國立政治大學金融研究所博士論文

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The Analysis of Strategic Participation in China Banking Sector by Foreign Financial Institutions

外資金融機構佈局中國大陸金融市場之決策研究

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韶光飛逝，六年的光陰說實不算短，當論文得以順利付梓，那剎那間泉湧般的思緒與感恩盈滿著心裡，在此就讓我先謝天吧！

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Abstract

In recent years China has experienced rapid economic growth that enables the advancement of the local financial industry, which benefited from the strong domestic consumption as well as improvement in average income per capita. The purpose of this paper is to point out an alternative direction for Taiwanese banks by mapping out the future China market expansion strategy, as the Taiwanese banks are facing prolong highly competitive domestic market.

This paper applies Cox's proportional-hazard survival model to analyze the strategic decisions of foreign financial institutions about acquiring equity stakes in Chinese banks. Based on principal component analysis, we extract significant independent variables from Cox's model and employ a maximum likelihood method to estimate parameters. With the probability of equity stake acquisition, we obtain the optimal probability hazard threshold and treat it as a criterion for the foreign financial institutions to conduct equity stakes acquisition. Our empirical results confirm that the decisions of foreign financial institutions about equity stake acquisitions are to increase the profitability and market values of the target Chinese banks. In general, financial institutions with higher earning ability and better asset quality have stronger motives to take part in the acquisition or disposal of equity stakes.

The contingent claim model is applied in this paper to examine the risk and return of foreign financial institutions after acquiring equity stakes of a Chinese bank. The model considers dynamic factors such as individual asset value and exchange rates to achieve the goal of maximizing shareholder value. In addition to analyzing the asset value and factors associated with risk after participation, this paper evaluates the optimal acquiring equity stakes proportion with numerical analyses under capital control. For China banking sector, we discover the overall portfolio risk of foreign financial institution will decrease after acquiring equity stakes when the asset value increases, the debt ratio decreases, and the required risk-weighted asset increases. Overall, these foreign financial institutions have well-diversified currency portfolio and enjoy a better asset quality and surplus earning; therefore, they will likely increase their optimal acquiring equity stakes proportion if the invested Chinese banks are with good assets quality and focused on local business.

For the analysis of equity stake acquisition in China banks by Taiwanese banks, invested in the joint-stock commercial banks exists the higher intensity than others, and pan-government-owned Taiwanese bank also stands on the better vantage point than private banks. Under the possession of policy advantage for its green channels, the Western China Region is the best district in China for Taiwanese banks. This paper also examines the appropriate time and method to enter the market in China by applying the real options model. Being the market follower, Taiwan banking industry would need to find the right timing when ready entering China sine the market is pretty much laid out by many other foreign financial institutions. Therefore, the paper discovered some salubrious circumstances for Taiwan banking industry to enter the market, for example, the local financial service has not saturated, and initial investment cost is lower or Taiwan businessman demands more service gradually. The paper also confirms the current practice, which is to establish a representative office first and then promote it to a branch, seems to be practical for Taiwanese banks enter the market. Once meet the standard requests and acquire the license to operate RMB business, Taiwanese banks can establish wholly-owned subsidiary bank or take ownership stakes by having the innovation and business strategy in the local financial market.

Keywords: equity stake acquisition, contingent claim, capital control, following financial institution, real option

摘 要

　　鑑於近年來中國大陸經濟高度成長，當地金融市場在其內需市場強勁，以及均富水準普遍提升下，更顯得朝氣蓬勃，本論文係以分析過去外資金融機構在中國大陸相關佈局模式及進行相關實證研究，並續以剖析臺灣銀行業未來佈局中國大陸市場策略，以作為現階段國內高度競爭金融環境下，拓展另片藍海空間之策略與方向。

　　本論文首先說明外資金融機構於近年來在高度發展中國大陸金融市場所扮演的角色與目標，並應用 Cox 比例強度存活模型，分析採行參股策略方式進入中國大陸銀行之動機與機率強度，並以主成份分析進行資料萃取及最大概似法估計模型參數。再者，藉由此參股機率估計值進而求得外資金融機構最適參股機率強度門檻，可作為日後金融機構（含臺灣銀行業）參股動機之衡量指標。實證研究顯示，過去外資金融機構採行參股策略之目的主要在於創造被參股對象市場價值，以增加其參股投資報酬。對於獲利能力及資產品質較佳之外資金融機構，以及資產品質較佳之中國大陸銀行，則往往具有較高的參股與被參股潛在動機。

　　再者，為進一步探討外資金融機構採行參股策略後之風險與報酬關係，本論文係以或有求償權之模式，同時納入參股外資金融機構與被參股中國大陸銀行之個別資產價值，以及匯率波動等三項動態因子，在股東權益價值極大化為目標，及因應風險性資產所導向之資本管制，據以剖析外資金融機構經參股後之資產價值風險及其影響因素，並以靜態分析所對應之最適參股比例變化情形。其數值分析研究發現：當參股外資金融機構資產價值遞增、負債比率降低，以及所面臨法定風險權數增加時，對於其參股後之整體資產組合風險將有所降低。同時，對於具有高資產品質、獲利佳及多元化幣別資產組合之外資金融機構，以及面臨資產品質佳且著重本土金融開發之被參股中國大陸銀行，將有助於提高外資金融機構之最適參股比例。

　　針對臺灣銀行業參股模式方面，以投資中國大陸股份制商業銀行之動機強度為最高，其中泛公股銀行相對民營銀行更具有條件優勢，並以具備綠色通道優惠之大西部地區為佳。研究亦顯示，在外資金融機構已著墨中國大陸金融市場些許時日下，對於身為追隨性金融機構的臺灣銀行業而言，在當地金融服務未臻飽和、初始投資成本降低，以及台商業務平均需求成長趨勢下，將有助於降低其進入門檻。同時，研究中也採行模型論證，對於現階段臺灣銀行業實務上多以先行成立代表人辦事處後升格分行，並儘速於合規範內取得人民幣業務承做資格方式，以深根當地金融市場之經營方向，同時研究亦指出臺灣銀行業應具備創新化業務與利基性策略，方能提高採行成立獨資子銀行或參股之進入動機。

關鍵字：參股、或有求償權、資本管制、追隨性金融機構、實質選擇權

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1. Introduction

Since open-door policy was implemented in the 1980s, the China government undertook major reforms and deregulation of the financial system. Various types of financial institutions were established and transformed, and foreign financial institutions started to return to the Chinese market, resulting in a great leap in the development of financial market during the last ten years. Foreign financial institutions started to enter the market by taking the forms of mergers and acquisitions and establishing branches, subsidiaries, or sole ownership when China government promised to completely open the financial market after it joined the WTO. As a result of the signing the Memorandum of Understanding (MOU) between China and Taiwan and the ongoing negotiations related to the supplementary agreement of Economic Cooperation Framework Agreement (ECFA), it is expected that cross-strait financial exchanges will become increasingly frequent. Opportunities to develop Chinese businesses in order to solve the problem of fierce competition that causes narrowing profit margins in Taiwan will be the most important goals and issues facing the domestic financial institutions today.

1.1 Background

With the booming economy and rapidly growing domestic consumption market, together with a commitment to foster a healthy operating environment, foreign financial institutions have been taking the approach of operating the Chinese market on a local basis, where the local unit assumes the responsibilities of operating and investment of the decision-making process. The rationale behind the market growth strategies is based on its own competitive advantage, motive behind the expansion, target profit, and the deregulation process. The vast Chinese market has caused the various economic zones to grow rapidly, and thus, foreign financial institutions have also been active in accelerating its growth to achieve the economies of scale. Initially foreign financial institutions focused on its own customers by offering corporate loans, foreign exchange, treasury, and derivative products to maintain their competitive advantage. However, the extensive spread in loans and deposits and improvement in people's livelihood has meant that foreign financial institutions today have adopted the approach of becoming a sole ownership, taking equity stakes or formed a strategic partnership with local banks to capture the retail and wealth management businesses opportunities.

Additionally, the wealthy level of local citizen in China has been cumulated to significant level under high-speed economic development in recent year, and the whole wealthy management market grows up rapidly and leap enormously more than 15% growth rate of million wealth family. With the more diversification of wealth management, tendency of development in district of non-along the coast, raise in the middle bourgeoisie gradually, and importance of asset portfolio in offshore, foreign financial institutions should take this opportunity to develop relative business scope under the consideration of advantage and disadvantage in oneself, and expand to the non-traditional niche banking market further.

The participation of foreign financial institutions in China's financial market has resulted in improvement of depth and width of financial services offered, asset quality, risk management, capital adequacy, operating structure, and corporate governance. Allowing foreign financial institutions to take a strategic stake in Chinese banks, the gaps between Chinese local banks and foreign financial institutions have narrowed under healthy operating environment, and the performance and profitability of Chinese banks have since improved sharply.

There are four types of Chinese banks: stated-owned commercial banks, joint-stock commercial banks, city commercial banks, and rural cooperatives. Four state-owned banks take up sixty percent of market shares; the market shares increase to more than eighty-five percent if joint-stock commercial banks are considered. Due to the poor performance of Chinese banks in the early years, including the high rate of non-performing loans and meeting of certain threshold of capital adequacy ratio required by the regulatory body, many banks utilize the advantages of vast customer base and large scale of operations to invite foreign financial institutions to take a minority equity stake. The move also benefits foreign financial institutions due to lower funding costs and the opportunity to develop new products that match the market demand, and to be the supplement of other entry model such as establishment of wholly-owned subsidiary bank or branch with in the face of defect that local business and network is hard to expand rapidly in short-term.

Moreover, China's 12th five-year plan, which is ready to implement a deeper reform on economic development transformation and proceed to make a comprehensive well-off society, will open its financial market and become a trend and main driving force to continue growing the China's economy. Most foreign financial institutions, along with local regulations, proceed with different strategies and objectives according to their own advantages and choose the most effective way to enter the market by building networks and developing multi-services. Therefore, any

institution that wishes to make a fine performance and be profitable in a competitive market will need a comprehensive plan to move ahead.

China has recently became world's fastest-growing emerging market, and many foreign financial institutions, including Taiwan's, have targeted it as the next primary expansion market as matter of course. Other than following the relevant laws and regulation, investors make full use of their own advantages actively, and utilize the advantages to achieve a breakthrough on existing scale of operations in order to make maximum profit possible in the market in China. Looking at the new trends and future development cross strait, as the topics of Economic Cooperation Framework Agreement continues to ferment and China keeps on expanding its domestic demands and accelerates the financial development, the financial economics and trading across strait will expect to be an interactive and two-way development. Taiwanese banks hence believe investing in China is necessary to grow business and make profit, in order to be the regional financial institutions in the near future.

As compared to the saturated financial market in Taiwan, China's financial market and the economy has shifted its development focus from the coastal area in early years to the more potential inland area in recent years. In addition as the economy advances it also improves the average income per capita in first tier cities in China, thus it is foreseeable in the near future that consumer finance and wealth management offered by the banks will be in hot demand. Since both Taiwan and China are sharing the same languages and cultures, it is expected that there will be room for Taiwanese banks to tap into the potential personal financial services in China with the precondition that the Taiwanese player must adjust its own strategy and their operation to fit into China's vast geographical and cultural differences.

In consideration of Taiwanese banks are mainly focusing on serving Taiwan-based companies doing business locally in China, the business scope would be limited if banks only continue with the same customer structures when going west. Looking at the recent change of Chinese economics structure, core operating entity has gradually transformed from state-owned enterprises into more balanced development between state-owned and medium and small-sized enterprises. Meanwhile, China authority aims to increase the domestic demand and reduce the disparity between urban and rural areas development is advantageous for Taiwanese banks giving that are more familiar with the financial services of SMEs. It is essential for Taiwanese banks to transform their services to local enterprises and consumers rather than serving Taiwan businessman merely in order to create unique opportunity, produce additional profit, and expand its foothold in China in the long run.

Taiwanese banks currently face potential challenges on planning strategic schemes in China. Other than rigorous financial regulations between Taiwan and China, limitations, such as slow expansion on operating sites, lacking sound personnel training and management system and having a considerable degree of compliance risk make Taiwan's banking sector in general is deficient in meeting the risk-based capital ratio and maintaining sufficient capital reserves than the international standards. The abovementioned problems hence restrict Taiwan banking sector in promoting business. In other words, the overall scale of operation and competitive ability of Taiwan banking sector are relative weaker than local Chinese banks and foreign financial institute congenital. If Taiwanese banks maintain the same operating mode and enter China as individuals, banks will likely to face the same situation in which having excessive competition with the same nature in one cluster area, and, in other words, not having sustainable developments. Eventually, the performance and profit would be damage once the market shows obvious overlapping on banking products and targeted customers.

In summary, as China has risen to become the world's largest emerging economy, both foreign and Taiwan financial institutions all target China as their next breakthrough market. In order to create optimal market entry strategy, therefore it is vital for all institutions to reassess their competitive advantages to achieve maximum operational efficiency.

1.2 Motive

As china experienced rapid economic growth with strong domestic consumption and rising average income per capita in recent years, together with China's entry to the WTO and subsequent granting market access to foreign players, foreign financial institutions based on their own strategic focus and growth plan has adopted different market entry strategy for the last ten years. Hence as Taiwan closing its ties with China follow by deregulation and the signing of Economic Corporation Framework Agreement in recent years, it is important to undertake thorough research on the condition and external factors that influenced the decision on how the foreign financial institutions entered the Chinese market. For Taiwanese financial instructions that wish to expand into the Chinese market can then use the result of the paper as a reference in shaping their own market entry strategy.

The purpose of this paper is to analyze the strategy of taking ownership stakes in Chinese banks by foreign financial institutions, which can be served as an example of Chinese financial market entry approach. Furthermore, the paper will attempt to

understand the individual factors and the motivations behind the strategy. In addition, the paper will explore the financial and operational synergies and the impact on the local banking sector after the bank's ownership stakes was acquired by the foreign financial institutions.

The paper will further explore the risk and rewards on the foreign financial institutions that acquired ownership stakes in Chinese banks. The paper will discuss the risk factors of the asset valuation and changes using static analysis in order to comply the Basel accord and the rules governing the risk weighted assets. In order to achieved maximum shareholder value after acquiring the ownership stakes in the Chinese banks, the conclusion will arrived by offering the ideal acquisition target under optimal portfolio risk.

Finally the paper will further explore Taiwanese bank's approach in entering the Chinese market by considering the bank's own financial and both internal and external variables. By using the motivation and strength of the strategy in taking ownership stakes in the Chinese banks, it can act as a reference for entering the Chinese market. In addition, the paper will explore the options of establishing representative office, branch, subsidiary and taking ownerships stakes in Chinese banks, by considering the cost and time value variables to suggest the ideal timing of entry.

1.3 Objective

Most major commercial banks in China gradually transform from local to cross-region operation, with being listing on the stock market as the optimal goal. Further, some banks look for the opportunity to cooperate by bringing in foreign financial institutions to participate in acquiring equity stakes to increase international visibility and opportunities overseas as business agents enhance the risk-control and capital adequacy to meet local statutory requirements. There were 25 foreign financial institutions, as the results, taking equity stakes of 34 Chinese banks during 2001 to 2011, and explained Chinese market is the main merges and acquisition (M&A) target market for foreign financial institutions in the last decade. Furthermore, current regulations to become listed on the stock market permit total foreign ownership of a Chinese bank up to 25 percent and no more than 20 percent held by a single entity. As such, cooperation mainly focuses on debt consolidation, cross-region operations, and compliance with all rules. Meanwhile, local banks can dominate in bank operating as well as exercise their rights in board meetings.

From the foreign financial institution's perspective, it is viable to adopt the subsidiary's approach when entering the Chinese market. However, detail research into the potential profitability must be taken into careful consideration. As the barrier to set up such subsidiary and the following branch network expansion are relatively higher compare to other entry option. Normally it will take the foreign financial institution 3 to 4 years to breakeven when taking the subsidiary approach. Moreover the rationales behind the decision in taking ownership stakes in the Chinese banks are: building brand awareness, intra regional expansion, mixed operation, internationalization strategy, enhancing market competitiveness, raising risk management capabilities and enriching human resources.

However, the Taiwanese bank's China current operation was only limited in serving the Taiwanese customers. Since both Taiwan and China shares the same languages and cultural background, Taiwanese banks should expand beyond their current operation scope by tap into the lucrative local market. As to whether the Taiwanese banks should take the approach of taking ownership stakes in the Chinese banks, the decision must be based on individual bank's strategy and their market share target. As Taiwanese bank's asset size are relatively smaller compared to the Chinese state owned and joint-equity commercial banks, plus it will not be viable in the short term for the state owned banks in Taiwan to take ownerships stakes in the Chinese banks. Therefore whether the privately owned Taiwanese banks has the capabilities to take ownerships stakes in the Chinese banks remains to be seen.

This paper will discuss the strategic participation in China banking sector by foreign financial institutions, and analyze the affected variables of equity stakes acquisition and its relative intensity. Meanwhile, the optimal acquiring equity stake proportion and portfolio risk for foreign financial institutions will be analyzed further under the regulatory capital control and objective of maximizing equity value. In the last, we will discuss the best timing and entry model of Taiwanese bank in China financial market.

Therefore, we first have empirical study in Chapter 3 about the equity stakes acquisition of foreign financial institutions in China banking sector with history data, and then adopt Cox proportional survival model with consideration of relative variables such as macroeconomic of home country of foreign financial institutions, interaction between foreign financial institutions home country and China and both of financial ratios for foreign financial institutions and invested Chinese banks. Besides figuring out the significance level respectively, we also discuss the optimal probability hazard threshold to be as determination to take strategy of equity stakes acquisition or

not for foreign financial institutions, including Taiwanese banks, in the near future.

Furthermore, it shall be necessary to comply with regulatory capital control for those foreign banking institutions under the Basel Accord. With this point of view, to analyze the optimal investment return with constraint to reasonable possession of risk is cardinal importance. In Chapter 4, we will assume the dynamics of the asset value of foreign financial institution and invested Chinese bank individually, and the dynamics of the exchange rate, and evaluate the optimal acquiring equity stakes proportion to achieve the goal of maximizing shareholder value under the limitation and bridle of risk exposure and appetite and have static analysis further.

We will stretch the research to the Taiwanese banking sector finally in Chapter 5. Except for the accordance to the model set up in Chapter 3 to estimating the respective intensity of equity stakes acquisition for Taiwanese banks in different types and located districts of Chinese banks, this paper also deliberates further in pan-government-owned banks and private banks separately. Moreover, as political and economic relationships of Taiwan and China getting in depth recently, China financial market is became main business scope for Taiwanese banks. When this market is pretty much laid out by foreign financial institutions as leading, we will adopt the real option approach to analyze the business strategy of the following financial institutions such as Taiwanese banks and discuss its optimal operating demand threshold. In addition, this paper will also involve the further discussion of current regulatory entry models respectively.

There are six chapters in this paper, including this introduction. In Chapter 2, the extant literatures about development of China banking sector, determinants of foreign financial institution expansions, merge and acquisition of financial institutions and strategy of entry in China by Taiwanese banks will be reviewed. The equity stakes acquisition of foreign financial institutions, the analysis of strategic investment under maximum equity value and timing and layout in China by Taiwanese banks are analyzed in Chapter 3, Chapter 4 and Chapter5 respectively, and offer conclusion and suggestion in Chapter 6.

2. Literature Review

On the premise of analyzing developing in China market by the foreign financial institutions and Taiwanese banks, we will discuss about the China banking sector in advance and relevant researches emphasized on its earning performance and management strategy in this chapter. Furthermore, the papers of studying on the determinants of oversea expansion and entry tactic in China financial market will be reviewed for the coordination with understanding the direction of business development for foreign financial institutions, including Taiwanese banks. In the end of this chapter, the relevant articles about analyzing the synergy of M&A in financial institutions will be reviewed, and to see if either the financial synergy or management synergy exists.

2.1 Development of China Banking Sector

To view the development of China banking sector, China government unify and dominates definitely all strategy and operation, and the People's bank of China acts as central role before 1979. The banking sector was classified as fiscal unit without the realistic function and independent operation during the Great Cultural Revolution. Under the open up with economic reform, the financial system strides forward modern frame from the highly centralized gradually, and tends to the individual regulation separately in the sector of banking, security and insurance after 1979. Garcia-Herreto et al. (2009) points out that the better capitalized banks tend to be more profitable. The same is true for banks with a relatively larger share of deposits. In addition, a less concentrated banking system increasing bank profitability, which basically reflects that the four state-owned commercial banks has been the main drag for system's profitability. Also, more market-oriented banks, such as joint-stock commercial banks, tend to be more profitable, which again points to the influence of government intervention in explaining bank performance in China. Wu (2002) finds the serious problem of vacancy of owners existing in state-owned banks. Without the sound board of directors system and the standard to appoint and remove the chief of bank procedure, the state-owned banks are viewed as only like unit of administrative organization in name only. It also finds that the managers are barely on the administrative responsibility and the efficiency of operating for banks declines in general without encouraging environment.

According to the CBRC annual report, the Chinese banking sector comprises policy banks and China Development Bank, large commercial banks, joint-stock commercial banks, city commercial banks, rural commercial banks, rural cooperative banks, rural credit cooperatives postal savings bank, and so on by the end of 2011. There were total of 3,800 banking institutions and 3.2 million employees, listed in Table 1, working in this sector.   Total assets of entire banking institutions as of the end of 2011 were RMB 113.29 trillion, an increase of 18.87% or RMB 17.98 trillion compared to previous year. Financial institutions distinguished by asset types and sorted by asset size, in Table 2, were large commercial banks (47.34%), joint-stock commercial banks (16.22%), city commercial banks (8.81%), and policy banks and China Development Bank (8.22%). As of end-2011, the outstanding balance of deposits maintained by entire banking sector increased by RMB12.1 trillion to RMB73.3 trillion as to the beginning of the year, among which the household savings deposits grew the most by 16.01%. The outstanding balance of loans maintained by entire banking sector went up by 19.7% to RMB50.9 trillion, among which the balance of short-term loans were RMB17.1 trillion, medium-to-long term loans were RMB30.5 trillion, and consumer loans were RMB7.5 trillion. Three types of loans were increased by 13.1%, 29.5% and 35.5% respectively compared to last year.

A report, 2011 China Banking Sector Survey, published by KPMG (2011) indicated that in order to provide better services to SMEs on financing, the local bank authority encouraged the large and joint-stock commercial banks to set up a special department to supple customers with independent credit limits, managements and operation teams, along with differentiated credit review policies and procedures to help SME on expansion and capital increased. Chu (2009) pointed out in the report that the services Chinese banks provided were substantially identical because Chinese banks were largely homogeneous. However, despite the keen competition, banks in China were still very profitable and were not affected by the different cost of capital as the lending interest rates were regulated by the government policy with fixed basis points.

