

# **CURRENCY RISK AND EXPOSURE**

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# CURRENCY RISK AND EXPOSURE

## Introduction

Currency risk is a form of risk that originates from changes in the relative valuation of currencies. These changes can result in unpredictable gains and losses when the profits or dividends from an investment are converted from the foreign currency into U.S. dollars. Investors can reduce currency risk by using hedges and other techniques designed to offset any currency-related gains or losses.

## TYPES OF CURRENCY RISKS

- Transaction exposure
- Translation exposure
- Economic exposure

## Transaction Exposure

Transaction Exposure is the risk of gains or losses that occurs when a firm engages in commercial transactions in which the currency of the transaction is foreign to the firm; i.e., it is denominated in a foreign currency. This is the type of exchange rate risk that we have looked at the various ways of managing via futures, forward contracts, options and money market hedges.

## Financial Techniques of Managing Transaction Exposure

We will briefly go over the standard financial methods available for hedging this exposure. The main distinction between transaction exposure and operating exposure is the ease with which one can identify the size of a transaction exposure. This, combined with the fact that it has a well-defined time interval associated with it makes it extremely suitable for hedging with financial instruments. Among the more standard methods for hedging transaction exposure are:

- Forward Contracts
- Futures Contracts
- Money Market Hedge
- Options

### **i) Forward Contracts**

When a firm has an agreement to pay (receive) a fixed amount of foreign currency at some date in the future, in most currencies it can obtain a contract today that specifies a price at which it can buy (sell) the foreign currency at the specified date in the future. This essentially converts the uncertain future home currency value of this liability (asset) into a certain home currency value to be received on the specified date, independent of the change in the exchange rate over the remaining life of the contract.

### **ii) Futures Contracts**

These are equivalent to forward contracts in function, although they differ in several important features. Futures contracts are exchange traded and therefore have standardized and limited contract sizes, maturity dates, initial collateral, and several other features. Given that futures contracts are available in only certain sizes, maturities and currencies, it is generally not possible to get an exactly offsetting position to totally eliminate the exposure. The futures contracts, unlike forward contracts, are traded on an exchange and have a liquid secondary market that make them easier to unwind or close out in case the contract timing does not match the exposure timing. In addition, the exchange requires position taker to post bond (margins) based upon the value of their positions. This virtually eliminates the credit risk involved in trading in futures.

### **iii) Money Market Hedge**

Also known as a synthetic forward contract, this method utilizes the fact from covered interest parity, that the forward price must be exactly equal to the current spot exchange rate times the ratio of the two currencies' riskless returns. It can also be thought of as a form of financing for the foreign currency transaction. A firm that has an agreement to pay foreign currency at a specified date in the future can determine the present value of the foreign currency obligation at the foreign currency lending rate and convert the appropriate amount of home currency given the current spot exchange rate. This converts the obligation into a home currency payable and eliminates all exchange risk. A firm that has an agreement to receive foreign currency at a specified date in the future can determine the present value of the foreign currency receipt at the foreign currency borrowing rate and borrow this amount of foreign currency and convert it into home currency at the current spot exchange rate. Since as a pure hedging need, this transaction replicates a forward, except with an additional transaction, it will usually be dominated by a forward (or futures) for such purposes; however, if the firm needs to hedge and also needs some short term debt financing, wants to pay off some previously higher rate borrowing early, or has the home currency cash sitting around, this route may be more attractive than a forward contract.

### **iv) Options**

Foreign currency options are contracts that have an upfront fee, and give the owner the right, but not the obligation to trade domestic currency for foreign currency (or vice versa) in a specified quantity at a specified price over a specified time period. There are many different

variations on options: puts and calls, European style, American style, and future-style etc. The key difference between an option and the three hedging techniques above is that an option has a nonlinear payoff profile. They allow the removal of downside risk without cutting off the benefit from upside risk. There are different kinds of options depending on the exercise time the determination of the payoff price or the possibility of a payoff. While many different varieties exist, there are a few that corporations have found useful for the purposes of hedging transaction exposures.

