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Master Thesis, Spring 2007

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Foreign Exchange Risk Management in Multinationals:

An Empirical Investigation on China, Japan and US
Acknowledgements

We first would like to address our gratitude towards Umea School of Business and Economics for giving us the opportunity to study in the Master Program of Accounting and Finance as the international students.

Then, a special thank to our supervisor Kerstin Nilsson for her great help and precious recommendations throughout the work with the thesis.

Finally, we would like to send a sincere thank to our family and friends who always support us, help us and give us encouragement.

Thank you all!

Li Lei
Niannian Ma
Abstract

Companies especially multinational companies are now exposed to risks caused by unexpected movements in exchange rate. The management of foreign exchange risk has become essential for the survival of companies in today’s volatile financial markets.

This paper reviews the traditional types of exchange rate risk faced by firms, namely translation, transaction and operating risk, presents measurement and management method for foreign exchange exposure and objectives of foreign exchange management.

The central purpose of this thesis is to examine the foreign exchange risk management in American, Japanese and Chinese companies by comparing hedging practices among 30 companies, of which are 10 from each country.

We approach our research by analyzing the annual report of our sample companies in the year of 2006, it is found that American and Japanese companies tend to hedge foreign exchange risk more than Chinese companies, also have more diversity of derivatives usage. Although China has reformed the exchange rate policy from pegging US dollar to a managed floating exchange rate system recently, it is still suggested that Chinese firms are less active than American and Japanese firms in the foreign exchange management activity. After we did our research, we found the companies always put focus on hedging transaction risk, the companies in China prefer to use home country currency as function currency while American and Japanese companies prefer to use domestic currency as function currency.

So after we did our analysis, we feel that in China, the company need to reinforce the consciousness to hedge exchange rate risk, use diversification instrument to hedge foreign exchange risk and doing adjustment in accounting rules in translation of foreign currencies.

For very little have been investigated on financial risk management in Chinese companies, we wish our study can contribute to the foreign exchange risk management research.
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1. Introduction

In this chapter, we will present our background of our research. Based on the background, we pose this research question and then followed a proposition for firm’s foreign exchange risk management.

1.1 Background of the study

With the accelerate development of economic globalization since 70’s last century, companies today operate in an integrated world marketplace. The international market introduces the global producer, supplier, customer, also competitor. It is common to know that money has no national boundary. Meantime, our increasing global business environment has brought new problems and opportunities for many organizations. They are facing with great pressure of operation risk, investment risk and financing risk. So a good knowledge of different risks and how to hedge or control the risk have become more important issue for those organizations. In particularly, the foreign exchange risk has been put up to the first place to be concerned for an effective management for multinational corporations, which play the most important role in globalization.

A multinational corporation (MNC) or multinational enterprise (MNE) is a corporation or enterprise that manages production establishments or delivers services in at least two countries.1

In recent years, foreign exchange risk management has received increasing attention in both corporate practice and the literature. A number of studies have contributed to develop the theory and provide insights into the corporate practices of the foreign exchange risk management, focusing on different aspects. Some of them attempted to study the exchange rate behavior such as Charles, Ronald and Herman (2000) and the volatility of the exchange rate such as Andersen, Bollerslev, Diebold and Paul (2001). A better understanding of foreign exchange risk which is essential for multinational firm’s management in today’s business market should start from knowing of volatile foreign exchange rates. The current international monetary system is characterized by a mix of floating and managed exchange rate policies pursued by each nation in its own best interest. Any appreciation of a currency relative value will bring exports decline or imports increase, vice versa. All firms must understand foreign exchange risk in order to anticipate increased competition from imports or to realize increased opportunities for exports. Since multinational firms have the advantage of being geographically diversified, they can easily shift production to countries with relatively undervalued currencies and to promote sales in countries with overvalued currencies and successfully hedge the risk even make

profit from that if they have understood the foreign exchange risk very well and effective risk management.

The foreign exchange risk manifests in different kind of exposures, which generally refer to the degree to which a company is affected by exchange rate changes. With ability to predict the foreign exchange rate, firms aim to measure foreign exchange exposure and further to manage it so as to maximize the profitability, net cash flow, and market value of the firm. Some researchers such as Bodnar and Marston (2000) and Lloyd, Baeyong and Mark (2006) have investigated the foreign exchange exposure and construct useful model to measure them. Based on the measurement of three basic types of exposure which are translation exposure, transaction exposure and operating exposure, several methods are available for managing foreign exchange exposure, including external methods with the use of financial derivatives such as forward contracts, futures, options and swaps, and internal methods like currency matching and netting. However, the question whether companies should or should not implement hedging strategies to reduce their foreign exchange exposure is still going on. Pramborg (2002) in his essays on “foreign exchange risk management” mentioned that Stulz (1984), Smith and Stulz (1985), DeMarzo and Duffie (1995), Froot et al. (1993), Nance et al. (1993), Mian (1996), Tufano (1996), and Geczy et al. (1997) have provided useful information on numerous valid reasons why companies should consider hedging to maximize shareholder wealth. Many prior studies pertaining to hedging have primarily focused on the use of derivative financial instruments not only in local markets, but compared derivatives used between countries, for example, Bodnar et al. (1995, 1996, 1998); Grant/Marshall (1997); Gregory (2000). These empirical studies were interested not only from an academic standpoint, but answers to the question of how corporate risk management should be organized, and provide managers with information on the current practices of other firms.

In our review, most empirical analyses are dominated by studies of US multinationals but few studied China. While, recently in July of the year 2005, China state announced it would immediately appreciate the RMB (Chinese Yuan) to the US dollar by 2.1% and began to adopt a floating exchange rate policy with abandoning its pegging to US dollar, more pressure about foreign exchange risk unavoidably should be taken for Chinese firms involved importing and exporting business. So it made us interested to explore the study for the foreign exchange risk management of Chinese firms. Our study examine the risk management practice of Chinese multinationals and comparison with US firms who has much experience in the foreign exchange risk management as the most developed represent, as well as with Japan the other Asian country as more advanced than China in this area. The main focus of our research is with multinationals’ perception of foreign exchange risk and how to managing the risk by those firms. Further we go to the control function for the multinational corporation. Based on our research for the foreign exchange risk stated above, we present several principal factors for the foreign exchange risk management.
1.2 Research question

- What exchange risk does the MNC face and whether they hedge or not?
- Whether these companies used derivatives instruments to hedge exchange rate risk or not?
- What kinds of derivative instruments are used in these companies?
- What are the objectives of foreign exchange risk management? (focus on translation, transaction or operating)
- How do these companies measure their foreign exchange exposure and the compliance with accounting rules requirement?

1.3 Purpose

The aim of this thesis is to describe the current actuality of the foreign exchange risk management in multinational companies of three countries (American, Japanese and Chinese companies).

1.4 Disposition

Chapter one: Introduction
Content: This part is where we introduced, the importance of the foreign exchange risk management, the study background and our study motive. The research problem has been brought up, and we provide reader with our research purpose.

Chapter two: Literature review
Content: It is the literature review part. Main contents would be the fundamental theory of foreign exchange risk management, includes concepts of foreign exchange risks, the classification, its characteristics and countermeasures for those foreign exchange risk by hedging, which mainly include the general objective and fundamental principle of foreign exchange risks, internal and external techniques.

Chapter three: Research methodology
Content: The third part is to provide reader with the methods used for the empirical study carried out, procedure of how the data was selected, gathered and analyzed.

Chapter four: Empirical findings
Content: In this chapter, we will use the data from annual report to do our research among America, Japan and China. These results will help us to analysis foreign exchange rate risk management in those three countries.

Chapter five: Comparative Analysis
Content: In this part, we will compare empirical results from other persons with our results comes from chapter 4.
Chapter six: Conclusions and Recommendations
Finally, chapter 5 will embody the summary of our empirical findings, implications and conclusions connected to the research question and existing theory. It also presents some suggestions for further research and evaluation our study.
2. Literature review

This chapter reviews the literature theory of foreign exchange risk management include the concepts of foreign exchange risks, its characteristics by different types, and hedge theory of foreign exchange risks.

2.1 Foreign exchange risk

2.1.1 The conception of foreign exchange risk

What is foreign exchange risk? There are different definitions of exchange rate risk which can be found in the literature. A book “New Developments in International Finance” edited by Stern and Chew (1987) introduces foreign exchange risk definitions by different authors. Niso Abuaf (P.29) defines “foreign exchange risk is the chance that fluctuations in the exchange rate will change the profitability of a transaction from its expected value”. It is a definition in terms of financial risk. Another definition is from Cornell and Shapiro (P.45) showed in the same book “we will define exchange risk - as the variability in the value of a firm as measured by the present value of its expected future cash flows - caused by uncertain exchange rate changes”. Here they emphasis on firms’ the cash flows. While Hekman (P.60) defines currency risk in terms of the control of firms as the possibility that operating and financial results might exceed or fall short of budget.

A common definition of exchange rate risk relates to the effect of unexpected exchange rate changes on the value of the firm by Madura (1989). It implies that the risk consists of the direct loss (as a result of an unhedged exposure) and indirect loss in the firm’s cash flows, assets and liabilities, net profit and its stock market value from an exchange rate change.