Forbes and China Construction Bank issued the "Private Banking White Paper 2011" and stated the liquidation dominated the China's capital and real estate market so it could recover rapidly from the Financial Crisis. Meanwhile, the wealth of UHNW (Ultra High Net Worth) individuals increased largely. The UHNW individual accounted for a total of 53% in Guangdong, Zhejiang, Jiangsu, Beijing and Shanghai in Chinese market.   The study also found that those individuals who had smaller asset size were more interested in investing in real estate. However, this proportion

dropped significantly as their asset size expanded. Additionally, overseas investment also became a trend. The report noted that 22.6% of the UHNW individuals held offshore assets, and Hong Kong was the first choice for these Chinese UHNW individuals' allocated offshore assets.

Furthermore, most of researches about the performance of China banking sector are focused on the state-owned banks in the early phase. Lardy (1999) showed the capital adequacy ratio, loan loss coverage ratio, return of equity and non-performing loan of major four types of China banks were deteriorated during 1985 to 1997 and lower than the average international level. Li et al. (2001) adopted the financial data of 15 representative China banks to analyze the management performing. The result showed that the return of asset and return of equity of joint-stock commercial banks is higher than state-owned banks, but possessed lower leverage ratio to bear less operating risk. Garcia-Herrero et al. (2009) also found that joint-stock commercial banks have more elasticity of business operating and expanding to increase profit due to higher privatization than others. It also had result that the reason of lower earning in China banking sector is caused by the un-ideal management performance of the state-owned banks.

According to the CBRC's 2011 annual report, after tax profit of China's banking industry was RMB 1,251.87 billion (See Table 3), representing an increase of 39.24% as 2010. Large commercial banks accounted for the highest, 53.09%, in the entire market, and following by the joint-stock commercial banks, 16.02%, city commercial banks, 8.63%, and policy banks and the State Development Bank, 4.29% accordingly. The overall ROA and ROE of the entire banking sector were 1.0% and 17.5%, respectively. Moreover, commercial banks (including large commercial banks, joint-stock commercial banks, city commercial banks, rural commercial banks and foreign banks) had 1.1% of ROA and 19.2% of ROE, better performance than the entire financial institutions. As for the asset quality, the year end outstanding balance of NPLs stood at RMB 1.24 trillion, a decline of RMB 169.6 billion from the beginning of year 2011. The NPL ratio of the entire banking sector was 2.44%, 0.89 bps lower than the beginning of year 2011. From the view Commercial banks, the average NPL ratio was 1.1% with 217.7% coverage ratio, an increase of 64.5 bps compared to the beginning of year 2011. Besides foreign banks, joint-stock commercial banks preformed and improved the most among all in asset quality. The NPL ratio was 0.7% and coverage ratio was 277.6%. Furthermore, the capital strength and adequate level of Chinese banks were significantly improved. The overall weighted average CAR of China's commercial banks was -2.98%, however, the

number had turned to positive in 2004. By the end of 2011, the CAR went up to 12.2% and Tier I also reached 10.1%.

Short (1994) pointed out that the ownership structure of company played an important role on operating performance. As for the agency theory, when a firm had more dispersed shareholdings, it would result in lack of effective control on managers' behavior, which may not efficiently enhance corporate performance. Dewenter and Malatesta (2001) made a comparison on profitability, labor intensity and debt levels between state-owned and private enterprises, and found out state-owned enterprises did not perform as well as private enterprises in many evaluation indicators. La Porta et al. (2002) also examined the performance on banks whose equity are held by the government do not perform as good as the private banks on financial and operating results. A study based on 92 countries' actual data discovered that when the government of a country holds higher stakes on the banking sector, its' financial development is far less compatible than those who do not.

Bonin et al. (1998) started an empirical research in the emerging countries in Eastern Europe and learned that although the state-owned banks' profitability is lower compared to the private banks, but the efficiency is not inferior to private banks. The article also pointed out that the privatization of state-owned banks must coordinate with other methods, in stead of only in pure privatization as a start. However, research also found on state-owned Chinese bank general performs negatively in banking operation and development in the similar theory. Tu (2000) noted a wholly-state-owned bank would be more politicization in operating, fiscal in financial, and administration in organization, and thereby affecting the profitability performance.

Wang (2002) suggested in order to effectively reach a permanent cure for state-owned banks reform, it must proceed from the changing the property system which included property ownership resulting in dualistic business objectives, legal system not working properly, restraint on alienation and encumbrance causing failure of economic incentive and restraint mechanisms, and property misallocation creating asymmetric situations in the responsibility and relationship. Lu (2006) studied the ownership structure among the non-commercial banks, state-owned banks, joint-stock commercial banks and city commercial banks, and came up conclusions that the higher proportion of share held by the central government, the lower the profitability it does, whereas the same method does not apply to local government-owned banks. The same research also found joint-stock and city commercial banks will perform better when the ownership structure are more diversified from local governments,

state-owned enterprises and private enterprises, along with fewer share held by government.

In view of high degree of internationalization and economic growth, the China government further requires banking industry to strengthen transparency in the management and accept inspection by the investors and publics in the near future. Meanwhile, the Chinese banks should begin to participate in international competition actively in order to consider their own competitiveness in international market. With continuously expansion on operational scales and profitable source as the goal, banks should extend the territory by establishing more institutions or M&A to implement internationalization strategy. As a result, 84 Chinese banks were nominated to The Banker's Top 1000 World Banks in 2011 as compared to 31 in 2007, which near double in 4 years. In addition, the four Chinese state-owned banks placed top 10 largest global banks in market capitalization.

Young et al. (2006) stated while the degree of internationalization of China's banking sector are low, other than strengthen the overseas expansion outside of China, they should start to look for developing in new market and personnel training, strengthen government oversight ability and implementation on business management direction in order to enhance its level. Chang et al. (2006) believed the Chinese multinational companies remain highly growth by following their customers to locate and globally, which could be the successful key to be cross-nationalized. Huang et al. (2009) indicated that the main key influence Chinese banking industry to expand internationalize effectively will be through overseas direct investment and exports. This paper also found that the Chinese banking industry tends to follow growth trends as the local enterprises do to be internationalized when investing oversea directly. The large-scale commercial banks in China had established 89 business institutions, 5 branches and 7 representative offices in is Asia, Europe, the Americas, Africa and Oceania, in addition to acquire or take ownership stake of 10 business institutions as the end of 2010. General speaking, there are two major considerations guide Chinese banks to set up overseas presence; one is that the areas have the prosperity through direct investment and global trading with the intention of provide customers with full services. Another is the area should be the global or regional financial center so as to have the latest financial information, management know-how and financial talents to develop and enhance operational efficiency.

2.2 Determinants of Foreign Financial Institution Expansions

　　With the accelerated pace of global economics growth, the international investment trend has shown the signs of scale of globalization. Many financial institutions are facing an important challenge to develop strategies and approaches to expand to all over the world with the aim to increase the number of income sources and profits.

　　Hill and Hoskisson (1987) believed when institutions expand globally, the adopt methods would be differed depends on their strategies, and the results will be varied according their methods. Sullivan (1994) employed three measures concerned with performance, structure and attitude, as well as nine indicators to evaluate the degree of internationalization. He suggested institutions should apply multiple measurements to ensure the degree of internationalization. Contractor et al. (2003) reached the three-stage theory of international expansion and found an inverse relation between the degree of internationalization and performance at the first stage, positive relation at the middle sage, and inverse relation, again, at the last stage, or so-called the "S-Curve" theory. Lin (2001) believed the diversification strategy and the degree of internationalization might be helpful on increasing the overall operating income, bank's financial performance, however, does not see the similar impact. Ramaswamy (1995) noted that the company should apply financial performance indicator to show their oversea operating performance with value chain activities, and obtain the relative competitive advantage with cost reduced and core competitiveness made. Chang et al. (2010) examined that Taiwan's commercial banks do not have significant improvement on operating performance, but have better enhancement in risk control to the degree of internationalization. In addition, she considered the performance had inverse relation with oversea sales and diversification strategy.

　　Multinational financial institutions can be considered as an international enterprise. Start from the local and develop by owning or control through the overseas branches to engage in international matters in order to expand the scale of business from local operation toward global enterprise. Multinational financial institutions generally contain four characteristics. First, the creation of multinational organization would be derivation. In other words, it will see the multinational investment as outward expansion tool with sufficient capital and the appropriate scale of operation as premise. Second, the base operations of multinational financial institutions should be supranational, meaning establishing various types of branches in different countries and regions. Then, the business multinational financial institutions operate should be less native, so they will achieve the expansion purpose and business

diversification when operating. Last, the strategy of multinational financial institutions should be globally in order to involve with the international investment activities.

The academic research often referred the theory of international trade, such as gravity model and comparative advantage theory, as well as the theory of international business, such as Follow the Customers hypothesis and eclectic theory when institutions considering about the oversea expansion. They analyzed in the light of the country of its origin, the oversea host country, and multinational financial institutions themselves to determine the factors of expansion. The gravity model of bilateral trade and economic scale with geography and culture relation analyzing was first introduced by Tinbergen (1962). Di Giovanni (2005) stated that overseas investment is proportional to the size of the economy, but is inversely proportional to the geographical distance under the gravity model. The author also believed the information, trading activity, degree of financial deepening and common language will stimulate bank to adopt cross-border mergers and acquisitions action. The comparative advantage theory analyzed the market size, trade and economic development, inflation, exchange rate and general economic factors between the home country and the host country's to decide whether the bank would adopt overseas expansion strategy. Esperanca and Gulamhussen (2001) used single host country bank expansion to overseas territory as the study model and found the larger the scale of the financial markets of the home country, and the greater the motivation of the local financial institutions would like to go overseas. Focarelli and Pozzolo (2005) indicated when the market shown good economic growth, stable exchange rate and continued expansion of the financial markets, then the banks of OECD countries would be willing to invest cross-nationally.

Williams (2002) shown that Follow the Customers hypothesis could be regarded as a defensive expansion to avoid interruption and assure adhesion with customers. Additionally, Grosse and Goldberg (1991), Esperanca and Gulamhussen (2001), Huang and Nguyen (2004) and Chou et al. (2009) also agreed with the same hypothesis. However, Seth et al. (1998) studied loan activities of six foreign banks in the United States and found some customers of these foreign banks didn't limit from their original home country. As a result, the application of the hypothesis still showed some conditions and limitations. Dunning (1977) argued the multinational corporations could compete with the host country enterprises when three advantages are satisfied, namely uniqueness, location and internalization-incentive in the eclectic theory. Piscitello (2003) pointed out the unique advantages included assets size,

volume of deposits and loans, financial performance, degree of internationalization and product differences. The location advantages included the economic size of the host country, the level of development of the financial industry, the whether the location is at the international financial center, regulatory environment, as well as the degree of economic and trade exchanges between two countries, plus the internalization advantages of the local country. Outreville (2007) research found the asset size, cultural, and human capital of the world's top 50 financial institutions had indeed a significant impact to their internationalization degree under the analysis of the location advantages.

In addition, the overseas expansion motivation could be further analyzed from the overall and individual environment. First, we can look at the regulatory factors impact in the overall environment. Levine (2002) suggested the good regulations could strengthen the financial environment and economic development, and be the excellent support for corporate to develop overseas. Slager (2006) believed the regulations on either host or original home country could impact overseas expansion behavior of multinational financial institutions. As for the economic environment, Goldberg and Johnson (1990) stated that conditions of economic development, such as trade volume and GDP, on both host and original home countries could affect banks strategies on going abroad. Chou et al. (2009) discovered the expansion and investment behavior of multinational banks at China, Taiwan, and Hong Kong had a positive relation on GDP of original home country. Finally, we examine the motivation to go overseas on the social, cultural and technological environment factors. Sebastian and Hernansanz (2000) researched the advances of Spanish banks in Latin America and found geographically adjacent, similar to the common language, history and culture were contributed to the development of overseas business. Outreville (2007) indicated the quality level of human resources was also the key factor for multinational financial institutions to consider going overseas, other than culture itself. Slager (2006) showed information technology could have two effects on degree of internationalization on banking sector. First, the information technology could shorten the processes of branch operations and investment, and provide services at regional centers. Second, information technology could reduce the monitoring cost of overseas expansion, and then consolidate its business scale.

We also look at different aspects on individual circumstances, for example industry competition, customer demand and supplier bargaining that could influence multinomial national institutions to invest overseas. The industry competition contained existing competitors, potential entrants, and substitute products. Buckley

(1988) believed that strong organizational structure is the competitive advantages of a company, and it could be best utilized by foreign direct investment and market internalization. Piscitello (2003) used financial indicators as the proxy variables to the model, and discovered the financial scale and overseas expansion had a positive relation. As for the customer demand, many studies showed empirical description on multinational financial institutions had a positive and significant impact with Follow the Customers hypothesis when expanding overseas. In addition, the difference between borrowing and lending rates of financial institutions would affect their overseas expansion decisions. Aliber (1984) indicated financial institutions had higher motivation to overseas development when their affiliated countries having lower capital costs and spreads. Slager (2006) also believed seeing as the main source of profit for banks was coming from interest income; it would motivate the local banks to adopt overseas expansion strategy when the home country spreads became narrower.

2.3 Merge and Acquisition of Financial Institutions

The economy was deeply impact by the subprime mortgage crisis, the global financial crisis and the euro zone crisis for the past few years. Therefore, the global mergers and acquisitions in financial institutions sector became a new wave after successive crises. Companies hoping they can rapidly expand their operations scale, scope of business, economic and investment value under the risk appetite by M&A or reinvestment. First, the companies can share research and development, human and marketing resources to reduce the associated operating costs after through the interbank M&A or reinvestment. Moreover, companies can strengthen the operational risk and stable earning in different business cycle when forming a strategic alliance with different business sectors.

Several researchers have stated ideas on the motivations of merger and acquisition (M&A) or in reinvesting to maximize shareholder value, with cost savings and efficiency analysis. Scherer (1980) believed merging was mainly does to reduce the cost on facilities and reinvestment to obtain efficient production and reach its economies of scale and operating synergies. However, M&A would tend to be less useful once the market reaches its smooth operations. Radecki et al. (1997) supposed that technology is the main key to expand economies of scale and enhance financial innovation. Vander (1997) found oligopoly could gain control on pricing power and then increase market share if banks adopted horizontal mergers. Pilloff et al.'s (1998) research found that the reasons for successful M&A in the banking sector include

large-scale banks that have superior professional management capacity and structure knowledge, which could help banks with relatively low efficiency and profit to escape their predicament. Hennart and Park (1993) showed that companies with higher levels of diversification and lower levels of R&D intensity would likely use mergers as the main approach to increase operations and earnings in the market.

In addition, for companies looking for M&A or reinvesting that did not seek maximize shareholder value, Halpern (1983) argued that once the merging company found that internal information was originally not reachable by an outsider, they could utilize the information better on production efficiency than could the merged company, thereby reducing the cost of bankruptcy. Fama and Jensen's (1983) research found that a company's management ownership and rights could be controlled via internal mechanisms when the controlling power was granted by merging. When management does not perform and stock prices decline, then share acquisitions could be foreseen, if the management level wanted to maximize shareholder value. Marcus (1982) pointed out that management level could adopt a diversified acquisition strategy to stabilize the operating performance and reduce fluctuations in personnel performance, thus, reduce the risk of bankruptcy while also reducing staff employment and reinvestment risk. Anderson et al.'s (1997) study showed that merging could urge the merging company with the existing network directly without rebuilding it.

Brealey and Myers (1988) pointed out that the added value of economic profit and activity on merged or acquired companies would be greater than the sum of each individual combined, or synergy. Synergy normally includes company mergers through acquisitions or reinvestments to improve current operating earnings and reach operating synergy so the company could have higher cash flow and lower capital cost of financial synergy. Smith and Triantis (1995) indicated traditional discounted net cash flow does not fully reflect the intrinsic value in the acquisition process. The value includes developing opportunities with better comparative advantages and invests timing and any other conditions that could increase the M&A synergies. Childs et al. (1998) also found that capital inflow injected into the merged party could be treated as the time value of an option premium when evaluating the merging effectiveness with a real option model. Further, Leland (2007) discovered that merging could improve solvency of a company. Additionally, the degree of financial synergy depends on taxation, bankruptcy cost and scale, level of cash flow, and its correlation. For example, a merged company with a high bankruptcy risk and cost would likely end up with a negative financial synergy value. Liao et al. (2005) discussed multinational corporations merging, which would have a negative financial

synergy if both parties were in a similar degree of interest rate and foreign exchange risk exposures. Conversely, companies with unequal size and risk exposures would tend to have positive corporate synergy.

Regarding the researches on financial institutions M&A or reinvestment, Moore (1997) adopted Multinomial logistic regression analysis to investigate the relevance between financial performance and M&A probability on US banks. The result showed that banks did not perform as well caused the lending business restricted had higher possibility to be merged. Besides those small banks mainly concentrated on SME financing did not prove to have synergy on M&A, most other banks often show positive results. Houston et al. (2001) examined major bank merger cases during 1985 to 1996 and found both acquirers and acquirees had positive impact on stock prices after merging. Another issue would like to be stated is surplus mainly coming from cost down instead of profit earned. Zollo and Singh (2004) noted having sufficient knowledge on M&A could perform better than having past experience, on the premise that the senior management of acquirees would maintain during the M&A process.

2.4 Strategy of Entry in China by Taiwanese Banks

The timing for Taiwan's banking industry to expand into Chinese market is behind foreign financial institutions as they had layout in mainland China for a period of time. Especially, most Taiwanese enterprises have working with the local Chinese banking since the early time. Although, it is difficult for Taiwan's banks to operate and compete with the advanced foreign banks in Chinese market, we can utilize the advantages on language and culture similarities to expand the market by providing professional services, successful SME business experience, and well-appointed risk management systems to build our completed strengths. With positive political interaction and the increasingly frequent contact on economic and trade, Taiwanese banks can definitely find the self niche advantages in the market.

For Taiwan's banking industry to expand it foothold to China, it first needs to obtain the approval from the competent authority domestically, then in accordance with the China norms and accords signed to apply and getting the approval from China. A report, Foreign Banks in China, published by PwC Taiwan (2010) supposed EFCA would stimulate the business contact between Taiwan and China. In the one way, lager-sized Chinese banks could expand their business territory by establishing branches in Taiwan. Furthermore, Taiwanese banking could also enter the market, start the RMB business and acquire equity stakes in Chinese banks more rapidly on the other way. Ultimately, a substantial increase in numbers of foreign investors could

help to reach perfect competition among foreign investors when entering the mainland market. Chang (2001) believed Taiwan's banking industry has a sound financial system and regulations to facilitate using own advantages and selecting specialty skills developing and competing in the Chinese market. Meanwhile, Taiwanese banks can carefully choose complementary peers when proceeding mergers and strategic alliances to make up shortfall of their own the business.

The exiting processes to enter the mainland Chinese financial market for foreign financial institutions include establishing a representative office, a branch, a wholly-owned subsidiary bank, acquiring equity stakes in Chinese banks, and forming strategic partnership. Foreign institutions will decide the right processes according to their business development strategies and operating conditions to enter the market and expand to overseas. Taiwan banks establish footholds in the Chinese market in succession as table four listed. The establishment procedure is mainly followed the ECFA which is after the representative office established for one year and transformed to a branch to operate the business as the main mode for Taiwan banks. Simultaneously, Taiwan banks can apply to operate the RMB business for Taiwanese-funded enterprises in China after running the branch for a year with surplus earnings.

Lee (2009) noted Taiwanese banks could enter the mainland market through the coordination of non-governmental organizations from both sides, and then choose Hong Kong branch, if available, as the bridge of cross-strait cooperation to build a financial supervision unit under the structure of WTO eventually. Lee (2002) believed Taiwanese banks have inherent advantages on language, culture and practice compared with other developed western investors. Even with the advantages on relative modern financial dealing ability than Chinese banks and having many Taiwanese companies that have invested in China, Taiwanese bank still face a challenge market with unfamiliar financial system and thus should be cautious with the plans to avoid potential risks and then create the maximum value of effort.

For the business location in China, most of Taiwanese banks choose the Yangtze River Delta as first priority such as Shanghai, Soochow and Zhejiang in the consideration of continuing the Taiwan local customers' service and higher economic development around coastal cities. Ju et al. (2007) pointed out although Taiwanese banks focused on providing the service of small merchant enterprises in Taiwan under customer-following theory, they should apply the present infrastructure and management of financial holdings into the China banking sector on the base of mixed operation in China in the near future. Additionally, besides of the policy inducement

of green channel under ECFA, Haixi Economic Zone was seemed to have more advantage for Taiwanese banks to develop because of its similarity in language, climate and culture, and neighboring location. Lin (2010) also showed Taiwanese banks should play a complementary role in the economic growth and local financial development to acquire the important position in this district when Haixi Economic Zone is getting more attention from China government.

As the main target for entry of Taiwanese banking industry is on the developing the local business, how to precisely satisfy the customer demand, go deep in the regional financial service and obtain better beneficial investment is worthy to discuss in depth. Jen (2007) believed the entry of Taiwanese banks in China would be helpful for raising quality of service in SME of Taiwan, but not direct rewarding in credit risk management. Taiwan government should be responsible for the realization of realistic circumstance among Taiwanese businessman to reduce the operating risk exposure with the business association and policy propaganda. Nieh (2010) shown the finance of SME is the principal business for Taiwanese banks for a long period and reach certain level in framework and accumulative experience. Therefore, Taiwanese banks should adopt this advantage to help grow of SME successfully in China and expand to local business further under the win-win strategy. They also suggested the market of retail finance and wealth management could be paid more attention, and developed and elaborated in the near future besides the RMB quoted loan finance.

Ju (2007) also believed that it was inevitable to have moderate open attitude toward to the mainland market for Taiwan as the Chinese authority implemented the WTO commitments on financial market fully, and many foreign financial institutions were gearing up to accelerate the layout. Taiwanese banks, otherwise, would be less competitive with constraint control on laws and policies internally. IBM (2009) also summarized the challenges that Taiwan's banking industry would be facing when going to China. The challenges included the level of understanding on the Chinese norms of laws, accounting methods and taxation. In addition, other challenges include the competition among local Chinese banks and foreign financial institutions, the abilities to create sales and servicing innovation, establishment on talented management mechanism, risk evaluation and so on. Banks also need to come up plans to have customer segmentation and utilizing technology to create different services with the support of latest technology when expanding the business and making decision.

In summary, Taiwanese banks shall take into consideration on its relative motive when enter the China vast financial market and make the suitable plan and strategy thereafter. Furthermore, it is definitely necessary to be good at China domestic regulation and limitation and establish the comported extent of close and confident relationship with government. The ability of product innovation and expanding business scope shall be strengthened finally.