## **Management of currency risk**

### **Transaction Hedging Under Uncertainty**

Uncertainty about either the timing or the existence of an exposure does not provide valid arguments against hedging.

#### ➤ Uncertainty about Transaction Date:

Many corporate treasurers loath to commit themselves to the early protection of foreign currency cash flow. Often the reason is that, although they are sure a foreign currency transaction will occur, they are unsure as of the exact date that the transaction will occur. These fears arising from a possible mismatch of maturities of transaction and hedge are unfounded. Through the mechanism of rolling or early unwinding, financial contracts leave open the possibility of adjusting the maturity at a later date, when more precise information is available. The resulting risk borne from the maturity mismatch is usually quite small relative to the total risk of leaving a transaction exposed until better information becomes available.

#### ➤ Uncertainty about Existence of Exposure:

Another form of uncertainty that arises regarding transaction exposure is in submitting bids with prices fixed in foreign currency for future contracts. If and when a bid is accepted, the firm will either pay or receive foreign currency denominated cash flows. This is a special source of exchange rate risk as it is a contingent transaction exposure. In such cases, an option is ideally suited. As mentioned above, the firm is really interested in insurance against adverse exchange rate movements between the time the bid is submitted and the time it may be accepted. Thus, an option can be used to protect the value of the foreign currency cash flows associated with the bid against adverse currency movements. The cost of the option, which can be included in the bid, protects the value of the expected cash flows from falling below a predetermined level and represents the most the firm can lose due to currency risk. Under such a situation there are four possible outcomes: the bid is either accepted or rejected and the option is either exercised or let to expire.

#### ➤ Operational Techniques for Managing Transaction Exposure:

Transaction exposures can also be managed by adopting operational strategies that have the virtue of offsetting existing foreign currency exposure. These techniques are especially

important when well-functioning forward and derivative market do not exist for the contracted foreign currencies.

**These strategies include:**

- **Risk Shifting-** The most obvious way to reduce the exposure is to not have an exposure. By invoicing all transactions in the home currency, a firm can avoid transaction exposure all together. However, this technique cannot work for every one since someone must bear transaction exposure for a foreign currency transaction. Generally, the firm that will bear the risk is the one that can do so at the lowest cost. Of course, the decision on who bears the currency risk may also impact the final price at which the contract is set.
- **Currency risk sharing** - An alternative to trying to avoid the currency risk is to have the two parties to the transaction share the risk. Since short terms transaction exposure is roughly a zero-sum game, one party's loss is the other party's gain. Thus, the contract may be written in such a way that any change in the exchange rate from an agreed upon rate for the date for the transaction will be split between the two parties.

Note that this does not eliminate the transaction exposure, it simply splits it.

- i) **Leading and Lagging** - Another operating strategy to reduce transaction gains and losses involves playing with the timing of foreign currency cash flows. When the foreign currency in which an existing nominal contract is denominated is appreciating, you would like to pay off the liabilities early and take the receivables later. The former is known as leading and the latter is known as lagging. Of course, when the foreign currency in which a nominal contract is denominated is depreciating, you would like to take the receivables early and pay off the liabilities later.
- ii) **Re invoicing Centers** - A re invoicing center is a separate corporate subsidiary that manages in one location all transaction exposure from intra company trade. The manufacturing affiliate sells the goods to the foreign distribution affiliates only by selling to the re invoicing center. The re invoicing center then sells the good to the foreign distribution affiliate. The importance of the re invoicing center is that the transactions with each affiliate are carried out in the affiliate's local currency, and the re invoicing center absorbs all the transaction exposure. Three main advantages exist to re invoicing centers: the gains associated with centralized management of transaction exposures from within company sales, the ability to set foreign currency prices in advance to assist foreign affiliates budgeting processes, and an improved ability to manage intra affiliate cash flows as all affiliates settle their intra company accounts in their local currency. Re invoicing centers are usually an offshore (third country) affiliate in order to qualify for local nonresident status and gain from the potential tax and currency market access benefits that arise with that distinction.

