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**FOREIGN EXCHANGE RISK MANAGEMENT: A DESCRIPTION AND
ASSESSMENT OF AUSTRALIAN FIRMS' PRACTICES**

A thesis is submitted in fulfilment of the requirements for the award of the degree

Doctor of Philosophy

From

University of Wollongong

By

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MM., Gadjah Mada University (Indonesia)

The School of Accounting and Finance
2006

CERTIFICATION

I, Bunyamin, declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the School of Accounting and Finance, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

.....

Bunyamin
31st August 2006

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As this study prolonged over a lengthy period, my family paid a great price in the absence of a husband and father who was deeply absorbed in reading journals, books, articles, and typing. First, I would like to thank my adored wife, without whose patient, understanding, and encouragement the completion of this dissertation would not have been possible. Second, I must appreciate my children Nia, Danny, Lia, Faris, and Allan who gave me a hug, smile, and kiss as a cerebral tablet when I was exhausted. Third, my special thanks go to my beloved mother Ibu Rintje I., who always prayed for my success not only during the period of this study but also throughout my whole life. In addition, I would also like to express my gratefulness for my parent-in-law, Ibu Dahniar and Pak Toyib, who always offered me financial, moral, and spiritual supports wherever and whenever I needed.

Finally, I must thank to all administrative staffs in the School of Accounting and Finance for providing their assistance needed during the period of study.

Abstract

The extension of floating exchange-rate regimes and going change in the global nature of business are the two of the most critical factors that constitute business risk today. Australian firms engaging in international business have to manage the adverse consequences of exchange rate movements because firms may confront greater business risk that arises from, among other factors, the volatility of the Australian dollar since floating in 1983, the nature of the Australian products sold overseas, and the increase in international operations of the firm. Recent corporate crashes, indeed, demonstrate the urgency for managing foreign exchange exposure as part of providing adequate corporate governance.

Against this background, this study aims to examine how Australian firms with significant foreign exchange exposure respond to such business environments. Specifically, this study is aimed at identifying and assessing the firms' practices on the management of foreign exchange exposure. This study also goes beyond a descriptive nature by investigating the potential association between firm-specific characteristic variables that may contribute to the efficacy of such practices and management practice variables.

The selected firms in the study comprise large Australian firms covering major industries, both foreign and domestic owned, based in New South Wales with annual sales equal to and greater than \$10 million AUD and those with significant foreign exchange exposure. Data was gathered from Dun & Bradstreet (D&B). From 25,580 Australian firms compiled by the database at June 2002, 9646 firms were based in New South Wales. From this number, 299 firms were selected for sample. A mailed questionnaire was sent to the selected firms and 20.4 percent were found to be useable for analysis.

The first part of analysis is essentially descriptive concerning the Australian firms' practices on foreign exchange exposure management. The description covers issues that are classified into exposure identification, policy adoption, and the techniques used in foreign exchange exposure management. Three types of foreign exchange exposures, translation, transaction, and economic exposures have been recognized by Australian firms of which transaction exposure is the most important form. Most of the surveyed firms identified that foreign sales and purchases were the major source of transaction exposure while forecasts based on 'orders' and 'cash-by-currency' were the principle techniques used for identification. An analysis on translation exposure revealed that the majority of participating firms do not manage this exposure because it is perceived as either not real or it is primarily addressed only at headquarters. A particular analysis on economic exposure showed that many Australian firms recognized this exposure type although only few firms managed it. This indicates an increase in the awareness of this type of exposure.

The analysis also described major aspects of foreign exchange exposure management policy. Most of the participating firms stated that 'the volatility of the foreign exchange of currency with which they are dealing' is the major factor driving the firms' foreign exchange exposure management. In terms of objectives, Australian firms tend to be more conservative and a passive policy is shown to be most popular. A particular analysis on forecasting policy also revealed that most firms undertake

formal foreign exchange forecasts which are mostly supplied by banks in particular forms, namely, 'indication of expected direction of movement' and 'point estimate of the expected rate at given future date'. As with previous studies, it is also reaffirmed that Australian firms have a high degree of centralization.

Finally, the use of internal and external techniques in this study showed that the most two popular internal techniques are 'netting' and 'a multi-currency billing system'. This study also found that there are a large number of firms that do not use any internal techniques due to insufficient information technology skills. With respect to the external techniques, forward contract is the most popular technique used.

The analysis in this study is then carried out to evaluate the efficacy of the firms' practices on foreign exchange exposure management. In general, this study suggests ineffective practices found in many exposure-management elements. In terms of identification, economic exposure is the only exposure that has not been properly identified and it appears to be properly managed by only a few firms. With respect to policy adoption, most Australian firms have a conservative attitude in their foreign exchange exposure management, which is reflected in their preference for a passive policy. Implementing a passive policy, particularly for firms with transaction exposure as their major type, is ineffective because most of the surveyed firms have sufficient forecasting components and a higher degree of centralization. In terms of techniques used, it appears that forward contracts are used as an implementation of passive policy although the use of the forward contracts in this way is arguably ineffective. This is because most Australian firms have employed a sufficient forecasting policy concentrating on currencies they are dealing with in the form of either 'an indication of expected direction of movement' or 'point of estimate at a given future date'. By having this forecasting information, it is possible to save costs by adopting a more active policy.

Finally, there are firm-specific factors that apparently contribute to the firms' practices on foreign exchange exposure management. Chi-squared tests for independence are used to investigate the association between firm-specific variables (firm size, the degree of foreign involvement, and ownership) and management practice variables (the adoption of either an active or passive policy, the degree of centralization and the techniques used). Although, there is no conclusive result, it appears that larger firms use more varied techniques than smaller firms because firm size implies greater resources that are available to cover the costs and potentially have a greater access to expertise. The degree of foreign involvement was found to be the only significant variable associated with the adoption of either an active or passive policy. This also suggests a more conservative attitude amongst firms. The degree of centralization is also another management practice variable found to be the only variable that has a significant association with ownership. It appears that foreign-owned firms need head office approval for foreign borrowing or lending of funds, conducting business involving foreign currencies, and entering into the foreign exchange markets for hedging purposes. Finally, there is a significant association between the degree of centralization and the adoption of either an active or passive policy. This provides a better result than previous studies that suggest an active policy when centralization is implemented. However, it has been found here that Australian firms tend to adopt a passive policy, even though a higher degree of centralization is implemented.

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CHAPTER 1

INTRODUCTION

1.1. Exchange-Rate Risk and Globalization

Exchange rate volatility is one of the most difficult and unrelenting problems in the era of globalization [Whitaker, in Amihud and Levich (1994, p.247)]. Firms with foreign transactions and obligations may face substantial losses due to adverse movements in exchange rates. As reported by Tully (2001), companies like IBM, Polaroid, and Heinz, denominated their sales extensively in Euro while their costs mostly in US dollar, have experienced a considerable squeeze in their profits due to the weakness of the Euro against the US dollar.

Firms are exposed to the adverse movement of exchange rates because of three broad reasons. First, all foreign financial transactions involving cash payments must often be denominated in the creditor's domestic currency. As described by Pedley-Smith (1996), since exchange rates fluctuate between the time of contract and the date of payment, there is the possibility of losses because the amount of money that has to be available for conversion from the debtor's to creditor's currency at the payment date is larger than it was expected on the contract.

Second, the exposure arises because of the size of the foreign transactions. A concise example is presented by Kim and Winsen (2001). The authors describe the size of transactions of Western Mining Company (WMC) which is an Australian based mineral producer of nickel, alumina, copper, uranium gold fertilizers, and other mineral products and has operation in nineteen countries. Although its products are produced in Australia, they are exported and priced in US dollars. When Australian dollar was depreciated against US dollar in the mid 1980s, Australian Firms including WMC experienced great losses due to an increase in foreign obligations.

Finally, the length between the date of contract and the date of payment is also the reason for firms' exposure to foreign exchange rate risk. Many studies looking into exchange rate volatility have suggested that the implementation of floating exchange rates in most foreign currency markets after the collapse of the Bretton Woods in the 1970s resulted in greater exchange rate volatility and

unpredictability [DeGrauwe (1989, pp.121-122); Lee (1994); Jorion and Khoury (1996, p.5)]. DeGrauwe (1989, p.179) for instance, concluded that the forward premia or discounts do not inform the size and the direction of the degree of exchange rate variability.¹ Such volatility implies greater risk for a firm with long-term foreign transactions because the larger the gap between the date of contract and the date of payment, the greater possibility of the firm's transaction value at the payment date deviating from the value written in the contract.

Over the last few decades, an increase in the global nature of business and the extension of floating exchange rates have been two amongst the important factors in currency markets that have brought a significant and continuing increase in potential foreign exchange losses due to exchange rate volatility.

CHART 1.1 INTERNATIONAL MERCHANDISE TRADE

The growth of world export, the amount of foreign currencies traded in the market, the amount of cross-border lending and equity transactions, global stock of derivatives, and outflows of global foreign direct investments have increased

¹ Markets participants often compare the nature of exchange rate volatility by comparing the observed exchange rate changes with the expected exchange rate changes. Interest parity theorem said that the forward premium is the best available forecast of the future exchange rates [Dufey and Giddy (1978); A more detailed Explanation can also be found in Kritzman (1992)].

² Data is available at: <http://stat.wto.org/StatisticaProgram/WSDBStatProgramYear.aspx?>

dramatically (Crook, 1992). The value of world trade for instance, has reached more than ten trillion US dollars and its value continues to increase (Chart 1.1). According to the Bank for International settlements (BIS), foreign exchange bought and sold in the period of 1989 to 1992, reached on average of US\$4930 billion per day and the amount was expected to increase in the future (Hodges, 1993). Nowadays, the number of foreign exchange traded in the market has grown exponentially and accounted for over one trillion dollar per day [Adler (1999); BIS (2002)]. Any firms involved in international transactions may confront greater business risk arising from the adverse consequences of exchange rate movement.

Besides the globalization, Australian firms are more susceptible to the adverse consequences of exchange rate movement due to several reasons. First, the Australian dollar (AUD) was floated in December 1983 and has been very volatile ever since. Chart 1.2 shows that the Australian foreign exchange market has grown rapidly accounted on average for nearly \$AUD 70 billion, and the AUD has become one of the most actively traded currencies in the world market [Maddox (1993); RBA (2005)].

CHART 1.2
THE DAILY TURNOVER of AUSTRALIAN DOLLAR (AUD)

³ Data is available at: <http://www.rba.gov.au/Statistics/Bulletin/index.html>

Another threat arises from the downward trend on the value of AUD against its major trading partners (Chart 1.3). For example, in the beginning of 1984 until the end of 1985, the value of trade-weighted exchange rate index (TWI) dropped by about 30%, and then increased by about 20% in the beginning of 1989. From this point until the end of 1993, the value of TWI went down 20%.

CHART 1.3
THE VALUE of TRADE WEIGHTED EXCHANGE RATE INDEX

The significant effect of exchange rate risk on Australian firms is due to the nature of Australian manufacturers' products sold overseas. According to Australian Bureau of Statistics (2001) major merchandises traded by Australian manufacturers from 1991 to 2000 were dominated by agricultural and mining products. Some of these products are sold under contract in the medium to long-term. Hence, the typical transactions exhibit greater exchange rate risk compared with those of short term.

In addition, the severity of adverse consequences of the exchange rate movement may also be greater for Australian firms with overseas foreign subsidiaries. For example, Western Mining Company (WMC) may face substantial

⁴ Data is available at: <http://www.rba.gov.au/Statistics/Bulletin/index.html>

losses due to conversion from local currency of its foreign-subsidaries' revenue to Australian dollar. The macroeconomic variables, such as inflation, exchange rates, and interest rates of which the firm's subsidiaries operate may also complicate the situation. For example, Asian buyers may take advantage of favorable exchange rate movement (Australian dollar is depreciated against the US dollar) and demand more supply that stimulates price reduction.

An early study by Bureau of Industry Economics (1986) concerning the impact of Australian dollar depreciation in 1985 on importers and exporters revealed that manufacturers charged higher prices for domestic and foreign customers because of cost pressures. Although the depreciation may increase the competitive advantage of Australian products sold overseas, this study concluded that the depreciation also induced higher prices of domestically produced importable and exportable inputs, wage costs, and interest charges.

1.2. The Problem Definition and Significance of Study

Given the observed volatility of the Australian dollar and its impact on the firms, foreign exchange rate exposure has to be managed. Some studies have confirmed the necessity to manage the exposure. An Australian study by Tilley (2001) suggests that firms do recognize the urgency of managing foreign exchange exposure. McPhee (2002) for instance, asserts that risk management is part of best practices in governance and acknowledges, "Members of boards in Australia are likely to continue to receive encouragement for more effective risk management".

Such statements reflect the global pressure for adequate integrated corporate risk management practices as an essential part of corporate governance processes. The integration must also include risk arising from the adverse effect of exchange rate because the adversity is one of the most significant financial risks that will deter the achievement of the corporate goals as well as shareholder' wealth.

McCrae and Balthazor (2000) suggest that the integration includes formulation, the implementation, and policy evaluation. The implications of these policy principles on particular area within the organization, including foreign exchange rate risk management, require all practices to be properly identified. They are crucial inputs of identifying fundamental principles and practices in the

establishment of an effective corporate risk management that must encompass the entire components of organizational risk management practices.

Unfortunately, little is known about the characteristics or adequacy of currency practices by Australian firms concerning foreign exchange exposure management. Existing evidence tends to suggest a variety of divisions characterized by inadequate or no protection for many firms, with only a few firms apply advanced risk management programs. As an example, a survey by the Sydney-based Australian Institute of Company Directors and accounting firm KPMG showed that 60% of firms do not have formal policies in risk management (Tilley, 1997). The lack of knowledge is significant in an effort to reduce this gap, which is useful for future improvements on corporate practices and regulations. The present study therefore, is timely and significant.

1.3. The Dimensions of Foreign Exchange Exposures

Beside the financial impacts of cash losses and increased debt obligations, the adverse effects of foreign exchange have several dimensions for firms with foreign operations. For the purpose of financial reporting, the foreign operational units must often translate items in the financial statement at the common exchange rate that may differ from the rate at which the transaction items prevail. As a result, the parent company will experience exchange gains or losses which, in turn, influences the firm's performance from the perspectives of investors, banks, analysts, and other external users who rely merely on consolidated financial statements.

The adverse effect of exchange rate movements for firms with foreign operations has yet another dimension. A depreciation of domestic exchange rate of the overseas operational units may not only change the value of assets and liabilities that are translated in the currency of the parent company but also increase the competitiveness of exportable products of the operational units [Dornbusch, in Amihud and Levich (1994, pp.15-36)]. Thus, the reported decrease in the assets and liabilities at the parent company do not reflect the true value of the revenue and expense streams of the operational units since any advantage from a depreciation may offset the lower value of assets and liabilities from translation. Hence, an

appropriate measure of the adverse effect of exchange rate movements is the expected cash flows of the operational units.

Although the first and the second dimensions of the adverse consequences of exchange rate movements appear contradictory, it may actually have the same effects on the parent company and the overseas operational units. For example, the decreased value of retained earnings when it is translated at the currency of the parent company may also be experienced by the foreign operating firms. This is because the real economic environment of the operating firms remains unknown (other improving or deteriorating).

Regardless of whether the domestic economic environment where the operational units conducting business improve or deteriorate the obvious effects of exchange rate movements on cash flows of both overseas operating firms and parent company is inevitable. The variability of input costs and a decrease in the products' competitive position may contribute to an increase in variability of the firm's expected cash flows. The persistent variability of cash flows can cause further severe direct and indirect problems including, liquidity [O Kelly (1995); Gerdrup, Lund and Weme (2000); Haddock (2000)], bankruptcy and financial distress [Smith Jr. and Stulz (1985); Stulz (1996)], spoiling investment decisions and the firm's ability to raise capital [Rawls and Smithson, in Chew (1993, pp.357-369)], and the perception of stakeholders, regulators, and society in general of inadequate corporate governance [McGuire, Sungren and Schneeweis (1988); Rosen, Sandler and Shani (1991); Shrader and Hickman (1993); Stulz (2000); Branch (2002)].

1.4. The Focus of Study

This thesis focuses on the state of current foreign exchange risk and exposure management within Australian firms with significant foreign exchange exposure. Two specific issues are addressed in this study. First, it is concerned with current practices of foreign exchange exposure management within Australian firms. Second, this study is concerned with the potential association between firm-specific factors and the practices of foreign exchange exposure management.

1.4.1. First Issue

There have been several extensive studies of foreign exchange exposure management practices conducted in the United States, United Kingdom, and other countries [(among others, Jilling (1978); Tran (1980); Collier and Davis (1985); Soenen and Aggarwal (1989); Collier, Davis, Coates and Longden (1990); Belk and Glaum (1990); Davis and militello (1995); Jesswein, Kwok and Folks Jr. (1995); Makar and Huffman (1997); Wallace (1998)].

Unfortunately, there have only been few studies conducted in Australia [(Weston (1986); Teoh and Er (1988); BIE (1990); Batten, Mellor and Wan (1993); Price Waterhouse Coopers (1990)]. It is not surprising, therefore that the current characteristics and effectiveness of practices on foreign exchange exposure management are not widely known. So, the first research questions concern with this issue on Australian firms with significant international transactions and therefore exposure to foreign exchange rate risk.

The purpose of the first part of the analysis is to identify and describe significant patterns and inter-relationship between selected aspects of current foreign exchange exposure management practices among Australian firms. This part of the analysis is essentially descriptive and evaluative. Three crucial aspects are included in the investigation of current firms' practices of foreign exchange exposure management. These are foreign exchange exposure identifications, policies, and techniques used. In particular, this study attempt to identify and to describe: (1) The types of foreign exchange exposure are being managed; (2) The sources and the primary reasons to manage each type of foreign exchange exposures; (3) The general objectives of managing translation, transaction, and economic exposures; (4) The major policy towards transaction, translation, and economic exposures; (5) The forecasting policies of foreign exchange rates; (6) The policy of how far the decision on managing foreign exchange exposures should be retained at the top level of management of channeled to the lower level of management; (7) The internal and external techniques that are used; (8) The critical factors attributed to the use of internal and external techniques used.

1.4.2. Second Issue

Previous studies have found that the degree of a firm's foreign exchange exposures is associated with firm-specific factors. Jorion (1990) for instance, found that the firm's international operations were a significant factor in determining the degree of foreign exchange exposure of US multinationals. Chow, Lee, and Solt, (1997) and He and Ng (1997) also found that firm size was one amongst the important variables in explaining the firm's degree of foreign exchange exposures. However, these variables have not been examined to a degree in the investigation of a firm's behavior on practices of foreign exchange exposure management.

The second research question, therefore, seeks to identify and evaluate the potential associations between selected firm-specific-characteristic variables and selected management practice variables of foreign exchange exposure among Australian firms. This can be formulated in the following proposition:

Selected firm-specific variables and selected management practice variables are independent one and the other

Specifically, the proposition asserts that there is an individual association between three selected firm-specific variables including firm size, the degree of foreign involvement and the ultimate ownership, and four management practice variables including the adoption of either an active or passive policy, the degree of centralization, the use of internal techniques, and the use of external techniques.

The testing of the proposition is accomplished through the construction of a questionnaire based upon the investigated variables that have been defined and measured. The questionnaire is then coded into the nominal scales for the purpose of analysis. Using Chi-Square test for independence, the association of each variable within the firm-specific characteristics is investigated towards each variable in the management practices. The methodology chapter contains a complete discussion about the selection, definitions, and measurements, of the selected variables and the method of analysis.

1.5. The Contributions of Study

The analysis in this study contributes to the knowledge of the state of corporate risk management practices of Australian firms in several important areas. First, the analysis presents the general characteristics of foreign exchange exposure management of the Australian firms that remain unanswered by previous studies. Previous studies conducted by BIE (1991) and Batten, Mellor and Wan (1993) do not select their sample based on the significant of exposures. Bhati (2000) focused on the small and medium enterprises (SMEs). Hence, only limited aspects of foreign exchange exposure management are analyzed because they are not relevant to large firms. This study adds to the knowledge in these areas as well as the effectiveness of foreign exchange exposure management by Australian firms.

Specifically, the analyses improve a wider understanding on the firms' practices with respect to exposure identification, policies and techniques used by Australian firms. In terms of exposure identification, the analysis expands previous studies by identifying the important aspects relating to each exposure type. Previous studies conducted in the UK and US investigated on the extent of management of each exposure type [among others, Collier and Davis (1985); Belk and Glaum (1990); Davis, Coates, and Longden (1992); and Davis and Militello (1995)]. This study presents a broader description of the firms' risk management practices by investigating additional important aspects of exposure identification such as what the sources are, how they are identified and measured, and their pattern and typicality. Furthermore, this study also improves the Australian study by Batten, Mellor, and Wan (1993) concerning the economic exposure which was the only exposure type that was not properly managed. As suggested by previous studies [Bartov and Bodnar (1994) and Hu (1996)] this study also identifies the extent of recognition on economic exposure among Australian firms.

With respect to risk management policies used by Australian companies, this study integrates broader aspects which are not addressed by previous studies. Studies by Collier and Davis (1985), Collier, Davis, Coates, and Longden (1992), and Belk and Glaum (1990) identified two key policies, namely an active and passive. Beside the key policies, this study also addresses a wider range of important

aspects including identification of major objectives, the percentage cover of each exposure type, forecasting policies, and the linkage of aspects in the policy.

In addition, this study adds to the knowledge concerning with the use of techniques on the firm's risk management practices by identifying the use of internal as well as external techniques. Previous studies in foreign exchange risk management were emphasized primarily on the use of external techniques [Batten Mellor, and Wan, 1993]; Geczy, Minton, and Schrand (1997); He and Ng (1997); and Berkman, Bradbury, Hancock, and Innes (2002)] because internal techniques are merely used to ensure the effectiveness of liquidity and working capital management, and the simplification of daily transaction processing [Rafuse (1996); Field (2003)]. However, they are also used by a firm to reduce the amount exposed to foreign exchange risk [Borenstein, in Antl, (1989, pp. 231-235)]. This study therefore includes identification of internal as well as external techniques and other related aspects such as the frequency of use and several factors that may influence to implement the techniques.

Second, the specific analysis on the types of foreign exchange exposure in this study reduces the gap between theoretical and practical perspectives about the importance of particular type of foreign exchange exposure. Theories in foreign exchange exposure have been disputing whether accounting or economic as a real exposure confronting firms.

From the accounting perspective, foreign exchange exposure should have an effect of on the balance-sheet items when multinationals have subsidiaries in foreign countries (Tran, 1980, p.15). Two methods of translation were finally recognized and currently used namely "current-rate method" and "temporal method" (Herz, Linsmeier, and Bhav, in Klopfenstein, 1997, pp.349-350). These methods prescribe a different reporting rule for exchange gains or losses resulting from the adverse consequences of exchange rate risk. From the economic perspective however, suggests that reported gains or losses resulting from translation of balance sheet items from home into the host country of parent company is inconsistent because of using historical data, no cash consequences, and may cause misinterpretation on financial-statement data [Aliber and Stickney (1975); Pringle and Connolly (1993) and O'Brien 1997)]. An analysis of types, sources, and methods of identification on

each type of exposures by obtaining information directly from Australian firms, provide the practical perspective on the debate.

The second analysis of this study contributes to discover the role of firm-specific factors that appear to be associated with the practices and effectiveness of foreign exchange exposure management by the Australian firms. Previous studies were conducted primarily to investigate the impact of foreign exchange rate risk on the value of firm [Jorion (1990); Lee and Solt, (1997)]. Although UK and US studies have described the corporate practices [Collier and Davis (1985); Collier, Davis, Coates, and Longden (1992); Belk and Glaum (1990); Davis and Militello (1995)], not much is known about Australian firms' practices, policies, their effectiveness, and factors that may influence the firms' practices. There is no recent analysis of such associations within the context of Australian firms with significant foreign exchange exposure. The analysis is useful for the Australian firms on assessing the efficacy of their foreign exchange exposure management consistently and continuously for future improvements particularly to anticipate the increasing demand on adequate corporate governance before they are forced to comply by the legislation.

1.6. The Structure of Thesis

The task in this study is divided into eight chapters. Chapter 1 presents the general issues, significant of study, the nature of foreign exchange rate risk, the focus of study, the contributions of study, and thesis structure.

Chapter 2 contains a review of literature on the importance and the necessity of foreign exchange exposure management within the theory of risk management and corporate governance in which this study is based. The concepts of risk, exposure, and foreign exchange exposure are firstly discussed. The importance of foreign exchange exposure management here is seen from its influence on the value of a firm. The necessities are emphasized on the accounting regulations with which a firm has to comply and the social responsibilities for managing foreign exchange exposure as part of adequate corporate governance.

Chapter 3 explains the three steps of an effective foreign exchange exposure management. These include foreign exchange exposure identification, policies, and

techniques used. This chapter is crucial because it provides knowledge to comprehend the issues investigated and the discussion of analyses.

Chapter 4 contains the methods issues that are crucial for analyzing the data. This chapter includes a brief restatement of the objectives of this study, the selection of firm-specific and the management practice variables and the justification about the relationships between the two variables, the data collection techniques, and the methods of analyzing the data.

Chapters 5, 6, and 7 present the results of this study. Specifically, Chapter 5 contains the description and analysis of corporate practices on foreign exchange exposure management within Australian firms. This analysis covers the description on the identification aspects, policies, and techniques in foreign exchange exposure management. Throughout the description the results of this study are compared and discussed with previous study where appropriate.

Chapter 6 evaluates the effectiveness of foreign exchange exposure management practices among Australian firms. As with Chapter 5, the analysis is organized by evaluating foreign exchange exposure management aspects, including the identification, policies, and techniques used, respectively. Results on each aspect are then discussed in terms of its efficacy based on the previous studies suggesting an effective foreign exchange exposure management. This segregation however, is meaningless to be stand alone because between one and another aspect are intertwined.

Chapter 7 presents the potential association between firm-specific characteristics and four management practices (the adoption of either an active or passive policy, the degree of centralization, and internal and external techniques used) in foreign exchange exposure management.

Finally, the results of the study and suggestions for future research are presented in Chapter 8. The summary includes restating the objectives of this study, the issues investigated, and the necessary steps taken in this study. The summary of results is the following content of this chapter. Finally, the numerous limitations of this study are presented and accompanied with possible suggestions that are useful for future research.

CHAPTER 2

THE CONCEPT OF RISK, EXPOSURE, AND THE IMPORTANCE AND THE NECESSITY OF MANAGING FOREIGN EXCHANGE EXPOSURE

Introduction

The purpose of this chapter is to explain the concept of risk, exposures, and to discuss the importance and the necessity of foreign exchange exposure management within the theory of corporate risk management and corporate governance in which this study is based. This chapter is divided into five sections.

Section 2.1 explains the concept of risk. This includes the meanings and types of risks confronting firms. The importance of this section is, First, to provide information for the readers of the other types of risks in order to be able to locate foreign exchange exposure within business and financial risk. Second, this will narrow the subject and define the boundaries of this study. Section 2.2 describes the difference in concept between foreign exchange risk and exposure because they are conceptually different and the term foreign exchange exposure is used throughout this study instead of foreign exchange rate risk. Section 2.3 and Section 2.4 are concerned with the importance and the necessity in managing foreign exchange exposure. The importance of foreign exchange exposure management in Section 2.3 is discussed by looking at the impact of foreign exchange exposure management on the value of the firm. The necessity of foreign exchange exposure management is also seen from the perspective of accounting regulations with which firms have to comply and the pressure from societies of adequate corporate governance (Section 2.4). Section 2.5 discuss the necessity of foreign exchange exposure for a firm by looking at the four famous theories including Purchasing Power Parity (PPP), Modigliani-Miller theorem (M-M), Capital Asset Pricing Model (CAPM), and the efficient market hypothesis, which are somewhat disagree with foreign exchange exposure management. This chapter is then summarized in the Section 2.5.

2.1. The Concepts of Risk

This section describes briefly the meanings, measurement, and the types of

risk. The descriptions are useful for: (i) providing the basis of understanding about the focus of this study; (ii) assisting to create boundary for this study in the sense that risk arising from the adverse consequences of foreign exchange rate movement is the one type of risk confronting firms.

2.1.1. Meaning of Risk

There are many definitions of risk. According to Webster Dictionary, risk is defined as something bad that may occur. In daily use and business in general, risk means condition or choices that have certain consequences of loss or danger (Chorafas, 1992, p.21). In probability and statistics, financial management, and investment management, risk is used to describe the likelihood of variability in outcomes around expected value (Harrington and Niehaus, 1999, pp.3-4), which is often measured by the extent of the dispersion around the mean or average value of the underlying variables (Moosa, 1998, p.416). Thus, the term risk, which is used here, refers to the situations where outcomes are uncertain that may lead to the losses.

2.1.2. Foreign Exchange Risk: One Type of Business Risk

Risk can be broadly classified into two groups business and financial (Jorion and Khoury, 1996, p.2). Business risk is associated with the operating environment such as technological changes, marketing, etc. Financial risk includes foreign exchange rates, interest rate, and commodity prices.

A more comprehensive classification has been presented by Harrington and Niehaus (1999, pp.4-10). In this classification, the business risk is divided into three types, price, credit, and pure. Price risk refers to uncertainty of cash flows owing to changes in output and input prices. Credit risk occurs mostly in financial institutions because loans are the primary products. Since there is a probability of default by the borrower, firms engaging in this business face credit risk. Non-financial firms are also vulnerable to this risk due to credit selling. The difference between financial and non-financial firms is the magnitude of the risk. Finally, pure risk refers to risk arising from three sources. The first source is risk of reduction in value of business

assets on account of physical damage, theft and expropriation. The second source is risk resulting from legal liability from harm to customers, suppliers, shareholders, and other parties. Finally, there is risk that may force a firm to pay benefits to injured workers which it is not covered by the workers' compensation.

According to Harrington and Niehaus (1999, pp.4-10), foreign exchange rate risk is only one source of price risk. This arises from fluctuations of input prices as a result of exchange rate movements. This type of risk occurs due to firms' activity to obtain inputs from foreign countries. The reasons for obtaining inputs from foreign markets are often dictated by several considerations, including price, quality, and availability. Under similar considerations, firms expand their operation by selling products in foreign countries. Since the sales price is affected by exchange rate changes, firms are exposed to foreign exchange rate risk.

This section shows that risk arising from the adverse movements of exchange rate, which is the major concern of this study, is only one type of financial risk that confronts firms. Obtaining inputs, selling outputs, borrowing or lending, and acquiring assets denominated in foreign currencies, are examples of business activities that may constitute losses due the risk.

The next section explains the difference in meaning between foreign exchange risk and exposures. This distinction is very important because the term foreign exchange exposure is used throughout this study and the terms are conceptually different.

2.2. Foreign Exchange Rate Risk and Exposure

In the literature on foreign exchange risk, the word risk is often used interchangeably with exposure. Although these words have a close relationship, the meaning is different (Moosa, 1998, p.420). Moosa (1998, pp.420-421) also argues that risk is usually concerned with the probability of an unexpected outcome, while exposure is concerned with the magnitude of the possibility of loss.

An example of daily activity may help to clarify the difference. A person on leaving home may often worry about his or her property being stolen. This means that there is a risk in leaving home. In this case, exposure is the value of the property contents in the house. How big the exposure faced by the person, is dependent upon

all assets that may be stolen. If the value of the property is restricted only to electronic goods, such as, TV, VCR, a computer, etc., which have a value of \$A 10,000, the exposure of leaving the house is \$A10,000.

As discussed above, the definition of foreign exchange risk differs to foreign exchange exposure. Levi (1996, p.293) defines foreign exchange risk as "related to the variability of domestic-currency values of Assets, liabilities, or operating incomes due to unanticipated changes in exchange rates, whereas foreign exchange exposure is "what is at risk". From this definition, there are two points which require explanation. First, foreign exchange risk arises as a result of uncertainty about the future spot exchange rate. Second, as a result of uncertainty about the future spot exchange rate (due to the variability of exchange rates), the domestic value of assets, liabilities, operating incomes, profit, rates of return, and expected cash flows that are stated in foreign currency are uncertain.

Levy's definition of exposure as 'what is at risk', principally follows Adler and Dumas (1984) who define foreign exchange exposure as the "sensitivity of changes in real domestic-currency value of assets, liabilities, or operating incomes to unanticipated changes in exchange rates". From this definition, at least three points can be underlined. The first is the sensitivity of the domestic currency value of the several items. The meaning of the word sensitivity is defined to show the degree to which the home currency value of the items is changed as a result of exchange rate changes. Moosa (1998, p.420) briefly states that foreign exchange exposure is the dollar amount exposed to foreign exchange risk. From this perspective, cash flows that are sensitive to exchange rate changes are at risk.

The next point to be underlined is that exposure can exist on assets, liabilities, and operating incomes. Exposure exists on foreign assets when the real domestic currency value of foreign assets rises and when the foreign currency appreciates, and vice versa. This relationship can be simplified with the following regression equation:

$$\Delta(A/L) = \beta \Delta S \quad (2.1)$$

Where, ΔA and L are changes in the real domestic currency value of foreign assets or liabilities, ΔS is changes in exchange rates, and β is the slope of the equation as well as a measure of exposure. The larger the value of β the more

sensitive the value of the assets towards exchange rate changes, and therefore, the larger the exposure.

Finally, this definition is concerned with unanticipated changes in exchange rates. This means that there is also a change in exchange rates that are anticipated. Dufey and Giddy (1978) define anticipated exchange rate changes as the difference between today's spot rate and forward rate whereas unanticipated change is the difference between forward rate and the actual future exchange rate. These explanations clarify the difference between foreign exchange exposure and foreign exchange risk. Therefore, the term foreign exchange exposure will be used throughout this study because it focuses more on the amount exposed to foreign exchange rate risk rather than its variability.

2.3. The Importance of Foreign Exchange Exposure Management

This section provides arguments on the importance of foreign exchange exposure management by looking at its impact on the value of the firm. The role of these arguments for this study is, first, to provide the readers about underlying theories concerning with the necessity for a firm to have proper exposure identification, policy establishment, selection of techniques, and its continuous assessment and improvement in order to establish an effective foreign exchange exposure management program since it influences the value of the firm. Second, the arguments provide not only theoretical but also practical justifications to signify the importance of the analyses. The theoretical justification on the importance of foreign exchange exposure management is presented by providing counter arguments for theories Purchasing Power Parity (PPP), Modigliani-Miller theorem (M-M), Capital Asset Pricing Model (CAPM), and the Efficient Market Hypothesis that challenge the necessity for managing the exposure. The practical justification is seen from both, the perspective of accounting regulations with which a firm has to comply and the demand from societies for an adequate corporate governance.

Under this heading five sub-sections are constructed. Three sub-sections accommodate several ways of foreign exchange exposure management that can increase the value of the firm and two sub sections are devoted to provide empirical evidence in relation to the importance of foreign exchange exposure management.

2.3.1. Foreign Exchange Exposure Management and the Value of Firm

Rawls and Smithson (1990) argue that a sufficient condition for managing foreign exchange exposures is that it increases the expected value of the firm. The value of the firm is the present value of the projected cash flows; that is, cash flows that have been discounted at a certain rate reflecting both the degree of risk in the business and the financing generated from many sources used by the firm (Damodaran, 1997, p.784).

Rawls and Smithson (1990) list three ways of increasing firm value by implementing exposure management: (i) Reduction in tax; (ii) The reduction of the expected cost of financial distress; (iii) Improving investment decisions and increasing the ability to raise capital.

Rawls and Smithson (1990) begin with the argument that the value of a firm is the sum of all future expected net cash flows (ENCF) that has been discounted by cost of capital. This statement can be written in the following formula:

$$V = \sum_{t=0}^T \frac{E(NCF_t)}{(1+r)^t} \quad (2.2)$$

Based on this formula, therefore, the value of a firm can be increased in two ways, either by increasing the expected net cash flows or decreasing the cost of capital.

2.3.2. The Reduction in Taxes and Exposure Management

With respect to increasing the expected the net cash flows, it is important to notice that it is implicitly concerned with the reduction of the out flows. One way to increase the net cash flows is by reducing the amount of tax in the pre-tax income. Exposure management can reduce the expected pre-tax income if a firm effective tax schedule is ‘convex’, that is, the amount of tax should be paid increase as the pre-tax income rises (progressive tax rate). The more convex the corporate tax schedule, the more benefit from exposure management can be gained [Smith Jr. and Stulz (1985); Stulz (1996)]. The reason for this is that exposure management can presumably

smooth out the pre-tax income. Since the amount of pre-tax cash flows moves in the mean, the amount of tax to be paid is less than that of pre-tax with variability.

2.3.3. Exposure Management and Expected Cost of Financial Distress

Besides the reduction in taxes, the value of a firm can also be increased by reducing the expected costs of financial distress. Grinblatt and Titman (1998, p.543) define financial distress as a situation where firms are close to bankruptcy even though they may never actually go bankrupt. Firms can be categorized as in financial distress when their income is not sufficient to cover all fixed claims. The probability of financial distress is determined by two factors. The first is the firm's ability to pay fixed claims. Another factor is firm's income volatility. The second factor should be considered as a determinant of probability of financial distress because the more volatile firms' income the higher the probability of default (Rawls and Smithson, 1990).

If financial distress leads to bankruptcy, there will be many expenses that should be paid. And there must be some dialogue between the management of the bankrupt firm and the creditors. There are also legal expenses to be paid, such as, court costs and advisory fees. The expected costs of financial distress arise from three sources (Peirson, Brown and Howard, pp.491-499). First, costs arising from the legal and administrative expenses of bankruptcy including court costs and advisory fees (direct costs). Second, costs arise from conflicts between debtholders and equityholders (indirect costs). Finally, costs arising from non-financial stakeholders, such as customers, employees, suppliers, and the community in which firms operate (indirect cost).

It has already been mentioned that exposure management could reduce the variability of expected future cash flows while the stability of cash flows can reduce the probability of financial distress. Therefore, foreign exchange exposure management increases the value of the firm by decreasing the problems associated with financial distress.

2.3.4. Exposure Management and Investment Decisions

In order to address the effect of exposure management as a financial policy towards investment decisions, it may be useful to look back to the central argument of the Modigliani-Miller theorem (1958) in which they argue that financing decisions, choosing between debt and equity, have no implications for investment. In the following description, the role of currency management on maintaining the stability of the firm's cash flows will explain how a financing decision will improve investment decisions and increase debt capacity. For this purpose, the cause of investment problems is explored, particularly those arising from conflict between debtholders and equityholders.

The conflict between debtholders and equityholders that is acknowledged as one aspect of the agency problem was introduced by Jensen and Meckling (1976). Basically, the problem arises because of self-interest towards claims between them. On the one hand, bondholders have fixed claims so that they have to bear most of the firm's risk. On the other hand, equityholders have claims based on a certain percentage of firm's cash flows. The real cause of the problem between them is the perception by debtholders that equityholders tend to dominate decisions in the firms. Therefore, managers of most firms will take action on behalf of the equityholders, thereby, maximizing the shareholders' benefits.

It can also be said that there is a possibility of the managers ignoring the interest of debtholders. For example, a firm's manager may take a risky project that has a high variability in its cash flows. If the risky project fails, the bondholders will bear all the risk. On the contrary, if the project is successful, the bondholders have fixed claims from the coupon rate. Unlike bondholders, equityholders will have more claims if the project is successful. The conflict can be reduced if the managers are able to convince bondholders that the variability of the cash flows can be smoothed out through managing exposure. At the same time, the conflict between them can be eased because bondholders will consider the project is not too risky and the equityholders will choose low-risk projects because a high-risk project means an increase in the cost of protecting the cash flows.

The conflict between debtholders and equityholders can usually be found in highly leveraged firms, that is, those with a larger portion of debt than equity to

finance the investment. Myers (1977) has recognized this problem widely known as ‘under investment’. The conflict between debt and equityholders occurs when the firm has a plan to finance a new investment with more debt. Certainly, this situation does not bring benefits within the perspective of current debtholders because financing investment using more debt will be more risky. As a result, the debtholders tend to limit the firm’s borrowing in the future or the existing bondholders will ask higher rate as compensation to bearing a higher risk. Due to this limitation, the firm has difficulty in financing the new investment with more debt. Consequently, although there is a project that has positive NPV, the equityholders will not take the investment particularly if the value of the firm assets is low because the bondholders will receive the benefit if the positive NPV project is taken.

This problem can be eased by the implementation of exposure management. Froot, Scharfstein, and Stein (1993) for example, developed a general framework for analyzing corporate risk management policies. Froot, Scharfstein, and Stein (1993) argue that currency exposure management can be implemented when the cost of external sources of funds are more expensive than of internal. If a firm does not manage exposures, there might be some variability in their cash flows. According to the authors, there will be two implications resulting from such variability. First, there will be variability in the amount of money raised internally. Second, there will be variability in the amount of investment. The investment and financing plan will be disturbed by a variability of cash flows. Therefore, maintaining the stability of cash flows in currency management is a logical argument because firms that have difficulty in financing investment using external sources of funds will rely on their internal sources.

2.3.5. Empirical Evidence of Exposure Management on the Financing Decision

The benefit of exposure management on the planning process of investment is a commonly held in finance literature. However, there have been disputes among researchers. Some researchers have argued that there is no relationship between the implementation of exposure management and the degree of leverage in a firm’s capital structure. Others conclude that there is a relationship which can avoid conflicts between debt and equityholders.

Wall and Pringle (1989) for instance, examined the characteristics of firms using interest rate swaps and the various explanations concerned with the development of the products. The authors described the phenomena using 289 the U.S. swap users firms collected from the National Automated Accounting Research System (NAARS) database. When agency cost was considered, the authors found that the behavior of the firms using interest swap to reduce their agency problem was not strong enough. For example, "six firms are paying fixed rates and have credit ratings of AA- or better and five firms are paying a floating rate and have credit ratings of BB or lower" (Wall and Pringle, 1989, p.67). The explanation of this finding is based on the use of short-term debt and swaps to solve agency problems. Normally, firms with higher risk (low rated) tend to issue short-term debt, and then swap to pay a fix rate for floating rate incomes. In this case, the under investment problem can be reduced because all investment gains go to shareholders. On the other hand, shareholders cannot choose risky projects because this action will increase the risk premium of the outstanding short-term debt.

Another important study that had similar finding was conducted by Nance, Smith, and Smithson (1993). This study examined the benefit of hedging among forward, future, swaps, and option users in which firm-specific characteristics were incorporated in their analysis. The data used for this analysis is based upon a questionnaire mailed to the firms' CEO in the Fortune 500 and the S&P 400 covering 169 firms in 1986. The empirical finding of this study is that there is a negative correlation between the degree of leverage measured by debt-to-equity ratio, in the capital structure and hedging. Hedging does not have an effect on the conflict between debtholders and equityholders raised from the degree of leverage. The reason for this inconsistency with the benefit of hedging to reduce underinvestment is because firms that have a bigger leverage usually also have smaller investment options, then hedge less since there are no sufficient funds for hedging.

The studies mentioned above have concentrated on the possibility to ease the conflict between debtholders and equityholders associated with underinvestment based merely upon obtaining capital from external sources (Nance, Smith, and Smithson, 1993). Regardless of the firm's ability to generate external sources of fund for investment, the fact is that maintaining stability of cash flows associated with exchange rate movements is a crucial aspect in the modern corporate finance. Lewent

and Kearney (1990, p.25) in their explanation of Merck & Co's currency management strategies, explain that in spite of external factors such as capital markets, regulations, and overseas investors, there are two internal factors motivating the management for hedging. The first factor is "the large portion the company's overseas earnings and cash flows". The reason for this is that different methods of doing business in which customers are billed on the local currency. Certainly, the effect of foreign exchange fluctuations on this industry is inevitable. The second factor is that "the potential effect of cash flow volatility on our ability to execute our strategic plan-particularly, to make the investment in R&D that furnish the basis for future growth". As a pharmaceutical industry, this reason is understood because of its long-planning horizon in which the complexity of research and the process of product registration are taken place. The Merck & Co's hedging strategy is an excellent example of the importance of currency management on maintaining cash flows' stability. In fact, Merck & Co is a big firm that can get easy access to external capital. However, it has an internal concern about its cash flows.

The exposure management strategies at Merck & Co have shown that the benefit of hedging to alleviate the underinvestment problems resulting from conflict between debtholders and equityholders is not confined with searching for more debt. Nance, Smith, and Smithson (1993) and Geczy, Minton, and Schrand (1997) have found that firms with a higher growth in their investment opportunity set are more likely to use derivatives to reduce the variance in the firm's value. Consistent with Lewent and Kearney (1990), the authors measure the firms with larger growth based on R&D expenditures and book-to-market ratio (BM).⁵

The explanation for why firms spending more on R&D tend to hedge more is due to the higher probability of financial distress. It was mentioned in the sub section two that highly leveraged firms had a greater probability of financial distress. Opler and Titman (1994) have found that highly leveraged firms lose their market share more than those with less leverage during industry downturns. According to the study, there are three possible causes of losing market share.

⁵ Book-to-market-ratio is the ratio between book value of equity (BV) and its market value (MV). This ratio shows share prices relative to book value. Firms with high MV/BV have low share price relative to book value. These firms tend to have lower profitability and are susceptible to financial distress (more detail in Fama and French (1995)). Therefore, MV/BV can be used as a proxy variable of firms with higher growth in their investment opportunity.

First, it is caused by competitor reaction ('competitor driven'). Firms that are financially stronger may take advantage of the condition by aggressive advertising or pricing their products to drive out the susceptible competitors. The second cause is called 'manager-driven', that is, managers may downsize the firms to achieve efficiency by for instance, selling unproductive assets. Third, customers may be reluctant to do business with distressed firms ('customer-driven'). When R&D is considered, the authors also found that customers would be more hesitant to deal with the firms that spent more on R&D. This is due to a customer perception that a high R&D expenditure indicates that those firms are specialized in the products. Consequently, highly leveraged firms with high R&D expenditure will be more susceptible to bankruptcy.

2.3.6. Empirical Evidence on the Effect of Foreign Exchange Exposure on the Value of the Firm

Previous sections (Section 2.3.1; 2; 3) described the importance of foreign exchange exposure management to increase the value of the firm through its ability to reduce the variability of cash flows. The influence of foreign exchange exposure on the value of the firm has yet not been confirmed. This section provides empirical evidence of the effect of foreign exchange exposure on the value of firm to confirm the need for foreign exchange exposure management.

It is widely accepted in the international finance literature [Eiteman, Stonehill and Moffett (1998); Levy (1996); Moosa (1998); Shapiro (1999); Bakers (1998)] that the volatility of exchange rates has dramatically increased since the 1970s. As a result, firms with foreign assets and liabilities are exposed to risk arising from exchange rate movements [Amihud and Levich, in Amihud and Levich (1994, pp.1-3)]. This was the subject of extensive investigation in the 1980s and continues into the present. Some studies are more concerned with stock price reactions while others investigate the stock returns.

An example of studies looking at stock price can be found Ma and Kao (1990). The authors examined the linkage between exchange rate changes and equity markets in the six major industrialized countries. The authors examined stock price reactions to exchange rate changes across many countries including UK, Canada,

France, West Germany, Italy, and Japan. Under the floating rate regime, stock returns are affected by two types of exposure, transaction and economic. Transaction exposure arises when gains and losses from the settlement of investment transactions denominate in the foreign currency. From the investors' perspective, therefore, high exchange rate levels reflect the attractiveness of investments since it causes favorable movements in stock prices. Economic exposure arises because exchange rate changes constitute variation in firms' discounted cash flows. Therefore, exchange rate levels and exchange rate changes determine the equilibrium of the relative stock price. The authors found mixed evidence regarding this exposure. On the one hand, for an export-dominant country, the currency appreciation has negative effect on the domestic stock market due to the reduction of export-markets competitiveness. On the other hand, for a dominant-import country, the appreciation causes positive impact on the domestic stock market since it causes lower input costs.

Jorion (1990), following the exposure definition of Adler and Dumas (1984), used regression analysis to examine the impact of exchange rate changes, which were measured by the rate of change in trade-weighted exchange rate, on the stock return of US multinationals. The result shows weak evidence, which is similar to the Bodnar and Gentry (1993). However, a further test has shown that exposure is closely related to the firms only with a high degree of foreign involvement, which has been extensively investigated by Errunza and Sanbet (1981).

The weak evidence in the study by Bodnar and Gentry (1993) was caused by the claim that the stock prices do not fully reflect changes in the dollar on a timely basis (Bartov and Bodnar, 1994). An interpretation of this result reveals that investors misprice the estimation of the relation between fluctuation in the dollar and firm value due to several reasons. One possible reason is that the fluctuations of the US dollar do not constitute stock price adjustment instantly. As suggested by Amihud (1994, in Amihud and Levich, pp.52-53), the effect of lagged exchange rate changes should also be examined when investigating its impact on the value of firms.

Even though the study of Bartov and Bodnar (1994) found the reason for the weak evidence of currency fluctuation and the firm's value, the authors have failed to show the relationship. In contrast to the previous studies of 409 US multinationals, Choi and Prasad (1995) found that the firm's value of sixty percent during the period of 1978-1989 were affected by US dollar fluctuations. The contradicting evidence is

due to the difference in research design. The authors argue that the macroeconomic factor including exchange rate risk will not have the same effect on all firms. Every firm has a different sensitivity to exchange rate risk depending on operating profiles, financial strategies, and other firm-specific variables. The result has confirmed this argument, even if firms are grouped based on similar line of business, and are still heterogeneous in terms of operational and financial characteristics.

Another recent study of the US multinational firms investigating the impact of exchange rate fluctuations on the value of firms was conducted by Chow, Lee, and Solt (1997). Using regression analysis towards the trade-weighted exchange rate changes and stock returns of 213 US multinational firms, the authors found strong evidence regarding foreign exchange exposure. Moreover, a further test to find the determinant of the exposure shows that firm size is a primary factor. This is consistent with the previous studies. Chow, Lee, and Solt (1997) however, failed to prove evidence for foreign to total sales as determinant of foreign exchange exposure, which is found to be a strong variable in Jorion (1990), and Choi and Prasad (1995).

In summary, the impact of exchange rate changes appears to be related with the value of the firm. Most of the above studies have employed the regression method to obtain beta as a definition of exposure suggested by Adler and Dumas (1984). Since beta reflects the sensitivity of the firms' value towards exchange rate changes, each firm has a different sensitivity and the magnitude is changing over time depending on the operational and financial characteristics.