2.1.2 The existing classifications of foreign exchange risks

Since the first writer who was Ankrom (1974) to classify the exchange risks as translation, transaction and economic risks, it has developed by many other writers such as Walker (1978), Wihlborg (1980), Dumas (1984), Shapiro (1989). Currently, there are three main types and their explanations which are considered in this research were given by Shapiro (2006):

1. “Translation exposure, also known as accounting exposure, arises from the need, for purposes of reporting and consolidation, to convert the financial statements of foreign operations from the local currencies (LC) involved to the home currency (HC). If exchange rates have changed, liabilities, revenues, expenses, gains, and losses that are denominated in foreign currencies will result in foreign exchange gains or losses.”
It is basically balance sheet exchange rate risk and impacts balance sheet assets and liabilities and income statement items that already exist.

2. “Transaction exposure, result from transactions that give rise to know, contractually binding future foreign-currency-denominated cash inflows or outflows. As exchange rates change between now and when these transactions settle, so does the value of their associated foreign currency cash flows, leading to currency gains and losses.”

It is basically cash flow risk and this exposure deals with changes in cash flows as the result from existing contractual obligations, such as the effect of exchange rate moves on transactional account exposure related to receivables (export contracts), payables (import contracts) or repatriation of dividends.

3. “Operating exposure, measures the extent to which currency fluctuations can alter a company’s future operating cash flows, that is, its future revenues and costs.” “The firm faces operating exposure the moment it invests in servicing a market subject to foreign competition or in sourcing goods or inputs abroad. This investment includes new-product development, a distribution network, foreign supply contracts, or production facilities.”

It is also cash flow risk but impacts revenues and costs associated with future sales.

Shapiro calls the combination of the two cash flow exposures – transaction exposure and operating exposure as economic exposure, which reflects basically the risk to the firm’s present value of its expected cash flows from exchange rate movements. Essentially speaking, economic risk concerns the effect of exchange rate changes both on revenues (domestic sales and exports) and operating expenses (domestic inputs cost and imports). It is essential for firm’s management to explore a strategy of managing foreign exchange risk that they have a clear identification of the various types of currency risk, along with their measurement.

2.2 Measurement of foreign exchange risk

For the characteristic of multinational firms, they must face foreign exchange exposure. Next should be the measurement of risks which is a crucial aspect for exchange risk management.

2.2.1 Measures of translation exposure

There are four principal translation methods in the literature: the current/noncurrent method, the monetary/nonmonetary method, the temporal method, and the current rate method, each of which is well demonstrated as the following table:
MEASURES OF ACCOUNTING EXPOSURE²

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<th>Current/Noncurrent</th>
<th>Monetary/Nonmonetary</th>
<th>Temporal</th>
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<td>Marketable Securities (At Market Value)</td>
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<td>Accounts Receivable</td>
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<td>Inventory (At Cost)</td>
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<td>Fixed Assets</td>
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<td><strong>LIABILITIES</strong></td>
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<td>Current Liabilities</td>
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<td>Long Term Debt</td>
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<td>Adjustment</td>
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Note: In the case of Income Statements, sales revenues and interest are generally translated at the average historical exchange rate that prevailed during the period; depreciation is translated at the appropriate historical exchange rate. Some of the general and administrative expenses as well as cost-of-goods-sold are translated at historical exchange rates, others at current rates.

"C" = Assets and liabilities are translated at the current rate, or rate prevailing on the date of the balance sheet.

"H" = Assets and liabilities are translated at the historical rate.

For the issue that which of these four methods should be used in the translation financial statement, the Financial Accounting Standard Board's Standard 8 (FAS 8) which came to govern the treatment of translation of foreign currency financial statements from 1975 required that companies use temporal method for translation and the gain or loss result from translation should be included in the income

statement. But this treatment was argued that it produced gains and losses which were not the economic reality of a company’s business. Thus any hedging for translation exposure under that method seems not realistic meaning. Till the advent of Standard 52 issued by the Financial Accounting Standards Board at the end of 1981, which replaces FAS 8 require companies to use the current rate method as the basic translation rule. FAS 52 introduced functional currency which is identified by each company for the primary economic environment and selected for each of the company’s foreign entities. If the functional currency is a foreign currency, FAS 52 requires to use the current rate method with any translation gain and loss taken directly to shareholders equity. If the functional currency is the parent’s company currency, it follows the rules of FAS 8. The above mentioned issue can be referred to Adrian Buckley’s book (2004) named “Multinational finance” (P145-152).

2.2.2 Measures of economic exposure

Since Dumas (1978) and Adler and Dumas (1980, 1984) defined foreign exchange exposure in terms of a regression of asset value on the exchange rate and suggested that exchange rate exposure of firms can be measured by the sensitivity of stock returns to exchange rate movements, many works such as Bodnar and Gentry (1993), Popper (1997) and recently Martin & Mauer (2003, 2005), have been done to investigate the exchange exposure. While measuring currency risk may prove difficult, at least with regards to economic risk as Holton (2003) indicated. A widely used method nowadays is the value-at-risk (VaR) model. Broadly, value at risk is defined as the maximum loss for a given exposure over a given time horizon with z% confidence which defined by Michael Papaioannou (2006).

2.3 Foreign exchange risk management

2.3.1 Corporate objectives of risk management

Having identified its foreign exchange exposures and measured the associated risk, the company should decide whether to hedge these risks or not, further know how these risks are handled. A contributed idea raised by Oxelheim and Wihlborg (1987) concerned currency risk as follows:

- “Risk aversion: This is seen as a wish to reduce the variability of the cash flows of business.”
- “The target variable: What precisely is the company trying to maximize or stabilize; Measurement in accounting or cash flow terms; Measurement in nominal or real terms”

An effective foreign exchange risk management requires well defined objectives which should reflect management’s attitude toward foreign exchange risk. For the decision to hedge or not to hedge the exchange exposure depends on the risk attitude of the company’s management, hedging strategy hence is practiced differently. Risk
averse companies want to hedge every exposure when any exposure arises, while on the contrary, risk taker companies would like to leave the exposure unhedged which is from the idea that the management of financial risks is unnecessary and the gain and loss will finally offset in term of equilibrium relationships in the international financial markets. This attitude is pointed by Dufey and Srinivasulu (1984): "Foreign exchange risk does not exist; even if it exists, it need not be hedged; even it is to be hedged, corporations need not hedge it." Although more practically oriented literature, it was generally agued that firms involved importing or exporting business as well as multinational corporations should hedge foreign exchange exposure as a risk averse attitude. Mostly in the real world, companies engage to manage foreign exchange exposure within an acceptable limit in stead of adopting neither of the two attitudes.

Management should be responsible for ensuring to take appropriate and economical action based on after-tax term to decrease exposure. Primarily, the objectives of foreign exchange risk management should be in line with the corporate objectives.

2.3.2 Theoretical appraisal of managing foreign exchange exposure

There is a basic strategy for hedging translation exposure is to increase hard currency (likely to appreciate) assets and decrease soft currency (likely to depreciated) assets, simultaneously to decrease hard currency liabilities and increase soft currency liabilities. However, many debates related to whether to hedge translation exposure exist in finance literature. Pramborg (2002) concludes that transaction exposure hedging comes to add value for Swedish companies while there is no positive value effect from translation exposure hedging. Butler (1999) pointed that it supports the general suggestion of the finance literature not to worry about this type of exposure and thus not to hedge it. The reasons are that translation exposure is uneconomic since it is based on historical book values and has no any direct impact on the firm’s cash flows. Thus, what should concern management is cash flow exposure.

Previous empirical studies by Belk and Glaum (1990) and Aobo (1999) who have investigated the foreign exchange risk management in UK and US multinationals, show that the management of transaction exposure is the focus of corporate exchange risk management for the transaction exposure influences the real cash flow.

Comparing to translation and transaction exposure, operating exposure is less precise and more difficult to manage. It is defined as the sensitivity of the firm’s future cash flows to unexpected exchange rate changes and changes in the competitive environment caused by these currency movements. Belk and Glaum (1990) found that companies were less concerned about the real impact of exchange rate changes on the competitive position of the companies. Bradley and Moles (2002) find that there is a significant relationship between a firm’s exchange rate sensitivity and the degree to which it sales, sources and funds itself internationally. According to Shapiro (2006), it could be concluded that a firm's operating exposure is attributed to the differentiated a
company’s product is, the international diversified its competitors is, the ability to shift production, the sourcing of inputs among countries, and fluctuations in the real exchange rate. To some extent, the greater the activities of firms in foreign markets, the larger its operating exposure is expected to be.

Whereas firms can easily hedge transaction exposure, competitive exposure (operating exposure) are longer-term and can not be dealt with solely through financial hedging techniques, they rather require making the longer-term operating adjustments concluded by Shapiro (2006). A strategic reorientation of operating policies regarding pricing, sourcing, location of production and financing needs corporate managements not only financial managers concern. Moffet and Karlsen (1994) describe the use of production, financial and marketing policies to manage economic currency exposures as 'natural hedging'. As being in a globalization business environment, diversification of international operations is crucial for multinational corporations to manage operating exposure. So it can provide companies maintain competitive advantage and defensive reactions to adverse exchange rate movement. When the domestic production or service cost of a firm is affected by an exchange rate changes relative to those of producing in a foreign country, the firm can shift product sourcing from those countries whose currency is depreciated or plant relocated there. The strategic marketing and production adjustments have in common is for cost-effective. Another operational process used to hedge operating exposure is financial management, which is structuring the firm’s assets and liabilities. One possibility is to finance the portion of a firm’s assets used to create export profits so that changes in foreign assets values caused by an exchange rate change is offset by relative changes in the debt expense in the same currency. For example, a firm should hold debt in currency of a foreign country, in which the firm develops a sizable export market. Current literature such as Glaum (1990) suggests economic exposure management should be incorporated into the long-range, strategic planning system of the corporation and integrated with all areas of corporate decision-making.