3. Equity Stakes Acquisition of Foreign Financial Institution

The merits of taking equity stakes in Chinese banks include the ability of foreign financial institutions to gain quick access into Chinese financial markets and facilitating expertise in business and product developments using Chinese bank's channels, but it is also worth mentioning that the foreign financial institutions also face the problem of uneven quality of Chinese banks. Moreover, one single foreign institutional investor is confined by the limitations of 20 percent shareholding, and total foreign institutional investors can hold only up to 25 percent shareholdings in one Chinese bank. As foreign banks cannot obtain full ownership and control of Chinese banks, the majority of the foreign banks adopted a strategic minority equity stake investment to promote the acquired bank's profitability and market value in order to create higher return on investment.

Some papers adopt Logit or Probit model to predict the probability of surviving in different times but only for one period, mentioned as the static model in Shumway (2001). In addition, Noh et al. (2005) pointed out that the survival model presents fewer type I and type II errors than other models. In addition to the biomedical field, the survival model has been applied to various areas in social science, such as econometrics, educational statistics, and finance, particularly in the measurement of default risk, financial institutions' bankruptcy, and financial crisis prediction. Whalen (1991) adopts a proportional hazards model to estimate the probability that U.S. banks with a given set of characteristics (total loans/total assets, return of asset, and total domestic deposits/total assets) will survive longer than some specified length of time into the future. Wheelock and Wilson (2000) examine the hazard of banks disappearing due to either acquisition or to failure via survival model and find, not surprisingly, that the banks that are less well capitalized and have high ratios of loans to assets, poor-quality loan portfolios, low earnings, and high managerial inefficiency are at greater risk of either acquisition or failure. This paper adopts the survival model to analyze the strategy of foreign financial institutions in entering into the Chinese banking sector by taking equity stake acquisition. Here the hazard function is used to represent the probability of the intensity of equity stake acquisition.

3.1 Proportional Hazard Survival Model and Principal Component Analysis

To further understand the intensity and timing of foreign financial institutions taking equity stake acquisitions in Chinese banks, we apply the survival model and

principal component analysis and derive the intensity of investment and relative significant variables. The variables considered are macroeconomic variables, such as country origin of foreign financial institution and the interaction between foreign bank's home country and China, and financial variables, such as financial ratios of foreign financial institutions and invested Chinese banks.

In this section, we illustrate the Cox's proportional hazard survival model and then apply the principal component analysis to analyze and deal with data linearity and extraction in financial ratios of foreign financial institutions and Chinese banks.

3.1.1 Cox's Proportional Hazard Survival Model and Parameters Estimation

In the survival model, we treat the time of foreign financial institution taking equity stake acquisition as the survive-ending point, which also refers to the default time or bankruptcy time. The advantage of the proportional intensity model proposed by Cox is that it estimates parameters with unknown population distribution and needs no assumptions about baseline hazard function, which contains the characteristics of the semi-parameter model. In contrast, under the non-parameter survival model the potential effect of survival probability, hazard function and average survival time can not be easily measured from relevant variables.

To estimate the conditional probability of foreign financial institutions taking equity stake acquisition in Chinese banks according to Cox's proportional hazard model, we assume T to be the time of investment, it also means the surviving-end point. Thus the probability of survival is represented as

$$S(t) = P(T \geq t) = 1 - P(T < t) = 1 - F(t),$$

where $S(t)$ is the probability that the time of equity stake acquisition is more than t, which is the same as the probability of survival time more than t. The hazard function (conditional probability) is defined by

$$h(t) = \lim_{\Delta t \to 0} \frac{\Pr(t \leq T \leq t + \Delta t)}{\Delta t} = \frac{f(t)}{S(t)} = \frac{-S^{'}(t)}{S(t)},$$

where $S(t) = \exp(-\int_0^t h(u)du)$.

According to the Cox proportional intensity model, the hazard function $h(t, x; \beta)$ of foreign financial institution taking equity stake acquisition is defined as follows:

$$h(t, x; \beta) = h_0(t)\exp(\beta_1 x_1(t) + \cdots + \beta_k x_k(t)) = h_0(t)\exp(\beta^{'} x(t)), \tag{1}$$

where the baseline hazard function $h_0(t)$ can be assumed to be either the Weibull model ($h_0(t) = \lambda p t^{p-1}$) or the exponential model ($h_0(t) = \lambda$), which will not affect the estimation of parameters. Furthermore, $x(t)$ is the variable at time t affecting hazard function, and β is the coefficient vector of variables.

The maximum likelihood method is used to estimate β in Cox's survival model. Assuming t_i to be the equity stake acquisition time of foreign financial institution i, the proportion of information contained in this sample to the whole risk set is $\dfrac{\exp(\beta' x(t_j))}{\sum\limits_{k \in R_j} \exp(\beta' x(t_k))}$, where R_j is the risk set in t_j. Taking natural logarithm of this risk information proportion, we obtain the log-likelihood function :

$$
\begin{aligned}
L(\beta) &= \log(\prod_j \frac{\exp(\beta' x(t_j)}{\sum\limits_{k \in R_j} \exp(\beta' x(t_k))}) \\
&= \sum_j \{\beta' x(t_j) - \log[\sum_{k \in R_j} \exp(\beta' x(t_k))]\}
\end{aligned}
\tag{2}
$$

This is viewed as complete data which could be observed when the sample firms default or bankrupt, meaning that taking equity stake acquisitions in the observable period. In contrast, it is from censored data, as the sample survival time is more than the observable period. Under this condition, we could obtain the partial likelihood function to estimate parameters (Cox, 1975):

$$
PL(\beta) = \log(\prod_j [\frac{\exp(\beta' x(t_j))}{\sum\limits_{k \in R_j} Y_{jk} \exp(\beta' x(t_k))}]^{\delta_j}),
\tag{3}
$$

where $t_j > t_i \Rightarrow Y_{ij} = 1$ and $t_j < t_i \Rightarrow Y_{ij} = 0$. Also, $\delta_i = 0$ if the sample is from the censored data, and $\delta_i = 1$, otherwise.

To optimize the likelihood function, the maximum likelihood estimator $\hat{\beta}$ contains the characteristics of asymptotical normal distribution (Casella and Berger, 2002), which causes it to be a consistent estimator of β and asymptotically efficient. In addition, the goodness-of-fit test of Cox's proportional survival model follows the log-likelihood function as

$$\chi_{Cox}^2(v) = -2\log\frac{(Maxium\ Likelihood_{without\ variables})}{(Maxium\ Likelihood_{with\ variable})}, \tag{4}$$

and rejects the null hypothesis $H_0: \beta = 0$ as $\chi_{Cox}^2(v) > \chi_\alpha^2(v)$ with a degree of v.

In addition, the significant variables in the model are tested by Wald test to reject the

null hypothesis $H_0: \beta_i = 0$ as $\chi_{wald}^2 = (\frac{\hat{\beta}}{SE(\hat{\beta})})^2 > \chi_\alpha^2(v)$.

3.1.2 Principal Component Analysis

Considering the high correlated homogeneous variable and existence of linear dependent property that would cause inefficient analysis in the Cox survival model, this paper adopts the principal component analysis as a factor analysis for data subtraction and establishes a set of variables to serve as independent principal components. These principal components are the linear combination of original variables and explain most total variation without significant loss of information contained in the original data. In other words, the principal component analysis sets up L mutually independent components by linear combination of K original variables and still maintains its power of explanation, even with data subtraction. The principal components can be represented as the linear combination of original variables as

$$P_j = \alpha_{j1}X_1 + \alpha_{j2}X_2 + \cdots + \alpha_{jK}X_K; \quad j = 1, 2, \cdots, L, \tag{5}$$

where $X_k; k = 1, 2, \cdots, K$, are the original variables, $P_j; j = 1, 2, \cdots, L$ are the

principal components, and α_{ji} is the weighting of j's principal component on i's

original variable. The purpose of the principal component analysis is to assign higher weight to the significant variable and lower weight to non-significant variables to maintain sufficient power of explanation.

When the cumulative factor loading is 100%, the principal component number is the same as that of original variables, and communality is equal to one. For the linear combination $P = \alpha_1 X_1 + \alpha_2 X_2 + \cdots + \alpha_K X_K$ as $a'a = 1$, the eigenvector α is corresponding to the eigenvalues of Σ thus maximizing the variance of

$Var(P) = a^{'} \sum a$, where $\sum$ is the covariance matrix of original variable, and the eigenvalue is larger than 1 by Kaiser criterion (Kaiser, 1960). Under the low correlation coefficient, the principal component analysis model does not have completeness in general, such that it is unsuitable for data subtraction, and cumulative factor loading of principal components subtracted shall be reached above the specified level. In addition, the factor rotation approach sifts the original variables that are highly correlated with the principal component. The principal component score is determined by subtracting and translating by weighting for the application of statistics or survival analysis.

3.2 Optimal Probability Hazard Threshold

In this section, we estimate the probability of intensity in equity stakes acquisition in the observable time via maximum likelihood estimator in survival model and principle component analysis which are mentioned in previously, and figure out the optimal probability hazard threshold with minimizing type I and type II error.

For the time of equity stake acquisition of foreign financial institution $t_i; i = 1,2,\cdots,N$, and correspondent variable $x_i(t)$, where N is the number of total samples in the observed period, we can derive its relative hazard function $h_i(t,x;\hat{\beta})$ by maximum likelihood estimator $\hat{\beta}$ in the specific baseline hazard function. Furthermore, the estimated probability of intensity in equity stake acquisition is $F_i(t,x;\hat{\beta}) = 1 - S_i(t,x;\hat{\beta})$.

After deriving the probability of intensity in equity stake acquisition and setting probability hazard threshold $B \in (0,1)$, we consider that the foreign financial institution will take equity stakes acquisition in the observed period if $F_i(t,x;\hat{\beta}) > B$. Therefore, the type I error, defined as the ratio to which samples are classified wrongly as not taking equity stake acquisition to those total samples taking equity stake acquisition in the observed period, is represented as

$$\alpha(B) = \frac{\sum_{i=1}^{N} \delta_i I(F_i(t,x;\hat{\beta}) \le B)}{N_1} , \tag{6}$$

where δ_i is the same as in (3) and $N_1 = \sum_{i=1}^{N} \delta_i$ is the number of foreign financial

institutions taking equity stake acquisition.

Similarly, type II error $\beta(B)$, defined as the ratio by which samples are classified wrongly as taking equity stakes acquisition to those total samples not taking equity stakes acquisition in the observed period, is represented as

$$\beta(B) = \frac{\sum_{i=1}^{N}(1-\delta_i)I(F_i(t,x;\hat{\beta}) > B)}{N_2}, \qquad (7)$$

where $N_2 = \sum_{i=1}^{N}(1-\delta_i)$ is the number of foreign financial institutions not taking equity stake acquisition in the observed period, and $N = N_1 + N_2$. The optimal probability hazard threshold $\hat{B}$ is the solution of $\min_{B \in (0,1)}\{\alpha(B) + \beta(B)\}$, i.e., which is obtained by minimizing the sum of type I and type II errors (Begley, Ming and Watts, 1996). $\hat{B}$ represents the threshold of investment.

After establishing this optimal probability hazard threshold of equity stake acquisition, we can derive the relative implicit estimation of hazard and survival and compare it to the optimal probability hazard threshold to determine whether the foreign financial institution, including Taiwanese banks, will take equity stake acquisition or not.

3.3 Empirical Data

In view of China's commitment to gradually open the financial market when entered WTO in 2001, the foreign banks began to enter the Chinese market before the market fully opened in 2008. This included the establishment of subsidiary, branch, and equity stake acquisition. We want to study and analyze the motives and timing of foreign banks in taking equity stakes in Chinese banks by collecting data on the timing of transaction and related explanatory variables from 2001 to early 2008. When foreign banks take equity stakes in Chinese banks during the above-mentioned time, it is defined as the survival endpoint, whereas the foreign banks which did not take equity stakes in Chinese banks during the interval are defined as the surviving samples.

This paper examines whether the factors of foreign financial institutions' countries of origin, interactive determinants between foreign banks' countries of origin and China, and financial indicators of foreign financial institutions and local banks have significant influence on the motives and timing of transaction. In line with

the purpose of this study, supra-national financial and non-financial institutions, such as International Finance Corporation, Asian Development Bank, and Temasek Holdings, were excluded from the observed samples. To summarize, there were 44 observed samples; 27 foreign banks took equity stakes during the time interval and were regarded as complete data. The remaining 17 foreign banks which did not take the forms of equity shares were regarded as truncated data. In addition, there were 29 Chinese banks which entered into strategic alliances with foreign banks taking the forms of equity investment; 4 were state-owned, 9 were joint-stock commercial banks, 15 were city commercial banks, and 1 was a rural cooperative. Their average and deviation of assets and revenue during the last five years are listed in Table 5.

The variables in the model are categorized as below for the analysis of the foreign financial institution taking equity stake acquisition in Chinese banks:

(1) Macroeconomic variables: GDP, GDP per capita, and GDP growth rate of home countries of foreign financial institutions.

(2) Interaction variables between foreign banks home country and China: bilateral trade, two countries' capital distance, foreign financial institutions ranked in the world's top 1,000 banks, and interest rate spread between foreign financial institutions home countries and China.

(3) Financial ratios variables of foreign financial institutions: CAMEL standards and indicators in Uniform Financial Institution Rating System adopted by FFIEC, including 10 financial ratios as in Table 6: capital adequacy, asset quality, management, earning capability, and liquidity.

(4) Financial ratios variables of invested Chinese banks: the same 10 financial ratios as (3), and taking into consideration of the weights by asset size in observed time when the Chinese banks received equity stake acquisitions.

3.4 Results and Analysis

In this section, we apply the principal component analysis to subtract the financial ratio variables of foreign financial institutions and Chinese banks and rotate them as principal component scores to be the alternative variables using the survival model. Thereafter, the maximum likelihood estimator is derived via Cox's proportional hazard survival model, involving the macroeconomic variables of foreign financial institutions' home country and interaction between foreign banks' home country and China for the rotated principal component scores. We derive the optimal

probability hazard threshold of equity stake acquisitions for foreign financial institutions by minimizing type I and type II errors in the specific baseline hazard function.

3.4.1 Subtraction of Financial Ratios Using Principal Component Analysis

With the principal component analysis in the subtraction of 10 financial ratios of foreign financial institutions and Chinese banks to eliminate the variables of low explanation, we have principal components mutually independent which still keep these alternative variables above a certain power of explanation and apply the principal component score as the financial alternatives in the survival model.

Table 7 presents the results of the principal component analysis regarding the financial ratios of foreign financial institutions. There are four principal components subtracted from 10 original financial ratios variables, with 81% power of explanation, and are viewed as alternatives of these financial ratios. Hence, we take the score of principal components 1 to 4 as the alternative variables for financial ratios of foreign financial institutions.

With the same approach in dealing with 10 financial ratios of Chinese banks, Table 8 shows that the cumulative variation reaches more than 80% after subtracting one principal component out and more than 92% after adding one more principal component. Thereafter, we take the score of principal component 1 as the alternative variable for financial ratios of Chinese banks.

3.4.2 Variables and Probability of Intensity in Equity Acquisition

When applying Cox's proportional hazard survival model to discuss the motives and timing of foreign financial institutions in taking equity stake acquisition, the macroeconomic variables of foreign financial institutions' home country, interaction between foreign bank's home country and China, and financial ratios alternatives of foreign financial institutions and Chinese banks are taken into consideration. Here we see that the goodness-of-fit of Cox's survival model is significant in Table 9, and a -2 log likelihood is less than the initial -2 log likelihood, and $\chi^2_{Cox}(v) > \chi^2_{\alpha}(v)$ to represent model is the most fitted.

The results in Table 10 show that the principal components 1 and 2 of the financial ratios of foreign financial institutions have a positive and significant effect on the probability of intensity of equity stake acquisition, which is the same as the

principal component 1 of the financial ratios of Chinese banks. This means that the foreign financial institutions with higher earning capability and better asset quality possess higher probability of intensity to improve the performance and earning capability of Chinese banks to make capital gain of equity stake acquisition and provide stability if China's economy fluctuates. Furthermore, for the Chinese banks with better asset quality like the state-owned, joint-stock city commercial banks, they have higher probability of intensity in general to attract the investment. The lower acquisition cost by that time and subsequent improvement in earning capability has enhanced the value of the tie-ups. In addition, advancing capital adequacy ratio improvement meant that the local bank is closing the gap with international standards.

For the interaction between foreign banks' home country and China, the results indicate that the ratio of top 1,000 banks ranked has positive and significant effects on the probability of the intensity of equity stake acquisition. It is observed that the relative probability of intensity of countries with higher financial development is higher generally than those countries of lower financial development. This echoes the results that higher earning capability and better asset quality of foreign financial institutions possess higher probability of intensity as illustrated previously. In addition, the variable of bilateral trade has a negative impact on the probability of intensity, which means the main purpose of foreign financial institution taking equity stake acquisition is to create the market value of invested Chinese bank for capital gain. Except that those foreign financial institutions are under higher bilateral-trade, it would adopt the approach of setting up a branch or subsidiary other than equity stakes acquisition in the Chinese market expansion strategy.

3.4.3 Financial Performance of Chinese Banks before and after Invested

To further understand whether or not the financial performance of Chinese banks has improved after foreign banks made equity stake acquisition, we apply the NPL ratio to represent asset quality on the basis of financial ratios as the principal component alternative 1 and observe the average NPL ratio before the year of investment, during the year of investment, and in the year after investment. In addition, we observe the average NPL ratio and its trend by the nature of the Chinese banks: state-owned, city commercial banks, and rural cooperatives.

From the perspective of the overall invested Chinese banks in Figure 1, the average NPL ratio appeared to demonstrate a downward trend after foreign banks took equity stake acquisitions; the NPL ratio fell from 5.59% in the year before the investment activity to 4.07% (or decreasing 27.17%) at the year of investment and to

3.25% (or decreasing 20.20%) the year after investment. This explains the events following Chinese banks' forming strategic partners with foreign banks via equity investment; there was positive improvement on asset quality. For the impacts on the four categories of banks, we find that the extent and impacts are most significant on joint-stock commercial banks (above 30% on average), followed by state-owned, city commercial banks and rural cooperatives. This is because the joint-stock commercial banks and state-owned banks are China's major banks, and the improvement of the asset quality is relatively important for the purpose of public listing and globalization.

In addition, we observed the capital adequacy and profitability of the Chinese banks before the investment activity took place, during the year of investment, and during the year after investment, using equity-to-assets ratio and return-on-equity ratio as the proxies for capital adequacy and profitability. We can see that both the equity-to-assets ratio and return-on-equity ratio showed upward trends in Chinese banks overall, and the capital adequacy and profitability have improved to a large extent, especially during the year of investment. Furthermore, the increases in equity-to-assets ratio and return-on-equity ratio of state-owned banks are significant during the year the investment took place, whereas during the year after investment, joint-stock commercial banks saw a significant increase in the ratios. This may be due to the simultaneous efforts in write-offs which affect capital adequacy and profitability at the year of investment, but it demonstrated a positive view in terms of more stabilized performance and enhanced capital structure in the future.

3.4.4 Optimal Probability Hazard Threshold of Equity Acquisition

In the Cox proportional hazard survival model, the baseline hazard function $h_0(t)$ is irrelevant to the parameter β, so we can assume it to be a specific form to figure out the probability of intensity of equity stake acquisition as $F(t) = 1 - S(t) = 1 - [e^{-h_0(t)}]^{\exp(\hat{\beta}'x(t))}$ at time t with maximum likelihood estimator $\hat{\beta}$ of significant variables $x(t)$.

Under the assumption that equity stake acquisition rate is constant during the observable period, we use the exponential form $h_0(t) = \lambda$ as the specific baseline hazard function to derive the optimal probability hazard threshold 0.535 using the approach of minimizing type I and type II errors described in section 2. This means that if the calculated probability of intensity (i.e., default probability) is more than this threshold with current variables in the model, then it is the optimal timing to take equity stake acquisition. According to the macroeconomic variables of of the foreign

financial institutions' home country, interaction with China, the financial ratios of both foreign financial institutions and local banks in China, and the maximum likelihood estimation together calculate the intensity of the share participation rate to be the optimal probability hazard threshold to minimize errors.

We overview the past observable samples with this optimal probability hazard threshold, and find that there are 25 with the relative probability of intensity among the 27 foreign financial institutions taking equity stake acquisitions. This result is more than this optimal threshold (or reaching 92.5%), and 14 have a relative probability of intensity of 17 not taking acquisition are less than the optimal threshold (or reaching 82.3%), and show us that this optimal probability hazard threshold exists as a reliable and significant reference. Meanwhile, the optimal probability hazard threshold could be the initial reference for foreign financial institutions to determine whether or not to take equity stake acquisition with local banks. In other words, when the probability of intensity (same as the default intensity in the model) exceeds this threshold, then we can say it could be the best time for foreign financial instructions to engage in equity stakes acquisition.

3.5 Brief Summary

This chapter employs the survival model to discuss the probability of intensity and timing of equity stake acquisitions. The results show that those foreign financial institutions with higher earning capability and better asset quality possess higher probability of intensity for capital gain in raising invested banks' earning capability and market value, and the Chinese banks with better asset quality also have higher probability of intensity for raising capital adequacy ratio to conform the regulation and international standard. In addition, the probability of intensity is higher for those financial institutions' home countries with higher financial development in empirical analysis, but it is lower for those with higher bilateral-trade volume, because they opt to set up a branch or subsidiary in substitution for equity stake acquisition to enter into the Chinese financial market.

Furthermore, the main purpose of foreign financial institution taking equity stake acquisition is to raise the market value of invested Chinese banks for capital gain, and it also responds to the restrictions from China's rules on acquisition proportion. Invested Chinese banks have shown positive improvements on asset quality, capital adequacy, and earning capability around the period of equity stakes acquisition, here joint-stock commercial banks have significant increased in asset quality improvement, and state-owned banks significantly improved their capital

adequacy and earning capability. In summary, the China banks will have strong tendency to bring in the equity stakes acquisition of foreign financial institutions as cooperative tactic to enhance the earning ability, performance of management and capital adequacy ratio respectively.