## **Information System for Exposure Management**

- Effective exposure management requires a well-designed management information system (MIS). Exposure above a certain minimum size must be immediately reported to the executive or department responsible for exposure management. The three types of exposure transactions, translation and operating must be clearly separated. In the case of cash flow exposures, the report must state the timing and amount of foreign currency cash flows, whether either or both are known with certainty or, if uncertain the degree of uncertainty associated with the timing or amount.
- The exposure management team must evolve a procedure of assessing the risk associated with these exposures by adopting a clearly articulated forecasting method scenario approach. The benchmark for comparing the alternative scenarios must be clearly stated. As argued above, the appropriate benchmark for short term transactions exposures is the relevant forward rate.
- If a discretionary hedging posture is to be adopted, stop loss guidelines must be clearly articulated. These can take the form of specified levels of forward rate or specified changes in the spot rate which when crossed would automatically trigger appropriate hedging actions.
- All exposed positions including their hedges if any should be monitored at frequent intervals to estimate mark-to-market value of the entire portfolio consisting of the underlying exposures and their corresponding hedges.
- When a particular exposure is extinguished, a performance assessment must be carried out by comparing the actual all in rate achieved with the benchmark. This should be done at regular intervals with the frequency of assessment being determined by the size of exposures and their time profiles. Periodic reviews must be carried out to ensure that the risk scenarios being considered are not far removed from actual developments in exchange rates due to large forecasting errors.

Effective management of operating exposures requires far more information and judgmental inputs from operating managers. Pricing and sourcing decisions must involve the exchange rate dimension and its likely impact on future operating cash flows. A strategic review of the entire business model must incorporate realistic assessment of the impact of exchange rate fluctuations on the firm's entire operations in the medium to long term.

## **Translation Exposure**

- Translation exposure is also referred to as accounting exposure or balance sheet exposure. The restatement of foreign currency financial statements in terms of a reporting currency is termed translation. The exposure arises from the periodic need

to report consolidated worldwide operations of a group in one reporting currency and to give some indication of the financial position of that group at those times in that currency.

- Translation exposure is measured at the time of translating foreign financial statements for reporting purposes and indicates or exposes the possibility that the foreign currency denominated financial statement elements can change and give rise to further translation gains or losses, depending on the movement that takes place in the currencies concerned after the reporting date. Such translation gains and losses may well reverse in future accounting periods but do not, in themselves, represent realized cash flows unless, and until, the assets and liabilities are settled or liquidated in whole or in part.
- This type of exposure does not, therefore, require management action unless there are particular covenants, e.g., regarding gearing profiles in a loan agreement, that may be breached by the translated domestic currency position, or if management believes that translation gains or losses will materially affect the value of the business. International Accounting Standards set out best practice.
- A firm which has subsidiaries and assets in another country is subject to translation exposure. Translation exposure results as a consequence of the fact that a parent company must consolidate all of the operations of its subsidiaries into its own financial statements.
- Since a foreign subsidiary's assets are carried on its books in a foreign currency, it is necessary to convert the foreign values into domestic currency for combining with the parent's assets.
- Fluctuating exchange rates, results in gains and losses occurring during the translation process. Since this type of exposure is related to balance sheet assets and liabilities, it is often referred to as accounting exposure.
- In any event, translation exposure is not a **real** gain or loss in terms of making or losing money. The *value* of the asset is the value of the asset. The gain or loss results simply from translating from one currency to another. In that sense, one should not really worry about translation exposure (except to the extent that there is a *perceived* gain or loss from unsophisticated users of the financial statements).

This is also referred to as conversion exposure or cash flow exposure. It concerns the actual cash flows involved in setting transactions denominated in a foreign currency. These could include,

- Sales receipts
- Payments for goods and services
- Receipt and/or payment of dividends

- Servicing loan arrangements as regards interest and capital

The existence of an exposure alerts one to the fact that any change in currency rates, between the time the transaction is initiated and the time it is settled, will most likely alter the originally perceived financial result of the transaction.

