

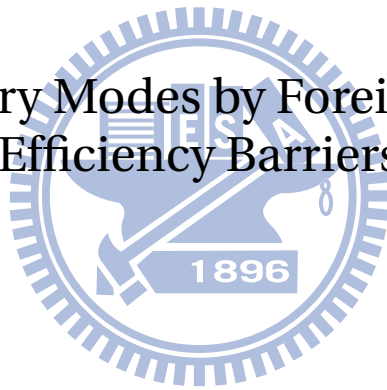
國立交通大學

財務金融研究所

碩士論文

效率障礙下外國銀行進入模式之選擇

Choice of Entry Modes by Foreign Banks with
Efficiency Barriers



研究生：郭芳彰

指導教授：承立平 博士

中華民國九十九年六月

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研 究 生：郭芳彰

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Advisor : Dr. Alfred Li-Ping Cheng

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摘要

金融市場自由化，使得外國銀行的跨國經營越來越常見。對於進入模式的選擇，除了外國銀行本身的效率外，被投資國家的情況為外國銀行的主要考量。本文在圓形市場上建立一理論模型，來分析外國銀行對新設、合資和併購，這三種進入模式的選擇。利用Matlab進行數值模擬，本文發現未公開資訊所帶來的利益、跨國經營所產生的效率障礙及銀行間的相對效率為決定進入模式的主要因素。效率較好的外國銀行傾向選擇併購，次之的銀行選擇新設，更差一些的選擇合資。此外，開發中國家傾向出現較多的外國銀行。市場規模較大的國家，外國銀行較喜歡採行新設。

關鍵字：外資銀行；進入模式；效率障礙；合資

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Student: Fang-Chang Kuo

Advisor: Dr. Alfred Li-Ping Cheng

Institute of Finance
National Chiao Tung University

Abstract

The increasing liberalization of financial markets has stimulated the presence of foreign bank entries. While making entry mode decisions, besides the efficiency of foreign banks, the conditions of host country are major considerations for foreign banks. In this thesis, I set up a theoretical model along a circular city to analyze the entry mode choice of Greenfield investment, joint venture and acquisition. By using Matlab to conduct numerical simulations, I find that benefit of soft information, efficiency barriers and relative efficiency are three major determinants to the entry modes choice. Foreign bank choose joint venture, Greenfield investment and then acquisition as its efficiency increases. Moreover, a less developed market is associated with more foreign bank entries. Bigger market size generally encourages foreign bank entry via Greenfield investment.

Keywords: Foreign Bank; Entry Mode; Efficiency Barriers; Joint Venture

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論文的完成，首要感謝我的指導教授承立平老師。從碩一開始擔任老師的助教，不論是課堂上或者下了課之後，總能在老師的對談間獲得許多的啟發。兩年來，每個星期固定的午餐時間，不僅是閒話家常而已，更是交換彼此對於各種議題不同看法的時間。在完成論文的過程中，老師給了我相當大的空間。從题目的找尋，到模型的設定推導，老師總是傾聽我一些不成熟的想法，然後適時地給我一些意見跟方向。在過程中雖然跌跌撞撞，但是最後終於摸索出一個方向來。另外，也感謝陳元保老師、干學平老師以及周幼珍老師，擔任我的口試委員，在漫長的口試中，依然給了我許多寶貴意見，作為論文修改方向。特別是干學平老師點出了許多我在論文寫作過程中，從未去思索的問題，使我能再論文修改的過程中，重新思考研究的問題以及整個模型的設定。也感謝周幼珍老師，從大學開始就一直鼓勵我認真向上，發揮我的潛力，雖然不知道有沒有達到老師的期許，我猜可能沒有。但每次一群人去找老師聊完天，總是可以轉換心情，老師的辦公室就像是我們的休息站，永遠可以休息一下，儲存一下精力，再出發。