Studies in this group have been conducted primarily using the US and UK multinationals. Only few similar studies were found to be of Australian content and only one, study by Loudon (1993), investigated the economic exposure of Australian firms. A recent study on this relationship is quite rare in Australia. This may be due to the fact that studies conducted on UK and US multinationals have found similar results. Hence, it may be assumed that similar results would be achieved on Australian studies. Even though studies in this group contribute to this present study in terms of the significant effect of firm specific characteristics in determining the currency exposure, there are at least two limitations.

First, firm-specific characteristics such as, firm size, the degree of foreign involvement, leverage, and other factors are important in explaining the impact of

foreign exchange exposure on the value of the firm. Unfortunately, these variables have not been investigated to any degree to determine a firm's behavior in managing its exposure.

Second, these studies are devoted primarily to investigating only one type of exposure, economic. In fact, translation and transaction exposures that occur simultaneously in affecting the firm's value are also important.

It is timely and therefore relevant for this study to focus not only on economic but also other exposure types. Firm-specific characteristics are variables investigated in the present study in terms of their relationship with the behavior of firms in managing foreign exchange exposures. Finally, studies to date have been conducted primarily using US multinationals.

2.4. Corporate Governance and Foreign Exchange Exposure Management

The necessity of foreign exchange exposure management is also determined by other factors, such as, accounting regulations, government, community, and banking. The following explanation is devoted to discuss the facets of foreign exchange exposure management from this perspective. Accordingly, two sub sections are constructed. The first deals with the accounting regulations. Two major aspects, translation including objectives and method, and accounting considerations for hedging (hedge accounting), are briefly explained. The second deals with the necessity of foreign exchange exposure management as a result of pressures from societies.

2.4.1. Translation; Definition, Objectives, and Methods

Currency translation plays an important role in foreign exchange exposure management because of accounting regulations with which a firm has to comply. In here, the meaning, objectives and the methods used are briefly discussed. The relevance of discussing this issue is because the first objective of this study is to describe the corporate practices in foreign exchange exposure management. This also includes the purpose of translation.

Basically, translation means conversion of foreign subsidiaries' financial statements denominated in foreign currencies into the home currency of the parent company for financial reporting (Grinblatt and Titman, p.732). Therefore, all items in the balance sheet and income statement have to be remeasured using common exchange rates.

In terms of terminology used, some authors distinguish the meaning between translation and other terms, such as, conversion or restatement. The term conversion means the exchange of one currency into another currency through banking channels (Chinlund, 1936). Other authors, Watt (1961) and Parkinson (1972, p.17) define translation as a restatement of amounts in one currency in terms of another currency. The primary difference between one and another is to assert that there are particular purposes or reasons to translate or convert balance sheet and income-statement items.

There are reasons to translate foreign financial statement into the home currency. First, a translated financial statement is often used as a measurer of subsidiaries' performance [Robin and Stobaugh (1972); Mauriel (1969); McInnes (1971)]. Second, it is used to provide accurate information for decision makers and investors (Walker, 1973).

Sercu and Uppal (1995, pp.517-518) summarize the purposes of translation for several following reasons: (1) Translation is used for tax purposes. Income earned by foreign subsidiaries is taxable in the home country of the parent company; (2) Translation is utilized for preparing consolidated financial statement; (3) Translation is often a useful guide for making a decision on investment and other financial decisions; (4) Translation is often used by external users, such as, investors, creditors, and financial analysts, to value the firm.

Since there are purposes in the translation, there should be a method in order that it provides a useful meaning, either for internal or external users. So far, there are two methods, which are used internationally, the current rate and the temporal method (Eiteman, Stonehill, and Moffett, 1998, pp.270-277).

Current rate method requires all financial-statement items are translated at the current exchange rates. Under this method, assets and liabilities are translated at the exchange rate in the effect of balance sheet date while income-statement items, revenues, expenses, gains and losses, are translated at the actual exchange rate when they were incurred or the weighted average exchange rate for the period of reporting.

Temporal method entails translation of monetary assets and liabilities at the current exchange rate whereas non-monetary assets and liabilities are translated at historical exchange rates. Income-statement items are translated at the average exchange rate for the period except cost of goods sold and depreciation translated using an historical rate. Distribution has to be converted at the rate when payment date takes place, and historical rates are used for translating equity items, common stock and paid in capital accounts.

With respect to which method should be used, there are rules that are fairly uniform throughout the English-speaking world (Nobes and Parker, 1995, p.196). British (SSAP 20) and Australian (AASB 1012/AAS 20) standards make obligations that current rate method should be used for self-sustaining subsidiaries and temporal method should be used for integrated subsidiaries.⁶ The American (FASB 52) standard requires functional currency, which has a similar pattern with determining the characteristics of foreign affiliates.⁷ The primary difference is that the Australian and British accounting standards allow the use of either average or closing rates for revenue and expense items.

2.4.2. Hedge Accounting

Beside the translation, accounting regulations require foreign exchange transactions for hedging to be recorded. Hedging particular items of the balance sheet, purchasing instruments, such as, forward contract, futures, options, and other derivatives, may result in gains and losses that are subject to accounting regulations.

Foreign exchange transactions for hedging are called hedge accounting. It generally means that gains or losses from the hedge positions are recognized in the same period of gains or losses on the hedge items are recognized [Herz, Linsmeier and Bhav, in Klopfenstein (1997, p.319)]. The recognition of gains and losses from

⁶ Self-sustaining affiliates are those operate in the local economic environment independent of the parent company whereas integrated foreign affiliates are those operate as an extension of the parent company, with cash flows and general business lines are highly interrelated with parent (Eiteman, Stonehill, and Moffett 1998, p.269).

⁷ Foreign affiliates are characterized based on functional currency, which determine the appropriate use of translation method. Several indicators used, such as, cash flows, sales price, sales market, expenses, inter-firm transactions and arrangements, and financing, to determine the functional currency of foreign affiliates (more detailed explanation can be found in Herz, Linsmeier and Bhav, in Klopfenstein (1997, pp.346-356).

hedging has to comply with a set of complex rules when a firm has to hedge its balance sheet. For example, FASB 52 provides guidance for every hedged item, such as, monetary assets and liabilities, net investment, firm commitment, and other balance sheet items, and the recognition and treatment of gains and losses [See, for example, Leger and Fortin (1993); Herz (1994)]. British and Australian standards make their own regulation based on recommendations from SFAS 52, international accounting standard (IAS), and other international accounting bodies in an effort to enforce uniform accounting disclosures on financial reporting (Knapp and Connolly, 2001).

The purpose of this section is not to describe accounting regulations encompassing all aspects in detail, but only describe briefly the accounting consideration on hedging. This is an attempt to highlight the importance of foreign exchange exposure management in the sense that foreign exchange exposure has to be managed, not only to ease the adverse effect of foreign exchange rates but also to consider accounting practices with which firms have to comply, in the business environment wherein they operate.

2.4.3. Social Responsibilities

So far, the literature in financial areas has provided the rationale for managing foreign exchange exposures. As above described, foreign exchange exposure management can increase the value of firm through several ways, reducing taxes, reducing the expected cost of financial distress and increasing the ability to raise funds (Rawls and Smithson, 1990), which in turn, maximize the shareholders' wealth.

In the perspective of modern corporations, risk management in general should also be responsible to a broader constituency (Harrington and Niehaus, 1999, pp.27-29). The understanding and commitment of reducing potential environment hazards, job creation, redistribution of income, and other public goals, are social responsibilities, have to be taken into consideration as an extension of responsibility to broader constituencies. Pratt (1997) suggests three areas of focus of the constituency, which are in line with the stakeholder theory, in order to be effective in

performing firms' social responsibility, these are, employees, the environment, and the community.

There are reasons for the importance of Social responsibilities because, first, as suggested by the stakeholder theory, the corporation lives at the intersection of a variety of interests; it is a small part in the composite relationships of dependency and expectation (Wood, 1991). Therefore, from the managerial viewpoint, the success of a corporation is dependent on an ongoing process of stakeholder management in which the interest and demands of stakeholders are identified and dealt with appropriately [(Freeman and Reed (1983); Freeman and Liedtka (1991))].

Second, non-shareholders constituencies react to both, financial and social decisions made by firms. The Wall Street Journal reported customers' reluctance to buy computers from Wang, a computer firm, due to financial difficulties (Bulkeley, 1989). Another similar example to buy firm's product due to fear of bankruptcy was experienced by Chrysler, car manufacturer industry. The firm lost its market share when the firm needed government loan guarantees (Times, 1981).

The reaction of the constituencies on firm's decision in social activities can also be seen from the connection between social and financial performance of corporations.⁸ McGuire, Sungren, and Shneeweis (1988) argue that a firm perceived as high in social responsibility may face relatively fewer labor problems or customers may be more favorably disposed to its products. Alternatively, corporate social responsibility might improve a firm's reputation and relationship with bankers, investors and government officials. Improved relationships with them may well be translated into economic benefits. According to Rosen, Sandler, and Shani (1991), Graves and Waddock (1994) and Pava and Krausz (1996), a firm's corporate social behavior seems to be a factor that influences banks and other institutions influencing investors' investment decisions. Hence, a better profile of social responsibility may improve a firm's access to sources of capital.

Foreign exchange exposure may fit into corporate social responsibilities as above described. Generally, the objective of managing foreign exchange exposure is

⁸ Social performance can be measured by a variety of indicators, such as, the ability to select good people, the quality of product or services, environmental responsibility, and community responsibility, and other social indicators [more detail in Cotrill (1990); Abbott and Monsen (1979)], while financial performance can be measured using traditional approach, such as, ROE, ROA, and ROI (McGuire, Sungren, and Schneeweiss, 1988).

a means of protecting the firms' survival. In a broader context, the firms' survival may well be translated not only to maximize shareholders' wealth but also to guarantee that they can continue to carry their societal roles and social responsibilities (Kaen, 2000, in Frankel, Hommel, and Rudolf, pp. 258-259).

2.5. The Failure of Argument against Foreign Exchange Exposure Management

The previous section (Section 2.3) described the importance of foreign exchange exposure management. This Section is devoted to discuss the arguments that are somewhat disagree with the need of foreign exchange exposure management. These arguments are derived from four famous theories, Purchasing Power Parity (PPP), Modigliani-Miller Theorem (M-M), and Capital Asset Pricing Model (CAPM), and the 'Efficient Market Hypothesis'. Then, it is followed with the counter arguments on their weaknesses to signify the necessity of foreign exchange exposure management.

2.5.1. PPP and Exposure Management

Principally, Purchasing Power Parity (PPP) is a theory of exchange rate determination, arguing that exchange rate between countries is determined by the price ratio between them. In practical terms, assuming markets are efficient, exchange rate can be easily determined by comparing the prices of identical products denominated in different currencies (Eiteman, Stonehill, and Moffett, 1998, pp. 118). Therefore, there is no need to manage foreign exchange exposure.

However, several other studies have questioned the reliability and validity of PPP [among others, Isard (1977); Richardson (1978); Giovannini (1988)]. Isard (1977) for instance, employed disaggregated commodity lists such as apparel, industrial chemical, paper, paper products, and glass material, so that U.S. and foreign prices (German, Canada, and Japan) can be matched. The author found that there was a substantial deviation, and continuous from the law of one price. Richardson found similar result after using the 4 and 7 digit SIC (standard industrial classification) data across disaggregated commodity arbitrage between the U.S. and Canada.

Previous studies have also confirmed that there are problems with PPP. First, PPP ignores the existence of inputs that are not highly traded in the market but contribute to the price differential such as local labor and rents, and trade barriers (Engel, 1993). Second, PPP does not consider the difference in marketing factors (Rogoff, 1996). Using the Big Mac Price index, the author point out that the index in US and Holland or Italy will be different since ketchup is free in the US whereas in Holland and Italy customers have to pay for it. Other factors, such as, taxes and transportation (Parsley and Wei, 1996), price discrimination [(Knetter (1993); (1994)], and the difference in each country's preference for choosing its own basket of goods (Engel, 1993), are factors contributing to the deviation of the law of one price (LOP).

Beside the inherent problems, PPP may hold over the long run and it is applicable in both, high inflation countries and under developed capital markets. The rejection of a short-run relationship between prices and exchange is due to several reasons, such as, the sticky price of goods⁹ (Dornbusch, 1976), no causal relationship between prices and exchange rates in the short run [Frankel (1979); Sharma, Mathur, and Wong (1991); Dornbusch and Fisher (1990, p.772-776)].

Even though there are early studies suggesting that PPP may not also hold in the long run due to the random walk of exchange rates, that is, impossible to converge over the long run [(Adler and Lehman (1983); Darby (1983); Hakkio (1984)], recent studies have found that PPP may hold in the long run with some temporary components associated with its deviation, although this deviation is not persistent or exchange rates tend to turn back to PPP rates [see for example, Whitt Jr. (1989); Abuaf and Jorion (1990); Hakkio (1992); Lothian and Taylor (1996)]. In addition, PPP may hold in the high inflation countries [Darby (1980); Zhu (1997)].

In short, there are many inherent problems in PPP, which lead to weaken its argument proclaimed with exposure management. It is true that exchange rates deviation will gravitate to its PPP rate. However, there will be time lags to move to the PPP rate. Consequently, if the planning horizon of a firm's hedging is shorter than the period of PPP holds, the effect of exchange rate changes will occur.

⁹Dornbusch (1976) said that price stickiness of the non-traded goods would generate overshooting, that is, exchange rates move beyond their new equilibrium before turning back to the long-run equilibrium.

As an example, a paper of McCallum (1997) has described the impact of the Canadian dollar that is under PPP against U.S. dollar on business and economy in the country. According to PPP, the exchange rate between the Canadian dollar and the U.S. dollar is supposed to be the ratio of the prices of like goods and services in each country.

For example, Green Bay Packers T-shirt costs \$30 in Canada and US\$25 in the United States. The exchange rate is expected to be 1.20 (30/25). The problem is that, at the time of writing, the Canadian dollar is far under its purchasing power parity value against the U.S. dollar. Based on "The Economist" (April 12, 1997) report, Big Mac purchasing power parity index put the Canadian dollar 14% below U.S. parity. Using relative Big Mac prices in Canada and the United States, the value of Canadian dollar to U.S. dollar is reported at \$1.19, which is far a way from the markets, \$1.39.

The above illustration shows that there are unfavorable impacts from the Canadian perspective. Americans may be reluctant to visit Canada because of the appreciating Canadian dollar or Canadian residents may find that the price of Big Mac burger is more expensive. The competitiveness of Canadian exports in the U.S markets will decrease as a result of U.S. customers' response to the increasing price. Certainly, such effect can be devastating for Canadian exporters.

2.5.2. Modigliani-Miller (M-M) Theorem and Exposure Management

Another countervailing argument of currency management is derived from the proposition of Modigliani-Miller (1958). The authors analyze the effect of capital structure on the value of a firm based on at least five assumptions (Peirson, Brown and Howard, 1997, p.384)¹⁰. One assumption that is relevant with exposure management is that of the change in proportion of debt and equity, which is on the right-hand side of balance sheet, will not change the total value of the firm's cash

¹⁰The assumptions are: Securities issued by firms are traded in the frictionless capital market in which there are no transaction costs and no barriers to obtain relevant information, there are no taxes, individual investors can borrow from external sources at the same rate with the firm, there are no costs associated with bankruptcy in financial distress, financing decisions does not affect firm's investment policy (Peirson, Brown, and Howard, 1997, p.384).

flows. The only change resulting from changes in the proportion is the portion of net operating cash flows between debtholders and shareholders.

The idea of this proposition is based on the argument that investors can borrow from the market by their own ('homemade leverage') at the same rate as the firm. As a result, investors have no additional earning per share whether borrowing is done by firms or investors. To quote Modigliani and Miller (1958, p.270), "leveraged companies can not command a premium over unleveraged companies because investors have the opportunity of putting equivalent leverage into their portfolio directly by borrowing on personal account". The proposition has also an implication on currency management. If investors can manage their exposed earning streams by their own, why the firm should do the same thing in which overall cash flows will be decreased. This reduction will also reduce the investors' earnings because there must be a cost to cover its financial position.

However, there are arguments that individual firms have a better position than investors in terms of covering exposure. Dufey and Srinivasulu (1983) have described that there are at least two barriers, size and structural barriers, and information gap. Size barriers exist because there is a minimum size requirement for transacting goods and services in the markets. Therefore, an investor managing his exposure using financial instruments offered in the market, such as, forward contracts, options, and other derivatives, will be confronted with the minimum amount of contracts which is usually too large for an individual. Moreover, there is a tendency that commercial banks limit the access of forward and currency options to individual customers who are involved in international trade.

The structural barriers refer to structuring activities in the different economic entities. For example, in the case where managing currency exposure is conducted in money market, investors may borrow in one currency for instance, and exchange the proceeds for another currency. However, an investing firm in a foreign country may have greater access than individual investors because it is resident of the host country. Moreover, if the investors get access to a foreign money market, they may face discriminatory taxes.

Finally, a firm may have more information than investors. Information about sourcing inputs and its costs, consumer behavior, demand elasticity of products, exchange rate forecast, and other operational and financial information required to

manage foreign exchange exposure, may be available during the planning period. Investors, however, may need to collect such information before managing the exposure. Moreover, it is too costly for individual investors to collect this information for a sole purpose, hedging.

Indeed, it is very difficult for individual investors to manage exposure on their own account since many barriers confronting investors wanting to manage foreign exchange exposure on their own account. To quote Aliber (1978, p.134), "the firm may have superior knowledge, and may be able to protect itself against these risks at lower cost".

2.5.3. CAPM and Exposure Management

According to the CAPM, the most important factor is systematic risk. This risk is a component of total risk that is due to economy-wide factors such as government regulations, interest rate, and other government announcement regarding economic indicators. Therefore, this risk will have an effect on all equity investors and cannot be diversified (Damodaran, 1997, p.93). Unsystematic risk will have an impact on some firms and hence, only on some investors. For example, a firm may announce the success of the new product developments that are more efficient than the existing products in the market. Certainly it has a positive impact on the firm's return and at the same time, causes negative impact on competitors' return in the industry. Certainly, it can be diversified by holding a bundle of assets, which have no correlation between one and another assets' return in the portfolio.

The basic argument of the theory objecting currency management is that if foreign exchange rate risk is an unsystematic risk, investors can diversify their currency risk in the process of constructing their portfolio. Diversification can be done either nationally or internationally. Conversely, if the exchange rate risk is a systematic risk, investors may be entering into a forward market to hedge their position. According to the CAPM, if all investors do that, the forward rate will be priced, which will be reflected in the security market line (SML). Therefore, hedging will not give any benefits for firms (Dufey and Srinivasulu, 1983).

However, there are strong countervailing arguments for CAPM with respect to the systematic and unsystematic risk. If exchange rate risk is an unsystematic risk,

assuming international diversification is used due to its superiority¹¹, investors may be confronted with foreign exchange rate risk if returns are generated in foreign currency (Lessard, 1983, pp.21-23). If exchange rate risk is a systematic risk, it is true, the forward rate may be priced at the SML. However, another argument of CAPM that concerns with reducing the probability of financial distress suggests that a greater cash flows' variability implies a greater probability of financial distress (Rawls and Smithson, 1990).

2.5.4. Efficient Market Hypothesis and Exposure Management

An efficient market hypothesis means that all information flows into the markets, in unpredictable and random fashion. The market price then responds to the incoming information accurately and the price of currency will change in a random. Under this line of reasoning, the future exchange rate is unpredictable and hedging is viewed as a "zero-sum game". Exchange losses from transactions might be offset by the gains in the long run. Hence, this theory is somewhat disagree with hedging.

This section reviews the previous studies on the weaknesses of this theory. These are used to provide the arguments that foreign exchange exposure management is necessary.

Logue and Oldfield (1977) were amongst the first to provide a theoretical basis for the argument against currency management based upon the efficient market hypothesis. In their paper, the authors observed the impact of currency fluctuations on the investment of foreign assets. They argued that when the foreign exchange markets are efficient, currency prices reflect all relevant economic information including fluctuation in exchange rates. For this reason, the authors concluded that there was no rational basis for hedging even though they are not completely against currency hedging since creditors might concern with total variability of cash flows in

¹¹ Eaker and Grant (1990) said that "International diversification of equity portfolios represents both an exposure to security risk and currency risk and an opportunity to benefit from security returns and currency returns" (p.30); Logue and Rogalski (1979) characterize the two types of gains from international diversification. The first gain is called "beta gains", that is, the gains of which the systematic risk cannot be diversified in a country may be diversifiable in the foreign markets. Alpha gains exist when securities in one market are mispriced relative to the others and are likely to provide unusual high returns.

which default may occur. If a firm experiences gains and losses as a result of exchange rate changes, the firm may find it difficult to raise capital from external sources. Hence, it may also have an impact on the valuation of the assets.

The arguments stating that currency management is not necessary derived from market efficiency, have been challenged by many researchers. Some have argued from a theoretical perspective while others have employed a statistical based study to test the efficient market hypothesis. Any discussion on the merits of this argument must begin with the meaning of efficient market and the several conditions that must be met for the market to be efficient will be discussed.

An efficient market means “all information available to date is reflected in the price of the currency” [McNew, in Klopfenstein (1997, p. 289)]. In this context, the meaning of available information is all information either it has been announced recently or predicted from historical announcements. Since this information flows into the market, the price in the market responds accurately and the exchange rates will change in a random form. Hence, there is no rational basis for hedging.

There is a list of conditions in order market to be efficient [McNew, in Klopfenstein, (1997, p. 290)]. The first is the existence of homogeneity in the expectation of individual investors. It means all investors will translate the new information in the same way. Certainly, this condition will never be fulfilled because it depends on several factors. For example, investors receiving information from newspapers will react differently from investors receiving information through electronic bulletins. The difference in speed of news dissemination, the volatility of exchange rates will be higher.

The evidence of the impact of news in the volatility of exchange rates can be found in the recent study of Melvin and Yin (2000). The authors examined the role of public information on foreign exchange market dynamics. In this study, information arrived is measured using Reuters Money Market Headline News. Among their empirical findings were that the volatility of mark-dollar exchange rate fluctuated positively with the rate that information arrived at the market and public information plays an important role in the evolution of the foreign exchange market.

The assumption of homogeneity in expectation is based on the economist proposition called rational expectations of market participants (Hopper, 1994). However, there is evidence for the failure of the expectations since it is not

observable. A study conducted by Frankel and Froot (1987) of private exchange rate forecasters suggests that investors in the foreign exchange market do not always have rational expectations. For example, the study found that the forecasters make bias predictions of future exchange rates. The market participants found to be heterogeneous and consequently, interpret common information in various ways.

The heterogeneity of market participants has been confirmed by many empirical studies. A study conducted by Ito (1990) for instance, found the difference in expectation between export and import industries both in the short (one month) and long run (six months). Looking at the Yen, the author suggests that in the short run, either exporters or importers have an expectation of the Yen to become appreciated. The difference in the expectation between them is that exporters have a lower expectation in the value of Yen. In the long run, the difference in expectation occurs when exporters expect the Yen to depreciate whereas importers remain constant. The logical argument of the difference in the expectation is that exporters expecting depreciation is concerned with the price of their goods sold in the market. If a domestic currency is depreciated against another currency, the exported products will be cheaper in the perspective of customers in the country experiencing the appreciation. On the other hand, importers expecting appreciation of Yen are concerned with the gain when payment claims are ready to be collected.

A recent study of MacDonald and Marsh (1996) supports the empirical finding of Ito. This study also examines the heterogeneity of expectation in the six and twelve months horizons, covering various market participant including economists, dealers, executives in over 150 firms and institutions in the G-7 nations. This study found that participants in the foreign exchange markets interpreted main variables in various ways, and each participant was stick to the individual biases relative to their rivals. Another finding is that there is an indication that forecasters of one currency are not always good in forecasting in other currencies.

Another condition found to be required for the market to be efficient is that "there is no uncertainty among market participants regarding whether the new information reaching the market was of a transitory or of a permanent nature." In fact, uncertainty regarding information cannot be avoided. For example, The Prime Minister of Australia states that he would like to see a stronger Australian dollar by the end of his term. This statement constitutes a problem for hedgers whether this

statement becomes the policy or just rhetoric. The hedgers must also consider whether this information is transitory or permanent.

Beside the above condition, the assumption that the market knows with certainty, about the true long- run equilibrium value of exchange rates is also another condition for market to be efficient. In this case, investors assume that in the long run Purchasing Power Parity (PPP) is an indicator of exchange-rates equilibrium. As described above (Section 2.4.1), there are many inherent problems regarding the hypothesis of the law of one price either in absolute or relative forms such as ignoring trade barriers, tax, and other regulations [(Rogoff (1996) and Knetter (1994)].

The assumption that investors are risk averse is also the condition required in order to achieve market efficiency. It can be argued then, if individual investors, financial institutions and firms, are all involved as foreign-exchange market participants, it is difficult to see similar attitudes toward risk. Individual investors with a huge amount of reserved money are completely different in attitudes toward risk to those with a small reserve of money because of this dissimilarity between classes. It is difficult to generate or classify the behavior of market participants toward risk.

In addition, in order to be an efficient market, there should not be any barriers that restrict investors to force exchange rates in order to be in line with their long-run equilibrium value. There are private and official barriers that restrict investors to do that, even if the market participants are willing to place a huge amount of money in the market. Moreover, the question remain how much money should be placed in the foreign exchange market since the size of the market is much bigger than any single investor's reserve of money.

In short, many recent studies have confirmed that foreign exchange market is not efficient. Several studies regarding the imperfection of foreign exchange markets have provided a rational basis for firms to manage foreign exchange exposures. If the market is not efficient, exchange gains and losses cause a high variability of a firm's cash flows. Hence, a firm that has a payable denominated in foreign currency and does nothing to protect its position because of the long-term period of contact, the cash flows will be volatile as exchange rate moves. This firm may face a greater possibility of encountering financial distress which may also lead to other difficulties

that include obtaining capitals, dealing with suppliers or customers, and other unfavorable impacts on the firm' value.

2.6. Summary

In this chapter, the concept of risk, including types, the difference between foreign exchange risk and exposure, and the importance of managing foreign exchange exposure, both, from a practical and theoretical perspectives have been explained. Risk arises from the adverse movements of exchange rates, which is the focus the study, is the major risk confronting business. The difference between foreign exchange risk and exposure has been described in order to clarify the term used throughout this study.

The importance and the necessity of foreign exchange exposure management from financial theories and governance perspectives have been highlighted to assert the importance of managing foreign exchange exposures as an integral part of conducting business and to provide the reasons for and the importance of conducting a study such as this.

From a financial perspective, managers who are responsible for managing foreign exchange exposures have to carry their duty to maximize shareholders' wealth by increasing the firm's value. In doing so, managers, may utilize foreign exchange exposure management to reduce the amount of taxes, the probability of firms encountering financial distress, and to improve investment decisions and the ability to raise capital. From a governance standpoint, managers are required to manage foreign exchange exposure within the accounting regulations and social pressures.

Financial theories, such as, PPP, M-M, and CAPM, which underlie the arguments against foreign exchange exposure management have been described for comparison. These theories are subject to assumptions and limitations. Hence, from this particular perspective, foreign exchange exposure management is also necessary for firms.

CHAPTER 3

EXPOSURE IDENTIFICATION, POLICY, AND TECHNIQUES IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Introduction

Chapter 2 highlighted the importance and necessity of foreign exchange exposure management. This chapter explores the three steps involved in effective foreign exchange exposure management program—identifying exposure, establishing policy, and employing appropriate techniques—which are essential in providing the basic knowledge to comprehend the issues investigated and the analyses. The chapter is divided into six main sections.

The first two sections (Section 3.1 and 3.2) outline the elements of exposure identification that includes types, sources, and measurements of foreign exchange exposures. Section 3.3 identifies policies in foreign exchange exposure management that includes several elements such as, identification of general objectives, the adoption of either a passive or active policy, and the organization of exposure management. These aspects are relevant to both the first and the second objectives of this study.

There are two broad categories of techniques, internal and external; these are explained in the Section 3.4. The internal techniques considered in this study are matching, netting, leading and lagging, inter-firm foreign exchange contract, price considerations and cash management improvements, external techniques involve spot cover, forward currency contract, options, and other derivatives. Section 3.5 presents the empirical evidence from previous studies concerning the influence of firm specific characteristics on foreign exchange exposure management practices. Finally, this chapter is summarized in Section 3.6.

3.1. Foreign Exchange Exposure Identification

This section explains the element of foreign exchange exposure identification that includes types, sources, and measurements of translation, transaction, and economic exposures. These elements are investigated in this study because the first

objective of this study, namely the description of foreign exchange exposure management practices, include the identification of types, sources, and measurement of foreign exchange exposures.

The literature in the areas of foreign exchange exposure management emphasizes the importance of the first step; identifying exposure [(Madura (1993a); (1993b); (1999); Cook (1995); Gilman (1995); Gillani (1996)]. Madura (1993a) defines this as identifying “future cash inflows and outflows for a given currency over the period of concern”. These cash flows can be combined to calculate the net position (inflows minus outflows) of units for each foreign currency. Hence, it needs accurate methods to forecast future payables and receivables.

Cook (1995) and Gilman (1995) presented a more comprehensive picture for the identification of foreign exchange exposure. Firstly, a firm has to classify their underlying exposure into several types, such as, transaction, economic, translation, contingent, and competitive. The firm must then, be able to identify the sources and to quantify the size of each exposure by currency. Gilman (1995) states that in order to be ready for managing exposure, a firm must know precisely what is being hedged and how much exposure should be hedged.

The above description shows that a firm has to understand what types of exposures are confronting the firm, what the sources are, and why they have to be managed as well as how they are identified and measured. Therefore, the next sections are devoted to explaining the elements of foreign exchange exposure identification mentioned above, because without this step, it is impossible to establish an effective risk management. To quote Gillani (1996, p.26), "In order to establish a sound risk-management framework you must identify and understand your exposures".

3.1.1. Types of Foreign Exchange Exposure

In the recent literature of foreign exchange exposure management, the types of exposures are usually summarized and simplified into three categories, translation, transaction, and economic [Cowdell (1993); Grinblatt and Titman (1998); Eiteman, Stonehill, and Moffett (1998)]. However, not all firms classify their exposure in this way since they are confronted with different types of exposures. For example, one of

the most important findings of a study by Davis and Militello (1995) is that most firms in the U.S. use an accounting model as a main basis to measure exposures.

This study classifies foreign exchange exposure into three categories, translation, transaction, and economic exposures. In order to clarify how the different types of exposures fall into these three categories, which is somewhat a combination of accounting and non-accounting model, it is useful to review the different perspectives between the accountants and economists on foreign exchange exposure. Then, the current classification of foreign exchange exposure based on accounting and non-accounting are explained. Finally, the reasons for using the three categories in this study are provided.

3.1.2. Accounting versus Economic Exposures

The controversy between accounting and economic approach in the foreign exchange exposure management has long been recognized since decades ago. Accounting approach emerges when multinationals have subsidiaries in foreign countries. Hence, there is a concern about the effect of foreign exchange exposure on their balance-sheet items (Tran, 1980, p.15).

The concern leads to the emergence of methods in translating foreign assets and liabilities from home into the currency of the parent company. After an extensive debate for approximately two decades within the accounting studies¹², two methods of translation are now widely used: “The current-rate method” and “The temporal method” (Eiteman, Stonehill, and Moffett, 1998, p.270).

Under current-rate method, assets and liabilities are translated at the current exchange rate at which the effect on the balance sheet is taken place while revenue and expenses are translated either at the current rate or the weighted-average exchange rate for the period of concern (Herz, Linsmeier, and Bhav, in Klopfenstein, 1997, pp.349-350).

Temporal method categorizes assets and liabilities into monetary and non-monetary. The monetary assets, such as, cash, marketable securities, and account receivables, and the monetary liabilities, such as, current liabilities and long-term

¹² A detailed discussion on the methods of translation within studies in accounting can be found in Hosseini, A., 1986, pp.2-19)

debt, are translated at the current exchange rates (Eiteman, Stonehill, and Moffett, 1998, p.273). Non-monetary items (inventory and fixed assets) are translated at historical exchange rates.

The primary difference between the two methods is on the reported exchange gains and losses. At the current-rate method exchange gains and losses caused by translation are reported in the separate equity reserve account while the temporal method requires the exchange gains and losses are reported in the income statement (Eiteman, Stonehill, and Moffett, 1998, p.272).

It appears that the current-method provides a better performance of consolidated financial statements because gains and losses are not reported in the income statement as prescribed by temporal method that may cause the variability of the reported earnings.

Since this study is not concerned with the methods used for translation and every country has applied a single method consistently in accordance with the accounting regulations within which a firm operates¹³, the discussion is continued by looking at these methods from the economists' perspectives.

In the early study by Aliber and Stickney (1975), data on prices, exchange rates, and interest rates in both, six developed countries for the period of 1960 to 1971 and seven less developed countries for the period of 1966 to 1971 were investigated. The authors found that for all developed and mostly less developed countries; the deviation from Purchasing Power Parity was smaller than that from Fisher Effect. The study, therefore, suggested that the Fisher Effect should be accepted if the Purchasing Power Parity was believed as a valid theorem.

The implication of the finding on both the temporal and current-rate methods suggests that they are inconsistent. Gains and losses resulting from translation on non-monetary items are mostly offset by changes in local currency where assets are located. It appears that this method accept the Purchasing Power Parity theorem that has larger deviations than Fisher Effect. On the other hand, it rejects the Fisher Effect by translating monetary items at the current exchange rate.¹⁴

¹³ Most countries like the US and UK, Australia, Canada and Germany use temporal method for their affiliates characterized as "Integrated foreign entity" or the current-rate method for affiliates characterized as self-sustaining foreign entity.

¹⁴ "Fisher Open" states that the spot exchange rate should change as big as the difference in interest rate between two countries in the opposite direction (Cumby and Obstfeld, 1981).

Pringle and Connolly in Kolb (1993, p.374) argue that economic exposure is the only real exposure. As he pointed out, “Measurement of forex gains and losses in this process represents the accounting systems’ attempt to measure economic *ex post*”. The authors provide at least two reasons the failure of accounting concept in measuring exposure. Firstly, accounting concepts uses historical costs. Secondly, it is merely a conversion from home into the currency of the parent company. Despite no cash consequences, the accounting systems on the methods of translation have been a subject of controversy that may deter the objective of managing foreign exchange exposure.

A more recent paper by O’Brien (1997) concluded that firm’s accounting exposure does not reflect the real economic exposure when a firm is managing economic exposure or accounting exposure using foreign debts. The gains and losses on foreign debt for hedging anticipated future revenues should be reported in the income statement instead of deferring the amount of the debt that causes the reported equity rise or fall even though the value of the equity does not change. Hence, investors or other external users should be very cautious in interpreting the information in the financial statement produced by a firm.

However, a cross-sectional study conducted by Bodnar and Gentry (1993) on 208 firms derived from two-digit SIC industries concluded that the complex relation between firm value and exchange rates is too difficult for investors to comprehend [see for example, Bartov and Bodnar (1994); Hu (1996)]. Hu (1996) for instance, said that investors find it difficult to understand not only the complex techniques used to manage economic exposure but also reporting rules.

Despite the difficulties in understanding economic exposure, a questionnaire-based study by Davis and Militello (1995) on 22 US corporations of various sizes in a variety of industries summarized their major principal finding about the importance of accounting concepts. As the authors pointed out, “Most companies appear to use the accounting model as the primary basis for measuring their exposure to exchange gains and losses because the companies have to comply with the accounting regulations (FASB 52) within which they operate” (Davis and Militello, 1995, p. 3).

The controversy between the accounting and economic perspectives on foreign exchange exposure is currently abated in terms of classifying the exposures. The current accounting approach extents types of foreign exchange exposures into

many categories. The following sections therefore, describe the current classification based on accounting and non-accounting approach.

3.1.3. Accounting Approach

Davis and Militello (1995) divide foreign exchange exposure into three categories, translation, transaction, and commitment. Principally, translation exposure arises as a result of translating the financial statement of foreign subsidiaries into the parent company in order to make a consolidated financial statement. Assets, liabilities, revenues, and expenses that are originally measured in foreign currencies should be restated in terms of the home currency. As a result of this translation, there will be foreign exchange gains and losses in the parent company. Even though there is recognition of gains and losses, in fact, there are no cash consequences.

The translation is usually used for measuring a subsidiary's performance (McInnes¹ (1971), providing accurate information for decision makers and investors [(Ross, 1992; Bartov (1995)], and for both internal and external users (Sercu and Uppal, 1995, pp.517-518). The common reason for translation from a foreign currency into the home currency is to meet the requirements of accounting regulations of home countries.

Another type of exposure within this approach is called transaction exposure. This exposure comes from the difference between the exchange rate at the time a transaction is conducted and the rate at which it is finalized. In a firm's financial statement, this transaction is reflected in the account receivable and account payable. If import is denominated in foreign currency, and the foreign currency is appreciated against home currency at the time of cash collection, then more cash has to be provided by importers in exchange for foreign currency. Therefore, this exposure has cash consequences. Exchange gains or losses resulting from this exposure are taxable in the home country.

In addition, commitment exposure has cash consequences. This exposure arises from transactions that are not booked but firmly committed. Therefore, this transaction is not reflected in the balance sheet. Examples of this type of exposure

are future lease payments, sales or purchases that are contracted but not yet booked (Davis and Militello, 1995).

3.1.4. Non-accounting Approach

According to this approach, exposure is divided into two types, economic, consisting of anticipated exposure and future net income and cash flow exposure, and competitive exposure.

Economic exposure results from a firm's concerns about the impact of unexpected exchange rate changes in the future on the expected cash flows. This exposure is subjective since it depends on the prediction of changes in future cash flows over an arbitrary time horizon (Davis and Militello, 1995, pp.22-29). The reason for being concerned with unexpected change in exchange rates is that expected change in exchange rates is already been taken into account by product pricing, interest rates, and forward foreign exchange contracts. For example, from a management perspective, a financial-statement budget should reflect information concerned with expected changes in exchange rates. Assuming under equilibrium conditions, the forward rate is an unbiased predictor of future spot rate, the operating budget is constructed based on forward rate rather than current spot rate.

It was noted at the beginning of this section that anticipated exposure is a part of economic exposure. This exposure is recognized even though a transaction is not committed. However, it can be predicted based on the historical patterns of transactions that have been recorded many times. Since the cycle of such transactions is determined, the exposure can be predicted.

Another exposure included in the economic exposure is that arising from the perspective of managers, investors, and financial analysts, concerned with the value of firms based on the prediction of firms' future cash flows [(Bartov (1995); Smith and Smithson (1993); Soo and Soo (1994)]. Since these cash flows may be exposed to exchange rate changes, this will also have an impact on the firm valuation.

Competitive exposure is another type of exposure outside the accounting model (Davis and Militello, 1995). This exposure is concerned with the competitiveness of a firm's products in the market. For example, a U.S. subsidiary in France that has to compete with a Japanese subsidiary in the same market, will loose

their market share if the Yen is depreciated against the Euro. This is because customers in France feel that the same products being sold by the Japanese are cheaper than that being sold by the American.

3.1.5. Three Categories of Foreign Exchange Exposure

Regardless of which approach (accounting or economic) is more reliable, in fact, translation, transaction, and economic are the types of exposure confronting firms simultaneously [Buckley (1986); Davis and Militello (1995)]. A transaction exposure of a foreign subsidiary constitutes transaction as well as translation exposure. Before a contract a transaction may be qualified as anticipated exposure because it is most likely to occur based upon the historical records. Then, it becomes commitment exposure (included in the transaction exposure) when the contract is agreed. Finally, this moves to be an accounting exposure.

This study, therefore, uses three classifications of exposures mentioned above, based on cash consequences. The cash consequences of transaction and economic exposures are quite clear and there is no need for further clarifications. For translation exposure, however, the cash consequences have to be clarified. Sercu and Uppal (1995, p. 518) said that there is a cash effect through the amount of after tax income paid by the parent company. Hence, it has to be included in this study.

3.2. Sources and Measurements of Foreign Exchange Exposure

The primary task in the exposure identification after the types of exposure is known is to understand what the sources are and how to measure them. The following section explains the sources and measurement based on the general classification of exposures, these are: transaction, translation, and economic. The reason for this classification is that these types are commonly accepted definitions in the foreign exchange exposure management [Antl and Hall, in Antl (1989, p.97)].

3.2.1. Sources and Measurements of Transaction Exposure

In Section 3.1.3, there was a recognition of exchange gains and losses of

translation. Briefly stated, gains and losses arise from the settlement of actual financial obligation stated in foreign currency. Eiteman, Stonehill, and Moffett (1998, p. 190) list four sources of transaction exposure, these are: (1) Purchasing or selling on credit; (2) Borrowing or lending funds; (3) Participating in unperformed currency forward contracts; (4) Acquiring assets and incurring liabilities.

After the sources are clearly identified, the methods of identifying and quantifying this exposure have to be determined. It is crucial for every firm to detect transaction exposure at an early stage in order to determine the net exposed positions. There are methods that can be used, such as, forecast based on order or contracts, cash forecast by currency, balance sheet/income forecast, and other informal methods (Bhati, 2000).

3.2.2. Sources and Measurements of Translation Exposure

The source of translation exposure occurs when a parent company has foreign affiliates in which assets and liabilities are not stated in the home currency. For example, an Australian firm that has two subsidiaries in the U.S. and Germany is preparing to make a consolidated financial statement. Since each affiliate states its own net assets or liabilities in local currency in its balance sheet, it needs to be translated into Australian dollar terms. As a result of the exchange rate changes when net assets or liabilities are translated into the home currency, exchange gains or losses arise.

One factor affecting the magnitude of recorded gains and losses is the accounting standard (Price Waterhouse Coopers, 1991 p.17). Since Accounting and Regulatory issues are not a main concern of this study and have already been discussed in chapter 2 (Section 2.4.2), they are not included in the next sections.

3.2.3. Sources of Economic Exposure

It has been shown in sub Section 3.1.4 that economic exposure is concerned with the impact of unexpected change in exchange rates on the firm's future cash flows. Therefore, the sources of this exposure are complex in nature since any firm activities that have an impact on the volatility of future cash flows will be

categorized into economic exposure. For this reason, sources of economic exposure can be clarified as having a narrow or a broad perspective [Pringle and Connolly, in Kolb (1993, p.365)].

The perspectives are important because one aspect of the issues investigated in this study is concerned with economic exposure. Precisely, this study attempts to identify the sources and the methods used in this exposure.

3.2.3.1. A Narrow Perspective

Most of the literature on currency exposure argues that the source of economic exposure is based on the impact of unanticipated changes in exchange rates on future cash flows [(for example, Jorion (1990); Loudon (1993); Nance, Smith and Smithson (1993); Pringle and Connolly (1993, in Kolb, pp. 363-374); Stulz (1996)]. According to Pringle and Connolly [in Kolb (1993, p.364)], the impact can be direct or indirect. For example, a direct impact of unexpected changes in exchange rate occurs when a firm sells its products abroad and the transaction is stated in the currency of the destination. If the home currency is appreciated against the currencies in which its products are marketed, the firm will experience an unfavorable impact. In other words, the revenue is worth less in the home currency's terms. This holds for transaction exposure as well.

Economic exposure may also have an indirect impact, which occurs when a firm has a supplier, customer, or competitor that is exposed to exchange rate risk. A firm obtaining material locally will be exposed to the foreign currency if its vendor imports material from another country. For example, an Australian firm might be exposed to the risk of the Yen appreciation because its Australian vendor imports material from Japan. As a result, the domestic competitors that obtain their material entirely from a local market would be more favorable if Australian dollars was depreciated against the Yen. This was discussed in Section 3.1.4 as competitive exposure.

3.2.3.2. A Broad Perspective

Unlike the narrow perspective, the broad perspective is based on the reality

that other macroeconomic factors have also contributed to the stability of a firm's future cash flows [Oxelheim and Wihlborg (1995); (2003)]. The authors believe that macroeconomic factors such as inflation, foreign exchange, and interest rates, have a separate impact on the firm's future cash flows. This belief is not surprising since even though these variables are interconnected, they are often in disequilibrium. For example, in Chapter 2 there was a detailed discussion on the relationship between exchange rates and prices (relative form of PPP) and showed that it does not hold in the short term. Even if it holds in the long term, there are still some deviations. Another variable that has a link with exchange rates is interest rates (interest rate parity). According to this theory, the interest rate differential between two countries must be equal to the forward premium or discount on both countries. However, many studies have confirmed that this relationship does not hold [for example, Bansal (1997); Shank (2002); and Moh, 2003)].

In an effort to prove their argument, Oxelheim and Wihlborg (1995) utilize the example of Volvo Company that manufactures its products mostly in Sweden but materials and primary markets are in foreign countries: Germany as a material supplier and the U.S. as a primary market. The significant empirical finding of this study is that there are three important macroeconomic variables influencing the company's future cash flows. The first is the exchange rate of the Swedish Krona and Deutschemark (now Euro). Since most of the materials are imported from Germany, the depreciation of the Krona should have a negative impact on the company. Fortunately, the depreciation causes competitiveness in the U.S. market because most of the company's competitors are German car manufacturers (BMW, Mercedes, and Audi). As a result, the depreciation of its Krona is favorable to the company's cash flows. The other variables improving the company's cash flows are the Swedish Krona short-term interest rates and the German inflation rate. The reduction of interest rate causes an increase in demand for the car manufactured by Volvo while an increase in the inflation rate causes an increase the German cars costs.

3.2.4. Measurements of Economic Exposure

Many models have been developed in the literature of foreign exchange exposure management to measure economic exposure [Among others, Adler and

Dumas (1984); Rawls and Smithson (1990); Jacque (1996, pp. xix-xxviii)]. The following sections look at the measurements of economic exposure. These particular aspects are important because, as with translation and transaction exposures, this study also attempts to identify what methods are used to measure this type of exposure.

3.2.4.1. Economic Exposure as a Regression Coefficient

Adler and Dumas (1984), have already proposed the measurement of exposure by using regression coefficient since they have defined the exposure as the sensitivity of several firm's financial items such as assets, liabilities and cash flows. However, it does not encompass the complexity of economic exposure with respect to the cash flows of a firm that has many foreign subsidiaries.

Another model that may cover the aspect of economic exposure has been proposed by Garner and Shapiro (1984). In their model, the free cash flows of foreign affiliates are firstly stated into the parent currency before it is formalized into a linear relationship with exchange rate changes. Basically, this relationship can be formalized into the following formula:

$$FCF_h = a + \beta Ex + e$$

Where β is a regression coefficient to measure sensitivity of foreign affiliates' free cash flows that have been stated into the parent currency or home country (FCF). The coefficient is very important because it shows the magnitude and the direction of the exposure. For example, the regression coefficient (β) is -0.25. The negative sign shows that exchange rate changes have a positive impact on the free cash flows and the magnitude is 0.25. If the currency drops 10%, the value of cash flows will increase by 2.5%. In this case, the cash flows are not exposed to currency risk after considering other indicators in regression have been fulfilled (t-statistic and R^2).

3.2.4.2. Economic Exposure as a Function of Financial Variables

Rawls and Smithson (1990) suggest that in order to measure economic exposure, the basis of measure should firstly be determined. According to the

authors, there are two basis, flow measures (single period) and stock measures (multi period).

3.2.4.3. Flow Measures

According to the flow measure, economic exposure can be measured by testing the sensitivity of income flows to the key financial variables such as interest rate, foreign exchange rates, and commodity prices (Rawls and Smithson, 1990). Usually, the sensitivity of income flows to those financial variables can be formalized in a linear relationship in which the cash flows are a function of the interest rate, foreign exchange rate, and commodity prices (regressors).

Jacque (1996, p.223) argued that flow measures fit well in "firms that engage in extensive financial planning simulation and will generally nurture a very helpful cross-fertilization among the various functional departments". For example, the sales and accounting department is expected to make planning as accurate as possible. In order to do that, they have to exchange information. The sales department needs accurate forecasts of exchange rates, which are commonly available in the treasury department at the same time the treasury department needs accurate sales forecast to estimate the net cash flows for hedging purposes.

It seems that this measurement covers all aspects of economic exposure. However, there are two major difficulties in terms of its applicability (Jacque, 1996, pp. 220-223). Firstly, the approach requires a significant amount of data. Secondly, the effectiveness of this approach is dependent upon the researcher's capability to make an accurate forecast of sales and costs under the constraint of those financial factors.

3.2.4.4. Stock Measures

This approach commonly relies on external data and information concerning the firm's market valuation. The typical indicator used is the firm's equity, which is known and popular as a market model. Under this approach, the sensitivity of the firm's stock movements to changes in the general market is measured by using a regression equation. The model is used as an attempt to find the sensitivity of the

firm's equity, by regressing between its rate of return and the return on the market portfolio. The coefficient found is called 'beta' as a measurement of systematic risk.

This model can also be utilized to find the sensitivity of a firm's equity on the financial variables in which those financial variables are treated as regressors. For example, in order to measure the sensitivity of a firm's equity to interest rate, changes in the three month LIBOR rate and 10-year treasury rate can be used. Similarly, the sensitivity to exchange rate changes can be measured by finding the coefficient of several currencies movements.

3.2.4.5. Other Approaches

Other models that have been developed to measure economic exposure use either an extension or a combination of flow and stock approach. For example, an early study by Jorion (1990) combined two approaches to measure the economic exposure of the U.S. multinational corporation. Here, Jorion (1990) utilized stock return, which was regressed against its market portfolio return and real exchange rate changes. The result confirmed that exchange rate is one factor differentially affecting U.S. stocks. A recent study conducted by Chow, Lee and Solt (1997) in the U.S., supports Jorion's (1990). The most interesting result is that the magnitude of economic exposure is less for larger than for smaller firms. One possible reason for this is larger firms tend to hedge more.

Another recent study measuring economic exposure in a different way is that of Kanas (1996). According to the author, measuring economic exposure by treating exchange rate as an exogenous variable is a reflection of short-term concern about exchange rate impact. Using this fact, the study develops a long-term perspective of economic exposure, which is, integrating exchange rate economic exposure with real income called 'business exposure'. In order to prove his argument, the behavior of the profit margin of an exporter that is exposed simultaneously to a real appreciation of its currency and a decline in the export market is examined.¹⁵ The result of this investigation is depicted in the risk profile as a reflection of the business exposure.

