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An Investigation of Foreign Exchange Risk Management in Chinese Multinational Companies Compared with US and UK MNEs

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***Abstract*—This paper investigated foreign exchange risk management of Chinese MNEs compared with US and UK MNEs. Based on the 14 MNEs selected from each country, annual reports are used to collect data. Whether hedging or not, foreign exchange risk measurement, foreign exchange risk management, determinations on hedging, and hedging techniques are the focus in this study. This study finds that USA and UK MNEs are more active in hedging than Chinese MNEs, which is in line with empirical findings. And more Chinese MNEs have not mentioned the way of measuring foreign exchange risk. In addition, compared with US and UK firms, a certain number of large-scaled Chinese MNEs have not hedged, which is opposite to most previous research results. Also Chinese firms with relatively lower centralization have lower percentage on hedging in foreign exchange risk, which is in line with empirical studies. On the other hand, the USA, the UK and China are very similar in terms of foreign exchange risk management, goals, and external hedging techniques. Moreover, there is no significant difference in the relationship between the percentage of overseas business and hedging. Finally, this study concludes with the findings and provides important recommendations for further research.**

***Keywords*—Foreign exchange management; Firm size; Centralization; Hedging techniques**

I. INTRODUCTION

As the decline of barriers resulting in the free flow of goods, services, and capital as well as changes in technological, particularly the rapid developments nowadays in communication, information, and transportation; there is a more integrated and interdependent world economy. Multinationals play more and more crucial role in today's business. Most multinational firms are risk averse and orientate their foreign exchange risk management policies solely towards hedging specifically to reduce the unpredictability of their cash flows, reduce taxes, and facilitate future financial planning and also to guarantee enough internal funds, while a few MNEs use their foreign exchange risk management policies for speculative purposes and hence seek to make profits [1-2]. Foreign exchange risk is a growing concern in especially MNEs, and foreign exchange risk management is one of the most important financial activities. Foreign exchange risk management has become more and more important in the last decade since there are unusual occurrences of huge number of currency crises [3]. And there is a huge increase in the amount of modern MNEs who need specific hedging [4-6]. In fact, there are no exact study investigated on foreign exchange risk management in Chinese MNEs, compared to US and UK MNEs. Moreover, most empirical analyses concern on US multinationals but few studies China. The fact is that US as the most developed represent owns much experience in the foreign exchange risk management, as well as UK are more advanced than China [7]. Therefore, this study investigate the foreign exchange risk management in Chinese multinationals comparing with situations in both US and UK, and concentrate on the risk, measurement, management as well as determination on hedging especially objectives, firm size, overseas business, and degree of centralization.

II. BACKGROUND OF FOREIGN EXCHANGE RESEARCH

A. Definition of foreign exchange risk

Madura defined foreign exchange risk related to unexpected exchange rate movements impacting on the value of the firm [8]. In general, the foreign exchange risk constitutes the direct loss caused by the unhedged exposure and indirect loss in the profitability, cash flow, and market value as a result of exchange rate movements [7]. There are three main different types of foreign exchange risk encountered by MNEs, namely, transaction, operating, and translation risk. Transaction exposure measures "changes in the value of outstanding financial obligations incurred prior to a change in exchange rates but not due to be settled until after the exchange rates change. It deals with changes in cash flows that result from existing contractual obligations". Operating exposure, also referred to economic exposure, competitive exposure, or strategic exposure, arises from unexpected exchange rate movements leading to a change in its future operating cash flows, which further causes the change in the present value of a firm. Translation exposure, also called accounting exposure, reflects the potential accounting-derived changes in owners' equity and consolidated income for the need to prepare consolidated financial statements by translating foreign currency denominated financial statements of foreign subsidiaries into a single currency [9].

B. Foreign exchange exposure measurement

According to Papaioannou [10], the main approach is the value-at-risk (VaR) approach at present. The VaR model is widely used recently, which defined as the maximum loss for a particular exposure over a predetermined time horizon with z% confidence, though the explanations are not given for (100-z) % confidence. The degree of foreign exchange transaction exposure that a multinational firm faces can be measured by calculating VaR, under which are two main approaches known as the historical simulation approach and the model-building approach [11].

According to Adler and Dumas [12], simulations are used to measure operating exposure. It is necessary to calculate the exact values of the firms' cash flows from possible future values of the spot exchange rates.