2.3.3 Tools and techniques for foreign exchange risk management

Today foreign exchange risk could not only influence a firm’s quarterly earnings, but also determine its survival. A variety of financial instruments emerge as the financial markets require managing the different growing exposure that firms face. For managing foreign exchange risk, there exist internal techniques such as matching inflows and outflows, inter-company netting of receipts and payments, transfer pricing agreement, etc, and external hedging tools involve the usage of different kinds of derivatives including forwards, futures, debt, options and swaps. Each of these techniques differs to hedge different exchange risk in each company situation. There has been many studies concerned with the effect from the use of these currency derivatives, e.g. recent study as Allayannis and Ofek (2001), Bengt Pramborg (2002).
2.3.3.1 Foreign exchange forwards

A forward foreign exchange contract is an agreement to exchange one currency for another with a specific quantity, where the exchange rate is fixed on the day of the contract but the actual exchange takes place on a pre-determined date in the future. The predetermined exchange rate is the forward exchange rate. The amount of the transaction, the value date, the payments procedure, and the exchange rate are all determined in advance. Forward contracts in major currencies can be available daily with maturities of up to 30-, 90-, and 180-day Two types of forwards contracts are often used: deliverable forwards (face amount of currency is exchanged on settlement date) and non-deliverable forwards (which are settled on a net cash basis).

A currency forward contract is normally used to hedge exposures that are short to medium term and whose timing is known for certainty. It is so important for corporations’ treasurers to trade in the forward market that they can fix the costs of imports and exports in advance for the payable or receivable amount. A lot of empirical researches such as Belk et al. (1992), Bodnar et al. (1995), Mallin et al. (2000) and Pramborg (2002) indicated that the most frequently used method is forward exchange contract. With forwards, the firm can be fully hedged. However, some risks including settlement risk that exchange rate moves in the opposite direction as their forecast, and counter party risk which the other party is unable perform on the contract, the high cost of forward contracts will sometimes prevent firms to exercise this tool to fully hedge their exchange exposure. For that reason, futures show more advantages.

2.3.3.2 Currency futures

Currency future as another instrument to reduce the risk of foreign exchange volatility is an exchange-traded contract specifying a standard volume of a particular currency to be exchanged on a specific settlement date. It is similar to forward contract in that they allow a firm to buy or sell certain currency at a fixed price and at a future point in time.

Yet, there are some differences between these two kinds of techniques. One of the future characteristics differ from forward is that futures are standardized both for amounts and delivery date (normally March, June, September and December), while Forward is for any amount and any delivery date which the two parties make agreed. Another difference is that forwards are traded by phone and telex and are completely independent of location or time while all clearing operations for futures markets are handled by an exchange clearing house. The biggest difference is in terms of liquidation that futures contracts are settled by offset of gains and losses for each day, while forward contracts are settled by actual delivery whether full delivery of the two currencies or net value only at the contract maturity. Giddy and Dufey said “This
daily cash compensation feature largely eliminates default risk.”

Both futures market and forward market are most important ways to hedge risk. David Tien (2002) indicated “Firms uncomfortable with the uncertainty involved in receiving a fixed payment in foreign currency can easily hedge the transaction using either futures or forward contracts.” Some studies as Belk and Glaum (1992) found that none of the companies which were interviewed used currency futures, because the standardized features of exchange traded futures most often do not enable the companies to hedge their positions perfectly. Mallin et al (2000) also found that only 9 companies out of 231 respondents to their survey used currency futures. Giddy and Dufey conclude that “forwards and futures serve similar purposes, and tend to have identical rates, but differ in their applicability. Most big companies use forwards; futures tend to be used whenever credit risk may be a problem.”

2.3.3.3 Currency options

A foreign exchange option which is different from currency forward contracts and currency futures is to give the holder of the contract the right to buy or sell a certain amount of a certain currency at a predetermined price (also called strike or exercise price) until or on a specified date, but he is not obliged to do so. The seller of a currency option has obligation to perform the contract. The right to buy is a call; the right to sell, a put. There is option premium needed to pay by those who obtain such a right. The holder of a call option can benefit from a price increases (profit is the difference between the market price and the strike price plus the premium), while can choose not to excise when the price decreases (locked in loss of the option premium). Vice versa is for the holder of a put option. For the advantages of simplicity, flexibility, lower cost than the forward, and the predicted maximum loss—which is the premium, the currency option has become increasing popular as a hedging devise to protect firms against the exchange movements. Whenever there is uncertainty in the size of cash flows and the timing of cash flows, currency option contracts would be superior to traditional hedging instruments such as forward contracts and futures contracts. Grant and Marshall (1997) examined the extent of derivative use and the reasons for their use by carried out surveys in 250 large UK companies, found that a widespread use of both forwards and options(respectively 96% and 59%). The pointed that comparing to the primary reasons for the use of forwards were company policy, commercial reasons and risk aversion, a good understanding of instrument, and price were prominent while the primary reasons to use option for company management.

2.3.3.4 Currency swaps

As a relative new financial derivative used to hedge foreign exchange exposure, currency swaps have a rapid development. Since its introduction on a global scale in the early 1980’s, currency swaps market has become one of the largest financial derivative markets in the world. A currency swap is a foreign exchange agreement
between two parties to exchange a given amount of one currency for another and, after a specified period of time, to give back the original amounts swapped. It can be negotiated for a wide range of maturities up to at least 10 years, and can be regarded as a series of forward contracts. It is commonly used under such situation that a firm operate in one currency but need to borrow in another currency. Currency swaps are often associated with interest rate swaps, as the common cross currency swaps the cross-currency coupon swap which is to pay fixed and receive floating interest payment meantime buying the currency swap. Another commonly used one is cross currency basis swap which is to pay floating interest in a currency and receive floating interest in another currency. The advantage of currency swaps is to enable each contracting part to borrow in their comparative favorable market, and both parties can benefit from the swaps by reduction in borrowing costs. The use of swaps now has grown rapidly in western countries such as Grant and Marshall (1997) found that the use of swaps and forwards/futures is dominant in UK, Bodnar et al. (1995) found that swaps dominate for interest rate risk management in US.

2.3.3.5 Internal hedging methods

For the reason that external hedging techniques with derivatives to manage foreign exchange exposure are often costly, many multinational firms would rather turn to consider using internal hedging devices such as Michael (2006):

- Currency matching, which involves pairing suitably a multinational firm’s foreign currency inflows and outflows with respect to amount and timing;
- Currency netting, which involves the consolidated settlement of receivables, payables and debt among the subsidiaries of a multinational firm;
- Invoicing in domestic currency, which reduces transaction risk primarily related to exports and imports.

As Bengt Pramborg (2002) has investigated the difference usage of internal hedging methods between Korean firms and Swedish firms, he found that Korean firms have relative propensity to substitute derivatives use for alternative methods.

2.3.4 Determination on hedging

Some factors which could expose firms to exchange rate movements are, for example, foreign income or sales from operations abroad, exports, imports and foreign competitors. Much empirical work such as Bodnar (1995), Grant and Marshall (1997), Allayannis and Ofek (2001), Pramborg (2002), and Muller and Verschoor (2005) have been done to examine the relation between the hedging decision and firm size and most of them have implied that it is a positive relationship between hedging and firm size.

Firm size standing the economies of scale can be measured by book value of total assets and revenues. Allayannis and Ofek (2001) employ a variable of foreign sales
for foreign exchange exposure, and found that the percentage of foreign sales is the most significant factor in explaining the use of foreign currency derivatives, besides, imports and exports in total sales are another important factor. Pramborg (2002) use the total revenues as the proxy for firm size to study the relationship between economies of scale and the decision of hedging and derivatives usage, he also got the positive result.

2.3.5 Objectives in derivatives use

The most important role for derivatives is for risk management, and an important issue in risk management is defining its goals indicated by Bodnar (1999). Some popular goals of hedging are summarized from researches by Bodnar (1999) and Pramborg (2002) as follows:

- minimize fluctuations in accounting earnings
- minimize fluctuations in real cash flows
- protect the appearance of the balance sheet

As some research results stated in many studies like Grant, Marshall (1997) who made a survey of 250 large UK companies indicate that the primary objective of their treasury department is to reduce risk and 90% of them do not speculate. Others did some comparisons with different countries, such as Bodnar (1999) found that US companies focus their use of derivatives in risk management primarily on minimizing the variability in cash flow and minimizing fluctuations in accounting earnings as a second objective, while a majority (55.3%) of German companies chose minimizing accounting earnings as their most important objective. Also Marshall (2000) found that Asian MNCs is similar to German to focus on accounting earning. They argue that the differences may be attributed to differences in accounting regulations where accounting rules in the non-US countries made stronger links between accounting earnings and cash flows.