¹⁵ The reason to investigate the simultaneous impact of foreign currency depreciation and demand reduction is based on the monetary approach of exchange rate determination. According to this approach depreciation of foreign currency will be followed with the decreasing of income in foreign country. Hence, demand of exporting product will decrease and creating business exposure.

3.3. Foreign Exchange Exposure Management Policy

Policies in foreign exchange exposure management are also an important aspect because it is an operational guideline for managing exposures. The scope of foreign exchange exposure management, objectives, responsibility, and accountability and authority, are major elements of the policy that have to be clearly set out [Koh, in Klopfenstein (1997, p.203)].

However, it is considered difficult to investigate the detailed elements of the policy. This study addresses three major elements of policies that have been described by Weston (1986, p.135) into defined separate facets. These includes, firstly, defining corporate attitudes towards foreign exchange exposures. Even though this factor is not the focus of this study, it is presented to show the systematic steps of foreign exchange exposure management. Secondly, policy has to define the appropriate objectives of foreign exchange exposure management. This is crucial because it is the ground rule and has to be fit with overall organization objectives [Zenof, in Antl (1989, pp.57-58)]. Thirdly, policy will include the choice of which style, either an active or passive, should be adopted in managing exposure.¹⁶ Finally, the policy should determine how the foreign exchange exposure management function is organized. This is critical because it relates to the authority: how far the responsibility to manage exposure should be retained at the top level of management or should be devolved at the lower level. These elements are explained the following sub sections.

3.3.1. Defining Corporate Attitude to Foreign Exchange Exposure

Weston (1986, p.135) categorized firms' attitude toward risk into three categories, risk loving, risk neutral and risk averse. Moreover, the author argued that to determine whether a firm is risk neutral, risk loving, or risk averse, is dependent on what the firm management perceives to be risk. In other word, risk must be defined in terms of the firm's objectives.

¹⁶ According to Collier, Davis, Coates, and Longden [(1991, p.27); (1992, pp.42-43)], a passive approach is a style of a hedger that has a tendency to cover all exposures whereas an active approach is a style in which a hedger is willing to accept open positions to a degree.

Two firms that have a different objective might have different attitudes toward risk. A firm that has an objective of maximizing profit suggests that the firm may be willing to take some risks in order to make a profit without considering the elimination of all exposure risks. In contrast, a firm may be completely risk-averse if its objective is to reduce to a minimum its foreign exchange exposures confronting the firm's operation.

For example, as reported by Cook (1995, p.3), the exposure management objective of Blount Inc. that "the corporation's policy is to take a non-speculative position with regard to foreign exchange exposures". ..., the aim of the corporation is to meet planned or budgeted cash flow targets, rather than to increase profits through favorable exchange rate movements related to speculative foreign currency positions".

In this step, it is clear that the firm's attitude to foreign exchange exposure is dependent on the firm's objective for foreign exchange exposure management. Therefore, the firm's attitudes also have implications for the strategy in foreign exchange exposure management. For example, in the establishment of a foreign exchange exposure management policy, a firm might adopt a certain style, which has also implications on the timing, the amount of exposure to be covered, and the instrument used.

Comparing two firms with different styles of policy in exposure management is useful for explaining the implication of individual firm's attitudes to foreign exchange exposure (Weston, 1986, p.135). Traditionally, the implementation of the passive style is the use of forward contract as an instrument to cover a certain percentage of exposures on monthly or quarterly basis (Gitlin, 1993, p.31). The main reason to use forward contract is that some researchers have found that forward rate is an unbiased predictor of future spot rate [among others, Philips and McFarland (1997); Gan and Soon (1997); Ho (2002)].

To illustrate the comparison, an Australian exporter, waiting for the payment of the 10,000,000 U.S. dollars receivable at the end of 1999, is given as an example. The exporter realizes that the receivable is exposed to currency changes and should be hedged. If the exporter adopts a passive approach, the firm might hedge by entering forward contract to sell the U.S. dollars against the Australian dollar at the price of the payment date. In contrast, if the firm adopts an active policy, it might

delay the forward contract until it moves to a cheaper price. In so doing, the firm has an opportunity cost between the decisions to lock in its position at the day the firm accepts the notice of the receipt or to lock in the position a few months after the notice because there is a possibility that the forward price might be traded at a cheaper price.

3.3.2. Foreign Exchange Exposure Management Objectives

The first objective of this study includes the identification of foreign exchange exposure management objectives by Australian firms. Since there is no uniformity in the major objectives of foreign exchange exposure management, it is therefore, useful to review the objectives found in the previous studies in order to be used in this study.

Weston (1986 p.140) maintains that constructing a foreign exchange exposure management strategy should begin with establishing policies that include setting the appropriate objective. The importance of the objectives is to ensure whether the activities in foreign exchange exposure management are used for reducing foreign exchange exposures or speculation. To quote Zenoff (in Antl, 1989, p.59), "Anyone who has been involved with foreign exchange is aware of the intellectual difficulties of formulating effective foreign exchange exposure objectives, defining speculation and what a company's position toward it should be".

In terms of objectives, the following are illustrations from Fortune's 500 Manufacturers Treasury Department: "The objective of the treasury department's foreign exchange risk management policy is to preserve the U.S dollar currency movements. The company will not enter into foreign currency transactions for the sole purpose of speculating on the potential future movements of exchange rate for such currency" (Davis and Militello, 1995, p.123). Another survey conducted by Price Waterhouse Coopers (1990, p.86) on Australian treasurers found five following objectives: "(1) Take a view on FX rates and cover or leave exposures uncovered, depending on view; (2) Actively manage all FX exposure on a daily basis; (3) Cover a portion of foreign exchange exposures and actively manage the initially uncovered position; (4) Cover net foreign exchange exposures to eliminate foreign exchange risk; (5) Cover all foreign exchange exposures to eliminate risk".

It appears that there is no uniformity among firms in terms of formulating their objectives. However, Zenoff (in Antl, 1989, pp. 59-60) argues that there are at least five principles of management that can be used as guidelines in the process of formulating the objectives. First of all, objectives should be formulated in such away as to provide a standard of reference and boundaries for entire levels and decisions of management and they can be used as a basis for consistency. Secondly, the objectives of foreign exchange exposure management should be consistent with the "where the company is in time and space". Thirdly, since the objectives cover all aspects that should be integrated, the next requirement is that the involvement of many members in the company such as line managers, non-financial functional officers, is a crucial element in the process of formulation. Fourthly, the efficacy of one objective may not be the same if it is applied to other companies. A company may adopt another company's objectives that have been proven effective within that organization, but it should not be assumed it would fit the other company. Finally, foreign exchange exposure management objectives should be revised and modified when there is a change in the organization.

3.3.3. Major Reasons for Managing Exposure

The objective of exposure management mentioned above is often too broad to be understood and implemented in a strategy. It seems that every firm has the same objectives toward the adverse movements of the exchange rate, that is, reducing exposure as little as possible. Therefore, the objective of managing exposures can be scrutinized by questioning the purposes of managing exposures. Since this study uses three types of exposure: translation, transaction, and economic exposures, the following explanation is focused on the reasons for managing those types of exposure. This is crucial to this study because it is a means of identifying the purpose of managing each type of exposure.

3.3.3.1. Major Reasons for Managing Translation Exposure

The purpose of managing translation exposure has become an area of debate. Some researchers provide evidence that it has no cash implication. Gains and losses

resulting from translation is merely a conversion from a subsidiary's financial statements from local currency to home currency. To quote Pringle and Connolly (1993, in Kolb, p.370), "measurement of forex gains and losses in this process represents the accounting system's attempt to measure economic exposure 'ex post'". Moreover, the authors provide two reasons for the failure of the accounting system. Firstly, there are many distortions in the measurement as a result of using historical costs. Secondly, the distortion to measure gains and losses because of the accounting conventions. Therefore, consolidated financial statements resulting from translation do not reflect the true economic value of firms (O'Brien, 1997).

However, a study by Davis and Militello (1995, pp.1-3) of U.S. foreign exchange exposure management practices have confirmed that accounting considerations remain the single most important factor influencing foreign exchange exposure management. This implies that there are other purposes for managing translation exposure. Sercu and Uppal (1995, pp.516-518) have listed several reasons for translations: (1) Translation plays an important role with respect to tax. Subsidiaries' income is taxable in the home country. Therefore, it has to be translated to home currency for tax purposes. If this is the case, the argument of economic-exposure proponent is not valid since accounting exposure has an impact on cash flows through tax; (2) Translation is used for reporting purposes; (3) Translation is important factor when parent company needs to consolidate the data for investment and financing purposes as well as subsidiary's performance; (4) Translation is needed for parent company to compensate managers because some companies have bonus plan for their managers. Since the bonus has to be linked with performance, translation is needed in order to establish a comparable performance measurement; (5) Investor or analysts sometimes need to value the firm while part of the information is based on accounting values even if the valuation based on cash flows approach. For example, the discounted cash flows of a firm are three times of its book value. The book value can be calculated after assets and liabilities of foreign subsidiaries are translated into the common currency.

3.3.3.2. Major Reasons for Managing Transaction and Economic Exposure

Unlike translation exposure, transaction exposure has a similarity with

economic exposure in the sense that transaction exposure has a direct cash implication. For this reason, Pringle and Connolly (in Kolb, 1993, p.363) argued that "transaction exposure is not a different type of exposure; it is rather, as we shall argue below, a form of economic exposure, one the results from contracting at fixed prices".

However, motivation to manage transaction exposure and economic exposure is different since each has a different concern about the impact of exchange rate changes. Transaction exposure emphasizes short-term impact of exchange rate changes on transactions denominated in foreign currency while economic exposure stresses the long-term impact [Hekman, in Antl (1989, pp.49-54)].

In the transaction exposure, gains and losses arise when the rate at the settlement differs from the rate at the time of contract. As a result, gains or losses arise and hence, it is reported in the financial statement. Even though there is a cash implication in this case through tax, the main concern of transaction exposure is still dominated by the accounting concept [Pringle and Connolly, in Kolb (1989, p.370)].

In contrast, economic exposure encompasses cash flows resulting from existing transactions and future transactions. Future cash flows can be predicted from the historical pattern of a firm. For example, information regarding inputs such as vendors and prices can be obtained through the firm's records. From a sales perspective, the markets, sales price, and competitors have all been identified in the planning process. Therefore, the primary reason to manage economic exposure covers broader aspects in order to maintain the firm's strategic positions, which in turn, increases the value of firm.

3.3.4. A Passive versus Active Policy in Currency Exposure Management

This section is crucial because it is the key issue in policy of foreign exchange exposure management (Wallace, 1998), which is also one aspect of issues investigated in this study. In relation to the second objective, this aspect is used as a variable of the management practices in the hypothesis that is going to be tested. This section therefore, explains the meanings and advantages and disadvantages of each policy.

Broadly, there are two schools of thought regarding the approach that should be taken in the management of translation, transaction, and economic exposures: an active and passive [McNew, in Klopfenstein (1997, p.279)]. According to Davis, Coates, and Longden (1991, p.27), a passive policy is “the style that allows a hedger to cover all exposures whereas an active policy is a style allowing a hedger to accept open positions to some degree”.

Kucemba (1996) describes a passive style in terms of techniques used in budgeting and planning. According to the authors, a passive management would utilize spot adjusted currency rates. For example, the estimation of account payables or receivables in the specific period can be determined by using an acceptable spot price of the underlying currencies at the beginning of the period. Then, the rate can be adjusted by using forward price. This means that the rate is the reflection of adjusted spot price and this may be the appropriate rate if forward hedges are performed. The reasons for using forward contract as a primary technique and its advantages and the disadvantages will be explained in a separate section at instruments used in the management of foreign exchange exposures as a more appropriate place for it.

In contrast, an active approach might utilize any method, beginning with the simplest technique from forward contract to the more complex instruments such as futures, options, and other derivatives. Furthermore, an active approach might not allow a firm or a hedger to lock in its position blindly with a forward contract; it is rather, looking for a more favorable movement of exchange rates before entering the contract to hedge the exposures. For these reasons, an active approach requires a closer look at the major currencies in which a firm's transactions are often denominated and a continuous look of economic variables to prepare an accurate forecast. To do this, an examination of the firm's exposure through currency by currency, period by period, and the appropriate actions taken based on the likelihood of exchange rate movements, are needed in order to implement an active style (Kucemba, 1996).

Unlike the passive approach, the reason for adopting the more active management style is not merely concerned with the instrument used but there is an opportunity cost associated with it [McNew, in Klopfenstein (1997, p.300)]. To clarify this, a simple example is given here. An Australian exporter is notified of an

Australian dollar receipt in November 1994 from the American importer. The firm is now long Australian dollar and hence, would want to set up a short position as a hedge. In this case, the firm has the flexibility to cover its position whether it hedges now or waits six months.

In this situation, the firm has the choice of entering into a forward contract to sell the Australian dollar against the U.S. dollar in November or leave the position open in the next six months period. A firm adopting a passive style might lock in its position on the payment date, November. A more active style firm might wait, however, based on its prediction that the Australian dollar is estimated to appreciate against the U.S. dollar in the six months time. Assuming the amount of money to be received is AUD 50,000,000, AUD/USD on November 1994 is 0.5014 and 0.5125 on May 1995. If the prediction were true, there would be an opportunity cost of USD 555,000 ($50,000,000 \times (0.5125 - 0.5014)$). However, if it is not true and the Australian dollar is depreciated in May 1995, the firm will experience losses as a result of the action.

When the policy toward each exposure is considered, it is not necessarily to choose a single approach to be applied to all types of exposure. There is a possibility for a firm to adopt a passive style in managing translation exposure whereas a more active approach may be implemented in managing transaction and economic exposures. Firms might have reasons for choosing a different style for each exposure type. A comparative study by Davis, Coates, and Longden (1991), towards translation and transaction exposures of UK and US multinational companies, have found that US multinational companies adopt a more active approach for transaction exposure and a more passive approach for translation exposure due to the obligation of periodical reporting.

Regardless of which policy should be implemented there are advantages and disadvantages of each policy. The advantages of a passive policy are that it is, simple, understandable, and has a low administrative cost. Therefore, this strategy can be considered as an alternative when an active strategy is expensive and too risky.

An active policy however, gives a higher profit compared with its cost because there is a high possibility of winning trade. Although there is a trade-off

between risk and return, the profit and potential benefit of an active management strategy outweighs the risks.

In conclusion in this sub-section, the approach that should be adopted regardless of its superiority is dependent on several factors. To quote the pertinent literature, “Passive management through hedging works best if your company is risk intolerant. However, those with higher threshold and stronger stomachs might appreciate a more active approach to risk management” (Kucemba, 1996, p.24). Ankrom (1974, p.88) in the early period of floating exchange rate era posited, “At one extreme, a company’s policy might be to hedge everything. For a small company with relatively little international business compared with its total activity, hedging everything may be the best policy to adopt, but for the larger company, such an approach could prove costly”.

From the statements above, the adoption of an active or passive policy is apparently influenced by firm-specific characteristic variables. Therefore, these variables are used in this study in order to investigate their influence on the adoption of either an active or passive policy.

3.3.5. Organizing Foreign Exchange Exposure Management

As a consequence of expanding their business in foreign countries, firms operating in more than one country, face various problems, such as, managing operations located in many different geographic areas, employees with different cultural backgrounds, coping with different political and economic environments, and different trends in several countries, which may not happen if firms restrict the expansion of their business within the home country (Behrman, 1970, p.4).

As the operation is distributed throughout many countries, a decision-making becomes very complex. Whether it should be executed at either the corporate level or at the operating level is a major concern. Goehle (1980, p.12) said that one of the biggest challenges for multinationals is that how far authority can be delegated to the subsidiaries and other affiliates of the organizations.

There are two schools of thought regarding this issue relevant to foreign exchange exposure management, a centralized or decentralized approach of currency management (Ross, 1990, pp.12-13).

The next explanation therefore, is begun from the discussion of centralization and decentralization in organizational management. Then it is followed by the degree of centralization in foreign exchange exposure management. The pros and cons of which approach is the most beneficial, is a debatable issue. The discussion on this issue is useful for both providing the reader to understand what is meant by the degree of centralization in foreign exchange exposure management. This understanding also helps to define the degree of centralization, which is a variable of policy investigated in this study.

3.3.5.1. Centralization vs. Decentralization in Organizational Management

In the general organizational management, the decision of how to balance the trade-off between delegation and control of decision rights focused on a centralization-decentralization continuum (Collis and Montgomery, 1997, p.137).

Stopford and Wells (1972, pp.5-12) have described the need to decentralized decisions is due to responding to the complexity of the business activity. Using 187 firms listed in 'Fortune 500' in 1963/1964, the authors introduced three stages of organizational development.

The first stage is that firms are usually small enough to be managed by a single person, whether the owner or manager and because the firm is small, there is no need to delegate the managerial tasks. Therefore, the success or failure of the firm depends on the capability of the person concerned. However, if the firm grows, usually it is realized that delegation is needed because a sole manager cannot cope with the mounting demand on his/her time.

The second stage is the one capable of "accommodating considerable growth, provided that growth is achieved by producing more of the product in the same national market" (Stopford and Wells, pp.11-12). This stage occurs in response to the problems found in the first stage. Firms start establishing functional departments, such as sales, production, and finance, and the head of each functional departments report directly to the owner. "At the point of transition, the firm is generally small and producing only a single product or a single line of closely related products and the spread of operations may not have reached even national dimensions.

In the third stage, a firm usually tries to create a structure, which is able to cope with the problems in stage two. The problems of the management structure occur when the firm produces new product lines or expands their business by entering new markets. "The functional departments are unable to absorb all the shock of learning how to manage the new activities and they throw the burden onto the shoulders of the president" (Stopford and Wells, 1972, p.15). As a response, the firm creates product or area divisions. Each division is headed by a general manager, who is responsible for handling those tasks previously done by the owner in stage two structures.

From the description of the development of organizational structure in relation to the additional product lines, it can be clearly seen that firms move from a centralized system in stage two to the decentralized system in stage three. This organizational change also occurs when the products are diversified abroad. The change occurs when the organizational structure moves from an international division to a global structure (Stopford and Wells, p.30).

3.3.5.2. Centralization vs. Decentralization in Exposure Management

The idea of adopting a decentralized approach is that subsidiaries are continuously confronted with risks in the business environment where they operate, including those arising from exchange rates. Therefore, it is logical to leave the decision to the subsidiary's managers since they are the only persons who are knowledgeable about anticipating the firm's exposure (Ross, 1990, p.12). For example, a large corporation has two foreign subsidiaries, one Australian and one Swiss. Each sells their products to the other subsidiaries and customers. If the Australian subsidiary has to import some inputs from the Swiss subsidiary, there will be an exchange exposure facing both. It is also a corporation's exposure since the costs of inputs are in Euro while the receipt is in Australian dollars.

According to the supporters of this approach, those responsible for managing the exposure in the long term are the managers of both subsidiaries. The reasons for this is that, if the exposure is managed at the head office or parent company, utilizing re-invoicing for instance, paying in Euro and receiving Australian dollars, there will be an ongoing covering cost to keep this position hedged. This condition will not

stimulate managers of either subsidiary to improve their performance since they rely on the corporate treasury department to handle this problem. The appropriate decision is, therefore, to leave the decision to both subsidiaries' managers. The Swiss subsidiary is expected to reduce the production costs but to obtain better prices for its products is the responsibility of the Australian subsidiary. This solution is a more realistic option for solving the problem in the long term.

In contrast to the previous approach, the centralized currency management system suggests that the risk arising from the exchange rates should be managed by the parent company. The underlying argument of this approach is that the corporation deals with various currencies in its cash flows. It is, therefore, logical for the corporation to make the decision since it has a clearer picture of the overall activities than its subsidiaries. To quote Ankrom (1974, p.90), "Central control and direction of foreign exchange are prerequisites if there is to be a rational, consistent approach to controlling exposure for the consolidated group"

It can be seen by using the previous example again, if the Swiss subsidiary imports some inputs from other suppliers from Australia and America, and at the same time the Australian subsidiary sells its product to other foreign customers including American, there will be many foreign currencies involve in the transaction, and the corporation is more exposed to the exchange rate.

The illustration implies that it would be difficult to delegate the decision of managing exposure to each subsidiary. It is inefficient for the Swiss subsidiary to buy a forward contract of U.S. dollars in order to protect the exposed account payable from the corporation's perspective. Since the Australian subsidiary has an exposed account receivable in U.S. dollars, it is more efficient to net out the U.S. dollar exposure rather than each subsidiary hedge its position. By netting out the exposure, the amount covered should be smaller, and thus, more efficient. This activity can only be performed at the home headquarters since it has the most information regarding subsidiaries' activities.

Indeed, many studies point toward centralization [Robbins and Stobaugh (1974); Prindl (1976); Jilling (1978)]. Robbins and Stobaugh (1974, pp.131-134) found that the treasurers of big and medium sized firms often discuss their protection programs and procedures and came to the conclusion that such a procedure through corporate headquarters is possible after studying 187 companies which were

categorized as 500 US largest. Based on a mail survey of 107 multinationals, Jilling (1978, p.176) found that 86% of the participating companies show that headquarters are responsible for the development of forecasting. Moreover, international division executives that are used to provide centralized guidance for international operations, handle the responsibility of exchange rate forecasts. When foreign exchange programs are considered, the author noted that net exposure to currency risk should be determined at the corporate level. This has been discussed widely by Lietaer (1971, pp.5-7). Prindl (1976) wrote that the centralized control could be used to mitigate the problem associated with liquidity since the data, which are used for liquidity management, are also important elements before making hedging decisions.

3.3.5.3. The Degree of Centralization

It was shown in the previous sub-section (3.3.5.2) that the centralized approach is the more appropriate response in a fluctuating exchange rate era. In reality, some tasks like identifying and calculating the amount of foreign exchange exposure might be done at the lower level of management while decisions to hedge are the responsibility of the top level. Even though a firm may adopt centralized approach in its foreign exchange exposure management, there are many variants (Davis, Coates, and Longden, 1991). The parent company may provide specific directions or more general guidelines if managing exposures is delegated to the operational units.

A study of UK multinationals by Collier and Davis (1985) showed various degrees of centralization made by the parent company towards domestic and foreign subsidiaries in many areas including a banking relationship, investment of surplus, borrowing, currency management, and currency dealing. For example, a firm may fully control foreign borrowing for its domestic subsidiaries while specific directions are used for overseas subsidiaries.

There are many varieties of category that can be found in the literature of foreign exchange exposure management or cash management practices used to categorize the degree of centralization. Belk and Glaum (1990) utilized high, low, and decentralized. McCrae and Walker [(1980, cited from Davis, Coates, and Longden, (1991, pp.45-53)] categorized the degree into four indicators: fully

centralized, subject to specific directives, subject to general guidelines, and largely autonomous. Other studies used the corporate levels, in which the responsibility is performed, such as, firm headquarters, divisional headquarters, regional headquarters, subsidiaries, or other level [for example, Soenen and Aggarwal (1988); (1989); Soenen and Madura (1991); Soenen and Sun (1995)].

3.4. The Use of Techniques

In foreign exchange exposure management, there are two broad categories of techniques, internal and external (Ross, 1990, p.20). This section is devoted to discussing these techniques. This is very important to the objectives of this study because the first is concerned with the current foreign exchange exposure management practices by Australian firms and its investigation will include the use of internal and external techniques. In respect to the second objective, the techniques are two of four variables in the hypothesis of this study.

3.4.1. Internal Techniques

The term internal means techniques employed from within a firm or a group of firms in an effort to reduce exposure [Borenstein, in Antl (1989, p.217)]. Since these techniques can be implemented without using services from financial institutions, they are often more cost effective than external techniques. The internal techniques considered in this study are matching, netting, leading and lagging, inter-firm foreign exchange contract, price considerations and cash management improvements.

3.4.1.1. Matching

This technique is used in order to offset all receivables and payables based on each currency so that the net exposure is the amount of exposure facing a firm. The net exposure can then be hedged using external techniques. This technique is applicable to cash flows arising either from inter-firm or third party, and can be profitable if it is applied on individual or a group of firms.

The application of this technique in individual firms produces a benefit in the form of spread-saving (Price Waterhouse Coopers, 1991, pp.219-221). For example, an Australian firm that has a policy of covering 100 % of its exposure can identify and offset sterling payables and receivable six months forwards. By doing this, individual forward contract for each exposure is not needed since it can be managed out of a sterling account. Thus, no dollar-sterling conversion will take place. As a result, there is a saving both from spot spread and forward points.

This technique can also be applied to a group of firms, which are typically managed by the central treasury. There are two options, which can be used either the treasury acts as a central control and a net-hedging operation or as a clearing center (Ross, 1990). As a center of control and hedging operation, it receives cash flow information, identifies the net exposure and hedges this exposure in accordance with group policy. Individual group firms deal purely on a spot basis so that currency gains and losses can be attributed to each subsidiary. In order to be effective in the settlement, which is usually annually, the gains and losses are booked as inter-firm accounts in the center. The benefit to the group from this technique is the spread saving of forward points but not spot spread.

As a clearing center, it facilitates a reduction in currency conversions by the group. There are two ways this can be implemented (Price Waterhouse Coopers, 1991, p.218). The first is by having subsidiary cash flows pass through a common set of currency accounts. For example, an Australian firm that has subsidiaries in many countries, Singapore, Indonesia, Malaysia, has to establish a clearing center in order to implement the matching system. The clearing center takes over the responsibility of all external fund flows from its subsidiaries. Usually, the center constructs a matrix. The rows containing each subsidiary in each country and the columns represent currencies. From this matrix, fund flows can be matched and can then be hedged. Utilizing this technique, the firm can save money from both spread saving (from buying and selling one currency to another) and currency fluctuations.

From the above description, the advantages of implementing this technique can be summarized into four points. Firstly, only unmatched values are hedged. This is not necessarily protecting firms from exchange rate exposure (Cook, 1995). Secondly, there is a reduction of banking charges and elimination of exchange

spreads. Thirdly, coordination of the group's exposure allows greater management control. Finally, it is applicable to the international trading organizations.

However, there are also disadvantages of this technique (Price Waterhouse Coopers, 1991, p.219). Firstly, it needs accuracy in the inter-firm accounts. Secondly, it will be more complex if transactions from third parties are involved. Thirdly, it needs accuracy in cash flow forecasts of the timing and amount of foreign currency settlements. It is, therefore, very difficult to implement this technique unless the exposed cash flows are relatively constant and easy to predict over time (Harris, Melumad, and Shibano, 1996).

It was noted at the beginning (Section 3.4.1.1.) that matching could also be applied in such a way that the treasury acts as clearing center. This assumes that responsibility should be for all external currency cash flows. The most economical and easy way to implement this type of matching is called **factoring** [Meierjohann, in Antl (1989, p.125)]. Using the previous example, the Indonesian and Malaysian subsidiaries are assumed as marketing subsidiaries, the manufacturing subsidiary is in Singapore and the headquarter is in Australia. If the company has decided to concentrate its exposure at the manufacturing level, all marketing subsidiaries have to be billed out in the currencies of those subsidiaries. For example, if the parent company in Australia supplies the Malaysian subsidiary, the payment should be in the Malaysian Ringgit. Similarly, the Indonesian subsidiary has to pay in Rupiahs to the Singapore subsidiary. In an effort to concentrate the company's exposure to a single manufacturing company, in Australia, the Singapore subsidiary sells its receivables to the Australian company, which holds all outstanding inter-company receivables from its marketing subsidiaries. By doing this, manufacturing subsidiaries are benefited in terms of payment to a single address. This benefit will grow according to the number of marketing firms and if they also have receivables from third parties.

Besides factoring, another technique that can be used is **re-invoicing**. Under this technique, the manufacturing subsidiaries bill the re-invoicing unit in the form of the currency they need, and, the unit bills the marketing firms in the currencies in which they generate funds. Usually, the re-invoicing firm is appointed by the parent company based upon the comparison of the tax rate in the area or country in which it operates. Since the risk arising from exchange rate fluctuations is converged in the

re-invoicing firm, that is, the exchange rate differential between the time at which the re-invoicing firm is billed and that of collecting the receivables of the manufacturing firms, marketing subsidiaries are charged based on forward rate during the period.

The primary disadvantage of this technique, compared with factoring, is the workload involved [Eiteman, Stonehill, and Moffett (1998, p.252); Ross, 1990)]. For example, in one transaction, both manufacturing and marketing firms must issue an invoice for a single transaction, instead of one. However, it offers two advantages. Firstly, this technique may save money from tax paid by the group if the tax rate both in the country of manufacturing and marketing firms is high. Secondly, it can transfer excess liquidity from the operating subsidiaries to the re-invoicing unit that may be useful for other subsidiaries.

3.4.1.2. Netting

This technique can be defined as "the process by which two or more affiliates settle inter-group financial transactions on a net, rather than on gross basis" [Borenstein, in Antl (1989, p.231)]. According to the author, it can be divided into two types, '**bilateral netting** and **multilateral netting**'.

The first type of netting occurs mostly when a corporation has two subsidiaries located in different countries. For example, an Australian corporation has two foreign subsidiaries, one in Germany and one in Malaysia and there are trade flowing between them. At the end of the period, the French subsidiary is prepared to invoice the German subsidiary in the Malaysian Ringgit for the equivalent of AUD 100,000. At the same time, the German subsidiary will bill Malaysian subsidiary in Euro for the equivalent of AUD 150,000. Utilizing bilateral netting, the subsidiaries do not need to issue two invoices and to convert the funds in the currency of the invoice because both transactions can be netted out. As a result, the Malaysian subsidiary has an obligation of AUD 50,000 to the German subsidiary. By doing this, both subsidiaries can reduce the amount of settlement and the related fees and commissions.

This technique can also be implemented even if no transaction occurred between them except both subsidiaries have obligations or payment claims denominated in currencies that are possible to be netted out. Using the previous

example, If the Malaysian subsidiary has a receivable of US\$ 100,000 from third parties whereas the German subsidiary has an obligation of US\$ 125,000, it can be netted out through collecting all receivable and payable by a central unit (multi currency management center), which acts as an agent to manage the cash flows.

Besides the bilateral netting, other types of netting are also applicable for corporations that have many subsidiaries located in different countries. The process is similar to the previous technique, netting out the obligations and payment claims of the operational units. Since there are more currencies involved, the process is more complex and needs a netting center in order to be able to offset one currency against another.

The above descriptions have shown that neither bilateral nor multilateral netting is a device to eliminate foreign exchange exposures; rather, they reduce the amount of exposed positions of a corporation. Thus, it reduces the cost of covering the exposures since each subsidiary does not need to cover in its own position. The effectiveness of this technique has been pronounced by researchers as a device of a cash management system. This technique discussed above, can reduce bank charges (related fees and commissions). However, many corporations have been able to negotiate with their banks on cutting costs for taking over their job. This is a more useful and efficient method rather than establishing a sophisticated netting program [Meierjohann, in Antl (1989, p.123)].

3.4.1.3. Leading and Lagging

Leading and lagging are techniques, which are mostly applicable for intra-firm transactions. Leading refers to making payments early, while lagging is delaying payment [Antl, in Antl (1989, p.210)]. The reason for paying early is often dictated by the convertibility of a currency in which transactions are denominated. Hence, it would reduce the amount exposed to an exchange rate risk (Rodriguez and Carter, 1984, p.202).

For example, an Indonesian subsidiary has to pay its payable to a German subsidiary. Since, they have agreed that payment is in Rupiahs, the German subsidiary will collect the payment as soon as possible in order to collect the receivable before it drops in value. On the contrary, if the payable is denominated in

Euro and the appreciation of Rupiahs against Euro is likely to occur, the Indonesian subsidiary will lag the payable, since the amount of money to be exchange for paying the obligations is smaller.

In spite of the internal applicability, this technique might also be applicable for inter-firm payments and receipts under a condition in which both firms receive the financial benefit (Eiteman, Stonehill, and Moffett, 1998, p.248). A firm that has a receivable denominated in soft currency has to be collected early and might offer a discount to the firm that holds the payable. The amount of the discount has to be more than the benefit of collecting the soft currency earlier than demanded. For example, the amount of discount, assuming equilibrium, can be calculated based on the difference in the interest rates of the creditor and debtor country for the period of prepayment.

It is clear that this technique can be implemented to reduce the amount of currency exposure particularly for group firms. Moreover, there are also many benefits of this technique. In spite of low cost (the facilities of netting and matching is used), it can also reduce the amount of tax that needs to be paid by the group. For example, in a country where the tax rate is very high, a group firm might obtain loans from others (within group), which are operating in the lower taxed countries. As a result, the tax shields are greater than the tax paid by other group firms. However, the primary disadvantage of this technique is the local regulations, which might prohibit applying it (Eiteman, Stonehill, and Moffett, 1998, p.249).

3.4.1.4. Inter-firm Foreign Exchange Contract

This technique is applied in the centralized treasury management by utilizing the central treasury department as a banker in which forward contract are bought and sold within the group companies [Meierjohann, in Antl (1989, p.122)]. For example, on the one hand a French subsidiary of a US corporation that has an exposed position equivalent of USD 2 million from selling its products has to hedge its exposure. On the other hand, a German Subsidiary has an exposed payable equivalent of USD one million, which needs to be hedged. Both subsidiaries may enter forward contracts in order to cover their positions. In this case, the treasury department acts as a banker by offering forward contract to each subsidiary. The French subsidiary sells the US

dollars to the treasury department whereas the German subsidiary buys the US dollars also from the center. From this activity, the exposure of each subsidiary is transferred into the center and might be hedged externally. The amount to be hedged by the central treasury is not based upon the exposed position from each subsidiary but by the net position, one-million-dollar long.

Certainly, this technique can save the corporation's money by reducing the amount of exposure as well as offer flexibility in terms of negotiation with each subsidiary compared with matching and netting, which an accurate coordination is required to match the amount and the settlement of exposure confronting each subsidiary or group company.

In contrast, in the intra-firm foreign exchange contract, the central treasury department may negotiate with each subsidiary regarding the amount and the date of settlements for each exposure. However, the applicability of this technique is limited to the condition that the subsidiaries have so much similarity in the currency of exposed positions. Otherwise, the benefit may be less than the cost resulting from the workload done in the central treasury.

Another difficulty in applying this technique is determining the actual exchange rate used. Finally, since the central treasury acts as a financial institution, the problems of liquidity may arise as the number of currencies involved is increased.

3.4.1.5. Price Considerations

This technique is used particularly when a firm is willing to reduce the impact of exchange rate movements by setting an appropriate price. This means that the firm has to anticipate both an increase in input costs and sales price. On the one hand, an increase in input causes an increase in production costs and sales price. On the other hand, the increasing sales price may lead to a reduction in the product competitiveness in the market.

According to Price Waterhouse Coopers (1991, pp.225-228), there are techniques of price adjustment in order to reduce the adverse impact of exchange rate movements. The first technique is that a firm may invoice its customers or supplier in a certain currency based on agreement (**currency of invoicing**). This technique is

utilized based on the consideration that an external hedge is expensive, and it is applicable if a firm has a good relationship, both, with its suppliers and customers (Ostro-Landau, 1995). Certainly, the invoicing currency has to be negotiated between them in order to benefit both sides. A supplier may ask for a premium for payment in a currency other than its base currency while customers may ask for a discount for paying in a currency in which they do not have a natural position. These are the costs of exposure reduction, which has to be compared with external hedge.

For example, a treasurer may compare the original price and the adjusted price and then compare this margin to the costs of an external hedge when the original price is used. If the cost of the external hedge is cheaper than that of price adjustment, a firm will utilize the external hedge. However, there are three conditions under which it will be cheaper for the firm to pay the new price than to establish its own hedge. The first is that the other party has an opposite position in the currency concerned. The second is that the other party might have access to the cheaper source of external hedging. The last is that other party has considered bearing the external hedging cost in an effort to retain the business.

The second technique, which is built and based also on a good relationship between a firm and its supplier or customers, is called **currency protection clauses**. In this technique a sale or purchase contract does not need price adjustment when the exchange rate moves within the specified range agreed to by both sides (Carter, Vickery, and D Itri, 1993). It implies that the price is adjusted when exchange rate moves outside the upper and lower limit. Obviously, the actual cost of cover when the exchange rate moves outside the bands confronting the suppliers or customers, has to be taken into consideration in order to ensure that the benefits outweigh the costs. Even though this technique is acceptable as an exposure reduction, the main difficulty is that the exchange rates are very volatile in a wide ranging.

This study does not end with the internal techniques used. The preference of external techniques used is also investigated. The next section therefore discusses the use of external techniques included in this study.

3.4.2. External Techniques

This first objective of this study includes the description of external

techniques used in Australian firms' foreign exchange exposure management. The second objective looks into the association between firm-specific characteristic and the corporate practices, including the external techniques used. This section therefore, explains the external techniques that include option cover, forward cover, currency futures, swaps, and options and the empirical evidence in relation to the influence of firm-specific characteristics and the use of derivatives.

3.4.2.1. Spot Cover

Spot cover is one amongst the available techniques that can be used for managing foreign exchange exposure. It considered important therefore, to understand the meaning, the jargon used and advantages and disadvantages of using this technique.

Spot deal involves the purchase of a foreign currency for immediate delivery (usually two days) at the rate agreed today (DC Gardner Group plc, 1991, p.10). From this definition, there are points should be clarified. Firstly, the rate used in this type of deal is the spot rate: the current exchange rates quoted on bank dealing screens or newspapers for settlement in two business days. Secondly, the period of the two-business day settlement is known as the 'value date'.

In relation to covering foreign exchange exposure, firms use spot transactions by simply converting the foreign exchange claims or obligations using current spot rate. For example, a firm that has foreign receivable payments may ask its domestic bank's correspondent banks for immediate conversion of the payments into the domestic currency in order to be credited into its account. In doing so, there are at least two benefits: (1) there is a certainty of the amount to be received; (2) only a little delay is expected between the time of execution and that of delivery (DC Gardner plc, 1991, p.8).

Despite the simplicity, covering foreign exchange exposure using spot transaction is the riskiest alternative. Kucemba (1996) posit that the conversion of proceeds using the current market rate is disadvantageous for long-term transactions because there is a possibility of significant losses resulting from the difference between exchange rate at the date of contract and that of settlement. In the case of foreign obligations, the amount of domestic currency sold in exchange for foreign

currency will be higher if the domestic currency is depreciated against the foreign currency of obligations.

The advantages and disadvantages imply a dilemma, whether or not a spot contract is an appropriate technique for hedging foreign exchange exposure. Kucemba (1996) said that the risk involved in the spot transactions might not discourage a firm to cover their foreign exchange exposure because of its ability to comprehend the likely direction of the currency movements. This suggests an extreme position in a firm's policy that shows the willingness to take risks. Recent evidence, however, shows that leaving all underlying exposures uncovered is considered as speculation [see for example, Ogden (1996); Cook (1995); Jadoul and Seeger (1994)]. Hence, it becomes an acceptable tool if only certain percentages of exposures are involved in spot transactions because they are not definitely exposed to exchange rate risk.

The spot deal discussed above seems appropriate for one-off foreign transactions in which there is a little time lag between the contract and the settlement date. However, most of business transactions are now conducted on credits that may take months or years for the settlements of claims or obligations. Therefore, the next external technique is discussed to accommodate this type of transactions.

3.4.2.2. Forward Cover

As with spot cover, this section also describes the meaning, the advantages and the disadvantages of forward contract. In this description, an illustration is also given in order to understand the application of this method in foreign exchange exposure management.

Forward contract is an agreement to buy or sell a foreign currency at future time with price agreed today (Hull, 1998, p.38). The contract is usually between two financial institutions or between financial institution and one of its corporate clients. A forward contract is commonly settled at maturity. In some cases, however, the client can reverse the contract earlier than maturity for a certain price.

Forward rate is offered by major commercial banks and often quoted in the form of a forward price at the date of maturity (Three-month forward German Euro 1.2800/US\$). The quotation means that in the next three months the price of 1.2800

German Euro is equal with one US dollar. Although this quotation is concerned with future price of Euro/\$, the price is agreed today by a customer that want to buy the forward contracts.

The above quotation facilitates comparing premiums or discounts in the forward market. Premiums or discounts refer to the annual percentage difference between forward and spot rate¹⁷. The premium indicates a positive value of the percentage whereas the discount shows a negative value.

Firms use forward contracts is normally for hedging their currency exposure. A firm that has receivables or a payables from its credit transactions and they are denominated in a foreign currency may enter into a forward contract to protect its positions. In the case of receivables, a firm enters into the forward contract because there is a possibility of the foreign currency to be depreciated at the date of settlement. The devaluation causes the domestic value of the receivables less than the amount expected at the time of contract.

For example, an Australian firm wants to hedge the 100,000 US dollars, which will be received on April 2000. On January 1, 2000, the spot rate of the Australian-American dollar rate is 60 cents (US) and the applicable forward rate is 58 cents (US). The Australian firm, therefore, enters a forward contract with its bank on January 1, 2000. This contract requires the Australian firm to deliver 100,000 US dollar in the value date in return for 172,414 AUD.

This technique offers several advantages. Firstly, it provides considerable certainty for maturities up to five years although the most frequently used maturities is likely one, three, or six months (Redhead, 2001). Secondly, this technique is quite simple to implement (Bennett and Vaughan, 1990). Most individuals can calculate a forward quote by using their calculators if they are really aware of the interest differentials between the countries of concern. Thirdly, compared with options, which is explained later (Section 3.4.2.5), entering a forward contract does not require an up-front cost (Mendelson, 1993).

It is not surprising therefore, the forward contract is still the most popular method instrument used by Firms confronted with foreign exchange exposure. According to the Bank for International Settlements (BIS, 2005) the daily turnover of

¹⁷ Premium/Discounts = ((Forward – Spot)/Spot) x (360/days of forward) x 100.

over-the-counter forward contracts in 2004 reached more than one trillion US dollars and it is expected to increase in the future (<http://www.bis.org/publ/rpfx05t.pdf>).

However, Bennett and Vaughan (1990) argue that there are at least two disadvantages of using this technique. First, a firm must deal with more than bank to obtain a competitive forward market quote. Second, this techniques do not help when a firm is uncertain about the exact timing of the collection date of its foreign receivables. Using the previous example, when Australian firm was uncertain of when its American customer will deliver the 100,000 US dollars, the firm would pay to the bank for the money that has yet not been received at the date of settlement. Hence, the losses from forward contract may offset the gains from the weakening of Canadian dollar at date of maturity.

Recent development of instruments offered by bank to meet the clients' requirement however, has helped a firm with the uncertainty of collection period under the specified time. One of them is "Window Forwards" that allow a firm enters into the contract when transactions are certain to be paid in the delivery months instead of specified date. Hence, there is no need to deliver the money on to the bank at the specified date while it has yet not received.

Considering the advantages and disadvantages, forward contract is honorable to be used in a firm that cost is a primary constraint or hedging is a new concept in its commitment for managing foreign exchange exposures [McNew, in Klopfenstein (1997, pp. 283-284)]. In order to use this technique a firm may only utilize regular spreadsheets to track information, such as, deal date, maturity date, currency, size of contract spot and forward points. Hence, there is no need to hire sophisticated personnel to handle the jobs.

In relation to the accounting regulation that requires gains and losses to be recognized at the income statement, forward contract requires no sophisticated model. In the United States (SFAS No. 52), in particular, gains and losses of forward contact are included or not in the determination of net income depending on the designation of foreign exchange exposure being hedged (Herz, Linsmeier, and Bhave, in Klopfenstein 1997, p.330). In Australia, however, there is no recognition and measurement of financial instruments (Ernst &Young, 2002).

As mentioned earlier that the one of the disadvantages of a forward contract is when there is uncertainty about the time of collection period and therefore the

uncertainty of the date on which the exchange of currencies will take place. The following technique is explained because of its superiority in this regard.

3.4.2.3. Currency Futures

Essentially a future contract is a commitment to buy or sell a standard amount of commodity at a predetermined future date and price (DC Gradner plc, 1991, p.8). The commodity can be a product, such as, oil, cocoa, livestock and meat, as well as a currency or interest rate, which are traded in the standardize exchanges (CBOT, CME, NYCE, NYFE, and so on).

The primary differences between forward and future contracts are the costs and the date of expiration (Kritzman, 1992). Unlike forward, future contracts require an initial cost, which is known as a “margin deposit” as well as the variation margin to cover daily price fluctuations (marking to market). Future contracts can be liquidated before the date of expiration that may not occur in the forward contract.

As with forward contract, future contract can be used for hedging foreign exchange exposure. For example, an Australian firm expects to receive 100,000 US dollars on April 30, 2000. In order to hedge this position, the Australian firm can buy a June future on the exchange and settle it daily until April 30 at which the future is sold. It is often however, to sell the future at the expiration date (usually before) because of the immediate need of hedging cash flow exposure or consideration of making a profit. This implies that futures are more flexible in timing than forward contract. It can be liquidated any time depending on the daily movements of the currency price or the need of a firm to hedge

However, the execution of future contracts can be more expensive than that of forward contracts when it involves a large trade. This is because a firm that wants either to establish a future position or close one out may find it difficult to find the counter parties that are willing to trade and therefore offers a higher price in order to introduce others to sell (Redhead, 2001). The exact measurement of either large or small trades unfortunately, cannot be defined precisely. To quote Kritzman (1992, p.29), “As a rule of thumb, though, multimillion dollar trades can usually be executed at lower price in the forward market while trades of less than a million

dollars can often be executed less expensively in the futures market". Hence, futures are most suitable for hedging short-term and relatively small exposures.

Another problem with this technique is the execution takes in a transparent trading environment (Taylor, in Klopfenstein, 1997, p. 38). In this way, all trading and quoting have to be performed openly in the trading pits (except for exchange for physicals market, known as EFP). Market makers may read the direction in which the clients want to trade and move the quote in accordance with that direction.

3.4.2.4. Currency Swaps

Currency swaps are a hedging instrument for which two parties agree to swap a debt denominated in one currency for that in another currency. For example, an agreement between two Firms to swap their debts of which one is denominated in Euro and that in US dollar (Leger and Fortin, 1994).

In order to explain the use of currency swaps, a Japanese firm that has exports to Australia is given as an example. The Japanese firm wants to protect its Australian-dollar receivables by using currency swap to match inflows in one currency with outflows in a foreign currency (natural hedging). Assuming the Japanese firm is not well recognized in the US financial markets, it may obtain funds from a domestic bank to swap with another firm that has dollar-denominated debt. This process is carried out by the swap dealers (usually banks) as an intermediary.

In its later development, currency swaps can also be combined with swapping fixed for floating interest rate of a debt obligation¹⁸. Similar to the above currency swaps, a firm paying floating interest rate debt denominated in one currency could swap for fixed floating interest rate in a foreign currency. For example, a firm paying floating six-months US dollar LIBOR (US treasury yield + offer spread) for seven years could swap with another party that has fixed rate payments in German Euro (Offer spread of EUR/\$).

The common objective of this type of transaction is that Firms want to alter various future currency cash flows in its schedules into a particular currency for which its future revenues will be generated (Eiteman, Stonehill, and Moffett, 1998,

¹⁸ An agreement between two parties to swap fixed for floating interest rate is often called "plain vanilla", which is often used to manage interest rate exposure (the variations and examples can be found in Lauwick (1996); Dago and Lauwick (1996); and Lynch (1996).

p.312). The preference of particular currency is caused by several factors, such as, capital market segmentation, “differences in regulation governing investment by institutional investors and asymmetry in the tax treatment of interest income and capital gains/losses” (Jacque, 1996, p.93).

Although there are other types of swaps involving foreign currencies, such as, foreign currency forward swaps, plain vanilla, and a three-way back-to-back currency swap, they are designated primarily for hedging interest rate exposure. It is therefore important to look into the next technique, which has different characteristics from forwards, futures, or swaps.

3.4.2.5. Options

This section explains briefly the meaning and the terminologies used of currency options. It is then followed by the difference between this technique and those described above.

A currency option is “a contract between the buyer and the seller, which gives the buyer the right, but not the obligation to buy or sell a specific amount of currency, at a predetermined price, on or before a specified date in the future” (DC Gardner plc, 1991, p.2). From this definition there are two types of options: (1) a call option, which gives the buyer (holder) the right to buy a currency at certain date for a certain price; (2) a put option that gives the holder the right to sell a currency at certain date for a certain price (Hull, 1998, p.169).

Options in the markets are written by both banks (over-the-counter) and organized exchanges (e.g. LIFFE and PHLX). The primary differences between the two option markets are the strike price, contract size, and maturity (Redhead, 2001). According to the author, over-the-counter options are offered by banks can be negotiated whereas that offered by exchanges are standardized.

In terms of the costs should be paid by the holder involved in this agreement is called *premium*. A premium has to be paid at front to the writer because the holder is given the right to buy or sell a certain amount of currency at a specific price (*strike price*). Since it is the right not the obligation, options can be exercised any time before the date of expiration (American style). European options, however, has to be exercised only at the expiration date.

The understanding about the premium and strike price is very important for the holders to make a decision whether or not an option is exercised. This is because the profits of either call or put buyers are determined by the level of premium, strike price, and spot rate. For example, a firm purchases an August call option on German Euro that has a strike price of 58 ½ (\$0.5850/EUR) and a premium of \$0.005/EUR. The decision to exercise this option is depending on the strike price. All spot rates above the strike price (in the money) represents the profit of the call option holder and therefore option would be exercised. In contrast, the call option holder will not exercise all spot rates below the strike price and the premium is the only cost has to be paid.

The above description shows the difference in characteristics between option and forward, futures, or swaps for two principal reasons. Firstly, this technique does not oblige the holder to exchange currencies at the predetermined exchange rate. As described above, the holder of option has the right to ignore the option when there is a possibility to exchange currencies at more favorable rate than the predetermined one. Secondly, an option gives the holder a protection from an adverse effect of exchange rate movement and the ability to make a profit from the favorable movement for a cost (premium) that has to be paid at front regardless of the exchange rate movements [Hopper, in Klopfenstein (1997, p.10)]. This cost is not applicable for forward, futures, or swaps.