After figure out the optimal probability hazard threshold of equity stakes acquisition by foreign financial institutions, we could use it as the criterion to determine taking as entry model in China banking sector or not. This probability of intensity is depends on the macroeconomic variables of home countries of foreign financial institutions, interaction variables between foreign banks home country and China, and financial ratios variables of foreign financial institutions and invested Chinese banks both. For foreign financial institutions, including Taiwanese banks, it will be taken as fundamental signal for taking equity stakes acquisition, and the higher of probability, and more suitable circumstance for this entry strategy it is.
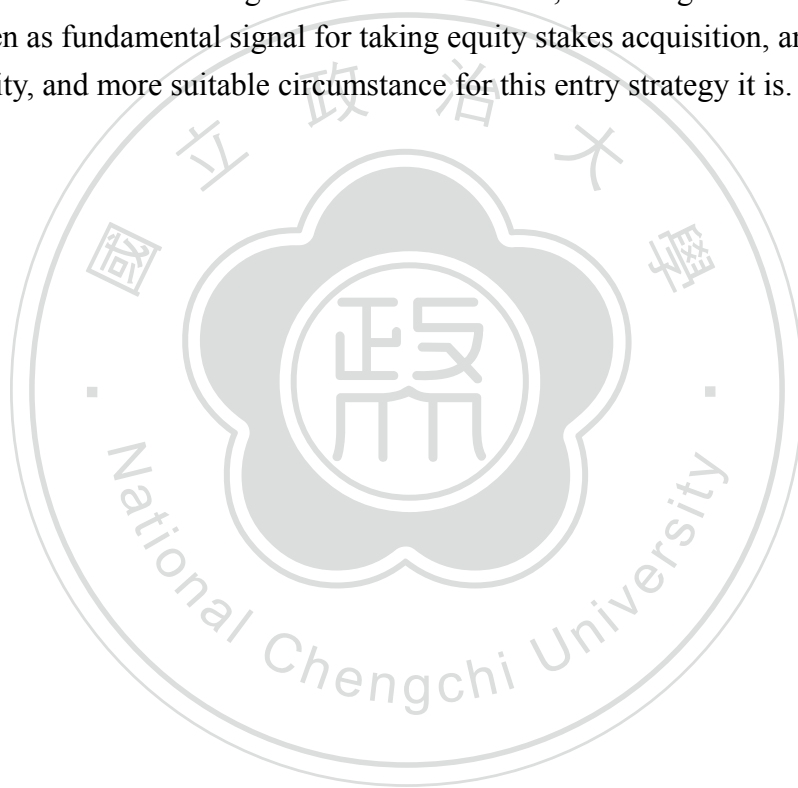
4. Analysis of Strategic Investment under Maximum Equity Value

Mergers or acquisitions are often used to grow business and gain market share to increase profits as a result of economies of scale by financial institutions. Therefore, to best understand the difference between pursuing a growing return and acquiring equity stakes, a company should spend some time analyzing and measuring its risk exposure to be within its reasonable risk appetite. However, the importance of risk tolerance is often neglected if companies only pay attention to factors that maximize shareholder value and returns while considering the strategy of acquisition and reinvestment.

To meet the social expectations of financial institution behavior in raising economic activities and leveraging environments, it is necessary for company to execute the valuation of both risk and return before making M&A or reinvestment decisions. Other than self-discipline, financial institutions are also required to adhere with the authorities' regulations, such as capital requirement when looking for maximized value in conducting M&A or reinvestment decisions.

We adopt option model with contingent claim to analyze the return and related risk after foreign financial institution acquires equity stakes. The foreign financial institution's assets after acquiring equity stakes is composed of some of the original assets before its M&A strategy and some of equities of the invested Chinese bank. With the goal of maximizing stockholder equity value of foreign financial institution acquiring equity stakes and considering the capital control and the limitation of financial institutions in its local country, we discuss the factors that effect risk and volatility.

4.1 Measurement of Risk and Return

Based on this model of analyzing return and risk of acquiring equity stakes, we also consider the exchange rate risk that is relevant for cross-border investment of acquiring equity stakes and assumed that both asset values of foreign financial institution and invested Chinese bank would also follow some dynamic models. Here, the assumptions of such dynamic model are set as follows:

Assumption 1: The dynamics of the asset value of a foreign financial institution acquiring equity stakes are given as:

$$\frac{dV_d(t)}{V_d(t)} = r_d(t)dt + \sigma_{V_d}dW_{V_d}^Q(t); \quad V_d(0) = V_d; \tag{8}$$

where r_d is the instantaneous risk-free rate of foreign financial institution, σ_{V_d} is the constant volatility of the rate of return of the asset of the foreign financial institution, and $W_{V_d}^Q$ is a Wiener process under foreign financial institution's domestic risk-neutral probability measure.

Assumption 2: The dynamics of asset value of an invested Chinese bank are given as:

$$\frac{dV_f(t)}{V_f(t)} = r_f(t)dt + \sigma_{V_f}dW_{V_f}^Q(t); \quad V_f(0) = V_f; \tag{9}$$

where r_f is the instantaneous risk-free rate of invested Chinese bank, σ_{V_f} is the constant volatility of the rate of return of the asset of an invested Chinese bank, and $W_{V_f}^Q$ is another Wiener process under an invested Chinese bank's foreign risk-neutral probability measure.

Assumption 3: The dynamics of the exchange rate are given as:

$$\frac{dX(t)}{X(t)} = (r_d(t) - r_f(t))dt + \sigma_X dW_X^Q(t); \quad X(0) = X; \tag{10}$$

where RMB treats as quoted currency that means 1 RMB is equal to X units of local currency of foreign financial institution acquiring equity stakes, σ_X is the constant volatility of the exchange rate and W_X^Q is another Wiener process under foreign financial institution's domestic risk-neutral filtered probability space.

According to Assumption 1-3, there are three types of risk factors in our framework, which are mutually correlated. The instantaneous correlation coefficients are assumed to be constant and are defined as follows:

$$\rho_{ij}dt = E^Q[dW_i^Q(t)dW_j^Q(t)];$$

where $i, j = V_d, V_f$ and X.

Furthermore, the dynamics of the asset value of an invested Chinese bank, in units of foreign financial institution's home country currency, is $V_{f(d)} = V_f X$. By Ito's lemma with (9) and (10), we have

$$\frac{dV_{f(d)}}{V_{f(d)}} = \mu_{V_{f(d)}} dt + \sigma_{V_{f(d)}} dW_{V_{f(d)}}^Q ; \tag{11}$$

where $\mu_{V_{f(d)}} = (r_d + \rho_{V_f X} \sigma_{V_f} \sigma_X)$ and $\sigma_{V_{f(d)}} = \sqrt{\sigma_{V_f}^2 + \sigma_X^2 + 2\sigma_{V_f} \sigma_X \rho_{V_f X}}$.(Appendix 1)

With the restrictions of the proportion of acquiring equity stakes of one foreign financial institution being no more than 20% and 25% for all foreign financial institutions, it is difficult to achieve main operating control and dominating rights under this M&A strategy. As noted above, foreign financial institutions that acquire equity stakes will emphasize sharing the profit of an invested Chinese bank and diversifying risk as financial investment. In this way, there is no operating synergy or interaction between the two banks.

After acquiring equity stakes, the asset value of the foreign financial institution will be volatile with gains or losses in this investment. Under the assumption of no interaction, the asset value of the foreign financial institution will be composed of asset values that are not invested in acquiring equity stakes and stockholder equity of an invested Chinese bank:

$$V_d^I = i_1 V_d + i_2 E_{f(d)} ; \tag{12}$$

where i_1 is the proportion of asset value that is not invested in acquiring equity stakes; $i_1 \in (0,1)$, i_2 is the proportion of stockholder equity of the Chinese bank invested in equity stakes; $i_2 \in (0,1)$, and $E_{f(d)}$ is the equity value of the invested Chinese bank in units of foreign financial institution's home country currency. By (11) and Ito's lemma, we have the dynamics of $E_{f(d)} = f(V_{f(d)})$ as

$$dE_{f(d)} = (g_2 + g_1 \mu_{V_{f(d)}} V_{f(d)} + \frac{1}{2} g_{11} \sigma_{V_{f(d)}}^2 V_{f(d)}^2) dt + g_1 \sigma_{V_{f(d)}} V_{f(d)} dW_{V_{f(d)}}^Q ; \tag{13}$$

where $g_1 = \frac{\partial E_{f(d)}}{\partial V_{f(d)}}; \quad g_2 = \frac{\partial E_{f(d)}}{\partial t}; \quad g_{11} = \frac{\partial^2 E_{f(d)}}{\partial V_{f(d)}^2} .$

Furthermore, the dynamics of the asset value of a foreign financial institution after

acquiring equity stakes is

$$\frac{dV_d^I}{V_d} = i_1 \frac{dV_d}{V_d} + i_2 \frac{dE_{f(d)}}{V_d}$$

$$= i_1 (r_d dt + \sigma_{V_d} dW_{V_d}^Q) + i_2 \left(\frac{g_2 + g_1 \mu_{V_{f(d)}} V_{f(d)} + \frac{1}{2} g_{11} \sigma_{V_{f(d)}}^2 V_{f(d)}^2}{V_d} dt + \frac{g_1 \sigma_{V_{f(d)}} V_{f(d)}}{V_d} dW_{V_{f(d)}}^Q \right) \quad (14)$$

$$= [i_1 r_d + \frac{i_2}{V_d} (g_2 + g_1 \mu_{V_{f(d)}} V_{f(d)} + \frac{1}{2} g_{11} \sigma_{V_{f(d)}}^2 V_{f(d)}^2)] dt + i_1 \sigma_{V_d} dW_{V_d}^Q + \frac{i_2}{V_d} g_1 \sigma_{V_{f(d)}} V_{f(d)} dW_{V_{f(d)}}^Q.$$

We also have the constant volatility of the rate of return of the asset of the foreign financial institution after acquiring equity stakes $\sigma_{V_d^I}$:

$$\sqrt{(w_1 \sigma_{V_d})^2 + (w_2 \sigma_{V_f})^2 + (w_2 \sigma_X)^2 + 2w_1 w_2 \sigma_{V_d} \sigma_{V_f} \rho_{V_d V_f} + 2w_1 w_2 \sigma_{V_d} \sigma_X \rho_{V_d X} + 2w_2 w_2 \sigma_{V_f} \sigma_X \rho_{V_f X}} \; ; \quad (15)$$

where $w_1 = i_1$ and $w_2 = \frac{V_{f(d)}}{V_d} g_1 i_2 = \frac{V_f X}{V_d} g_1 i_2$. (Appendix 2)

As above, the instantaneous volatility is affected by the correlation coefficient of asset return of the foreign financial institution acquiring equity stakes and the invested Chinese bank. This also includes the correlation coefficients of individual asset and exchange rate. The investment risk of acquiring equity stakes for foreign financial institutions would be diversified in the following situations:

(1) The business models and sources of profit of foreign financial institutions acquiring equity stakes and invested Chinese banks are complementary or uncorrelated.

(2) The correlation coefficients of asset returns of foreign financial institutions and their related cross currency are negative or uncorrelated. This derives that the RMB is not heavy weighted or, most wholly, currency in the portfolio is negatively correlated to RMB in foreign financial institutions' multiple investment portfolios.

(3) The correlation coefficients of asset returns of invested Chinese banks and their related cross currency are also negative or uncorrelated. This means that the business of the invested Chinese bank is primarily focused on local currency assets or its portfolio of overseas assets is negative with the exchange rate of the foreign financial institution acquiring equity stakes via domestic currency and RMB.

4.2 Optimal Acquiring Equity Stakes Proportion under Capital Control

In accordance with the requirement of new Basel Capital According, financial institutions shall consider the capital control derived by risky assets when expanding their business category and scope. The total level of capital shall also be calculated with the risk weights such that the minimum capital requirement is satisfied. Assume the average risk weight of foreign financial institution acquiring equity stakes be w. The minimum amount of capital K_d^I should be no less than the product of risk weight, asset value V_d^I and volatility of asset return $\sigma_{V_d^I}$ after acquiring equity stakes:

$$K_d^I = V_d^I - B_d^I \geq w\sigma_{V_d^I} V_d^I \Rightarrow B_d^I \leq V_d^I(1 - w\sigma_{V_d^I}); \tag{16}$$

where B_d^I is the amount of liability of foreign financial institution acquiring equity stakes.

The equity value of foreign financial institution acquiring equity stakes E_d^I is regarded as a call option on the underlying asset V_d^I with exercise price B_d^I. Under capital K_d^I invested by foreign financial institution acquiring equity stakes and the restriction of minimum capital adequacy ratio, the objective of maximizing stockholder's equity value ca be set as:

$$\max_{\sigma_{V_d^I} \in R} L_d^I = E_d^I - K_d^I; \quad st. \ B_d^I \leq V_d^I(1 - w\sigma_{V_d^I}); \tag{17}$$

where $E_d^I = V_d^I N(d_1) - B_d^I e^{-rT} N(d_2)$,

and $d_1 = \dfrac{\ln(\dfrac{V_d^I}{B_d^I}) + (r + \dfrac{1}{2}\sigma_{V_d^I}{}^2)T}{\sigma_{V_d^I}\sqrt{T}}$, $d_2 = d_1 - \sigma_{V_d^I}\sqrt{T}$.

Considering the restriction in capital allocation $B_d^I = V_d^I(1 - w\sigma_{V_d^I})$, we would like to figure out the volatility of the rate of return of the asset of the foreign financial

institution after acquiring equity stakes $\sigma_{V_d^I}$ such that maximizing the objective

function L_d^I. The first order condition is

$$\frac{\partial L_d^I}{\partial \sigma_{V_d^I}} = \frac{\partial (E_d^I - K_d^I)}{\partial \sigma_{V_d^I}} = \frac{\partial V_d^I N(d_1)}{\partial \sigma_{V_d^I}} - \frac{\partial B_d^I e^{-rT} N(d_1 - \sigma_{V_d^I}\sqrt{T})}{\partial B_d^I} \frac{\partial B_d^I}{\partial \sigma_{V_d^I}} - \frac{\partial K_d^I}{\partial \sigma_{V_d^I}}$$

$$= V_d^I N'(d_1) + V_d^I w e^{-rT} N(d_1 - \sigma_{V_d^I}\sqrt{T}) - V_d^I w, \qquad (18)$$

and the second order condition is

$$\frac{\partial^2 L_d^I}{\partial \sigma_d^{I^2}} = V_d^I N''(d_1) + V_d^I w e^{-rT} N'(d_1 - \sigma_{V_d^I}\sqrt{T})(\frac{\partial d_1}{\partial \sigma_{V_d^I}} - \sqrt{T}); \qquad (19)$$

where $\frac{\partial d_1}{\partial \sigma_{V_d^I}} - \sqrt{T} = -(\frac{\ln(V_d^I / B_d^I)}{\sqrt{T}} + r\sqrt{T})(\sigma_{V_d^I})^{-2} - \frac{\sqrt{T}}{2} \le 0$.

The second order condition is negative in sign and means that there exists optimal instantaneous volatility of asset return $\sigma_{V_d^I}^*$ in foreign financial institution acquiring equity stakes to maximize stockholder equity. Without the closed form, we will adopt numerical analyses $\sigma_{V_d^I}^*$ with different parameters. Furthermore, the comparative static statistics and the results will be discussed to analyze the risk factor of the portfolio after acquiring equity stakes.

4.3 Result and Analysis

In this section, we will inspect the investment objectives under the restriction of capital control and pressure for maximizing shareholder value and look into the numerical analyses with optimal asset risk portfolio and its proportion of acquiring equity stakes. By (18), the relative comparative statics will be discussed as follows.

(1) The asset return volatility and increasing foreign financial institution asset value after acquiring equity stakes show negative correlation as shown in Figure 1. With the asset value approach demonstrating an increase of the foreign financial institution's asset value, the volatility of the asset return would be lower. Simultaneously, the foreign financial institution must also pay attention on the

s liability have positive correlation after taking equity stakes as shown in Figure 2. The result shows that an increase in the liability ratio to asset causes the asset return volatility to increase when foreign financial institutions invest via borrowing. In other words, the portfolio risk and liability increase simultaneously.

(3) The asset return volatility on foreign financial institution and risk weight has negative correlation, as shown in Figure 3. When the amount of liability is limited with high-risk weight, the foreign financial institution must have more capital and less risk-weighted assets to reduce the portfolio risk and asset return volatility.

Furthermore, we could calculate the corresponding optimal acquiring equity stakes proportion i_2^* when $\sigma_{V_d^I}^*$ is known. This optimal proportion will be affected by eight factors: the asset value of Chinese bank V_f, and liability B_f; the individual volatility of asset return on invested Chinese bank σ_{V_f} and foreign financial institution σ_{V_d}; the volatility of the exchange rate on the home country of foreign financial institution and invested Chinese bank σ_X; the correlation coefficient of the asset return on a foreign financial institution and invested Chinese bank ρ_{V_d,V_f}; the correlation coefficient of an asset return and exchange rate of the foreign financial institution $\rho_{V_d,X}$, and the correlation coefficient of an asset return and exchange rate on the invested Chinese bank $\rho_{V_f,X}$. In what follows, we will discuss the effects of these eight factors on choosing the optimal proportion.

(1) The optimal proportion shows positive correlation (Figure 4) with asset value V_f, and negative correlation (Figure 5) with liability B_f, in proportion with the asset value of the invested Chinese bank. This result can be explained as if the Chinese bank had a higher asset value or lower liability value, then its responding equity will be higher as well. In other words, the foreign financial institution will

σ_{V_f} of invested Chinese bank (Figure 6). When foreign financial institution is restricted on capital, as guided by risk-weighted asset, it will likely not invest in a higher risk object to reduce the portfolio risk. This conclusion is similar to the argument in the previous part in which, when the invested Chinese bank has better asset quality with stable volatility asset returns, it can help stimulate the foreign financial institution to invest and increase the optimal acquiring equity stakes proportion.

(3) The optimal proportion and asset return volatility σ_{V_d} of foreign financial institution after acquiring equity stakes also shows negative correlation (Figure 7). That also illustrates that when the foreign financial institution has good asset quality and high profitability, its asset quality will be more stable with tolerable risk taking and exposure.

(4) The optimal proportion and exchange rate volatility σ_X have negative correlation (Figure 8). From this result, we can say that, when the foreign financial institution's country of origin belongs to a major currency country or the portfolio's denominated currency has low volatility of exchange rate with RMB, it will help increase the optimal acquiring equity stakes proportion. When economic and trade activities become more frequent and stable between the foreign financial institution and local bank's country of origin, it will help keep the volatility level and increase its optimal proportion.

(5) The optimal proportion and correlation coefficient of an asset value between the foreign financial institution and invested Chinese bank ρ_{V_d,V_f} has negative correlation (Figure 9). When foreign financial institution acquires equity stakes of invested Chinese bank, it will focus on creating more value and developing complementary businesses more than the local bank. These activities are in lieu of reaching economic scales by acquiring equity stakes. Additionally, two institutions that have a low correlation in asset portfolios will help reduce the portfolio risk and meet risk-weighted assets requirements as required by its home country.

(6) The optimal proportion has both negative correlations with the correlation coefficient of the exchange rate and the foreign financial institution's asset value $\rho_{V_d,X}$ and the correlation coefficient of the exchange rate and the Chinese bank's asset value $\rho_{V_f,X}$ (Figures 10 and 11). This indicates that, when the foreign financial institution has diversified its currency portfolio with invested Chinese bank, the optimal proportion will be increased while the foreign financial institution can reduce the risk of exposure to meet the risk-weighted assets requirement.

4.4 Brief Summary

As transnational investment is a trend, this paper has considered exchange rate cross-currency risk with the capital restrictions of Basel According in analyzing foreign financial institution's acquisition of Chinese banks. By using the contingent-claim optimization model, we find that the correlation coefficients, including both the individual return of the asset values and exchange rate, would affect the instantaneous standard deviation on both institutions. In addition, if two institutions were complementary or have a low correlation and the overall asset portfolio of the foreign financial institution have a negative correlation or no relation with the RMB currency or the invested Chinese bank as mainly operating locally, then the risk of the foreign financial institution could be reduced by participating in acquiring equity stakes.

Other than meeting the minimum BIS ratio requirement for foreign financial institution to take ownership stakes of Chinese bank and pursue the goal of maximizing shareholder value, we also found the instantaneous standard deviation of the optimal returns of an asset. With numerical analyses, the results show that the overall portfolio risk of foreign financial institution would be reduced under the circumstances that the asset value increases, the debt ratio decreases, and regulatory risk weight decreases after acquiring equity stakes, if the foreign financial institution is restricted on the risk-weighted asset guided by current regulations.

Finally, we examine the factors that could affect the optimal acquiring equity stakes proportion. Specifically, this proportion would be affected by factors such as the Chinese bank's asset value, liability, volatility of asset return, and the correlation coefficient between the returns and exchange rate. Other factors include the correlation coefficient of the foreign financial institution's asset value and exchange

rate and the volatility of an asset return. The result show that other than the asset value of the Chinese bank has a positive direction with optimal proportion, the remaining factors appear to show negative relations. This result could be explained as when foreign financial institutions implement the strategy of acquiring equity stakes, apart from meeting the capital requirement to lower portfolio risk, they could create maximum values and returns by picking local banks with good asset qualities that are locally and financially well-developed. Furthermore, the optimal proportion could be more beneficial if both parties operated complementary business.

Currently there are restrictions on the proportion of acquiring equity stakes not more than 20% by anyone foreign financial institution and 25% for all foreign financial institutions. However, foreign financial institutions can still be beneficial on equity returns by helping the Chinese banks to create a strong earning power, designed business expansion and corporate governance from acquiring equity stakes. This argument comes with the same conclusion as the model applied in this paper.
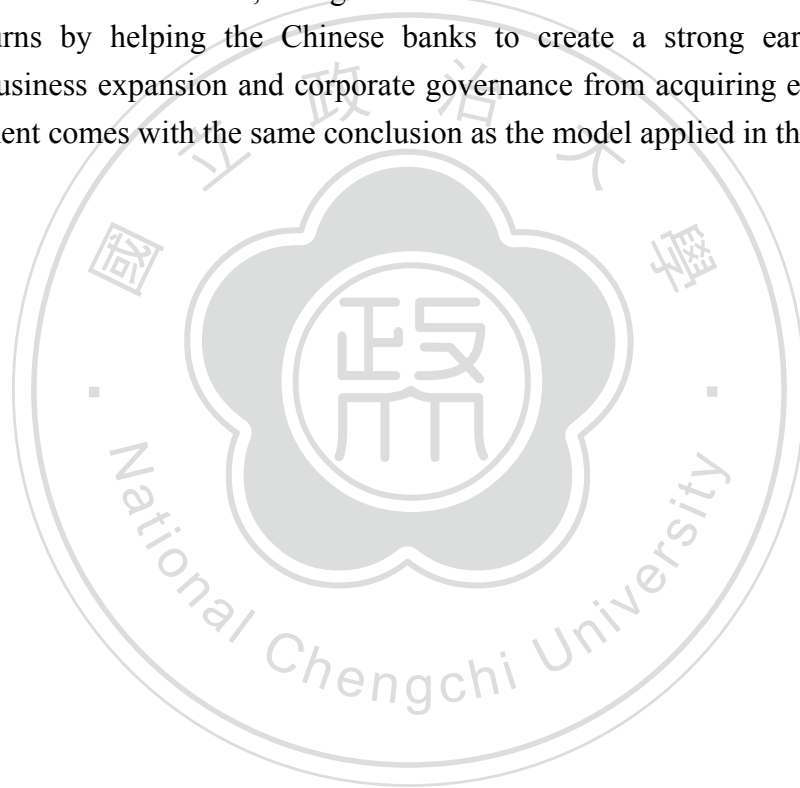
5. Timing and Layout in China by Taiwanese Banks

Taiwanese banks entering into the Chinese financial market at this stage are to be qualified to offer RMB services to the Taiwanese customer. Although the timing and the operation scale are relatively smaller compared to other foreign financial institutions, the improving cross strait relationships have created a healthier mutual environment and conditions that provide the Taiwanese banks a competitive advantage over its competitors. Moreover, the fierce competition in the Taiwan banking environment and the rising domestic consumption market in China together with the increasing size of the economy have all led the Taiwanese banks to devise an appropriate strategy in China's financial market.

