

California State University, San Bernardino

**CSUSB ScholarWorks**

---

Theses Digitization Project

John M. Pfau Library

---

2004

## **Minimization of currency risk exposures by developing foreign currency trading strategies for a multinational United States company**

Korhan Cam

Follow this and additional works at: <https://scholarworks.lib.csusb.edu/etd-project>



Part of the [International Business Commons](#)

---

### **Recommended Citation**

Cam, Korhan, "Minimization of currency risk exposures by developing foreign currency trading strategies for a multinational United States company" (2004). *Theses Digitization Project*. 2601.  
<https://scholarworks.lib.csusb.edu/etd-project/2601>

This Project is brought to you for free and open access by the John M. Pfau Library at CSUSB ScholarWorks. It has been accepted for inclusion in Theses Digitization Project by an authorized administrator of CSUSB ScholarWorks. For more information, please contact [scholarworks@csusb.edu](mailto:scholarworks@csusb.edu).

MINIMIZATION OF CURRENCY RISK EXPOSURES BY  
DEVELOPING FOREIGN CURRENCY TRADING  
STRATEGIES FOR A MULTINATIONAL  
UNITED STATES COMPANY

---

A Project  
Presented to the  
Faculty of  
California State University,  
San Bernardino

---

In Partial Fulfillment  
of the Requirements for the Degree  
Master of Business Administration

---

by

Korhan Cam

June 2004

MINIMIZATION OF CURRENCY RISK EXPOSURES BY  
DEVELOPING FOREIGN CURRENCY TRADING  
STRATEGIES FOR A MULTINATIONAL  
UNITED STATES COMPANY

---

A Project  
Presented to the  
Faculty of  
California State University,  
San Bernardino


---

by

Korhan Cam


June 2004

Approved by:

  
Mohamad Vaziri, Ph.D., Chair, Accounting  
& Finance

5/26/04  
Date

  
Rauf Khan, D.B.A. Accounting & Finance

  
Otto Chang, Ph.D., Department Chair,  
Accounting & Finance

## ABSTRACT

This paper will examine a case study of developing foreign currency trading strategies for trading operations for a multi-million dollar company that sells analytical products and services to European countries. Particularly, this study will focus on defining the currency risk exposures this company facing and what types of remedies exist to manage that risk. Besides, the study will also focus on accounting perspective of the foreign currency transactions of multinational companies. The overall analysis will provide a general framework for managing currency risk exposures for U.S. Multinational companies. Since our chosen company is a private ownership, it will be called as Company X in the text. Regarding the organization of the study, the general concept of currency risk management, defining and managing the exposures will be given in details in chapter 1. Then in chapter 2, the foreign currency risk management of the chosen company will be analyzed. The chapter 3 summarizes and concludes the study.

## TABLE OF CONTENTS

ABSTRACT .....	iii
LIST OF TABLES .....	vi
LIST OF FIGURES .....	vii
CHAPTER ONE: GENERAL CHARACTERISTICS OF CURRENCY RISK MANAGEMENT	
Justification for Currency Risk Management .....	1
Literature Review .....	1
Defining Exposures .....	6
Transaction Exposure .....	7
Contingent Exposure .....	7
Translation Exposure .....	8
Translation and Financial Accounting Standards-52 .....	8
The Concept of Functional Currency .....	9
Accounting Translation Methods .....	9
Economic Exposure .....	9
Measuring Exposure: Accounting Versus Cash Flow .....	10
Managing Exposure: Hedging .....	12
The Process .....	13
Hedging Considerations .....	13
Accounting for Hedging Transactions .....	14
Hedge Accounting .....	16
CHAPTER TWO: MANAGING EXPOSURE TO CURRENCY RISK FOR COMPANY X	
About Company X .....	19

Currency Risk Analysis for Company X .....	20
Measuring the Impact of Currency Movements on Company X .....	23
Currency Risk Minimization versus Keeping the Competitive Position .....	27
CHAPTER THREE: RECOMMENDED STRATEGIES AND CONCLUSIONS .....	33
APPENDIX: COMPANY X 2002 INTERNATIONAL SALES .....	39
REFERENCES .....	41

## LIST OF TABLES

Table 1. What is The Word On Hedging and Derivatives So Far? .....	15
Table 2. Scenario I .....	25
Table 3. Scenario II .....	26
Table 4. Cash Flow Effect .....	26
Table 5. Accounting Effect .....	26

## LIST OF FIGURES

Figure 1. Hedge-Accounting Criteria .....	18
---	----



CHAPTER ONE  
GENERAL CHARACTERISTICS OF CURRENCY  
RISK MANAGEMENT

Justification for Currency Risk Management

Management of corporate exposure to currency risk in the present environment of floating exchange rates has become a difficult and an often a painful task for many companies. Companies having foreign operations and/or international trade transactions denominated in a foreign currency are directly exposed to losses associated with changing exchange rates. Corporations have come to recognize that exchange-rate considerations cannot be overlooked in any strategic planning, whether it involves short-term financing of working capital or longer-term investments. Therefore, clearly defined corporate objectives are a prerequisite to the effective management of currency exposure.

Literature Review

Dumas (1978) emphasized that exposure contains an "operational" element that accounts for the firm's responsiveness to exchange rate changes. It could be argued, for instance, that the unique ability of

multinationals to shift production from one country to another actually lessens their exchange rate exposure.