The different characteristics between options and forwards or futures imply the favorable conditions in which option can be used as a hedging device for managing foreign exchange exposure (Redhead, 2001). The first is when there is uncertainty of whether or not cash flow will be hedged. The second is when the a firm' foreign exchange exposure management permits its treasurer to take a view on the future direction of exchange rate movements, in making the decision for covering all or certain percentage of underlying exposures.

The brief description of the external techniques may provide the basic foundation of understanding the instruments used in foreign exchange exposure management. In order to understand the issues and the analyses in this study, however, factors that should be considered for using the techniques as well as other management practice variables have to be clarified.

3.5. Firm-specific Characteristics, Empirical Evidence

The above descriptions show that the use of derivatives includes the consideration of costs. McNew (in Klopfenstein, 1997, p.275) said that the costs of hedging include 'cash-flow related cost for contract settlement, contract trading costs, management and custodial fees'. These costs affect Firms' decision to use currency derivatives (Nance, Smith, and Smithson, 1993). The authors argued that size of a firm is a proxy for economy of scales. This argument has long been recognized by Kimberly (1976). Hence, larger firms have greater financial capabilities than smaller firms in terms of covering hedging costs. This has been confirmed by many studies that examined the determinants of hedging [(Geczy, Minton, and Schrand (1997); He and Ng (1997); Berkman, Bradbury, Hancock, and Innes (2002)]. The next explanation therefore is devoted to review prior studies that employ similar variables and how they are operationalized and measured.

The construct of firm size has been extensively used in many areas of research. Firm size has been investigated in terms of its relationship to profit [Whittington (1980); Hill (1985); Poensgen and Marx (1985); Nguyen (1985); Acs (1992)], compensation [Magnan, St-Onge, and Thorne (1995); Balsam and Ryan (1996); McKnight (1996)], export behavior (Bonaccorsi, 1992; Calof, 1993, 1994; Wolff and Pett, 2000), and other variables. Hence, it seems plausible to investigate the association between firm size and management practice variables.

Firm size has been operationally defined with the variety of definitions. Kimberly (1976) lists four aspects of size definitions that has been derived from many literatures, these are, the physical capacity of an organization, the personnel available to an organization, organizational inputs or outputs, and discretionary resources available to an organization. Moreover, the author suggested that operational definition of firm size does not have to cover the entire aspects; it would be sufficient to represent one aspect only of firm size.

The measurement of firm size has also been numerous. Kimberly (1976) cited that there was several measurers of firm size can be found in literature, which include capacity, number of clients served, net assets, and sales volume. On the other hand, Bates (1964, pp.174-177), based on economic viewpoint, suggested two forms of

indicators than can be used to measure firm size, physical measure including employment and output, and financial measure such as assets or market value.

The difference in measuring firm size is not based merely upon the background of researchers; it is rather, the difference in the theoretical foundation. As Kimberly argued (1976), there were differences in measuring firm size between organizational behaviorist or sociologist and economist since they had a different interest. Organizational behaviorist or sociologist is more interested in the effect of number of people on firm structure, human relationships, and the mechanics of administrative control. Hence, the measurement of firm size is the number of employee or capacity. Another example in this issue is studies focusing on the broader context of firm behavior associated with the relationships between firm size and export behavior. Cavusgil (1984) and Bonaccorsi (1992) utilized sales volume, the number of employee, or both of them, as a measurement of firm size since they are interested in the organizational characteristics of firm and export behavior.

In contrast, economists are interested in profitability, efficiency, and wealth resulting from assets invested in the business. Therefore, the measurers of firm size often used are assets turnover, rate of growth, and other measurers. Finance is one example, perhaps, of a subject that has adopted several theories developed by economists. Hence, financial measurers are often used.

In the capital market, firm size is often measured by market capitalization, that is, the market value of firm's outstanding shares (Grinblatt and Titman, 1998, p.177). The reason for using this measurement is that many studies conducted in this area are interested in the prediction of stock returns in terms of its relation to both, stock characteristics and CAPM beta, hence, market capitalization can be used as a predictor of the average historical returns [Chan and Chen (1988); Brown, Kleidon, and Marsh (1983); Tsetsekos and DeFusco (1990); Chan, Hamao, and Lakonishok (1991); Fama and French (1992); Barbee, Mukherji, and Raines (1996)].

In the area of foreign exchange exposure management, firm size has been measured by using various indicators. In the study of foreign exchange economic exposure and its relationship to the prediction of stock returns, firm size has been measured by market capitalization [for example, Choi and Prasad (1995); Chow, Lee, and Solt (1997); He and Ng (1998)]. The reason for this measurement is to address foreign exchange exposure in the prediction of stock return. Similar

measurement of firm size has also been used in terms of its relationship with the use of derivatives as a technique in exposure management (Nance, Smith, and Smithson, 1993). In addition, studies addressing several aspects of corporate foreign exchange exposure management practices, measure firm size by variety of indicators: sales [Tran (1989, p.5); Jilling (1978)], sales turnover (Teoh and Er, 1988), and total assets [Mathur (1982); Malindretos and Tsanacas (1995); Jesswein, Kwok, and Folks Jr. (1995)]. Other studies in this area utilize a combination of measurements such as assets and sales turnover (Collier, Davis, Coates and Longden, 1990), sales and foreign exchange turnover (Batten, Mellor, and Wan, 1993).

This study also includes the degree of foreign involvement (DFI) as one of firm-specific variables that appears to be associated with management-practice variables. Previous studies confirmed that foreign exchange exposure of a firm is associated with its degree in foreign activities [Jorion (1990); He and Ng (1997)] because the higher the degree of foreign involvement of the firm the greater the cash flows exposed to exchange rate risk. Hence, it may also influence how the exposure is managed.

Since there are numerous definition and measurement of DFI, the next explanation is devoted to explore underlying theories that constitute the difference. According to Nguyen and Cosset (1995) there are at least two reasons explaining the use of various measurers of DFI. First, there has been dispute among economists associated with the definition of a multinational corporation (MNC). The second is the availability of data. A brief discussion associated with those reasons is presented to justify the definition and measurement used in this study.

Lilienthal [(1960), cited from Hu (1992)] who firstly introduced the term MNC, defines MNC as a firm that operates in more than one country. Therefore, a firm is classified as MNC based upon structural or organizational criterion: the number of foreign countries in which a firm is conducting business. Some researchers [for example, Dunning (1973); Hood and Young (1979, pp.13-41); and Caves (1982)] appear to be disagree with this criterion in terms of having business in foreign country. They have suggested that a firm is qualified as an MNC when it has a production activity in at least one foreign country because production factors

between countries are immobile. Other researchers [Vernon (1971, p.11); Rugman (1980, p.34-35)] suggest that a firm is qualified as a multinational corporation when it has operation in at least six foreign countries.

With respect to the availability of the data, Litvak and Maule (1975) define Canadian MNC as firms with two foreign countries of operation. This simplicity of measurement leads to the frequent use of DFI measurer. As argued by Miller and Pras (1980), the appropriate definition of MNC should not be based on the number of foreign countries of operation but countries diversification of assets.

Since the data was not available, the authors propose an entropy index that is not only reflects the number of foreign countries but also the broad dimension of assets diversification.¹⁹ The study of Errunza, Senbet, Bicksler (1984) has confirmed this measurement in analysing the effect of international operations on the market value of firm.

Another criterion used to qualify a firm as multinational is focused on the financial characteristics including earnings, sales or assets, and the number of employees. Rugman (1996, pp.75-80) for instance, uses foreign to total operations F/T) as a measurer of DFI. Another conclusive result can be found in the study of Lee and Kwok (1988) use a similar measurement in terms of the percentage of foreign to total tax.

In addition, the definition of DFI is based upon behavioral characteristics. One characteristic of this perspective is that each subsidiary (and parent) is embedded in its host country's network of supplier and customers. Each subsidiary is also a member of worldwide network based on its industry. In addition, it is a member of an organizational network under the parent-firm control [Ghosal and Bartlett (1990); Eiteman, Stonehill, and Moffett (1998, p.493)]. However, this definition is difficult to quantify. To quote Rugman (1980, p.24), "there is nothing

¹⁹ The index is calculated as an entropy of each firm's relative country (or regional) holding as follows:

$$D_2 = - \sum S_i \text{Log}_e S_i$$

Where, S_i is the ratio of the firm's holdings (the number of subsidiaries) in country (or region) i to the total number of its foreign subsidiaries. The D_2 index of multinational diversification was calculated at the end of years. The larger is the index, the greater the number of countries or regions. With this measurement, the possibility to examine the behavior of the MNC in relation to the area of diversification is promising.

wrong with such definitions but they are of little use in building a theory of the MNE which will concentrate upon economic questions”.

Another firm-specific variable that has to be taken into consideration in influencing the management practice variables is ownership of a firm. The difference in ownership causes the difference in the process of decision-making. Dunning (1981, pp.185-186) illustrates the effect of ownership on the international production of two firms that are affiliates of an MNC. The author describes that an affiliate owned by the country where it operates, might use its own resources and make decisions without interference from parent company. On the other hand, a foreign affiliate that is owned and controlled by the parent company has to follow the overall strategy that are tightly guided by the parent company to ensure the activities of this affiliate is in line with the interest of the whole corporation.

The influence of ownership may also be applicable in the area of foreign exchange exposure management. A firm can transact foreign exchange business is dependent on whether or not it is owned and controlled by the parent company. Policy and strategy may be provided by the parent company for an affiliate owned by the home country. In contrast, a foreign affiliate that is resident of the host country may apply its own decisions concerning types of exposure managed, the percent coverage of exposure, and instruments used.

The ownership in this study is defined whether a firm is domestic or foreign-owned. This is considered important because some firms in the survey are foreign-owned. They are mainly the investment of a foreign firm in the different economic entity. Hence, it creates uncertainty for the parent company. For this reason, the parent company may impose a greater control and requires the subsidiaries to have an approval to employ the derivatives in their foreign exchange exposure management. This study therefore, looks into the possibility of the ownership in influencing the decision to use the external techniques.

3.6. Summary

This chapter has described the aspects and elements of foreign exchange exposure management practices investigated in this study. The description is organized into steps that have to be addressed in establishing effective foreign

exchange exposure management. It is expected therefore, the descriptions assist to comprehend the issues investigated and the analyses.

The first step discussed the identification aspect of foreign exchange exposure management. This includes several elements such as types of exposure that have to be identified, their sources and measurements. This step is very important in the beginning of establishing effective foreign exchange exposure management because the understanding of the exposures is a prerequisite before they are managed.

The second step discussed the policy and its elements that have to be established after understanding of exposure. Policy has to address the entire elements since it is a blue print of how exposure should be managed. This study however, looks into the particular elements that are crucial in foreign exchange exposure management. These include the objectives, the issue of either an active or a passive policy, and the degree of centralization.

Finally, the use of internal and external techniques was discussed. Internal techniques refer to the hedging tools that can be done internally without involving products offered in the financial markets. Internal techniques used in this study include matching, netting (bilateral and multilateral), leading and lagging, inter-firm foreign exchange contract, and price considerations (currency of invoicing and currency protection clauses). External techniques discussed in this study include spot cover, forward cover, currency futures, currency swaps and currency options.

In this stage, the knowledge to understanding the issues investigated and the discussion in the analyses were discussed. The next chapter is concerned with the how this study is undertaken and therefore the methodology used to analyze the data.

CHAPTER 4

RESEARCH METHOD

Introduction

This chapter deals with the empirical research method used to select, collect, and analyze the data to address research issues raised in this study. This chapter is divided into six sections. Section 4.1 contains restatement of objectives pursued in this study because this determines the empirical research method and techniques used, that is, the determination of what data has to be collected, how they are collected, and what appropriate techniques are used for analyzing the data to derive the results of this study. Section 4.2 reviews the data collection techniques used in prior relevant studies as a basis for selecting the data and sampling techniques used in this study. The review is then used to develop and justify the detailed criteria for the sample selection applied in this study. Section 4.4 describes the questionnaire that includes type, pilot study, classification, and treatment of each question. This description is central for this study to assure, explicability, validity, and replicability. The nature of research objectives in this study requires two types of data analyses that are explained in Section 4.5. Two separate sub-sections are constructed in accordance with the methods used for data analysis, descriptive evaluative and quantitative method. Finally, a summary of this chapter is presented in the last section (Section 4.6).

4.1. Research objectives and Hypothesis

The present study addresses two major objectives and tests only one hypothesis: the second objective. The two major objectives of this study are the following: *(i) describing selected aspects of foreign exchange exposure management practices of the Australian firms; (ii) Determining the potential association, between selected firm-specific-characteristics variables and foreign exchange exposure management practice variables.*

The reason for not constructing a hypothesis for the first objective is merely due to the descriptive nature of it. However, a wide range of aspect in foreign

exchange exposure management practices of the Australian firms is addressed. This includes the description of exposure identifications, policies, and the use of techniques in foreign exchange exposure management.

In particular, the first objective of this study is contained in the following questions: (1) *Do they manage transaction, translation, and economic exposures?*; (2) *What are the sources of their exposures?*; (3) *What are the primary reasons to manage the exposures?*; (4) *What are the general objectives of managing translation, transaction, and economic exposures?*; (5) *What are their policy towards particular exposure, transaction, translation, and economic exposures?*; (6) *What are their forecasting policies of foreign exchange rates?*; (7) *How frequently do they revise the policy?*; (8) *How far the decision on managing foreign exchange exposures should be retained at the top level of management or channeled to the lower level of management?*; (9) *What techniques are being used?*; (10) *What factors are critical for techniques used? And how frequent they use external techniques?* These reflect the elements of foreign exchange exposure management practices of the Australian firms included in the survey

The above questions relate to the specific elements of foreign exchange exposure management. Questions 1, 2, and 3, are those concerned with foreign exchange exposure identification. Question 4, 5, 6, 7, and 8 are selected elements of policies, and the rests are concerned with techniques used in foreign exchange exposure management.

The second objective investigates the association between selected firm-specific-characteristic variables and foreign exchange exposure management practice variables. The hypothesis of this study is: *Foreign exchange exposure management variables (active and passive policy, the degree of centralization, and the use of internal and external techniques) and selected firm-specific-characteristic variables (firm size, the degree of foreign involvement, and the ultimate ownership) are independent of one another.*

In order to achieve the objectives, the types of data and the techniques used in collecting them have to be cautiously determined. This can be performed by reviewing data collection techniques that have been used by previous studies.

4.2. Methods of Data Collection Used in Previous Studies

Techniques used for collecting data in the study of foreign exchange exposure management can be divided in accordance with the purpose of studies. There are two broad research areas that are relevant to the purpose of this present study. The first is studies investigate corporate exposure management practices. The second is those addressing the issue of economic exposure and the value of the firm. The following is a brief review of those studies.

4.2.1. The First Area

Studies addressing corporate practices of foreign exchange exposure management use a different technique for selecting their sample. Their objective is typically to describe particular aspects of corporate practices on exposure management. In contrast to the previous area of study that mostly relies on secondary data, the studies exploring corporate practices often rely on primary data. Among others, the studies by Rodriguez and Hawkins (1981), Belk and Glaum (1990), and Davis, Davis, Coates, and Longden (1990), utilize the interview while others use mailed questionnaires [Teoh and Err (1988); Collier and Davis (1985)] as their primary methods of data collection.

Studies in corporate practices using the interview for collecting data often focus on in-depth particular aspects of foreign exchange exposure management practices. Among others, studies by Rodriguez and Hawkins (1981), Belk and Glaum (1990), Collier, Davis, Coates, and Longden (1990) employed this technique at a time when research into corporate practices was scant. Rodriguez and Hawkins (1981) for instance, investigated whether U.S. multinational corporations affected the exchange rate when the controversy about the role of U.S. multinational corporations occurred in the late 1971. This was when Nixon commenced devaluating the U.S. dollar. Interviews were conducted with 70 financial officers of U.S. multinational corporations selected from Fortune 500, based on their substantial involvement in Europe and Japan.

Motivated by the finding of Rodriguez and Hawkins (1981) that characterizes U.S. multinational corporations as risk averse, which also occurred in the UK

(Collier and Davis, 1985), Belk and Glaum (1990) interviewed 17 senior financial officers of U.K. multinational corporations with significant degree of foreign involvement. The authors found that they are risk seeking. However, a more recent study of Collier, Davis, Coates, and Longden (1990), an extension of previous study by Collier and Davis (1985), both using the case study the authors found similar result after comparing corporate practices of U.S. and U.K. multinational corporations on their foreign exchange exposure management.

Studies using mailed questionnaires for collecting data are often characterized by descriptions, explanations, and generalization of particular aspects in foreign exchange exposure management. Some studies might plainly describe and explain whereas others might use statistical analysis for the purpose of generalization. Mathur (1982), Soenen (1989), Soenen and Aggarwal (1988; 1989), Malindretos and Tsanacas (1995), and Soenen and Sun (1995) have employed mailed questionnaires as a method of data collection for describing corporate practices on exposure management.

Mathur (1982) described and explained corporate practices of U.S. firms engaged in international trade covering several aspects such as policy, the implementation of forecasting, and the use of internal and external techniques. 300 firms of Fortune 500 were selected based on random sampling. The selected firms were sorted based on firm listed by "Dun and Bradstreet", directory of international companies, in order to assure that the selected firms are only those with significant international activities. Finally, only 55 firms can be used for the basis of the analysis.

Soenen (1989) who is also interested in describing corporate practices on treasury management, including banking relationship, domestic cash management, and foreign exchange management, covering major industrial sectors in Belgium, uses a different technique to the previous study. In his study sample was selected based on firms with annual sales of greater than one hundred and fifty million Belgian francs (Bfr) listed in value-added-tax-payers (VAT-payers). The selected firms were then divided into two groups, below or above one billion Bfr. Every third of those below one billion on the list were selected as samples. In the category of annual sales greater than one billion, one firm out of two was selected from VAT-payers. 1887 questionnaires were sent to the firms satisfied the criteria.

A recent study by Soenen and Aggarwal (1988) looked at similar aspects of cash and foreign exchange management employed a simpler procedure in selecting their samples. 200 members of Association of the Association of Corporate Treasurer in the UK were selected. In Netherlands and Belgium, 250 and 300 firms were selected based upon their rank published by leading financial newspapers in those countries.

Soenen and Sun (1995) investigating similar aspects of cash and foreign exchange exposure management on Chinese enterprises covering two specific industries, harbor constructing and transportation industry employed different method in sample selection. 41 state enterprises were chosen randomly, and then divided by position held, sales, and total assets.

A more recent study that has a different focus on aspects of foreign exchange exposure management has been conducted by Malindretos and Tsanacas (1995). Since the purpose of their study was to understand whether chief financial officers (CFOs) of U.S multinational corporations have sufficient understanding of translation, transaction, and economic exposures, samples are selected from CFOs of 150 U.S. based multinational companies.

In summary, studies that are merely concerned with the description of corporate practices may not need to consider the measurements and scales used since generalization is made without constructing a hypothesis. In contrast, a mailed questionnaire devoted to investigate hypotheses has to be constructed in such a way that it is possible to meet the requirement of validity, reliability, and the statistical methods of analysis. Since the present study covers both the investigation of corporate practices as well as testing the hypotheses, a mailed questionnaire which is designed and manipulated to meet these requirements is used (explained in section 4.3).

4.2.2. The Second Area

Typically, studies addressing the effect of exchange rate on the value of firms select their sample based on the purpose (purposive random sampling). Jorion (1990) for instance, select 287 U.S. multinational corporations from 673 firms included in monthly CRSP based on the degree of foreign involvement. The reason for this

technique is to highlight and prove that the magnitude of foreign exchange exposure is greater for firms with a higher degree of foreign involvement. Following Jorion (1990), He and Ng (1998) employ similar techniques, that is, samples are selected based on export ratio, overseas ratio, or trade ratio²⁰, which are provided by Japan Company Handbook, published by Toyo Keizai Inc. The principal purpose of using this techniques is to prove that the higher the degree of foreign involvement, the greater the exposure.

In short, studies focusing on the effect of exchange rate on the value of firms tend to select their samples in such a way that the effect of exchange rate on stock return is proven. Therefore, they select their samples based on certain criteria that represent the degree of foreign involvement such as export ratio, trade ratio or other criteria. The study by Chow, Lee, and Solt (1997) for instance, uses other criterion in which 213 multinational firms are selected based on diversified equity portfolios. Bartov and Bodnar (1994) apply a more stringent selective procedure for their sampling. They choose firms with a high degree of foreign involvement.

The sample selection based on international activities is crucial, as agreed by academics in the financial area [Rawls and Smithson, in Chew (1993, pp. 357-369)]; Nance, Smith and Smithson (1993); Stulz (1996)], to confirm the effect of foreign exchange exposure on the value of firms. As an example, an Australian Study by Loudon (1993) across industries has found weak evidence regarding the effect of exchange rate exposure on stock return because the author ignored the criteria of samples to be included in the investigation. The present study therefore, applies the criteria described in the next section (Section 4.3).

4.3. Sample Selection

The selected firms in the present study are large Australian firms, covering major industries, both foreign and domestic owned, based in New South Wales with annual sales equal to and greater than \$10 million AUD and with a significant amount of exposures. Data were gathered through a credible database, Dun & Bradstreet (D&B) that has held an ISO certificate for a considerable period of time.

²⁰ Export ratio represents a firm's export as a percentage of total sales; overseas ratio express a construction firm's ratio of construction carried out overseas; and the trade ratio measures a trading firm's ratio of export, import, and offshore trading relative to total sales.

From 25,580 Top Australian firms compiled by the database at June 2002, 9646 firms are based in New South Wales. From this number, 299 firms were selected into the sample based on purposive sampling, that is, respondents are selected into the sample based on the researcher's judgment of their "typicality" [(Cohen and Manion (1989, p.103); Cooper and Schindler (1997, p.245)]. Two criteria are applied for this purpose. The firms are selected based on average annual sales or revenues equal to and greater than 10 million (Australian dollar) and those with significant foreign exchange exposures.

There are several reasons to select firms based on these criteria. First, prior studies investigating corporate practices on foreign exchange exposure management mostly use financial criteria to ensure only those with the capability to bear the costs of managing foreign exchange exposures are selected. For example, Collier and Davis (1985) selected their sample study based on 200 top Times magazine in which average sales and net assets turnover were used. An Extension study of Collier and Davis (1985) is the study of Collier, Davis, Coates, and Longden, (1990) using two sources Times and Fortune Magazines. Other studies, Soenen and Sun (1995) and Jesswein, Kwok, and Folks Jr. (1995) use one or combination of financial criteria such as, annual sales, assets, and other financial criteria. Second, firms with significant foreign exchange exposure are chosen since it is the purpose of this present study to obtain information regarding corporate policies and practices on foreign exchange exposure management.

4.4. Method of Data Collection

This section explains the type, reasons, and the contents of questionnaire used for collecting data. Under this heading, a sub section is constructed to disclose the process of the pilot-study testing before the questionnaire is distributed. In an effort to provide the detailed explanations of the questionnaire in accordance with the first and the second objectives, a separate sub-section is also constructed under this heading.

4.4.1. Type of Questionnaire

A mailed questionnaires consisting of 36 questions, covering issues in foreign exchange exposure management is employed in this study. The questionnaire is designed for using checklist response. Several alternative answers are given in each question for the ease of answering. Alternative answers are designed in such away that they are easily classified and manipulated in order to satisfy the research questions.

The reason for employing this type of questionnaire is based on both, how the data will be treated and practicality (Tuckman, 1999, pp.248-249). Practicality refers to the type of response mode that provides familiarity to the respondents (Cohen and Manion, 1989, p.112) while the treatment of data refers to how the analysis is carried out to achieve the objectives.

In accordance with the first objective of this study, checklist response is useful to obtain information on each issue investigated without losing the dimensions of corporate practices and policies. Although closed questions are easier to administer and manipulate, the alternative answers provided may not be applicable for some respondents. Hence, the description of corporate policies and practices, which is the first objective, may not reflect the reality.

In relation to the second objective, the checklist response can be classified and transformed into nominal or ordinal scales for the purpose of statistical testing (Tuckman, 1999, p.249). The detailed explanation of this aspect is presented in section containing method of analysis (Section 4.5).

Regardless of the advantages and the disadvantages of this type of questionnaire, it has to be pilot-study tested.

4.4.2. Pilot study

Prior to the primary survey, the questionnaire was pilot-study tested. Questionnaires with prepaid self-addressed envelopes were distributed to 20 firms of the selected sample. Guidance to fill in the questionnaire was given and respondents were asked to pass this questionnaire onto the more appropriate person, usually chief financial officer, financial controller, accountant, or a person responsible or involved

in the daily activities for managing foreign exchange exposures in the firm. Respondents were also asked to indicate which questions were not applicable.

The reason to test using a small number of firms within the sample for the pilot study is due to constraint factors, costs and time (Dillman, 1991). To decide which firms should be chosen, prior studies suggest that the pilot-study group should be part of the general group being investigated in the primary survey [Brouthers (1995); Shrader, Oviatt, and McDougall (2000); Tilley (2001)].

The results of the pilot study revealed that some revisions were needed. First, the guidance details at the beginning, in particular, on some of the terminologies used in the questions, such as, the definition of translation, transaction, and economic exposures. In the primary survey, however, these definitions were paraphrased using simple straightforward language and each definition was presented in a corresponding question rather than at the beginning. Another revision needed was achieved by revising and removing unnecessary repetitive questions.

Besides these revisions, the most important issue was the difficulty to create a proper communication for clarifying some responses. A telephone call was used for this purpose. Since there was no specific name for persons who are intended to fill in the questionnaire, a proper communication was difficult. For this reason, in the main survey, the name of person who is responsible for managing the exposure in each firm was asked directly through the secretary or administrator of each firm.

Even though this strategy is, in fact, time consuming and costly, there are several theoretical and practical considerations. From the theoretical viewpoint, the mail survey may not display the entire population due to response bias (Dwyer, 1980). Therefore, a specific name and person in each firm responsible for filling in the questionnaire was typed on the self-adhesive label to augment credibility, personal appeal, and relevance (Kerndt, 1989). In doing so, the respondents might realize the significance of this study [Dillman (1991); Dillman, Singer, Clark and Treat (1996)].

From a practical viewpoint, the labeling of the envelope with the responsible officers name made the follow up via telephone communication more productive. This strategy also confirmed the validity and reliability of the questionnaire since the target person was contacted directly.

4.4.3. Classification of statements in Questionnaire

Statements in the questionnaire are divided into four parts that accommodate issues investigated in this study. Each part contains several questions of particular aspects of foreign exchange exposure management. The first contains questions of firm characteristics. The second accommodates questions of specific aspects of foreign exchange exposure management, foreign exchange exposure identification. The third is concerned with questions on policies of foreign exchange exposure management. The fourth contains questions associated with techniques in exposure management.

4.4.3.1. Part 1: Firm Characteristics

In the first part (question 1 to 5), respondents are asked to identify their organizational characteristics: whether a firm is a parent company, a subsidiary of a foreign firm, or independent firm (question 1). Ownership of the firm (foreign-owned or Australian-owned), the amount of average annual sales or revenues (in Australian dollars) and the proportion of foreign sales and/or purchases to total, are asked directly with alternative answers (question 2; 3; 4; 5). Annual sales or revenues are also asked by providing four alternative answers: up to 50 million AUD; 50 to 100 million AUD; and so on) while foreign sales and purchases are given five alternative answers in percentage range (none; 10 to 15 %; greater than 15 to 30 % and so on).

The reason for asking firm characteristics is due to the objectives of the study. In terms of the first objective, the pattern, characteristics, and the effectiveness of corporate policies and practices can be identified and compared based on the firm characteristics. In relation to the second objective, this study seeks the association between selected firm-specific characteristic variables and foreign exchange exposure management practice variables.

4.4.3.2. Part 2: Foreign Exchange Exposure Identification

The second part of this questionnaire contains important statements representing the first step in the management of foreign exchange exposure. This is relevant to the first objective: describing corporate practices, particularly, on foreign exchange exposure identification. Several elements of the exposure identification, including types, sources, and measurements of exposures (question 6 to 15), are important elements of the exposure identification. They relate to the specific research questions of the first objective (point 1, 2, and 3 in Section 4.1). It is crucial to address these issues in order to implement an effective foreign exchange exposure management (Gillani, 1996).

In this part, respondents are also asked whether translation exposure is recognized and managed or not and the reasons for currency translation (Question 6 and 7). Four alternative answers are given to question 6 (all of the time; sometimes; never; not applicable). If it is applicable, respondents are asked to fill out question 7 asking the reasons for currency translation. Three alternative answers are given based on the financial theory for managing translation exposure [Sercu and Uppal (1995); Eiteman, Stonehill, and Moffett (1998, p.289)], such as, preparation of consolidated financial statement, to comply with tax and accounting regulations, and other purposes.

The next two questions in the second section (question 8 and 9) are asking for the primary sources of transaction exposure and the methods used to identify this exposure. All alternative answers provided are based on underlying theories and a blank space is also provided to accommodate a response that may not be listed.

Besides its relevance to the first objective, the reason for obtaining this information is also motivated by the fact that prior studies in foreign exchange exposure management practices have been concerned with particular types of exposure [see for example, Collier and Davis (1985); Collier, Davis, Coates, and Longden (1990)]. The study of Davis, Coates, and Longden (1991); Collier, Davis, Coates and Longden (1992) for instance, focuses on transaction and translation exposures. Jorion (1990), Loudon (1993), and Chow, Lee, and Solt (1997) are concerned with economic exposure. Even though the Australian study of Batten,

Mellor, and Wan (1993) addresses the three types of exposure, the study does not mention the identification system, sources, and measurement of each exposure.

For that reason, questions 10 to 15 are constructed since they are concerned with economic exposure and are associated with research question at the first objective ((point 1, 2, and 3). Respondents are asked whether they recognize economic exposure or not (question 10). Three alternatives answers are provided, all of the time, sometimes, and never. If respondents answer never, they will be asked to leave question 11 to 15 unanswered. On the other hand, if the answer is all of the time or sometimes, respondent are asked to continue with question 11.

Question 11 collects information on whether economic exposure is managed or not. If the answer is never, respondents are asked to leave question 12 to 14 blank. Question 12, 13, and 14 ask for information on sources and measurements of managing economic exposure and the reasons for managing the exposure. The last question in this section is information on which type of exposure is the major one confronting the firm (question 15). This question is very important for both understanding the major exposure facing Australian firms and analyzing the policy, which is the next section of the questionnaire.

4.4.3.3. Part 3: Foreign Exchange Exposure Management Policy

This section contains questions on policies in foreign exchange exposure management (question 16 to 31). Question 16 asks information of factors typically driving the firms' foreign exchange exposure management. Question 17 to 23 accommodates information on the major objectives of foreign exchange exposure management, key issues in policy (active or passive) on each exposure and the percentage of cover on translation, transaction, and economic exposures. Questions 24 to 28 carry information regarding the frequency of revising policy toward translation, transaction, and economic exposure, sources and presentation of exchange rate forecast, and frequency of revising the forecast. The last three questions (question 29, 30, and 31) of this section deal with the degree of centralization in particular aspects of foreign exchange exposure management including foreign borrowing, entering transaction involving foreign currencies, and entering foreign exchange markets for hedging purposes.

The purpose of collecting information in this section is based upon the first objective. Statements in this section are associated with the research question 4, 5, 6, 7, and 8 (Section 4.1): describing policies on foreign exchange exposure management.

Question 16 is relevant to research question number 4. Firms are given four alternative answers in which the last one is other factors that may influence the policy to manage foreign exchange exposure management. The first three alternative answers are, the volatility of foreign currency they are dealing with, pressure from investors, and accounting regulations, which are derived from prior studies.

A study by Davis and Militello (1995) toward corporate practices of US multinational corporations has revealed that accounting is still a dominant factor driving corporate policy toward foreign exchange exposure management. Therefore, the list of alternative answers includes accounting regulation besides the volatility of currency they are dealing with and pressure from investors.

The volatility of currency is listed as one of the possible answers due to the argument mentioned in the chapter one that the adverse movements of exchange rates causes potential losses [Moosa (1998, p.420); Levi (1996, p.293)] and other financial and social problems from the perspective of corporate governance.

Question 17 in this section is the information collected in relation to research question 5, the major objective of managing transaction, translation, and economic exposures. Six alternative answers are given, including: cover all exposure whenever possible; my company is not in the business of foreign exchange exposure; avoid surprises; minimize quarter-to-quarter fluctuations; and minimize dollar equivalent of foreign incomes. The last alternative answer is provided for respondent to fill in their own response, considering alternative answers that may not be accommodated in the list. These lists of response are derived from prior studies [See for example, Zenof, in Antl (1989, p.59); Davis and Militello (1995, p.123)].

Question 18, 19, and 20 on the exposure management policy, are those relevant for analyzing whether a firm adopts more active or passive policy, which is one variable of foreign exchange exposure management practices. Questions 21 to 28 are for supplementary information on policy (active or passive), that is, assessing whether the percent coverage of each exposure (question 21, 22, and 23) is based on the adoption of policy or not. These questions and the alternatives answers are

derived from prior studies [See for example, Wallace (1998); BIE (1991)]. Questions 24 to 28 are also supplementary questions for the adoption of the policy in terms of forecasting policy since prior studies suggest the more active policy requires accurate forecast [(Carter, Vickery, and D Itri (1993); Owen and Jones (1993); Kucemba (1996); Nathan and Hoeg-Krohn (1999)].

Questions 29, 30, and 31, carry relevant information for analyzing the degree of centralization, which is another variable of foreign exchange exposure management policy. Those questions are relevant, both, to the first and second objectives. Those questions are relevant to the research questions 5, 7, and 8 (Section 4.1). In relation to the second objective, this study seeks the association between selected firm-specific characteristic variables and foreign exchange exposure management variables in which active or passive policy and the degree of centralization are included. The detail treatment associated with these data is presented in the section containing methods of analysis (Section 4.5.2.).

4.4.3.4. Part 4: Techniques in Foreign Exchange Exposure Management

This section is the final section of the questionnaire. This section contains questions of both internal and external techniques used. Questions 32 and 33 are those asking the respondents to identify what internal techniques are used and what critical factors contribute to the possibility of employing the techniques. Questions 34, 35, and 36 are those asking respondents to identify what external techniques are used, the frequent used of the techniques, and the critical factors influencing the choice of applying the techniques.

In relation to the internal techniques used, respondents are asked to identify between several alternatives answers on internal techniques such as, netting, multi-currency billing and price adjustment, leading and lagging, factoring, centralized settlements, re-invoicing and other techniques. Information technology, the availability of sufficient skill, regulations, costs and other factors are alternative answers for the critical factors in applying the internal techniques. The lists of answers for these questions are derived from the most common internal techniques used [Soenen and Aggarwal (1987); Meierjohann (in Antl, 1989, pp. 119-129)].

Besides the internal techniques used, respondents are also asked to identify what external techniques, such as, spot, forward contract, foreign currency swaps, foreign currency futures contracts, options, foreign exchange agreements (FRAs), and option hybrids (caps, collars, and floors). Besides the techniques used, respondents are questioned about the frequent use of the techniques, and critical factors, such as, cost of cover, the availability of skill, accounting regulations, and other factors that contribute to the choice of techniques used.

The purpose of collecting data on internal and external techniques is based upon their relevance to the objectives of this study. In terms of the first objective, this study is aimed at describing the use of internal and external techniques and what factors are critical to implement or choose the techniques. In terms of the second objective, the use of internal and external techniques are variables of foreign exchange exposure management practice, which is to be associated with firm-specific-characteristic variables.

4.5. Method of Analysis

Method of analyses used in the present study is, basically, divided into two types, qualitative and quantitative. Qualitative analysis refers to descriptive analysis in which firm-specific-characteristic variables and foreign exchange exposure management practices variables are analyzed and compared. The next analysis examines the linkage between the two sets of variables using a non-parametric test, Chi-square (X^2).

4.5.1. Qualitative analysis

Qualitative analysis used in this study refers to describing foreign exchange exposure management practices of the Australian firms. This type of analysis is often called descriptive statistics, that is, “methods of organizing, summarizing, and presenting data in an informative way” (Mason Lind, and Marchal, 1999, p.5). Accordingly, the next sub section is devoted to explaining how analysis is carried out and the corresponding questions used. The similarities and differences of aspects investigated between this study and previous studies are also highlighted. This

explanation is organized based upon issues investigated: describing foreign exchange exposure identification, policy, and techniques in foreign exchange exposure management.

4.5.1.1. Foreign Exchange Exposure Identification

Initially, this analysis is directed to describe foreign exchange exposure identification. It is then directed to describe the number and percentage of Australian firms managing translation, transaction, and economic exposures and is accompanied by a classification of major sources, and the measurement of foreign exchange exposures. Questions to be used for this purpose are 6 to 15.

Prior studies have used this type of analysis to explain corporate practices on foreign exchange exposure management (see for example, Mathur, 1982; Belk and Glaum, 1990; Batten, Mellor, and Wan, 1993). In terms of foreign exchange exposure identification, Mathur (1982) describes the number of US companies that minimize translation and translation exposures. Belk and Glaum (1990) investigate the number of UK multinational companies with respect to the importance of transaction exposure, the extent of managing accounting and economic exposures. An Australian Study of Batten, Mellor, and Wan (1993) have described the number of Australian firms managing translation, transaction, and economic exposures.

This study also investigates foreign exchange exposure identification that has also been examined in past studies. The major difference between this study and the others, in terms of describing foreign exchange exposure identification, is that this study depicts not only which type of exposures is managed but also identify the major sources and measurements used of each type of exposures. This study may help to provide more comprehensive features of foreign exchange exposure management practices.

4.5.1.2. Foreign Exchange Exposure Management Policies

Besides foreign exchange exposure identification, this study describes each elements of the exposure management policy by Australian firms, including the presentation of major factors driving the corporate practices and the identification of

major objective in managing foreign exchange exposures, the key issue in policy (active or passive), the percent coverage of identified exposures, forecasting policy, and the degree of centralization.

With respect to the first two elements of policy, analysis is carried out to present the value and percentage of firms in accordance with the alternative answers. Analysis is drawn from the information in questionnaire (questions 16 and 17). The alternative answers to the question regarding the major factors driving the firms foreign exchange exposure management practices (question 16) and information on the major objective of foreign exchange exposure management (question 17) have been explained in the former section (classification of statements in questionnaire, Section 4.4.2.).

Previous studies have identified the two elements of policy [Zenof, in Antl (1989, p.59); Davis and Militello, 1995, p.123)]. Zenof (1989) listed the major objective among Fortune 100 companies while Davis and Miltello (1995) drew their overall conclusion on the major factors based on interview toward US multinationals. Since prior studies suggest no uniformity in terms of the major objectives, presentation of these elements is useful.

The analysis on policy in this study also describes whether Australian firms are more active or passive in their policy of exposure management. This analysis involves calculation of the major exposures confronting Australian firms (question 24). This description is then combined with the information on the key issue of policy (active or passive) in managing translation, transaction, and economic exposures (questions 18, 19, and 20). Therefore, which question is used is depended on the major exposure confronting each firm. The alternative answers for each type of exposures are: (1) leave exposure uncovered; (2) cover all exposures; (3) take a view on foreign exchange rates and cover or leave exposure uncovered, depending on view. Respondents are categorized active if they choose point 3 of the alternative answers. Choosing point 1 or 2 will fall into passive category.

Studies of Collier and Davis (1985); Collier, Davis, Coates, and Longden (1990), have provided the basis on how to classify a firm into adopting active or passive policy. Collier, Davis, Coates, and Longden (1990, p.27) define active or passive policy in terms of the willingness to accept risk (prepared to accept open position to a degree or attempt to cover positions). Therefore, points 1 or 2 of the

alternative answers represent passive policy whereas point 3 stands for active policy. Hence, the responses are scored 1 for adopting passive policy and scored 2 for adopting active policy.

Besides the policy adoption, this study describes one of the other elements of policy, the percent coverage of each identified exposure. Questions used for this analysis are 21, 22, and 23. Respondents are provided with four alternative answers: (1) up to 25 %; (2) 25 to 50 %; (3) 50 to 75 %; (3) greater than 75 %. The analysis of this element is not merely presentation of the percent coverage of each exposure by Australian firms but also useful in describing whether the percent coverage is based upon the adoption of policy (active or passive). This analysis is drawn from the study by Wallace (1998).

Forecasting is also included in the aspect of policy analysis. Information used for this analysis is drawn from question 25, 26, 27, and 28. Each question accommodates information on the sources, the presentations, the currency concentration of exchange rate forecast, and the frequency of revising the forecast. This analysis is also useful in order to evaluate the existence of a sufficient exchange rate forecast if an active policy is adopted [Carter, Vickery, and D Itri (1993); Owen and Jones (1993); Kucemba (1996); Nathan and Hoegh-Krohn (1999)].

Finally, the last aspect of foreign exchange exposure management policy investigated in this study is the degree of centralization. Questions used for this analysis are 29, 30, and 31. Each question represents the degree of centralization on foreign borrowing or lending, entering transaction involving foreign currencies, and entering into foreign exchange market for hedging purposes, respectively. Each question is given the same four following alternative answers: (1) in its own name; (2) under general guidelines from head office; (3) under specific direction from head office; (4) only head office can borrow or lend in foreign currencies; enter foreign transactions; enter foreign exchange market for hedging.

Analysis is carried out by classifying firms into two classifications, low and high degree of centralization. Points 1 and 2 of the alternative answers represent lower degree of centralization whereas 3 and 4 stand for higher degree of centralization. Then responses are classified 1 for higher degree of centralization and 2 for lower degree of centralization.

The studies of Collier and Davis (1985); Collier, Davis, Coates, and Longden (1990), Belk and Glaum (1990), and Batten, Mellor, and Wan (1993), have provided the basis for this analysis. Rae and Walker (1980) categorized the degree of centralization into fully centralized, subject to specific directives, subject to general guidelines, largely autonomous. This category also used by Collier, Davis, Coates, and Logden (1990) in classifying the degree of centralization on several areas of cash management, including banking relationship, investment of surplus, borrowing, currency management, and currency dealing. Batten, Mellor, and Wan (1993) focused the degree of centralization on two aspects of exposure management, foreign borrowing or lending and foreign transactions.

Considering the simplicity of classification used by Belk and Glaum (1990), firms are categorized into low, high, and completely decentralized, and the study of Batten, Mellor, and Wan (1990), this study adopts the classification by applying in three important areas of exposure management, foreign borrowing or lending, foreign transactions, and hedging foreign exchange exposures.

4.5.1.3. Techniques in Exposure Management

The analysis of techniques used is directed to look at the preference of both, internal and external techniques. Information used for this purpose is derived from questions 32 and 34. A list of internal and external techniques is the alternative answers for these questions. The analysis is accompanied by identification of the critical factors for applying the techniques (question 33, 35, and 36).

Previous studies in the area of foreign exchange exposure management have used this type of analysis to describe the preference of external techniques [among others, Batten, Mellor, and Wan (1993); Jesswein, Kwok, and Folks Jr. (1995)]. Batten, Mellor, and Wan (1993) describe this preference by dividing external techniques into physical and synthetic products used by Australian firms. Jesswein, Kwok, and Folks Jr. (1995) divide this technique into the first, second, third, and fourth generations.

The primary difference between one study and another in describing the external technique used is dependent on the depth of investigation. One study may only list the preference of techniques used (Batten, Mellor, and Wan, 1993) while

other studies may use other data, such as, the period of marked-to-market (Wallace, 1998), awareness (Jesswein, Kwok, and Folks, Jr., 1995), and the amount of risk reduction (Khim and Liang, 1997). Since this study focuses on the preference of technique used, the analysis is accompanied with the frequencies of use of the technique and critical factors being considered for choosing techniques that may use.

With respect to the internal techniques, there has been little interest among researchers in looking at these techniques. This lack of interest is because they are aimed initially for managing cash (do not reduce the amount of exposure) and dependent on several factors, such as, technology, the availability of skill, and other condition Meierjohann (in Antl, 1989, pp.119-129). For this reason, analysis in this study is accompanied by a list of the critical factors for applying internal techniques that the respondents may use.

4.5.2. Quantitative Analysis

Quantitative analysis in this study is used to test the hypothesis, which is the second objective of this study. According to Malhotra (1996, p.148) hypothesis can be tested using parametric and non-parametric, depending on the type of variables of investigation. Siegel (1997, p.637) posits that non-parametric test is an appropriate method of nominal and ordinal data.

The questionnaire in this study is developed using nominal and ordinal scales. Therefore, principles of the normal distribution are violated and non-parametric statistics can be used [Coakes and Steed (1997); Doumpos and Zpounidis (1999) Meric, Kyj, Welsh, and Meric (2000); Morgan, Griego, Gloeckner, 2000, p.31). Hence, this study adopts non-parametric statistics for data analysis. Chi-square test is employed to test hypothesis in this study.

Chi-square test is non-parametric statistics used to test nominal and ordinal data (Cooper, 1998, p.486). This method can be used “to decide whether two qualitative variables are independent or not” (Siegel, 1997, p.645). This study seeks whether there is an association between selected firm-specific-characteristic variables and foreign exchange exposure management practice variables. In other words, this study tests whether the two variables are independent of one another.

The next sub sections are presented to provide a comprehensive picture of this analysis. Based on the review of prior studies that employ similar variables in section 3.5 (Chapter 3, page 86 to 90), variables in this study are defined and measured. Then, the description clarifies how the data are grouped and transferred into the ordinal and nominal scales for the purpose of analysis. Three firm-specific-characteristic variables are used in this study, firm size, the degree of foreign involvement, and the ultimate ownership. The three variables are investigated towards four management practice variables: the adoption of either active or passive policy, the degree of centralization and the use of internal and external techniques.

4.5.2.1. Firm Size

In the present study, firm size is measured by using the Australian dollar amount of sales. The question used for this variable is number 3. Respondents are asked to classify their sales based on range provided with four scales of measurement. This measurement is then split into two categories smaller and bigger size and scored 1 or 2, respectively. The basis of categorizing is based on the median value of the samples (Tuckman, 1999, p.317).

There are reasons to employ a single measure of firm size, that is, sales, as an indicator. First of all, sales volume is one dimension of the firm size (Kimberly, 1976). Second, some indicators are interchangeable. Shalit and Sankar (1977) found correlations between sales, total sale, total assets, employment, equity, and market value while child (1973) found a strong correlation between net assets and employment for 82 firms. Third, the availability of data and methods are also another aspect that has to be taken into consideration. As argued by Kimberly (1976, p.581), “Empirical and methodological constraints have played a considerable-and perhaps an usually large-part in determining the kinds of questions that have been asked, the kinds of studies that have been carried out, and the kinds of answers that have been found in analyses of the size structure relationships”.

4.5.2.2. The Degree of Foreign Involvement (DFI)

There has been dispute among researchers regarding the measurement of the degree of foreign involvement. Some researches define DFI based upon the amount of geographic locations where firms operate (Dunning, 1973; Caves, 1982), while others use performance characteristics (Lee and Kwok, 1988; Agmon and Lessard, 1977) such as earnings, assets, and the number of employees. As listed by Aharoni (1978), the measurements of the firms' DFI are based basically upon three criteria, depending on structural, performance, and behavioral characteristics. Therefore, one measurer based upon one of the above criteria might oppose to another depending on the researcher's interest.

A brief discussion on the measurements of DFI and the underlying theories above-mentioned in section 3.5 (Chapter 3, page 86 to 90), contribute to the DFI measurer of the present study. Financial characteristic is chosen as a measurer of the present study. Precisely, the percentage of foreign sales ratio is used. Initially, respondents are scored 1 to 5 in accordance with the alternative answers of corresponding data (question 4). Then, the score is split into two categories higher and lower degrees based upon similar techniques used on firm size, the median value. Hence, respondents are scored 1 if their answer is below the median and 2 if their answer is above the median.

There are two considerations to employ the measurement of DFI. First, this measurer is the most popular indicator (Burgelman, 1996). The study by Nguyen and Cosset (1995) has confirmed the reliability of this measurer. Second, this study is concerned with currency exposure management. Hence, the way to manage exposure is more or less influenced by the amount of foreign transactions exposed to the adverse movements of exchange rate.

4.5.2.3. Ultimate Ownership

This study defines ownership as whether a firm is Australian or foreign-owned. The question used is number 2 with two categories: respondents are scored 1 if the answer is foreign-owned and 2 for Australian-owned.

With respect to the foreign exchange exposure management practice variables, four variables are investigated, the adoption of either active or passive policy, the degree of centralization, the use of internal techniques, and the use of external techniques. Each variable is operationally defined and transferred into nominal and/or ordinal scales after reviewing prior studies.

There are two principles of approach in the policy of exposure management: either active or passive [Collier and Davis (1985); Davis, Coates, and Longden (1991); McKnew (in Klopfenstein (1997, pp.273-302); Schwartzman (1993)]. Certainly, there are varieties of definition used to describe firms adopting either active or passive approach. Some authors emphasize on techniques used, the percentage of exposure covered, and others describe this approach covering both aspects. The brief description of this issue is presented below.

Carter, Vickery, and D Itri (1993) and McKnew (1997 in Klopfenstein, pp. 279-287) have described either active or passive approach in exposure management in terms of techniques. McKnew (1997) for instance, describe a passive policy in terms of entering forward contract at the beginning of period when exposure is recognized since it is simplest and popular techniques. On the other hand, active policy might enter forward contract at a discretionary timing depending on the exchange rate movements or use other techniques. Carter, Vickery, and D Itri (1993) defines passive policy in the broader context, that is, techniques such as, agree to payment in the supplier's currency, hedge by purchasing forward contracts, hedge by purchasing futures contracts, negotiate the contract for payment in U.S. dollars, and negotiate a risk sharing contract.

Another description of either active or passive strategy based upon the percentage exposure covered (Wallace, 1998). According to the author, hedging 100 percent of underlying exposure without discretion to hedge based upon foreign exchange rate views is considered as passive approach. On the other hand, active approach might hedge 25 percent or 75 percent depending on the exchange rate movements. This definition and measurement of either active or passive approach are quite simple. However, considering the study of Belk and Glaum (1990), the percentage of exposure covered is used for classifying whether a firm risk averse or risk loving. Therefore, the definition and measurement of active or passive using the percentage of exposure covered is somewhat confusing.