## **Concept and Measurement of Translation Exposure**

Translation exposure measures the effect of an exchange rate change on published financial statements of a firm.

- Assets & liabilities that are translated at the current exchange rate are considered to be exposed (uncovered) as the balance sheet will be affected by fluctuations in currency values overtime.
- Assets & liabilities that are translated at a historical exchange rate will be regarded as not exposed as they will not be affected by exchange rate fluctuations.
- So, the difference between exposed assets & exposed liabilities is called translation exposure.

## **Transaction Exposure Vs. Translation Exposure**

**Translation Exposure = Exposed Assets-  
Exposed Liabilities (Change in the  
Exchange Rate)**

Under the generally accepted US accounting principles, the net monetary asset position of a subsidiary is used to measure its parent's foreign exchange exposure. The net monetary asset position is monetary assets such as cash & accounts receivable minus monetary liabilities such as accounts payable & long-term debt.

The translation of gains & losses does not involve actual cash flows – these gains or losses are purely on paper i.e. they are of an accounting nature.

## **STEPS for Measuring Translation Exposure are:**

- Determine functional currency.
- Translate using temporal method recording gains/losses in the income statement as realized
- Translate using current method recording gains/losses in the balance sheet & as realized
- Consolidate into parent company financial statements.

## Exchange Risk Management

- The economic exposure refers to the possibility that the value of the enterprise, defined as the net present value of future after tax cash flows when exchange rates change.
- Economic exposure will almost certainly be many times more significant than either transaction or translation exposure for the long-term well-being of the enterprise risk, by its very nature, it is subjective and variable, due *in part* to the need to estimate future cash flows in foreign currencies.
- The enterprise needs to plan its strategy, and to make operational decisions in the best way possible, to optimize its position in anticipation of changes in economic conditions.
- The accounting context and has to do with the strategic evaluation of foreign transactions and relationships. It concerns the implications of any changes in future cash flows which may arise on particular transactions of an enterprise because of changes in exchange rates risk or on its operating position within its chosen markets.
- Its determination requires an understanding of the structure of the markets in which an enterprise and its competitors obtain capital risk, labour, materials, services and customers.
- Identification of this exposure focuses attention on that component of an enterprise's value that is dependent on or vulnerable to future exchange rate movements. This has bearing on a corporation's commitment, competitiveness and viability in its involvement in both foreign and domestic markets.

## Operating Exposure

Operating exposure is known as **economic exposure**. The extent to which the value of the firm changes when the exchange rate changes (value is measured as the present value of expected future cashflows)

PV = present value of the firm

$\Delta$ PV = change in present value  
of the firm  $\Delta$ S = change in  
exchange rate

If  $\Delta PV/\Delta S \neq 0$ , then the firm is exposed to currency risk (i.e., operating exposure)

Operating exposure arises because currency fluctuations can alter a firm's future revenues and costs (i.e., its operating cash flows).

## Measuring and Managing Operating Exposure

Long-term; Techniques involve:

### Marketing Management

#### Market Selection

To examine which markets to sell products (strong currency market vs. weak currency market). Sell in multiple markets to take advantage of economies of scale and diversification of exchange rate risk.

#### Pricing Strategy

Emphasize on market share or profit margin. Exporters will benefit from a weak home currency and can either increase price or increase market share.

#### Product Strategy

The operating exposure measuring operating exposure is quite difficult as anticipating how a company's sales, input prices will be affected due to change in the forex rate.

### Production Management

- **Product Sourcing:** purchase components overseas (outsource components)
- **Plant Location:** shift production to lower cost sites. Increase production in a country with a weaker currency, and decrease production in a country with a stronger currency (e.g., Honda built North American factories in response to strong yen, but later Honda imported the cars from Japan because of a weak yen).
- **Increase Productivity:** close inefficient plants, high automation.

### Financial Hedging

It involves the use of currency swaps, currency futures, currency forwards, and currency options.