Moreover by understanding the current problems facing the Chinese financial institutions will be able to assist the decision of selecting the ideal market entry option and strategy. Currently the problems facing the Chinese financial institutions are: 1. Chinese banks are majorly owned by the State which resulted in the agency relationships conflicts; 2. Lack of corporate governance; 3. Shortage of human resources; 4. Inferior asset quality resulted in lower capital adequacy ratio. Furthermore, there are 5 aspects the foreign financial institution take into consideration when developing a strategic plan for entering the Chinese market: 1. Product scope and characteristics-the expansion and innovation of the services; 2. Target market and geographical boundaries-using internet banking as a tool to address the issue of lack of service networks; 3. Economies of scale- adopting the option of taking ownership stakes in the Chinese banks to enter the China market which obtained competitive advantage compared to other players; 4. Degree of vertical integration-using differentiation strategy in different regions in China as well as reducing undertaking risk and changes in home country's regulation; 5. Competitive advantage-developing differentiation retail banking businesses to grow niche market

5.1 Market Layout in China

The current regulations for foreign financial institutions entering the market are mainly based on "People's Republic of China on the Administration of Foreign-funded Banks" and "Administration of Equity Investment of Overseas Financial Institutions in Chinese-funded Financial Institutions Procedures." There are basically five methods applied by foreign financial institutions who have entered the market, such as launch a representative office, establish a branch, set up a wholly

owned subsidiary of foreign banks, acquire equity stakes of Chinese-funded bank and form a strategic partnership.

(1) Representative Office

It has the least difficulty to establish a business unit in China among all five methods; however the attainable business is limited at the same time. A representative office could build a good relationship between government and business and gathering market information as well as studying local humanities simultaneously. Taiwan banking industry also sees this method as the stepping stone to expand business in the future when entering the mainland market. Subject to cross-strait regulations and follow the Taiwanese business servicing direction, foreign financial institutions take on this method to enter the market because it is less restrictive in time so as to develop more business when transferring into a branch or sub-branch later on.

(2) Branch

Low capital requirement is the primary reason to choose having a branch setup in China (capital requirement is 200 million in RMB). Other than capital requirement, an oversea branch could implement the strategy and direction with flexibility as well as on risk control, for example, sharing the line of credit of Taiwan-based corporations with the parent company. Due to the difficulty for the host company (China) to have operating risk control on foreign institution funded branches as they do not obtain the legal status in China, China government would only open specific area and allow these branches to run wholesale banking business and not the more profitable retail banking. Thus, with the location and customers are constrained, setup a branch would effect overall business expansion for a foreign financial institute due to the waiting period to acquire running the retail business would takes three to five years for every single branch.

(3) Wholly Owned Subsidiaries of Foreign Banks

All wholly owned subsidiaries (subsidiaries) of foreign banks are required to register in China with direct supervision of CBRC (China Banking Regulatory Commission) in order to protect the local deposits and maintain customers' rights. The subsidiaries thus can operate RMB business without the restriction on location and types of customers because the risk is isolated from their parent companies. Although the advantages of having a subsidiary can have less restriction on operating business and enhance the local supervision by establishing a barrier that acts as a firewall to protect the locals, the establishment requires

higher capital that would reduce the desire to establish subsidiaries. In addition, only few were examples entering the mainland market by establishing a subsidiary successfully because the attainable business was limit by the asset size at the early stage and subsidiaries are not capable to have direct funding from parent company. In recent development, Chinese authority encourages foreign financial institutions to promote their branches into subsidiaries by opening RMB retail business and reducing the geographical restrictions, plus the large-sized financial institutions are looking for comprehensive expansion on locations and business, more and more financial institutions have applied to set up a wholly-owned subsidiary bank in China.

(4) Equity Stakes Acquisition of Chinese Banks

Foreign financial institute adopts this mode would need to acquire certain percentage of equity stakes of the Chinese-funded bank through equity purchasing or equity swap to enter the market and business indirectly. The main advantage on this mode would be the institution can enter the market within the shortest time by utilizing the current resources, bases and customers. The foreign financial institute can develop the business or types of products that the institutions are ready excelled in and reach the local market that the institutions are unfamiliar with or no experience in any way at once with the assist of existing resources. The downside about the mode is the complexity for a foreign financial institute to pay the right price on the Chinese bank when acquiring equity stakes given that the operations and profitability may not have the unified standard in the all Chinese banks. In addition, the foreign financial institute would not have the dominance to take operating control as the current law regulates a Chinese bank cannot exceed 20% stake from one single foreign shareholder and 25% overall. Generally, there are two ways for any foreign financial institute acquires stakes on Chinese-funded bank, financial and strategic investments. It can be treated as strategic investment if the equity proportion reaches 5%, which is capable for a foreign financial institute to affect the operating strategies of the Chinese Bank. Therefore, CBRC opens up opportunities for foreign investors with long-term invest interest to acquire equity stake of Chinese banks in order to first improve the operation mode and corporate governance, and then introduce the latest management skill and business expertise to the local financial industry.

(5) Strategic Partnership

Forming a strategic partnership is mainly to have business cooperation, and do not involve with equity swap or transfer. Therefore, foreign financial institute adopts

this mode to enter the market because it is more flexible on cooperation projects and timing. Both parties can decide the cooperation projects according to their strategic directions and goals with less capital spending and regulation restriction. However, the cooperation focuses on the business projects merely; and do not have any operating control on each other. General speaking, the mode can be practiced as preliminary cooperation before foreign financial institute acquires equity stakes on Chinese bank officially. This mode is beneficial for both parties to understand each other's organizational culture, personnel background, business philosophy before acquiring stakes officially and helping each other to attain the goal of total efficiency of operations and profitability.

According to Regulations Governing the Banking Activity and the Establishment and the Investment by Financial Institution Between the Taiwan Area and the Mainland Area promulgated by Financial Supervisory Commission, there are four types such as representative offices, branches, or subsidiary banks or making equity investment for banks, and equity investment for financial holding companies in Taiwan area respectively. When a Taiwan bank applied to establish a branch or subsidiary bank, or make equity investment in Mainland China, or a subsidiary company with over 50 percent of total outstanding voting shares or capital owned directly or indirectly by the bank intends to make investment in Mainland Area, the cumulative allocated operating capital and total amount of investment therefore combined shall not exceed 15 percent of the bank's net worth at the time of application, and then 10 percent of the financial holding company's net worth when applying to make equity investment by Taiwan financial holding company.

Furthermore, Taiwan financial holding companies and banks shall follow the statutory requirement for approval to entry model in Mainland China besides the contemplation on the prospect of entering in China and being sound for the development in the domestic financial market. Those requirements are group's capital adequacy ratio and double leverage ratio after the proposed equity investment, bank's ratio of equity capital to risk-weighted assets, bank's ratio of Tier 1 capital to risk-weighted assets after deducting the amount allocated for the proposal investment in the subsidiary bank in Mainland Area, non-performing loan ratio and loan loss coverage ratio during the latest fiscal half year, and term of having established a branch and operated business in a member country of OECD country shown in Table 15.

By the Regulations of the People's Republic of China on the Administration of Foreign-invested Banks and Measures for the Administration of the Investment and Shareholding in Chinese-funded Financial Institutions by Oversea Financial Institutions, the requirements that shall meet respectively to establish representative offices, branches, wholly foreign-invested banks, sino-foreign joint venture banks and the investment and shareholding in Chinese-funded financial institutions are enumerated shown in Table 16. According to the Cross-straits Economic Cooperation Framework Agreement which is effective on September 12, 2010, the commitments of Mainland side on liberalization of financial sector are listed on the Annex IV: Sectors and liberation measure under the early harvest for trade in services shown in Table 17. For the banking and other financial services, to set up wholly owned banks or branches in the Mainland as well as the application to conduct RMB business are listed in the early harvest but without the commitment to the equity stakes acquisition in Chinese banks.

Taiwanese banks provide mainly the financial service for SME of Taiwan in China by establishment of representative office or branch at present. Besides that Fubon Bank (Hong Kong) was on behalf of Taipei Fubon Bank to invest equity of Xaimen Bank around 19.99% with 230 RMB million in November 2008, for those banks that established representative office in early stage such as Land Bank of Taiwan, First Commercial Bank, Hua Nan Commercial Bank, Chang Hwa Bank, Taiwan Cooperative Bank, Cathay United Bank and Chinatrust Bank, they had got approval from Financial Supervisory Commission to set up branch in China in September 2010 and then operated business in December. For the other Taiwanese banks such as Bank of Taiwan, Mega International Commercial Bank, E. sun Bank and Taiwan Business Bank, they continued to set up branch with the reference to the regulation that shall have representative office in the Mainland for more than one year before application under ECFA. The present entry model and location of Taiwanese banks in China are summarized in Table 4.

5.2 Analysis and Application of Real Option Model

The accession to WTO in 2001 facilitates China's market to be the business battle ground for foreign financial institute to join and expand its territory with different kind of entering method. In addition, the Chinese market is gradually opening up to join with the ongoing negotiation on ECFA, significant relaxation of bilateral relations and increased frequency of trading; Taiwan banking industry has changed its conservative attitude of establishing only representative offices to a more

aggressive action recently. Therefore, we would like to understand with many other foreign financial institutions have entered China's market in certain period of time, what are the incentives and conditions for Taiwan banking industry entering the market.

In this sector we will adopt a real option to analyze the situation. The foreign financial institute (exclude Taiwan banking industry) is the leading financial institutes since it entered the market ahead of us, and Taiwan banking industry is the following financial institutes because of the late release to Chinese market. For any financial services provide by foreign financial institute that are beneficial on cooperating banking, retail banking, credit card and wealth management business overall will be seen as inverse market demand function

$$f(q,\eta) = \eta - q; \tag{20}$$

here η is the stochastic demand shift parameter and $q = q_1 + q_2$ is the total amount of financial services that foreign financial institutions provide where q_1 equals to the amount of the financial services provided by leading financial institutes and q_2 equal to the amount of the financial services provided by following financial institutes.

Furthermore, we also assume η follows the process of geometric Brownian motion as

$$d\eta = \mu\eta\,dt + \sigma\eta\,d\omega; \tag{21}$$

here μ is the instantaneous expected rate of unit time; σ is standard deviation of instantaneous expected rate; dw is the incremental and follows wiener process with initial value η_0.

To simplify the analysis, this model also assumes the linear demand function of financial services provided by foreign financial institution does not have externalities and no variable cost. Therefore, once the following financial institutes enter the market, the operating flow at time t for leading financial institutes ($i = 1$) and following financial institutes ($i = 2$) would be

$$C_i(\eta_t) = f(q_i,\eta_t)q_i = q_i(\eta_t - q_i); \quad i = 1, 2. \tag{22}$$

The discounted value for operating flow and net present value will respectively be

$$V_i = E[\int e^{-rt}C_i(\eta_t)dt] = \frac{C_i}{2\delta}, \tag{23}$$

and

$$NPV_i = V_i - I_i; \tag{24}$$

here $\delta = \lambda - 2\mu - \sigma^2$. λ is the constant equilibrium risk-adjusted discount rate and

I_i is the fixed cost that leading financial institutes and following financial institutes have injected after entering the market.

Once the market reaches Cournot-Nash equilibrium of competitions, the reaction function for leading and following financial institutes will be

$$R_t^1(q_2) = \frac{\eta_t - q_2}{2} ,$$ (25)

and

$$R_t^2 = \frac{\eta_t - q_1}{2} .$$ (26)

The competitive equilibrium would be $q_1^E = q_2^E = \frac{\eta}{3}$. Therefore, we can have the net present value under the equilibrium of competitions on leading and following financial institutes to both be

$$NPV_i^E = V_i^E - I_i = \frac{C_i^E}{2\delta} - I_i = \frac{q_i^E(\eta - q_1^E)}{2\delta} - I_i = \frac{\eta^2}{9\delta} - I_i .$$ (27)

When the staring amount of investment, I_i, is known with great fluctuations on the overall financial services demand, the market is believed at its expansion period, which shows higher profitability for both leading and following financial institutes. We can further apply this concept on analyzing the potential business type and location for foreign financial institute to find its niche market.

In addition, although the leading financial institutes (exclude Taiwan banking industry) own the advantages of early entry so that monopolizing the market, they will soon face the competition from following financial institutes due to their aggressive moves.   We further examine the strategic investment decision on entering the market, factors that would have an effect on optimal entry threshold and static analysis according to the above condition for following financial institutes.

We assume the condition of instantaneous equilibrium return in starting point before the following financial institutes enter the market to be

$$E[dV_0(\eta)] = rV_0(\eta)dt ;$$ (28)

here $V_0(\eta)$ is the operating value of staring point and r is the risk free rate. We then adopt Ito's lemma to get

$$E[dC(V)] = (\eta\mu V_0^{'}(\eta) + \frac{1}{2}\eta^2\sigma^2 V_0^{''}(\eta))dt .$$ (29)

From (28) and (29), the Bellman function will be

$$rV_0(\eta) = \eta\mu V_0^{'}(\eta) + \frac{1}{2}\eta^2\sigma^2 V_0^{''}(\eta) + \frac{\eta^2}{9\delta} . \qquad (30)$$

This explains the operating value of following financial institutes fit above equation under the dynamic random uncertainty with the operating value at starting point satisfy the boundary condition $\lim_{\eta\to 0^+} V_0(\eta) = 0$. The polynomials solutions of (30) will be

$$V_0(\eta) = K_1\eta^{\theta_1} + K_2\eta^{\theta_2} + \frac{\eta^2}{9\delta} ; \qquad (31)$$

here K_1 and K_2 are endogenous constant value, and both of θ_1 and θ_2 satisfy the following equation

$$\frac{1}{2}\sigma^2\theta^2 + (\mu - \frac{1}{2}\sigma^2)\theta - r = 0 . \qquad (32)$$

In the Cournot-Nash equilibrium of competitions, we have $K_1 = K_2 = 0$ and the operating value at the starting point for following financial institutes will be $V_0(\eta) = \frac{\eta^2}{9\delta}$. Assuming the fixed cost for following financial institutes be I, we have the net present value of investment $NPV_0(\eta) = V_0(\eta) - I$.

If the business plan for following financial institute contains features on existing uncertainty, having irreversible cost or optional investment plan, as the future stochastic demand shift parameter, η, exceeds the fundamental thresholds of investment η^*, then the optimal waiting to invest operating value will be equivalent to the net present value when executing the business plan by then. The equation will be

$$NPV(\eta^*) = E_\eta[e^{-rT}(V_0(\eta^*) - I)] ; \qquad (33)$$

here E_η is the operating value of risk-neutral expectation operator at starting point.

Dixit and Pindyck (1994) indicated when $T = \inf(t \geq 0 : \eta_t \geq \eta^*)$, we have

$$E_\eta[e^{-rT}] = (\frac{\eta}{\eta^*})^{\theta_1} \text{ with } \theta_1 = \sqrt{\alpha^2 + \frac{2r}{\sigma^2}} + \alpha ; \alpha = \frac{\sigma^2 - 2\mu}{2\sigma^2} . \text{ Therefore, the optimal}$$

waiting to invest operating value will be also shown as

$$NPV(\eta^*) = (\frac{\eta^*}{9\delta} - I)(\frac{\eta}{\eta^*})^{\theta_1}. \tag{34}$$

By the first order condition, the thresholds on optimal operating stochastic demand shift parameter for following financial institutes will be

$$\eta^* = 3\sqrt{\frac{I\delta\theta_1}{\theta_1 - 2}}. \tag{35}$$

As stated above, when the demand volatility for financial services, σ, is rising, the instantaneous expected rate of unit time, μ, is decreasing, the investment fixed cost at starting point, I, is growing and risk free rate, r, is also increasing, then the thresholds on optimal operating stochastic demand shift parameter, η^*, will enhance at the same time. This also means the longer waiting period on operating for following financial institutes.

Taiwan banking industry is able to take more aggressive and diversified means to enter as well as expand the market benefit from improved bilateral relations in economics and trade with open financial market as a result of ECFA in recent years. The following financial institutes, such as Taiwanese banks, are facing the challenge that many other foreign financial institutions have entered the really competitive market and operate for a period of time. However, the demand for Chinese financial services market has not yet reached its saturation and would continue to expand, Taiwanese banks, considered as the following financial institutes in this model due to the late entering, can still be profitability under specific conditions and environmental factors.

The model shows us when the demand of Chinese financial services markets is highly uncertain and the average demand growth of is reducing, the optimal stochastic demand shift parameter to enter the market will be increased respectively. However, there are some conditions could help Taiwan baking industry lower the uncertainty toward to the Chinese market, for example, they have more stable customer sources compared with other foreign financial institutions because many existing customers are Taiwan-funded enterprise. In addition, while as waiting the right time to enter the market and starting the RMB business, Taiwanese banks promote the representative office to a branch, establish subsidiaries or acquire equity stake to reach right customers in a timely manner. Therefore, if Taiwanese banking industry committees to develop the existing market, the demand of Chinese financial services market will increase as China's economy remains strong in which facilitates Taiwan-funded

enterprise continue to develop and grow in China. Therefore, the barrier for Taiwan's banking industry to entry the Chinese financial market would be reduced under the above factors e as well as expand the Chinese financial market.

The global economy is slowly recovered from financial and credit crisis, the growth momentum, however, does not remain the same. In addition, as a result of strong domestic demand and highly economic grow, China government adopts macro-economic control to mitigate the market from overheated economy into economic bobble, which reducing the entry and startup cost on acquire equity stake or operating setup indirectly for foreign financial institutions. Besides, many governments choose not to raise the current interest rate in order to protect the slowly recover global economy since the subprime mortgage crisis, which creates a reasonably threshold to invest in Chinese market and creates motivations for Taiwan banking industry.

After analyzing on the model, we verified that among several strategies to enter the Chinese financial market, setting up a representative office to cope with the procedure on becoming a branch soon possible under the promise of ECFA have lower optimal operating stochastic demand shift parameter on following financial institutes with the same expectation profit compared with establishing a wholly owned subsidiary or acquire equity stake. Furthermore, with this application, Taiwanese banks could reduce the demand uncertainly because of the main operating business for Taiwanese banks would be serving Taiwan-funded enterprises and gradually expending the RMB business in accordance with regulations. As we expect the Taiwan-funded enterprises continue to grow in the unsaturated market, the demand for better financial services would help Taiwanese banking industry to maintain the current application to Chinese market and reach a goal to have low threshold on optimal operating stochastic demand should be positive.

On the other hand, for banks chosen to enter the China market by establishing a wholly own subsidiary can attain the retail RMB business and expand business to different levels with less constraints compared with other mode of entry. However, the operating cost is much higher with minimum registered capital for setting up a commercial bank is 1 billion in RMB per branch. Once the operating cost increases, the threshold on optimal operating stochastic demand will be increased so that extend the waiting period on investing under this mode. Furthermore, most international foreign institutions, in recent years, have chosen to establish wholly-own subsidiaries and make market segment to distinguish their services from locals' in order to create a niche market with their experiences and specialty when working in Chinese market.

Consequently, Taiwanese banking industry will face severe competition, from both local and foreign, if applying the same mode as leading foreign financial institutions. Unless having had distinguish services or ability to create a niche market, Taiwanese banks choose to establish wholly-own subsidiaries would only bring more uncertainly to the decision and increase the optimal investment threshold thereby decrease the effectiveness on investment.

5.3 Equity Stakes Acquisition under Optimal Probability Hazard Threshold

With further application of the survival model in specific baseline hazard function and the maximum likelihood parameter estimator of significant explanatory variables, we derive the intensity of the motives of Taiwanese banks in Chinese banks' equity stake acquisitions and observe the changes in motives over the past five years. There are two subsections in this section. In subsection 1, in addition to mainly discuss the motives of overall Taiwanese banks in Chinese bank equity stake acquisition, we also go a step further regarding state-owned and private Taiwanese banks. Furthermore, in subsection 2 we also dissect the intensity and tendency of equity stake acquisition of overall, state-owned, and private Taiwanese banks in accordance with the types of Chinese banks (state-owned, joint-stock commercial banks, city commercial banks, and rural cooperatives) and its region (Bohai and Beijing-Tianjin-Hebei Economic Rim, Yangtze River Delta, Western China Region, Haixi Economic Zone, and Pearl River Delta).

5.3.1 The Motives of Equity Stake Acquisitions by Taiwanese Banks

To examine the motives of Taiwan's banking industry going to mainland China in taking equity stake acquisition, we include 19 main commercial banks in our paper samples. More specifically, among the 19 samples, 8 are pan-government-owned banks, and the rest are private banks. In Tables 11 and 12 we show the average financial ratios for all banks and the achievements of asset and profitability between pan-government-owned and private banks in the last five years. When analyzing the motives of Taiwanese banks taking equity stake acquisition opportunities in China, the relevant variables are included after the principal component analysis for data extraction and are imported into the survival model in order to calculate the intensity of the motives in equity stake acquisitions during the period. We find that over the past five years (2005~2009) Taiwanese banks overall have not reached the threshold of 0.535, the optimal probability hazard threshold derived in section 4. However, as observed in Figure 2, the probability of intensity rebounds to its relatively higher

0.271 in 2009 with its lowest of 0.013 in 2008. This was mainly due to the financial crisis in 2008, and Taiwanese banks overall tended to be conservative in business expansion in China. As cross-straits relations improved and the economy slowly recovered in 2009, the confidence of the expanding China banking market is regained, and thus the probability of intensity has reached its highest point.

We can also analyze the probability of intensity between pan-government-owned banks and private banks and find that the results are similar to those of the overall banks'; that is, the probability of intensity is at its lowest in 2008 and rises in 2009. However, the probability of intensity of pan-government-owned banks, 0.328, is relatively higher than private banks' 0.189 in 2009, and 0.016 and 0.009 in 2008, respectively. It appears that the pan-government-owned banks generally take advantage of the motives and the terms of equity stakes acquisitions as compared to the private banks outside of non-objective reasons such as political issues and government shareholding constraints.