A recognized objective of financial and corporate management is to maximize shareholder value (Rappaport, 1986). The increasing economic integration and development of global markets means that few companies, if any, are unaffected by currency movements. Unexpected changes in exchange rates affect firms' ability to sell abroad, increase the cost of foreign-sourced inputs, and reduce their domestic and international competitiveness. Firms involved in international trade are subject to transaction risk arising from payables and receivables in foreign currencies. In addition, multinational firms with operations in several countries will have translation risks from having assets and liabilities denominated in foreign currencies. Economic exposure includes these accounting effects but also incorporates the competitive situation of the firm (Shapiro, 1992). Even firms not subject to accounting exposures, by only sourcing in and servicing in their domestic markets, face economic currency exposure (Adler & Dumas, 1984).

According to Adler and Dumas (1984), a reasonable measure of exposure to currency -risk should meet the following three criteria:

- (1) Its dimension should be an amount of currency, domestic for domestic currency and foreign for foreign currency risk.
- (2) It should be a characteristic of any asset or liability, physical or financial, that a given investor might own or owe, defined from that investor's view-point.
- (3) It should be implementable in the dual sense that, first, measurement can be accomplished with available techniques; and, second, exposure so measured can be hedged or covered with available financial instruments.

Beginning with Jorion (1990), researchers have concluded that foreign exchange gains and losses should be accepted as the basis for examining the impact of exchange rate changes on value of the firm. Those studies provided evidence that a company's total foreign currency exposure (defined as the sensitivity of the value of the firm to random changes in exchange rates) is positively correlated with its degree of foreign involvement. That is, the higher the relative level of foreign sales (relative to company's size), the greater the response of stock returns to unanticipated changes in exchange rates.

As of June 1990, the Financial Accounting Standards Board (FASB) has required U.S. multinational companies to provide information concerning the usage of foreign exchange derivatives. In Statement of Financial Accounting Standards (SFAS) No. 105, the FASB requires companies to disclose the notional amount of foreign exchange derivatives. Per SFAS No. 105, notional amounts are intended to measure the company's extent of involvement in transactions that have off-balance sheet risk. According to Goldberg, Triteschler and Godwin (1995), the descriptive evidence indicates that while foreign exchange derivatives usage is often substantial, the level of usage varies considerably across U.S. companies. In particular, Goldberg et al. report that the notional amount of foreign exchange derivative as a percentage of total assets varies from zero to more than 60 percent.

It is an empirical fact that firms are increasingly using derivatives to manage financial risks. Dolde (1995) finds that derivatives were used to manage financial risk by 84% of 244 Fortune 500 firms. In research conducted by Ernst and Young consultancy 105 multinational companies were surveyed. About 90 % of these multinationals reported to use derivative instruments to hedge currency or

interest rate exposure. The firms primarily use the derivatives to hedge the risk of specific transactions.

The characteristics of firms that hedge are the subject of a number of surveys. Nance, Smith and Smithson (1993) use survey data from own research as well as previous research to compare the characteristics of firms that do hedge and firms that do not hedge. They find that firms with leveraged capital structures hedge more. They also find that high dividend paying firms and R & D intensive firms are more likely to hedge. The proposition by Mello and Parsons (1995) that risk management decisions are in fact ordinary capital structure decisions that should be analyzed as such is therefore confirmed by the empirical findings of Nance, Smith, and Smithson (1993). Dolde (1995) also analyzes the relation between hedging and leverage. When he controls for firm specific characteristics he finds a statistically significant complementary relationship. He also confirms the finding by Nance, Smith and Smithson (1993) that corporations with high R&D expenses will hedge more. Geczy, Minton and Schrand (1997) reach the same conclusion that firms with higher R&D expenditures are more likely to use foreign currency derivatives. Bodnar, Hayt, Marston and Smithson

(1995) show that in their sample large firms use derivatives a lot more than the small firms.

Allayannis and Ofek (1996) analyze the motive for the use of financial derivatives by firms. They examine the use of the foreign currency derivatives by S&P 500 nonfinancial firms during 1992-1993 and find strong evidence that firms use foreign currency derivatives to hedge, rather than to speculate in the foreign exchange market. By including exposure factors such as the ratio of foreign sales to total sales and total foreign trade to total production the explanatory power of variables previously found to be important for a firms' decision to hedge, like R&D expenditures and firm size, reduces significantly.

### Defining Exposures

Perhaps the best place to start is to define the different types of exposure that may confront a businessperson. These are transaction, translation, and economic exposure. The corporate treasurer concerned with the effects of the exchange rate fluctuations on current period cash flows is interested in transaction exposure. Translation exposure means the accounting impact of such fluctuations, while economic exposure takes a longer term

cash flow view. However, it is important to remember that transaction, translation, and economic exposure overlap to some degree.

### Transaction Exposure

Transaction exposure is defined as the potential impact on current period cash flows created by fluctuating exchange rates between one's home currency and the currency in which the transaction is denominated. Every firm with current foreign currency denominated transactions (receivables, payables, loans, etc.) has transaction exposure. A change in the value of the foreign currency alters the value of foreign currency cash flows, once they are measured in the local currency.

### Contingent Exposure

An extension of transaction risk that is often overlooked concerns potential foreign exchange transactions that are known but have not materialized. This type of risk, known as "contingent" exposure, is also a real transaction risk to the firm. Contingent exposure can be illustrated in the bidding on projects that are denominated in a foreign currency. The bid, and implicitly the firm's profit margin, is based on the exchange rates as they are perceived when the proposal is submitted.

Months may go by before the contract is awarded. Time creates uncertainty. Exchange rate fluctuations over the evaluation period can cause serious planning problems. The firm ultimately receiving the contract would clearly like to have been hedged over the evaluation period. On the other hand, those firms not receiving the contract, in retrospect, would not need to be hedged. However, since firms cannot know beforehand whether or not they will get the project, they do have a hedging problem.