Collier and Davis (1985) suggested that the principle of exposure management is not restricted to the making on profits or losses by taking risk but includes action to reduce risk. For this reason, the authors define either active or passive policy as the extent to which a firm accept risk or alternatively, resort to automatic close out (Davis, Coates, and Longden, 1991, p.27). In this context, an active or passive policy is measured by the willingness of a person who is responsible for managing exposure, whether he or she makes an effort to cover all positions (close out) or has been prepared to accept an open position to a degree.

This definition seems appropriate since to accept open positions a firm must make reliable forecasting, investigate firm exposure each currency and its period. As argued by Kucemba (1996, p.22) “a more active approach to risk management means tracking the currencies of the countries in which you are doing business, or in whose currency you must trade, and staying abreast of economic variables. You must watch your company's exposure currency-by-currency, period-by-period, and take appropriate actions based on the likelihood of exchange rate movements. You must arm yourself with economic and political information about your customers' (suppliers') countries and develop an internal foreign exchange policy consistent with your company's long-term trade objectives”. In contrast, a passive management approach is not as comprehensive as an active approach. This method utilize only spot adjusted exchange rate (usually forward rate) of a specific transaction in the planning period of budgeting. Hence, if forward hedging is performed, the appropriate rate is the adjusted spot rate.

Following Collier and Davis (1985) and Davis, Coates, and Longden (1991), the definition of active and passive approach in the present study is based on the action taken by Australian firms regarding their exposures. Therefore, the corresponding questions (question18, 19, 20) are constructed with three alternatives of answer: leave exposure unmanaged; cover all exposures; and leave or cover exposure depending upon the views [see for example, Collier and Davis (1985); Davis, Coates, and Longden (1991)]. Hence, respondents are scored 1, 2, and 3, respectively. From these questions, only one is used in accordance with the major exposure with which they are confronted (question 24). Hence, firms are scored 1 (passive) if the answer is either leave exposure unmanaged or cover all exposures and scored 2 (active) if the answer is 3.

4.5.2.4. The Degree of Centralization

The debate on the pros and cons of how much control of managing currency exposure leads to the discussion of centralization and decentralization. The proponents of decentralization usually argue based upon the complexity of organizations in which several tasks cannot be managed by single person (president), and alternatively, should be delegated to the operational managers (Stopford and Wells, 1972, pp.5-12). However, normative models suggest that an appropriate response to the fluctuating exchange-rate environment, taxation differentials, control on currency flows, and other factors require highly centralized financial decision-making (Lessard and Lorange, 1977).

For this reason, it has no benefit to duplicate the discussion regarding centralization and decentralization continuum. The finding of Jilling (1978, pp.95-96) reveals that 85% of U.S. multinational corporations centralize their foreign exchange exposure management. This finding has been confirmed by many researchers [among others, Collier and Davis (1985); Davis, Coates, and Longden (1991); and Scheirer (1994)]. To quote Scheirer (1994, p.55) who survey small and large companies in the U.S., “decentralization is ‘Out’. Companies clearly prefer a centralized approach to risk management. ... Senior managers view centralization as the key means of control”.

As mentioned earlier, the main focus of this section is to clarify what is meant by the degree of centralization used in this study. The degree of centralization in this study is defined as how much control of foreign borrowing or lending, transacting foreign exchange, and hedging should be retained at the top level or delegated to the lower management level.

Since the degree of centralization has many variants (Davis, Coates, and Longden, 1991), the measurement of the degree of centralization is important. As an illustration, currency cash flows may be stationed at the center for the basis of preparing actions to be taken whereas final exercise may be delegated to the operational units with general guidelines. In the case of multinational corporations, exposure identification maybe delegated to each foreign subsidiary in which they know more about its business than the parent company, then, the identified exposures should be channeled to the parent company that may know more about its portfolios

and hedge all subsidiaries in a more systematic manner for the benefit of the organization.

So far, there are varieties of measurement associated with the degree of centralization. Mathur (1982) utilize three measurements, high, low, and decentralized. High means decisions and implementation done at the parent whereas low decision made at the parent and the implementation at the operating units. Certainly, decentralized means decision and implementation exercise at the operating units.

Another measurement of the degree of centralization has been revealed by Collier and Davis (1985); Collier, Davis, Coates, and Longden (1990, p.44) in which four scales of measurement are used, these are, fully centralized control, subject to specific directives, subject to general guidelines, and largely autonomous. This measurement is much broader than that of Mathur (1982).

Considering the weaknesses and strengths of prior studies, the present study defines this variable as how far the decision on three aspects, foreign borrowing or lending, entering into foreign transactions, and entering into foreign exchange market for hedging, are retained at the top level or devolved at the lower level of management. Questions used of each aspect are 29, 30, and 31, respectively. Alternative answers that represent the degree of centralization are provided and firms are scored 1 to 4 depending on the answers. These scores are then transferred into nominal scales, using three categories (lower/higher degree, or decentralized). Firms are scored 1(low degree) if the answer is either 1 or 2 and 2 (high degree) if the answer is 3 or 4.

4.5.2.5. The Use of Internal and External Techniques

In the foreign exchange exposure management there are varieties of techniques than can be used as an implementation of the strategy. Basically, the techniques can be broadly divided into two classifications (Ross, 1990, p.23). The first classification is internal techniques including netting, currency invoicing, matching, leading and lagging, and other techniques. Another technique is called external or transactional in which several instruments used are offered in the

financial markets such as, forward contracts, futures, options, FRA, and other derivatives.

Since the definitions of these techniques are quite similar between one and another author, it is not a crucial aspect to discuss each definition with another. The important aspect should be clarified in this section is the measurement of these techniques. Therefore, the following explanation is devoted to clarify the theoretical background and measurement of internal and external techniques.

Empirical studies associated with the internal techniques, unfortunately are scant. Davis, Coates, and Longden (1991, pp.61-64) has documented the use of internal techniques limited on netting and re-invoicing. There are several reasons, perhaps, for the lack of curiosity. As widely known, internal techniques are those associated with utilizing any means within the business without needing to undertake further transactions (Ross, 1990, p.23), hence, there are varieties of way depending on the firm's sophistication in the information technology. Netting for instance, needs sophisticated netting program that its costs might outweigh the benefit of using banking services. Government regulations are another reason for the reluctant to investigate the internal techniques. Leads and lags for instance, were prohibited in Japan during 1980s (Meierjohann, in Antl, 1989, p.123). Tax and other legal costs are another example that has an influence to use re-invoicing center.

Even though there are many obstacles and influencing factors on the application of internal techniques accounted for the lack of empirical nature, it is investigated in this study using discretionary measurement. The internal techniques used in this study are netting, leading and lagging, centralized settlements, multi-currency billing systems and price adjustment, factoring, re-invoicing. The use of internal technique is defined as the number of internal techniques utilized in Foreign exchange exposure management. Question used are number 32 and 34. Respondents are scored 1, 2, or 3, and so on, using ordinal scales based upon the amount of internal and external techniques they may use. As with internal techniques, the definition and the measurement of external techniques used is based upon the number of the instruments utilized by Australian firms in foreign exchange exposure management (question 35 and 36).

After transforming the data into nominal scale, Chi-square test is then performed using SPSS to test whether or not the firm specific variables and the management practice variables are independent one and another.

4.6. Summary

At this stage, the sample of study, method of data collection, the data used, and method of analysis have been described. With respect to the sample selection, techniques used is purposive random sampling in which sample are selected based on average annual sales or revenues and the degree of foreign involvement.

A questionnaire with checklist responses is used for collecting data. Statements in the questionnaires are classified into four parts in accordance with the issues investigated in this study. The first contains statement on firm-specific characteristic. The second accommodates statements on the identification aspect that include types, sources, and methods of identification of foreign exchange exposure management. The third accommodates statements that are concerned with policies including major objectives, the adoption of either active or passive policy, forecasting, and the degree of centralization. The fourth contains statement on internal and external techniques used.

Finally, two methods of data analysis, descriptive evaluative and quantitative analyses have been explained. With respect to the first method, analysis is carried out by presenting the count and cross tabulation on data of foreign exchange exposure management practices. The quantitative analysis used in this study is an application of non-parametric statistics using Chi-Square test for testing the hypothesis.

CHAPTER 5

FOREIGN EXCHANGE EXPOSURE MANAGEMENT PRACTICES BY AUSTRALIAN FIRMS

Introduction

Chapter 5 defined the focus of this study, the precise research questions, research objectives, the data required for empirical investigation, and techniques for collecting and analyzing the data. This chapter presents the results of the entire process with respect to the first objective of this study: identifying corporate practices on foreign exchange exposure management. This includes descriptions on exposure identification, policy, and the techniques used, in foreign exchange exposure management.

Section 5.1 outlines the reasons for describing the practices, and how this description will assist to achieve the objective of the present study. Section 5.2 accommodates the analysis of the first aspect of foreign exchange exposure management: foreign exchange exposure identification. Section 5.3 outlines the analysis on the policy aspects of foreign exchange exposure management. Six elements of policy are analyzed in separate sub-sections including identification of major factors driving corporate foreign exchange exposure management, identification of the major objectives, assessment on whether Australian firms adopt a passive or more active policy, identification on percentage of cover for each exposure type, the identification on forecasting policy, and the assessment on the degree of centralization which is the final element of policy. Finally, a summary of results is presented in the final section.

5.1. Reasons for Identifying Corporate Practices

Globalization increases corporate financial risks, particularly those operating internationally. One of the biggest risks confronting the firms is the adverse consequence of exchange rate movements. Payable, receivable, borrowing or lending, and operating cash flows, denominated in foreign currencies are all exposed

to foreign exchange rate risk. This exposure may lead to loss consequences and cause unfavorable impacts on the value of a firm.

Many studies have been conducted to investigate this impact of foreign exchange rate risk on the value of firm [see for example, Jorion (1990); Lee and Solt, (1997)]. However, little attention has been given to investigate the corporate behavior in managing foreign exchange exposure. This fact stimulates academics as well as practitioners to investigate corporate practices on foreign exchange exposure management. Many of them have been conducted in an effort to identify UK and US corporate practices [Collier and Davis (1985); Collier, Davis, Coates, and Longden (1992); Belk and Glaum (1990); Davis and Militello (1995)]. Unfortunately, not much is known about corporate practices and policy of foreign exchange exposure management on Australian firms.

This study describes what practices on foreign exchange exposure management of Australian firms are currently in use. The focus of the objective includes descriptions of the identification aspects, policy aspects, and techniques used in foreign exchange exposure management. The analysis is essentially descriptive and evaluative.

These analyses are useful not only in describing these aspects independently but also relating one element to another of each aspect. This is expected to identify their pattern and typicality in order to present a clear description of firms' practices on foreign exchange exposure management. Therefore, the analyses are organized in accordance with these aspects.

Section 5.2 accommodates the analysis of the first aspect of foreign exchange exposure management: foreign exchange exposure identification. This includes separate sub-sections describing selected elements of the identification, such as, major types of foreign exchange exposures (5.2.1), what types of exposure are being managed (5.2.1),

Section 5.3 outlines the analysis on the policy aspects of foreign exchange exposure management. Six elements of policy are analyzed in separate sub-sections. Sub-section 5.3.1 contains identification of major factors driving corporate foreign exchange exposure management. The importance of this part is to justify whether exchange rates volatility is indeed a major factor, as described at the introductory

chapter, or whether there are other factors contributing to managing foreign exchange exposures.

Sub-section 5.3.2 presents the policy used by Australian firms that includes the identification of the major objectives of foreign exchange exposure management. The importance of describing this element is to understand the general objectives within Australian firms compared with that of other countries in the previous studies as well as an understanding on whether or not Australian firms allow some speculative motive in their policy of foreign exchange exposure management.

Sub-section 5.3.3 acquaints with the key issue in foreign exchange exposure management policy. Analysis here is directed to assess whether Australian firms adopt a passive or more active policy towards each type of exposures. This is crucial for performing complementary analysis on the identified major objectives in Sub-section 5.3.2 and providing information for the second type of analysis, which is presented in chapter 7.

Sub-section 5.3.4 portrays the fourth element of policy on exposure management concerning the percentage of cover on translation, transaction, and economic exposures. The results found here are then evaluated by incorporating either an active or passive policy that is adopted by most Australian firms. The importance of evaluation is to show whether the percentage of cover on underlying exposures is influenced by the adoption of an active or passive approach by Australian firms.

Sub-section 5.3.5 depicts analysis on forecasting policy which is the fifth element of policy. This includes the identification of sources of exchange rate forecast, the form of presentation of exchange rate forecast, and concentration of currency of forecast. This analysis is very important, firstly, for describing the corporate forecasting policy as well as for providing a complementary argument for the previous sub sections. The result of this analysis can be used to complement whether or not exchange rate volatility is a major factor for corporate foreign exchange exposure management. Secondly, the analysis can be used to evaluate the role of forecasts in relation to either an active or passive adopted by Australian firms.

Sub-section 5.3.6 shows the analysis on the degree of centralization which is the final element of policy. The degree of centralization analyzed here covers three major areas including foreign currency borrowing or lending, transacting foreign

exchange business, and hedging foreign exchange exposure. This analysis is crucial because any policy should include a responsibility aspect and provides information on how far foreign exchange exposure management function is retained at the top level of management or devolved at the lower level of management. This information is used to assess whether Australian firms have a high or low degree of centralization on each type of exposure. It is also useful in providing relevant information for the second type of analysis presented chapter 7.

Sub-section 5.3.6 contains an analysis on techniques used by Australian firms in their foreign exchange exposure management. Two broad categories of techniques, internal and external, are analyzed in this section.

5.2. Foreign Exchange Exposure Identification

Foreign exchange exposure identification is the first step and the most important aspect in managing foreign exchange exposure (Gillani, 1996). A clear understanding of the elements of the identification, such as, types of exposure confronting firms, the sources, and the reason for managing exposures, is a prerequisite before managing the exposures. The results therefore, are organized in accordance with these elements.

Sub-section 5.2.1 contains identification of major exposures confronting Australian firms. Sub-section 5.2.2 holds analysis of identification of what types of exposure are being managed by Australian firms. Since three types of foreign exchange exposures are addressed in this study, a more detailed analysis is then carried out in accordance with each type of exposure.

Finally, an analysis on economic exposure is presented by using a cross-tabulation of two variables: recognition and management of this exposure. This is useful to identify the number of Australian firms that recognize this exposure and the number of firms that manage this exposure. This analysis is important to provide evidence of the recognition of this type of exposure since other studies have revealed the firms' reluctance to manage this exposure.

5.2.1. Major Exposures

Table 5.1 shows major exposures that are confronted by Australian firms. Most (82%) are confronted with transaction exposure. Even though other types of foreign exchange exposures exist, only four of the surveyed firms face translation and 3 face economic exposures. Only four firms are confronted with two types of exposures, two firms face translation and transaction exposures, and two face transaction and economic exposures.

Table 5.1
Major Exposures
Confronted by Australian Firms

Exposures Types	Frequency	Percent
Translation Only	4	6.6
Transaction Only	50	82.0
Economic Only	3	4.9
Translation and Transaction	2	3.3
Transaction and Economic	2	3.3
Total	61	100.0

The result from the table above is not surprising. Most of the finance literatures suggest that transaction exposure is the real exposure confronting firms [for example, Pringle and Connolly (in Kolb, 1993, pp.364-365); Rawl and Smithson (1993)]. A study by Collier and Davis (1985) towards UK multinational firms and the Australian study by Batten, Mellor, and Wan (1993) have confirmed the importance of this type of exposure. The main reason behind the argument on transaction exposure is that there are cash consequences. The classic example about this type of exposure is Account payable or receivable denominated in foreign currencies.

Unlike transaction exposure, translation and economic are not the major exposures with which they are confronted. The result of this study demonstrates that only four firms see translation as their major exposure and three firms face economic exposure. This number has confirmed that translation exposure is apparently seen as

a conversion from the host into the home currency of foreign company [Pringle and Connolly, in Kolb, (1993, p. 370).

5.2.2. Types of Foreign Exchange Exposure Managed

Three types of foreign exchange exposure have been identified. One important aspect of this is to consider what types of exposure are being managed. To answer this question, three variables from questionnaire: the management of translation (trmgm), transaction (tranmgm) and economic (ecmgm) exposures, are utilized. The information is then used to develop one variable, that is, exposure management (idt_scor). Using frequency distribution, the number of Australian firms and what types of exposure are being managed can be identified. Then, this analysis is incorporated with the relevant information, sources, methods of identification, and the reason for managing each type of exposure, and other relevant information where appropriate.

Table 5.2
Types of Foreign Exchange Exposures Managed
by Australian Firms

Types of Exposure	Frequency	Percent
Transaction Only	35	57.4
Transaction and Translation	7	11.5
Transaction and Economic	7	11.5
Transaction, Translation, and Economic	12	19.7
Total	61	100.0

Table 5.2 shows the types of exposure being managed by Australian firms. The above table shows that 57% of the Australian firms manage transaction exposure only. This result is consistent with the study of Collier and Davis (1985) on UK multinationals in which transaction exposure is seen as a centerpiece of their exposure. Mathur (1982) found that only transaction exposure was managed more (25% of fifty-five responding firms). This was followed by other types of exposure.

Table 5.3
Sources of Transaction Exposure
Identified by Australian Firms

Sources	Frequency	Percent
(1) Foreign Sales or Purchases	37	60.7
(2) Foreign Borrowing or Lending	6	9.8
(3) Contracted Sales and Purchases, not Yet Booked	3	4.9
(4) Other	1	1.6
(1) and (2)	9	14.8
(1) and (3)	4	6.6
All Above	1	1.6
Total	61	100.0

The sources of transaction exposure (table 5.3.) shows approximately 60% of surveyed firms respond that foreign sales or purchases are the main sources of their foreign exchange exposure. This result is understandable since around 43% of surveyed firms have foreign to total purchases greater than 50% (Appendix B.4.). The other sources of this exposure come from borrowing or lending (10%), contracted sales and purchases but not yet booked (commitment exposure) accounted for 5%, other source (trade in capital goods) accounted for one firm, and a combination of those sources (23%).

The way a firm identifies this exposure is presented in table 5.4. Among surveyed firms, various methods are being used. Most firms (23.3 %) utilize forecast using contract and informal methods, ten firms use cash forecast by currency, six firms use a combination of forecast based on contracts and orders, and two firms use a combination of the three above. This figure portrays the importance of trade exposure, which is usually documented based on either sale or purchase contract, or orders. The cash forecast by currency as a methods of identification, is quite clear since cash forecast is commonly based on the historical pattern of the firm's contract.

Besides the transaction exposure, translation exposure is another exposure being managed by Australian firms. As table 5.2 shows, few firms (11.5%) manage both transaction and translation exposures.

Table 5.4
Cross Tabulation of Methods Used and the Extent of
Management on Transaction Exposures
by Australian Firms

Methods	Management of Transaction Exposure		Total
	All of the Time	Sometimes	
Forecast Using Contracts	13		13
Forecast Using Orders	7		7
Cash Forecast by Currency	9	1	10
Balance Sheet/Income Forecast	2		2
Informal Method	11	2	13
Forecast Using Contracts and Orders	6		6
Forecast Using Contracts, Orders, and Cash	2		2
Combination (other then specified)	8		8
Total	58	3	61

This number is quite surprising, particularly, in relation to the finding of other studies that have revealed the significant amount of firms that manage translation exposures. Mathur (1982), Belk and Glaum (1990) for instance, found that 32 of 55 and 12 of 17 firms, respectively, manage these types of exposures.

The possible reason for this figure is because a few firms (68.85%) say that managing translation exposure is, either never or not applicable for them. Table 5.5 presents a detailed explanation of this figure. Among this number, eighteen are independent firms that have no obligation to translate their foreign transaction into the home currency. While twenty two are a subsidiaries of a foreign company in which translation exposure is managed by their parent company.

However, there is an exception shown in table 5.5 in which two parent firms do not manage translation exposure. One possible reason to this is, perhaps, the perception among Australian firms on this type of exposure. As the finance literature suggests, this type of exposure is merely a conversion from the host to the home currency of the parent company, hence, it is not real exposure [Pringle and Connolly (in Kolb, 1993, p. 374); O'Brien (1998)].

Table 5.5
Cross-Tabulation of Organizational Characteristics and
The Extent of Translation Exposure Management

Organizational Characteristics	Management of Translation Exposure				Total
	All of The Time	Sometimes	Never	Not Applicable	
Parent Company of Foreign subsidiaries	5		2		7
A Subsidiary of A Foreign Company	12	2	13	9	36
Independent Firm				18	18
Total	17	2	15	27	61

From the data of the purpose of currency translation, the firms that do not manage translation exposure present the reason for currency translation: for preparation of constructing consolidated financial statements (Appendix C.3.). This is rather ambiguous. A follow up was conducted to clarify this point. The reason given for this is that exchange gains and losses resulting from translation will never be hedged. Among the other firms that manage translation exposure, 47.5% say that currency translation is used for preparation of consolidated financial statements, 6.6% for tax and regulatory purposes, 4.9% for both purposes, and the rests do not translate their foreign currency transactions (Appendix C.3.).

The management of the three exposures, translation, transaction, and economic exposures (table 5.2. above), demonstrates that just about 20% of surveyed firms manage all exposures. This figure is not far different to the Australian study of Batten, Mellor, and Wan (1993), with only a slight increase from 16.6% to 19.7% over a decade. The primary reason for the small number of firms managing this type of exposure in their study was found to be the small number of firms that manage economic exposure. The authors concede that there is room for further research regarding this type of exposure. For this reason, information is collected in this study regarding the recognition, sources, and measurements used.

Table 5.6 portrays the extent of recognition and the management of economic exposures. From firms in the survey only few firms (40.98%) recognize economic

exposure whereas a large group of firms (59%) firms do not recognize this type of exposure.

Table 5.6
Cross Tabulation of the Extent of Recognition and
Management of Economic exposures
By Australian Firms

The Extent of Recognition	Management of Economic Exposure				Total
	No Management	All of The Times	Sometimes	Never	
All of The Times	-	8	5	3	16
Sometimes	-	1	5	3	9
Never	36	-	-	-	36
Total	36	9	10	6	61

Among firms that recognize economic exposures, 76 percent manage this exposure (31%) of total surveyed firms. This number is far better than the Australian study of Batten, Mellor, and Wan (1993). The result of this study indicates an increase in the awareness of the impact of this exposure on firm's cash flows, which in turn, has an impact on the value of firm.

As shown in table 5.6, 59 percent firms in this study do not recognize this exposure nor manage it. This is also consistent with other studies. Bartov and Bodnar (1994) highlights the investors opinion regarding the impact of this exposure on the value of firm which is usually measured by the complex relation between exchange rate and expected stock return. Therefore, investors rely on financial statement for valuation. Techniques employed to manage this type of exposure are also difficult and confusing in terms of reporting rules. These factors might contribute to the reluctance of managing economic exposure (Hu, 1996).

The above descriptions of exposure identification suggest that all exposures are managed. This is consistent with the literature in the foreign exchange exposure management area [Davis and Militello (1995, pp.20-24); Davis, Coates, and Longden (1991, pp.17-18)]. For example, credit sales or purchases denominated in foreign currencies by a subsidiary of a foreign firm, creates both transaction as well as translation exposures for its parent company. Economic exposure may occur when

the product is shipped into the foreign markets. A depreciation of local currency of product destination may influence the product's competitiveness. It creates economic exposure. Another example is foreign borrowing. This transaction constitutes translation exposure for all consolidated accounts until repayment. The fund received and the repayment including interest creates transaction exposures.

5.3. Policies in Foreign Exchange Exposure Management

Policy in foreign exchange exposure management should cover detailed elements of foreign exchange exposure management aspects [Weston (1986, p.134); (Koh, in Klopfenstein, 1997, p. 203)]. Six elements of policy are addressed here. The first is major factors driving the corporate practices on foreign exchange exposure management. The second is the major objectives of foreign exchange exposure management. The third is the adoption of an active versus passive approach, which is the key issue in foreign exchange exposure management policy (Wallace, 1998). The fourth is forecasting policy that may be used for an assessment of an active policy if it is adopted by most of the surveyed firms. This information is then compared with the policy on the amount of exposure covered (the fifth element of policy) to explain whether the percentage coverage is influenced by the adoption of either an active or passive approach. Finally, policy should address responsibility of managing foreign exchange exposures. In this study, the aspect investigated is the question of whether managing exposure should be delegated to the lower level of management or should be retained at the top level of management (the degree of centralization). Accordingly, the analyses below are organized into separate sub sections in accordance with those aspects.

5.3.1. Driving Factors of Foreign Exchange Exposure Management

Table 5.7 below, displays the result of major factors driving the firms' foreign exchange exposure management. Most of surveyed firms (91.8%) state that the volatility of exchange rate is a major factor for managing currency exposures. Only five firms say that both accounting regulations and volatility of exchange rates as

major factors. The results indicate that the volatility of exchange rate that has been described in the first chapter is confirmed.

Table 5.7
Major Factors Driving Australian Firms’
Foreign Exchange Exposure Management

Factors	Frequency	Percent
The Volatility of Currency With Which They Are Dealing	56	91.8
The Volatility and The Accounting Regulations (1 and 2)	5	8.2
Total	61	100.0

5.3.2. Major Objectives

Table 5.8 displays the objective of foreign exchange exposure management among Australian firms. The results demonstrate the variety of objectives among surveyed firms. Most firms (29.5%) say that avoiding surprises is their major objectives, 25% cover all exposures, and another 25% state that their firm is not in the business of foreign exchange exposures. The table also shows that there small groups of firms (11.5%) respond a combination of alternative answers: three firms cover all exposures and avoid surprises, two firms avoid surprises and are not in the business of foreign exchange, three firms minimize quarter-to-quarter fluctuations and avoid surprises, and three firms use a combination of two or three of the above.

The results in table 5.8 indicate a conservative among Australian firms attitude toward foreign exchange exposure management. This is consistent with Davis and Militello (1995, p.123) on US multinationals. Among Fortune 500 companies, their formal policy and objectives are defined as, “The company will not enter into foreign currency transactions for the sole purpose of speculating on the potential future movement of exchange rate...”. Belk and Glaum (1990) found that UK multinational companies are generally conservative even though they criticize other studies for stating conclusively about the risk aversion of all UK multinational firms.

Table 5.8
Major Objectives Identified in Australian Firms’
Foreign Exchange Exposure Management

Objectives	Frequency	Percent
Cover All Exposures Whenever Possible	15	24.6
My Firm Is Not in The Business of F.X.	15	24.6
Avoid Surprises	18	29.5
Minimize Quarter-to-quarter Fluctuations	1	1.6
Maximize Dollar Equivalent of Foreign Incomes	2	3.3
Both 1 and 3	3	4.9
Both 2 and 3	2	3.3
Both 3 and 5	2	3.3
Combination (2 or 3 obj. of the above, Other than Specified)	3	4.9
Total	61	100.0

In contrast to the previous figure, a small number of firms (3.3.%) have, apparently, aggressive foreign exchange exposure management objectives. As in Rae and Weston (1986 p.135), “a profit maximizing objective for foreign exchange risk management suggest the company would be prepared to take some risks in order to make a profit and would not be concerned with avoiding all exposure risks”. However, this number cannot be used to represent the foreign exchange exposure management objective for Australian firms.

The results of this present study suggest that there is no uniformity in terms of stating their major foreign-exchange objectives even though there is a conservative attitude among firms in the survey. This figure was expected since the result of study by Zenof (in Antl, 1989, p.59) have revealed the variety of foreign exchange exposure management objectives, such as, “prevent FX losses, no FX losses, cover FX wherever possible, maximize dollar equivalent of foreign income ... minimize quarter-to-quarter fluctuations”.

5.3.3. An Active versus Passive Policy

The adoption of either an active or passive policy is the key issue in the policy of foreign exchange exposure management (Wallace, 1998). The analysis of this variable will be useful if the data of an active or a passive policy is combined with the identified major exposures (majorex) and the major policy toward corresponding exposures. Table 5.9 below, presents the cross tabulation between major exposures confronting Australian firms and the policy adopted, either a passive or active.

Table 5.9
Cross Tabulation of Major Exposures
and an Active versus Passive Policy

Major Exposures	Active versus Passive				Total
	Active Policy	%	Passive Policy	%	
Translation Exposure Only	-		4	6.6	4
Transaction Exposure Only	22	36.1	28	45.9	50
Economic Exposure Only	-	-	3	4.9	3
Translation and Transaction Exposures	-	-	2	3.3	2
Transaction and Economic Exposures	1	1.64	1	1.6	2
Total	23	37.7	38	62.3	61

In terms of which policy is the dominant one adopted by Australian firms, most firms (62.3%) adopt a passive policy whereas 37.7% implement a more active policy. This is consistent with the major objectives of Australian firms, which are labelled in the sub section 5.3.2. As in Collier and Davis (1985), Collier, Davis, and Longden (1990; 1992), passive policy is defined in accordance with the decision to cover all underlying exposures while an active policy is characterized with hedge all or partially hedge depending on the view of expected direction of exchange the rate movements and hence prepared to an open position to a degree at spot transaction. From this viewpoint, this result indicates that there are a few firms that are risk intolerant. It also suggests that the objective of foreign exchange exposure management might be influenced by the willingness to accept risk.

Another possible reason is due to the sample imbalance with respect to the size of selected firms. Most of the surveyed firms (65.6%) have sales up to \$50 millions. Only 21 firms have sales greater than \$50 million: 10 firms greater than \$50 to \$100 million, 7 firms greater than \$100 to \$500 million, and only 4 firms have sales greater than \$500 million (Appendix B.6.). These figures suggest that the adoption of either an active or passive policy is, more or less, influenced by Firm size. As in Kucemba (1996, p.24), “Passive management.... However, those with higher thresholds and stronger stomach might appreciate a more active approach to risk management”.

However, from table 5.9, there are some firms (37.34%) that actively manage their underlying exposures. Similar to the previous explanation, this is inconsistent with the major objectives adopted by Australian firms because only two firms have a maximizing objective for their exposure management while a few adopt an active policy. One possible reason for the inconsistency is that making profits from hedging foreign exchange exposure is considered as an acceptable objective of foreign exchange exposure management Rodriquez (1981).

Between the adoption of an active or passive policy and the major exposures, most firms (36%) implement an active while 45 percent implement a passive policy on transaction exposure. This result is different to the study of Collier, Davis, and Longden (1990; 1992) in which US and UK multinational companies are more active in managing translation and transaction exposures.

In relation to the management of translation and economic exposures, the result portrays the adoption of a passive approach on both types of exposure, 4 and 3 firms, respectively. The result suggests that there is a risk aversion among Australian firms in managing translation and economic exposures. This is consistent with the finding of Rodriquez (1981), particularly on translation exposure, exchange gains or losses as a result of managing translation exposure is reported in the financial statements, which may influence the valuation of corporate performance as well as manager who is responsible for managing the exposure.

5.3.4. Percentage of Cover on Foreign Exchange Exposures

The amount of exposure covered in the policy of foreign exchange exposure management is commonly stated in percentage form. Four variables are being used, the percentage of cover on transaction, translation, and economic exposures, and the adoption of an active and passive policy (Table 5.10; 11; 12, respectively).

Table 5.10
Cross-tabulation of Percentage of Cover on Transaction Exposure and
The Adoption of Policy

Percent Cover of Transaction Exposure	Active versus Passive				Total
	Active Policy Approach	%	Passive Policy Approach	%	
up to 25 %	10	16.39	8	13.11	18
greater the 25 % to 50 %	3	4.91	14	22.95	17
Greater then 50 % to 75 %	3	4.92	7	11.48	10
Greater then 75 %	7	11.48	9	14.75	16
Total	23	37.7	38	62.3	61

The above table shows that the amount of exposure covered is apparently not influenced by the policy adopted. From all categories of coverage, the amount of exposure covered is larger on firms adopting a passive policy (62.3%) than those implementing an active policy (37.7%). This figure is expected because, firstly, most firms adopt a passive policy regardless of the amount of exposure covered, and secondly, many studies have revealed that it is quite often that the exposure coverage is influenced by other factors, such as, the willingness to accept risk (Wallce, 1998) and the firm's awareness of its risk exposures [Koh, in Klopfenstein (1997, p.200)].

Similar to the results found in the transaction exposure, the amount of exposure covered toward translation exposure in all categories occurs mostly in those firms adopting a passive than those with an active policy (Table 5.11). The primary difference between transaction and translation exposure in this regard is that there is a large group of firms (70.49%: 18+25) that do not cover their translation exposure whereas in transaction exposure, no single firm leaves its exposure uncovered. This

result is expected since table 5.1 in the Sub-section 5.2.1 reveals that transaction exposure is the major exposure confronting firms in the survey.

Table 5.11
Cross-tabulation of Percentage of Cover on Translation Exposure and
The adoption of Policy

Percent Cover of Translation Exposure	Active versus Passive				Total
	Active Policy Approach	%	Passive Policy Approach	%	
No Cover	18	29.5	25	40.98	43
Up to 25 %	3	4.91	7	11.48	10
Greater then 25 % to 50 %	-	-	2	3.27	2
Greater then 50 % to 75 %	-	-	2	3.27	2
Greater then 75 %	2	3.3	2	3.27	4
Total	23	37.7	38	62.3	61

Table 5.12 below, portrays the percentage of cover on economic exposure does not relate to either an active or passive policy. In general, the table shows that the higher the percentage of cover the smaller the number of firms in implementing both policies. For example, for the percentage of cover up to 25% six and ten firms adopt both an active and passive policy, respectively. Then, in the range of 25% to 50%, the number of firms declines to one that adopts an active policy and three that implement a passive approach.

From 5.10; 11; and 12 above, it is found that, firstly, the percent coverage on transaction exposure is covered more than the other type of exposures. All firms in the survey cover transaction exposure. In contrast, a significant number of firms do not cover translation and economic exposures (70.49% and 63.93%, respectively). Secondly, the percentage cover of transaction exposure is also higher than the other types of exposures. For coverage greater than 75%, there are a large group of firms (26.2 %) cover transaction exposure while there is a small group (6.6%) covers translation, and economic exposure (1.6%). This result suggests the importance of transaction exposure in firms (explained in the sub section 5.2.1.)

Thirdly, the percentage of cover on each type of exposure is not based upon the adoption of either an active or passive policy. In all categories of coverage, the

amount of exposure covered by most firms in the survey is dominated by those adopting a passive policy. This implies that the higher percentage of cover is not determined by the adoption of either an active or a passive policy.

Table 5.12
Cross-tabulation of Percentage of Cover on Economic Exposure and
The Adoption of Policy

Percent Cover of Translation Exposure	Active versus Passive				Total
	Active Policy Approach	%	Passive Policy Approach	%	
No Cover	18	29.5	21	34.43	39
Up to 25 %	5	8.2	11	18.03	16
Greater then 25 % to 50 %	-	-	4	6.56	4
Greater then 50 % to 75 %	-	-	1	1.63	1
Greater then 75 %	-	-	1	1.63	1
Total	23	37.7	38	62.3	61

5.3.5. Exchange-rate Forecast

Three important elements of exchange rate forecast are addressed in this section. The first is the sources of forecast. Analysis of this aspect is expected to support the assertion that the recent volatility of the Australian dollar has resulted in an increase in the awareness of the exchange rate forecast. The second is the forms of presentation on exchange rate forecast. The final element is the concentration of exchange rate forecast.

Table 5.13
Sources of Forecast
Used by Australian Firms

Sources	Frequency	Percent
Company's Forecast	10	16.4
Banks	44	72.1
Other Financial Services	3	4.9
Firm's Forecast and Banks	3	4.9
Bank and Other Financial Services	1	1.6
Total	61	100.0

Table 5.13 demonstrates that all of the surveyed firms have a formal exchange-rate forecast with the primary source is forecast sold by bank (72%). However, there are also a variety of sources that have been used. For example, some firms (11.5%) has their own forecast while others utilize both the firm's and the bank's forecast (4.9%) and rely on either financial services or both financial services and banks (6.5%).

Table 5.14 below, presents the cross-tabulation of presentation of exchange-rate forecast and the sources of forecast. This is expected to present a more comprehensive description in terms of the form of forecast provided by the bank as a major source of exchange rate forecasting among the surveyed firms.

Table 5.14
Cross-Tabulation of Presentations and Sources
Of Exchange-rate Forecast

Presentation Form of Exchange-rate Forecast	Sources of Forecast					Total
	Firm's Forecast	Banks	Other Financial Services	Firm's Forecast and Banks	Bank and Other Financial Services	
1. Indication of The Expected Direction of Movement	6	24		3		33
2. Point Estimate of The Expected Rate at Given Future Date	1	11				12
3.Interval Estimate of The Expected Rate	2	5	2			9
4. Both 1 an 2		4			1	5
5. Both 1 and 3	1					1
6. All Above (1; 2; 3)			1			1
Total	10	44	3	3	1	61

Banks offer a variety of exchange rate forecast forms, which can be categorized into six categories. The first three are: the expected direction of movement, point estimate of the expected rate at a given future time, and interval estimate of the expected rate while the rests are combination of the first.

Those with the bank as their primary source of forecast, 55 percent prefer identification of the expected direction of movement rather than other presentation forms. A similar figure applies to those relying on the firm's forecast (10 firms). These accounted for approximately 60 percent. This is consistent with the purpose of exchange rate forecast, that is, to predict the expected direction of movement of exchange rate forecast (Jilling, 1978, pp.113-114). Even though there is a small group of firms that use the interval estimate, the purpose is most likely to predict the direction of exchange rate movement.

Another aspect of forecast addressed in this analysis is the concentration of currency of forecast (table 5.15). This table portrays the importance of which currency of forecast should be the focus. Among surveyed firms, 46 focus their forecast on currencies in which they have a significant exposure, 36% emphasize on the currency with which they are dealing. This suggests that forecasting is primarily directed to assist foreign exchange exposure management because the forecast is only concentrated on the two categories above. It also implies that forecasting is not directed to assist speculation.

Table 5.15
Concentration of Currency of Forecast Used
by Australian Firms

Currency of Concentration	Frequency	Percent
All Currency They are Dealing with	22	36.1
Currencies of Significant Exposure	28	45.9
The More volatile Currencies	2	3.3
Other	3	4.9
Both 1 and 2	1	1.6
Combination of 2 & 3	4	6.6
All above (1; 2; 3)	1	1.6
Total	61	100.0

The result of forecast policy generally supports the effectiveness of foreign exchange exposure management practices that require a formal exchange rate forecast and this forecast is directed to reduce the adverse consequences of exchange

rate movements. However, it would be useful if firms had their own exchange rate forecast.

5.3.6. The Degree of Centralization

The degree of Centralization on this study is applied to three aspects of foreign exchange exposure management, foreign borrowing or lending, foreign exchange transaction, and entering into the foreign exchange market for hedging purposes. Three items are being used and described.

The result of this study shows that firms are more centralized. This is measured by the last two alternative answers: either under specific direction from head office or only head office performs foreign borrowing, foreign transactions, and hedging foreign currencies (presented in table 5.16; 17; and 18, respectively).

Table 5.16
The Degree of Centralization on Foreign Borrowing or Lending

The Degree of Centralization	Frequency	Percent	Valid Percent
In Its Own Name	21	34.4	34.4
Under General guidelines	9	14.8	14.8
Under Specific Direction	13	21.3	21.3
Only Head Office can Borrow/Lend	18	29.5	29.5
Total	61	100.0	100.0

Table 5.16 shows that 34.4% percent of surveyed firms can borrow or lend funds denominated in foreign currencies in its own name and 14.8% under general guidelines. Even though this figure can be seen as a low degree of centralization, the number of firms with a specific direction that cannot borrow or lend in foreign currencies accounts for more than 50 percent ($21.3\% + 29.5\% = 50.8\%$). One possible reason for more centralization on foreign currency borrowing is its impact on the overall company's exposures. A subsidiary of a multinational company for instance, may obtain cheaper funds from other foreign subsidiaries without creating more exposures for the group.

The degree of centralization on foreign transactions is shown by a large number of firms (75.4%) that have a lower degree of centralization (table 5.17.). The possible reason for this explanation is that foreign exchange transactions can be traced based on historical patterns. Hence, a foreign trade from a foreign subsidiary would be easily predicted by its parent company so that overall exposures might have already been predicted. Hence, this decision is left at the lower level of management.

Table 5.17
The Degree of Centralization on Foreign Transactions

The Degree of Centralization	Frequency	Percent	Valid Percent
In Its Own Name	33	54.1	54.1
Under General Guidelines	13	21.3	21.3
Under specific directions	6	9.8	9.8
Only Head Office can Transact	9	14.8	14.8
Total	61	100.0	100.0

Similar to the degree of centralization on foreign borrowing or lending, entering into the foreign exchange market for hedging purposes, exhibits a high degree of centralization (table 5.18.). 54% of the surveyed firms with a high degree of centralization, 24.6% can enter into the foreign exchange market for hedge under general guidelines from head office while 29.5% do not have the power to enter into the foreign exchange markets.

There are possible reasons for implementing a high degree of centralization. Internal factors, such as, the availability of skill, information system, size of exposure, and other factors that may contribute to the ineffectiveness for hedging done by a subsidiary or outside the head office. Another possible reason is external factors, such as accounting and tax regulations, the availability of a foreign exchange market, and so on.

Table 5.18
The Degree of Centralization on Hedging Foreign Currency
By Australian Firms

The Degree of Centralization	Frequency	Percent
In Its Own Name	20	32.8
Under General Guidelines	8	13.1
Under Specific Directions	15	24.6
Only Head Office can Hedge	18	29.5
Total	61	100.0

Overall, the result on the degree of centralization is consistent with other studies in the foreign exchange exposure management [Collier and Davis (1985); Belk and Galum (1990); Collier, Davis, and Longden (1992)]. Collier and Davis (1985) specify subsidiaries of UK multinationals into two categories, overseas and domestic. This study found that a high degree of centralization is implemented on domestic subsidiary (32 firms). The study of Belk and Glaum (1990) toward UK multinationals also found nine of seventeen surveyed firms had a high degree of centralization.

5.4. Techniques in Foreign Exchange Exposure Management

Techniques in exposure management can be broadly classified into two categories, internal and external. Two items are used for the internal techniques, these are, the types of techniques used and the critical factors in applying them. Two items are also used for the external techniques, the types of techniques used and the critical factors that influence the selection of the techniques.

Table 5.1.9 shows the internal techniques used by Australian firms. Among the surveyed firms 44.2 percent do not used internal techniques while 55.8% used a variety of internal techniques. The most popular internal technique used is netting (offsetting debt against claims) accounted for 24.6%. The result is consistent with the study of Soenen (1989) of large Belgian firms when it was found that 27 percent of 422 firms implement this technique. Meijerjohann (in Antl, 1989, p. 123) said that its simplicity makes it reliable to be applied in foreign exchange exposure management.

Other various techniques are also used by Australian firms. Among the surveyed firms, multi-currency billing system is the second choice of technique used after netting (11.5%) but only one firm uses leading and lagging.

Table 5.19
Internal Techniques Used by Australian Firms

Techniques	Frequency	Percent
1. No Internal Techniques Used	27	44.2
2. Netting	15	24.6
3. Multi-currency Billing System	7	11.5
4. Leading and Lagging	1	1.6
5. Both 1 and 2	3	4.9
6. 1, 2 and 3	2	3.3
7. Both 1 and 4	1	1.6
8. Both 1 and 5	3	4.9
9. Combination of Both 4,5 and 1 or 3	2	3.3
Total	61	100.0

Table 5.20 displays the critical factors for applying internal techniques. Most of the surveyed firms (26.2%) state that the existence of information technology is crucial. This is understandable, particularly since the implementation of internal techniques involves a various currency with different date maturity. Netting for instance will be very difficult to implement without technology since offsetting debt in a variety of currencies with different maturity date has to be converted into a common currency [Borenstein, in Antl (1989, p. 233)].

Besides information technology, costs are another factor that contributes to the use of internal techniques. This factor is related to the information technology, which needs a substantial amount of funds to invest in it. For example, employees may also need to be trained after new system is developed. The approval from head office is also a factor that contributes to the utilization of these techniques

Table 5.20
Critical Factor in Applying Internal Techniques
Faced By Australian Firms

Types of Techniques	Frequency	Percent
No Answer (do not use this techniques)	6	9.8
Information Technology Only	16	26.2
The availability of Sufficient Skill	14	23.0
Regulations	1	1.6
Costs	8	13.1
Other (head office approval)	3	4.9
Both IT and Availability of Suff. Skill	5	8.2
Both IT and Costs	7	11.5
Combination	1	1.6
Total	61	100.0

As with the internal techniques, the analysis describes the use of external techniques which cover the first, second, and third generations. Spot and forward contract are examples of the first generation while currency swaps, future contracts, and options are the second generation instruments. The third generation covers instruments, such as, caps, collars, floors, and FRAs (Jesswein, Kwok, and Folks Jr., 1998).

Table 5.21 below, portrays the variety of external techniques employed for hedging foreign exchange exposures. The first generation techniques are the most popular, accounted for approximately 59%. Other techniques are employed in a combination form between one and second generations (14.75%), one and third generations (16.40%), and all the three generations (6.6%).

Within the first generation techniques, forward contract is the most popular. The result of external techniques used is consistent with the previous studies [Mathur (1982); Australian study of Teoh and Er (1988); and Batten Mellor, and Wan, 1993)]. Foreign currency swaps is the most popular method within the second generation techniques for hedging currency exposure. The most interesting figure is on the third generation techniques where caps, collars, and floors, are the most techniques used. A possible reason for this explanation is that firms move from using

simple currency options, which were found to be the most popular technique in the study of Batten, Mellor, and Wan (1993), to a more sophisticated technique for hedging foreign exchange exposures.

Table 5.21
External Techniques Used

Techniques	Frequency	Percent
None	1	1.6
1. Spot Only	6	9.8
2. Forward Contract Only	6	9.8
3. Both 1 and 2	24	39.3
4. 3 and FC Swap	3	4.9
5. 3 and Options	1	1.6
6. 3 and FRAs	2	3.3
7. 3 and Caps, Collar, Floors	5	8.2
8. 4 & Curr. Futures	2	3.3
9. 4 and Caps, Collars, Floors	1	1.6
10. Combination of 3 & Options, FRAs, Caps, Collar, Floors	1	1.6
11. Combination of 2 and FX Swaps	3	4.9
12. Combination of 2 and FRAs	2	3.3
13. Combination of 2; Caps; Collars; Floors	1	1.6
14. Combination 13 and Options	1	1.6
15. Combination 11; options; FRAs	1	1.6
16. Combination of FRAs & Caps, Collar, Floors	1	1.6
Total	61	100.0

5.5. Summary

In this chapter, a descriptive analysis of firms' practices on foreign exchange exposure management, which is the first objective of this study have been given. The

analysis includes several aspects of policy and corporate practices, such as, identification and policy aspects, as well as the techniques used in foreign exchange exposure management.

Three types of foreign exchange exposures, translation, transaction, and economic exposures have been identified in which transaction exposure is the major type (86 % of the surveyed firms) confronting Australian firms.

The analysis has also identified the types of exposure being managed. Most firms (57%) managed transaction exposure only. The primary sources and methods of identifying transaction exposures have already been recognized in this analysis. Foreign sales and purchases is the major source of this exposure while forecast based on orders and cash by currency are the techniques used to identify these exposures.

Even though the results of this study found that translation and economic exposures are managed, the number of firms that manage these exposures is less than those managing transaction exposures. The number of independent firms participating in this study is the primary explanation for the lower number of firms managing translation exposure.

An analysis on economic exposures has shown that this exposure has been recognized. However, the number of firms manage this type of exposure is limited. This finding indicates that there is an increase in the awareness of understanding of this type of exposures.

Despite the identification aspects, this analysis has identified six major aspects of foreign exchange exposure management policy. Firstly, the volatility of the foreign exchange of currency with which they are dealing is the major factor driving corporate practices and policy on foreign exchange exposure management. This is consistent with the evidence provided in the chapter one regarding the volatility of the major currencies due to the globalization. Secondly, this analysis has identified the major characteristics of Australian foreign exchange exposure management objectives. The results of this analysis indicate that Australian firms tend to be more conservative. This analysis is supported by the passive policy shown to be the one most adopted.

The next important finding in the policy is that the percentage of cover on each exposure is not influenced by the adoption of either an active or passive policy. Analysis of forecasting policy has also revealed that most firms have a formal

foreign exchange forecasts, which is mostly supplied by banks in particular forms, namely, indication of expected direction of movement and point estimate of the expected rate at given future date. Finally, this analysis has identified the responsibility aspect of policy: the degree of centralization. As with previous studies, it was reaffirmed that Australian firms have a high degree of centralization.

Finally, internal and external techniques in this study have been identified. Our result show that the most two popular internal techniques are netting and a multi-currency billing system. Since this study found that 46 % of firms do not use any internal techniques, analysis is carried out in order to identify what major factors are critical in applying the techniques they may use. Two factors are considered important for using these techniques, information technology and the availability of sufficient skills. With respect to the external techniques, the first generation techniques, forward contract is the most popular.

CHAPTER 6

THE EFFICACY OF CURRENT FIRMS' PRACTICES and THE IMPORTANCE OF FIRM-SPECIFIC CHARACTERISTICS

Introduction

This study is concerned with the description of current corporate practices on foreign exchange exposure management as well as the potential associations between firm-specific variables and the two management policies (the adoption of either an active or passive policy and the degree of centralization) and two management practice variables (the internal and external techniques used).

Chapter 6 described the current corporate practices on foreign exchange exposure management. This chapter presents the analyses on whether: (1) all exposures are properly identified; (2) policies are properly set out; (3) internal and external techniques are used in accordance with the policies.

The analyses are used to evaluate the effectiveness of current practices and to reveal the potential firm-specific factors that may contribute to the efficacy. This chapter is divided into four sections. Section 6.1 deals with the identification issues. Section 6.2 analyzes the policies. Section 6.3 presents analysis on internal and external techniques used. This chapter is then summarized in the Section 6.4.

6.1. Foreign Exchange Exposure Identification

This section begins with the summary of foreign exchange exposure identification presented in Chapter 5 (Section 5.2.1; 2). It is then continued to determine what types of exposures are not properly identified and managed.

From the previous chapter (Table 5.1 and Table 5.2), it was found that transaction exposure was the major exposure that confront and is managed by all firms (100%) participating in the survey. This result is expected since Australian firms selected in this survey are those with international trade and most of them (60%) say that foreign sales or purchases are the major sources of their foreign exchange exposures.