As the exchange rate changes leading to the change of the firm value, it is important to appropriately translate the income statements and items in the balance sheet to the currency used by the parent firm. There are several ways accordingly [13]. One is the current rate method of translation accounting. Meanwhile, items in the income statement are able to be translated using the current rate, average rate over the reporting period, or the actual exchange rates.

C. Foreign exchange risk management

Transaction exposure can be managed indicatively to preserve cash flows and earnings by forward, futures, money market and option hedges as well as certain operating strategies [10]. Glaum [14] and Kohn [15] point out that operating exposure management is the most important conception in foreign exchange management. According to Eiteman et al. [9], there are six proactive techniques that are used to manage operating exposure in practice: matching currency cash flows; risk-sharing agreements; back-to-back loans; currency swaps; leads and lags; and rein-voicing centers. Moreover, operating exposure can be managed through such strategic measures as diversifying operations and sources of financing. Furthermore, contractual approaches like options and forwards have occasionally been used to hedge operating exposure. Therefore, operating exposure management requires long-term strategic planning within corporate decision making [14]. Balance sheet hedge is the crucial approach to translation exposure minimization. In addition, some companies have attempted to hedge in the forward market. However, it largely depends on a precise prediction of future exchange rates as a hedge will not work over a range of possible future spot rates.

D. Hedging

According to Eiteman et al. [9], "Hedging is the taking of a position, acquiring a cash flow, an asset, or a contract (including a forward contract) that will rise (fall) in value and offset a fall (rise) in the value of an existing position". In a broad sense, hedging means all possible actions to change its foreign exchange exposure. There are internal and external categories. Hedging eliminates the uncertainty of the cash flows to the firm and protects firm from loss, though it also limits any gain from an increase in the value of the asset hedged against. Hedging reduces some variance in the value of future expected cash flows. In conclusion, the hedging instruments to manage currency risk are enormous in both variety and complexity. The most common tools are involving foreign exchange forwards, futures, options and swaps. Since currency hedging is often costly, "natural" hedging may be firstly considered [8].

III. Investigation In China, UK And USA

A number of works are related to the development of foreign exchange management, but few are related to exchange rate exposure of Chinese firms examine hedging practices in China. Recently, Patrick J. Schena [16] found that Chinese multinational firms have experienced crucial foreign exchange exposure, but no empirical findings concerned Chinese firms involving in hedging actions as the currency derivative market is developing. In China, foreign exchange risk management is all brand-new fields to the most of firms. Xiao found nearly one-third of Chinese firms studied in his sample have experienced substantial exchange rate risks and he indicated that it is urgent to develop effective foreign exchange risk management in Chinese firms since they are becoming increasingly involved in international markets [17]. Under the circumstances that the external context of foreign currency risk management is not yet mature and the internal control environment is not optimal, it is particularly crucial to develop Chinese firms' risk management capabilities in order to appropriately reverse foreign exchange risk.

Based on the reported US data under investigation by Papaioannou, it has showed derivatives use practices in US non-financial firms with certain features like many other surveys such as done by Bodnar et al., Treasury Management Association, Bodnar and Gebhardt and so on and so forth. Papaioannou [10] has pointed out that larger sized US non-financial firms are more likely to use derivatives when managing foreign exchange risk. Also, it is evident that both the percentage of overseas business and the degree of centralization are positively related to the derivatives use in the financial markets.

There are a number of studies of foreign exchange risk management in UK Multinational Companies. Rodriguez and Davis et al. investigated foreign exchange risk management in the US and UK MNCs. Collier et al. and Belk and Glaum considered currency risk management in 51 and 17 UK companies, respectively. And Grant and Marshall survey firms in the UK. In UK, the management of operating exposure has received very little attention. Empirical studies in the UK disclaimed that firms manage transaction exposure more than the other two exposures. However, Rodriguez [18] and Collier et al. [19] confirm that UK companies do manage translation exposure. Moreover, both internal and external hedging techniques are important in UK. In general, UK and USA MNEs have similar foreign exchange risk management characteristics.