#### Translation Exposure

Translation exposure appears when the multinational corporation consolidates the financial statements of all of its foreign subsidiaries with the parent company. All items must be translated into home (and/or reporting) currency. Should a currency depreciate or appreciate between consolidation dates, items translated at current rates are vulnerable to exchange rate fluctuation. Those translated historically are not.

#### Translation and Financial Accounting Standards-52

Through its FAS rulings, the Financial Accounting Standards Board (FASB) sets guidelines on how U.S. corporations are to report foreign currency accounts in their financial statements. In the United States the



exposure considers the effect of currency fluctuation on the discounted value of both the current and future cash flows of the firm. Calculating exposure in this context requires estimating the effects of exchange rate fluctuations on the firm's current and future product/market areas and investment decisions. This quickly becomes a complicated task that is highly the firm specific.

Measuring economic exposure from an economic perspective is complicated by two factors: First, there are many potential price and volume reactions to a given exchange rate change. Many values must be estimated. Therefore, economic measurements involve a considerable degree of subjectivity and uncertainty. Second, evaluating the overall performance is normally gathered from an accounting standpoint, not an economic one.

#### Measuring Exposure: Accounting Versus Cash Flow

Company objectives ultimately dictate how exposure is measured and subsequently hedged. Companies interested in measuring the impact of currency movements on their balance sheets will likely use an accounting approach. Those monitoring the cash impact measure their exposure from a cash flow perspective. Often companies measure and

hedge using both approaches. That is, companies commonly hedge individual foreign exchange transactions throughout the year. These same firms (or their parents), however, may also be hedging projected balance sheet figures (accounting) to assure favorable year-end statements. It is important to keep in mind that cash-flow exposure often differs from accounting exposure. In order to have a better understanding of the distinction, it is vital to have consistent and uniform definitions for both accounting exposures and cash-flow exposures. From a consolidated after-tax viewpoint accounting exposures consist of two elements: first, all monetary assets and liabilities of the parent company in currencies other than its own and, second, all monetary assets and liabilities of the foreign entities. Cash-flow exposures, on the other hand, can be defined as those monetary assets and liabilities in currencies other than the local currency of each of the foreign entities and the parent. The difference between accounting and cash-flow exposure is that the latter does not include in its definition those monetary assets and liabilities of foreign entities denominated in their respective local currencies.

It could be argued that only the current portion of the long-term debt should be included in the definition of

cash-flow exposures. Such a restricted view, however ignores the potential longer-term effects, and therefore is not necessarily consistent with the long-term objectives of a company. The cost of debt denominated in foreign currencies is not simply the interest cost; the stream of the interest and principal paybacks for the entire term of the debt must be adjusted for exchange rate movements in measuring the overall cost to the borrower.

For the purpose of exposure management, it is desirable to extend the above narrow definition of cash flow exposure to include anticipated allowances of profits by foreign entities. A long-term planning horizon extending several years into the future is desirable, and anticipated allowances from each of the foreign entities should be separately estimated for each of those years. At the very least, anticipated allowances in the current fiscal year should be estimated at the beginning of each year and steps should be taken to preserve their dollar value.

#### Managing Exposure: Hedging

Hedging techniques may be implemented either internally or externally. Managing exposure internally entails using sources within the firm to hedge foreign exchange risk. Balance sheet manipulation, pricing policies, and so forth

fall into this area. External methods are those that require the hedger to venture outside the organization for aid in protecting the exposure. These include bank forward foreign exchange contracts, currency futures and options, and other instruments.

### The Process

The process begins with top management recognizing the potential impact currency risk can have on the organization, and then instituting procedures for controlling that risk.

### Hedging Considerations

Often more than one technique may be used to cover a specific exposure. This can create difficulties when time comes to evaluate and select the hedge that is the best interest of the both the exposure and the firm as a whole. The following five factors serve as basic guidelines to proper hedge selection.

1. Performance
2. Cost/Risk
3. Time
4. Flexibility
5. Regulations

## Accounting for Hedging Transactions

The FASB decided that an interim step, improved disclosure about financial instruments was necessary due to the complexity of the accounting issues involved, specifically with regard to the recognition and measurement issues. In this regard, three Statements of Financial Accounting Standards (SFAS) - No. 105, 107, and 119- have been issued (See Table. 1). While these statements did not alter the existing accounting practices, they did mandate much more extensive disclosure about fair values of, and market and credit risk inherent in, financial instruments in general, and derivatives in particular. Further, in 1996, the Securities and Exchange Commission (SEC) proposed new rules that will require companies to significantly expand and enhance these risk management disclosures.

Table 1 provides relevant authoritative literature relating to accounting and disclosure for specific transactions that may involve hedging and derivatives.

Table 1. What is The Word On Hedging and Derivatives So Far?