在交大經過了大學四年，研究所兩年，前後加起來有六年之多，在這六年間，許多同學一直陪在我身邊，像是宗穎、偉哲跟御衡，我們一起聊天打屁、一起翹課看球、一起熬夜、一同吃消夜、一同增加體重的日子，終於畫下句點。雖然沒有一絲不捨，但始終有些惆悵。畢竟，六年的革命情感，不容易建立。在未來的人生中，很難再有像這樣每天互動密切的日子。所以，祝福我的同學們，一帆風順，也祝福在交大我所認識的每一個人，大家未來一切順利。

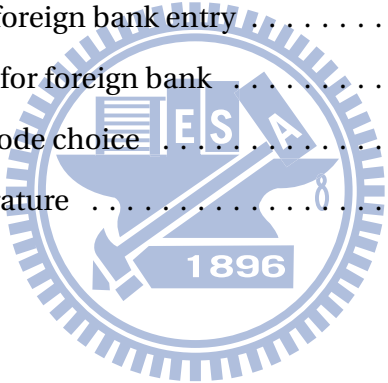
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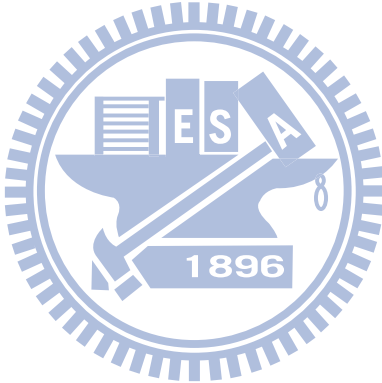
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1 Introduction

Foreign bank entry is a process that a foreign bank sets up operations in a host country. In the past two decades, the growing liberalization of financial markets has stimulated the presence of foreign bank entries, especially in emerging economies in Central and Eastern Europe and Latin America. In those countries, averagely 40% of total assets are held by foreign banks. For some countries, such as Mexico, Peru, Slovakia and Uruguay, the number even rises to over 80% (Beck and Peria, 2010; Micco et al., 2007). Generally, the presence of foreign banks in a host country may have different organizational forms, including branches, subsidiaries, representative office, agency of the parent bank or foreign strategic investors with minority shareholdings and limited control rights. Among these organizational forms, only branch and subsidiary can be regarded as full penetration in a host country since other forms are limited to certain businesses operations (Cerutti et al., 2007; Clarke et al., 2003).¹ Foreign banks can set up a subsidiary by two entry modes, Greenfield (de novo) investment or acquisition of an incumbent bank. In addition to entry mode choice, the level of control over local engagement (full ownership vs. joint venture) is another important strategic decision faced by multinational enterprises, including foreign banks (Mueller, 2007).

de Haas and van Lelyveld (2006) analyze the ownership structure and the entry modes of foreign banks in Central and Eastern Europe. They find that in total of 104 foreign banks, 68 of them chose Greenfield investment and 36 of them acquired domestic banks. Petrou (2009) summarizes nine entries pursued by Société Générale during 2001 to 2006 in different countries.² Those foreign entries, all in different countries, consist of five acquisitions, one joint venture, two Greenfield investments and one minority share holding. The above facts and studies leave several interesting questions: Why do foreign bank choose to enter one market via Greenfield investment, another market via joint venture and still another market via acquisition? How does foreign bank make entry mode decisions? What are the factors that determine the entry mode choice?

¹Cerutti et al. (2007) study the factors influencing international banks' organizational forms, subsidiary or branch, of world's top 100 banks operating in Latin America and Eastern Europe. In this paper, I assume the organization form of foreign bank is subsidiary instead of branch because subsidiary can undertake full operations in a host country (Clarke et al., 2003).

²The nine countries which Société Générale entered are Czech Republic, Slovenia, Morocco, Tunisia, Cyprus, Croatia, Russia, India and Greece.