5.3.2 The Types and Regions of Invested Chinese Banks

Taking equity stake acquisitions as the strategy to enter into Chinese financial market, most Taiwanese banks have recently assessed the best timing and the types or regions of Chinese banks in accordance with the business development prospect, customers' attribute, and competition tactics. In this subsection, we categorize the types of Chinese banks as state-owned, joint-stock commercial banks, city commercial banks, and rural cooperatives, in the five regions of Bohai and Beijing-Tianjin-Hebei Economic Rim, Yangtze River Delta, Western China Region, Haixi Economic Zone, and Pearl River Delta. We analyze the probability of intensity of overall, pan-government-owned, and private Taiwanese banks during the last five years as the reference of strategy in taking equity stake acquisition of Chinese banks in the near future.

Considering the type of invested Chinese banks, we find that the joint-stock commercial banks possess the highest probability of intensity, followed by then state-owned and city commercial banks and rural cooperatives, as shown in Table 13. This illustrates the outcome that the Chinese bank with superior asset quality has a higher probability of intensity. This intensity decreased from 2005 continuously, reaching its lowest in 2008, but it rebounded significantly in 2009 at 0.304 for joint-stock commercial banks and 0.247 for state-owned and 0.147 for city commercial banks and rural cooperatives. Although the joint-stock commercial banks have higher probability of intensity than the other types of Chinese banks, most

Taiwanese banks take into account the city commercial banks and rural cooperatives as first priority, as the statutory equity stake acquisition proportions of the joint-stock commercial banks are mostly reached for foreign financial institutions, and the acquisition cost is getting higher and also cannot acquire the deterministic certain proportion among management power and members of the board of directors. In addition to the lower invested cost to earn more capital gain and obtain the power of management and strategy decision, most Taiwanese banks focus on regional banks, such as the city commercial banks and rural cooperatives, to be the object of equity stake acquisition to integrate with the ways of establishment of branch, subsidiary, or sole ownership on the premise of proximity to the clients to promote the management synergy of the Chinese financial market in the near future.

Furthermore, within this analysis, we categorize Taiwanese banks as pan-government-owned banks and private banks and find that both banks' intensity of taking equity stake acquisition have been decreased from 2005 and reached its lowest level in 2008, but it rebounded significantly and was relatively higher in 2009. In addition, both pan-government-owned banks and private banks identically possessed the highest intensity for joint-stock commercial banks, followed by state-owned banks, city commercial banks, and rural cooperatives in order. The empirical study shows that the pan-government-owned banks have stronger motives of acquisition than private banks for all types of Chinese banks, but there is less difference in city commercial banks and rural cooperatives and more in joint-stock commercial banks generally. For instance, in 2009, the largest difference in equity stakes acquisition between pan-government-owned banks and private banks is 0.153 (0.366 / 0.213) in joint-stock commercial banks, then 0.128 (0.299/ 0.171) in state-owned banks, and the smallest difference − 0.081 (0.181 / 0.100) in city commercial banks and rural cooperatives. This implies that the timing of choosing Chinese banks for equity stakes acquisition which are suitable for business strategy and management prospect is most important and helps prevent them from falling behind competitors and missing the best opportunity in advance, as most Taiwanese banks consider city commercial banks and agricultural banks' acquisition recently, and both intensities are closing.

In addition, for the intensity of Chinese banks equity stake acquisition in different districts for Taiwanese banks, we categorize five districts as Bohai and Beijing-Tianjin-Hebei Economic Rim, Yangtze River Delta, Western China Region, Haixi Economic Zone, and Pearl River Delta. These five districts reveal the same circumstances in which intensity reaches its lowest in 2008 and ascends apparently in 2009. The empirical study shows that the Western China Region is the most attractive

region to Taiwanese banks for acquisition, followed by Yangtze River Delta, Haixi Economic Zone, Pearl River Delta, and Bohai and Beijing-Tianjin-Hebei Economic Rim, as shown in Table 14. This is due to the asset quality, such as NPL ratio and NPL/equity ratio, of banks in Bohai and Beijing-Tianjin-Hebei Economic Rim being relatively higher than other districts on average during the last five years and affected negatively its intensity of equity stakes acquisition, as it dropped to only 0.002 in 2009, less than 0.399 in Western China Region, 0.160 in Yangtze River Delta, and 0.118 in Haixi Economic Zone.

We can also analyze pan-government-owned banks and private banks. The results reveal that the intensity of pan-government-owned banks is higher than private bank in all districts, and both reach their highest in Western China Region, followed by Yangtze River Delta and Haixi Economic Zone, and reaches the lowest in Pearl River Delta and Bohai and Beijing-Tianjin-Hebei Economic Rim. In addition, the intensity of allover Taiwanese banks is low − below that of pan-government-owned banks but exceeding private banks. Under the tendency of increasing cross-strait financial exchange and the recently signed ECFA agreement, the Western China Region which is known for its green channels, Yangtze River Delta in which most Taiwanese businesses are clustered, and Haixi Economic Zone which has similar culture and is close to Taiwan, are main districts for Taiwanese banks to access objectively in taking acquisition strategy. Hence, these three districts could be treated as the most fitting acquisition developing direction for Taiwanese banks presently with its respective estimated probability of intensity.

As the foreign financial institutions enter the China banking sector for a long period, and statutory equity stake acquisition proportions of state-owned banks, joint-stock commercial banks and major city commercial banks are mostly reached, the objects for Taiwanese banks for acquisition are seldom only for the subordinate city commercial banks and rural cooperatives besides taking over the existing equity stakes of foreign financial institutions. Although the global economy and prosperity is declined and beneficial to lower the cost of acquisition, it also will affect the performance of management and earning ability of invested Chinese banks in the near future. With the target of purely financial investment or expanding the next business scope, we should go a step further to analyze principal tactic and main prospect of taking equity stake acquisition, and contemplate the integration of both entities different culture and frame of management after acquisition to bring into the significant synergy.

5.4 Brief Summary

China has committed the promise on open its financial market under the principles of Most Favored Nation treatment, transparency, increasing the participation of developing country, open market, achieving a progressive level of liberalization and so on when accepted to the WTO. With high degree of economic development and improved living standard in China, all foreign financial institutions hope to come up with different strategies along with their specialties in order to acquire strategic opportunities and cooperative benefits at this massive financial market.

While the bilateral financial communication and cooperation have upgraded to a new level, plus the significant relaxation of political relations and increased contact on trading, many Taiwanese banks have targeted the Chinese financial markets as the new strategic objective in recent year. With all the possible entry means, for example, launch a representative office, establish a branch, set up a wholly owned subsidiary of foreign banks, acquire equity stakes of Chinese-funded bank and form a strategic partnership, to choose from, Taiwanese banking industry makes many effort to evaluate the opportunity to enter the market in order to create the maximum value with the ongoing negotiation of ECFA.

For the equity stakes acquisition of Chinese banks under having minimized the type I and type II errors and specific baseline hazard functions, we derive the optimal probability hazard threshold of equity stakes acquisition. During 2005 to 2009, the probability of intensity of equity stake acquisition has reached the relative higher value in 2009 from the lowest point in 2008, and even the overall Taiwanese banks have not reached this optimal threshold as Cross-Straits relations improved and the economy has slowly recovered. This paper finds that the probability of intensity of state-owned Taiwanese banks is higher than that of private banks and joint-stock commercial banks and of the Western China Region, and it has higher intensity of being invested than other types of Chinese banks or areas in China. We can derive the intensity of probability with relative implicit estimation of hazard and survival value, by comparing to this optimal threshold, the likelihood of foreign financial institution, including Taiwanese banks can determine whether or not to take equity stake acquisition.

Eventually, no matter for foreign financial institutions as leading or follower such as Taiwanese banks, all of them possess the ability to make earning under the demand has not yet reached its saturation and would continue to expand. Meanwhile, this paper points out: Taiwanese banks tend to promote the representative office to a branch or establish subsidiary in recent year for many existing Taiwan-funded enterprises as customers, and wait the right time to enter the local market and start the RMB business. This will diminish the uncertain expectation for the demand of China financial market and shorten the waiting period on operating. After the China government adopts macro-economic control to mitigate the market from overheated economy into economic bobble, it will also lower the cost on both of establishment and operation to reduce the entry barrier for Taiwanese banks and waiting period on operating in this circumstance.

6. Conclusion

As china experienced rapid economic growth with rising average income per capita in recent years, together with China's entry to the WTO and subsequent granting market access to foreign players, foreign financial institutions regard China as an important market to explore with sizeable profit potential. Moreover, as Taiwan and China deepening its economic relationships and ongoing discussion on future cooperative framework in finance, Taiwanese banks should rethink their China market entry strategy. In order to gain market share swiftly, Taiwanese banks needs to explore the options other than setting up representative office and then upgrading to a branch. Such options includes subsidiary, taking ownerships stakes and looking for strategic alliance partners. By doing so, the Taiwanese banks can find a new way to rejuvenate growth in the sector that in the current intense domestic market competition condition does not provide.

First, this paper analyzes the strategic decisions of foreign financial institutions about equity stakes acquisition in China banking sector. Besides in consideration of macroeconomic variables of home country of foreign financial institutions and interaction variables between foreign banks home country and China, we also take into the financial ratios variables of foreign financial institutions and invested Chinese banks both to figure out relative significance level, and discuss the optimal probability hazard threshold further.

Moreover, the contingent claim model is applied to examine the risk and return of foreign financial institutions after acquiring equity stakes of Chinese bank. To comply with regulatory capital control, this paper also analyzed the asset value of foreign financial institution and factors associated with risk after acquisition. Under the limitation and bridle of risk exposure and appetite, we evaluate the optimal acquiring equity stakes proportion to achieve the goal of maximizing shareholder value.

We stretch the analysis on the appropriate time and entry model to China banking sector for Taiwanese banks finally. When the China financial market is pretty much laid out by many other foreign financial institutions as leading, this paper apply real option model to discuss the threshold on optimal entry point as being the market followers such like emerging country banking industry as Taiwanese banks. Meanwhile, we figure out respective intensity of equity stakes acquisition to determine the best Chinese bank and district to invest under the previous derived

optimal Cox's proportional-hazard survival model.

For the research in the investment of foreign financial institutions by equity stakes acquisition in China banking sector, this paper shows that those with higher earning capability and better asset quality possess higher probability of intensity to raise the management performance of invested Chinese banks and earn significant return. Moreover, the Chinese banks with good asset quality also have higher intensity to invest with consideration of creating strategic cooperative value in the win-win status. Meanwhile, the probability of intensity is higher for those financial institutions' home countries with higher financial development, but it is lower for those with higher bilateral-trade volume under the customer followed, and adopt without equity stakes acquisition such as others like establishment of branch or wholly owned banks for foreign financial institutions.

Furthermore, invested Chinese banks have shown positive improvement on its asset quality, capital adequacy and earning ability as the strategy of equity stakes acquisition by foreign financial institutions, here the joint-stock commercial banks have significant increase in asset quality especially. The earning ability has improved to a large extent during the year of investment for the state-owned banks, whereas during the year after investment, the joint-stock commercial banks reach their significant point. This may be due to the simultaneous and active effort in write-off policy. Meanwhile, in Cox proportional-hazard survival model, we could figure out relative intensity of taking equity stakes acquisition for foreign financial institutions with data in China banking sector before, and derive the optimal probability hazard threshold, to be determinant of whether or not to take equity stake acquisition by foreign financial institutions, including Taiwanese banks.

After the discussion of the motives and its optimal probability hazard threshold of equity stakes acquisition by foreign financial institutions, we will implement dynamic processes to analyze the relationship between risk and return using contingent claim model for foreign financial institutions that acquire equity stakes of invested Chinese banks. Additionally, we set up both of asset values of foreign and local financial institutions individually, as well as consider the influence of exchange rate. The above-mentioned factors are required to follow the concept of maximizing shareholder value and stipulating the capital requirements of a certain portion on risk-weighted assets.

Based on the aforementioned situations and conditions, we further infer the optimal return volatility and its corresponding acquiring proportion for foreign financial institutions to take stakes in Chinese banks. The Static analysis have conducted on different variables and find the numerical results of the asset risk and asset value of the foreign financial institutions; The results show that, for foreign financial institution to lower the portfolio risk under capital control environment, it would reduce the asset price volatility and maintain lower leverage ratio to mitigate the equity risk of investing and take as the buffer with higher capital. Furthermore, considering the new asset value after acquiring equity stakes that would come from both parties with certain portion, searching for the optimal ownership stakes proportion with right risk tolerance is important for the foreign financial institution. The proportion will be in a positive direction with the asset value of the Chinese bank, but negative with the factors such as the asset return volatility of foreign financial institution and invested Chinese bank, exchange rate return volatility and correlation coefficient of return of each other and so on. When foreign financial institutions acquire equity stakes of Chinese bank, besides following the statutory capital requirements and reducing the portfolio risk of the asset, they will also aim to create investment value and return simultaneously.

Furthermore, the study evaluates the entry modes and time into Chinese financial market for following-entry banking industry. The result showed the requirement on launching representative offices or branches have lowest cost and threshold, however, the profit growth could be restricted since banks wouldn't be able to operate RMB business immediately. On the other hand, establish wholly owned subsidiaries could obtain qualification on operating the RMB business and start doing business sooner before all methods, and thus became the primary strategic choice for foreign financial institutions. Furthermore, cost on acquiring equity stake will likely to be raise on local Chinese commercial banks because the company values have increased gradually due to the better performance. Therefore, selecting city or country commercial banks with similar asset size and returns have became the alternative for banks to take consideration.

The paper adopts real option application to analyze the entry time and mode to the Chinese market with the viewpoint of leading foreign institution and following financial institutes. We find the market has potential benefit waiting to be developed for foreign institution as the domestic market demand remain strong and the financial market has not yet reached its saturation. Although the Chinese economic remains strong, the government adopts macro-economic control in order to mitigate the

inflation so that the cost of entry can be reduced for foreign financial institutions. Additionally, the increasing demand on payment service between foreign country and China also assist following financial institutes to lower the barrier to enter the Chinese market and then expand to other related businesses.

The paper also discovered the current practice, establishes a representative office first and copes with the procedure on becoming a branch soon possible, is practical for banks following-entry the market. While serving the country-fund enterprises and being familiar with the local financial market, the following financial institutes can also obtain the qualification to operate RMB business with regulated procedure. This study also noted that this current practice is practicable and appropriated for banking industry to adopt when enter the Chinese market. The main support was this application could lower the uncertainty when entering the market with the overall demand on financial market remains positive and the country-fund business continues to grow, the threshold on optimal entry point would be reduce. Entering the market by establishing a wholly own subsidiary or acquiring equity stake of local bank could increase the fixed cost and result in higher threshold on optimal entry point and longer investing waiting period with the current practice, On the other hand, if following-entry banking industry can crate innovative business and niche strategy and then compete with the local and leading foreign financial institution, then establishing a wholly own subsidiary or acquiring equity stake of local bank should be feasible on the operating effectiveness.

For the analysis of motives of Taiwanese banks in equity stakes acquisition, we find the intensity would be raised generally as the cross-strait policy environment tends to stale and economics recovery moderately. The pan-government-owned banks generally takes advantage of the motives and terms equity stakes acquisition as compared to the private banks outside under steady of earning ability and good asset quality. Furthermore, for the types and regions of invested Chinese banks, this paper also finds the joint-stock commercial banks posses the highest probability of intensity, and then followed by state-owned and city commercial banks and rural cooperatives. As the statutory equity stakes acquisition proportions of the joint-stock commercial banks and state-owned banks are mostly reached for foreign financial institutions, most Taiwanese banks take into consideration on the city commercial banks and rural cooperatives as first priority to acquire the deterministic certain proportion among management power and have investment return. For the types, the results reveal that the probability of intensity reach highest in Western China Region, followed by Yangtze River Delta and Haixi Economic Zone, and reaches the lowest in Pearl River

Delta and Bohai and Beijing-Tianjin-Hebei Economic Rim. This responds to result that the Taiwanese banks access objectively in taking equity stakes acquisition strategy in the districts such that the Western China Region which is known for its green channel, Yangtze River Delta in which most Taiwanese business are clustered, and Haixi Economic Zone which has similar culture and location closed to Taiwan.

The paper attempts to explore China market entry strategy from the foreign financial institution (including the Taiwanese banks) perspective.   As the paper is based on the models and empirical study on the foreign financial institution taking ownerships stakes in the Chinese banks, analyzing the other market entry options of set up branch and subsidiary were only limited to theoretical validation.   Therefore in order to formulate a comprehensive China market entry strategy, it is necessary to build related research model and undertaking statistical analysis of the different market entry options as the direction for future research.
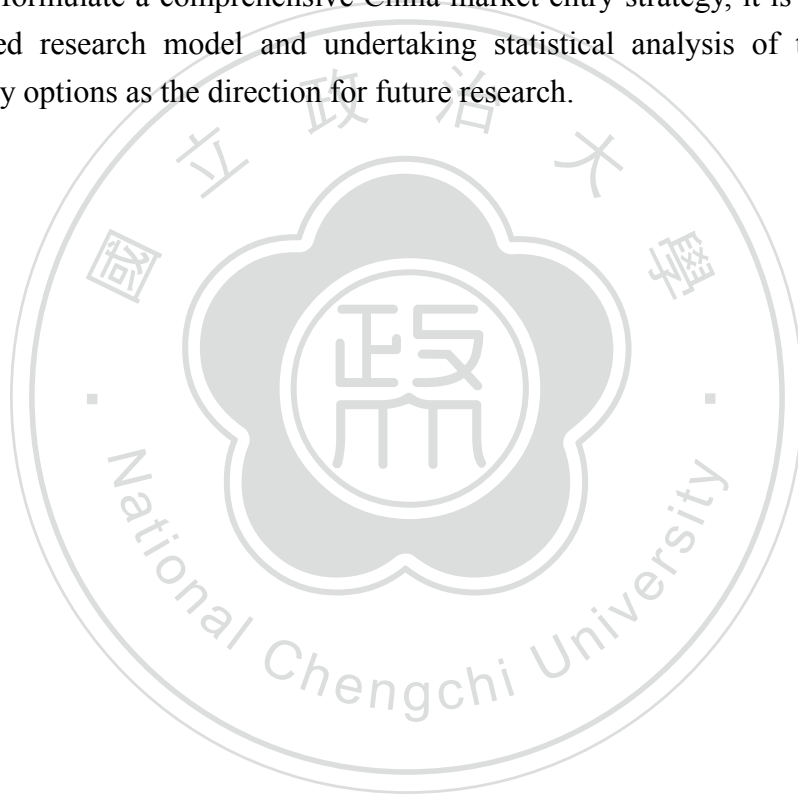
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Appendixes

Appendix A

Consider two dynamic processes as

$$\frac{dV_f(t)}{V_f(t)} = r_f(t)dt + \sigma_{V_f} dW_{V_f}^Q(t) \quad \text{and} \quad \frac{dX(t)}{X(t)} = (r_d(t) - r_f(t))dt + \sigma_X dW_X^Q(t).$$

The dynamics of asset value, $V_{f(d)}(t) = V_f(t)X(t)$, calculated by Ito's lemma is

$$dV_{f(d)} = (\frac{\partial V_{f(d)}}{\partial t} + \frac{\partial V_{f(d)}}{\partial V_f} r_f V_f + \frac{\partial V_{f(d)}}{\partial X}(r_d - r_f)X + \frac{1}{2}\frac{\partial^2 V_{f(d)}}{\partial V_f^2}(\sigma_{V_f} V_f)^2 +$$

$$\frac{1}{2}\frac{\partial^2 V_{f(d)}}{\partial X^2}(\sigma_X X)^2 + \frac{\partial^2 V_{f(d)}}{\partial V_f X}\rho_{V_f X}\sigma_X \sigma_{V_f} V_f X)dt + \frac{\partial V_{f(d)}}{\partial V_f}\sigma_{V_f} V_f dW_{V_f}^Q + \frac{\partial V_{f(d)}}{\partial X}\sigma_X X dW_X^Q;$$

where $\frac{\partial V_{f(d)}}{\partial t} = \frac{\partial V^2_{f(d)}}{\partial V_f^2} = \frac{\partial V^2_{f(d)}}{\partial X^2} = 0; \quad \frac{\partial V_{f(d)}}{\partial V_f} = X; \quad \frac{\partial V_{f(d)}}{\partial X} = V_f; \quad \frac{\partial V_{f(d)}}{\partial V_f \partial X} = 1.$

Furthermore, we have

$$\frac{dV_{f(d)}}{V_{f(d)}} = \mu_{V_{f(d)}} dt + \sigma_{V_{f(d)}} dW_{V_{f(d)}}^Q;$$

where $\mu_{V_{f(d)}} = (r_d + \rho_{V_f X}\sigma_{V_f}\sigma_X)$ and $\sigma_{V_{f(d)}} dW_{V_{f(d)}}^Q = \sigma_{V_f} dW_{V_f}^Q + \sigma_X dW_X^Q,$

and

$$Var(\sigma_{V_{f(d)}} dW_{V_{f(d)}}^Q) = Var(\sigma_{V_f} dW_{V_f}^Q) + Var(\sigma_X dW_X^Q) + 2Cov(\sigma_{V_f} dW_{V_f}^Q, \sigma_X dW_X^Q)$$

$$\Rightarrow \sigma_{v_{f(d)}}^2 Var(dW^*) = \sigma_{V_f}^2 Var(dW_{V_f}^Q) + \sigma_X^2 Var(dW_X^Q) + 2\sigma_{V_f}\sigma_X Cov(dW_{V_f}^Q, dW_X^Q)$$

$$\Rightarrow \sigma_{v_{f(d)}}^2 dt = \sigma_{V_f}^2 dt + \sigma_X^2 dt + 2\sigma_{V_f}\sigma_X \rho_{V_f X} dt$$

$$\Rightarrow \sigma_{V_{f(d)}} = \sqrt{\sigma_{V_f}^2 + \sigma_X^2 + 2\sigma_{V_f}\sigma_X \rho_{V_f X}}.$$

Appendix B

According to $V_{f(d)} = V_f X$ and $\sigma_{V_{f(d)}} dW^Q_{V_{f(d)}} = \sigma_{V_f} dW^Q_{V_f} + \sigma_X dW^Q_X$, we have

$$Var(i_1 \frac{dV_d}{V_d} + i_2 \frac{dE_{f(d)}}{V_d})$$

$$= Var(i_1 \sigma_{V_d} dW^Q_{V_d} + \frac{i_2}{V_d} g_1 \sigma_{V_{f(d)}} V_{f(d)} dW^Q_{V_{f(d)}})$$

$$= Var(i_1 \sigma_{V_d} dW^Q_{V_d} + \frac{i_2}{V_d} g_1 V_{f(d)} (\sigma_{V_f} dW^Q_{V_f} + \sigma_X dW^Q_X))$$

$$= Var(i_1 \sigma_{V_d} dW^Q_{V_d} + \frac{V_{f(d)}}{V_d} i_2 g_1 \sigma_{V_f} dW^Q_{V_f} + \frac{V_{f(d)}}{V_d} i_2 g_1 \sigma_X dW^Q_X)$$

$$= Var(w_1 \sigma_{V_d} dW^Q_{V_d} + w_2 \sigma_{V_f} dW^Q_{V_f} + w_2 \sigma_X dW^Q_X) ;$$

where $w_1 = i_1$ and $w_2 = \frac{V_{f(d)}}{V_d} g_1 i_2$.