Document	Title	Application
SFAS No. 52	Foreign Currency Translation	Establishes hedge accounting standards for foreign currency transactions, including forwards and currency swaps.
SFAS No. 80	Accounting for Futures	Establishes accounting and reporting standards for future contracts.
SFAS No. 104	Statement of Cash Flows - Net reporting of certain cash receipts and cash payments and classification of cash flows from hedging transactions.	As described in title.
SFAS No. 105	Disclosure of information about financial instruments with off-balance sheet risk and financial instruments with concentrations of credit risk.	Establishes disclosures standards for information on financial instruments with off-balance sheet exposure and credit risk concentrations.
SFAS No. 107	Disclosures about fair value of financial instruments.	Requires disclosures of fair value of financial instruments.
SFAS No. 115	Accounting for certain investments in debt and equity securities.	Definition of equity securities includes purchased options.
SFAS No. 119	Disclosure about derivative financial instruments and fair value of financial instruments.	Requires specific disclosures on derivatives, distinguishing between derivatives held for trading purposes and those held for other than trading. Encourages other disclosures on derivatives. Amends certain aspects of SFAS No. 105 and 107.
FASB Interpretation No. 39	Offsetting of amounts related to certain contracts.	Discusses right of offset for derivative transactions executed with the same counterparty.
AICPA Issues Paper No. 86-2	Accounting for Options	Gives nonauthoritative guidance on accounting for options and hedging with options.
EITF Issue No. 84-36	Interest Rate Swap Transactions	Gives guidance that reflects general practice rather than authoritative rules.

Document	Title	Application
EITF Issue No. 90-17	Hedging Foreign Currency Risk with purchased Options.	As described in title.
EITF Issue No. 91-1	Hedging Intercompany Foreign Currency Risks	As described in title.
EITF Issue No. 91-4 and SEC Comments Thereon	Hedging Foreign Currency Risks with complex options and similar transactions.	As described in title.

### Hedge Accounting

While the rules for hedge accounting vary across borders, nearly universal requirements are (1) that the transactions which are part of the hedge must be designated by the enterprise as constituting risk-offsetting transactions, (2) that there must be risk reduction as a result of the combined transactions and (3) that there must be correlation between the underlying transaction and the risk management transaction taken as a hedge. The purpose of hedge accounting is to provide a match of related gains and losses and to avoid distorting financial reports. The Securities and Exchange Commission and members of the Financial Accounting Standards Board are engaged in complex discussions over some aspects of the use of hedge accounting in financial reporting. This discussion may lead to differences between the economic effect of a risk management transaction and its reflection in financial reports. The growth in mark-to-market

accounting worldwide is leading to a reduction in hedge accounting applications.

Currently, no one comprehensive authoritative pronouncement exists that addresses accounting for hedging transactions. Accordingly, current practice for a number of financial instruments is quite diverse. Although there is no comprehensive authoritative pronouncement that specifies the hedge accounting, there is general agreement that hedging transactions are accounted for differently from transactions for other purposes, and that certain criteria (see Figure 1) must be met to account for a transaction as a hedge.