Researchers have answered these questions differently. Beermann (2007) argues that fixed costs determine different entry modes while Lehner (2009) states that screening technology is the major determinant of entry mode choice. However, acquisition is showed to be the optimal entry mode in van Tassel and Vishwasrao (2007). In Petrou (2009), various concerns, including control and regulations, are taken into consideration of entry mode choice for executives.

The aim of this paper is to understand why foreign banks choose entry modes differently when efficiency barriers cause extra costs for foreign banks. Efficiency barriers include problems of managing institutions from a distance, unfamiliarity with legal environment, culture and language barriers and difference in currency (Berger et al., 2001). Those efficiency barriers cause extra costs for foreign banks during their entries. In this paper, I analyze three entry modes, including Greenfield investment, joint venture and acquisition. These entry modes differ in profit functions and costs from efficiency barriers. So, foreign banks may make entry mode choices differently in different situations.

In order to analyze the issue, I set up a model which yields the equilibrium profits in three different entry modes. Two domestic banks and one foreign bank are in the model. Both domestic and foreign banks are located equidistantly along a circular city. They compete in interest rates for borrowers with either good or bad projects. When borrowers apply for a loan at a bank, they incur travel costs which depend on the distance between borrower and the bank. Comparing the interest rates offered by respective banks and the different travel costs, borrowers choose one bank to make the deal.

Foreign bank can enter the market through joint venture, Greenfield investment or acquisition. Through Greenfield investment, foreign bank incurs costs from efficiency barriers. The profit is reduced by the costs from efficiency barriers. However, if entering via joint venture, foreign bank can reduce efficiency barriers and lower the costs by finding a local partner, who holds better knowledge about the local market but will take away part of the profit from foreign bank. Acquiring a domestic bank can also ease the problem of efficiency barriers by accessing local resources, such as knowledge of the market, market share, human capital and relationships with local customers, of the acquired bank.

In this paper, I show that foreign bank chooses entry mode between joint venture and

Greenfield investment according to the relative efficiency between domestic banks and foreign banks. Foreign banks with better efficiency enter via Greenfield investment, while those with less efficiency enter through joint venture. The level of efficiency barriers and market size affect choice between Greenfield investment and joint venture. As the cost of efficiency barriers increases, foreign bank tends to choose joint venture over Greenfield investment. However, in larger market, foreign bank tends to choose Greenfield investment instead.

However, if acquisition is considered, it generally edges out both Greenfield investment and joint venture with sufficient benefits from soft information. Information which can't be summarized in a numerical way and can't be verified easily is called soft information.³ Soft information is collected by domestic banks through past lending relationships with their clients. If acquisition doesn't bring in enough benefits of soft information, the entry mode patterns are separated into two patterns. When acquiring higher benefit of soft information, foreign bank only choose between acquisition and joint venture and never choose Greenfield investment. On the contrary, foreign bank choose joint venture, Greenfield investment and then acquisition with increasing efficiency.

Development of the host country may affect the entry mode choice of foreign bank. It is found that in a less developed market, Greenfield investment and joint venture become more profitable while acquisition remains unaffected. Thus, foreign banks tend to choose Greenfield investment and joint venture over acquisition. Also, the level of development is associated with the presence of foreign banks. In a less developed country, more foreign bank entries take place. On the other hand, a more developed market discourages foreign bank entries.

The remaining parts of this paper are organized as follow. In section 2, I review some related literature. Section 3 describes the settings of the model. Three different entry modes are presented in Section 4. Section 5 analyze the choice of three different entry modes. Section 6 is the conclusion.

³Petersen (2004) not only gives a detailed definition of soft information but also provides comparison of soft information and hard information.

2 Literature Review and Implications

This section discusses the literature related to foreign bank entry in three parts: 1) The characteristics of foreign bank entry, 2) Different entry modes for foreign bank, and 3) The impact of entry mode choice. Implication follows.