IV. Results And Analysis

A. Methodology and Data

This study uses a unique database generated directly from companies' annual reports relating to their foreign exchange exposures, hedging, determinants and the use of derivatives. Hence, quantitative method is better. Using annual report is able to reduce the non response from sample companies and give a cheap way for the research. Moreover, as all of the financial data in the annual reports are audited by official audit office, it is valid for our study on data collection and analysis. Also individual preconceptions will not influence the result. All the data collection as well as discussion and analysis of research results are based on the annual reports of investigated companies. Annual reports are collected on the fiscal year 2016. From each country, this research collected 14 companies' data over different industries to give more general results. All of MNEs are chosen randomly and are listed on New York Stock Exchange Market, which is the biggest exchange market in the world. As there are highest admittance conditions in the New York Stock Exchange Market, companies chosen in that exchange market are filled with experience in exchange rate risk management.

B. Hedge or not and determinations on hedging

In our investigation, all American MNEs researched had recognized and hedged foreign exchange risk while only one UK firm has not hedged such a risk. However, more than 70% Chinese MNEs do not hedge such foreign exchange risk. One is Huaneng Power International, which regards that there is no material impact of foreign exchange rate fluctuations on the firm. Lianhua Supermarket Holding Co. also considered that the Group is not experienced any material exposure related to foreign exchange risk and the Directors believe the Group meets foreign exchange requirements. Gome does not hedge foreign currency risk currently but the Group stated in the 2009 annual report that the Group will consider to hedge in the future. Others have not given any reasons related to why the Group not hedged.

In sample American companies, the primary objective of using derivative instruments to hedge foreign exchange rate risk is managing the volatility associated with earnings. The percentage is about 80%. And 60% American researched firms are to minimize fluctuations in cash flows. Only one US company Diebold clearly mentioned that the aim of hedge foreign exchange risk is to protect balance sheet. All UK firms stated that they consider hedge primarily to mitigate the fluctuation effect of foreign exchange rate on firm's cash flow. 60% indicated that they are object to reduce foreign exchange risk associated with earnings. No firm tells that it is aimed to protect balance sheet. Generally speaking, the situation in UK is similar to that in USA. For Chinese companies, the main objectives of managing foreign exchange exposure are the elimination of risks relating to both earnings and cash flows. 80% of researched Chinese firms said that they hedge for earnings and cash flows respectively. Also there is no firm mentioned to hedge for protecting balance sheet. It is in line with empirical studies [20]. And from this, it seems to be no big differences in the objectives of hedging among China, USA and UK.

From the view of firm size, all US firms hedge foreign exchange rate risk. For UK companies, Lloyds TSB is the only company in UK surveyed firms that do not hedge with the minimal total assets. Thus, larger size companies tend to hedge foreign exchange rate risk. Our finding on American and British companies is corresponding with other empirical results while China is opposite. With regard to China, the result is opposite. According to Li and Ma [7], it does not so positively support the empirical evidence that refer to economies of scale to the decision to use derivatives, because there are larger size companies with turnover beyond RMB 100 billion have not hedge the foreign exchange exposure at all. In our research, the findings are the same.

Moreover, the percentage of overseas business is direct related to hedging. The result indicates that more revenue generated from overseas business, the more emphasis it place on foreign exchange policy. Overall, nearly 90% researched firms which do not hedge have lower percentage even no percentage of overseas business. Groups hedged foreign exchange risks usually have certain global presences. Therefore, the results comply with empirical studies. And there is no big difference among USA, UK and China.

Furthermore, based on the degree of centralization, the research on US, UK and China shows slightly different results. In the sample investigation, USA and UK have the same percentage on centralization which is as high as 72%, while China owns only 50%. This illustrates that USA and UK with the same percentage high as 72% on degree of centralization are positively related to the high proportion of hedging. Compared to China, China with lower percentage on degree of centralization consequently has relatively lower percentage on hedging foreign exchange rates. The results comply with empirical researches such as Popov and Stutzmann and Walsh.

C. Foreign exchange risk management

In previous researches, transaction exposure is the most managed foreign exchange risk while operating and translation exposures are not well identified and managed, which mainly because firms believe it is unnecessary or too complex. In this study, all researched MNEs in USA, UK and China use hedging instruments to hedge transactional foreign exchange risk. It is in line with empirical studies involving Srinivasulus, Belk and Edelshain, Duangploy et al., Khoury and Chan, Belk and Glaum, and Aobo. Xiao [17] finds that transaction risk is the most important risk to manage in US, UK and Asian companies. Most empirical studies especially in the UK and USA argued that most companies manage transaction exposure more than operating and translation exposure.