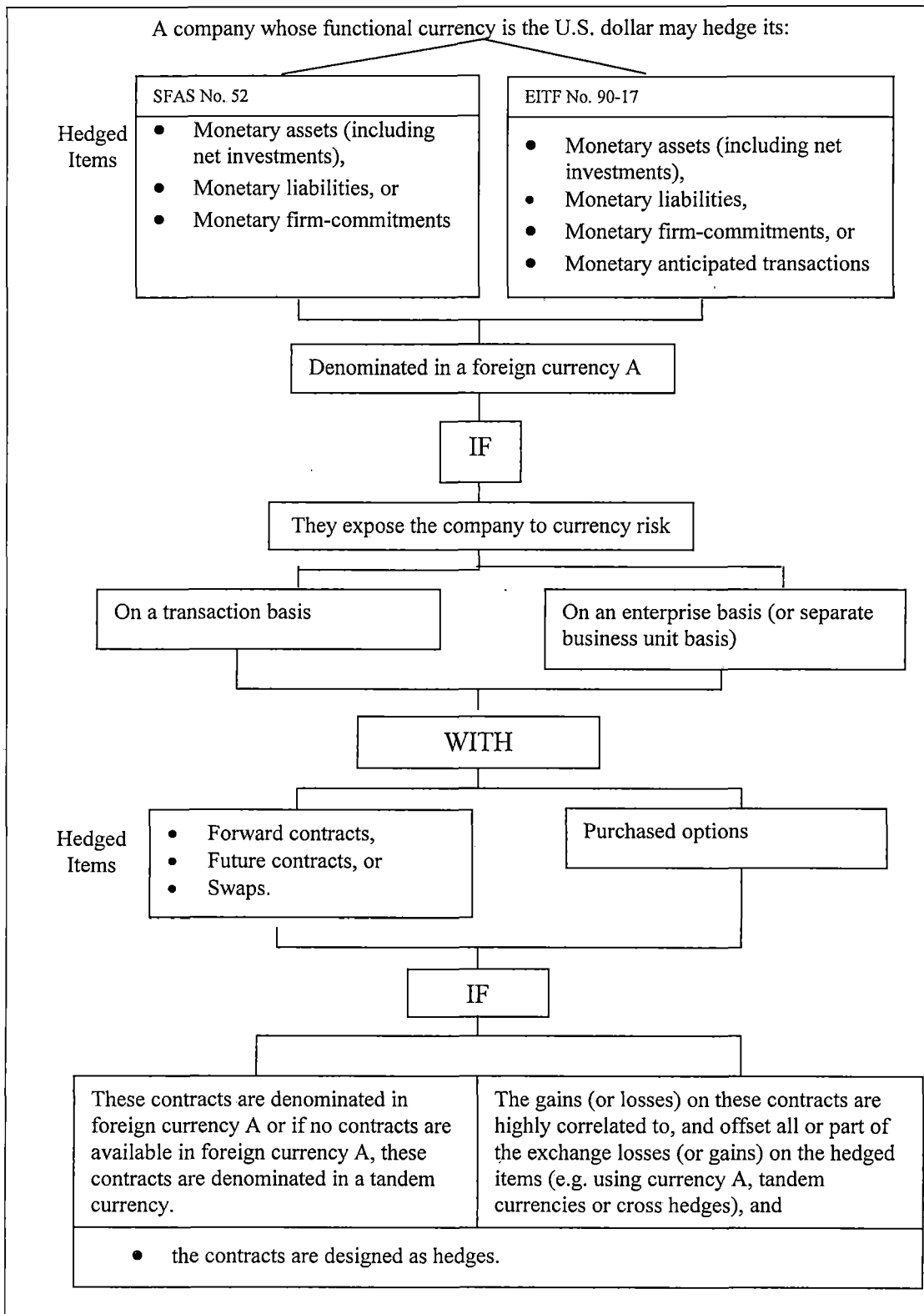


Figure 1. Hedge-Accounting Criteria

## CHAPTER TWO

### MANAGING EXPOSURE TO CURRENCY RISK FOR COMPANY X

#### About Company X

Company X is a leading developer and manufacturer of ultraviolet products. Besides, it focuses on innovative product solutions for molecular biology applications. Products include imaging and analysis software systems and chemiluminescent western blot detection kits. These high-tech engineering products are sold throughout the U.S. as well as in international markets (See Appendix A). The management sees the opportunity of growth in increasing international sales. Therefore, the company acquired a subsidiary in England for European operations. However, the biggest challenge the management facing about the international trade is the currency risk management. The volatility of the exchange rates and corresponding accounting applications has been hurting the company financially. The following text will examine the exposures of the company resulting from the international transactions and their corresponding remedies including the right corporate management approaches that will lead the appropriate overall strategy.

## Currency Risk Analysis for Company X

From the translation exposure point of view, for example, suppose the financial officer of the British subsidiary of company X is evaluating the subsidiary's year end financial statements. The statements show that over the course of the year the subsidiary has maintained an average net asset position equal to 3 million British Pounds. The dollar value of the pound has fallen from \$1.99 to \$1.89 over the same time period. Translation into U.S. dollars reduces the value of net asset position from \$4.5 million to \$4.2 million. The result is a \$300,000 loss to the parent company.

U.S. corporations, including those with no foreign operations and no foreign currency assets, liabilities or transactions, are generally exposed to foreign currency risk. Therefore, the corporate management approaches to currency risk management should begin with definition and measurement of the exposures. There are two types of currency risk exposures; accounting and cash-flow exposures. In the following section of the study, I will analyze the cash flow versus accounting exposures to currency risk and hedging as a tool for minimization of this risk for company X.

British subsidiary of company X manufactures and sells analytical products and services locally. As a result of having financed most of its investments by local currency borrowings, it has a net liability exposure in sterling. If the parent wants to avoid any adverse effects to its reported consolidated income and earnings per share as a result of dollar/sterling fluctuations, it must hedge this balance sheet exposure. Let us assume that parent obtains the necessary after-tax protection by a forward purchase of sterling against the dollar. In this typical situation, if sterling weakens, an accounting gain upon translation and an offsetting cash loss on the contract will result, excluding the cash impact from the discount or premium on the forward purchase of sterling. Since the gain is purely an accounting adjustment and hence a "paper gain," the real net effect is a cash loss from the contract. Furthermore, if the subsidiary were to pass on its operating profits to the parent, the value of the transfer of funds measured in dollars would be reduced, though not reflected as a loss in any accounting measurement. Contrary to what the accounting exposure would dictate, a management approach purely based on cash-flow considerations should try to eliminate the

opportunity cost arising from the reduction in the dollar value of earnings that are sent back.

Proponents of an accounting approach to exposure management argue that book losses ultimately lead to cash losses, and hence must be protected whenever the cost of the cover is not excessive. This argument apparently justifies cash loss on the hedge in return for a book gain-implying a willingness on the part of a corporate management to risk current income in return for potential future income. On the other hand, a cash flow approach to exposure management emphasizes present cash flow, and hence current income, and to a lesser future income. Ideally, corporations should manage their exposure to exchange risk from the viewpoint of minimizing present and future cash flow losses. In order to maximize the present value of a stream of future income, long-term protective measures, which often require short-term sacrifices, are necessary. In the present environment most corporations are unwilling to take the route because it is often requires ignoring accounting results.

There appears to be no immediate clear-cut solution. However, one starting point could be additional disclosure on the part of the corporations. Current cash-flow impacts should be readily distinguishable from those arising from

translation of financial statements. Appropriate accounting procedures have to be adopted to measure the cash flow effects of currency movements as they affect a company's currency operations. This implies that the accounting for and proper use of an additional important information that certainly has a bearing on management decisions. A breakdown of foreign exchange impacts, when made public, would assist stockholders and analysts in making better judgments about the soundness of a company's management policies. And as far as corporate management is concerned, it should choose the approach that best suits its present and future needs as dictated by overall financial and operating considerations.

#### Measuring the Impact of Currency Movements on Company X

A rational approach to exposure management requires a proper understanding of both accounting and potential cash-flow impacts of anticipated currency movements. The crucial difference between a cash-flow approach and an accounting approach is that the former views the impacts of currency movements in relation to the local currency of the entity carrying the exposure, while the latter considers it in relation to the currency of the parent. Therefore, from a cash-flow viewpoint, the relative

movement between the currency of exposure and the local currency is all that counts. And that is what and why each individual operating unit understands best.