2.1 The characteristics of foreign bank entry

When operating in a different country, foreign banks generally suffer from the unfamiliarity of local environments. It often requires some adjustments in operations to fit into a host country. Thus, costs of these adjustments occur during entry. Berger et al. (2001) first argue that "efficiency barriers" such as geographical distance and differences in language, culture, currency, and regulatory or supervisory structures limit the consolidation of financial institutions within Europe.⁴ Buch and DeLong (2004) then connotate "efficiency barriers" to "information cost" and examine three different measures of information costs, including geographical distance, a common language, and a common legal system. They confirm that information costs significantly impede cross-border bank mergers. These two studies point out that operating across borders will bring "efficiency barriers," which make entry more difficult for foreign financial institutions.

Information asymmetry has been always one of the most important characteristics in credit market and it also affects foreign bank entry. Dell'Ariccia (2001) studies the relationship between information and market structure in the banking market. He argues that information asymmetry between foreign banks and domestic banks existing in banking market will result in entry barriers for foreign banks. He then sets up a multi-period spatial competition model around a circular city and finds that information asymmetry gives information capital to incumbent banks and this capital will deter the entry of other banks even if there is no entry cost. Due to the information asymmetry, only a finite number of banks exist in the market. That is, information asymmetry between foreign and domestic banks can be regarded as entry costs, which deter foreign bank entries, in a credit market.

⁴Consolidation not necessarily mean entry into another country. For example, a foreign bank can merge another bank after it entered the host country. Berger et al. (2001) focus on more general situations including commercial banks, securities firms and insurance companies. Foreign bank entry via acquisition is a special case of financial consolidation.

Also, a market with fewer but more competitive rivals is positively related to the level of information asymmetry.

In order to overcome the information asymmetry, banks entering a market may need some other advantages over incumbent banks. Dell’Ariccia and Marquez (2004) point out the trade-off between information advantage for incumbents and cost advantage for entrants. They focus on the credit allocation of informed lender when low-cost competitors enter the market. They find that as informational advantage decreases, lenders’ bids become more competitive and informed lender’s portfolio quality is better; as cost advantage decreases, both lenders’ bids become less competitive and informed lender’s portfolio quality get worse. Sengupta (2007) not only incorporate the trade-off between information and cost but also introduce collateral as a screening technology for foreign banks. He argues that foreign banks with less information can use collateral to screen out risky borrowers and overcome their information disadvantage. He finds that foreign bank with small cost advantage can attract high-risk borrowers. Also he concludes that better legal protection will facilitate foreign bank entry. That’s because better legal protection can reduce loss from collateral. Foreign banks incur less loss by using collateral to screen out high-risk borrowers and overcome information disadvantage in a host country. Similarly, Lehner (2009) analyzes entry mode choice by assuming that foreign banks have better screening technology and cost advantage to overcome information disadvantage. The above studies generally apply to foreign bank entries in developing economies because foreign banks from developed economies tend have cost and technology advantages over domestic banks.

2.2 Different entry modes for foreign bank

The choice of entry mode is broadly vital for all multinational enterprises, including multinational banks. Mueller (2007) sets up a model based on Hotelling’s model along a straight line with only two firms. He finds that for markets with extremely high or low competitive intensity, Greenfield investment is the optimal entry mode for multinational enterprises. However, with intermediate competitive intensity, acquisition is the optimal entry mode choice. Although, in his article, he doesn’t incorporate the level of control over local investment into his model, he argues that it is an important strategic decision for

foreign direct investment.