2.4 Theory development of foreign exchange risk management and applying in China

Nowadays, more and more attention in foreign exchange risk management has been given both in corporate practice and the literature in a range of world. For the central topic of the foreign exchange risk management, whether companies should hedge exchange exposure or not, and which methods they should use to hedge have attracted a number of studies to discuss. Some have attempted to provide insights into the exchange risk management practices of multinational corporations such as Glaum/Roth (1993) and Aobo (1999), others like Bodnar et al (1995,1996,1998) and Grant/Marshall (1997) focus on the use of derivative financial instruments by corporations. Mallin and Ow-Yong (2000) found that derivative has become widespread to adopt since mid –1980s, particularly among large companies in economies with well-developed financial markets.
Bodnar et al carried out three different surveys in 1994, 1995 and 1998. He found from the 1995 survey that derivatives are used most commonly to reduce the volatility of firm’s cash flows and derivative usage among large firms was greater than among smaller firms. The latter find was also reinforced in the 1998 survey, which was that derivative use is still not as widespread with half of the US population survey using financial derivatives of any kind. Bartram et al (2003) compare the derivative usage of 7,292 companies in 48 countries primarily US firms and find that 59.8% use derivatives with 43.6% using foreign exchange derivatives. Grant and Marshall (1997) carried out a study on derivatives usage in large UK companies and found that most large companies use derivatives and which most often used to manage foreign exchange.

Martin Glaum (1999) did an empirical study into the foreign exchange risk management of large German non-financial corporations. Of the 154 firms that were addressed, a total of 74 took part in the study. The managers of these firms were asked about the measurement of exchange risk, about their management strategies, and about organizational issues. The results could be summarized as following: the majority of the firms concerned about managing their transaction exposure; most firms adopted a selective hedging strategy based on exchange rate forecasts; only small minorities of firms did not hedge foreign exchange risk at all, and only few companies hedged their transaction exposure completely. Looking in more detail at the management of the firms' exposure to the US-dollar, the author found that only 16% of the firms were fully hedged. The majority of firms had realized hedge ratios between 50 and 99%. The author indicated that the implementations of risk management activities were even more strongly centralized. Moreover, the author presented the participants with three possible answers: (i) high degree of centralization; (ii) medium degree of centralization; (iii) low degree of centralization. Furthermore, in the thesis, the author mentioned that there was not a single case where the subsidiaries were fully autonomous with respect to the implementation of hedging decisions. 47% of the firms were characterized by a medium degree of centralization and in 53 % of the firms the local financial managers were obliged to settle all hedging transactions with the head office.

A great deal of prior works contributing to the development of foreign exchange management, but few is concerned for exchange rate exposure of Chinese firms, either examining hedging practices in China. Till recent study by Patrick J. Schena (2004) found that international orientated Chinese firms have experienced significant foreign exchange exposure, he also found no empirical evidence to suggest that Chinese firms are engaged in hedging activities when measured against the trade-weighted index, but indicated that Chinese firms in particular exporters engage in some form of active foreign exchange risk management when exposures are measured in yen terms. We notice that result is got under the Chinese currency regime of managed floating exchange rate system RMB pegging USD/HKD, furthermore the
underdevelopment of the markets for currency derivatives make hedging difficult and costly. So just like Patrick J. Schena pointed out that the peg, acts to make hedging unnecessary against the US and HK dollars and is likely sustainable only as long as currency controls remain in effect.

However, the currency exchange policy of China has been reformed on July 21st, 2005, since when our state has ceased the peg to US dollar and already carried on a managed floating exchange rate system based on the market supply and demand. The RMB exchange rates is determined and adjusted according to “a basket of currencies” floating. The officially released a list of currencies entering into this basket is which: dominant currencies amongst the basket are the US dollar, the euro, the Japanese yen and South Korea's won, the Singapore dollar, pound sterling, the Malaysian ringgit, the Russian rouble, the Australian dollar, the Thai baht and the Canadian dollar are also considered in the calculation. Under this currency policy, RMB exchange rate is more elasticity, simultaneously it brings higher foreign exchange risk for those companies involved importing or exporting, particularly multinational companies.
3. Research methodology

In this chapter, we will present our reason of doing choice on subject, research approach, research method, the method of chosen data and methodology overview.

3.1 Choice of subject

Talk about why we choose our subject. Firstly, this is because we are interested in foreign exchange risk management in Chinese MNE, up to now, little paper did the research in this aspect, we consider it is the new area and valuable to do the research and we also think with the policy changing in China, it must be bring the big adjustment in Chinese MNE. We also choose the American and Japanese companies to do the research. This is because we want to absorb some advance experience from developed countries that we can know the gap between developed countries and China, furthermore American and Japanese companies have so much experience on hedging exchange rate risk. The American companies are the representation of modern financial system and put the risk management as the emphases of financial management. Japanese companies accumulated the experience because they came through three appreciations in Japanese Yen. So because of the above reason, we choose the foreign exchange risk management in multinationals: an empirical investigation on China, Japan and US as our subject.

3.2 Perspective

The perspective of our thesis is considered in the financial management. We believe the foreign exchange risk management is important for the MNE, it may be influence the many aspects of the company, such as profitability, cost of their products. Especially in China, the research in this aspect is little, so we want to stand in the management angle to give some suggestions to Chinese MNE in currently policy and knowing the gap between China, America and Japan.

3.3 Preconceptions

Both of us are the students of master’s program in Accounting and Finance, we have some knowledge in foreign exchange risk, but because we do the research on real figures from annual reports, we believe our individual preconceptions will not be influence our outcome in this thesis.

3.4 Research approach

William M.K. Trochim (2006) said, in logic, they often referred to the two broad methods of reasoning as the deductive and inductive approaches. Deductive
reasoning works from the more general to the more specific. Sometimes this is informally called a "top-down" approach. We might begin with thinking up a theory about our topic of interest. We then narrow that down into more specific hypotheses that we can test. We narrow down even further when we collect observations to address the hypotheses. This ultimately leads us to be able to test the hypotheses with specific data -- a confirmation (or not) of our original theories (William M.K. Trochim, 2006).

Inductive reasoning works the other way, moving from specific observations to broader generalizations and theories. Informally, we sometimes call this a "bottom up" approach. In inductive reasoning, we begin with specific observations and measures, begin to detect patterns and regularities, formulate some tentative hypotheses that we can explore, and finally end up developing some general conclusions or theories (William M.K. Trochim, 2006). 3

When we write our thesis, our aim is not to develop the new theory, so from the steps to do research and our research method, the deductive approach is better for our research.

3.5 Research method

As William M.K. Trochim (2006) said, he just wanted to make a fundamental distinction between two types of data: qualitative and quantitative, the way they typically define them, they called data 'quantitative' if it was in numerical form and 'qualitative' if it was not. Notice that qualitative data could be much more than just words or text. Photographs, videos, sound recordings and so on, can be considered qualitative data. 4

When we do our research, we will use annual reports to do the research. This is because doing survey will be face non-response, especially in China; it is difficult to use surveys to collect data, because most Chinese companies haven’t the obligation to open their internal financial information. Compared with the survey, we consider that using annual report to do analysis can eliminate the risk of non response from investigated companies and prove cheaper than sending out postal surveys or conducting telephone interviews. The most important reason is that the authenticity of annual report, because all of the financial data are audited by official audit office. So we think the quantitative method is better.


3.6 Validity and reliability

All of our data from the annual reports, and we will do the data collection and analysis as the carefully attitude, so we are sure of the validity of our study.

Because our analysis based on the data in 2006, so we consider that if the year changed, the results will be change.

3.7 Data collection method

All the research and analysis would be depended on their annual reports. We collected 10 companies’ data from several kinds of industries in each country. Chosen the data from different industries because our research is not limitation in one industry, we want to give suggestions to Chinese companies that they have exchange rate risk, so we need to do analysis on different industries companies.

We gathered data on the fiscal year 2006. The key reason to collect data in this year is that in 2005, the Chinese government has been changed the fixed exchange rate system into dirty floating exchange rate system. This changing must bring serials altering in the Chinese companies in 2006, especially in the exchange rate risk management.

All of the American and Japanese firm we chosen as the examples are listed on New York Stock Exchange Market. Doing this choice is because the New York Stock Exchange Market is the biggest exchange market in the world, has the highest admittance conditions in the world and serves for the mature companies. So we think these companies always have good experience in exchange rate risk management.