Although the cash-flow and accounting impacts on the parent's own exposure are identical, they differ when they relate to a foreign subsidiary's exposure. For example, the manager of a British subsidiary is concerned if euro payables for the imports used for his manufacturing processes require more pound sterling at the time of settlement of those payables. He views this possibility as an important element that affects his subsidiary's profitability. He is far less concerned about the accounting gain that the parent could feasibly get if the dollar appreciates against the euro. On a pre-tax basis there is no accounting impact if the exposed currency does not change in its value against the dollar, and there is no cash-flow effect if the exposed currency does not change in comparison with the local currency.

The tax effects under both accounting and cash-flow approaches are identical. It is the cash flow impact of currency movements that is subject to taxes; both individual and consolidated financial statements reflect the implication of local taxes. Foreign exchange gains and losses arising from translation of foreign financial

statements into dollars do not normally give rise to any taxes because the parent company is considered to be in a position to defer payment of U.S. taxes, if any, until it receives a dividend. Every unit is subject to taxes on its own foreign exchange gains or losses, depending on its exposure in currencies other than its own and the movements of those currencies in comparison with its local currency. To the extent that the entity carrying the exposure has a potential or realized cash-flow impact as a result of currency movements, it is normally subject to local taxes. Very often these taxes are significant and directly affect the earnings of the company, and should be carefully considered in both management approaches.

To fully illustrate the after-tax impacts of both approaches on company X, let us once again consider the example of the British subsidiary of company X that imports from Germany. For simplicity, I will assume that this subsidiary presently has only one exposure of € 300,000 payable, recorded at \$ / £ = 1.89 and \$ / € = 1.277.

Table 2. Scenario I

U.K. Subsidiary (£)			
		Payables	£202,698.4 ( € 300,000 )
Inventory	£202,698.4		
Fixed Assets	£1,000,000	Owner's Equity	£1,000,000



Table 3. Scenario II

U.K. Subsidiary (\$)			
		Payables	\$383,100
Inventory	\$383,100		
Fixed Assets	\$1,890,000	Owner's Equity	\$1,890,000

Note that the fixed assets of the British subsidiary were initially also recorded at the dollar / pound sterling rate of 1.89.

Further assume that the subsidiary is subject to a 40 percent tax rate on its exchange gains or losses. Below, I will examine the after- tax impacts under both approaches as a result of rate changes to \$ / £ = 1.50 and \$ / € = 1.00.

Table 4. Cash Flow Effect

U.K. Subsidiary (£)			
		Payables	£200,000 ( € 300,000 )
Tax Credit	£1,079.36		
Inventory	£202,698.4		
Fixed Assets	£1,000,000	Owner's Equity	£1,003,777.76

Cash Flow Effect = £1,003,777.76 - £1,000,000 = £3,777.76 gain

Table 5. Accounting Effect

U.K. Subsidiary (\$)			
		Payables	\$300,000
Tax Credit	\$33,240		
Inventory	\$383,100		
Fixed Assets	\$1,890,000	Owner's Equity	\$2,006,340

Accounting Effect = \$2,006,340 - \$1,890,000 = \$116,340 gain

## Currency Risk Minimization versus Keeping the Competitive Position

In seeking to manage economic exposure, company X can adopt either operational or financial hedging strategies, or more typically a combination of both. However, the ability of financial instruments, such as foreign currency forward contracts and options, to hedge long-term currency exposures is limited. This arises because the economic exposure leads to the underlying cash flows being uncertain and not just the exchange rate at which they will be converted. In particular, financial hedging cannot prevent a company's competitive position being eroded by a strengthening domestic currency.

Operational hedging involves firms in decisions as to the location of their production facilities, sourcing of inputs, the nature and scope of products, the firm's choice of markets and market segments, and strategic financial decisions, such as the currency denomination of the firm's debt. The objective is to match the input and output sensitivities so as to reduce the degree of exposure. Moffet and Karlsen (1994) describe the use of production, financial and marketing policies to manage economic exposures as 'natural hedging'. There is empirical evidence for this approach and, insofar as firms

can implement appropriate internal solutions, these will be adopted. Broder (1984) in a survey of the top 250 listed UK companies found that less than a quarter of responding firms made operational decisions without considering the effects of currency exposure. Holland (1992) argues that correctly managing foreign exchange risk will not compromise the objective of shareholder wealth maximization. His case study of 14 internationally involved UK companies highlighted the fact that many of the firms had a degree of freedom when formulating and revising production, financing and marketing decisions and used these in the first instance to manage their exposures. However, he concluded that in the final analysis many companies selected inflexible operational strategies in order to benefit from factor market competitive and comparative advantages. Exchange rates were therefore only one of a number of strategic factors that needed to be considered. However, he concluded that the operational approach was particularly useful when applied to difficult-to-predict, longer-term currency cash flows. Dolde (1993) makes the case that the advantages in economies of scale in production and distribution and the transaction costs involved in making changes significantly limit the feasibility of complete operational hedges.

Edelshain (1995), in a survey of large UK companies, found that switching suppliers to take advantage of currency effects was not widespread, with only 4 per cent of his sample moving away from strong or strengthening currencies.

A key element of strategic exposure management is the extent to which operating departments are actively involved in managing these strategic risks. In order to make use of operational hedges, the responsibility for foreign exchange risk management cannot be solely a financial responsibility. Operating departments must view the impact of currency movements as an important strategic consideration to be included in the long-term planning decision rather than a risk to be hedged on a reactive basis. Edelshain (1995) suggests that relatively few companies use operational hedges to manage currency exposure because in most companies the management of exchange rate risk is allocated to the finance function.