Refer to operating exposure in all researched MNEs, there is only one MNE in USA (Ford) and two UK companies (BP and Kingfisher) mentioned that they are intended to recognize and hedge such risk more or less. Operating risk is seldom hedged, which is corresponding with the result of Shapiro, Glaum, Kohn, Dhanani and Groves, Papaioannou, Froot et al., and Marshall; as it is difficult to quantify and requires longer-term operating adjustments and could not be dealt with solely through financial hedging techniques.

With regard to translation exposure, the percentage of using hedging techniques to hedge such a risk among USA, UK and China are 57%, 50% and 22% respectively. This is in line with empirical studies such as Pramborg, Papaioannou, Srinivasulus, Rodriguez, Collier et al., and Butler that translation exposure is hedged infrequently and non-systematically. In USA, UK and China, foreign exchange risk management is similar that transaction foreign exchange risk is the most managed by researched firms while both operating and translation foreign exchange risk are seldom hedged due to reasonable explanations above. Additionally, objectives of foreign exchange risk management in researched firms are approximately same in each country. Moreover, percentage of overseas business as one factor of determinations on hedging has no big difference among USA, UK and China. 90% of researched firms without hedging are correlated with lower or no percentage of overseas business.

With reference to hedging techniques, the finding of internal hedging comparison is not so clear in this investigation. Many firms have not indicated internal hedging obviously in annual reports, which largely affects our results. So it is not appropriate to conclude in this academic research. Among firms stated internal hedging, netting is the most used as given by empirical studies. In this research, the percentage of using netting and matching in USA, UK, and China is 72%, 90%, and 100%, respectively.

With regards to external hedging, types of external hedging techniques are similar used in USA, UK and China, but there is a slight difference. Forward is the most widely used instrument, which complies with empirical studies such as Belk and Edelsain, Bodnar, Nguyen and Faff, and Pramborg. The figure is 92% of American MNEs adopt such technique, while the figure is 91%, and 100% for UK and China, respectively. It is because forward foreign exchange contracts owns flexibility, ease of use, fixed transaction cost, and longest trading derivative and well established in the financial markets. Currency swaps are also preferred by all researched firms, regardless USA, UK or China. Currency options are preferred by USA and UK MNEs, but it is not the case in China. The reasons stated above are currency options are too new for Chinese MNEs to use in the new financial market and also the cost is relatively high.

V. Conclusion

In today's competitive global markets, firms are threatened by the increasing exchange rate uncertainties. MNEs draw lots of attention on foreign exchange risk management. In this investigation, traditional types of foreign exchange risks are identified with measurement and management. This study focuses on comparisons among USA, UK and China on hedging or not, foreign exchange risk measurement, foreign exchange risk management, determinations on hedging and hedging techniques. This study finds that USA and UK MNEs are more active in hedging than Chinese MNEs, which complies with empirical findings. And more Chinese MNEs have not mentioned the way foreign exchange risk measured. In addition, certain amounts of Chinese MNEs with large firm size have not hedged compared to US and UK firms, which is opposite to most prior research results. Also Chinese firms with relatively lower percentage on degree of centralization have lower percentage on hedging foreign exchange risk, which in line with empirical studies. On the other hand, with regards to foreign exchange risk management, objectives and external hedging techniques, the situation is much similar in USA, UK and China. Moreover, there is no big difference in the relationship between percentage of overseas business and hedging.

In order to form a better understanding of MNEs' practices in foreign exchange risk management, more empirical studies needed to be undertaken. It is necessary for MNEs to build a framework of best practices for exchange rate risk management [10]. It includes "the identification of the types of exchange rate risk that a firm is exposed to and measurement of the corresponding risk exposure, development of an exchange rate risk management strategy, creation of a centralized entity in the firms' treasury to deal with the practical aspects of the execution of exchange rate hedging, development of a set of controls to monitor a firms' exchange rate risk and ensure appropriate position taking, and establishment of a risk oversight committee" [10]. Furthermore, it is suggested that written policies and procedures related to foreign exchange can improve foreign exchange risk management.

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