van Tassel and Vishwasrao (2007) focus on the entry mode choice of multinational bank. They argue that acquisition is more attractive than Greenfield investment for foreign banks. They find that foreign banks generally prefer acquisition to de novo investment (Greenfield investment) when expanding abroad. Beermann (2007) builds a model of sequential entries in a circular market and focuses on how fixed costs affect the choice between Greenfield investment and acquisition. He shows that banks with low fixed costs of operation will enter another country via merger and acquisition, banks with medium-level cost enter via Greenfield investment and banks with high cost will not enter the market. Lehner (2009) considers three entry modes, cross border lending, de novo investment and acquisition, in a circular spatial competition model.⁵ Her main focus lies in how screening technology affects entry mode choice. She shows that with increasing efficiency in screening technology, foreign bank then chooses to expand abroad via cross-border lending, then de novo investment and then acquisition. She finds that the entry mode choices of multinational banks are not only determined by the level screening technology but also affected by the financial development and market size of host countries. In less developed host country, foreign banks would prefer to make cross-border lending and acquisition. In large host country, foreign banks would prefer to make de novo investment. Combining the above three studies, foreign bank with better efficiency in screening technology and fixed costs tend to choose acquisition over other entry modes. However, their studies do not consider how "efficiency barriers" affect the choice of entry modes. The above studies focus on choice between Greenfield investment and acquisition. They don't take joint venture as one of the entry modes.

In addition to Greenfield investment and acquisition, Petrou (2009) discusses entry mode choices with managerial concerns including control, local resources, host/home country differences, regulation and parent size. He argues that these concerns affect the different decisions toward entry modes for foreign banks. Host/home country difference and regulation are similar to the concept of "efficiency barriers," stated by Berger et al.

⁵Although Lehner (2009) studies cross-border lending, I don't take cross-border lending as one of the entry modes because cross-border lending doesn't require foreign bank to enter the host country.

(2001). Different from other studies on entry mode choice (Beermann, 2007; van Tassel and Vishwasrao, 2007; Lehner, 2009), Petrou (2009) considers joint venture which requires foreign bank to give up part of control but brings in local knowledge for foreign bank. He proposes several hypotheses from his foreign entry mode selection model and conducts a mail survey by sending questionnaires to executives of multinational banks to test the hypotheses. He finds that joint venture is preferred if regulation and host/home country difference are more desirable for executives. Overall, acquisition and Greenfield investment are selected if full control is desired.

2.3 The impact of entry mode choice

A lot of literatures study the impact of foreign bank entry from different aspects, including efficiencies for both foreign and domestic banks, credit access for local firms and competition in local market (Claessens et al., 2001; Clarke et al., 2006; Micco et al., 2007; Berger et al., 2009; Beck and Peria, 2010). In fact, most studies treat foreign banks as one homogenous group. However, foreign banks can be categorized according to their entry modes because the choices of entry modes reflect strategies and characteristics of foreign banks themselves (de Haas and van Lelyveld, 2006; Havrylchyk and Jurzyk, 2006).

In addition to the relationship between information asymmetry and entry modes, van Tassel and Vishwasrao (2007) also contribute to the literature by showing the impact of de novo investment and acquisition. They find that de novo investment will lead to lower average interest rates in the credit market while acquisition makes the capital allocation more efficient by financing high quality projects. Thus, host countries may face trade-off between lower interest rates and better capital allocations when considering different forms of financial liberalization. Claey's and Hainz (2007) not only develop a model to discuss the effects of different entry modes but also test their hypotheses empirically. Their model predicts that foreign bank entry via Greenfield investment reduces the lending of domestic banks more strongly than acquisition does. Empirical evidence also supports the predictions.

de Haas and van Lelyveld (2006) separate foreign banks into Greenfield foreign banks and take-over foreign banks. They argue that foreign banks may serve as stabilizing forces

during banking crisis in host country. The empirical evidence shows that the argument only holds for foreign banks via Greenfield investment. Havrylchyk and Jurzyk (2006) analyze profitability of foreign banks via Greenfield investment and acquisition. They find that the performance of Greenfield foreign banks are superior to acquisition foreign banks and domestic banks based on return on assets, costs and interest margins. Also, the presence of foreign bank entry brings spillover effects to the domestic banks and there is convergence in profits and costs between domestic banks and foreign bank over time. Lehner and Schnitzer (2008) study the spillover effects of different entry modes in their model. They show that entry through acquisition will increase domestic banks' incentives to invest in screening technology. Due to spillover effects, it may increase the welfare of borrowers and domestic banks. Thus, acquisition is preferred by policy makers when the market competition is restricted by the government. Entry through Greenfield investment has opposite results.

