about exchange rate exposure is irrelevant. Suppose a country is facing a high rate of inflation, will lead to depreciation of currency in term of other currency. This will lead to high import bill on account of depreciation of currency. The picture of high inflation is exactly matched by the high import bill. This in turn would lead to constant competitive position between the importing firm and the domestic firms even after the movement in exchange rate. Therefore, this argument goes against the relevance of foreign exchange exposure.

4.2 Relevance of Exposure

This argument is based on the output of some good empirical research on the applicability of PPP in both short-run and long-run**.** As we know that PPP is not workable even in the long run, there so many factors apart from inflation rate differential, that influence the exchange rate. On the ground of this argument, the change in exchange rates would not be matched by the same proportion change in the inflation rate differential. Therefore, this argument goes in favour of the relevance of exposure in the international financial environment.

5. Know the Nature and Different Types of Exposure

5.1 Transaction Exposure

Transaction exposure occurs when a company trades, borrows or lends in a foreign currency, or sells fixed assets of its subsidiaries in a foreign country. All these operations involve time decay between the commitment of the transaction (sale of an asset, for example) and the receipt or delivery of the payment. During this time interval exchange rates will most probably change and the company is exposed to a risk that could be positive or negative.
Imagine the case of a local Indian importer and a foreign, let us say US supplier. If the importer pays in the currency of the supplier (US dollars) then it is the importer who carries the risk or he has to buy dollars in order to pay the supplier. Alternatively, if the importer pays in its own currency (Indian Rupee) then the exporter is the one who carries the risk or then it is up to him to change the Indian Rupee into dollars. Usually it is the exporter who is exposed to the exchange rate risk because usually he quotes the price in the buyer‘s currency.

5.2 Translation Exposure

Translation exposure arises from converting financial statements expressed in foreign currencies into the home currency. When a company consolidates the results of all its foreign subsidiaries, it has to present a final report to shareholders and the numbers in this document should be expressed in one currency. All foreign currency denominated assets and liabilities as well as revenues and costs have to be translated in one basic currency. Assets, liabilities, and equity on a balance sheet are expressed in historical values and the foreign exchange rate at which the currencies trade at the end of the accounting period is most probably not the same foreign exchange rate when the accounts were booked.
For example: - A US parent company has a wholly owned subsidiary in Australia. This subsidiary has exposed assets of AUD100 million and exposed liabilities of AUD50 million. The exchange rate declines from AUD 4 per US$ to AUD5 per US$. The potential foreign exchange loss on the company's exposed net assets of AUD50 million would be US$2.5 million. In this case,

Net Exposure (AUD100 million – AUD50 million)	AUD50 million
Pre devaluation rate (AUD4 = US$1) AUD50 mill.	US$12.5 million
Post devaluation rate (AUD5 = US$1) AUD50 mill.	US$10.0 million
Potential exchange loss	US$2.5 million

5.3 Economic Exposure

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. Future cash flows can be divided into cash flows resulting from contractual commitments and cash flows from anticipated future transactions. In a way, economic exposure includes transaction exposure in itself. Transaction exposure is the part of economic exposure comprising future cash flows resulting from contractual commitments and denominated in foreign currency. However, we should make a clear distinction between transaction exposure and economic exposure. Transaction exposure arises from firm contractual commitments and the amounts to be paid or received are known. With economic exposure these amounts are uncertain and based on estimates. Economic exposure can be defined as the future effect of foreign exchange changes on liquidity, operations, financial structure and profit.

Economic risk arises, for example, when a multinational firm incurs costs in one currency and generates sales in another. In this case, changes in foreign exchange rates affect the competitive position of the firm. Profits may decrease if the cost currency appreciates against the sales currency or it becomes more expensive to buy materials and cheaper to sell finished goods, for example. This will inevitably change the expected future cash flows and thus the value of the firm, which is the present value of these cash flows. Price changes are another component of a firm‘s economic exposure because they affect future cash flows. Economic exposure can arise because the competitive position of a company could be affected by a given exchange rate volatility. Different factors can affect the future cash flows of a company and hence its economic exposure: the investment policy of the company, or external factors such as a political crisis in a country that would affect the level of sales, for example. It is difficult to identify and quantify this kind of risk as it may involve movements in currencies in which the company has no physical dealings.

From a theoretical point of view, economic exposure should be the relevant exposure concept. However, it is more complex to cover economic exposure than transaction exposure.

5.4 Transaction, Translation and Economic Exposure: Comparisons

Transaction exposure and translation exposure are interrelated. A company will not be able to do away with both these exposure. If it minimizes transaction exposure, then it incurs translation exposure or vice versa.

For example, a parent may ask a subsidiary to bill all its payments to and receipts from the parent in parent’s reporting currency. This mitigates the transaction exposure to the parent as the parent’s all receipt and payments are in its reporting currency. But this increases the subsidiary’s transaction exposure as the reporting currency of the subsidiary is different than the parent’s reporting currency. By doing this, the parent may reduce its own translation exposure but all its subsidiaries would incur transaction exposure.