At the same time we chose partly Chinese companies are listed on Hong Kong Stock Exchange Market. At the beginning, we decided to choose all of the companies from New York Stock Exchange Market, unfortunately, up to now there are 22 Chinese companies listed on this market but only 5 Chinese companies could supply worthless information to our analysis and research. So we have to select some companies from other exchange market. The Hong Kong Stock Exchange Market is the relative international market in Asian; the management in this market is flexible, efficient and ensure explore all of the important facts fairly.
<table>
<thead>
<tr>
<th>Name of the company</th>
<th>Type of the company</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. O. Smith Corporation</td>
<td>Electrical Components &amp; Equipment</td>
</tr>
<tr>
<td>Ball Corporation (Ball)</td>
<td>Containers &amp; Packaging</td>
</tr>
<tr>
<td>Convergys Corporation (Convergys)</td>
<td>Computer Network</td>
</tr>
<tr>
<td>Wal-Mart Stores, Inc (Wal-Mart),</td>
<td>Broadline Retailers</td>
</tr>
<tr>
<td>Deluxe Corporation</td>
<td>Financial Administration</td>
</tr>
<tr>
<td>Diebold, Inc</td>
<td>Financial Service</td>
</tr>
<tr>
<td>H. J. Heinz Company</td>
<td>Food Products</td>
</tr>
<tr>
<td>Eli Lilly and Company</td>
<td>Pharmaceuticals</td>
</tr>
<tr>
<td>Hospira, Inc</td>
<td>Pharmaceuticals</td>
</tr>
<tr>
<td>National Semiconductor Corporation</td>
<td>Semiconductors</td>
</tr>
<tr>
<td>Name of the company</td>
<td>Type of the company</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Advantest Corp</td>
<td>Semiconductors</td>
</tr>
<tr>
<td>Hitachi, Ltd. (Hitachi)</td>
<td>Electronic Equipment</td>
</tr>
<tr>
<td>Konami Corporation (Konami)</td>
<td>Toys</td>
</tr>
<tr>
<td>Kubota Corporation (Kubota)</td>
<td>Commercial Vehicles &amp; Trucks</td>
</tr>
<tr>
<td>Honda Motor Co., Ltd</td>
<td>Automobiles</td>
</tr>
<tr>
<td>Mizuho Financial Group, Inc. (MHFG)</td>
<td>Bank</td>
</tr>
<tr>
<td>Ntt DoCoMo, Inc. (DoCoMo)</td>
<td>Mobile Telecommunications</td>
</tr>
<tr>
<td>TDK Corporation (TDK)</td>
<td>Electrical Components &amp; Equipment</td>
</tr>
<tr>
<td>Toyota Motor Corporation</td>
<td>Automobiles</td>
</tr>
<tr>
<td>Nis Group Co., Ltd</td>
<td>Consumer Finance</td>
</tr>
</tbody>
</table>
Chinese Companies
Name of the company                     Type of the company
※ China Cosco Holdings Company Limited  Container Shipping
※ Angang Steel Company Limited          Steel products
※ Air China Limited                     Airlines
※ China Shenhua Energy Company Limited  Integrated Coal-based Energy
※ Weiqiao Textile Company Limited       Cotton yarn, Grey fabric and Denim
China Mobile Limited                    Mobile Telecommunications
China Netcom Group Corporation (Hong Kong) Limited Fixed Line Telecommunications
China Unicom                            Mobile Telecommunications
Petro China Company Ltd.                Integrated Oil & Gas
China Petroleum & Chemical Corporation  Integrated Oil & Gas

Note: All of the companies with the signal of “※” represent that these companies are listed on Hong Kong Stock Exchange Market.

3.8 Methodology overview

From totally, we think that our research methodology is suitable. This is because of following reasons. Firstly, from this methodology, we can get answers of our research questions clearly. Secondly, through this methodology, we will achieve our research aims that knowing the gap between China, America and Japan on exchange rate risk management, we can find the main problems in Chinese companies on the hedging foreign exchange rate risk and also can get some feasibility suggestions, and the second reason is also our contribution of this thesis. Thirdly, we collected data from different industries; this method let our research not limit in one industry, expand our research range.

At the same time, we also consider there is some disadvantages in our methodology, such as from the annual reports, we can’t get the clearly answers on two questions: one is foreign exchange risk estimating methods; the other is organization of
financial risk management function, so we don’t think using annual report to do the research on management foreign exchange rate risk is the best choice to answer these two questions. But because these disadvantages could not prevent us to achieve our research aims, we still use our methodology to do analysis.
4. Empirical data research

In this chapter, we will use the data from annual reports among American, Japanese and Chinese companies to do our research.

4.1 Descriptive features of companies and the hedge activity

4.1.1 American and Japanese companies

In the following two tables, we can see the relationship between the hedging decision and the company size in American and Japanese companies. Here we use the turnover to be the proxy for firm size as same as Pramborg (2002). Another measure used in the empirical study is the book value of total assets which we mentioned in the chapter two.

**Table 4.1** Hedging decision by company size – American companies in different industries

<table>
<thead>
<tr>
<th>Revenues (USD Dollar' million)</th>
<th>Hedge</th>
<th>Not Hedge</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 500</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>501– 5000</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>5001 – 10000</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>10001 – 100000</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>100001+</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

**Table 4.2** Hedging decision by company size – Japanese companies in different industries

<table>
<thead>
<tr>
<th>Revenues (USD Dollar' million)</th>
<th>Hedge</th>
<th>Not Hedge</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 500</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>501– 5000</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>5001 – 10000</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>10001 – 100000</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>100001+</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

All of the American and Japanese companies we collected data had the revenues between 288 dollars in million and 315,654 dollars in million in 2006. From the above table, we could see that in 2006, 90% sample companies hedged foreign exchange rate risk; only 2 companies didn’t hedge foreign exchange rate risk.

In the following two tables, we can see the relationship between derivatives usage among those who hedge foreign exchange exposure and the company size.
Table 4.3 Derivative usage by company size - American companies in different industries

<table>
<thead>
<tr>
<th>Revenues (USD Dollar’ million)</th>
<th>Use Derivatives</th>
<th>Don’t Use Derivatives</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 500</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>501– 5000</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>5001 – 10000</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>10001 – 100000</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>100001+</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>0</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 4.4 Derivative usage by company size – Japanese companies in different industries

<table>
<thead>
<tr>
<th>Revenues (USD Dollar’ million)</th>
<th>Use Derivatives</th>
<th>Don’t Use Derivatives</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 500</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>501– 5000</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>5001 – 10000</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>10001 – 100000</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>100001+</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>0</td>
<td>9</td>
</tr>
</tbody>
</table>

From the table 4.3 and table 4.4, we could see clear relationship between derivatives usage among those who hedge foreign exchange exposure and the company size in America and Japan. We could know that the relative larger companies prefer to hedge foreign exchange rate risk. Because in America and Japan, the sample companies which didn’t hedge foreign exchange rate risk in 2006 called Deluxe Corporation and Nis Group Co., Ltd, these two companies’ revenues were below 500 dollars in million, which were the minimal number in all of the sample companies.

4.1.2 Chinese companies

Meanwhile, all of the Chinese companies used in the research operating international business. The annual group turnovers of the companies in the year of 2006 ranged between RMB 19billion to RMB 1, 077billion. Table 4.5 illustrates whether hedge the foreign exchange exposure in relation to company size. Further table 4.6 shows the relationship between derivatives usage among those who hedge foreign exchange exposure and the company size.
Table 4.5 Hedging decision by company size – Chinese companies in different industries

<table>
<thead>
<tr>
<th>Turnover (RMB’billion)</th>
<th>Hedge</th>
<th>Not Hedge</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 – 50</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>51 – 100</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>101 – 500</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>501 – 1000</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1001+</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>4</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 4.6 Derivative usage by company size - Chinese companies in different industries

<table>
<thead>
<tr>
<th>Turnover (RMB’billion)</th>
<th>Use Derivatives</th>
<th>Don’t Use Derivatives</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 – 50</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>51 – 100</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>101 – 500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>501 – 1000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1001+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

Note: The mid exchange rate of Chinese currency (RMB) to USA currency (USD) was 780.87: 100 at the 2006-12-31 which was informed by Bank of China.  

4.1.3 Reasons for not hedge

For the reason of those who did not hedge foreign exchange rate risk, we found that:

- The two companies in America and Japan which didn’t use instruments to hedge foreign exchange rate risk called Deluxe Corporation and Nis Group Co., Ltd. On page 47 of the Deluxe Corporation’s annual report 2006, it described that they were exposed to changes in foreign currency exchange rates. Investments in and loans and advances to foreign subsidiaries and branches, as well as the operations of these businesses, are denominated in foreign currencies, primarily the Canadian dollar, the effect of exchange rate changes is expected to have a minimal impact on their results of operations and cash flows, as their foreign operations represent a relatively small portion of our business. In the Nis Group Co., Ltd’s annual report 2006, it didn’t mention why they didn’t hedge foreign exchange rate risk.

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5 http://www.bank-of-china.com/
Furthermore, among those 10 Chinese companies, 4 of them did not hedge the foreign exchange rate risk, although all of which are exposed to foreign exchange risk arising from various currency exposures. Only one company gave the reason why it did not hedge was because the Group did not expect any appreciation or depreciation of the Renminbi against foreign currency which might materially affect the Group’s result of operations. Other three companies did not mention any reason.