2.4 Implications from literature

According to previous literature, efficiency barriers and information disadvantage are two major characteristics for foreign bank entry. However, most studies don't consider the costs from efficiency barriers. So, it seems important to incorporate the concept of "efficiency barriers" into an analytical model. Besides, like most studies, I assume that domestic banks possess more information than foreign banks do. Faced with two major disadvantages, foreign bank may try to reduce costs from efficiency barriers and gain more information by choosing alternative entry modes. Joint venture and acquisition can reduce efficiency barriers by accessing local resources (Petrou, 2009). However, Greenfield investment can't reduce the costs. So, Greenfield investment may be preferred if costs from efficiency barriers is lower. Also, acquisition can bring the information held by acquired domestic bank to foreign bank. The benefits of information may play an important role in entry mode choices. In the following sections, I compare three entry mode choices of Greenfield investment, joint venture and acquisition. The model set-ups are introduced in next section.

3 The Model

In this thesis, I follow Lehner (2009) by using similar model settings. Consider a banking market and two kinds of players, borrowers and banks. Both borrowers and banks are risk neutral and try to maximize profits. Banks serve as the only source of capital. The market has two domestic banks, Bank 1 and Bank 2. Meanwhile, Bank F from another country is making entry into the market. Foreign bank and two domestic banks are located equidistantly along a circular city (Salop, 1979). In the market, the number of borrowers is m and all the borrowers are uniformly distributed along a circle with circumference 1.

Salop's circular city model is capable of analyzing competition between more than two banks while Hotelling's linear city model focuses on only two competitors.⁶ In addition, along circular city, locations of competitors are located equidistantly from one another.⁷ The choice of location is exogenously imposed. This allows the model to focus on the choice of entry mode in a simple and tractable way.

Every borrower can undertake a project with initial investment of 1. With no cash at hand, borrower must apply for a loan at a bank to finance the project. Borrower can either take a good project, which generates a return R with certainty, or a bad project, which always yields a return of zero. A borrower must incur a linear form of travel cost tx , where x is the distance between borrower and bank and t is a parameter of travel cost, when applying for a loan.⁸ Borrower can only apply for a loan at one bank. I assume that banks can observe the location of borrowers so that borrower whose application is denied by one bank can't apply at another bank.⁹ Comparing the interest rates offered by different banks and the travel cost determined by the relative distance, borrower will decide at which bank to apply for financing. In order to satisfy the individual-rationality condition, I assume that the return R is always big enough to cover the repayment and travel cost.

⁶In Dell'Ariccia (2001), the number of banks is N along a circular city and Lehner (2009) considers two domestic banks and one foreign bank in Salop's model.

⁷Mueller (2007) only considers one foreign firm and one domestic firm in Hotelling's model with two firms located at two endpoints.

⁸In spatial competition models, the cost usually refers to travel cost or transportation cost because of the distance between consumers and firms. However, in this paper, the cost can be regarded as application cost for borrower. Also it can serve as an indicator of development of the host country.

⁹This assumption is also used by Dell'Ariccia (2001) and Lehner (2009) to simplify analysis in a circular market model.

In the market, borrowers consist of old borrowers with a fraction of θ and new borrowers with a fraction of $1 - \theta$. The fraction of borrowers with good projects is λ and that with bad projects is $1 - \lambda$. A portion of borrowers with bad projects will be screened out based on banks' screening technologies and the application of loan is rejected by banks. Through long-term relationships with clients, only domestic banks have access to soft information of the old borrowers. So, with the help of soft information, domestic banks can screen out all the "old" borrowers with "bad" projects. As for the new borrowers, the screening technology help domestic banks screen out a fraction $0 \leq \delta_D \leq 1$ of borrowers with bad projects. On the other hand, since foreign banks just enter this market and haven't established any long-term relationship with local borrowers, soft information is not available for foreign bank. All the borrowers are new to foreign bank. So, foreign bank can screen out a fraction $0 \leq \delta_F \leq 1$ of borrowers with bad projects. The costs of fund for domestic and foreign banks are i_D and i_F .