Table 6.1
Major Foreign Exchange Exposures and Types Managed
By Australian Firms

Major Exposures and Types of Exposure Managed	Frequenecy	Percent
Translation Only	4	6.6
Transaction Only	50	82.0
Economic Only	3	4.9
Translation and Transaction	2	3.3
Transaction and Economic	2	3.3
Total	61	100.0

Unlike transaction exposure, translation and economic exposures are not their major exposures (Table 6.1). Hence, they are managed less than transaction exposures. Translation exposure figure, it is an obvious that since nearly 30 percent of the surveyed firms are independent firms and have no obligation to translate their foreign transactions (Table 6.2). On the other hand, among firms that must translate their foreign transactions, parent companies (11.48%) and subsidiaries of foreign companies (58.53%), 39.3 percent admit that translation exposure has, either never been managed or not applicable. In this group, there are two parent firms and thirteen subsidiaries of foreign firms that never manage translation exposure while nine foreign subsidiaries say that managing this type of exposure is not applicable.

Table 6.2
Cross-Tabulation of Organizational Characteristics and
The Extent of Translation Exposure Management

Organizational Characteristics	Management of Translation Exposure								Total	
	All of The Time		Sometime s		Never		Not Applic.			
	F	%	F	%	F	%	F	%	F	%
Parent Company of Foreign subsidiaries	5	8.2	-		2	3.3	-		7	11.48
A Subsidiary of A Foreign Company	12	19.67	2	3.28	13	21.3	9	14.75	36	59
Independent Firm	-	-	-	-	-	-	18	29.5	18	29.5
Total	17	27.87	2	3.28	15	24.6	27	44.25	61	100

This is understandable since all subsidiaries in the surveyed firms are foreign-owned (Appendix C.2) that allow translation exposure being managed by their parent companies while two parent companies that never manage translation exposure admit that they translate foreign transactions but not hedge exchange gains and losses from translation.

The above description indicates that transaction and translation exposures have been properly identified, but not economic exposure. As suggested by the literature in foreign exchange exposure management [Madura (1993a); (1993b); Koh, in Klopfenstein (1997, p.194)], all underlying foreign exchange exposures confronting firms should be identified and managed, including economic exposure, in order to establish effective foreign exchange exposure management.

Even though economic exposure is managed by 31 percent of the surveyed firms, which is far larger than the finding of other Australian studies [for example, Batten, Mellor, and Wan (1993); Teoh and Er (1988), the number of firms that manage this type of exposure should have been more than this figure because there is a large group of the surveyed firms (more than 40%) states that that they have recognized this type of exposures.

It appears that 9% and other firms (60%) that do not recognize nor manage economic exposure are reluctant to managing this type of exposure possibly because they do not know what methods can be used to identify or how to manage this exposure. These difficulties, as argued by Aggarwal and Soenen (1989), are the long-term period of coverage and the need to integrating strategies, such as, production, marketing, and financial, in order to manage this exposure.

The above descriptions have shown that not all foreign exchange exposures are properly identified in particular, economic exposure. Hence, this indicates the ineffectiveness at the first step of managing foreign exchange exposure by Australian firms. The next step to be evaluated is their foreign exchange exposure management policy.

6.2. Policy

This section analyzes the current policies on the objectives, the adoption of either an active or passive policy, forecasting, and the degree of centralization. These

policies are analyzed in terms of their interdependence. The adoption of either an active or passive policy by Australian firms is analyzed in accordance with the major objectives of foreign exchange exposure management. Then, the adopted policy is assessed with respect to the supporting aspects, such as, forecasting policy and the degree of control to determine whether such policy is effective and efficient.

Chapter 5 revealed the various forms of stating the foreign exchange exposure management objectives among Australian firms (Table 5.8). The most interesting point from the result is that most firms (80.3%) admit, “Cover all exposures whenever possible”, “My company is not in the business of foreign exchange”, “Avoid surprises”, and “Minimize quarter-to-quarter fluctuations”, are their major objectives, which show the generally conservative attitude towards their foreign exchange exposure management. Only two firms have a more aggressive objective: “maximizing dollar equivalent of foreign income”.

The objectives are often followed with a formal key policy: either an active or passive policy (Wallace, 1998). Chapter 5 (Table 5.9) revealed that the passive policy is used more than the active one on transaction, translation, and economic exposures, which are congruent with the major objectives.

However, there is a difference between the adoption of either a passive or active policy of those firms with transaction exposure and those confronted with other types of exposures as their major concern. As described above, the passive policy is adopted dominantly by firms confronted with all types of major exposure but there are a few firms (36%) with transaction as their major exposure that adopt a more active policy. This percentage is quite surprising compared with that of adopting a passive policy (46%). The result indicates that there are few firms willing to implement an active policy to manage their transaction exposures.

In order to justify the effectiveness of the passive policy that is adopted by a large group of Australian firms in the transaction exposure, the percentage of cover on this exposure has to be evaluated. As suggested by some authors [among others, Wallace (1998); Jadoul and Seeger (1994); Cook (1995)], a more active policy means managers or treasurers are given an authority to cover underlying exposures at a particular percentage based on the future direction of exchange movements.

Chapter 5 (Table 5.10) presents the amount of exposure covered on transaction exposure. It is obvious that in almost all categories of coverage: “up to

25%”, “greater than 25% to 50%”, and so on, there are firms that are prepared to manage actively their transaction exposure. If this is the case, then the large group of firms (62.3%) that adopt a passive policy on transaction exposure is, in deed, ineffective. In other word, they should have been more active because three following reasons.

The first is most firms (82%) with transaction as their major exposure have employed a sufficient forecasting policy (Appendix C.15; 16; and 17). These firms have used any sources of forecast in which 70 percent use their bank as their primary source of information of exchange rate forecast (Appendix C.15.).

As suggested by many authors [Levich and Thomas (1993); Carter, Vickery, and D'Itri (1993); Vickery, Carter, and D'Itri (1992); Kucemba (1996); McNew, in Klopfenstein (1997, pp.291-302)], a more active policy requires adequate forecasting because covering exposure at a certain percentage (leaving the other percentage uncover) creates an exposed position. If future spot exchange rate occurred as predicted, there would be a cost saving from this policy. On the contrary, if the future spot exchange rate was far off the predicted exchange rate, a greater loss would be inevitable. These firms have used any sources of forecast within which 70 percent use their bank as their primary source of information of exchange rate forecast (Appendix C.15.).

The sufficient forecasting policy can also be seen from the concentration of forecasted currency and the forms of exchange rate forecast. Most firms (84%) concentrate their forecast on currencies with which they are dealing and that of significant exposures (Appendix C.16.). This forecast is stated in the forms of both: indication of expected direction of exchange rate movement (52%) and a point estimate at a given future date (22%).

Second, firms in the survey have significant foreign exchange exposure (Appendix B.5). Among these firms, 65.6 percent have foreign-to-total sales larger than 15 percent and foreign-to-total purchases larger than 30 percent (higher degree), and 34.4 percent have foreign-to-total sales smaller than 15 percent and foreign-to-total purchases smaller than 30 percent (lower degree). Firms with a higher degree of foreign involvement and transaction as their major exposure, account for approximately 52.46 percent of the surveyed firms. Hence, there is a large group of firms that are more exposed to the exchange rate risk.

Finally, the ineffectiveness of the passive policy is due to the fact that most firms adopt a high degree of centralization (Table 5.16; 18 in Chapter 5). The study of Jilling (1978), Collier and Davis (1985), Collier, Davis, and Longden (1992) prescribed the importance of centralized control in the adoption of the active policy. This is because a central control makes it possible for head office to net out the exposed positions of its operational units. Hence, hedge can be performed effectively instead of being performed individually by the operational units. To quote Ankrom (1974), “central control and direction of foreign exchange are prerequisites if there is to be a rational consistent approach to controlling exposure”

Table 6.3
The Degree of Centralization on Foreign Borrowing/Lending and
Hedging Foreign Currency by Australian Firms

Directions	The Degree of Centralization	
	Foreign Borrowing/Lending (%)	Hedging Foreign Currency
In Its Own Name	34.4	32.8
Under General guidelines	14.8	13.1
Under Specific Direction	21.3	24.6
Only Head Office can Borrow/Lend	29.5	29.5
Total	100.0	100.0

Table 6.3 shows that the decision to borrow or lend funds in foreign currencies and enter into the foreign exchange market for hedging purposes are either under specific direction from head office or only head office can perform such decisions. This means Australian firms adopt a higher degree of centralization even though most firms are given autonomy to make business transactions involving foreign currencies (Table 5.17).

One possible argument for the implementation of a higher degree of centralization in this study is that a large group of firms (58.53%) are subsidiaries of foreign firms and they are all foreign-owned (Appendix C.2.). For example, any foreign borrowing or lending funds by a subsidiary of a corporation will also increase the total exposure at the corporation level. Hence, it is more effective and efficient to

centralize this decision at the head office because it may have more information on which subsidiaries have surplus funds that can be matched with other subsidiaries that need them.

The decision to centralize the power to enter into the foreign exchange market for hedging is also similar with that on foreign borrowing or lending. There are costs associated with hedging, such as, cash flow related costs for settlement of contract, contract-trading costs, management fees, custodial costs (Gitlin, 1993, p.27). Hence, hedging is more efficiently conducted at head-office because it has more information on the exposed positions of overall subsidiaries so that they are possible to be netted out before hedging is performed.

The passive policy adopted by Australian firms in their foreign exchange exposure management is both ineffective and inefficient. Even though most of their objectives in foreign exchange exposure management indicate a conservative attitude toward foreign exchange exposures, the decision to adopt a passive policy is, inappropriate, particularly, for those with transaction as their major exposures. A large number of Australian firms with a high degree of foreign involvement and centralization, and a sufficient forecasting policy, may need to consider adopting a more active policy.

In an effort to justify the overall policies and practices, however, the evaluation has to be completed with the effectiveness of internal and external techniques used.

6.3. Techniques

This section analyzes the effectiveness of internal and external techniques used by Australian firms. Two separate sub sections accommodate the analyses.

6.3.1. Internal Techniques

The internal techniques used by Australian firms are firstly summarized in this sub section. They are then analyzed to justify whether the use of internal techniques is congruent with the policy. Some firm-specific factors are also

incorporated in the analysis to highlight whether those factors influence the use of the techniques.

Chapter 5 (Table 5.19) described that netting and multi-currency billing system as the major internal techniques used (29.5% and 11.5%, respectively) by Australian firms. However, there are a large number of firms (39.3%) that do not use any internal techniques. Among this number, 44 percent are firms with transaction as their major exposures (Table 6.4).

Table 6.4
The Number of Internal Techniques Used and Transaction Exposure
As Major Exposure Faced By Australian Firms

The Number of Internal Techniques Used	Major Exposure	Total
	Transaction Exposure Only (% of Total Co.)	
No Techniques	48.0%	48.0%
Only One	36.0%	36.0%
Two Techniques	12.0%	12.0%
Three Techniques or more	4.0%	4.0%
Total	100.0%	100.0%

These numbers support the logical argument for the adoption of a passive policy among the surveyed firms. Since an active policy explained in the previous section requires a high degree of centralization, there are potential internal techniques that are not used by a large number of Australian firms. This makes an active policy difficult to implement. For example, offsetting debts against claims of within subsidiaries by head office requires implementation of netting.

There are several reasons for firms not using the internal techniques. First, there are limited financial capabilities among Firms that do not use these techniques. Among the surveyed firms, 20.8 percent say that they do not have sufficient information technology, 25 percent admit that there is insufficient skills available in the firm, 4.2 percent state that costs are their major factor, and 29.1 percent disclose a combination of all the above factors. Additionally, there is a group of firms (20.8%) that neither uses these techniques nor provides the reasons. (Appendix C.18.).

The financial capabilities of the surveyed firms that do not use internal techniques can also be clarified by looking at their sales. As argued by Kimberly (1976), the firm's sales reflect the economy of scales. As outlined above, the information technology and the availability sufficient skills are the most critical factors for them not using the internal techniques. It is plausible, therefore, to conclude that they do not use these techniques because they cannot afford to build the information systems and/or to employ the personnel that have sufficient skill to handle this job.

The cross tabulation between the firm's sales and the critical factors in applying the internal techniques provides the evidence for the above argument. Firms that do not use any internal techniques are mostly (87.5%) in the lowest category of sales: up to 50 million dollars. This percentage is quite large compared with 12.5 percent of firms in the category of sales "grater than 50 to 100 million dollars (Appendix C.20.).

Besides financial capabilities, another potential factor that may contribute to their reluctance to use internal techniques is the organizational characteristic of the surveyed firms: whether they are subsidiaries, parent firms or independent firms. The cross tabulation between the characteristics and ownership of Australian firms may clarify this factor.

Table 6.5
Organizational Characteristics and
Ownership of Australian Firms Participating in the survey

Organizational Characteristics	Foreign / Australian Owned		Total
	Foreign-Owned	Australian Owned	
Parent Company of Foreign subsidiaries	2	5	7
A Subsidiary of A Foreign Company	36	-	36
Independent Firm	-	18	18
Total	38	23	61

As outlined in Table 6.5, 38 firms are foreign-owned in which 36 are subsidiaries of foreign firms, and 23 are Australian-owned. Among the number of

Australian-owned, 78.26 percent are independent, and 21.73 percent are parent companies. From the foreign-owned subsidiaries and parent companies, 36.84 percent do not use internal techniques. In this case, these companies may need head office approval, to implement these techniques.

One possible explanation of why Australian-owned firms do not use these techniques (43.5%) is because, as mentioned above, most of them are independent firms that might not need to organize their foreign exchange exposure management using a sophisticated information technology for handling their foreign exchange exposure management. They might not have significant intra-firm foreign transactions. Even if they have branches that can authorize business transactions involving foreign currencies without specific direction from head office. They might use less sophisticated technology to understand overall position of the branches. This may be because their branches are located in only one country.

The large number of firms that do not use the internal techniques in this study is expected because a passive policy is preferable to the active one (section 6.2). The description also shows that financial capabilities deter the establishment of information technology for Australian firms that do use these techniques. Additionally, whether these techniques are used or not may also be influenced by the organizational characteristic of firms upon which the necessity to establish information system at the operational units is approved by head office.

The above description shows that the use of internal techniques is limited because Australian firms dominantly adopt a passive policy. However, if the passive policy is ineffective, as prescribed above (section 6.2), a more active policy should have been implemented and either limited number or no techniques used by a large group of firms are ineffective.

In order to justify the effectiveness of the overall techniques employed in exposure management, it is also essential to evaluate the external techniques used by Australian firms.

6.3.2. External Techniques

This section analyzes the effectiveness of external techniques by presenting the summary of preferred external techniques used by Australian firms outlined in

chapters 5. Then, these techniques are evaluated in relation to the adopted policy to validate whether the use of these techniques is effective in foreign exchange exposure management.

Table 5.21 in chapter 5 revealed that spot and forward contracts are the most preferable external techniques used by most Australian firms (39.3%). Among this group, 79 percent adopt a passive policy. This result indicates that the first generation techniques are utilized in the implementation of the passive policy. This is theoretically consistent, particularly if the major exposure that confronts Australian firms is transaction exposures [McNew, in Klopfenstein, (1997, p. 284)]. However, the use of forward contracts for this purpose may be unfavorable.

The disadvantages of using forward contracts is that most firms have employed a good forecasting policy, particularly, those with transaction exposures. Using forward contract as an implementation of the passive policy does not need an accurate forecasting since foreign receivable for instance, can be done by selling the foreign currency of receivable against domestic currency in the date of settlement [McNew, in Klopfenstein, (1997, p.300)].

A more active policy, however, may not be blindly entering into the forward contract at the early period to hedge foreign receivable. It is rather, waiting and observing the likelihood of exchange rate movements to see the possibilities that future exchange rates move in favor of the home currency (appreciation).

The comparison between passive and active policies in hedging receivable constitutes an opportunity cost. This cost arises from the difference between exchange rates at the date of settlements and possible appreciation of domestic currency against foreign currency of the receivable at the period after. For this reason, using forward contract to implement passive strategy is ineffective and inefficient particularly when accurate forecasting can be used to predict the likelihood of future exchange rate.

The extensive use of the first generation techniques is apparently not dictated by merely the adoption of either an active or passive policy. The diversity of Australian firms that use the first generation techniques is one possible reason. For example, the number of firms that use the first generation techniques based on organizational characteristic (independent, subsidiaries, or parent companies) and the degree of foreign involvement shows that the techniques are extensively used by 62.5

percent of foreign subsidiaries and 70.8 percent of firms with a higher degree of foreign involvement (Appendix C.21; 22.). Hence, there is a possibility of firm-specific factors of the surveyed firms influencing the decision to use the first generation of external techniques.

6.4. Summary

This chapter has evaluated the effectiveness of firms' practices on foreign exchange exposure management by Australian firms

In terms of identification, transaction and translation exposure have already been properly identified. Economic exposure is the only exposure that has not been properly identified and it appears to be managed by only a few firms. Even though this study found larger numbers of Australian firms that recognize and manage the economic exposure, this finding indicates that current foreign exchange exposure is ineffective because a few firms in the survey have recognized this type of exposure but they do not manage it.

Most Australian firms in this study have a conservative attitude in their foreign exchange exposure management, which is reflected in their preference of a passive policy. However, implementing a passive policy, particularly, for firms with transaction as their major exposure, is ineffective for several reasons. Firstly, most of the surveyed firms have sufficient forecasting components in their policy. Secondly, most firms have a high degree of centralization, particularly foreign-owned subsidiaries, which can be used to support a more active policy for managing transaction exposures. Finally, there are indications that the adoption of the policy is not solely dictated by those factors but also firm-specific characteristics.

As an implementation of policy, a few Australian firms have used limited number of internal techniques (netting accounted for 29 percent) but there is a large group of firms (39%) that do not use any of these techniques. If more active policy were implemented to achieve the effective policy, the number internal techniques used by Australian firms would be inadequate.

The limited number of internal techniques used and the large number of firms that do not use them is apparently, caused by the financial restraints of the firms to built sufficient information system for their exposure management. The analysis also

found that there is potential linkage between organizational characteristics of Australian firms (independent, subsidiaries, or parent companies) and the internal techniques used.

When external techniques are considered, the first generation is the most popular ones. It appears that forward contract is used as an implementation of passive policy although the use of the forward contract in this way is ineffective. This is because most Australian firms have employed a sufficient forecasting policy concentrated on currency they are dealing with in the form of an indication of expected direction of movement and point of estimate at a given future date. By having this forecasting information, it is possible to save costs by adopting a more active policy.

Finally, there are apparently firm specific factors that contribute to the number of external techniques used. This should be tested. The next chapter therefore, is devoted to test the hypothesis of the association between form-specific factors and the management practice variables.

CHAPTER 7

FIRM-SPECIFIC CHARACTERISTICS AND FOREIGN EXCHANGE EXPOSURE MANAGEMENT PRACTICES

Introduction

The previous two chapters (5 and 6) described the major characteristics and effectiveness of foreign exchange exposure management by Australian firms. The descriptions suggested ineffective practices in their foreign exchange exposure management, there are however, contributing factors that have not been confirmed.

This chapter goes beyond the descriptive nature by constructing hypotheses to test the association between potential firm-specific factors and four variables of management policy and practice (the adoption of either an active or passive policy, the degree of centralization, internal and external techniques used).

This chapter is organized into six sections. Section 7.1 specifies the hypothesis tested, method used, and its limitations. The next three sections (7.2; 3; and 4) present and discuss the results of empirical tests: the association between firm size, the degree of foreign involvement, and ownership, and each variable of the management practices, respectively. Section 7.5 contains a presentation and discussions on the significant association between the degree of centralization and the adoption of either an active or a passive policy. Finally, in section 6 the results of this study are summarized.

7.1. Specification of Hypotheses

This study questions whether there is an association between firm-specific-characteristic variables and foreign exchange exposure management-practice variables. *Firm-specific variables selected in this study are firm size, the degree of foreign involvement, and ownership while the management practice variables are the adoption of an active or a passive policy, the degree of centralization, the use of internal techniques, and the use of external techniques.* This is formulated in the following hypothesis:

H₀: The firm-specific characteristic variables and the management practice variables are independent of one another.

To test this hypothesis, chi-square is used. This method is appropriate because, as described in the methodology chapter, the nominal scales are used for all variables in the hypothesis. However, there are two important assumptions that have to be considered (Mason, Lind, and Marchal, 1999, pp.521-522). First, if the test is conducted individually and therefore two cells are tested, the expected count in each cell should be five or more. Secondly, for more than two cells, the expected count of less than five in all cells should not be more than 20 percent.

The data collected in this study is only 20.4 percent of the selected sample (61 of 299 firms). The testing of the hypothesis, therefore, cannot be performed simultaneously because the likelihood of expected count less than five is large. Hence, testing is carried out on twelve hypotheses concerned with the individual association between three firm-specific factors and four variables of foreign exchange exposure management policy and practice.

7.2. Firm Size and the Management Practice Variables

This section is organized based on the significant association of either management practice or policy variable and firm size. It is then followed by the presentation and discussion of each management practice variable that has no significant association with firm size. This section therefore, is divided into four separate sub-sections that accommodate individual test between firm size and each management practice variables.

7.2.1. Firm size and External Techniques Used

This study hypothesize that there is an association between firm size, which is defined as the dollar amount of average annual sales or revenues and the external techniques used. This hypothesis can be formulated in the following null hypothesis.

H1: Firm size and the external techniques used are independent of one another

Firm size is measured by two scales of measurement, the smaller (scored one) and the larger firms (scored two). Score one is used if firms have an average annual sales or revenues of up to fifty million dollars and score two is applied to firms with larger sales.

The use of external techniques is defined as the number of external techniques used including spot cover, forward cover, foreign currency swaps, foreign currency futures, options, foreign exchange agreements (FRA), and other interest based options, such as, caps, collars, and floors. Four scales of measurement are used. Firms are scored zero, one, two, or three depending on the number of external techniques used. Since most firms in the survey have employed two and occasionally three or more techniques (Appendix B.33.), those that use three or more techniques are scored three.

Table 7.1 presents the result of the test of association between firm size and the external techniques used. This table shows that the Chi-Square value (20.770) is greater than its critical value (7.815; df.3). It is, therefore, the null hypothesis of firm size and the use of external techniques is rejected (at $\alpha = 0.05$). This result shows that firm size is apparently associated with the use of external techniques.

Table 7.1
Chi-Square Test for Independence of
Firm size and the External Techniques Used

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.770(a)	3	.000
Likelihood Ratio	22.951	3	.000
Linear-by-Linear Association	17.782	1	.000
N of Valid Cases	61		
a) 3 cells (37.5%) have expected count less than 5. The minimum expected count is .30.			

The result, however, is unreliable because there are three cells that have an expected count of less than five. Among these are in the categories of no external techniques used by both smaller or larger firms and one cell in the category of one external technique used by larger firms (Appendix C.26).

Since previous studies [(see for example, Geczy, Minton, and Schrand (1997); He and Ng (1997); Berkman, Bradbury, Hancock, and Innes (2002)] asserts that there is an association between the two variables, respondents are then selected by eliminating those that did not use any external techniques. The reason for eliminating this category because there are two firms, which are only 1.6 percent (one firm) of the surveyed firms, in cells that have expected count less than five (Appendix C.26.).

Table 7.2 below, presents the test with selected respondents. A better result is achieved with the Chi-Square value of 20.152 that is above its critical value. However, there is one cell that has an expected count of less than five because no large firm uses only one technique (Appendix C.26B.). Therefore, it is difficult to conclude the significant association between firm size and the external techniques used due to the dissatisfaction of statistical assumption.

Table 7.2
Chi-Square Test for Independence of
Firm size and the External Techniques Used
(Selected Respondents)

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.152(a)	2	.000
Likelihood Ratio	22.244	2	.000
Linear-by-Linear Association	18.061	1	.000
N of Valid Cases	60		
a) 1cell (16.7%) has expected count less than 5. The minimum expected count is 3.60.			

The result of this test (Table 7.1; 2) seems consistent with Jesswein, Kwok, and Folks (1995) that found that firm size is not significant in explaining the use of the external techniques. These authors use the regression analysis and measure firm size uses logarithm of assets to determine its influence on the extensive use of the techniques. The measurement of size in this study is the logarithm of assets, which is used to avoid the normality problem of a variable in the parametric test (Hair, Jr., Anderson, and Tatham, 1995, pp.66-67). The present study does not employ such manipulation to measure the firm size.

Most previous studies, however, suggest that larger firms may employ more external techniques because the firm size implies economy of scales (Kimberly, 1976). Nance, Smith, and Smithson (1993) and Geczy, Minton, and Schrand (1997) posit that hedging will be useful if the benefits are greater than costs. Hence, larger firms employ derivatives more than smaller firms because they have greater resources for covering the cost of employing the instruments and have a greater access to the exposure-management expertise.

Table 7.3
Cross-tabulation of Firm Size and
The Use of External Techniques

Counts	Two Techniques	Three Techniques or more	Total
Count	25	5	30
% Within Firm Size	83.3%	16.7%	100.0%
% Within The Number of External Techniques Used	80.6%	29.4%	62.5%
% Of Total	52.1%	10.4%	62.5%
Count	6	12	18
% Within Firm Size	33.3%	66.7%	100.0%
% Within The Number of External Techniques Used	19.4%	70.6%	37.5%
% Of Total	12.5%	25.0%	37.5%
Total	31	17	48

The question remains, whether larger firms tend to apply more techniques than smaller firms regardless of the violation of statistical assumption. Table 7.3 is presented to show that most firms (78.69%) in the survey employ more than one external technique at the same time. Among these firms, 37.5 percent are larger firms in which 33.3 percent and 66.7 percent employ two and three or more techniques, respectively. In contrast, the number of smaller firms that employ two and three or more techniques is 25 (83.3%) and 5 (16.7%), respectively. This fact suggests that larger firms tend to utilize a greater number of combinations of external techniques than smaller firms. Hence, the finding of this study is consistent with those of previous studies.

Even though the finding of this present study is apparently consistent with the previous studies, the measurements and/or the method of analysis used are often different due to the difference in either research design or the focus of the study. The Australian study by Batten, Mellor, and Wan (1993) used Chi-Square test for their hypothesis. This is a similar method to this present study. However, the measurer of firm size was foreign exchange turnover while this study uses average annual sales.

Compared with the finding of Batten, Mellor, and Wan (1993), this present study provides better measurement in terms of measuring firm size because foreign exchange turnover can also be used as a measure of the degree of foreign involvement, which is also a variable of firm specific characteristics. Hence, the association within firm-specific factors may influence the weak linkage between firm size and the management-practice variables. However, the study of Batten, et al. (1993) gives a more reliable result because all variables are tested simultaneously.

Nance, Smith, and Smithson (1993) and Geczy, Minton, and Scrand (1997) are amongst previous studies that have a different focus with this study. The difference also causes the difference in the measurement of similar variable. The authors used a regression method to determine variables (including firm size) of hedging in the capital markets while the present study employs non parametric statistics to seek the possible association between firm size and the number of external techniques used. Hence, the measurement of firm size used is also different. The authors used market capitalization whereas the present study uses average annual sales.

The above explanations show that firm size has been extensively investigated as an important variable in hedging. Although there are differences in the measurements and method of analysis in the investigation between firm size and the use of external techniques, it is merely a different approach in the research design.

The above description also shows that firm size apparently has a link with the use of external techniques. It was noted at the beginning (Section 7.2.1), firm size implies economy of scales and larger firms tend to utilize a greater combination of external techniques. It seems plausible to conclude that the larger the size of a firm the greater resources that are available for employing more various techniques in their management of foreign exchange exposure.

7.2.2. Firm Size and Internal Techniques Used

As with external techniques, the resource-based argument of firm size is also applicable for questioning the association between firm size and the internal techniques used by Australian firms. The null hypothesis employed is:

H2: Firm size and the internal techniques used are independent of one another

The internal techniques used in this study are defined as the number of techniques used by Australian firms. Hence, firm is scored one, two, or three depending on the number of techniques used. Table 7.4 presents the test between these two variables.

Table 7.4
Chi-Square Value for Independence of
Firm Size and the Internal Techniques Used

	Value	df	Asymptotic Sig. (2-sided)
Pearson Chi-Square	1.464(a)	3	.691
Likelihood Ratio	1.456	3	.692
Linear-by-Linear Association	1.137	1	.286
N of Valid Cases	61		
a) 3 cells (37.5%) have expected count less than 5. The minimum expected count is .59.			

The above table shows that the Chi-Square value is 1.464, which is far below its critical value of 9.488 ($\alpha = 0.05$; df.4). Hence, the null hypothesis is accepted and therefore there is no association between firm size and the internal techniques used.

The insignificant association is expected for at least two reasons. First, there is a large group of firms (44.3%) in the survey that do not use any of these techniques (Appendix C.25). Second, information obtained directly from the questionnaire reveals that the unavailability of sufficient information technology and skills are major reasons for applying these techniques (Appendix C.18). Unfortunately, there is no further detailed information on current technology used collected in this study.

7.2.3. Firm Size and the Adoption of an Active versus Passive Policy

The previous section (Section 7.2.1) found the tendency of larger firms to employ more external techniques because of the greater resources available for covering the costs of the techniques. Hence, many would argue that the larger the firm size and therefore the greater the availability of resources, the larger the possibility of firm to adopt an active policy.

This section tests and discusses the association between firm size the adoption of either an active or passive policy in foreign exchange exposure management. This is formulated in the following null hypothesis.

H3: Firm size and the adoption of either an active or passive policy are independent of one another

The adoption of either an active or passive policy in this study is measured by the firm's way in covering its exposure. Firms in the survey are classified into passive and scored one when they simply cover all they major exposure. In the case of translation as a major exposure, firms are scored one when they cover all or leave translation exposure uncovered. Firms are classified into active and scored two when they decide to cover or not cover, and partially cover is dependent on their view of the direction of exchange rate movements.

Table 7.5
Chi-Square Test for Independence of
Firm Size and the Adoption of an Active or Passive Policy

	Value	df	Asymptotic Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.208(b)	1	.649		
Continuity Correction(a)	.028	1	.868		
Likelihood Ratio	.210	1	.647		
Fisher's Exact Test				.775	.438
Linear-by-Linear Association	.204	1	.651		
N of Valid Cases	61				
Computed only for a 2x2 table					
b) 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.79.					

Table 7.5 shows the Chi-Square value is 0.0208, which is far below the critical value 3.841 ($\alpha = 0.05$). Therefore, the null hypothesis is accepted: firm size is not associated with the adoption of either an active or passive policy.

Previous studies suggest that larger firms should implement a more active policy in managing their exposure than smaller firms because they are generally risk neutral (Kucemba, 1996). Moreover, as mentioned above, firms with an active policy would have an attitude of covering exposure based on the direction of exchange rate movements. This requires accurate forecasting [Koh, in Klopfenstein (1997, pp. 298-302); Nathan and Hoegh-Krohn (1999)] either sourced internally or externally. If it is conducted internally, there will be substantial costs to be considered. A firm may need to hire an expert in the relevant area and provide a reliable information system that can link internal and external systems. There are also fees to consider when forecasting is sourced from banks or other financial services. Larger firms may have greater ability to cover financial costs than smaller firms.

As mentioned above, the size of the firm in this present study is not associated with the adoption of either an active or passive policy because most firms in the survey adopt passive policy. Table 7.6 presents the precise descriptions on the amount of firms that implement either an active or passive policy.

Table 7.6
Cross-tabulation of Firm Size and Active vs. Passive Policy

Firm Size	Active versus Passive Policy		
	Passive	Active	Total
Smaller Firms	26	17	43
	42.6%	27.9%	70.5%
Bigger Firms	12	6	18
	19.7%	9.8%	29.5%
Total	38	23	61

The above table shows that most firms (70.5%) in the survey with sales up to 50 million dollars, 29.5 percent are the larger firms. Within the smaller firms group, 60.5 percent adopt a passive policy but there is also a large percentage (66.7%) within larger firms group that adopt a passive policy. Hence, the pattern between firm size and the adoption of either active or passive policy is difficult to explain because both categories adopt a passive policy. Therefore, firm size does not correlate with both policies.

7.2.4. Firm Size and the Degree of Centralization

The degree of centralization is also another management policy variable that is tested to seek its correlation with firm size. The hypothesis of this test is:

H4: Firm size and the degree of centralization are independent of one another

The degree of centralization is measured in three categories, lower, higher, and decentralized based upon the extent of head office approval towards foreign transactions, borrowing or lending, and entering into the foreign exchange market for hedging. Table 7.7 presents the result of this test.

Table 7.7
Chi-Square Test for Independence of
Firm Size and the Degree of Centralization

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.262(a)	2	.532
Likelihood Ratio	1.333	2	.514
Linear-by-Linear Association	1.060	1	.303
N of Valid Cases	61		
a) 2 cells (33.3%) have expected count less than 5. The minimum expected count is 4.13.			

The above table shows that the Chi-Square Value of this test is 1.262, which is below the critical value of 5.991 ($\alpha = 0.05$). Therefore, the null hypothesis is accepted and firm size is not associated with the degree of centralization.

This finding is consistent with the Australian study by Batten, Mellor, and Wan (1993). However, it contradicts to the early study of Robin and Stobaugh (1976). The authors found that US firms moves from centralized into decentralized approach. This is explained by introducing the three stages of organizational development as a firm grows.

7.3. The Degree of Foreign Involvement (DFI) and the Management Practice Variables

Section 7.2 shows that the use of external technique is the only variable that appears to be associated with firm size. This section presents the result and discussion of the association between the degree of foreign involvement and the management policy and practice variables. The discussion begins with the analysis of the management policy and practice variables that have a significant association with the degree of foreign involvement. It is then followed by the discussion of insignificant association between the two variables investigated.

The degree of foreign involvement (DFI) here is defined as the ratio of the firm's foreign to total operation and measured by the ratio of foreign-to-total sales and/or purchases. Two scales of measurement are used, lower and higher degree.

Firms in the survey categorized as having a higher degree (Scored two) are those with foreign-to-total sales greater than 15 percent and/or foreign to total sales greater than 30 percent.

7.3.1. The DFI and The adoption of Active versus Passive Policy

Previous studies by Errunza (1994), Jorion (1990), He and Ng (1997) shows that foreign exchange exposure of a firm is associated with the degree of foreign involvement. Hence, the firm is more exposed to the adverse effect of exchange rates. Hence, it is expected the firm will be more active in managing their foreign exchange exposure. It is, therefore, logical to question the relationship between the degree of foreign involvement and the adoption of either an active or passive policy on Australian firms. This question is formalized into the following null hypothesis.

H5: The degree of foreign involvement and the adoption of an active or passive policy are independent of one another

Table 7.8
The Chi-Square Value for Independence of
The Degree of Foreign Involvement and The active vs. Passive Policy

	Value	df	Asymptotic Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.985(b)	1	.005		
Continuity Correction(a)	6.491	1	.011		
Likelihood Ratio	7.940	1	.005		
Fisher's Exact Test				.006	.006
Linear-by-Linear Association	7.854	1	.005		
N of Valid Cases	61				
a) Computed only for a 2x2 table					
b) 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.92.					

The above table (7.8) shows that the Chi-Square value is 7.985, which is above its critical value of 3.841 ($\alpha = 0.05$; df.1). Therefore, the null hypothesis is

rejected and a significant association between the degree of foreign involvement and the adoption of either an active or passive policy is confirmed.

The linkage between the DFI and the adoption of an active or passive policy can be explained by reviewing the meaning of the degree of foreign involvement and its linkage to foreign exchange rate risk management.

The degree of foreign involvement defined in this study is derived from the economic perspective concerning the characteristics of a firm: whether it is engaged in domestic or multinational business [Fatemi (1988); Lee and Kwok (1988)]. Since firms selected in this study have exports and/or imports, the degree of foreign involvement means the ratio of foreign sales and/or purchases to total. The ratio can also be used as a proxy to measure the size of firm's exposure (Makar and Huffman, 1997). A firm with the greater ratio of foreign-to-total will be more exposed to foreign exchange rate risk because the riskiness of its cash flows due to the significant amounts of transactions denominated in foreign currencies. Collier and Davis (1985) found that the choice of whether to adopt an active or a passive strategy is associated with the riskiness of currency cash flows. The authors argue that firms would adopt a passive policy when currency risk was high and adopt an active policy when the risk is low.

Although the choice of adopting either a passive or an active approach is merely a management style that has no connection with the riskiness of cash flows [McNew, in Klopfenstein, 1997, p.279)]. A possible reason for adopting a passive policy when risk is high is based upon the arguments derived from the utility theory. This theory suggests that risk aversion would occur when significant wealth was at stake (Bodie, Kane, and Marcus, 1999, pp.173-177). Hence, decision makers in the foreign exchange exposure management would adopt either a passive or an active policy depending on the riskiness of cash flows.

7.3.2. The DFI and the Degree of Centralization

The previous section (7.3.1) found that the adoption of either an active or passive policy is associated with the degree of foreign involvement. A more active policy requires an accurate forecast of exchange rates and a precise picture of the overall exposed positions of a consolidated group because it involves the firm's

consideration of how much risk is willing to be accepted (Wallace, 1998). Head office is the appropriate place to have the overall picture of exposures. To quote Ankron (1978), “Central control and direction of foreign exchange are prerequisites if there is to be a rational, consistent approach to controlling exposure for the consolidated group”. Hence, it is plausible to question the direct linkage between the degree of foreign involvement and the degree of centralization. This question is formulated in the following null hypothesis.

H6: The degree of foreign involvement and the degree of centralization are independent of one another

Table 7.9
Chi-Square Value for Independence of
The DFI and the Degree of Centralization

	Value	df	Asymptotic Sig. (2-sided)
Pearson Chi-Square	5.194(a)	2	.074
Likelihood Ratio	5.137	2	.077
Linear-by-Linear Association	1.052	1	.305
N of Valid Cases	61		
a) 1 cell (16.7%) has expected count less than 5. The minimum expected count is 4.82.			

The test reveals that null hypothesis is accepted since the Chi-square value is below its critical value ($\alpha = 0.05$; df. 2) and therefore there is no significant association between the degree of centralization and the use of external techniques (Table 7.9).

This finding is inconsistent with the early studies of Collier and Davis (1985), Collier, Davis, Coates, and Longden (1990), and Davis, Coates and Longden (1991). As noted above, the higher the degree of foreign involvement, the more exposed firms are to foreign exchange rate risk. According to these studies, when the risk is high the responsibility of managing foreign exchange exposure is more likely to be retained at the corporate level rather than delegated to the lower level of management

because the overall firms exposure can be seen comprehensively at the upper level of management.

The possible reasons for the insignificant association is, firstly, the existence of a cell in the two- way table of the DFI and the degree of centralization that have expected count less than five. Secondly, the two-way table of the DFI and the degree of centralization shows that 35 percent of firms in the survey have a lower degree of foreign involvement (Appendix C.28.). Hence, the result of this study is apparently inconsistent with the previous studies because there is a large group of firms with a lower degree of both foreign involvement and centralization.

7.3.3. The DFI and External techniques Used

Besides the implementation of policies, this study also seeks to uncover the association between the degree of foreign involvement and the external techniques used by Australian firms. This question is formulated in the following null hypothesis.

H7: The degree of foreign involvement and the number of external techniques used are independent of one another

Table 7.10
Chi-Square Value for independence of
The DFI and the External Techniques Used

	Value	df	Asymptotic Sig. (2-sided)
Pearson Chi-Square	7.128(a)	3	.068
Likelihood Ratio	7.416	3	.060
Linear-by-Linear Association	6.560	1	.010
N of Valid Cases	61		
a) 3 cells (37.5%) have expected count less than 5. The minimum expected count is .34.			

Table 7.10 shows that the external techniques used are apparently not associated with the degree of foreign involvement because the Chi-Square value is below its critical value of 7.815 ($\alpha = 0.05$; df. 3). When this association is tested at a higher level of significance (10%), the Chi-Square value is above its critical value (6.251). Unfortunately, the result violates the assumption that requires no cells have an expected count of less than five. Hence, the result is unreliable.

This finding is inconsistent with the previous studies [among others, Block and Gallagher (1986); Nance, Smith, and Smithson (1993); Jesswein, Kwok, and Folks Jr. (1995)]. Firms with a high degree of foreign involvement can be thought of as having well diversified cash flows (Eiteman, 1998, p.439). Hence, these firms may have a better access to obtaining capital from foreign sources. As a result, they should hedge more and use a variety of external techniques because foreign debts create an exposure for the firms [Block and Gallagher (1986); Nance, Smith, and Smithson (1993)]. These studies suggest that there should be an intervening variable, that is, debt ratio, to explain the association between the degree of foreign involvement and the use of external techniques. However, there is no further detailed information collected on the firms' debt ratio in this study.

One possible reason, which can be derived directly from the questionnaire with respect to the insignificant association in this present study, is the existence of a large group of firms that do not utilize any techniques or utilize three or more techniques (Appendix C.22). These firms are those with lower degree of foreign involvement and they might consider that protecting their foreign exchange exposure does not bring any benefits. Although there is a possibility to select respondents with no external techniques used, a significant result would be difficult to achieve since there are firms with three techniques used under the expected count required to use this type of analysis. Therefore, the association between the degree of foreign involvement and the use of external techniques is not significant.

7.3.4. The DFI and the Internal Techniques Used

In the same way as dealing with external techniques, this study also hypothesizes that there would be an association between the degree of foreign involvement and the use of internal techniques. Although Internal techniques are

used mostly to ensure the effectiveness of liquidity and working capital management, and the simplification of daily transaction processing [Rafuse (1996); Field (2003)], they are also used by a firm to reduce the amount exposed to foreign exchange rate risk, not the exposure [Borenstein, in Antl, (1989, pp. 231-235)]. Netting for instance is utilized to offset debts against claims that are denominated in foreign currencies. Hence, these techniques are more effective for a firm to reduce the amount exposed rather than hedging the foreign debt and claims separately. It is therefore expected that the two variables are associated. This is expressed in the following null hypothesis.

H8: The degree of foreign involvement and the number of internal techniques used are independent of one another

However, table 7.11 shows that the null hypothesis is accepted because the Chi-Square value of the test is below its critical value ($\alpha = 0.05$; df. 3) and obviously, there is no significant association between the degree of foreign involvement and the use of internal techniques.

Table 7.11
The Chi-Square Value for Independence of
The DFI and the Internal Techniques Used

	Value	df	Asymptotic Sig. (2-sided)
Pearson Chi-Square	1.405(a)	3	.704
Likelihood Ratio	1.412	3	.703
Linear-by-Linear Association	.072	1	.789
N of Valid Cases	61		
a) 3 cells (37.5%) have expected count less than 5. The minimum expected count is .69.			

Two possible reasons are apparently responsible for the insignificant association. First, there are cells with the expected count of less than five in the two-way table (Appendix C.21). Second, there are a few firms do not use the techniques (Appendix B.33.).

The second reason is considered the most important factor because the implementation of the internal techniques requires sufficient information technology in the cash management system (Hansen, 2004). The description of corporate practices in chapter six has revealed that information technology and the availability of sufficient skills are two amongst the critical factors in applying the techniques (Appendix B.34.).

7.4. Ownership and the Management Practice Variables

This section is divided into four separate sub-sections. Each section presents and discusses the result of the test between ownership and each management practice variables including the adoption of either an active or passive policy, the degree of centralization and the use of internal techniques, and the use of external techniques. The presentation and discussion begins with the association between ownership and each management policy and practice variables. Ownership in this study is defined as whether a firm is either Australian (Scored 1) or Foreign- owned (scored 2).

7.4.1. Ownership and the Degree of Centralization

The Ownership may impose the type of control in the organization [Jaeger (1983); Demirag (1994)]. This is very importance for this study because a large group of the surveyed firms (62.3%) is foreign-owned (Appendix B.2.). These firms are an investment of a parent company located in a foreign country. The investment may have greater uncertainty because they are located in a different economic entity in which financial as well as organizational problems may occur. In order to reduce the uncertainties and to achieve the goals prescribed by the parent company, a central control is often needed.

The above situation may occur in a particular area of management: managing foreign exchange exposure. It is logical to question the association between the ownership of Australian firms in the survey and the degree of centralization in their exposure management. The null hypothesis is:

H9: The ownership and the degree of centralization are independent of one another

Table 7.12 below shows that the Chi-Square value is 7.365, which is above its critical value (5.991; $\alpha = 0.05$; df.2). Therefore, the null hypothesis is rejected and there is a significant association between ownership and the degree of centralization. This finding is consistent with the study by Batten, Mellor, and Wan (1993) in which the Australian-own firms were found to have a greater autonomy than those that were foreign-owned.

Table 7.12
Chi-Square Value for Independence of
Ownership and the Degree of Centralization

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.365(a)	2	.025
Likelihood Ratio	7.428	2	.024
Linear-by-Linear Association	1.474	1	.225
N of Valid Cases	61		
a) 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.28.			

Table 7.13
Cross Tabulation of
Ownership and the Degree of Centralization

		The Degree of Centralization			Total
		Lower Degree	Higher Degree	Decentralized	
Foreign-Owned	Count	8	24	6	38
	% Of Total	13.1%	39.3%	9.8%	62.3%
Australian-owned	Count	6	7	10	23
	% Of Total	9.8%	11.5%	16.4%	37.7%
Total	Count	14	31	16	61
	% Of Total	23.0%	50.8%	26.2%	100.0%

In this study, the greater autonomy is reflected by the power of the Australian firms to conduct foreign transactions, foreign borrowing, and to enter into the foreign exchange markets for hedging purposes. Table 7.13 above shows that Australian-owned firms have a lower degree of centralization and are more highly decentralized than Foreign-owned firms. A few Australian firms (26.2%) can make foreign business transactions, borrow or lend funds, and enter into the foreign exchange markets in its own name or under general guidelines from head office, or without head office approval (decentralized). In contrast, a large group of firms (39.3%) with foreign ownership are highly centralized, and only 9.8 percent of these compared with 16.4 percent of Australian-owned firms are decentralized. This fact suggests that foreign-owned firms tend to implement a higher degree of centralization.

There are at least two potential reasons for foreign-owned firms to implement a higher centralized policy. First, there is an existence of conflicts within the firms due to operating in a different economic entity, diverse nationalities of employees, and other factors that may threaten the achievement of the overall total corporate goals [Toyne and Kuhne (1983); Boseman and Phatak (1984)]. From the corporation level, foreign-owned firms operating in foreign countries are mainly subsidiaries and seen as part of a portfolio of investments. The existence of those factors may cause operational difficulties, such as, problems of communication, attitudes, and goals that are carried out by managers with different cultural backgrounds (Ghoshal and Bartlett, 1990).

The problems may also occur with decisions on foreign exchange exposure management. A manager hired locally from a country in which the subsidiary operates, may have different perspectives to those employed from the country in which head office plans and controls its business. In obtaining foreign debt for instance, the former may consider obtaining funds as cheaply as possible from any foreign exchange markets. In contrast, to obtain a cheaper rate, the later may use extensive consultations with the head office to determine a currency of foreign debt that does not increase the overall corporate exposure.

Among others, Egelhoff (1984) and Boyacigiller, (1990) have confirmed this evidence in the context of management in general. Egelhoff (1984), in his study of US and UK multinationals, found that managers hired locally communicate less and often act incongruently with the parent company's interests than those with the same

nationality as the parent company. Hence, in an effort to reduce conflicts and to ensure the achievement of corporate objectives of foreign exchange exposure management, firms implement a greater centralized policy.

Second, in an effort to guarantee continuous improvement and the achievement of goals, the culture of the parent company has often been transferred into the subsidiaries in the form of control [Jaeger (1983); Martinez and Ricks, 1989)]. Jaeger (1983) for instance found that foreign subsidiaries are managed in line with the culture of the parent company. It seems reasonable that the management of foreign exchange exposure may follow that pattern.

7.4.2. Ownership and the Adoption of Active vs. Passive Policy

As with the previous section (7.4.1), whether an active or passive policy adopted by Australian firms is a decision in which ownership may play a role. This study therefore, also questions the association between ownership and the active or passive policies adopted by Australian firms. This is operationalized in the following null hypothesis.

***H10: The ownership and the adoption of an active or passive policy
are independent of one another***

Table 7.14 below presents the test of the hypothesis. The Chi-Square value is 0.524, which is far below its critical value (3.841; $\alpha = 0.05$; df. 1) and therefore the association between the two variables is insignificant.

The two-way table between the two variables reveals that both foreign and Australian-owned firms adopt a passive policy in their exposure management (Appendix C.31.). From 61 Australian firms in the survey, 62.3 percent are foreign-owned and 37.7 percent are Australian-owned. Among firms owned by foreign nationalities the passive policy is preferred (65.8%) to an active policy. This also holds for the Australian-owned firms within which 56.5 percent adopt a passive policy. This means that the Australian firms, regardless of its ownership, attempts to cover all underlying exposures rather than taking a view to cover or not depending on the direction of the exchange rate movements.

Table 7.14
Chi-Square Test for Independence of
Ownership and the Adoption of an Active vs. Passive Policy

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.524(b)	1	.469		
Continuity Correction(a)	.204	1	.652		
Likelihood Ratio	.521	1	.470		
Fisher's Exact Test				.587	.325
Linear-by-Linear Association	.515	1	.473		
N of Valid Cases	61				
a) Computed only for a 2x2 table					
b) 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.67.					

This finding is apparently inconsistent with the previous studies because either an active or passive policy is a management style [McNew, in Klopfesnstein (1997, p.279)] that may vary in accordance with ownership (Jaeger 1983). However, the result of this study is still in line with the previous studies in the sense that the adoption of either an active or passive policy is not determined by the ownership but the extent to which firms are exposed to foreign exchange rate risk [Collier and Davis, (1985); Collier, Davis, Coates, and Longden (1990); Davis, Coates, and Longden (1991); Kucemba (1996)] that has been tested in the previous section (7.3.1.).

7.4.3. Ownership and the Use of Internal Techniques

The use of internal techniques is principally an implementation policy in foreign exchange exposure management. The previous section (7.3.1; 7.3.2.) investigated the association of ownership and the policies. To question the association between ownership and the use of internal techniques is the next relevant question in this study, which is formalized in the following null hypothesis.

H11: The ownership and the number of internal techniques used are independent of one another

Table 7.15 below presents the result of the test. The Chi-Square value is below its critical value (7.815; $\alpha = 0.05$; df.3) and therefore the null hypothesis is accepted. This finding suggests that there is no significant association between ownership and internal techniques.