4.2 Types of derivatives used and types of exposure hedged

4.2.1 American companies

<table>
<thead>
<tr>
<th>Name of the company</th>
<th>Name of the derivatives instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. O. Smith</td>
<td>Forward Contract</td>
</tr>
<tr>
<td>Ball</td>
<td>Option contract</td>
</tr>
<tr>
<td>Convergys</td>
<td>Forward contract</td>
</tr>
<tr>
<td>Wal-Mart</td>
<td>Currency swap</td>
</tr>
<tr>
<td></td>
<td>Cross-currency swap</td>
</tr>
<tr>
<td>Deluxe Corporation</td>
<td>No</td>
</tr>
<tr>
<td>Diebold, Inc</td>
<td>Forward contract</td>
</tr>
<tr>
<td>H. J. Heinz Company</td>
<td>Forward contract</td>
</tr>
<tr>
<td></td>
<td>Option contract</td>
</tr>
<tr>
<td></td>
<td>Cross-currency swap</td>
</tr>
<tr>
<td></td>
<td>Foreign currency debt instrument</td>
</tr>
<tr>
<td>Eli Lilly and Company</td>
<td>Forward contract</td>
</tr>
<tr>
<td></td>
<td>Option contract</td>
</tr>
<tr>
<td>Hospira, Inc</td>
<td>Forward contract</td>
</tr>
<tr>
<td>National Semiconductor</td>
<td>Forward contract</td>
</tr>
<tr>
<td></td>
<td>Option contract</td>
</tr>
</tbody>
</table>

After research, we could see that forward contract, option contract, currency swap, cross-currency swap, foreign currency debt instrument were used in American sample companies in 2006. The table 4.7 shows the frequency of using different derivatives.
Table 4.7 Derivatives usage by type of instrument in American firms

<table>
<thead>
<tr>
<th>Foreign Exchange Risk Derivatives</th>
<th>forward contract</th>
<th>option contract</th>
<th>cross-currency swap</th>
<th>currency swap</th>
<th>foreign currency debt instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of companies enter into derivatives</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Percentage of companies enter into derivatives</td>
<td>88.9%</td>
<td>44.4%</td>
<td>22.2%</td>
<td>11.1%</td>
<td>11.1%</td>
</tr>
</tbody>
</table>

So, in detail, 88.9% companies used forward contract, 44.4% companies used option, 22.2% companies used cross-currency swap, 11.1% companies used currency swap and 11.1% companies used foreign currency debt instrument.

4.2.2 Japanese companies

<table>
<thead>
<tr>
<th>Name of the company</th>
<th>Name of the derivatives instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantest Corp</td>
<td>Forward contract</td>
</tr>
<tr>
<td>Hitachi</td>
<td>Forward contract Cross-currency swap</td>
</tr>
<tr>
<td>Konami</td>
<td>Forward contract</td>
</tr>
<tr>
<td>Kubota</td>
<td>Forward contract Currency swap</td>
</tr>
<tr>
<td>Honda</td>
<td>Forward contract Currency swap Option contract</td>
</tr>
<tr>
<td>MHFG</td>
<td>Currency swap Spot contract Forward contract</td>
</tr>
<tr>
<td>NTT</td>
<td>Forward contract Currency swap</td>
</tr>
<tr>
<td>TDK</td>
<td>Forward contract Currency swap Option contract</td>
</tr>
<tr>
<td>Toyota</td>
<td>Forward contract Option contract</td>
</tr>
<tr>
<td>Nis Group Co., Ltd</td>
<td>No</td>
</tr>
</tbody>
</table>

Compared with American companies, Japanese companies used forward contract, cross-currency swap, currency swap, option contract, spot contract to hedge foreign exchange risk in 2006. The table 4.8 shows the frequency of using different derivatives.
Table 4.8 Derivatives usage by type of instrument in Japanese firms

<table>
<thead>
<tr>
<th></th>
<th>Foreign Exchange Risk Derivatives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>forward contract</td>
</tr>
<tr>
<td>Number of companies</td>
<td>9</td>
</tr>
<tr>
<td>enter into derivatives</td>
<td></td>
</tr>
<tr>
<td>Percentage of companies</td>
<td>100%</td>
</tr>
<tr>
<td>enter into derivatives</td>
<td></td>
</tr>
</tbody>
</table>

From the table 4.8, 100% companies used forward contract, 55.6% companies used currency swap, 33.3% companies used option, 11.1% company used cross-currency swap and 11.1% company used spot contract.

4.2.3 Chinese Companies

Furthermore, the annual reports of the Chinese firms show that 3 of 4 companies who hedge their foreign exchange exposure with currency derivative use the forward contract which can be proved is the most popular instrument used by firms to hedge their foreign currency exposures.

Table 4.9 Derivatives usage by type of instrument in Chinese firms

<table>
<thead>
<tr>
<th></th>
<th>Foreign Exchange Risk Derivatives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Foreign exchange forward</td>
</tr>
<tr>
<td>Number of companies</td>
<td>3</td>
</tr>
<tr>
<td>enter into derivatives</td>
<td></td>
</tr>
<tr>
<td>Percentage of companies</td>
<td>75%</td>
</tr>
<tr>
<td>enter into derivatives</td>
<td></td>
</tr>
</tbody>
</table>

4.3 Other foreign exchange risk management methods

The American companies Ball Corporation used cash flow hedges to hedge foreign exchange risk in 2006. The company Wal-Mart Stores has designated debt of approximately £2.0 billion as of January 31, 2006 and 2005, as a hedge of their net investment in the United Kingdom. The H. J. Heinz Company used certain foreign currency debt instruments as net investment hedges of foreign operations.

In Japanese company which we called Mizuho Financial Group, Inc applied the deferred method of hedge accounting to hedge foreign exchange risks associated with
various foreign currency denominated monetary assets and liabilities. In addition to the above methods, these subsidiaries applied the deferred method or the fair-value hedge method to portfolio hedges of the foreign exchange risks associated with investments in subsidiaries and affiliates in foreign currency and other securities in foreign currency.

We also notice that there are some other hedging methods as internal methods used in some Chinese firms. 2 of 10 in our sample companies use internal methods, one takes the method of currency matching to hedge against the import and export activities, another takes the currency netting method to hedge the inter-company receipts and payments.

4.4 Foreign exchange risk management objective

4.4.1 American and Japanese companies

From our research on sample American and Japanese companies, we found that most American and Japanese companies put the emphasis on hedging transaction risk. The two American companies such as Ball Corporation, Eli Lilly and one Japanese company such as Konami Corporation not only use derivative instruments to hedging transaction exposure but also use them to hedge translation exposure. From the table 4.10 and 4.11, you will see the quantitative results:

Table 4.10 Foreign exchange risk management objectives in USA

<table>
<thead>
<tr>
<th>Foreign Exchange Objectives</th>
<th>Number of the companies</th>
<th>Percentage of the companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management of Transaction Risk</td>
<td>6</td>
<td>60%</td>
</tr>
<tr>
<td>Management of Translation Risk</td>
<td>2</td>
<td>20%</td>
</tr>
<tr>
<td>Management of Operating Risk</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>No stated objectives</td>
<td>3</td>
<td>30%</td>
</tr>
<tr>
<td>Do not manage foreign exchange exposure</td>
<td>1</td>
<td>10%</td>
</tr>
</tbody>
</table>

Table 4.11 Foreign exchange risk management objectives in Japan

<table>
<thead>
<tr>
<th>Foreign Exchange Objectives</th>
<th>Number of the companies</th>
<th>Percentage of the companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management of Transaction Risk</td>
<td>8</td>
<td>80%</td>
</tr>
<tr>
<td>Management of Translation Risk</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>Management of Operating Risk</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>No stated objectives</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>Do not manage foreign exchange exposure</td>
<td>1</td>
<td>10%</td>
</tr>
</tbody>
</table>
4.4.2 Chinese Companies

For Chinese companies in our sample who manage their foreign exchange exposure, we can see from their annual reports that almost all of them aim to hedge the transaction exposure and only one of the annual reports shows the risk objective relate to the translation exposure. The different objectives presented in those companies’ annual report have been illustrated in Table 4.12 as below.

<table>
<thead>
<tr>
<th>Foreign Exchange Objectives</th>
<th>Number of the companies</th>
<th>Percentage of the companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management of Transaction Risk</td>
<td>5</td>
<td>50%</td>
</tr>
<tr>
<td>Management of Translation Risk</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>Management of Operating Risk</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>No stated objectives</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>Do not manage foreign exchange exposure</td>
<td>4</td>
<td>40%</td>
</tr>
</tbody>
</table>

4.5 Difference in applying accounting rules to measure translation exposure

The graph 4.1 and 4.2 show the specific percentages in these two countries:

**Graph 4.1 American companies situation**

Note: Type A means companies which chose the home country currency as function currency and not calculate the gain or loss of translation assets and liabilities as a part of equity;

Type B means companies which chose the foreign country currency as function currency and calculate the gain or loss of translation assets and liabilities as a part of equity.
Graph 4.2: Japanese companies situation

Note: Type A means the companies which chose the home country currency as function currency and not calculate the gain or loss of translation assets and liabilities as a part of equity; Type B means the companies which chose the foreign country currency as function currency and calculate the gain or loss of translation assets and liabilities as a part of equity.

For all of Chinese companies in our sample, they choose home country currency as the function currency.

4.6 The method usage to measure economic exposure

We also collect the data of methods used in measuring economic risk, as we found, most of companies not mentioned the methods to estimate foreign exchange risk, some of them not indicated clearly what the methods they used, few of them showed the methods clearly. In the graph 4.3, we will show the above situation in sample American companies.

Graph 4.3: The situation of mentioned the measurement method in annual report

Note: Type A means the companies which mention clear measurement methods; Type B means the companies which not indicated clearly what the methods they used; Type C means the companies which not mentioned the measurement methods.