If foreign bank enters the host country via Greenfield investment, it incurs "efficiency barriers" due to less local knowledge to the host country. I define C as the costs which are caused by efficiency barriers. These costs undermine the profits of foreign bank. On the other hand, entry via joint venture gets the local knowledge by introducing a local partner and giving up part of profits. So, the problem of efficiency barrier can be alleviated. Also, entry via acquisition can reduce efficiency barrier by acquiring the knowledge of acquired domestic bank. Acquisition can increase the efficiency of foreign bank because foreign bank can distinguish between old borrowers and new borrowers by obtain the soft information held by acquired banks. However, an acquisition price P^{AC} is paid to acquired bank if foreign bank choose acquisition as its entry mode.

Generally, foreign bank's profit is given by

$$\pi_F = mS_F[\lambda(r_F - i_F) - (1 - \lambda)(1 - \delta_F)(1 + i_F)],$$

where S_F is the market share for foreign bank. In a circular city model, market share for foreign bank S_F can be solved by finding marginal borrower who is indifferent to applying loan from foreign or domestic banks (Tirole, 1986). When entering via Greenfield investment, costs from efficiency barriers C must be subtracted from π_F . As for joint venture, C is discounted because of the help of local partner. So, costs from efficiency barriers via

joint venture become βC , where $0 < \beta < 1$. Moreover, a fraction $1 - \alpha$ of the total profits are distributed to local partner. So, foreign bank can only get $\alpha(\pi_F - \beta C)$. Acquisition price and costs from efficiency barriers lower the profits for acquisition. Foreign bank gets different discounts when it acquires different domestic banks. So, costs from efficiency barriers become $\rho_j C$, where $j = 1, 2$. The final profits for acquisition is $\pi_F - P^{AC} - \rho_j C$.



4 Analysis of Entry Modes

4.1 Greenfield investment

The fraction λ of good borrowers make repayment so that the foreign bank can get margin $r_F - i_F$. Since foreign bank doesn't have any access to soft information, it can't screen out old borrowers with bad projects. Foreign bank needs to evaluate all the borrowers, including old and new borrowers. So, foreign bank can only screen out the fraction δ_F of all borrowers with bad projects. The fraction $1 - \delta_F$ of bad borrowers get financed and don't make any repayment. That results in default loss, $(1 - \lambda)(1 - \delta_F)(1 + i_F)$. The total market share is mS_F^{GR} , where m is the number of total borrowers in the market and S_F^{GR} is the demand for foreign bank. The marginal borrower who is indifferent between getting loan from foreign bank or domestic bank is located at \hat{x} , where \hat{x} is the distance between foreign bank and marginal borrower and $\frac{1}{3} - \hat{x}$ is the distance between domestic bank and marginal borrower. Comparing the travel cost or application cost and interest rates offered by foreign bank and domestic bank, marginal borrower will be indifferent to getting loans from foreign or domestic bank. The equality is $\hat{x}t + r_F = (\frac{1}{3} - \hat{x})t + r_D$. $\hat{x} = \frac{1}{6} - \frac{r_D - r_F}{2t}$. Since foreign bank is located equidistantly from two domestic bank The market share S_F^{GR} equal $2\hat{x}$. And market share S_D^{GR} for domestic bank is $\frac{1}{3} + \hat{x}$. Foreign bank incurs efficiency barriers, or information costs when entering another country. Efficiency barriers decrease profit of Greenfield investment by the amount of C . So, the profit for the foreign bank is given by