Table 7.15
The Chi-Square Test for Independence of
Ownership and Internal Techniques Used

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.392(a)	3	.942
Likelihood Ratio	.389	3	.943
Linear-by-Linear Association	.053	1	.817
N of Valid Cases	61		
a) 3 cells (37.5%) have expected count less than 5. The minimum expected count is .75.			

The insignificant association between the two variables, as mentioned above, is because these techniques are often used in the cash management system to reduce the amount exposed to foreign exchange rate risk [Borenstein, in Antl, (1989, pp.231-236)]. Hence, it seems reasonable that factors, such as, information technology, costs, and the availability of sufficient skills, are the most critical factors in applying these techniques rather than ownership.

7.4.4. Ownership and External Techniques Used

In the same way this study looking at internal techniques, it also seeks to find the potential association between the use of external techniques and ownership. The Australian Study by Teoh and Er (1988) found that ownership is the only significant variable at 5 percent in influencing the time devoted to manage foreign exchange

exposure management. A more recent Australian study by Batten, Mellor, and Wan (1993) also found that the most popular products used are spot and forward cover. Hence, it is expected that firms with foreign ownership have a more comprehensive understanding of using variety of external techniques than Australian-owned firms. The potential association is formulated in the following hypothesis.

H12: The ownership and the number of external techniques used are independent of one another

The test of the association between the two variables is presented in table 7.16. The Chi-Square value of this association is 1.805, which is far below its critical value (7.515; $\alpha = 0.05$; df.3) and therefore, there is no significant association between the two variables.

Table 7.16
The Chi-Square Test for Independence of
Ownership and Internal Techniques Used

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.805(a)	3	.614
Likelihood Ratio	2.106	3	.551
Linear-by-Linear Association	.163	1	.686
N of Valid Cases	61		
a) 3 cells (37.5%) have expected count less than 5. The minimum expected count is .38.			

This finding is consistent with the previous studies because the use of external techniques, such as forward contract, currency swaps, options, and other derivatives, are not associated with the ownership but the availability of resources for a firm to cover the costs [Nance, Smith, and Smithson (1993); Batten, Mellor, and Wan (1993); and Geczy, Minton and Schrand (1997)] and the degree of foreign involvement or the extent of firm is exposed to foreign exchange rate risk [Jesswein, Kwok, and Folks Jr. (1995); Makar and Huffman (1998)].

7.5. The Degree of Centralization and The adoption of Active vs. Passive Policy

Previous studies by Collier and Davis (1985) and Collier, Davis, Coates and Longden (1990; 1992) found that there was a tendency to centralize foreign exchange exposure management in UK and US multinationals when an active policy was adopted. This evidence suggests that an active approach requires precise forecasting and accurate cash management systems, so that the net exposure that has to be hedged is known precisely. This can be done through centralization in foreign exchange exposure management (Ankrom, 1974). It is, therefore, relevant to seek the association between the two management practice variables in Australian firms. This is expressed in the following hypothesis.

H13: The degree of centralization and the use of external techniques are independent of one another

Table 7.17
Chi-Square Test for Independence of
The Degree of Centralization and The adoption of an Active/Passive Policy

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.552(a)	2	.014
Likelihood Ratio	9.151	2	.010
Linear-by-Linear Association	8.411	1	.004
N of Valid Cases	61		
a) 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.28.			

Table 7.17 shows that the Chi-Square value is 8.552, which is above its critical value (5.991; $\alpha = 0.05$; df.2) and therefore the null hypothesis is rejected. This means there is a significant association between the two variables and this is consistent with the previous studies [Collier and Davis (1985); Collier, Davis, Coates and Longden (1990; 1992)].

However, it is apparently that Australian firms are more likely to adopt a passive policy even though they implement a higher degree of centralization (Appendix C.35.) This was not expected to occur because these firms (84.2%) are mostly foreign-owned and might be expected to centralize their exposure management for the purpose of implementing an active policy.

One possible reason is that factors like the willingness of the firms to accept risk (Kucemba, 1996) and the conservative attitude amongst Australian firms may influence the decision to adopt an active policy. For example, the objectives of foreign exchange exposure management among the surveyed firms are: “covering all exposures whenever possible” (24.6%), “my company is not in the business of foreign exchange” (24.6%), and “avoid surprises” (29.5%). This evidence suggests that most Australian firms (78.7%) have a conservative attitude in managing foreign exchange exposure (Appendix B.19). With respect to the firms’ willingness to accept risk, there is insufficient information collected to categorize firms into risk avoidance, risk neutral, and risk seekers.

7.6. Summary

This chapter has tested the potential association between selected firm-specific-characteristic variables and the management policy and practice variables of the Australian firms. Three firm-specific factors included in this analysis are firm size, the degree of foreign involvement, and ownership. Four management policy and practice variables include the adoption of either an active or passive policy, the degree of centralization, internal and external techniques were used. Previous studies suggested that there is a potential association between the degree of centralization and the adoption of either an active or passive policy. Therefore, this chapter tested the association of the two variables.

Among the management practice variables, the use of external techniques, which include spot and forward cover, currency swaps, options, FRAs, and other interest based options, such as, caps, collars, and floors, is the only variable that has a significant association with firm size. Although, there is no conclusive result, it appears that larger firms use more varied techniques than smaller firms because firm

size implies greater resources available in the firm to cover the costs and to have a greater access to expertise to utilize the techniques.

The test between the degree of foreign involvement and the management practice variables shows that the adoption of either an active or passive policy is the only significant variable amongst the management practice variables. This is not surprising because a higher degree of foreign involvement means a greater possibility of the firm being exposed to foreign exchange rate risk. It appears from the analysis that firms apparently prefer to adopt a passive policy because of the possibility of losses may be greater when exposures are partially or not covered, based merely on the prediction of the direction of exchange rate movements.

The use of external techniques is another management practice variable that is tested with the degree of foreign involvement. The result shows that there is no significant association between the two variables at the level of significance 5 percent. When the association is tested at $\alpha = 0.1$, the association appears significant. However, there are cells in the table that have an expected count of less than five and therefore it is unreliable to conclude that there is an association between the two variables.

The degree of centralization is the only variable that has a significant association with ownership. It appears that foreign-owned firms need head office approval for foreign borrowing or lending of funds, conducting business involving foreign currencies, and entering into the foreign exchange markets for hedging purposes. The higher control imposed by foreign-owned firms might be caused by the concern of the parent company to ensure the achievements of total corporate goals and to reduce the costs associated with the conflicts resulting from diverse nationalities of employees, communication, and other difficulties.

Finally, there is a significant association between the degree of centralization and the adoption of either an active or passive policy. The result was expected to occur because some previous studies have detected the possibility of this association in spite of no significant statistical backup for proof. Although this study provides a better result than previous studies because the association is significant at 5 percent, it has shown apparently a reverse direction prescribed by previous studies. The degree of centralization is often implemented when a firm adopts an active policy. However, it has been found here that Australian firms tend to adopt a passive policy

even though a higher degree of centralization is implemented. The dominance of the passive policy adopted by most Australian firms in the survey is, perhaps, the primary cause of ineffective policy.

This chapter has accomplished to test the association between firm-specific characteristics and four management practice variables. The results of this test are expected to complement the previous chapters of analysis in the sense that there are firm-specific variables contributed to use and its effectiveness of practices on foreign exchange exposure management.

However, it needs to look at the limitations of this study so that this result will not overstate the descriptions and the effectiveness of current practices on foreign exchange exposure. The next chapter therefore summarizes the overall steps of this thesis and outlines the limitations that are useful for future research.

CHAPTER 8

CONCLUSION

Summary of Study

The objective of this thesis is to describe current Australian firms' practices on foreign exchange exposure management due to an increase in the volatility of exchange rate as a result of globalization. In particular, this study focuses on the characteristics, styles, and effectiveness of foreign exchange exposure management. This includes foreign exchange exposure identification, policies, and techniques used in foreign exchange exposure management. Throughout this study, responses to a particular important question are cross tabulated against the other responses to provide reasonable explanations. The effectiveness of Australian firms' practices is assessed by proving the relevant literatures on foreign exchange identification, policies, and techniques used. This comparison however, may intertwine within or between each issue investigated. The analysis goes further by constructing the hypotheses to seek the possible association between form-specific characteristics and four management practice variables, including the adoption either an active or passive policy, the degree of centralization, the use of internal and external techniques.

In this chapter, the task of this thesis and empirical findings in the previous chapters are summarized. The limitations of this study are also discussed in order to give the direction for future research in the area of foreign exchange exposure management practices.

The tasks of this thesis are divided into eight chapters. Chapter one was meant to introduce this thesis. This includes the discussion of the adverse consequences of exchange rate movements as a real threat to the firm's survival due to an increase in the global dealings and therefore the foreign exchange exposure. As explained above, the focus of study was also discussed. Concentrating at the effectiveness of foreign exchange exposure management is due to its urgency by looking at the facts that recent corporate crises are caused by inadequate corporate governance.

Chapter two reviews the importance and the necessity of foreign exchange exposure management within the theories of risk management and corporate governance in which this thesis is based. This is seen from its effect on the value of a firm and the corporate governance process that can be outlined in the following explanation.

It has been a model for firms; at least in the Anglo-American countries; an increase in shareholders' wealth is the goal of management. Hence, the objective of foreign exchange exposure management has to be an integral part of the management goal. The objective of foreign exchange exposure management has to be directed to reduce the amount of potential losses and therefore to increase the value of a firm through the reduction in taxes, probability of financial distress costs, and the improvement of investment decisions and the ability to raise capital. An effective foreign exchange exposure management may assure the achievement of the goal.

In the modern corporate finance however, the achievement of the goal can extend beyond the direct impact on the reduction in taxes, the improvement of investment decisions and the ability to raise capital. The reduction of cash flows variability is necessary when a firm with foreign subsidiaries has to prepare a consolidated financial statement. Investors, creditors, and other external users may see the volatility of reported net income in the consolidated financial statement as having inadequate protection for adverse consequences of exchange rate risk.

The complexity of accounting regulations with which the firms have to comply may confuse the firm's decisions in foreign exchange exposure management. The consistency of translation methods used for preparing the consolidated financial statements has to be maintained for internal and external purposes. Gains and losses as a result of the translation have to be reported in the financial statement for the disclosure purposes. The gains and losses of using instruments for hedging foreign exchange exposure have to be recognized in the financial statements. A failure to consider such regulations in foreign exchange exposure management program would result a perception of inadequate corporate governance by banks, investors, regulators, and other external users. This creates the difficulty in achieving the goal.

Besides the regulations the necessity of foreign exchange exposure management is also driven by the society in general. As mentioned above, inadequate protection from the adverse effect of foreign exchange exposure may

increase the expected costs of financial distress. Suppliers may be reluctant to deal with a distress firm because of their perception that the distress firm will be difficult to meet the quality or quantity of products as written in the contract. Customers may not also deal with the distress firm because the firm will not fulfill the after-sales-service agreement.

Pressure from societies in general has yet another dimension for firms to manage their foreign exchange exposure. Societies expect the survival of the firm in order to carry their social responsibilities such as, providing jobs, protecting environment, and paying tax. Hence, a firm has to protect themselves from any risks threatening its survival in order to carry their social responsibilities. There has been extensive evidence on the firm's social and financial performance. A firm that carries social responsibilities might improve its relationships with creditors, investors, and government officials. Hence, establishing an effective foreign exchange exposure management can also be translated into the economic benefit for a firm as well as its shareholders.

An effective foreign exchange exposure management should then be clarified, which is in chapter three. This chapter is crucial to comprehend both, the issues investigated in this study and the discussion of analyses. Therefore, the aspects and elements of foreign exchange exposure were discussed and organized into steps. The following explanations are the brief picture of chapter three.

At the beginning of this chapter the identification aspects and elements are discussed because it is the first and critical step that has to be addressed in an effective foreign exchange exposure management program. There are various types of foreign exchange exposures in the identification process of foreign exchange exposure management. Since it is the focus of this study to evaluate whether or not all underlying exposures have been properly identified, it is crucial to understand what types, sources, and methods of identification used in this study.

The types of foreign exchange exposure used in this study are translation, transaction, and economic exposures. However, there has been a dispute among the academics regarding what types of exposures should be managed. It is therefore important to look into their arguments to show how the different of exposure types fall into the three types used in this study.

According to the economists, translation exposure is merely a conversion of financial statement items from foreign into the home currency of a parent company. Hence, there are no cash consequences and therefore it is not real exposure. The real exposures are those with cash consequences, transaction and economic. This is known as cash flow approach.

According to the accountants, translation exposure is not a conversion because the term conversion means simply an exchange of one currency for another without a purpose. The term translation means there are purposes of translation such as, preparing a consolidated financial statement, which is useful for investors, creditors and other external users, and measuring subsidiaries performance. Exchange gains and losses resulting from the translation may influence investors' or creditors' decisions. Hence it has to be managed.

The controversy however, looked at the types of foreign exchange exposure partially. In fact, these types of exposures confront firms together. A subsidiary of a foreign company may face economic exposure even though its products have not been contracted because of the likelihood of transactions based on its historical patterns. An appreciation of domestic currency against the currency of the product destination may reduce the products competitiveness. This exposure migrates to transaction exposure when it is contracted and settled. When the time to be reported to the parent company it moves to translation exposure. This study therefore, uses the three types of exposure in the identification process. The purpose of the translation, the sources and methods used for each type of exposure are incorporated into the investigation of foreign exchange identifications.

Besides the foreign exchange exposure identification, the policy is the next aspect to be investigated because an effective foreign exchange exposure management should address all aspects, including the objectives, accountability and responsibility. It is a blue print in foreign exchange exposure management. However, it is considered difficult to address all aspects within the time constraint. This study therefore, looks into the major policies, in particular, the major objectives, style of policy used and the responsibility in foreign exchange exposure management. These are included in the review because they relate in to the first and second objectives. The following is the brief descriptions of the issue and the reviews needed.

Part of the important aspects of major objectives of foreign exchange exposure management is to look into the attitude of a firm whether or not some speculations are permitted. However, there is no clear cut between hedging and speculation. This study therefore, provides a list of possible answers that may cover both sides.

In order to cover both the conservative and aggressive attitude of the objectives, review on previous studies discussing major objectives of foreign exchange exposure management is needed. Some studies have listed several major objectives while the others in the form of statement. Since there is no uniformity of major objectives found in the previous studies, the possible answers that cover conservative as well as aggressive attitudes are combined.

As mentioned above, the styles of policy addressed in this study refer to whether firms in the survey adopt a passive or an active policy. Based on review of previous studies, a passive policy is the one prescribes its manager or the person responsible for managing day-to-day foreign exchange exposure to cover all foreign exchange exposures. In the case of translation exposure, this policy allows to leave this exposure uncovered. An active policy means managers are allowed to cover all or partially cover depending on the likely direction of future exchange rate. In other words, a firm that adopts this policy is prepared to open position to a degree in the spot transactions.

The importance of addressing these styles is that it determines the manner of foreign exchange exposure being managed. A firm may allow its manager to hedge all underlying exposures, in the forward market for instance, without considering the likely direction of future exchange rate. In contrast, a passive policy may cover a certain percentage of the underlying exposure based on the likelihood of future exchange rate movements.

In order to evaluate which type of policy is more appropriate, the advantages and disadvantages, forecasting policy, and firm-specific factors included in the review because they relate to the first and second objective. In relation to first objective, this review is useful to evaluate whether or not the policy adopted by firms in the survey is effective. As described above, an active policy requires sufficient forecasting to hedge a certain percentage of particular exposure. Hence, the availability, sources, forms of presentation, and concentration of currency of forecast

are also investigated in this study. In relation to the second objective, the adoption of either an active or passive policy is one of foreign exchange exposure management policy variables. Hence, the review assists to define this variable.

The last but not least, the degree of centralization is a policy investigated in this study. It relates to the responsibility aspect of policy in foreign exchange exposure management. The reviews included in this discussion are: the controversy of centralization versus decentralization in the organizational structure and foreign exchange exposure management, their advantages and disadvantages.

The debate of centralized and decentralized approach in the organizational structure has long been recognized. At the beginning, when a firm has a single product and is relatively small, centralized approach reflects an effective organizational structure. However, the proponent of decentralized approach argue that firms can no longer be managed by a single person because of a huge amount of works should be done as a firm grows.

The controversy is also applicable in a particular function, foreign exchange exposure management. The proponents of decentralized approach argue that when a firm has subsidiaries or branches in foreign countries, managing exposure should be done at the subsidiary level because they have more knowledge about the economic environment where they operate. In contrast, the proponents of centralized approach (known as normative model) argue that it is more effective and efficient to hedge at the top level (at headquarter) because the data of exposed positions of the overall subsidiaries can be clearly seen from the top. Moreover, there is a possibility to net out one and another exposed position before hedging is performed. Hence, it reduces the costs of hedging. More and more arguments point towards centralization in foreign exchange exposure management.

The above reviews are needed because it relates to first and second objectives of this study. In relation to the first objective, it helps, firstly, to compare the magnitude of autonomy between domestic and foreign-owned firms in the survey, secondly, to evaluate whether the degree of centralization among firms in the survey is congruent with the adoption of either an active or passive policy in the framework of an effective foreign exchange exposure management. Based on the review, an active policy requires a more centralized approach because it involves a greater risk to bear than the passive one.

In relation to the second objective, the review assists to define the degree of centralization, which is one of foreign exchange exposure management policy variables. Even though centralization has been known as the most appropriate approach in foreign exchange exposure management, it has so many variants. There are some decisions that are decided at headquarter but executed at the lower level. In some cases headquarter only provides general guidance but leave the decisions on the subsidiary level. Hence, centralization represents the degree to which some decisions should be retained at the top or devolved at the lower level of management. In this study the degree of centralization is applied on three major decisions that include conducting business transactions involving foreign currencies, borrowing or lending funds, and entering foreign exchange market for hedging purposes.

Besides policy, the third chapter includes the review of techniques used in foreign exchange exposure management. Two broad classifications of techniques used in this study, internal and external. Internal techniques refer to those used within the firm. The techniques considered in this study is netting, multi-currency billing, matching, leading and lagging, inter-firm foreign exchange contract, and price considerations. External techniques included in this study are spot cover, forward cover, currency futures, swaps and options. The review of external techniques is also accompanied by empirical evidence on the influence of firm-specific characteristics on the external techniques used.

The above review is relevant to the first and second objective. In relation to the first objective, the number of internal and external techniques is evaluated in accordance with the policy. For example, the more techniques use the greater the centralized approach is needed. The number of external techniques is assessed in terms of either an active or passive policy adopted by majority of firms in the survey. The variety of external techniques used requires an active policy rather than passive one. A passive policy may need to cover exposures by simply entering into the forward contract for hedging. In relation to the second objective, testing the association between firm-specific characteristics and the number of internal and external techniques used, the reviews assist to understanding the role of firm specific-characteristics.

In order to be effective in the investigations the corporate practices described above, a chapter of method was constructed. This chapter deals with the data

collection and methods of data analysis. Data is gathered from the Dun and Bradstreet (D & B) database. Firms that are selected to be a sample of study, are Australian firms based in New South Wales. These firms are then selected based on both, average annual sales or revenues equal with or above ten million dollars (AUD) and their significance of exposure. From 299 firms that meet the criteria, only 20.4 % was ready to participate in this survey.

Data is collected through the distribution of the questionnaire that is designed for checklist response and divided into four sections in accordance with the issues investigated. These sections include 36 questions of firm characteristics, identification aspects, policies, and techniques used. Pilot study was also undertaken to assure validity and reliability of the instruments used before the primary survey.

The data was analyzed using the descriptive analysis for the first objective and Chi-square test for independence for testing the hypothesis of association between firm specific factors and four management practice variables. The next remaining three chapters contain the analysis, and the important findings are highlighted under several heading based upon issues investigated.

The Effectiveness of Corporate Practices

The summary of the description and effectiveness of corporate practices will include identification aspects, policies, and techniques used. The summary is organized by describing the results of this study before the evaluation of their efficacy.

Foreign Exchange Exposure Identification

While the academics disputed the difference between accounting and non-accounting approach, in the reality firms do not really distinguish the classification. The results at least, show that three types of exposure, transaction, translation, and economic have been identified and managed in the Australian firm's foreign exchange exposure management.

In terms of the concern, transaction is even now the major exposure confronting Australian firms, accounted for 82 percent. Foreign sales or purchases

are the dominant source (60.7 %) of this exposure. It is not surprising that there are various methods used to identify transaction exposure. The popular methods used are forecast using contracts, orders, or cash forecast. However, there is a large group of firms (20.1 %) uses informal method to identify this exposure.

Translation exposure is at the second rank after transaction exposure that is managed by Australian firms. A large group of firms in the survey either subsidiaries or parent companies manage this type of exposure. This was expected because the organizational characteristics of both companies are qualified to do so. For a parent company, it is understandable because the volatility of reported income in the consolidated financial statement will influence the company's performance. For a subsidiary, reported financial statement to the parent company may be used to assess its operational performance.

In relation to the economic exposure, this study distinguishes the extent of its recognition and management because it was found, at least in the theory; firms do not understand how to manage this type of exposure because they are confused by the accounting rules in hedging this exposure. The result shows that 31 percent of firms in the survey recognize and manage this type of exposures but most of them do not recognize nor do manage it.

The summary of results shows that there has been a constant pattern in the identification of foreign exchange exposure in which transaction exposure is seen at major concern among firms in the survey. The pattern was predicted since firms included in this survey are those with significant trade exposure.

In terms of effectiveness, the results found that foreign exchange exposures are not properly identified. There are a few firms using informal method to identify transaction exposure even though transaction is the major concern of firms in the survey. They should have had a combination of methods if one of them does not fit to the types of their business transaction.

Economic is another type of exposure that is not properly identified. Most of firms in the survey do not recognize nor do manage it. Although they manage transaction exposure, they are merely concerned with short-term effect on cash flows. They should have been more cautious with their product competitiveness in the long term because they have capability to do so. They have used forecast by orders, contract of sales or purchases, and other proper methods to identify transaction

exposure. These records can be used to predict future cash flows for hedging economic exposure, which is more concerned with the long-term effect on cash flows. Hence, at the beginning of foreign exchange exposure management steps it has shown ineffective practices in terms of identifying exposure.

Policies in Exposure Management

This study found that major objectives in Australian firms' foreign exchange exposure management are primarily to reduce potential losses as a result of exchange rate movements. This is consistent with the argument in the chapter one: an increase in the volatility increases management's awareness of foreign exchange exposure. This state of awareness is revealed in this study. It is shown in their response that the volatility of currency with which they are dealing is one of the most important factors driving the foreign exchange exposure management in the firm.

Major objectives of Australian firms can also be translated into their attitude toward foreign exchange exposure. The result shows their conservativeness in the foreign exchange exposure management even though little group of firms has an aggressive foreign exchange exposure management reflected in their respond, "Maximize dollar equivalent of foreign incomes".

The conservative attitude is then followed by the adoption of passive policy by most of Australian firms. However, there is a large group of firms that are willing to implement an active policy towards transaction exposure. This is understandable since it was found as the major concern among firms in the survey.

Another result of this study on policy that has responsibility dimension is the degree of centralization. In terms of conducting transaction involving foreign currencies, most firms are either largely autonomous or under general guidelines from head office. However, in the foreign the area of borrowing/lending and hedging foreign exchange exposure, a large group of firms in the survey admit that head office is the only place to execute the decision or specific direction is given.

The policy described above has shown that the policy in foreign exchange exposure management policy by Australian firms is ineffective for two reasons. First, it was found that most firms have a sufficient forecasting. Most firms use bank as their primary source of forecast and it is presented in mostly the forms of either

likely direction of future exchange rate or a point estimate at a given future date. The exchange rate forecast is also concentrated on currency with which they are dealing and of significant exposures. This can be used to support a more active policy instead of passive one, particularly for firms with transaction as major exposure.

Second, the adoption of a passive policy is ineffective because a large number of firms in the survey are highly centralized in the foreign borrowing and hedging foreign exchange exposure. Head office for instance, could inform to its subsidiaries about the overall positions of group exposure as well as individual subsidiary's exposure, which then can be hedged by its subsidiaries. An active approach therefore should have been implemented for hedging based on the net exposed position of their subsidiaries.

Techniques in Foreign Exchange Exposure Management

The result found that netting is the most popular internal techniques used by Australian firms. The result also shows that there is a large group of firms that do not use internal techniques for one primary reason, financial capabilities. Most of them admit that information technology, the availability of sufficient skills, and costs, are the most critical factors in applying internal techniques. Spot and forward cover are found to be the most popular external techniques in this study. It is understandable because both techniques are simple particularly when passive policy is implemented.

It appears that the use of internal as well as external techniques is ineffective because of two reasons. Firstly, there is a large group of firms that do not use internal techniques. Bilateral netting and leading and lagging for instance, can be applied with less sophisticated technology. External techniques used also ineffective because an active policy is possible to implement. Hence, using forward contract, as an implementation of a passive policy is ineffective, because there is a possibility to predict the likely direction of future exchange rate and leave partial exposure uncovered rather than directly lock in their position on forward contract. There is an opportunity costs that can be saved by most Australian firms in the survey.

The above summaries suggest ineffective foreign exchange exposure management. The next section therefore, summarizes the possible association between firm-specific characteristics that may contribute to the ineffective

foreign exchange exposure management. This result is hopefully useful for firms, regulators, and other professional bodies that there are factors relating to the practices used in foreign exchange exposure management.

Firm-specific Characteristics and The management Practices

This study hypothesize that there is an association between firm-specific characteristics (firm size, the degree of foreign involvement, and Ownership) and four management policy and practice variables (the adoption of either an active or passive policy, the degree of centralization and the use of internal and external techniques).

Those variables are transformed into nominal scales for data analysis using Chi-square test. Instead of conducting simultaneous test on the variables, this study implements individual associations because of the sample size. If the data is analyzed by simultaneous investigation, it is likely to violate the Chi-square assumption which requires the expected count of cells that should be less than five, below or equal with 20 percent. In this summary therefore, the results are organized by presenting the association of each firm-specific variable and the management policy and practice variables.

Firm Size and the Management Policy and Practice Variables

The individual test between firm size and the management practice variables has shown that only the number of external techniques used is apparently associated with firm size. This finding supports the argument that firm size implies economy of scales. Hence, larger firms tend to employ more various techniques than smaller firms. However, the relationship is not too strong since there are cells that have expected count of less than five.

The Degree of Foreign Involvement and the Management Practice Variables

Among variables of the management practice variables, only an active or passive policy has an association with the degree of foreign involvement. There is

tendency that the higher the degree of foreign involvement the greater the exposure faced by Australian firms. Hence firms tend to adopt passive policy as a conservative attitude. This finding supports the utility theory.

Ownership and the Management Practice Variables

The result shows that only the degree of centralization is associated with ownership. The two-way table of this test also reveals that Australian-owned tend to have a greater autonomy than foreign-owned firms. This was predicted because firms that are subsidiaries of a foreign company may increase the uncertainty of the parent company's investment. Hence, they tend to impose a greater control towards their subsidiaries operating in the different economic entity.

Limitations and Directions for Future Research

This study is restricted to investigating current corporate practices by Australian firms. Other difficulties that have to be handles by the firms are therefore, not examined.

Scientific research such as this is subject to numerous limitations. First, data is collected based on average annual sales or revenues and the significant degree of exposure. Although the sales can be used as a proxy to measure firm size, there are other measurements that can be considered such as, the number of employees, and assets for comparison instead of single measurements. Future research is expected to consider this issue to assure the homogeneity of the sample, the possibility of obtaining better result in finding the association, and the possibility to implement various statistical methods in an effort to explain the corresponding research issue.

Second, the method used to analyze the hypothesis is Chi-Square test for independence. Besides its assumptions, this method has limitation to show the strength of an association because it looks primarily at the independence between two variables. Hence, causal relationships cannot be used in the interpretation of analysis. Next study therefore may consider other statistical analyses that are more convincing (for example: cluster, correlation, and regression analyses) for finding not

only the possible association between firm specific characteristics and management practice variables but also the pattern and their causal relationships.

Third, this study employs individual analysis between firm-specific and the management practice variables. In fact, these variables affect a firm's foreign exchange exposure management simultaneously. The possibility to perform such analysis is dictated by the samples to fulfill the assumption if Chi-square test is used. Although follow up through a telephone call was conducted to assure the reliability of the questionnaire, the response might not reflect the true condition because it depends on the interest of the person that is responsible for this job. Although interview can be used to reduce this problem, it is difficult to cover all samples in the survey. Many would argue that using questionnaire in the data collection has to confront with the classical problem: a low respond rate. The next study is expected to obtain larger data without overlooking the quality of the respondents. This strategy can be achieved, for example, by joining the association of corporate treasurers, attending treasury courses and seminars, and other activities that may help to be close to the source of data to guarantee an effective data collection.

In addition, there are limitations of aspects investigated in this study. In terms of identification foreign exchange exposure, there is an important element that is not included. This study should have questioned the currency in which transactions is denominated because the degree of foreign exchange exposure of each firm may also be incorporated with the volatility of the currency of denomination. In relation to the policy aspects, this study looks at the firms' attitude through their major objectives and the adoption of either an active or passive policy. This attitude should have been incorporated with the state of awareness because the greater the awareness of management to its risk exposure, the more convincing result can be achieved. In relation to the use of internal techniques, most of firms in the survey admit that information technology, the availability of sufficient skills, and cost are the critical factors in applying these techniques. Unfortunately, there is no further information collected in relation to the current technology used, the capability of the technology to cope with foreign exchange exposure management tasks, and the comparison between costs of establishing the exposure management system and its benefits. Future study may include those aspects that are ignored in this study.

The limitation described above may complicate the interpretation and knowledge generated by this study. However, this study is expected to provide meaningful descriptions of current corporate practices and their effectiveness of the Australian firms without superstitions. The result of the association between firm-specific characteristics and the management practices can be used by firms for evaluating their exposure management program. The regulators, and other professional bodies may consider that there are firm-specific characteristics that play a role in the practices of foreign exchange exposure management when they are about to introduce new regulation in the foreign exchange exposure management area.

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APPENDIX A
COVERING LETTER & QUESTIONNAIRE

APPENDIX A.1
COVERING LETTER

APPENDIX A.2 QUESTIONNAIRE

Foreign Exchange Risk Management: A Description & Assessment of Australian Firm's Practices

This questionnaire is a major part of my PhD study into the risk management practices of Australian companies with foreign exchange risk exposure. It takes less than 10 minutes to complete.

The questions relate to (i) the sources and size of your firm's risk exposure, (ii) the techniques you may use to manage that exposure, and (iii) the firm-specific factors of your firm influencing risk management policy development and selection of foreign exchange risk management practices in your firm.

I would greatly appreciate response to the 36 short questions either by yourself or the person involved in foreign exchange risk management.

In all cases the anonymity of respondent and firms is carefully protected. Any academic publication will only contain aggregate data.

Please return the completed questionnaire in the self addressed envelope enclosed with the questionnaire

Please tick appropriate answer in the box provided (you can tick more than one)

Section 1. Firm characteristics

1. Is your firm?

- 1. () Parent company of other foreign subsidiaries
- 2. () A subsidiary of other foreign companies
- 3. () Other, please specify.....

2. Is your firm mainly?

- 1. () Foreign-owned
- 2. () Australian Owned

3. Which category best represents the usual value of annual sales/revenue?

- 1. () Up to \$50 million
- 2. () Greater than \$50 –\$100 million
- 3. () Greater than \$100 - \$500 million
- 4. () Greater than \$ 500 million

4. What proportion of your total sales or business revenue comes from overseas (**Foreign sales/revenue to total**)?

- 1. () None
- 2. () 10 % - 15 %
- 3. () Greater than 15 % - 30 %
- 4. () Greater than 30 % - 50 %
- 5. () Greater than 50 %

5. What proportion of your total purchase or sales expenses comes from overseas (**Foreign purchases or sales expenses to total**)?

1. () None
2. () 10 % - 15 %
3. () Greater than 15 – 30 %
4. () Greater than 30 % - 50 %
5. () Greater than 50 %

Section 2. Identification Of Foreign Exchange Exposure

*If your firm is a subsidiary or if it owns overseas subsidiaries, financial statements must often be translated into the home currency of the parent company. This translation may lead to a foreign exchange exposure called **translation exposure**. If this applies to you then*

6. Is translation exposure recognized and managed by your firm?

1. () All of the times
2. () Sometimes
3. () Never
4. () Not applicable

7. What are the primary reasons for currency translation?

1. () Preparation of consolidated financial statements
2. () Accounting and tax regulations
3. () Other purposes (please specify):.....

*Foreign exchange exposure that arises from the normal course of business is called **transaction exposure***

8. What are the primary sources of this firm's transaction exposure?

1. () Foreign sales and/or purchases
2. () Foreign borrowing or lending
3. () Contracted sales and/or purchases, but not yet booked
4. () Other (please specify):.....

9. Which of the following methods do your firm use to forecast likely future foreign exchange exposures?

1. () Forecast using the contracts
2. () Forecast using orders
3. () Cash forecast by currency
4. () Balance sheet/Income forecast
5. () Informal method
6. () Other, please specify.....

*Adverse exchange rate movements may cause changes in future operating cash flows (decline in sales volume, increase in input costs, or decrease in competitive position known as **economic exposure***

10. Does your firm recognize **economic exposure**?

1. () All of the times
2. () Sometimes
3. () Never

If your answer never, go directly to question 15

11. Is economic or strategic exposure managed by the firm?

1. () All of the times
2. () Sometimes
3. () Never

If your answer never, go directly to question 15

12. What are the primary sources of the firm's economic exposure?

1. () Intra-firm and inter foreign debt
2. () Inter-firm and intra-firm payments for goods and services
3. () Rent and lease payments
4. () Royalties, license fees, and management fees
5. () Other (please specify):

13. Do you use any of the following measurers to estimate the firm's economic exposure?

1. () Regression on firm's free cash flows as exogenous variables
2. () Regression on cash flows sensitivity to financial variables
3. () Regression on firm's equity to financial variables
4. () Other approach (please specify):

14. What are the major reasons why your firm manages economic exposure?

1. () Cash-flows stability
2. () Tax reduction
3. () Competitive positions
4. () Investment and Financing decision
5. () Other (please specify):.....

15. We have identified 3 types of foreign exchange rate exposure. What are the major types of exposure confronting your firm?

1. () Translation
2. () Transaction
3. () Economic exposure
4. () Other, please specify

Section 3. Foreign Exchange Exposure Management Policy

16. Identify factors typically driving your foreign exchange exposure management

1. ☐ The volatility of foreign currency value your are dealing with
2. ☐ Pressure from investors
3. ☐ Accounting regulations
4. ☐ Other factors (please specify):.....

17. What is the major objective of your currency exposure management?

1. ☐ Cover all exposures whenever possible
2. ☐ My firm is not in the business of foreign exchange
3. ☐ Avoid surprises
4. ☐ Minimize quarter-to-quarter fluctuations
5. ☐ Maximize dollar equivalent of foreign incomes
6. ☐ Other, please specify.....

18. Which of the following statements best represents your firm's policy on **translation exposure**

1. ☐ Leave translation exposure uncovered
2. ☐ Cover all translation exposures
3. ☐ Take a view on foreign-exchange rates and cover or leave translation exposure uncovered, depending on view

19. Which of the following statements best represents your firm's policy on covering exposure that arises from normal business transactions (**transaction exposure**)

1. ☐ Leave transaction exposure uncovered
2. ☐ Cover all transaction exposures
3. ☐ Take a view on foreign-exchange rates and cover or leave transaction exposure uncovered, depending on view

20. Which of the following statements best represents your firm's policy on **economic exposure**

1. ☐ Leave economic exposure uncovered
2. ☐ Cover all economic exposures
3. ☐ Take a view on foreign-exchange rates and cover or leave economic exposure uncovered, depending on view

21. What is the percent coverage of your firm's **translation exposure**?

1. ☐ Up to 25 %
2. ☐ Greater than 25 – 50 %
3. ☐ Greater than 50 – 75 %
4. ☐ Greater than 75 %

22. What is the percent coverage of your firm's **transaction exposure**?

1. ☐ Up to 25 %
2. ☐ Greater than 25 – 50 %
3. ☐ Greater than 50 – 75 %
4. ☐ Greater than 75%

23. What is the percent coverage of your firm's **economic exposure**? (If your answer is 1 for question 12)

1. () Up to 25 %
2. () Greater than 25 – 50 %
3. () Greater than 50 – 75 %
4. () Greater than 75 %

24. How frequently do you revise your policy toward **translation, transaction, and economic exposures**?

1. () Monthly
2. () Quarterly
3. () Annually
4. () Other, please specify

25. Identify the primary source of your foreign exchange rate forecast:

1. () No forecast
2. () Firm's forecast
3. () Banks
4. () Other financial services

26. In what form do you present your exchange rate forecast?

1. () Indication of the expected direction of movement
2. () Point estimate of the expected rate at given future date
3. () Interval estimate of the expected rate
4. () Probability distribution of the expected rate

27. Identify your concentration of exchange-rate forecast

1. () All currencies you are dealing with
2. () Currencies in which you have significant exposure
3. () The more volatile currencies
4. () Other; please specify

28. How frequently do you revise formal exchange rate forecast?

1. All currencies your are dealing with
()daily ()weekly ()monthly () quarterly () annually () other
2. Currencies in which you have significant exposure
()daily ()weekly ()monthly () quarterly () annually () other
3. The more volatile currencies
()daily ()weekly ()monthly () quarterly () annually () other
4. Other
()daily ()weekly () monthly () quarterly () annually () other

29. Which of the following statements best represents your firm's delegation of authority on foreign currency borrowing or lending
1. () In its own name
 2. () Under general guide lines from head office
 3. () Under specific direction from head office
 4. () Only head office can borrow or lend
30. Which of the following statements best represents the power of the firm to enter into transactions involving foreign currency
1. () In its own name
 2. () Under general guidelines from head office
 3. () Under specific directions from head office
 4. () Only head office can transact foreign exchange business
31. Which of the following statements best represents the power of the firm to enter into foreign exchange market for hedging foreign exchange exposure
5. () In its own name
 6. () Under general guidelines from head office
 7. () Under specific directions from head office
 8. () Only head office can transact foreign exchange business

Section 4. Techniques in Foreign Exchange Exposure Management

32. Do you use any of the following techniques to manage foreign exchange exposures?
1. () Offsetting debts against claims (Netting)
 2. () Multi-currency billing systems and price adjustment
 3. () Leading and Lagging
 4. () Factoring
 5. () Centralized settlements
 6. () Re-invoicing
 7. () Other, please specify.....
33. Are any of the following factors critical for applying any the internal exposure management techniques you may use?
1. () Information technology
 2. () The availability of sufficient skill
 3. () Regulations
 4. () Costs
 5. () Other, please specify
.....

34. If your firm hedges foreign currency exposures, which of the following instruments do you use?

1. ☐ Spot
2. ☐ Forward contracts
3. ☐ Foreign currency swaps
4. ☐ Foreign currency futures contracts
5. ☐ Options
6. ☐ Foreign exchange agreements (FRAs)
7. ☐ Caps, Collars, Floors

35. How frequently do you use such instruments?

1. Spot
☐ Very often ☐ Often ☐ Rarely ☐ Never
2. Forward contracts
☐ Very often ☐ Often ☐ Rarely ☐ Never
3. Foreign currency swaps
☐ Very often ☐ Often ☐ Rarely ☐ Never
4. Foreign currency futures contracts
☐ Very often ☐ Often ☐ Rarely ☐ Never
5. Options
☐ Very often ☐ Often ☐ Rarely ☐ Never
6. F.X. Agreements (FRAs)
☐ Very often ☐ Often ☐ Rarely ☐ Never
7. Caps, Collars, Floors
☐ Very often ☐ Often ☐ Rarely ☐ Never

36. Which of the following factors influence your choice of instruments you may use for hedging

1. ☐ Cost of cover
2. ☐ The availability of skill
3. ☐ Accounting Regulations
4. ☐ Other, please specify.....

-----END-----

APPENDIX B
STATISTICAL SUMMARY OF SURVEY RESPONSES

APPENDIX B.1
FORMS OF THE AUSTRALIAN FIRMS
PARTICIPATING IN THE CURRENT SURVEY OF
FOREIGN EXCHANGE EXPOSURE MANAGEMENT PRACTICES

Forms	Frequency	Percent	Cumulative Percent
Parent Company of Foreign subsidiaries	7	11.5	11.5
A Subsidiary of A Foreign Company	36	59.0	70.5
Independent Firm	18	29.5	100.0
Total	61	100.0	

APPENDIX B.2
OWNERSHIP OF THE AUSTRALIAN FIRMS
PARTICIPATING IN THE CURRENT SURVEY OF
FOREIGN EXCHANGE EXPOSURE MANAGEMENT PRACTICES

Ownership	Frequency	Percent	Cumulative Percent
Foreign-owned	38	62.3	62.3
Australian Owned	23	37.7	100.0
Total	61	100.0	

APPENDIX B.3
FOREIGN-TO-TOTAL SALES RATIO OF THE AUSTRALIAN FIRMS PARTICIPATING
IN THE CURRENT SURVEY OF
FOREIGN EXCHANGE EXPOSURE MANAGEMENT PRACTICES

Ratio	Frequency	Percent	Cumulative Percent
None	11	18.0	18.0
10 to 15 %	32	52.5	70.5
Greater Than 15 to 30 %	5	8.2	78.7
Greater Than 30 to 50 %	3	4.9	83.6
Greater Than 50 %	10	16.4	100.0
Total	61	100.0	

APPENDIX B.4
FOREIGN-TO-TOTAL PURCHASES RATIO OF THE AUSTRALIAN FIRMS
PARTICIPATING IN THE CURRENT SURVEY OF
FOREIGN EXCHANGE EXPOSURE MANAGEMENT PRACTICES

Ratio	Frequency	Percent	Cumulative Percent
None	6	9.8	9.8
10 to 15 %	10	16.4	26.2
Greater Than 15 to 30 %	10	16.4	42.6
Greater Than 30 to 50 %	9	14.8	57.4
Greater Than 50 %	26	42.6	100.0
Total	61	100.0	

APPENDIX B.5
THE DEGREE OF FOREIGN INVOLVEMENT (DFI)
AMONG AUSTRALIAN FIRMS PARTICIPATING IN THE CURRENT SURVEY OF
FOREIGN EXCHANGE EXPOSURE MANAGEMENT PRACTICES

The Ratio of Foreign to Total	Frequency	Percent	Cumulative Percent
Foreign/total sales \leq 15 % or Foreign/total purchases \leq 30 %	21	34.4	34.4
Foreign/total sales > 15 % or Foreign/total purchases > 30 %	40	65.6	100.0
Total	61	100.0	

APPENDIX B.6
AVERAGE ANNUAL SALES RATIO OF THE AUSTRALIAN FIRMS PARTICIPATING IN
THE CURRENT SURVEY OF FOREIGN EXCHANGE EXPOSURE MANAGEMENT
PRACTICES

Sales	Frequency	Percent	Cumulative Percent
Up to \$ 50 millions	40	65.6	65.6
Greater than \$ 50 to \$ 100 millions	10	16.4	82.0
Greater than \$ 100 to \$ 500 millions	7	11.5	93.4
Greater than \$ 500 millions	4	6.6	100.0
Total	61	100.0	

APPENDIX B.7
THE EXTENT TRANSLATION EXPOSURE IS MANAGED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Categories	Frequency	Percent	Cumulative Percent
All of the Time	17	27.9	27.9
Sometimes	2	3.3	31.1
Never	15	24.6	55.7
Not Applicable	27	44.3	100.0
Total	61	100.0	

APPENDIX B.8
MAJOR REASONS FOR CURRENCY TRANSLATION IDENTIFIED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Reasons	Frequency	Percent	Cumulative Percent
Do not Translate	25	41.0	41.0
Preparation of Consolidated Financial Statements	29	47.5	88.5
Accounting and Tax Regulations	4	6.6	95.1
Preparation of Consolidated F.S. & Regulations	3	4.9	100.0
Total	61	100.0	

APPENDIX B.9
THE EXTENT TRANSACTION EXPOSURE IS MANAGED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Categories	Frequency	Percent	Cumulative Percent
All of the Time	58	95.1	95.1
Sometimes	3	4.9	100.0
Total	61	100.0	

APPENDIX B.10
SOURCES OF TRANSACTION EXPOSURE IDENTIFIED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Sources	Frequency	Percent	Cumulative Percent
Foreign Sales or Purchases	37	60.7	60.7
Foreign Borrowing or Lending	6	9.8	70.5
Contracted Sales and Purchases, not Yet Booked	3	4.9	75.4
Other	1	1.6	77.0
1 and 2	9	14.8	91.8
1 and 3	4	6.6	98.4
All Above	1	1.6	100.0
Total	61	100.0	

APPENDIX B.11
IDENTIFICATION METHODS OF TRANSACTION EXPOSURE IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Methods of Identification	Frequency	Percent	Cumulative Percent
Forecast Using Contracts	13	21.3	21.3
Forecast Using Orders	7	11.5	32.8
Cash Forecast by Currency	10	16.4	49.2
Balance Sheet/Income Forecast	2	3.3	52.5
Informal Method	13	21.3	73.8
Forecast Using Contracts and Orders	6	9.8	83.6
Forecast Using Contracts, Orders, and Cash	2	3.3	86.9
Combination (other than specified)	8	13.1	100.0
Total	61	100.0	

APPENDIX B.12
THE EXTENT ECONOMIC EXPOSURE IS RECOGNIZED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Extent of Recognition	Frequency	Percent	Cumulative Percent
All of the Time	16	26.2	26.2
Sometimes	9	14.8	41.0
Never	36	59.0	100.0
Total	61	100.0	

APPENDIX B.13
THE EXTENT ECONOMIC EXPOSURE IS MANAGED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Extent of Management	Frequency	Percent	Cumulative Percent
No Management	36	59.0	59.0
All of the Time	9	14.8	73.8
Sometimes	10	16.4	90.2
Never	6	9.8	100.0
Total	61	100.0	

APPENDIX B.14
SOURCES OF ECONOMIC EXPOSURE IDENTIFIED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Sources	Frequency	Percent	Cumulative Percent
No Identification	36	59.0	59.0
Foreign Debt	2	3.3	62.3
Payments for Goods and Services	23	37.7	100.0
Total	61	100.0	

APPENDIX B.15
MEASUREMENTS OF ECONOMIC EXPOSURE USED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Measurements	Frequency	Percent	Cumulative Percent
No Measurement	42	68.9	68.9
Regression on Firm's Equity to Financial Variables	8	13.1	82.0
Other Measurer	3	4.9	86.9
Ad Hoc	8	13.1	100.0
Total	61	100.0	

APPENDIX B.16
MAJOR REASONS FOR MANAGING ECONOMIC EXPOSURE IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Reasons	Frequency	Percent	Cumulative Percent
No Reasons	42	68.9	68.9
Cash-flows Stability Only	6	9.8	78.7
Cash-Flow Stability and Competitive Position	9	14.8	93.4
Cash-Flow Stability and Financing Decisions	4	6.6	100.0
Total	61	100.0	

APPENDIX B.17
MAJOR EXPOSURES IDENTIFIED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Major Exposure	Frequency	Percent	Cumulative Percent
Translation Only	4	6.56	6.56
Transaction Only	50	82.0	88.56
Economic Only	3	4.92	93.48
Translation and Transaction	2	3.28	96.76
Transaction and Economic	2	3.28	100.0
Total	61	100.0	

APPENDIX B.18
MAJOR FACTORS DRIVING
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Major Factors	Frequency	Percent	Cumulative Percent
The Volatility of Currency They Are Dealing with	56	91.8	91.8
The Volatility and The Accounting Regulations (1 and 2)	5	8.2	100.0
Total	61	100.0	

APENDIX B.19
MAJOR OBJECTIVES IDENTIFIED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Major Objectives	Frequency	Percent	Cumulative Percent
Cover All Exposures Whenever Possible	15	24.6	24.6
My Firm Is Not in The Business of F.X.	15	24.6	49.2
Avoid Surprises	18	29.5	78.7
Minimize Quarter-to-quarter Fluctuations	1	1.6	80.3
Maximize Dollar Equivalent of Foreign Incomes	2	3.3	83.6
Both 1 and 3	3	4.9	88.5
Both 2 and 3	2	3.3	91.8
Both 3 and 5	2	3.3	95.1
Combination (2 or 3 obj. of the above, Other than Specified)	3	4.9	100.0
Total	61	100.0	

APENDIX B.20
ACTIVE/PASSIVE POLICY USED ON TRANSLATION EXPOSURE IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Policy	Frequency	Percent	Cumulative Percent
No Particular Policy	22	36.1	36.1
Leave Translation Exposure Uncovered	24	39.3	75.4
Cover all Translation Exposure	2	3.3	78.7
Take A View on F.X. Rates & Cover/Leave Depending on View	13	21.3	100.0
Total	61	100.0	

APENDIX B.21
ACTIVE/PASSIVE POLICY USED ON TRANSACTION EXPOSURE IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Policy	Frequency	Percent	Cumulative Percent
Cover All Transaction Exposure	20	32.8	32.8
Take A View on F.X. Rates & Leave/Cover Depending on Views	41	67.2	100.0
Total	61	100.0	

APENDIX B.22
ACTIVE/PASSIVE POLICY USED ON ECONOMIC EXPOSURE IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

POLICY	Frequency	Percent	Cumulative Percent
No Particular Policy	23	37.7	37.7
Leave Economic Exposure Uncovered	16	26.2	63.9
Take A View on F.X. Rates & Cover/Leave Depending on View	22	36.1	100.0
Total	61	100.0	

APENDIX B.23
THE POLICY ON THE AMOUNT OF TRANSLATION EXPOSURE COVERED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

PERCENT COVER	Frequency	Percent	Cumulative Percent
No Cover	43	70.5	70.5
Up to 25 %	10	16.4	86.9
Greater than 25 % to 50 %	2	3.3	90.2
Greater than 50 % to 75 %	2	3.3	93.4
Greater than 75 %	4	6.6	100.0
Total	61	100.0	

APENDIX B.24
THE POLICY ON THE AMOUNT OF TRANSACTION EXPOSURE COVERED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