In the sample American companies, we found that the companies which mentioned
the methods clearly used the sensitivity analysis to estimate their foreign exchange risk. In this method, foreign exchange risk exposure has been defined as the changes in fair value of derivative instruments. To test the sensitivity of their risk exposure, they have estimated the changes in fair value of foreign exchange rate risk sensitive instruments assuming a hypothetical 10 percent adverse change in market prices or rates. The sensitivity model also assumes an instantaneous, parallel shift in the foreign currency exchange rates. Exchange rates rarely move in the same direction. The assumption that exchange rates change in an instantaneous or parallel fashion may overstate the impact of changing exchange rates on amounts denominated in a foreign currency.

In the Japanese companies, the situation of mentioned the methods was different from American companies in 2006. We just found only one company showed what the method they used-------Toyota. Other sample companies not mentioned the methods.

In the Toyota's annual report, it indicated on the page 87 that they used a value-at-risk analysis (“VAR”) to evaluate its exposure to changes in foreign currency exchange rates. The value-at-risk of the combined foreign exchange position represents a potential loss in pre-tax earnings that was estimated to be ¥57.1 billion as of March 31, 2005 and ¥51.9 billion as of March 31, 2006. Based on Toyota’s overall currency exposure (including derivative positions), the risk during the year ended March 31, 2006 to pre-tax cash flow from currency movements was on average ¥46.6 billion, with a high of ¥51.9 billion and a low of ¥44.1 billion. The VAR was estimated by using a Monte Carlo Simulation method\(^6\) and assumed 95% confidence level on the realization date and a 10-day holding period.

Besides, among the Chinese sample companies, we haven’t found that any company talks about its measurement method.

\(^6\) Monte Carlo simulation is a method for iteratively evaluating a deterministic model using sets of random numbers as inputs. This method is often used when the model is complex, nonlinear, or involves more than just a couple uncertain parameters. A simulation can typically involve over 10,000 evaluations of the model, a task which in the past was only practical using super computers.

http://www.vertex42.com/ExcelArticles/mc/MonteCarloSimulation.html
5. Comparative Analysis

In this chapter, we will do the analysis based on our empirical findings and compare our data with other empirical study results.

5.1 Analysis on hedge activities

From our results, we could know that in the Chinese companies, it is not so positive support the empirical evidence that there are economies of scale to the decision to use derivatives, since the larger size companies with turnover beyond RMB 100 billion have not hedge the foreign exchange exposure at all.

On the contrary, the opposite findings arise in different countries; we can easily see that the American and Japanese companies with larger size tend to hedge foreign exchange rate risk, the two companies which did not hedge foreign exchange rate risk have the minimal revenues in each country in 2006. Our finding is corresponding with other empirical results such as: derivative usage among large firms was greater than among smaller firms (Bodnar) 1995; most large companies used derivatives and which most often used to manage foreign exchange rate risk (Grant) (Marshall) 1997; other empirical results like Allayannis and Ofek (2001), Pramborg (2002), and Muller and Verschoor (2005) proved that the decision to hedge and to derivatives usage has positive relationship with firm size. Although, they did researches in different countries from us, we could also know that our analysis on American and Japanese companies on the above question support some empirical studies, while China is opposite.

Furthermore, you could see that compared with American and Japanese companies, the hedge percentage in Chinese companies was lower, which was 60%, meanwhile in America and Japan, the rate were 90%. For China, this finding might be supportive in some degree for the research result made by Patrick J. Schena (2005) that no empirical evidence to suggest that Chinese firms are engaged in hedging activities. But we also notice that he did the research under the Chinese fixed foreign exchange system, now since China changed the fixed to the managed floating foreign exchange system, so our result prove that the policy change may bring impact on the companies hedging activities.

5.2 Analysis on the tools and techniques used in companies for hedging

5.2.1 Derivatives instruments

Among America, Japan and China, we know that the forward contract is received by most companies which were hedge foreign exchange rate risk, in detail, 88.9% American sample companies used forward contract, 100% American sample companies used this instrument and 75% Chinese sample companies used.
This finding is as the same as some empirical studies, for example Belk (1992), Bodnar (1995), Mallin (2000) and Pramborg (2002) indicated that the most frequently used method is forward exchange contract. And Pramborg (2002) showed that over 75% of firms in each country (Sweden and Korea) used the forward contracts. The flexibility, ease of use and the fixed transaction cost involved with using forward contracts are some of the possible reasons for using forward contracts, as well as the fact that it is the longest trading derivative and well established in the financial markets.

At the same time, option contract is also preferred by American sample companies, so we can get the results that forward contract and option contract are the most popular derivative instruments in America companies. This finding is consistent with Marshall (1994) and The Bank of England (1995). Marshall (1994) found the result through the survey among 30 UK companies that widespread use of both forwards and options. The Bank of England (1995) found that the use of forwards was more widespread, the percentage users of forwards and options were 96% and 59% respectively. We also found currency swap were preferred by Japanese and Chinese sample companies. As can be seen from Table 4.8 and Table 4.9, currency swaps are used more frequently by firms than other derivatives such as options and futures. There are not so much empirical studies about the acceptation degree of currency swaps in Asia companies, but Grant and Marshall (1997) found that the use of swaps now has grown rapidly in western countries. Especially, the annual reports of Chinese companies also showed no usage of currency futures and currency options in the management of foreign exchange risks. This might be attributed to the fact that these management techniques are relatively new and the higher transaction cost which prevent Chinese companies from using them.

Cost efficiency, less risky - depending on how to use them, higher potential returns, more strategic alternatives are the main advantages of option. Currency swap can increase financial liquidity, lower financial costs and save time for the company. From these advantages, we can easily understand why the firms prefer these instruments.

5.2.2 Other methods used for hedging

Through our research, we saw that there were some other foreign exchange risk management methods used in those companies, such as Ball Corporation used cash flow hedges to hedge foreign exchange risk; Wal-Mart Stores has designated debt; the H. J. Heinz Company used certain foreign currency debt instruments; Mizuho Financial Group applied the deferred method; Toyota used the location of its

7 http://www.investopedia.com/articles/optioninvestor/06/Options4Advantages.asp, “The four advantages of options”
8 http://english.bzwbk.pl/21052, “Foreign currency swap”
production facilities in different parts of the world to reduce and the currency matching and netting methods used in 2 of 10 Chinese companies. It is because as Michael (2006) indicated that external hedging techniques with derivatives to manage foreign exchange exposure are often costly, some multinational firms would rather turn to consider using internal hedging devices.

Our finding on Toyota also is consistent with empirical study. Moffet and Karlsen (1994) described the use of production, financial and marketing policies to manage economic currency exposures as ‘natural hedging’. As being in a globalization business environment, diversification of international operations is crucial for multinational corporations to manage economic exposure. So it can provide companies maintain competitive advantage and defensive reactions to adverse exchange rate movement. When the domestic production or service cost of a firm is affected by an exchange rate changes relative to those of producing in a foreign country, the firm can shift product sourcing from those countries whose currency is depreciated or plant relocated there.

Each of these techniques and methods differs to hedge different exchange risk in each company situation. Comparing to Bengt Pramberg (2002) who has investigated the difference usage of internal hedging methods between Korean firms and Swedish firms and found that Korean firms have relative propensity to substitute derivatives use for alternative methods, we could not get the similar conclusion for the comparisons among US, JP and China. However, we can easily find that the US and Japanese companies use internal methods more various than Chinese companies.

5.3 Analysis on the objective of foreign exchange risk management

After doing research on sample American and Japanese companies, we found that the main objectives of using derivative instruments to hedging foreign exchange rate risk were manage the volatility associated with foreign currency purchases, sales and certain intercompany transactions; protect foreign cash flows and earnings; protect the company’s receivables and payables that are denominated in currencies different from the functional currencies of the company or the respective subsidiaries. From totally, most American and Japanese companies put the emphasis on hedging transaction risk. We also summarized the main reason why the American and Japanese companies used derivatives instruments. The companies which used derivatives instruments for hedging in 2006 was had the same objective that they wanted to protect foreign cash flows and earnings associated with foreign exchange rate changes through the use of instruments.

The percentage of using derivative instruments to hedge transaction risk among America, Japan and China were 60%, 80% and 50% respectively, while to hedge translation risk were 20%, 10% and 10% respectively. For the reason why the sample companies seldom used derivative instruments to hedge translation risk, we
can use the sentence on the page of 66 of Toyota’s 2006 annual report as the representative to explain. Though the fluctuations of currency exchange rates to the Japanese yen can be substantial and therefore, significantly impact comparisons with prior periods and amongst the various geographic markets, the translation effect is a reporting consideration and does not reflect company’s underlying results of operations. This finding is consistent with empirical studies though we based on different countries to do the research, such as Pramborg (2002) concluded that transaction exposure hedging come to add value for Swedish companies while there is no positive value effect from translation exposure hedging, which also supported Butler (1999) result that the general suggestion of the finance literature not to worry about translation exposure and thus not to hedge it.

Additionally, it can be found that the main objectives of manage foreign exchange exposure in Chinese companies involves the elimination of the translation risk arising from consolidation of foreign subsidiaries into parent currency, the elimination or reduction of risks relating to known payments and receipts denominated in foreign currency arising from previous contractual transactions, and finally the reduction of any economic exposure which may affect the companies competitive position and expected future cash flows. In summarize, all of the Chinese companies which hedge the currency risk are try to minimize the risk of exchange rate fluctuation, in particular, none of the companies who use derivatives trade or speculate in the derivatives market. So these findings which objective of hedging is to reduce foreign exchange risk instead of speculation are line with prior empirical results as Grant, Marshall (1997). Besides, all annual reports of the collected Chinese companies in our research shows that they take a risk adverse attitude instead of risk taker. From the annual reports, we can read all of them are cognizant of the foreign exchange risk, although some (40%) make the decision of not hedging currency exposure.