The instantaneous volatility of asset return of a foreign financial institution after taking ownership stake is

$$Var(\frac{dV_d}{V_d}) = Var(w_1 \sigma_{V_d} dW^Q_{V_d} + w_2 \sigma_{V_f} dW^Q_{V_f} + w_2 \sigma_X dW^Q_X)$$

$$= (w_1 \sigma_{V_d})^2 + (w_2 \sigma_{V_f})^2 + (w_2 \sigma_X)^2 + 2 w_1 w_2 \sigma_{V_d} \sigma_{V_f} \rho_{V_d V_f} + 2 w_1 w_2 \sigma_{V_d} \sigma_X \rho_{V_d X} + 2 w_2 w_2 \sigma_{V_f} \sigma_X \rho_{V_f X}.$$

Tables

Table 1: Number of legal entities and staff of the banking institutions in China (As of end-2011)

Institutions / Items	Number of banks	Number of staff
Large commercial banks (1)	5	1,626,223
Policy banks & the CDB	3	61,015
Joint-stock commercial banks (2)	12	278,053
City commercial banks	144	223,238
Rural credit cooperative	2,265	533,999
Rural commercial banks	212	155,476
Rural cooperative banks	190	70,115
Finance companies of corporate groups	127	7,018
Trust companies	66	8,944
Financial leasing companies	18	1,483
Auto financing companies	14	3,381
Money brokerage firms	4	313
Consumer finance companies	4	417
New-type rural financial institutions & Postal savings bank	692	177,856
Banking asset management companies	4	8,113
Foreign financial institutions	40	42,269
Banking institutions in total	3,800	3,197,913
(1) Large commercial banks are Bank of China, China Construction Bank, Agricultural Bank of China, Industrial and Commercial Bank of China and Bank of Communications.		
(2) Joint-stock commercial banks are China Citic Banks, China Everbright Bank, Huaxia Bank, Guangdong Development Bank, Shenzhen Development Bank, China Merchants Bank, Shanghai Pudong Development Bank, Industrial Bank, China Minsheng Bank, Evergrowing Bank, China Bohai Bank, China Zheshang Bank.		

Table 2: Total assets of banking institutions in China (2009-2011)

In RMB hundred million

Institutions / Year	2009	%	2010	%	2011	%
Policy banks & the CDB	69,456	8.73%	76,521	8.03%	93,133	8.22%
Large commercial banks	407,998	51.31%	468,943	49.20%	536,336	47.34%
Joint-stock commercial banks	118,181	14.86%	149,037	15.64%	183,794	16.22%
City commercial banks	56,800	7.14%	78,526	8.24%	99,845	8.81%
Rural commercial banks	18,661	2.35%	27,670	2.90%	42,527	3.75%
Rural cooperative banks	12,791	1.61%	15,002	1.57%	14,025	1.24%
Urban credit cooperatives	272	0.03%	22	0.00%	30	0.00%
Rural credit cooperatives	54,945	6.91%	63,911	6.71%	72,047	6.36%
Non-bank financial institutions	15,504	1.95%	20,896	2.19%	26,067	2.30%
Foreign banks	13,492	1.70%	17,423	1.83%	21,535	1.90%
Postal savings bank & New-type rural financial institutions	27,045	3.40%	35,101	3.68%	43,536	3.84%
Banking institutions in total	795,146	100%	953,053	100%	1,132,875	100.00%

Table 3: Profit after tax of banking institutions (2009-2011)

In RMB hundred million

Institutions / Year	2009	%	2010	%	2011	%
Policy banks & the CDB	352.5	5.27%	415.2	4.62%	536.7	4.29%
Large commercial banks	4,001.2	59.86%	5,151.2	57.29%	6,646.6	53.09%
Joint-stock commercial banks	925.0	13.84%	1,358.0	15.10%	2,005.0	16.02%
City commercial banks	496.5	7.43%	769.8	8.56%	1,080.9	8.63%
Rural commercial banks	149.0	2.23%	279.9	3.11%	512.2	4.09%
Rural cooperative banks	134.9	2.02%	179.0	1.99%	181.9	1.45%
Urban credit cooperatives	1.9	0.03%	0.1	0.00%	0.2	0.00%
Rural credit cooperatives	227.9	3.41%	232.9	2.59%	531.2	4.24%
Non-bank financial institutions	298.7	4.47%	408.0	4.54%	598.8	4.78%
Foreign banks	64.5	0.96%	77.8	0.87%	167.3	1.34%
Postal savings bank & New-type rural financial institutions	32.2	0.48%	119.0	1.32%	257.9	2.06%
Banking institutions in total	6,684.2	100%	8,990.9	100%	12,518.7	100.00%

Table 4: Entry model and location of Taiwanese bank in China

Name of Bank	Entry Model	Location
Land Bank of Taiwan	Branch	Shanghai
First Commercial Bank	Branch	Shanghai
Hua Nan Commercial Bank	Branch	Shenzhen
Chang Hwa Bank	Branch	Kunshan
Taiwan Cooperative Bank	Branch Representative Office	Soochow Beijing
Cathay United Bank	Branch	Shanghai
Chinatrust Bank	Branch Representative Office	Shanghai Beijing
Bank of Taiwan	Branch	Shanghai
Mega International Commercial Bank	Branch	Soochow
E. Sun Bank	Branch	Dongguan
Taiwan Business Bank	Representative Office	Shanghai
Taipei Fubon Bank (1)	Equity Investment Representative Office	Xaimen Soochow
(1) Fubon Bank (Hong Kong) is on behalf of Taipei Fubon Bank to invest equity of Xaimen Bank around 19.99% with 230 RMB million in November 2008.		

Table 5: The average and deviation of assets and net income of invested Chinese banks in the last five years

In USD thousand

State-owned banks	Asset	Mean	3,345,805,184
		Deviation	1,108,072,969
	Net income	Mean	12,319,633
		Deviation	6,779,435
Joint-stock commercial banks	Asset	Mean	856,325,466
		Deviation	383,502,232
	Net income	Mean	6,608,271
		Deviation	4,349,354
City commercial banks	Asset	Mean	178,212,579
		Deviation	76,516,521
	Net income	Average	1,809,978
		Deviation	981,607
Rural cooperatives	Asset	Average	22,244,362
		Deviation	6,188,218
	Net income	Average	109,990
		Deviation	104,068

Table 6: The financial ratios of foreign financial institutions and Chinese banks

Item	Financial ratio
Capital adequacy	Capital adequacy ratio Equity / Asset ratio
Asset quality	Non-performing-loan ratio NPL / Equity ratio
Management	Net income per employee Cost income ratio
Earning capability	Return on average asset Return on average equity
Liquidity	Loan-to-deposit ratio Liquidity asset / Deposit ratio

Table 7: Total variance explained of financial ratio variables of foreign financial institutions

	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
Component 1	3.848	38.477	38.477
Component 2	1.804	18.042	56.519
Component 3	1.304	13.036	69.555
Component 4	1.175	11.752	81.307

Table 8: Total variance explained of financial ratio variables of Chinese banks

	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
Component 1	8.076	80.755	80.755
Component 2	1.208	12.078	92.833

Table 9: Goodness-of-fit of survival model

Initial -2 log likelihood	184.352
Current -2 log likelihood	119.353
Chi-square	90.839
df (v)	12

Table 10: The fitted result of Cox's proportional hazard survival model

Variables	β	Wald
Ln GDP	0.295 (0.366)	0.648
Ln GDP Per Capital	-4.451 (2.889)	2.374
GDP growth rate	0.003 (0.169)	0.000
Ranking of top 1,000 banks in the world	0.267 (0.126) **	4.497
Interest spread	-0.284 (0.215)	1.739
Ln bilateral-trade	-2.467 (0.846) ***	8.510
Ln distance	-0.545 (1.034)	0.277
Principal component 1 of financial ratio of foreign financial institutions	1.331 (0.465) ***	8.193
Principal component 2 of financial ratio of foreign financial institutions	0.538 (0.311) *	2.992
Principal component 3 of financial ratio of foreign financial institutions	0.325 (0.216)	2.260
Principal component 4 of financial ratio of foreign financial institutions	0.409 (0.344)	1.413
Principal component 1 of financial ratio of Chinese banks	7.237 (2.682) ***	7.281

Note: ***, ** and * denote significance at 1%, 5% and 10%, respectively; standard error is in parentheses.

Table 11: The average financial ratios of Taiwanese banks

	2005	2006	2007	2008	2009
Capital adequacy ratio	11.10%	11.25%	10.75%	10.90%	13.08%
Equity / Asset ratio	5.83%	5.94%	6.11%	5.67%	5.73%
Non-performing loan ratio	1.61%	1.49%	1.29%	1.21%	1.07%
NPL / Equity ratio	20.62%	18.45%	15.63%	15.55%	13.05%
Net income per employee	28.48	22.24	36.73	22.89	24.77
Cost income ratio	53.76%	56.28%	56.87%	58.75%	57.56%
Return of average asset	0.26%	0.17%	0.44%	0.27%	0.27%
Return of average equity	2.96%	2.62%	7.11%	4.49%	4.69%
Loan to deposit ratio	68.88%	71.78%	73.91%	73.56%	74.47%
Liquidity asset / Deposit ratio	0.18%	0.18%	0.18%	0.19%	0.22%

Table 12: The average and deviation of asset and net income of Taiwanese banks in the last five years

In USD thousand

Pan-government-owned banks	Asset	Mean	472,928,526
		Deviation	44,137,479
	Net income	Mean	1,547,184
		Deviation	763,836
Private banks	Asset	Mean	261,221,422
		Deviation	26,088,894
	Net income	Mean	435,001
		Deviation	880,300

Table 13: The probability of intensity of Taiwanese banks taking into the type of invested Chinese banks

Overall banks					
	2005	2006	2007	2008	2009
State-owned banks	0.062	0.278	0.033	0.013	0.247
Joint-stock commercial banks	0.998	0.182	0.060	0.014	0.304
City commercial banks and rural cooperatives	0.878	0.154	0.016	0.004	0.147
Pan-government-owned banks					
	2005	2006	2007	2008	2009
State-owned banks	0.065	0.420	0.037	0.016	0.299
Joint-stock commercial banks	0.998	0.285	0.067	0.018	0.366
City commercial banks and rural cooperatives	0.889	0.244	0.018	0.005	0.181
Private banks					
	2005	2006	2007	2008	2009
State-owned banks	0.058	0.120	0.027	0.009	0.171
Joint-stock commercial banks	0.996	0.076	0.048	0.010	0.213
City commercial banks and rural cooperatives	0.858	0.064	0.013	0.003	0.100

Table 14: The probability of intensity of Taiwanese banks taking into the district of China

Overall banks					
	2005	2006	2007	2008	2009
Bohai and Beijing-Tianjin-Hebei Economic Rim	0.611	0.019	0.001	0.000	0.002
Yangtze River Delta	0.043	0.010	0.003	0.002	0.160
Western China Region	0.791	0.724	0.025	0.005	0.399
Haixi Economic Zone	0.091	0.002	0.021	0.003	0.118
Pearl River Delta	0.987	0.352	0.000	0.000	0.006
Pan-government-owned banks					
	2005	2006	2007	2008	2009
Bohai and Beijing-Tianjin-Hebei Economic Rim	0.627	0.032	0.001	0.000	0.002
Yangtze River Delta	0.045	0.016	0.004	0.002	0.197
Western China Region	0.805	0.884	0.028	0.007	0.473
Haixi Economic Zone	0.095	0.003	0.024	0.003	0.146
Pearl River Delta	0.990	0.516	0.000	0.000	0.008
Private banks					
	2005	2006	2007	2008	2009
Bohai and Beijing-Tianjin-Hebei Economic Rim	0.583	0.008	0.001	0.000	0.001
Yangtze River Delta	0.040	0.004	0.003	0.001	0.109
Western China Region	0.765	0.398	0.020	0.004	0.286
Haixi Economic Zone	0.084	0.001	0.017	0.002	0.080
Pearl River Delta	0.983	0.157	0.000	0.000	0.004

Table 15: The statutory requirement for approval to entry model in Mainland China for Taiwan financial holding company and bank

	Representative Office	Branch	Subsidiary bank	Equity Investment
Group's capital adequacy ratio after the proposed equity investment (higher)	—	—	—	110%
Group's double leverage ratio after the proposed equity investment (higher)	—	—	—	115%
Bank's ratio of equity capital to risk-weighted assets (higher)	10%	10%	—	10% (after deducting the amount allocated for the proposed equity investment)
Bank's ratio of Tier 1 capital to risk-weighted assets after deducting the amount allocated for the proposal investment in the subsidiary bank in Mainland Area (higher)	—	—	8%	—
Non-performing loan ratio; during the latest fiscal half year (lower)	—	2%	1.5%	2%
Loan loss coverage ratio during the latest fiscal half year (higher)	—	60%	100%	60%
Term of having established a branch and operated business in a member country of OECD country (longer)	2 years	5 years	5 years	5 years

Taiwan banks that intend to establish representative offices, branches, or subsidiary banks or make equity investment in Mainland Area and Taiwan financial holding companies that intend to make equity investment in Mainland Area shall also meet the following requirements:
1. The financial holding company / bank is in compliance with the law, is soundly managed and has not been subject to any disciplinary action, or has been subject to disciplinary action but specific remedial actions have been taken therefor and accepted by the Competent Authority within three years prior to application;
2. The bank has international financial knowledge and experience.

Table 16: The regulatory requirement for entry models in China

Requirement for Establishment of Represent Offices, Branches, Wholly Foreign-invested Banks and Sino-Foreign Joint Venture Banks

➤ The shareholders of a proposed wholly foreign-invested bank or of a proposed Sino-foreign joint venture bank or the foreign bank that proposes to establish branches or representative offices shall meet the following requirements:

  (1) being of ongoing profitability, good credit standing and having no record of major violation of laws or regulations;

  (2) that the shareholders of a proposed wholly foreign-invested bank, or the foreign shareholders of a Sino-foreign joint venture bank, or a foreign bank that proposes to establish branches or representative offices shall have experiences in international financial activities;

  (3) having effective policies on anti-money laundering activities;

  (4) that the shareholders of a proposed wholly foreign-invested bank, or the foreign shareholders of a Sino-foreign joint venture bank, or a foreign bank that proposes to establish branches or representative offices shall be subject to effective supervision by the financial regulatory authority of the country or region of the place where they are located with their applications consented by such financial regulatory authority; and

  (5) that other prudential requirements required by the bank regulatory authority of State Council shall be satisfied.

➤ Besides the requirements listed above, the foreign bank proposing to establish branches shall meet the following requirements:

  (1) that the total asset by the end of the year prior to the application for establishment shall be no less than USD20 billion;

  (2) that the capital adequacy ratio shall meet the requirement by the financial regulatory authority of the country or region where they are located and the banking regulatory authority of the State Council; and

  (3) that it shall have established a representative office in the territory of China for more than 2 years when initially establishing a branch in China.

➤ A shareholder that proposes to establish a wholly foreign-invested bank must be a financial institution and besides the requirements listed in above, the sole shareholder or the controlling shareholder shall meet the following requirements:

  (1) that they must be commercial banks;

(2) that they must have established a representative office in the territory of China for more than two years;

(3) that the total asset by the end of the year prior to the application for establishment shall be no less than USD10 billion; and

(4) that the capital adequacy ratio shall meet the requirement by the financial regulatory authority of the country or region where they are located and the banking regulatory authority of the State Council.

➢ Besides the requirements listed above, the foreign shareholder and the sole Chinese shareholder or any principal Chinese shareholder shall be a financial institution and the sole foreign shareholder or any principal shareholder shall meet the following requirements:

(1) that it must be a commercial bank;

(2) that it must have established a representative office in the territory of China for more than two years;

(3) that the total asset by the end of the year prior to the application for establishment shall be no less than USD10 billion; and

(4) that the capital adequacy ratio shall meet the requirement by the financial regulatory authority of the country or region where it is located and the banking regulatory authority of the State Council.

➢ The country or regions where the shareholders of a proposed wholly foreign-invested bank, or the foreign shareholders of a Sino-foreign joint venture bank, or a foreign bank that proposes to establish branches or representative offices are located shall have perfect financial supervision systems and their financial regulatory authorities shall have established good regulatory cooperation mechanism with the bank regulatory authority of the State Council.

➢ The minimum amount of registered capital of a wholly foreign-owned bank or of a Sino-foreign joint venture bank shall be RMB1billion or the equivalent in a freely convertible currency and the registered capital shall be the paid-in capital.

➢ With respect to a branch established by a wholly foreign-owned bank or by a Sino-foreign joint venture bank within the territory of the People's Republic of China, its head office shall grant without compensation operating capital no less than RMB100 million or equivalent of a freely convertible currency. The sum of operating capital granted by a wholly foreign-owned bank or a

> With respect to a branch of a foreign bank, the head office shall grant it operating capital no less than RMB200 million or equivalent of a freely convertible currency.

> The banking regulatory authority of the State Council may raise the minimum amount of the registered capital or operating capital of the business institution of a foreign-invested bank and the RMB shares among them according to their business scopes and the need for prudential supervision.

The Investment and Shareholding in Chinese-funded Financial Institutions by Oversea Financial Institutions

> China Banking Regulatory Commission (CBRC) shall be responsible for supervising and administering the overseas financial institutions' investment and shareholding in Chinese-funded financial institutions in the light with law.

> An overseas financial institution shall obtain the approval of CBRC so as to make investment or hold shares in a Chinese-funded financial institution.

> An overseas financial institution shall, when making investment or holding shares in a Chinese-funded financial institution, do so on the basis of good credit and with the goal of medium-and long-term investment.

> An overseas financial institution shall, when making investment or holding shares in a Chinese-funded financial institution, make the capital contribution in money.

> In order to invest or hold shares in Chinese-funded financial institutions, an overseas financial institution shall meet the conditions as follows:

(1) In a general principle, for making investment or holding shares in a Chinese-funded commercial bank, the total assets of the overseas financial institution at the end of the last year shall, as, be no less than 10 billion US dollars; for making investment or holding shares in a Chinese-funded urban credit cooperative or rural credit cooperative, the total assets at the end of the last year shall be no less than 1 billion US dollars; for making investment or holding shares in a Chinese-funded non-bank financial institution, the total assets at the end of the last year shall be no less than 1 billion US dollars;

(2) The long-term credit rank given by an international ranking institution recognized by CBRC for that overseas financial institution is good;

(3) The overseas financial institution has made profit for two consecutive fiscal years;

(4) If the overseas financial institution is a commercial bank, the capital adequacy rate shall be no less than 8%; if it is a non-bank financial institution, the total amount of capital shall be no less than 10% of the total amount of the risk-weighted assets;

(5) The overseas financial institution has sound internal control system;

(6) The place of registration of the overseas financial institution has sound supervision and administration system;

(7) The home country (region) of the overseas financial institution has satisfactory economic status; and

(8) Other prudential conditions required by CBRC.

In the light with the risk status of the financial industry and the needs of regulation, CBRC may adjust the qualification requirements for overseas financial institutions, which intend to make investment and hold shares in Chinese-funded financial institutions.

➢ The proportion of the investment or shareholding in a Chinese-funded financial institution by a single overseas financial institution may be no more than 20%.

➢ For several overseas financial institutions:

(1) If the total proportion of the investment or shareholding in a non-listed Chinese-funded financial institution by several overseas financial institutions reaches or exceeds 25%, that non-listed financial institution shall be considered an overseas-funded financial institution in the supervision and administration;

(2) If the total proportion of the investment or shareholding in a listed Chinese-funded financial institution by several overseas financial institutions reaches or exceeds 25%, that listed financial institution shall still be considered a Chinese-funded financial institution in the supervision and administration.

➢ In the case that an overseas financial institution intends to make investment or hold shares in a Chinese-funded financial institution, the Chinese-funded financial institution that absorbs the investment shall act as the applicant and submit the application to CBRC.

> Others
>
> (1) The term "overseas financial institutions" as used herein include international financial institutions and financial institutions of overseas countries;
>
> (2) The term "international financial institutions" refers to the World Bank and the affiliated agencies thereof, other intergovernmental development financial institutions, and other international financial institutions recognized by the China Bank Regulatory Commission (hereinafter referred to as CBRC);
>
> (3) the term "financial institutions of overseas countries" refers to the financial holding companies, commercial banks, securities companies, insurance companies, and funds that are registered in overseas countries, and other overseas financial institutions recognized by CBRC;
>
> (4) The term "Chinese-funded financial institutions" as used herein refers to the Chinese-funded commercial banks, urban credit cooperatives, rural credit cooperatives, trust and investment companies, enterprise group finance companies, and financial leasing companies that are set up within China in the light with law, and other Chinese-funded financial institutions that are set up upon approval of CBRC.
>
> (5) The term "proportion of the investment or shareholding" as used herein refers to the share that the capital contributed or the shares held account for in the paid-in total capital or total shares of the Chinese-funded financial institution.

Exacted from "Regulations of the People's Republic of China on the Administration of Foreign-invested Banks" and "Measures for the Administration of the Investment and Shareholding in Chinese-funded Financial Institutions by Oversea Financial Institutions"

Table 17: The commitments of the Mainland side on liberalization of financial sector on the "Annex IV: Sectors and Liberalization Measures Under the Early Harvest for Trade in Services" of Cross-Straits Economic Cooperation Framework Agreement

Banking and Other Financial Services (excluding securities, futures and insurance)

➢ For Taiwan banks to set up wholly owned banks or branches (not branches affiliated to a wholly owned bank) in the Mainland with reference to the Regulation on Administration of Foreign-funded Banks, they shall have representative offices in the Mainland for more than one year before application.

➢ For the operating branches of Taiwan banks in the Mainland to apply to conduct RMB business, they shall have been operating in the Mainland for more than two years and be profitable in the preceding year before application.

➢ For the operating branches of Taiwan banks in the Mainland to apply to conduct RMB business for Taiwan corporates in the Mainland, they shall fulfill the following conditions: they should have been operating in the Mainland for more than one year and been profitable in the preceding year.▪

➢ The operating branches of Taiwan banks in the Mainland may set up special agencies providing financial services to small businesses, the specific requirements of which shall follow relevant rules in the Mainland.

➢ Fast tracks shall be established for Taiwan banks applying to set up branches (not branches affiliated to wholly owned banks) in central and western, as well as northeastern regions of the Mainland.

➢ In conducting profitability assessment on the branches of Taiwan banks in the Mainland, the relevant authorities shall take into account the overall performance of the Taiwan bank under assessment.

Securities, futures and other related services

➢ Proper facility shall be provided to the qualified Taiwan-funded financial institutions applying for qualification of Qualified Foreign Institutional Investor (QFII) in the Mainland.