PERCENT COVER	Frequency	Percent	Cumulative Percent
Up to 25 %	18	29.5	29.5
Greater the 25 % to 50 %	17	27.9	57.4
Greater than 50 % to 75 %	10	16.4	73.8
Greater than 75 %	16	26.2	100.0
Total	61	100.0	

APENDIX B.25
THE POLICY ON THE AMOUNT OF ECONOMIC EXPOSURE COVERED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

PERCENT COVER	Frequency	Percent	Cumulative Percent
No Cover	39	63.9	63.9
Up to 25 %	16	26.2	90.2
Greater than 25 % to 50 %	4	6.6	96.7
Greater than 50 % to 75 %	1	1.6	98.4
Greater than 75 %	1	1.6	100.0
Total	61	100.0	

APENDIX B.26
THE FREQUENCY OF REVISING POLICIES ON
TRANSLATION, TRANSACTION AND ECONOMIC EXPOSURES IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Periods	Frequency	Percent	Cumulative Percent
Monthly	14	23.0	23.0
Quarterly	6	9.8	32.8
Annually	23	37.7	70.5
Other (weekly; ad hoc)	18	29.5	100.0
Total	61	100.0	

APENDIX B.27
SOURCES OF FORECAST IDENTIFIED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Sources of Forecast	Frequency	Percent	Cumulative Percent
No Forecast	5	8.2	8.2
Firm's Forecast	7	11.5	19.7
Banks	42	68.9	88.5
Other Financial Services	3	4.9	93.4
Firm's Forecast and Banks	3	4.9	98.4
Bank and Other Financial Services	1	1.6	100.0
Total	61	100.0	

APENDIX B.28
FORMS OF PRESENTATION OF
FOREIGN EXCHANGE-RATES FORECAST IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

FORMS OF PRESENTATION	Frequency	Percent	Cumulative Percent
Indication of The Expected Direction of Movement	33	54.1	54.1
Point Estimate of The Expected Rate at Given Future Date	12	19.7	73.8
Interval Estimate of The Expected Rate	9	14.8	88.5
Both 1 an 2	5	8.2	96.7
Both 1 and 3	1	1.6	98.4
All Above (1; 2; 3)	1	1.6	100.0
Total	61	100.0	

APENDIX B.29
CONCENTRATIONS OF FORECASTED CURRENCY IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Concentrations of Exchange-rate Forecast	Frequency	Percent	Cumulative Percent
All Currency They are Dealing with	22	36.1	36.1
Currencies of Significant Exposure	28	45.9	82.0
The More volatile Currencies	2	3.3	85.2
Other	3	4.9	90.2
Both 1 and 2	1	1.6	91.8
Combination of 2 & 3	4	6.6	98.4
All above (1; 2; 3)	1	1.6	100.0
Total	61	100.0	

APENDIX B.30
THE DEGREE OF CENTRALIZATION ON
FOREIGN BORROWING/LENDING IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

The Degree of Centralization	Frequency	Percent	Cumulative Percent
In Its Own Name	21	34.4	34.4
Under General guidelines	9	14.8	49.2

APPENDIX B.30 CONTINUED

The Degree of Centralization	Frequency	Percent	Cumulative Percent
Under Specific Direction	13	21.3	70.5
Only Head Office can Borrow/Lend	18	29.5	100.0
Total	61	100.0	

APENDIX B.31
THE DEGREE OF CENTRALIZATION ON
FOREIGN TRANSACTIONS IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

The Degree of Centralization	Frequency	Percent	Cumulative Percent
In Its Own Name	33	54.1	54.1
Under General Guidelines	12	19.7	73.8
Under specific directions	7	11.5	85.2
Only Head Office can Transact	9	14.8	100.0
Total	61	100.0	

APENDIX B.32
THE DEGREE OF CENTRALIZATION FOR HEDGING IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

The Degree of Centralization	Frequency	Percent	Cumulative Percent
In Its Own Name	20	32.8	32.8
Under General Guidelines	7	11.5	44.3
Under Specific Directions	16	26.2	70.5
Only Head Office can Hedge	18	29.5	100.0
Total	61	100.0	

APENDIX B.33
INTERNAL TECHNIQUES USED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Internal Techniques	Frequency	Percent	Cumulative Percent
No Internal Techniques Used	27	44.3	44.3
Netting	15	24.6	68.9
Multi-currency Billing System	7	11.5	80.3
Leading and Lagging	1	1.6	82.0
Both 1 an 2	3	4.9	86.9
1, 2 and 3	2	3.3	90.2
Both 1 and 4	1	1.6	91.8
Both 1 and 5	3	4.9	96.7
Combination of Both 4,5 and 1 or 3	2	3.3	100.0
Total	61	100.0	

APENDIX B.34
CRITICAL FACTORS IN APPLYING INTERNAL TECHNIQUES IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Critical Factors	Frequency	Percent	Cumulative Percent
No Answer (do not use these techniques)	6	9.8	9.8
Information Technology Only	16	26.2	36.1
The availability of Sufficient Skill	14	23.0	59.0
Regulations	1	1.6	60.7
Costs	8	13.1	73.8
Other (head office approval)	3	4.9	78.7
Both IT and Availability of Sufficient Skills	5	8.2	86.9
Both IT and Costs	7	11.5	98.4
Combination	1	1.6	100.0
Total	61	100.0	

APPENDIX B.35
EXTERNAL TECHNIQUES USED IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

External Techniques	Frequency	Percent	Cumulative Percent
None	1	1.6	1.6
(1) Spot Only	6	9.8	11.5
(2) Forward Contract Only	6	9.8	21.3
(3) Both 1 and 2	24	39.3	60.7
(4) Combination of (3) and F.C. Swap	3	4.9	65.6
(5) Combination of (3) and Options	1	1.6	67.2
(6) Combination of (3) and FRAs	2	3.3	70.5
(7) Combination of (3) and Caps, Collars, Floors	5	8.2	78.7
(8) Combination of 4 & C. Futures	2	3.3	82.0
(9) Combination of (4) and Caps, Collars, Floors	1	1.6	83.6
(10) Combination of (3) & Options, FRAs, Caps, Collar, Floors	1	1.6	85.2
(11) Combination of (2) and FX Swaps	3	4.9	90.2
(12) Combination of (2) and FRAs	2	3.3	93.4
(13) Combination of 2; Caps; Collars; Floors	1	1.6	95.1
(14) Combination (13) and Options	1	1.6	96.7
(15) Combination (11); options; FRAs	1	1.6	98.4
(16) Combination of FRAs & Caps, Collars, Floors	1	1.6	100.0
Total	61	100.0	

APPENDIX B.36
CRITICAL FACTORS OF SELECTING EXTERNAL TECHNIQUES IN
AUSTRALIAN FIRMS' FOREIGN EXCHANGE EXPOSURE MANAGEMENT

Major Factors	Frequency	Percent	Cumulative Percent
(1) Cost of Cover	26	42.6	42.6
(2) The availability of Skill	14	23.0	65.6
(3) Accounting regulations	2	3.3	68.9
(4) Other (Practicality; Head Office Approval)	9	14.8	83.6
(5) Combination of (1) and (2)	5	8.2	91.8
(6) Combination of (1), (2), and (3)	1	1.6	93.4
(7) Combination of (2) and (4)	3	4.9	98.4
(8) Combination of (3) and (4)	1	1.6	100.0
Total	61	100.0	

APPENDIX C
CONTINGENCY TABLES OF ANALYSIS

APPENDIX C.1
CROSS TABULATION OF THE DEGREE OF FOREIGN INVOLVEMENT
AND TRANSACTION AS A MAJOR EXPOSURE OF
AUSTRALIAN FIRMS

Major Exposure	The Degree of Foreign Involvement		Total
	Lower Degree	Higher Degree	
Transaction Exposure	18	32	50
% of Total	36%	64%	50
Total	18	32	50
% of Total	36%	64%	50

APPENDIX C.2
CROSS TABULATION OF ORGANIZATIONAL CHARACTERISTICS
AND OWNERSHIP OF AUSTRALIAN FIRMS
PARTICIPATING IN THE SURVEY

Organizational Characteristics	Foreign / Australian-owned		Total
	Foreign-owned	Australian-owned	
Parent Company of Foreign subsidiaries	2	5	7
A Subsidiary of A Foreign Company	36		36
Independent Firm		18	18
Total	38	23	61

APPENDIX C.3
CROSS TABULATION OF THE SOURCES OF TRANSACTION EXPOSURE AND
THE EXTENT OF ITS MANAGEMENT
BY AUSTRALIAN FIRMS

Sources of Transaction Exposure		Management of Transaction Exposure		
		All of the Time	Sometimes	Total
(1) Foreign Sales or Purchases	Count	37		37
	% of Total	60.7%		60.7%
(2) Foreign Borrowing or Lending	Count	5	1	6
	% of Total	8.2%	1.6%	9.8%
(3) Contracted Sales and Purchases, not Yet Booked	Count	3		3
	% of Total	4.9%		4.9%
Other	Count		1	1
	% of Total		1.6%	1.6%

APPENDIX C.3 CONTINUED

Sources of Transaction Exposure		Management of Transaction Exposure		
		All of the Time	Sometimes	Total
1 and 2	Count	8	1	9
	% of Total	13.1%	1.6%	14.8%
1 and 3	Count	4		4
	% of Total	6.6%		6.6%
All Above	Count	1		1
	% of Total	1.6%		1.6%
Total	Count	58	3	61
	% of Total	95.1%	4.9%	100.0%

APPENDIX C.4
CROSS TABULATION OF THE IDENTIFICATION METHODS AND THE EXTENT
OF MANAGEMENT ON TRANSACTION EXPOSURE
BY AUSTRALIAN FIRMS

Methods of Identification		Management of Transaction Exposure		Total
		All of the Time	Sometimes	
Forecast Using Contracts	Count	13		13
	% of Total	21.3%		21.3%
Forecast Using Orders	Count	7		7
	% of Total	11.5%		11.5%
Cash Forecast by Currency	Count	9	1	10
	% of Total	14.8%	1.6%	16.4%
Balance Sheet/Income Forecast	Count	2		2
	% of Total	3.3%		3.3%
Informal Method	Count	11	2	13
	% of Total	18.0%	3.3%	21.3%
Forecast Using Contracts and Orders	Count	6		6
	% of Total	9.8%		9.8%
Forecast Using Contracts, Orders, and Cash	Count	2		2
	% of Total	3.3%		3.3%
Combination (other then specified)	Count	8		8
	% of Total	13.1%		13.1%
Total	Count	58	3	61
	% of Total	95.1%	4.9%	100.0%

APPENDIX C.5
CROSS TABULATION OF CURRENCY-TRANSLATION PURPOSES AND
THE EXTENT OF MANAGEMENT ON TRANSLATION EXPOSURE
BY AUSTRALIAN FIRMS

Purposes of Translation		Management of Translation Exposure				Total
		All of the Time	Sometimes	Never	Not Applicable	
Do not Translate	Count			1	24	25
	% of Total			1.6%	39.3%	41.0%
Preparation of Consolidated Financial Statements	Count	13	2	12	2	29
	% of Total	21.3%	3.3%	19.7%	3.3%	47.5%
Accounting and Tax Regulations	Count	2		1	1	4
	% of Total	3.3%		1.6%	1.6%	6.6%
Preparation of Consolidated F.S. & Regulations	Count	2		1		3
	% of Total	3.3%		1.6%		4.9%
Total	Count	17	2	15	27	61
	% of Total	27.9%	3.3%	24.6%	44.3%	100.0%

APPENDIX C.6
CROSS TABULATION OF THE EXTENT OF RECOGNITION AND
MANAGEMENT ON ECONOMIC EXPOSURE
BY AUSTRALIAN FIRMS

Recognition of Economic Exposure		Management of Economic Exposure				Total
		No Management	All of the Time	Sometimes	Never	
All of the Time	Count		8	5	3	16
	% of Total		13.1%	8.2%	4.9%	26.2%
Sometimes	Count		1	5	3	9
	% of Total		1.6%	8.2%	4.9%	14.8%
Never	Count	36				36
	% of Total	59.0%				59.0%
Total	Count	36	9	10	6	61
	% of Total	59.0%	14.8%	16.4%	9.8%	100.0%

APPENDIX C.7
CROSS TABULATION OF THE SOURCES OF ECONOMIC EXPOSURE
AND THE EXTENT OF ITS MANAGEMENT
BY AUSTRALIAN FIRMS

Management of Economic Exposure		Sources of Economic Exposure			Total
		Unidentified	Foreign Debt	Payments for Goods and Services	
No Management	Count	36			36
	% of Total	59.0%			59.0%
All of the Time	Count		1	8	9
	% of Total		1.6%	13.1%	14.8%
Sometimes	Count		1	9	10
	% of Total		1.6%	14.8%	16.4%
Never	Count			6	6
	% of Total			9.8%	9.8%
Total	Count	36	2	23	61
	% of Total	59.0%	3.3%	37.7%	100.0%

APPENDIX C.8
CROSS TABULATION OF THE MEASUREMENTS AND THE EXTENT OF
MANAGEMENT ON ECONOMIC EXPOSURE
BY AUSTRALIAN FIRMS

Measurements of Economic Exposure		Management of Economic Exposure				Total
		No Management	All of the Time	Sometimes	Never	
No Measurement	Count	36			6	42
	% of Total	59.0%			9.8%	68.9%
Regression on Firm's Equity to Financial Variables	Count		7	1		8
	% of Total		11.5%	1.6%		13.1%
Other Measurer	Count		1	2		3
	% of Total		1.6%	3.3%		4.9%
Ad Hoc	Count		1	7		8
	% of Total		1.6%	11.5%		13.1%
Total	Count	36	9	10	6	61
	% of Total	59.0%	14.8%	16.4%	9.8%	100.0%

APPENDIX C.9
CROSS TABULATION OF THE REASONS FOR MANAGEMENT AND
THE MEASUREMENTS OF ECONOMIC EXPOSURE
BY AUSTRALIAN FIRMS

Reasons for Managing Economic Exposure		Measurements of Economic Exposure				Total
		No Measurement	Regression on Firm's Equity to Financial Variables	Other Measurerer	Ad Hoc	
No Reason	Count	42				42
	% of Total	68.9%				68.9%
Cash-flows Stability Only	Count		5	1		6
	% of Total		8.2%	1.6%		9.8%
Cash-Flow Stability and Competitive Position	Count		1	2	6	9
	% of Total		1.6%	3.3%	9.8%	14.8%
Cash-Flow Stability and Financing Decisions	Count		2		2	4
	% of Total		3.3%		3.3%	6.6%
Total	Count	42	8	3	8	61
	% of Total	68.9%	13.1%	4.9%	13.1%	100.0%

APPENDIX C.10
CROSS TABULATION OF ACTIVE VS. PASSIVE POLICY USED AND
MAJOR EXPOSURES CONFRONTED
BY AUSTRALIAN FIRMS

Major Exposures		Active versus Passive		Total
		Passive Policy	Active Policy	
Translation Exposure Only	Count	4		4
	% of Total	6.6%		6.6%
Transaction Exposure Only	Count	28	22	50
	% of Total	45.9%	36.1%	82.0%
Economic Exposure Only	Count	3		3
	% of Total	4.9%		4.9%
Translation and Transaction Exposures	Count	2		2
	% of Total	3.3%		3.3%
Transaction and Economic Exposures	Count	1	1	2
	% of Total	1.6%	1.6%	3.3%
Total	Count	38	23	61
	% of Total	62.3%	37.7%	100.0%

APPENDIX C.11
CROSS TABULATION OF ACTIVE VS. PASSIVE POLICY USED AND
THE AMOUNT OF COVERAGE ON TRANSACTION EXPOSURE
BY AUSTRALIAN FIRMS

Percent Cover of Transaction Exposure		Active versus Passive		Total
		Passive Policy	Active Policy	
Up to 25 %	Count	8	10	18
	% of Total	13.1%	16.4%	29.5%
Greater the 25 % to 50 %	Count	14	3	17
	% of Total	23.0%	4.9%	27.9%
Greater then 50 % to 75 %	Count	7	3	10
	% of Total	11.5%	4.9%	16.4%
Greater then 75 %	Count	9	7	16
	% of Total	14.8%	11.5%	26.2%
Total	Count	38	23	61
	% of Total	62.3%	37.7%	100.0%

APPENDIX C.12
CROSS TABULATION OF ACTIVE VS. PASSIVE POLICY USED AND
THE AMOUNT OF COVERAGE ON TRANSLATION EXPOSURE
BY AUSTRALIAN FIRMS

Percent Cover of Translation Exposure		Active versus Passive		Total
		Passive Policy	Active Policy	
No Cover	Count	25	18	43
	% of Total	41.0%	29.5%	70.5%
Up to 25 %	Count	7	3	10
	% of Total	11.5%	4.9%	16.4%
Greater then 25 % to 50 %	Count	2		2
	% of Total	3.3%		3.3%
Greater then 50 % to 75 %	Count	2		2
	% of Total	3.3%		3.3%
Greater then 75 %	Count	2	2	4
	% of Total	3.3%	3.3%	6.6%
Total	Count	38	23	61
	% of Total	62.3%	37.7%	100.0%

APPENDIX C.13
CROSS TABULATION OF ACTIVE VS. PASSIVE POLICY USED AND
THE AMOUNT OF COVERAGE ON ECONOMIC EXPOSURE
BY AUSTRALIAN FIRMS

Percent Cover of Economic Exposure		Active versus Passive		Total
		Passive Policy	Active Policy	
No Cover	Count	21	18	39
	% of Total	34.4%	29.5%	63.9%
Up to 25 %	Count	11	5	16
	% of Total	18.0%	8.2%	26.2%
Greater then 25 % to 50 %	Count	4		4
	% of Total	6.6%		6.6%
Greater then 50 % to 75 %	Count	1		1
	% of Total	1.6%		1.6%
Greater then 75 %	Count	1		1
	% of Total	1.6%		1.6%
Total	Count	38	23	61
	% of Total	62.3%	37.7%	100.0%

APPENDIX C.14
CROSS TABULATION OF FORMS OF PRESENTATION AND
CURRENCIES OF CONCENTRATION OF EXCHANGE-RATE FORECAST
BY AUSTRALIAN FIRMS

Forms of Forecast Presentation		Concentration of Exchange-rate Forecast							Total
		All Currencies They are Dealing with (1)	Currencies of Significant Exposure (2)	Volatile Currencies (3)	Other (4)	(1) & (2)	Comb. of (2) & (3)	All of The Above	
(1) Indication of The Expected Direction of Movement	Count	13	17				2	1	33
	% of Total	21.3%	27.9%				3.3%	1.6%	54.1%
(2) Point Estimate of The Expected Rate at Given Future Date	Count	3	7	1			1		12
	% of Total	4.9%	11.5%	1.6%			1.6%		19.7%
(3) Interval Estimate of The Expected Rate	Count	5	3	1					9
	% of Total	8.2%	4.9%	1.6%					14.8%
Both (1) and (2)	Count	1			3	1			5
	% of Total	1.6%			4.9%	1.6%			8.2%
Both (1) and (3)	Count		1						1
	% of Total		1.6%						1.6%
All Above (1; 2; 3)	Count						1		1
	% of Total						1.6%		1.6%
Total	Count	22	28	2	3	1	4	1	61
	% of Total	36.1%	45.9%	3.3%	4.9%	1.6%	6.6%	1.6%	100.0%

APPENDIX C.15
CROSS TABULATION OF SOURCES OF FORECAST USED AND
TRANSACTION AS MAJOR EXPOSURE CONFRONTED
BY AUSTRALIAN FIRMS

Sources of Forecast		Major Exposure	Total
		Transaction Exposure Only	
No Forecast	Count	3	3
	% of Total	6.0%	6.0%
Firm's Forecast	Count	6	6
	% of Total	12.0%	12.0%
Banks	Count	35	35
	% of Total	70.0%	70.0%
Other Financial Services	Count	2	2
	% of Total	4.0%	4.0%
Firm's Forecast and Banks	Count	3	3
	% of Total	6.0%	6.0%
Bank and Other Financial Services	Count	1	1
	% of Total	2.0%	2.0%
Total	Count	50	50
	% of Total	100.0%	100.0%

APPENDIX C.16
CROSS TABULATION OF CONCENTRATION OF CURRENCIES OF FORECAST
AND TRANSACTION AS MAJOR EXPOSURE CONFRONTED
BY AUSTRALIAN FIRMS

Concentration of Exchange-rate Forecast		Major Exposure	Total
		Transaction Exposure Only	
All Currency They are Dealing with	Count	19	19
	% of Total	38.0%	38.0%
Currencies of Significant Exposure	Count	23	23
	% of Total	46.0%	46.0%
The More volatile Currencies	Count	1	1
	% of Total	2.0%	2.0%
Other	Count	2	2
	% of Total	4.0%	4.0%
Both 1 and 2	Count	1	1
	% of Total	2.0%	2.0%
Combination of 2 & 3	Count	3	3
	% of Total	6.0%	6.0%
All above (1; 2; 3)	Count	1	1
	% of Total	2.0%	2.0%
Total	Count	50	50
	% of Total	100.0%	100.0%

APPENDIX C.17
CROSS TABULATION OF PRESENTATION OF EXCHANGE-RATE FORECAST
AND TRANSACTION AS MAJOR EXPOSURE CONFRONTED
BY AUSTRALIAN FIRMS

Presentation Form of Exchange-rate Forecast		Major Exposures	Total
		Transaction Exposure Only	
(1) Indication of The Expected Direction of Movement	Count	26	26
	% of Total	52.0%	52.0%
(2) Point Estimate of The Expected Rate at A Given Future Date	Count	11	11
	% of Total	22.0%	22.0%
(3) Interval Estimate of The Expected Rate	Count	8	8
	% of Total	16.0%	16.0%
Both 1 an 2	Count	4	4
	% of Total	8.0%	8.0%
Both 1 and 3	Count	1	1
	% of Total	2.0%	2.0%
Total	Count	50	50
	% of Total	100.0%	100.0%

APPENDIX C.18
CROSS TABULATION OF THE NUMBER INTERNAL TECHNIQUES USED
AND THEIR CRITICAL FACTORS FACED
BY AUSTRALIAN FIRMS

Critical Factors for Applying Internal Techniques		The Number of Internal Techniques Used				Total
		No Techniques	Only One	Two Techniques	Three Techniques or more	
No Answer (do not use these techniques)	Count	5	1			6
	% of Total	8.2%	1.6%			9.8%
Information Technology Only	Count	5	8	2	1	16
	% of Total	8.2%	13.1%	3.3%	1.6%	26.2%
The availability of Sufficient Skill	Count	8	5	1		14
	% of Total	13.1%	8.2%	1.6%		23.0%
Regulations	Count		1			1
	% of Total		1.6%			1.6%
Costs	Count	2	4	2		8
	% of Total	3.3%	6.6%	3.3%		13.1%
Other (head office approval)	Count	2			1	3
	% of Total	3.3%			1.6%	4.9%
Both IT and Availability of Suff. Skill	Count	2	1	2		5
	% of Total	3.3%	1.6%	3.3%		8.2%
Both IT and Costs	Count	3	3	1		7
	% of Total	4.9%	4.9%	1.6%		11.5%
Combination	Count			1		1
	% of Total			1.6%		1.6%
Total	Count	27	23	9	2	61
	% of Total	44.3%	37.7%	14.8%	3.3%	100.0%

APPENDIX C.19
CROSS TABULATION OF THE NUMBER OF INTERNAL TECHNIQUES USED
AND TRANSACTION AS MAJOR EXPOSURE FACED
BY AUSTRALIAN FIRMS

The Number of Internal Techniques Used		Major Exposure	Total
		Transaction Exposure Only	
No Techniques	Count	24	24
	% of Total	48.0%	48.0%
Only One	Count	18	18
	% of Total	36.0%	36.0%
Two Techniques	Count	6	6
	% of Total	12.0%	12.0%
Three Techniques or more	Count	2	2
	% of Total	4.0%	4.0%
Total	Count	50	50
	% of Total	100.0%	100.0%

APPENDIX C.20
CROSS TABULATION OF THE AVERAGE ANNUAL SALES OR REVENUES EARNED
AND THE FIRST GENERATION TECHNIQUES USED
BY AUSTRALIAN FIRMS

Firm's Sales or Revenues		External Techniques	Total
		First Generation	
Up to \$ 50 millions	Count	4	4
	% of Total	23.5%	23.5%
Greater then \$ 50 to \$ 100 millions	Count	6	6
	% of Total	35.3%	35.3%
Greater then \$ 100 to \$ 500 millions	Count	3	3
	% of Total	17.6%	17.6%
Greater then \$ 100 to \$ 500 millions	Count	4	4
	% of Total	23.5%	23.5%
Total	Count	17	17
	% of Total	100.0%	100.0%

APPENDIX C.21
CROSS TABULATION OF THE DEGREE OF FOREIGN INVOLVEMENT (DFI)
AND THE USE OF FIRST GENERATION TECHNIQUES
BY AUSTRALIAN FIRMS

The Degree of Foreign Involvement		The First Generation Techniques	Total
Lower Degree	Count	7	7
	% of Total	29.2%	29.2%
Higher Degree	Count	17	17
	% of Total	70.8%	70.8%
Total	Count	24	24
	% of Total	100.0%	100.0%

APPENDIX C.22
CROSS TABULATION OF AUSTRALIAN FIRMS'S OWNERSHIP
AND THEIR USEGE OF FIRST GENERATION TECHNIQUES

Ultimate Ownership		First Generation Techniques	Total
Foreign-owned	Count	15	15
	% of Total	62.5%	62.5%
Australian-owned	Count	9	9
	% of Total	37.5%	37.5%
Total	Count	24	24
	% of Total	100.0%	100.0%

APPENDIX C.23
TWO-WAY TABLE OF CHI-SQUARE TEST BETWEEN
ACTIVE VS PASSIVE POLICY USED AND THE FIRM SIZE IN
FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

Active versus Passive Policy		Firm Size		Total
		Smaller Firms	Bigger Firms	
Passive	Count	26	12	38
	Expected Count	26.8	11.2	38.0
	% within Active versus Passive Policy	68.4%	31.6%	100.0%
	% within Firm Size	60.5%	66.7%	62.3%
	% of Total	42.6%	19.7%	62.3%

APPENDIX C.23 CONTINUED

Active versus Passive Policy		Firm Size		Total
		Smaller Firms	Bigger Firms	
Active	Count	17	6	23
	Expected Count	16.2	6.8	23.0
	% within Active versus Passive Policy	73.9%	26.1%	100.0%
	% within Firm Size	39.5%	33.3%	37.7%
	% of Total	27.9%	9.8%	37.7%
Total	Count	43	18	61
	Expected Count	43.0	18.0	61.0
	% within Active versus Passive Policy	70.5%	29.5%	100.0%
	% within Firm Size	100.0%	100.0%	100.0%
	% of Total	70.5%	29.5%	100.0%

APPENDIX C.23A
CHI-SQUARE TEST FOR INDEPENDENCE OF ACTIVE VS PASSIVE POLICY USED AND
THE FIRM SIZE IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

	Value	df	Asymptotic Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.208(b)	1	.649		
Continuity Correction (a)	.028	1	.868		
Likelihood Ratio	.210	1	.647		
Fisher's Exact Test				.775	.438
Linear-by-Linear Association	.204	1	.651		
N of Valid Cases	61				
a) Computed only for a 2x2 table					
b) 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.79.					

APPENDIX C.24
TWO-WAY TABLE OF CHI-SQUARE TEST BETWEEN
THE DEGREE OF CENTRALIZATION AND THE FIRM SIZE IN
FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

The Degree of Centralization		Firm Size		Total
		Smaller Firms	Bigger Firms	
Lower Degree	Count	9	5	14
	Expected Count	9.9	4.1	14.0
	% within The Degree of Centralization	64.3%	35.7%	100.0%

APPENDIX C.24 CONTINUED

The Degree of Centralization		Firm Size		Total
		Smaller Firms	Bigger Firms	
Higher Degree	% within Firm Size	20.9%	27.8%	23.0%
	% of Total	14.8%	8.2%	23.0%
	Count	21	10	31
	Expected Count	21.9	9.1	31.0
	% within The Degree of Centralization	67.7%	32.3%	100.0%
	% within Firm Size	48.8%	55.6%	50.8%
	% of Total	34.4%	16.4%	50.8%
	Count	13	3	16
	Expected Count	11.3	4.7	16.0
	% within The Degree of Centralization	81.3%	18.8%	100.0%
Decentralized	% within Firm Size	30.2%	16.7%	26.2%
	% of Total	21.3%	4.9%	26.2%
	Count	43	18	61
Total	Expected Count	43.0	18.0	61.0
	% within The Degree of Centralization	70.5%	29.5%	100.0%
	% within Firm Size	100.0%	100.0%	100.0%
	% of Total	70.5%	29.5%	100.0%
	Count	43	18	61

APPENDIX C.24A

**CHI-SQUARE TEST FOR INDEPENDENCE OF ACTIVE VS PASSIVE POLICY USED AND
THE FIRM SIZE IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.262(a)	2	.532
Likelihood Ratio	1.333	2	.514
Linear-by-Linear Association	1.060	1	.303
N of Valid Cases	61		
a) 2 cells (33.3%) have expected count less than 5. The minimum expected count is 4.13.			

APPENDIX C.25
TWO-WAY TABLE OF CHI-SQUARE TEST BETWEEN
THE NUMBER OF INTERNAL TECHNIQUES USED AND THE FIRM SIZE
IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

The Number of Internal Techniques Used		Firm Size		Total
		Smaller Firms	Bigger Firms	
No Techniques	Count	21	6	27
	Expected Count	19.0	8.0	27.0
	% within The Number of Internal Techniques Used	77.8%	22.2%	100.0%
	% within Firm Size	48.8%	33.3%	44.3%
	% of Total	34.4%	9.8%	44.3%
Only One	Count	15	8	23
	Expected Count	16.2	6.8	23.0
	% within The Number of Internal Techniques Used	65.2%	34.8%	100.0%
	% within Firm Size	34.9%	44.4%	37.7%
	% of Total	24.6%	13.1%	37.7%
Two Techniques	Count	6	3	9
	Expected Count	6.3	2.7	9.0
	% within The Number of Internal Techniques Used	66.7%	33.3%	100.0%
	% within Firm Size	14.0%	16.7%	14.8%
	% of Total	9.8%	4.9%	14.8%
Three Techniques or more	Count	1	1	2
	Expected Count	1.4	.6	2.0
	% within The Number of Internal Techniques Used	50.0%	50.0%	100.0%
	% within Firm Size	2.3%	5.6%	3.3%
	% of Total	1.6%	1.6%	3.3%
Total	Count	43	18	61
	Expected Count	43.0	18.0	61.0
	% within The Number of Internal Techniques Used	70.5%	29.5%	100.0%
	% within Firm Size	100.0%	100.0%	100.0%
	% of Total	70.5%	29.5%	100.0%

APPENDIX C.25A
CHI-SQUARE TEST FOR INDEPENDENCE OF INTERNAL TECHNIQUES USED AND
THE FIRM SIZE IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.464(a)	3	.691
Likelihood Ratio	1.456	3	.692
Linear-by-Linear Association	1.137	1	.286
N of Valid Cases	61		
a) 3 cells (37.5%) have expected count less than 5. The minimum expected count is .59.			

APPENDIX C.26
TWO-WAY TABLE OF CHI-SQUARE TEST BETWEEN
THE NUMBER OF EXTERNAL TECHNIQUES USED AND THE FIRM SIZE
IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

The Number of External Techniques Used		Firm Size		Total
		Smaller Firms	Bigger Firms	
No Tech.	Count	1	0	1
	Expected Count	.7	.3	1.0
	% within The Number of External Techniques Used	100.0%	.0%	100.0%
	% within Firm Size	2.3%	.0%	1.6%
	% of Total	1.6%	.0%	1.6%
Only One	Count	12	0	12
	Expected Count	8.5	3.5	12.0
	% within The Number of External Techniques Used	100.0%	.0%	100.0%
	% within Firm Size	27.9%	.0%	19.7%
	% of Total	19.7%	.0%	19.7%
Two Techniques	Count	25	6	31
	Expected Count	21.9	9.1	31.0
	% within The Number of External Techniques Used	80.6%	19.4%	100.0%
	% within Firm Size	58.1%	33.3%	50.8%
	% of Total	41.0%	9.8%	50.8%

APPENDIX C.26 CONTINUED

The Number of External Techniques Used		Firm Size		Total
		Smaller Firms	Bigger Firms	
Three Techniques or more	Count	5	12	17
	Expected Count	12.0	5.0	17.0
	% within The Number of External Techniques Used	29.4%	70.6%	100.0%
	% within Firm Size	11.6%	66.7%	27.9%
	% of Total	8.2%	19.7%	27.9%
Total	Count	43	18	61
	Expected Count	43.0	18.0	61.0
	% within The Number of External Techniques Used	70.5%	29.5%	100.0%
	% within Firm Size	100.0%	100.0%	100.0%
	% of Total	70.5%	29.5%	100.0%

APPENDIX C.26A

**CHI-SQUARE TEST FOR INDEPENDENCE OF EXTERNAL TECHNIQUES USED AND
THE FIRM SIZE IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS**

	Value	df	Asymptotic Sig. (2-sided)
Pearson Chi-Square	20.770(a)	3	.000
Likelihood Ratio	22.951	3	.000
Linear-by-Linear Association	17.782	1	.000
N of Valid Cases	61		
a) 3 cells (37.5%) have expected count less than 5. The minimum expected count is .30.			

APPENDIX C.27
TWO-WAY TABLE OF CHI-SQUARE TEST BETWEEN
THE ACTIVE VS PASSIVE POLICY USED AND THE DEGREE OF FOREIGN
INVOLVEMENT (DFI) IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

Active versus Passive Policy		The Degree of Foreign Involvement		Total
		Lower Degree	Higher Degree	
Passive	Count	8	30	38
	Expected Count	13.1	24.9	38.0
	% within Active versus Passive Policy	21.1%	78.9%	100.0%
	% within The Degree of Foreign Involvement	38.1%	75.0%	62.3%
	% of Total	13.1%	49.2%	62.3%
Active	Count	13	10	23
	Expected Count	7.9	15.1	23.0
	% within Active versus Passive Policy	56.5%	43.5%	100.0%
	% within The Degree of Foreign Involvement	61.9%	25.0%	37.7%
	% of Total	21.3%	16.4%	37.7%
Total	Count	21	40	61
	Expected Count	21.0	40.0	61.0
	% within Active versus Passive Policy	34.4%	65.6%	100.0%
	% within The Degree of Foreign Involvement	100.0%	100.0%	100.0%
	% of Total	34.4%	65.6%	100.0%

APPENDIX C.27A
CHI-SQUARE TEST FOR INDEPENDENCE OF ACTIVE VS PASSIVE POLICY USED AND
THE DEGREE OF FOREIGN INVOLVEMENT (DFI)
IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

	Value	df	Asymptotic Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.985(b)	1	.005		
Continuity Correction(a)	6.491	1	.011		
Likelihood Ratio	7.940	1	.005		
Fisher's Exact Test				.006	.006
Linear-by-Linear Association	7.854	1	.005		
N of Valid Cases	61				
a) Computed only for a 2x2 table					
b) 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.92.					

APPENDIX C.28
TWO-WAY TABLE OF CHI-SQUARE TEST BETWEEN
THE DEGREE OF CENTRALIZATION AND THE DEGREE OF FOREIGN
INVOLVEMENT (DFI) IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

The Degree of Centralization		The Degree of Foreign Involvement		Total
		Lower Degree	Higher Degree	
Lower Degree	Count	8	6	14
	Expected Count	4.8	9.2	14.0
	% within The Degree of Centralization	57.1%	42.9%	100.0%
	% within The Degree of Foreign Involvement	38.1%	15.0%	23.0%
	% of Total	13.1%	9.8%	23.0%
Higher Degree	Count	7	24	31
	Expected Count	10.7	20.3	31.0
	% within The Degree of Centralization	22.6%	77.4%	100.0%
	% within The Degree of Foreign Involvement	33.3%	60.0%	50.8%
	% of Total	11.5%	39.3%	50.8%
Decentralized	Count	6	10	16
	Expected Count	5.5	10.5	16.0
	% within The Degree of Centralization	37.5%	62.5%	100.0%
	% within The Degree of Foreign Involvement	28.6%	25.0%	26.2%
	% of Total	9.8%	16.4%	26.2%
Total	Count	21	40	61
	Expected Count	21.0	40.0	61.0
	% within The Degree of Centralization	34.4%	65.6%	100.0%
	% within The Degree of Foreign Involvement	100.0%	100.0%	100.0%
	% of Total	34.4%	65.6%	100.0%

APPENDIX C.28A
CHI-SQUARE TEST FOR INDEPENDENCE OF ACTIVE VS PASSIVE POLICY USED AND
THE DEGREE OF FOREIGN INVOLVEMENT (DFI)
IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

	Value	df	Asymptotic Sig. (2-sided)
Pearson Chi-Square	5.194(a)	2	.074
Likelihood Ratio	5.137	2	.077

APPENDIX C.28A CONTINUED

	Value	df	Asymptotic Sig. (2-sided)
Linear-by-Linear Association	1.052	1	.305
N of Valid Cases	61		
a) 1 cell (16.7%) has expected count less than 5. The minimum expected count is 4.82.			

APPENDIX C.29
TWO-WAY TABLE OF CHI-SQUARE TEST BETWEEN
THE NUMBER OF INTERNAL TECHNIQUES USED AND THE DEGREE OF FOREIGN
INVOLVEMENT (DFI) IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

The Number of Internal Techniques Used		The Degree of Foreign Involvement		Total
		Lower Degree	Higher Degree	
No Techniques	Count	10	17	27
	Expected Count	9.3	17.7	27.0
	% within The Number of Internal Techniques Used	37.0%	63.0%	100.0%
	% within The Degree of Foreign Involvement	47.6%	42.5%	44.3%
	% of Total	16.4%	27.9%	44.3%
Only One	Count	6	17	23
	Expected Count	7.9	15.1	23.0
	% within The Number of Internal Techniques Used	26.1%	73.9%	100.0%
	% within The Degree of Foreign Involvement	28.6%	42.5%	37.7%
	% of Total	9.8%	27.9%	37.7%
Two Techniques	Count	4	5	9
	Expected Count	3.1	5.9	9.0
	% within The Number of Internal Techniques Used	44.4%	55.6%	100.0%
	% within The Degree of Foreign Involvement	19.0%	12.5%	14.8%
	% of Total	6.6%	8.2%	14.8%
Three Techniques or more	Count	1	1	2
	Expected Count	.7	1.3	2.0
	% within The Number of Internal Techniques Used	50.0%	50.0%	100.0%

APPENDIX C.29 CONTINUED

The Number of Internal Techniques Used		The Degree of Foreign Involvement		Total
		Lower Degree	Higher Degree	
	% within The Degree of Foreign Involvement	4.8%	2.5%	3.3%
	% of Total	1.6%	1.6%	3.3%
Total	Count	21	40	61
	Expected Count	21.0	40.0	61.0
	% within The Number of Internal Techniques Used	34.4%	65.6%	100.0%
	% within The Degree of Foreign Involvement	100.0%	100.0%	100.0%
	% of Total	34.4%	65.6%	100.0%

APPENDIX C.29A
 CHI-SQUARE TEST FOR INDEPENDENCE OF INTERNAL TECHNIQUES USED AND
 THE DEGREE OF FOREIGN INVOLVEMENT (DFI)
 IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
 BY AUSTRALIAN FIRMS

	Value	df	Asymptotic Sig. (2-sided)
Pearson Chi-Square	1.405(a)	3	.704
Likelihood Ratio	1.412	3	.703
Linear-by-Linear Association	.072	1	.789
N of Valid Cases	61		
a) 3 cells (37.5%) have expected count less than 5. The minimum expected count is .69.			

APPENDIX C.30
TWO-WAY TABLE OF CHI-SQUARE TEST BETWEEN
THE NUMBER OF EXTERNAL TECHNIQUES USED AND THE DEGREE OF FOREIGN
INVOLVEMENT (DFI) IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

The Number of External Techniques Used		The Degree of Foreign Involvement		Total
		Lower Degree	Higher Degree	
No Tech.	Count	1	0	1
	Expected Count	.3	.7	1.0
	% within The Number of External Techniques Used	100.0%	.0%	100.0%
	% within The Degree of Foreign Involvement	4.8%	.0%	1.6%
	% of Total	1.6%	.0%	1.6%
Only One	Count	7	5	12
	Expected Count	4.1	7.9	12.0
	% within The Number of External Techniques Used	58.3%	41.7%	100.0%
	% within The Degree of Foreign Involvement	33.3%	12.5%	19.7%
	% of Total	11.5%	8.2%	19.7%
Two Techniques	Count	10	21	31
	Expected Count	10.7	20.3	31.0
	% within The Number of External Techniques Used	32.3%	67.7%	100.0%
	% within The Degree of Foreign Involvement	47.6%	52.5%	50.8%
	% of Total	16.4%	34.4%	50.8%
Two Techniques	Count	3	14	17
	Expected Count	5.9	11.1	17.0
	% within The Number of External Techniques Used	17.6%	82.4%	100.0%
	% within The Degree of Foreign Involvement	14.3%	35.0%	27.9%
	% of Total	4.9%	23.0%	27.9%
Total	Count	21	40	61
	Expected Count	21.0	40.0	61.0
	% within The Number of External Techniques Used	34.4%	65.6%	100.0%
	% within The Degree of Foreign Involvement	100.0%	100.0%	100.0%
	% of Total	34.4%	65.6%	100.0%

APPENDIX C.30A
CHI-SQUARE TEST FOR INDEPENDENCE OF EXTERNAL TECHNIQUES USED AND
THE DEGREE OF FOREIGN INVOLVEMENT (DFI)
IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

	Value	df	Asymptotic Sig. (2-sided)
Pearson Chi-Square	7.128(a)	3	.068
Likelihood Ratio	7.416	3	.060
Linear-by-Linear Association	6.560	1	.010
N of Valid Cases	61		
a) 3 cells (37.5%) have expected count less than 5. The minimum expected count is .34.			

APPENDIX C.31
TWO-WAY TABLE OF CHI-SQUARE TEST BETWEEN
ACTIVE VS PASSIVE POLICY USED AND OWNERSHIP IN
FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

Active versus Passive Policy		Ultimate Ownership		Total
		Foreign-owned	Australian-owned	
Passive	Count	25	13	38
	Expected Count	23.7	14.3	38.0
	% within Active versus Passive Policy	65.8%	34.2%	100.0%
	% within Ultimate Ownership	65.8%	56.5%	62.3%
	% of Total	41.0%	21.3%	62.3%
Active	Count	13	10	23
	Expected Count	14.3	8.7	23.0
	% within Active versus Passive Policy	56.5%	43.5%	100.0%
	% within Ultimate Ownership	34.2%	43.5%	37.7%
	% of Total	21.3%	16.4%	37.7%
Total	Count	38	23	61
	Expected Count	38.0	23.0	61.0
	% within Active versus Passive Policy	62.3%	37.7%	100.0%
	% within Ultimate Ownership	100.0%	100.0%	100.0%
	% of Total	62.3%	37.7%	100.0%

APPENDIX C.31A
CHI-SQUARE TEST FOR INDEPENDENCE OF ACTIVE VS PASSIVE POLICY USED
AND OWNERSHIP IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

	Value	df	Asymptotic Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.524(b)	1	.469		
Continuity Correction(a)	.204	1	.652		
Likelihood Ratio	.521	1	.470		
Fisher's Exact Test				.587	.325
Linear-by-Linear Association	.515	1	.473		
N of Valid Cases	61				
a) Computed only for a 2x2 table					
b) 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.67.					

APPENDIX C.32
TWO-WAY TABLE OF CHI-SQUARE TEST BETWEEN
THE DEGREE OF CENTRALIZATION AND OWNERSHIP IN
FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

The Degree of Centralization		Ultimate Ownership		Total
		Foreign-owned	Australian-owned	
Lower Degree	Count	8	6	14
	Expected Count	8.7	5.3	14.0
	% within The Degree of Centralization	57.1%	42.9%	100.0%
	% within Ultimate Ownership	21.1%	26.1%	23.0%
	% of Total	13.1%	9.8%	23.0%
Higher Degree	Count	24	7	31
	Expected Count	19.3	11.7	31.0
	% within The Degree of Centralization	77.4%	22.6%	100.0%
	% within Ultimate Ownership	63.2%	30.4%	50.8%
	% of Total	39.3%	11.5%	50.8%
Decentralized	Count	6	10	16

APPENDIX C.32 CONTINUED

The Degree of Centralization		Ultimate Ownership		Total
		Foreign-owned	Australian-owned	
	Expected Count	10.0	6.0	16.0
	% within The Degree of Centralization	37.5%	62.5%	100.0%
	% within Ultimate Ownership	15.8%	43.5%	26.2%
	% of Total	9.8%	16.4%	26.2%
Total	Count	38	23	61
	Expected Count	38.0	23.0	61.0
	% within The Degree of Centralization	62.3%	37.7%	100.0%
	% within Ultimate Ownership	100.0%	100.0%	100.0%
	% of Total	62.3%	37.7%	100.0%

APPENDIX C.32A

**CHI-SQUARE TEST FOR INDEPENDENCE OF THE DEGREE OF CENTRALIZATION
AND OWNERSHIP IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS**

	Value	df	Asymptotic Sig. (2-sided)
Pearson Chi-Square	7.365(a)	2	.025
Likelihood Ratio	7.428	2	.024
Linear-by-Linear Association	1.474	1	.225
N of Valid Cases	61		
a) 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.28.			

APPENDIX C.33

**TWO-WAY TABLE OF CHI-SQUARE TEST BETWEEN
THE NUMBER OF INTERNAL TECHNIQUES USED AND OWNERSHIP IN
FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS**

The Number of Internal Techniques Used		Ultimate Ownership		Total
		Foreign-owned	Australian-owned	
No Techniques	Count	16	11	27
	Expected Count	16.8	10.2	27.0
	% within The Number of Internal Techniques Used	59.3%	40.7%	100.0%
	% within Ultimate Ownership	42.1%	47.8%	44.3%

APPENDIX C.33 CONTINUED

The Number of Internal Techniques Used		Ultimate Ownership		Total
		Foreign-owned	Australian-owned	
Only One	% of Total	26.2%	18.0%	44.3%
	Count	15	8	23
	Expected Count	14.3	8.7	23.0
	% within The Number of Internal Techniques Used	65.2%	34.8%	100.0%
	% within Ultimate Ownership	39.5%	34.8%	37.7%
	% of Total	24.6%	13.1%	37.7%
Two Techniques	Count	6	3	9
	Expected Count	5.6	3.4	9.0
	% within The Number of Internal Techniques Used	66.7%	33.3%	100.0%
	% within Ultimate Ownership	15.8%	13.0%	14.8%
	% of Total	9.8%	4.9%	14.8%
	Count	1	1	2
Three Techniques or more	Expected Count	1.2	.8	2.0
	% within The Number of Internal Techniques Used	50.0%	50.0%	100.0%
	% within Ultimate Ownership	2.6%	4.3%	3.3%
	% of Total	1.6%	1.6%	3.3%
	Count	38	23	61
	Expected Count	38.0	23.0	61.0
Total	% within The Number of Internal Techniques Used	62.3%	37.7%	100.0%
	% within Ultimate Ownership	100.0%	100.0%	100.0%
	% of Total	62.3%	37.7%	100.0%
	Count	38	23	61

APPENDIX C.33A
CHI-SQUARE TEST FOR INDEPENDENCE OF THE NUMBER OF INTERNAL
TECHNIQUES USED AND OWNERSHIP IN
FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

	Value	df	Asymptotic Sig. (2-sided)
Pearson Chi-Square	.392(a)	3	.942
Likelihood Ratio	.389	3	.943
Linear-by-Linear Association	.053	1	.817
N of Valid Cases	61		
a) 3 cells (37.5%) have expected count less than 5. The minimum expected count is .75.			

APPENDIX C.34
TWO-WAY TABLE OF CHI-SQUARE TEST BETWEEN
THE NUMBER OF EXTERNAL TECHNIQUES USED AND OWNERSHIP
IN FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

The Number of External Techniques Used		Ultimate Ownership		Total
		Foreign-owned	Australian-owned	
No Tech.	Count	0	1	1
	Expected Count	.6	.4	1.0
	% within The Number of External Techniques Used	.0%	100.0%	100.0%
	% within Ultimate Ownership	.0%	4.3%	1.6%
	% of Total	.0%	1.6%	1.6%
Only One	Count	8	4	12
	Expected Count	7.5	4.5	12.0
	% within The Number of External Techniques Used	66.7%	33.3%	100.0%
	% within Ultimate Ownership	21.1%	17.4%	19.7%
	% of Total	13.1%	6.6%	19.7%
Two Techniques	Count	19	12	31
	Expected Count	19.3	11.7	31.0
	% within The Number of External Techniques Used	61.3%	38.7%	100.0%
	% within Ultimate Ownership	50.0%	52.2%	50.8%
	% of Total	31.1%	19.7%	50.8%
Three Techniques or more	Count	11	6	17
	Expected Count	10.6	6.4	17.0
	% within The Number of External Techniques Used	64.7%	35.3%	100.0%
	% within Ultimate Ownership	28.9%	26.1%	27.9%
	% of Total	18.0%	9.8%	27.9%
Total	Count	38	23	61
	Expected Count	38.0	23.0	61.0
	% within The Number of External Techniques Used	62.3%	37.7%	100.0%
	% within Ultimate Ownership	100.0%	100.0%	100.0%
	% of Total	62.3%	37.7%	100.0%

APPENDIX C.34A
CHI-SQUARE TEST FOR INDEPENDENCE OF THE NUMBER OF
EXTERNAL TECHNIQUES USED AND OWNERSHIP IN
FOREIGN EXCHANGE EXPOSURE MANAGEMENT
BY AUSTRALIAN FIRMS

	Value	df	Asymptotic Sig. (2-sided)
Pearson Chi-Square	1.805(a)	3	.614
Likelihood Ratio	2.106	3	.551
Linear-by-Linear Association	.163	1	.686
N of Valid Cases	61		
a) 3 cells (37.5%) have expected count less than 5. The minimum expected count is .38.			