We also get the result that the companies seldom use derivative instruments to hedge operating risk, which is corresponding with the result of Shapiro (2006). Shapiro (2006) indicated that whereas firms could easily hedge transaction exposure, competitive exposure (operating exposure) were longer-term and could not be dealt with solely through financial hedging techniques, they rather require making the longer-term operating adjustments, for example, proactive marketing initiatives and proactive production initiatives.

As we observed, the sample companies employ established risk management policies and procedures to reduce their foreign exchange rate exposure to fluctuations, monitor foreign exchange risk in such areas on a continuous basis. They always have the complete risk system to control foreign exchange rate from evaluate, set down the policies to monitor.
5.4 Analysis on the measurement of foreign exchange exposure

5.4.1 Measures of translation exposure

The Financial Accounting Standard Board's Standard 52 requires that companies should use the current rate method as the basic translation rule to measure the translation exposure. Since FAS 52 introduce that functional currency which is identified by each company for the primary economic environment and selected for each of the company’s foreign entities, it is very important in the process of managing exchange rate risk. As FAS 52 requires, if the company sets the foreign currency as function currency instead of using home country currency, all the assets and liabilities in the subsidiary companies should change into home country currency depending on the current exchange rates. Moreover, the profit or loss in the changing process is not including in the income but as the equity in adjustment to confirm. Because this adjustment has no business with the accounting income, so many American and Japanese companies prefer this method as we can see that 80% of American companies and 70% of Japanese companies choose this method from Graph 4.1 and Graph 4.2.

If the company set the home country currency as function currency which all of Chinese companies use, there is the different result. Under the same condition, the profit or loss could reflect in income statement using temporary method. Totally, comparing to foreign currency, using home country currency as function currency can give much fluctuate to accounting income. But, there are also disadvantages in the rule of FAS 52. Firstly, this method distorts the data in balance sheet and history cost. Secondly, because many financial data in the company have connecting with different function currency, the financial staffs should be more careful when they do the analysis on foreign subsidiary which play important part in the whole company. From that point, it should be recognized that Chinese companies are more conservative in choosing the method than American and Japanese companies.

5.4.2 Measures of economic exposure

As can be seen from our empirical data on the measurement of economic exposure, 50% of American companies use sensitivity analysis to measure their economic exposure, 10% Japanese companies use VAR method. For half of American companies, 90% of Japanese companies and none of Chinese companies do not mention how they measure the foreign exchange risk, it is difficult either to do any comparison, or get some valuable conclusion. But at least, we can see that measuring economic exposure with some technique method is not the easy thing for companies.

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5.5 Analysis on the organization of financial risk management function

The debate on the pros and cons of how much control of an organization should be retained at the level of top management or devolved to lower management levels occupies a substantial part of organizational theory in general, it is one which is also relevant to the management of foreign exchange activities. A decentralized risk management of a company means each affiliate is responsible for its own risk management whereas for a centralized function of the company organization, the responsibility of risk management lies with the corporate center.

Doing research on sample American companies, we haven’t found any company talk about whether they belonged to the decentralized risk management or the centralized risk management in their annual report.

Doing research on sample Japanese companies, only Toyota showed what type it belonged to in its annual report. Toyota's treasury policy is to maintain controls on all exposures, to adhere to stringent counterparty credit standards, and to actively monitor marketplace exposures. Toyota centralized, and is pursuing global efficiency of, its financial services operations through Toyota Financial Services Corporation.

By looking at the annual reports of the Chinese firms, we can possibly determine the organizational form adopted for treasury management and specifically that of foreign exchange risk management. Only 6 of 10 Chinese companies in our sample, particularly those large companies in term of turnover mentioned their risk management function and all of them are centralized, other 4 companies did not state clearly in the annual report whether there were a centralized or decentralized treasury function. But we can find that the centralized structure of the risk management is more common in Chinese firms.
6 Conclusions and recommendations

6.1 Conclusions

Our paper gives the results of the study into the foreign exchange risk management in American, Japanese and Chinese companies. Totally, 30 companies involved in our study. Our main questions included the situation in used derivatives instruments, the type of derivatives instruments, the effect of derivatives instruments and the accounting rules in translation foreign currencies. The results can be summarized as following:

In sample American companies, 90% companies used derivatives instruments to hedge exchange rate risk, the company which didn’t use derivatives instruments to hedge had the minimum revenues in 2006. In the sample Japanese companies, the above results also had been approved. But in China, the situation was not optimistically. Only 60% sample companies hedged the foreign exchange rates, only 4 of 6 companies used derivatives instruments to hedge. It is found that American and Japanese companies tend to hedge foreign exchange risk more than Chinese companies, although China has reformed the exchange rate regime from the managed floating exchange rate system since 2005. In particularly, larger size of firm is more likely to hedge the risk and use derivatives for American and Japanese firms, however the same conclusion which can not be got in Chinese firms. It might because that some of Chinese companies in our sample is very large comparing to American and Japanese companies, so they could control the market in some degree and do not pay much attention on foreign exchange risk. But in a long run with the development of international market, we think that definitely Chinese companies will face more risk related to foreign exchange risk and they should change to take more actions for hedging the risk. And for that reason, they can learn more form American and Japanese multinationals risk management.

To answer the question that what kinds derivatives instruments they used in companies, from our research, you can know in America, the forward contract and option were popular in 2006; In Japan, the forward contract and currency swap were used most frequency in 2006; In China, the forward contract and currency swaps also were get the most receivable in 2006. Our findings also suggested that Chinese firms are less diversity of derivatives usage than American and Japanese firms in the foreign exchange management activity. So we noticed that the Chinese companies’ ability to receive the new derivatives instruments was not good.

Almost all of those companies (80% in Japan, 60% in US and 50% in China), who mentioned their hedging objective were focus on hedging transaction risk, a minority of them ( 20% in US, 10% separately in China and Japan) used derivatives instruments to hedge translation and none hedge operating risk. It might be because the complexity of the hedging strategy for the operating exposure which as Shapiro
(2006) indicate that competitive exposure (operating exposure) are longer-term and can not be dealt with solely through financial hedging techniques, they rather require making the longer-term operating adjustments. A strategic reorientation of operating policies regarding pricing, sourcing, location of production and financing needs corporate managements not only financial managers concern.

From the accounting rules in translation foreign currencies, we have observed that most American and Japanese companies use domestic currency as function currency. This method changes the assets and liabilities in the subsidiary companies into home country currency depending on the current exchange rates. Meanwhile, Chinese companies prefer to use home country currency as function currency, this method can be give much fluctuate to accounting income.

6.2 Recommendations

After analyzed the 30 companies, we know the companies that could hedge exchange rate risk successfully not only depending on whether they can command derivatives instruments successfully but also because other reasons, such as perfect management system in the company, multinational markets, production structure and so on. So in China, if we want to improve companies’ ability in hedging foreign exchange rate risk, we need to develop companies’ system in several aspects.

- The company need to reinforce the consciousness to hedge exchange rate risk
  So many Chinese companies that have businesses with foreign countries have dim consciousness on hedging exchange rate risk, through our comparison before, the hedge percentage in Chinese companies was lower relative to USA and Japan. This was because there was relative stable exchange rate policy in China in the past long period. As Patrick J. Schena indicated that the peg foreign currency system in China burdened the establishment of a culture of currency risk management, while creating a false sense of security.

- Use diversification instrument to hedge foreign exchange risk
  Through our analysis, we knew that the Chinese companies no usage of currency futures and currency options in the management of foreign exchange risks. They just used foreign exchange forward and currency swap while the American and Japanese companies used foreign exchange forward, option, currency swap, cross-currency swap, foreign currency debt instrument, currency swap, spot contract.

- Doing adjustment in accounting rules in translation of foreign currencies
  When setting function currency, the Chinese companies prefer to set home country currency as function currency while American and Japanese companies like using domestic currency as function currency. The latter choice let the profit or loss in the changing process is not including in the income but as the equity in adjustment to
confirm.

6.3 Further research

By covering the most important part of foreign exchange risk management presented in our theory and topics emerged from the empirical study, we attempt to describe the current actuality of the foreign exchange risk management of multinational companies in three countries (America, Japan, especially China).

A great deal of academic study have been explored for US companies and some for Japanese, but very few can be found to investigate Chinese, we believe that our study can contribute to the research for foreign exchange management applied in different countries, in particular open a new aspect area of research to attract new attention on China since China have been accelerating her pace to development in the financial risk management.

However, due to the fact of the limited research time and the current small quantity of multinationals in China, we just choose 10 companies from each country and approach our analysis based on the annual report. Some detailed information, for example, how to examine the foreign exchange risk, the organization of financial risk management function, can not exactly be found in annual report. While we notice that many companies of China will adopt the international statement of financial accounting standard to report, it will be better for further research.

We just limit our study to medium and large multinationals, it might be got different and valuable information to study further research on small sized companies, or some import and export companies. Besides, further research can have more available data to investigate.
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