The major differences between operation/economic exposure and translation exposure are:-

- Translation exposure arises only when a firm has a foreign subsidiary or foreign operation. But economic exposure arises even when a company is purely domestic company.
- Economic exposure measures the impact of exchange rate on all future cash flow while translation exposure arises only when consolidated account statements are prepared. Hence economic exposure is a forward looking concept while translation exposure is backward looking i.e. past performance of the subsidiary is translated as per the parent's reporting currency.
- Economic exposure affects actual cash flow of the company while translation exposure results in translation gain or loss – mere accounting entry

6. Measurement of Different Types of Exposure

6.1 Measurement of Translation Exposure

6.1.1 THE CURRENT/NON-CURRENT METHOD

This approach uses the traditional accounting distinction between current and long term items and translates the former at the closing rate and the latter at the historical rate. Accounting exposure for a foreign subsidiary at a particular point in time is given by the net figure of assets less liabilities that are exposed to potential change should exchange rates alter. Evidently, according to the current/non-current method, the sum exposed is net current assets.

One of the implications of this method of translation is that inventory is exposed to foreign exchange risk but long-term debt is not.

The logic of such an assumption is by no means apparent. Indeed it should be clear that long-term debt is very much exposed to exchange risk. In home currency terms, the cash amount of a foreign currency- denominated loan (whether a payable or receivable loan) will change as exchange rates change. This lack of logic underpins the move away from the current/non-current method which has been witnessed over recent years.

6.1.2 THE ALL-CURRENT (CLOSING) METHOD

This method merely translates all foreign-currency-denominated items at the closing rate of exchange. Accounting exposure is given simply by net assets or shareholders' funds (sometimes called equity). This method has become increasingly popular over time and is now the major worldwide method of translating foreign subsidiaries' balance sheets.

6.1.3 THE MONETARY/NON-MONETARY METHOD

Monetary items are assets, liabilities or capital, the amounts of which are fixed by contract in terms of the number of currency units regardless of changes in the value of money. Translation via the monetary/non-monetary method involves monetary assets and monetary liabilities being translated at the closing rate while nonmonetary items are translated at their historical rate. Accounting exposure under this method is given by net monetary assets. In terms of development of accounting reporting, this method of translating foreign subsidiaries' accounts seems to have been a halfway house between the current/ non-current method and the all-current method.

6.1.4 THE TEMPORAL METHOD

The temporal method of translation uses the closing rate method for all items stated at replacement cost, realizable value, market value or expected future value, and uses the historical rate for all items stated at historic cost. The rationale for the temporal approach is that the translation rate used should preserve the accounting principles used to value assets and liabilities in the original financial statements. According to the temporal method, the translation rate for each asset or liability depends upon the measurement basis used in the foreign subsidiary's original account.

6.2 Measurement of Transaction Exposure

Transaction exposure arises because the cost or proceeds (in home currency) of settlement of a future payment or receipt denominated in a currency other than the home currency may vary because of changes in exchange rates. Clearly transaction exposure is a cash flow exposure. It may be associated with trading flows (such as foreign-currency-denominated trade debtors and trade creditors), dividend flows or capital flows (such as foreign-currency-denominated dividends or loan repayments).

6.3 Measurement of Economic Exposure

The measurement of economic exposure is difficult because it is almost impossible to measure the effects of exchange rate movement on cash flows without simultaneously considering the impact on cash flows of the underlying relatives rates of inflation associated with each currency. Therefore, it is not possible to hedge economic exposure because one cannot know a- priori, what would be the effect of exchange rate movement on future cash flows and hence future profitability.

7. Summary

- Foreign exchange risk implies the exposure of a company to the potential impact of movements in foreign exchange rates. Foreign exchange risk arises mainly due to currency differences in a company's assets & liabilities and cash flow differences.
- Exposure has been defined as the sensitivity of changes in the real domestic currency value of assets, liabilities or operating incomes due to unanticipated change in exchange rates.
- Actual exposure exists when a currency receipt or payment that will definitely take place because it results from a firm order or sale for which an invoice or other documentation has been issued.
- Exposure has been measured as a slope of regression line which sensitive due to unanticipated change in exchange rates.
- Transaction Exposure – The risk that the base-currency value of a foreign currency-denominated trading transaction will vary as a result of changes in exchange rates giving rise to an increase or decrease in reported profit.
- Translation Exposure – The risk that, when translated at the foreign exchange rates which will apply at a future balance sheet date, the domestic or base currency values of asset and liabilities on the balance sheet will alter, resulting in a reported gain or loss.
- Economic Exposure – 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. Economic risk arises, when a multinational firm incurs costs in one currency and generates sales in another currency.
- In current/non-current method, all current assets and liabilities are translated into domestic currency at current exchange rate.
- In case of current rate method, all balance-sheet and income statement items are translated at current exchange rate except equity.
- In case of monetary/non-monetary, all monetary items are translated at current exchange rate while non-monetary items are translated at historical exchange rate.
- In case of temporal method, there is only one modification over monetary/non-monetary, on the treatment, inventory is translated at current exchange rate.
- Transaction exposure arises because the cost or proceeds (in home currency) of settlement of a future payment or receipt denominated in a currency other than the home currency may vary because of changes in exchange rates.
- The measurement of economic exposure is difficult because it is almost impossible to measure the effects of exchange rate movement on cash flows without simultaneously considering the impact on cash flows of the underlying relatives rates of inflation associated with each currency.