## **Proactive Management**

Six of the most commonly employed proactive policies are:

- Matching currency cash flows
- Risk-sharing agreements
- Back-to-back loans
- Currency swaps
- Leads and lags (pay early and pay late)
- Re invoicing centers

### **Matching Currency Cash Flows**

- One way to offset an anticipated continuous exposure to a particular currency is to acquire debt denominated in that currency.
- This policy results in a continuous receipt of payment and a continuous outflow in the same currency.
- This can sometimes occur through the conduct of regular operations and is referred to as a natural hedge.

### **Risk-Sharing Agreements**

Risk-sharing is a contractual arrangement in which the buyer and seller agree to share or split currency movement impacts on payments.

### **Parallel Loan**

A back-to-back loan, also referred to as a parallel loan or credit swap, occurs when two firms in different countries arrange to borrow each other's currency for a specific period of time

- The operation is conducted outside the FOREX markets, although spot rates may be used to decide the equivalent amount.
- This swap creates a covered hedge against exchange loss, since each company, on its own books, borrows the same currency it repays.

### **Currency Swaps**

- Currency swaps resemble back-to-back loans except that it does not

appear on a firm's balance sheet.

- In a currency swap, a dealer and a firm agree to exchange an equivalent amount of two different currencies for a specified period of time.
- Currency swaps can be negotiated for a wide range of maturities.
- A typical currency swap requires two firms to borrow funds in the markets and currencies in which they are best known or get the best rates.

### **Leads and Lags: Re-Timing the Transfer of Funds**

- Firms can reduce both operating and transaction exposure by accelerating or decelerating the timing of payments that must be made or received in foreign currencies
  - To lead is to pay early
  - To lag is to pay late
- Leading and lagging can be done between related firms (intracompany) or with independent firms (intercompany)
- Leading and lagging **between related firms** is more feasible because they presumably share a common set of goals for the consolidated group.
- In the case of financing cash flows with foreign subsidiaries, there is an additional motivation for early or late payments to position funds for liquidity reasons.
- Leading or lagging **between independent firms** requires the time preference of one firm to be imposed to the detriment of the other firm.
- However, the only way the Brazilians would be willing to pay their accounts payable early would be for the German creditor to **offer a discount** about equal to the forward discount on the real (or the difference between Brazilian and German interest rates for the period of prepayment)

### **Re-Invoicing Centers**

- A re-invoicing center is a separate corporate subsidiary that serves as a type of “middle-man” between the parent or related unit in one location and all foreign subsidiaries in a geographic region.
- However, the physical goods are shipped directly to Trident Brazil.
- The re-invoicing center in turn re-sells to Trident Brazil in Brazilian real.
- Consequently, all operating units deal only in their own currency, and all

transaction exposure lies with the re-invoicing center.

There are three basic benefits arising from the creation of a re-invoicing center:

- Manage foreign exchange exposures (specialization; economies of scale)
- Guarantee the exchange rate for future orders (marketing focus)
- Manage intra-subsidary cash flows (hedge residual cash flows)

The main disadvantage: an additional corporate unit must be created (setup cost) and a separate set of books must be kept.

### **Management of Currency Risk**

Managers of multinational firms employ a number of foreign exchange hedging strategies in order to protect against exchange rate risk. Transaction exposure is often managed either with the use of the money markets, foreign exchange derivatives such as forward contracts, futures contracts, options, and swaps, or with operational techniques such as currency invoicing, leading and lagging of receipts and payments, and exposure netting.

### **Value at Risk**

Practitioners have advanced and regulators have accepted a financial risk management technique called value at risk (VAR), which examines the tail end of a distribution of returns for changes in exchange rates to highlight the outcomes with the worst returns. Banks in Europe have been authorized by the Bank for International Settlements to employ VAR models of their own design in establishing capital requirements for given levels of market risk. Using the VAR model helps risk managers determine the amount that could be lost on an investment portfolio over a certain period of time with a given probability of changes in exchange rates.