Company X's economic exposure arises directly from revenues and costs denominated in foreign currencies. These transactional effects are relatively easy to identify and manage, especially over short time periods. The indirect effects, that are changes to the firm's competitive position, are less easy to manage. Ahkam

(1995) highlighted the need for firms to develop ways of measuring and managing economic exposure in its entirety. Miller (1998) argues that integrated risk assessment requires firms to analyze all aspects of the firm's position, competitive, input supply, market demand, and technological risks in assessing economic exposure.

A possible reason for the popularity of foreign currency-denominated debt is the flexibility that it provides. One advantage is that it is an add-on to the asset liability management process. Firms can elect to raise such debt if it is advantageous. In addition, the creation of a financial liability within normal capital structure parameters only has a small impact on the firm's existing or future business operations. Given the existence of early call or redemption provisions on debt and the currency swaps market it is also relatively easy to modify the exposure at a later date. Furthermore, debt policy is usually the responsibility of the finance department which is likely to be most involved in currency risk management. Consequently, foreign currency denominated debt might be considered a hybrid strategy having features of both operational and financial hedging which would explain its popularity.

The most favored operational strategies appear to be those designed to insulate the firm by matching the currency denomination of cash inflows and outflows. Operational matching reduces the size and hence impact of the currency mismatch.

Differentiating the firm's products and diversifying sales in many currencies are also used to reduce the sensitivity of sales volumes to price changes caused by exchange rate fluctuations. These results provide considerably more support for these strategies than those of Edelshain (1995). His results found only approximately 10 per cent of his sample located production in selling markets, compared to our 40 per cent. To some extent these differences can be explained by the different questions being asked. The results, however, lend strong support to the arguments relating exchange rate exposure to other strategic decisions within the firm. Sundaram and Mishra (1991) and Sundaram and Black (1992) make the case that a firm's exposure depends on the elasticity of customer demand which in turn depends on the degree of product differentiation. As a result, firms with more differentiated products are less subject to economic exposure.

Consequently, it is vital for company X to keep the firm's competitive position. If necessary, the U.S. operation should ultimately take the exchange rate loss. On the other hand, company X might choose to operate in the same currency as its main competitors. By choosing to do so, company X is limiting the impact of exchange rate movements on its profit margin and sales volume since all its competitors are affected in the same way.

## CHAPTER THREE

### RECOMMENDED STRATEGIES AND CONCLUSIONS

Implementation of sound projection strategies requires an orderly and planned approach to the foreign exchange problem. Management must have a clear understanding of the company's exposure to exchange risk and the alternatives available for providing adequate cover. The impact of anticipated currency movements on the overall performance of the company must be thoroughly examined from both short-term and long-term perspectives before one can decide on the suitability of a given management approach or the convenience of a protection strategy. The long-term objective governing every exposure management decision should be the maximization of the present value of all net cash inflows of the various operating units combined.

The amount of protection desired in any given exposure situation depends on at least four factors:

- 1) the management approach chosen;
- 2) the after-tax exposure consistent with that approach;
- 3) the level of exchange risk;
- 4) the cost of cover.



The purpose of projecting future currency movements and their impact on the exposure is to evaluate the degree of exchange risk in maintaining an unhedged or partially hedged position. In order to facilitate estimating the level of risk, each exposure must be expressed on an after-tax basis and in accordance with the chosen approach. The impact of currency movements, measured in terms of the potential exchange loss, can then be compared against the cost of providing cover by means of the least expensive hedge.

Because of the important role that taxes play in deciding the final impact of currency movements, all exposures should be measured net of taxes. Tax rates may vary from country to country and, therefore, exposures originating at different locations must be treated separately. Proper measurement of the consolidated after-tax net exposure of the company requires identifying each item of exposure by its currency of denomination and location, and adjusting it for the effect local taxes. Depending on the management approach, these calculations can be aided by the use of simple formulas. The exposure of the parent on an after-tax basis is identical under both approaches, and is equal to

$$\text{pre-tax exposure} * (1 - \text{local tax rate}).$$

However, foreign currency exposures of subsidiaries abroad give rise to additional after-tax exposures in their respective local currencies. Under a cash flow approach, this additional exposure is equal to

$$\text{-pre-tax exposure} * \text{spot rate of exposed currency} * (1 - \text{local tax rate}) / (\text{spot rate of local currency}).$$

An accounting approach gives rise to an after-tax exposure in local currency equal to

$$\text{pre-tax exposure} * \text{spot rate of exposed currency} * (\text{local tax rate}) / (\text{spot rate of local currency}).$$

The application of the above formulas to the example given in the previous section yields the following results: Under a centralized cash flow approach, the pre-tax liability exposure of € 300,000 of the British subsidiary is identical to an after liability exposure of € 180,000 and an after-tax liability exposure of € 121,619.05.

In spite of the simplicity of the formulas, the calculations involved are not always straightforward, especially in the case of foreign currency exposures of subsidiaries abroad. For companies with a number of exposed items it would be highly desirable to automate the calculations required in order to arrive at the overall after-tax net position in each currency under both

approaches. The impacts of anticipated currency movements under different outlooks may be stimulated in order to estimate the level of exchange risk to which the company is exposed. An exposure evaluation system that would generate up-to-date and accurate information from all operating units, calculate and compare the impacts of anticipated currency movements under both approaches, select appropriate protection strategies, and estimate the cost of implementing them, should be set and integrated within the financial management framework of the company.

Exchange exposure management, above all, was seen to be anticipatory. This puts particular emphasis on forecasting systems, both of cash flows and projected balance sheet alterations. That necessity can require additional reporting elements, again not always of a type normally produced by the accounting mechanism.