➢ Taiwan Stock Exchanges and Taiwan Futures Exchanges shall be included as

➤ Relevant procedures shall be simplified for Taiwan securities practitioners applying for and obtaining qualifications and certificates of practice in the Mainland.

Insurance and Insurance – Related Services

➤ Groups formed by Taiwan insurance companies through integration or strategic mergers shall be allowed to apply for entry into the Mainland insurance market with reference to market access conditions for foreign-funded insurance companies (total assets held by the group of over US$ 5 billion; more than 30 years of establishment experience of any one of the Taiwan insurance companies in the group; and a representative office established in the Mainland for over 2 years by any one of the Taiwan insurance companies in the group).
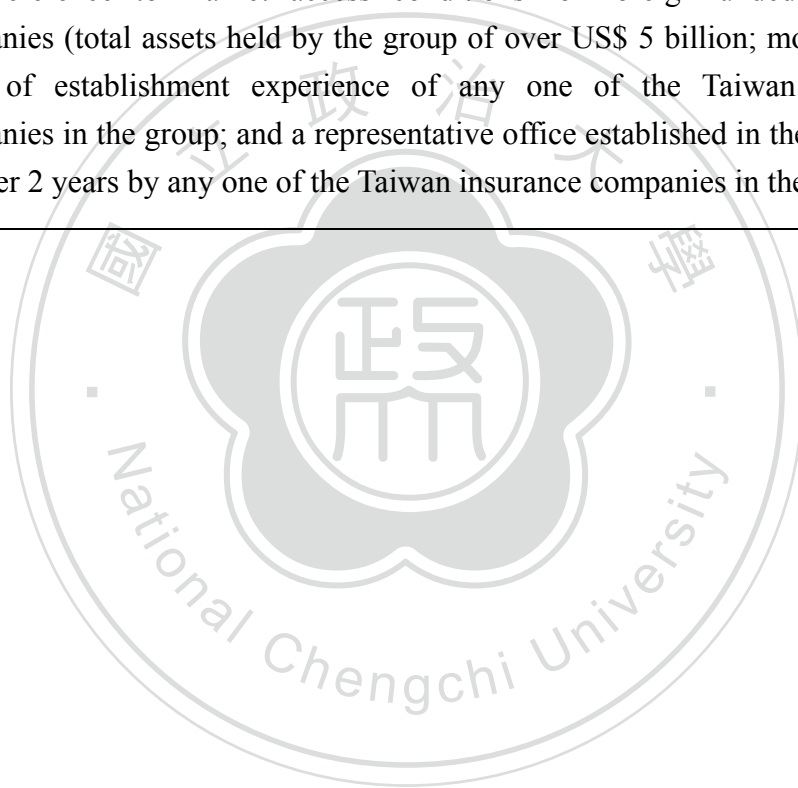
Figures

Figure 1: The trend of asset quality (non-performing loan ratio) of invested Chinese banks
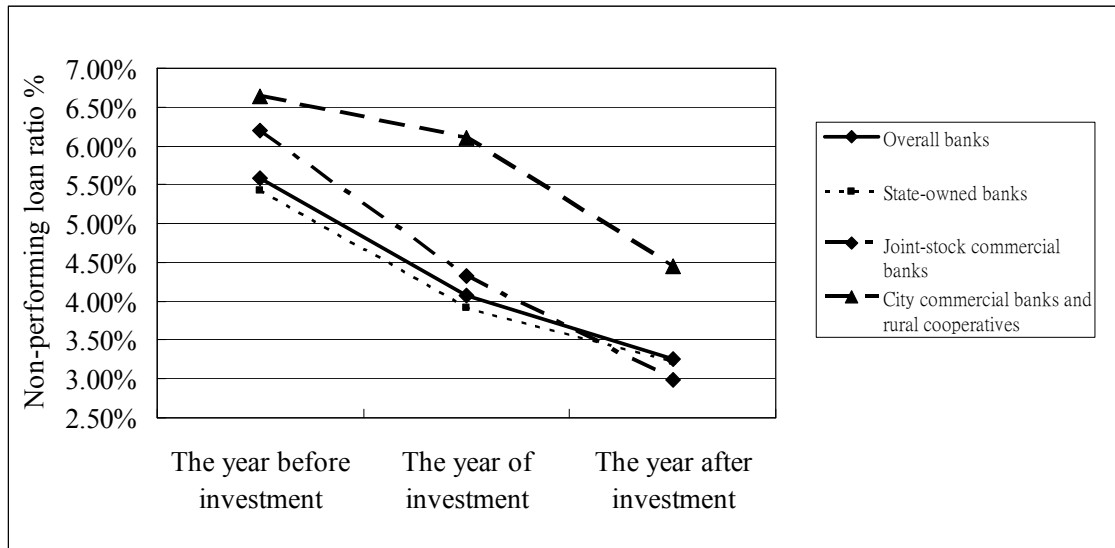
Figure 2: The probability of intensity of taking equity stake acquisitions of Taiwanese banks
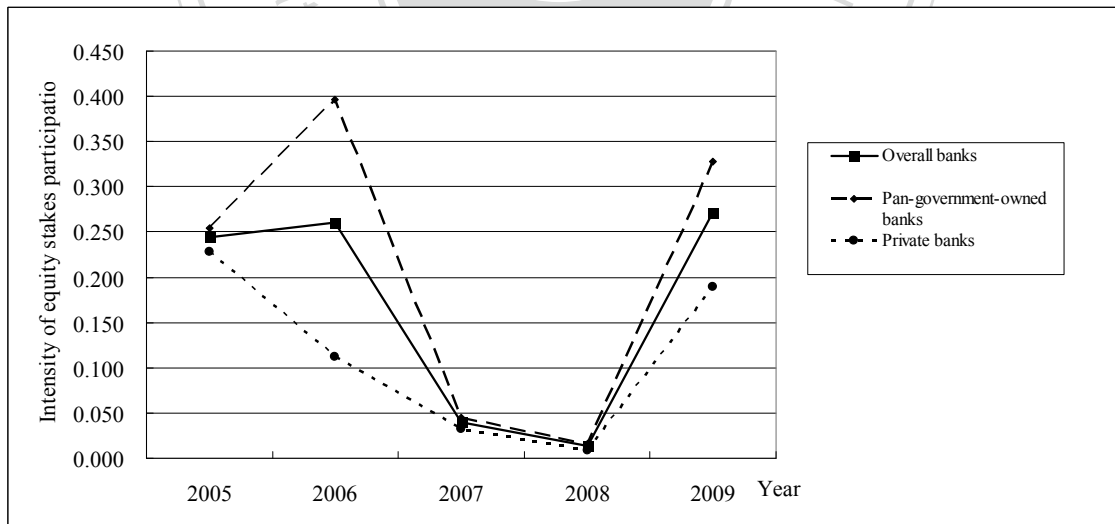
Figure 3: Relationship of asset return volatility and asset value of foreign financial institution
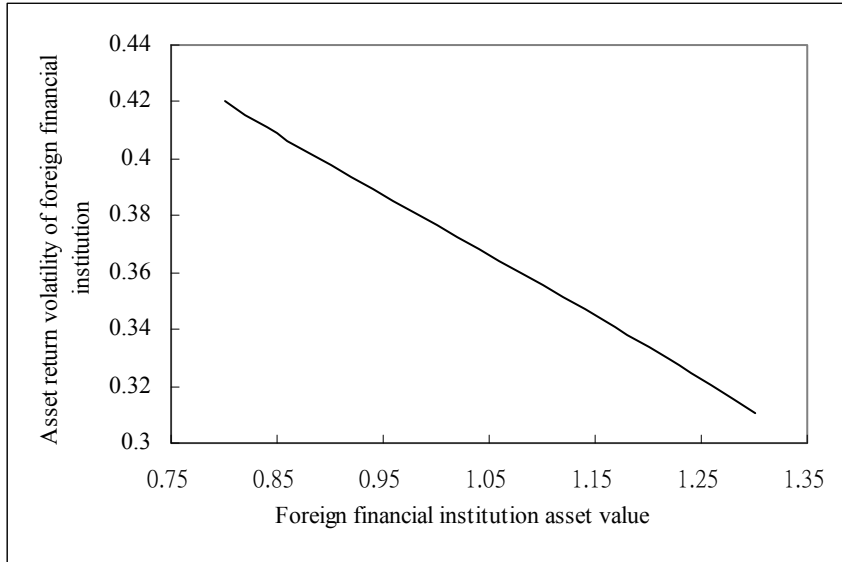
Figure 4: Relationship of asset return volatility and liability of foreign financial institution
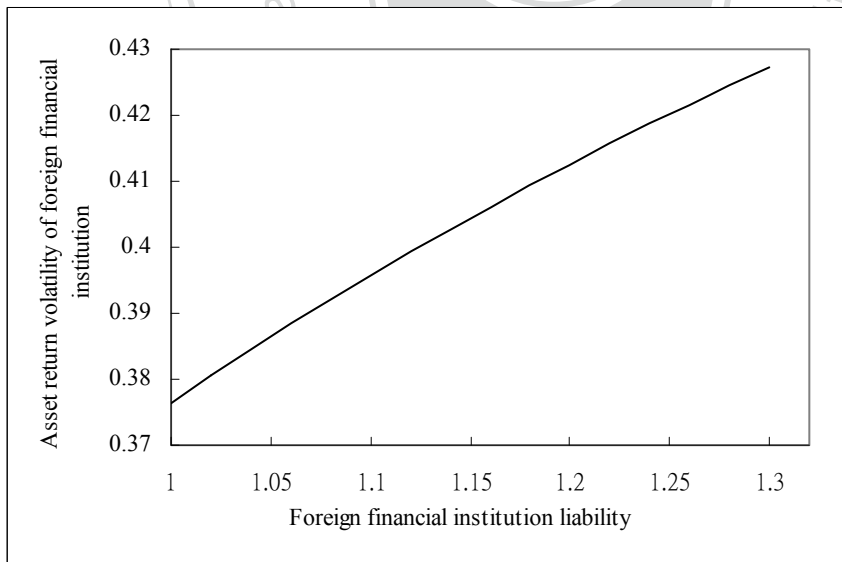
Figure 5: Relationship of asset return volatility of foreign financial institution and risk weight
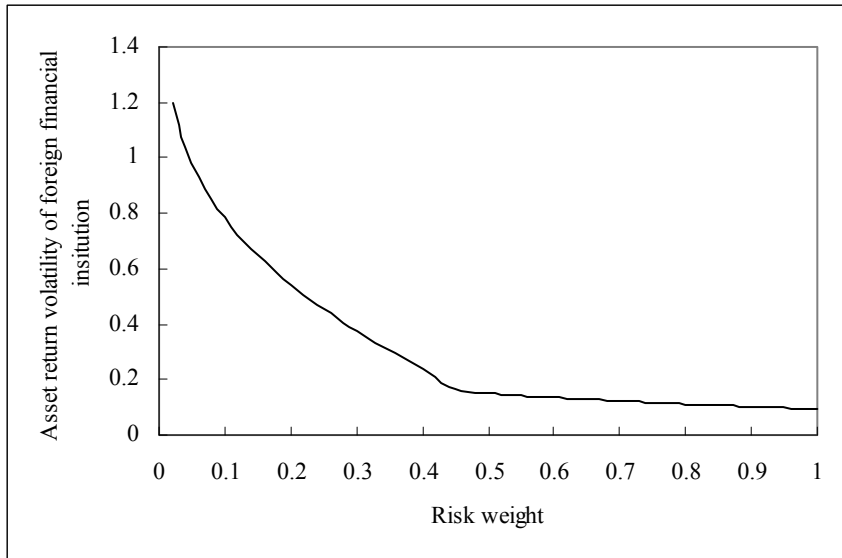
Figure 6: Relationship of optimal acquiring equity stakes proportion and invested Chinese bank asset value
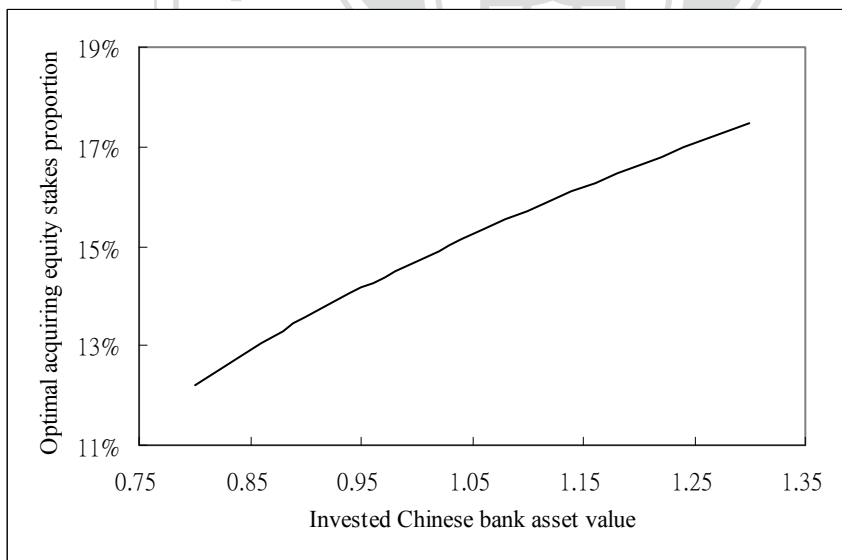
Figure 7: Relationship of optimal acquiring equity stakes proportion and liability in proportion of invested Chinese bank asset value
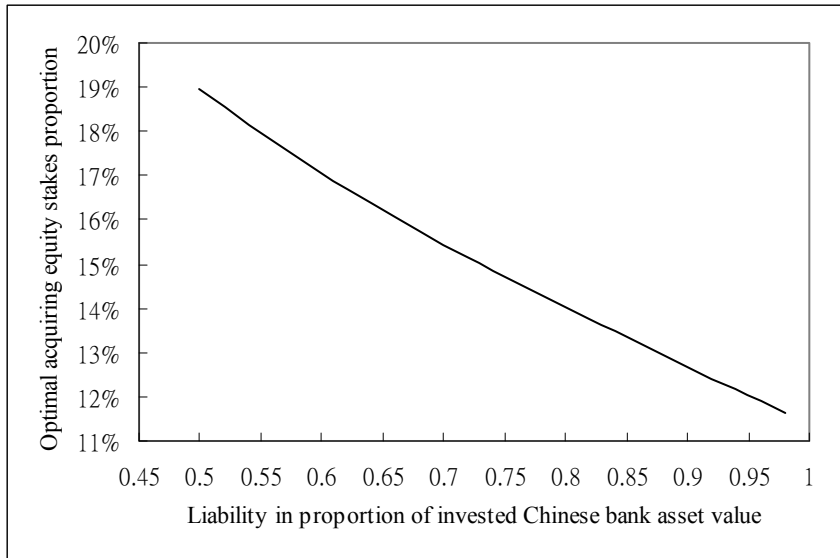
Figure 8: Relationship of optimal acquiring equity stakes proportion and asset return volatility of invested Chinese bank
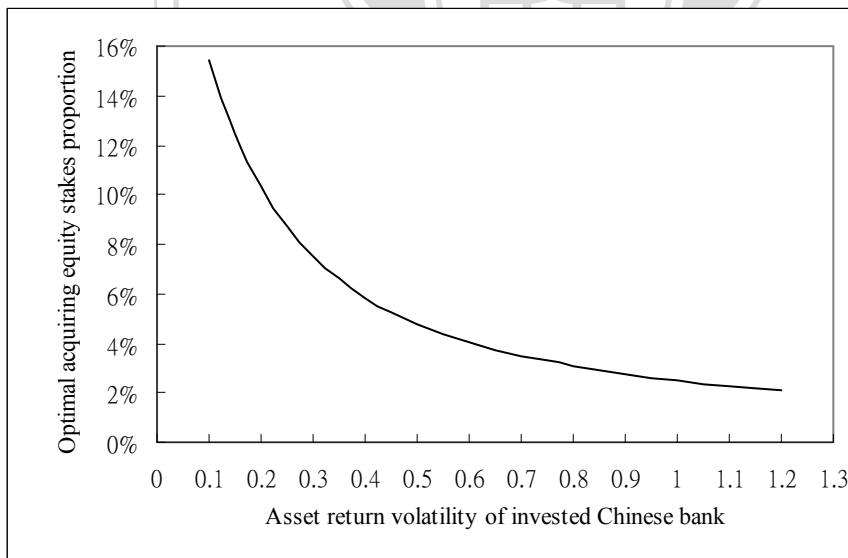
Figure 9: Relationship of optimal acquiring equity stakes proportion and asset return volatility of foreign financial institution
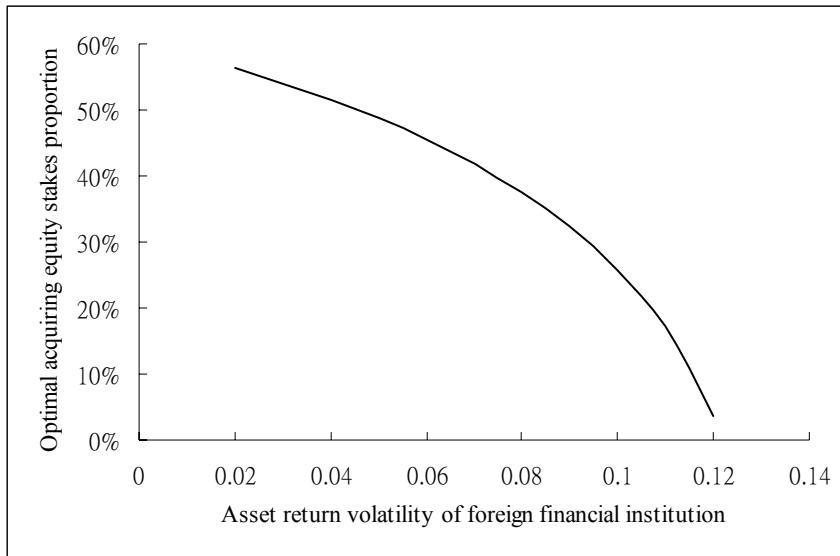
Figure 10: Relationship of optimal acquiring equity stakes proportion and exchange rate volatility
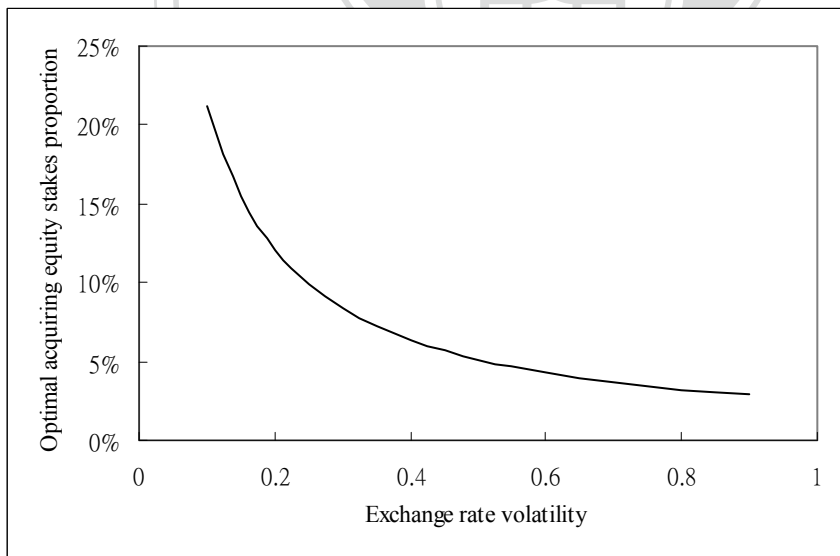
Figure 11: Relationship of optimal acquiring equity stakes proportion and correlation coefficient of asset value between foreign financial institution and invested Chinese bank
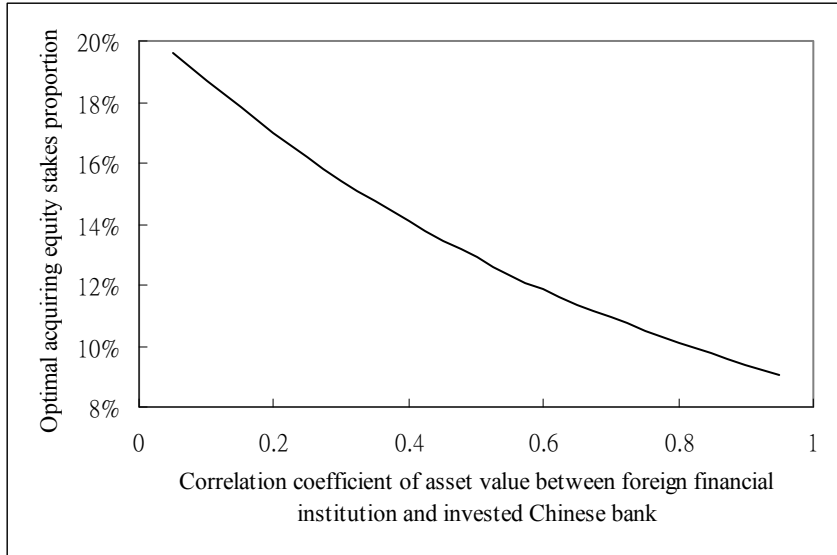

Figure 12: Relationship of optimal acquiring equity stakes proportion and correlation coefficient between exchange rate and asset value of foreign financial institution
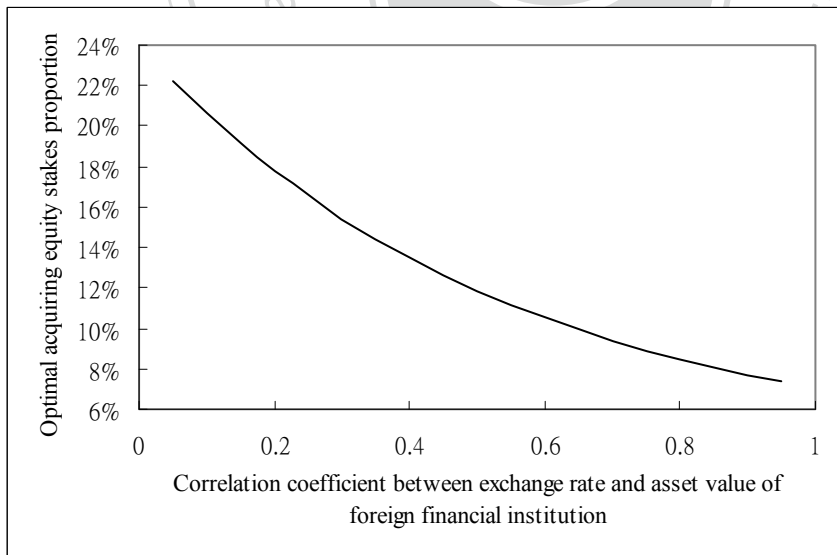
Figure 13: Relationship of optimal acquiring equity stakes proportion and correlation coefficient between exchange rate and asset value of invested Chinese bank