The accounting exposure risk consists of potential effects on published statements when currencies possessed or owed by any entity of the group and corresponding income streams are translated into a common functional currency used by the parent company. The economic exposure can arise in intercompany loans or accounts, in inventory and other items. It may also have material importance for future cash flows, profits or even direct investment.

To summarize, the international corporation dealing with exchange risk should:

- (1) Make its exposure management anticipatory, based on perception of future risk as well as present positions.
- (2) Centralize control over exposure risk as far as possible.
- (3) Review its reporting systems as regards their adequacy and timeliness.
- (4) Cover economic, transactional exposures generally and translation risk when the maximum potential translation losses are considered to be unacceptable by whatever corporate criteria are definitive. This implies a selective coverage policy, not one of being completely covered at all times in all currencies.
- (5) Analyze and make exposure decisions on a post-tax basis.
- (6) Look skeptically at exchange rate forecasting which provides one-point or very narrow-band estimates of future spot rates, just as skeptically at massive computer simulation programs which claim to simplify the decision-making.

- (7) Coordinate exchange management closely with liquidity management, as both have common goals and are equally affected by environmental and structural constraints.
- (8) Consider making the Head Office finance department a profit center in its own right.
- (9) Be aware of the non-financial implications of exposure strategy, particularly the personnel effects of centralization and the necessity to deal with an array of governmental and institutional contracts.

Installation of an exchange exposure management along with these principles will allow a structured approach to an increasingly complex and critical area and complement the optimal development of International Money Management within the firm.

APPENDIX  
COMPANY X 2002 INTERNATIONAL SALES

Company X  
2002 International Sales

**NORTH AMERICA**

CANADA	\$ 196,000
MEXICO	144,000

**SOUTH AMERICA**

BRAZIL	138,000
ARGENTINA	3,000
CHILE	19,000
OTHERS	15,000

**ASIA**

JAPAN	1,285,000
KOREA	335,000
TAIWAN	255,000
CHINA	692,000
THAILAND	93,000
SINGAPORE	61,000
AUSTRALIA	38,000
VIETNAM	43,000
MALAYSIA	6,000
OTHER ASIA	83,000

**EUROPE**

RUSSIA	59,000
GERMANY	73,000

**INTERNATIONAL SALES TOTAL**

---

\$ 3,538,000

## REFERENCES

- Adler, M. and Dumas, B. (1984) "Exposure to currency risk: Definition and management," *Financial Management*, pp. 41-50.
- Ahkam, S.N. (1995) A model for the evaluation of a response to economic risk by multinational companies, *Managerial Finance*, 21(4): 7-22.
- Allayannis, G. and Ofek, E. (1996) "Exchange rate exposure, hedging and the use of foreign currency derivatives," University of Virginia, VA.
- Bodnar, G., Hayt, G., Marston, R. and Smithson, W. (1995) "Wharton Survey of derivatives usage by US non-financial firms," *Financial Management*, Vol. 24 no. 2, pp. 104-114.
- Broder, P. G. (1984) An empirical analysis of the relationship between prices and exchange rates, 1974-82 and an investigation of the foreign exchange risk management function in UK multinationals, PhD dissertation, University of Wales Institute of Science & Technology.
- Dolde, W. (1993) Use of foreign exchange and interest rate risk management in large firms, Working Paper 93-042, November, University of Connecticut, School of Business Administration.
- Dolde, W. (1995) "Hedging, leverage and primitive risk," *Journal Financial Engineering*, pp. 234-256.
- Dumas, B. (1978) "The Theory of the Trading Firm Revisited," *Journal of Finance*, pp. 1019-1029.
- Edelshain, D. (1995) British corporate currency exposure and foreign exchange risk management, PhD dissertation, London Business School.
- Geczy, C., Minton, B. and Schrand, C. (1997) "Why firms use currency derivatives?," *Journal of Finance*, pp. 123-174.
- Goldberg, S., Tritschler, Charles A. and Godwin, Joseph H. "Financial Reporting for Foreign Exchange Derivatives," Purdue University, IN.



- Holland, J. (1992) Foreign exchange risk management - a balanced portfolio, *Managerial Finance*, 18(3): 2-20.
- Jorion, Ph. (1990) "The pricing of exchange rate risk in the stock market," *Journal of Financial and Quantitative Analysis*, pp. 363-376.
- Mello, A. and Parsons, J. (1995), "Hedging a flow of commodity deliveries with futures: Problems with a rolling stack," *Derivatives Quarterly*.
- Miller, K. D. (1998) Economic exposure and integrated risk management, *Strategic Management Journal*, 19:497-514.
- Moffet, M. and Karlsen, J. (1994) Managing foreign exchange rate economic exposure, *Journal of International Financial Management and Accounting*, 5(2): 157-175.
- Nance, D., Smith, C. and Smithson, C. (1993) "On the determinants of corporate hedging," *Journal of Finance*, no 1, pp.267-284.
- Rappaport, A. (1996) "Creating Shareholder Value", New York: Free Press
- Shapiro, A. C. (1992) *Multinational Financial Management* (4th ed.), Allyn & Bacon, London.
- Sundaram, A. K. and Black, J. S. (1992) The environment and internal organization of multinational enterprises, *Academy of Management Journal*, 17:729-757.
- Sundaram, A. K. and Mishra, V. (1990) Currency movements and corporate pricing strategy. In K.S. Khoury, (ed.) *Recent Developments in International Banking*, pp. 203-241 (Amsterdam, Netherlands: Elsevier Science Publishers).