$$\pi_F^{GR} = mS_F^{GR}[\lambda(r_F - i_F) - (1 - \lambda)(1 - \delta_F)(1 + i_F)] - C, \quad (1)$$

with

$$S_F^{GR} = \frac{1}{3} + \frac{r_{D1} + r_{D2} - 2r_F}{2t}.$$

On the other hand, domestic banks can screen out all the old borrowers with bad projects with soft information and don't incur efficiency barriers. Profits for two domestic banks are the same, the profit is given by

$$\pi_{D_j}^{GR} = mS_D^{GR}[\lambda(r_D - i_D) - (1 - \theta)(1 - \lambda)(1 - \delta_D)(1 + i_D)], \quad j = 1, 2 \quad (2)$$

with

$$S_{D_1}^{GR} = \frac{1}{3} + \frac{r_{D_2} + r_F - 2r_{D_1}}{t}, \quad S_{D_2}^{GR} = \frac{1}{3} + \frac{r_{D_1} + r_F - 2r_{D_2}}{2t}.$$

Since the locations for both foreign and domestic banks are assumed to be equidistant, banks compete in interest rates, r_F , r_D , to maximize their profits. Lemma 1 shows the equilibrium profits when foreign bank selects Greenfield investment.

Lemma 1. *If foreign bank enters another market via Greenfield investment, the equilibrium profits for foreign bank and domestic banks are given by*

$$\pi_F^{GR} = m\lambda t \left(\frac{1}{3} + \frac{2\Phi}{5t} \right)^2 - C, \text{ and} \quad (3)$$

$$\pi_D^{GR} = m\lambda t \left(\frac{1}{3} - \frac{\Phi}{5t} \right)^2, \quad (4)$$

with

$$\Phi \equiv i_D + \frac{(1-\theta)(1-\lambda)(1-\delta_D)(1+i_D)}{\lambda} - i_F - \frac{(1-\lambda)(1-\delta_F)(1+i_F)}{\lambda}.$$

Proof. The marginal borrower between domestic bank and foreign bank is give by

$$r_F + t\hat{x} = r_D + t \left(\frac{1}{3} - \hat{x} \right) \Rightarrow \hat{x} = \frac{1}{6} + \frac{r_D - r_F}{2t},$$

where \hat{x} is the distance between foreign bank and marginal borrower and $\frac{1}{3} - \hat{x}$ is the distance between marginal borrower and domestic bank. Borrowers within the range of \hat{x} will apply for loans at foreign bank. So, multiplying \hat{x} by 2 yields the market share for foreign bank. Since two domestic banks are symmetric, their market share are equal to $\frac{1}{3} - \hat{x} + \frac{1}{6}$. The market shares are given by

$$S_F^{GR} = \frac{1}{3} + \frac{r_{D_1} + r_{D_2} - 2r_F}{2t}, \quad S_{D_1}^{GR} = \frac{1}{3} + \frac{r_F + r_{D_2} - 2r_{D_1}}{2t}, \quad S_{D_2}^{GR} = \frac{1}{3} + \frac{r_F + r_{D_1} - 2r_{D_2}}{2t}.$$

The loss of profits resulted from efficiency barriers is C . So, the profit functions are given by

$$\pi_F^{GR} = mS_F^{GR}[\lambda(r_F - i_F) - (1-\lambda)(1-\delta_F)(1+i_F)] - C \text{ and}$$

$$\pi_{D_j}^{GR} = mS_{D_j}^{GR}[\lambda(r_D - i_D) - (1-\theta)(1-\lambda)(1-\delta_D)(1+i_D)] \quad j = 1, 2.$$

Differentiating the profit functions with respect to interest rates and letting the F.O.C. equal zero yields respective reaction functions:

$$r_F = \frac{t}{6} + \frac{r_{D_1} + r_{D_2}}{4} + \frac{\tilde{r}_F}{2},$$

$$r_{D_1} = \frac{t}{6} + \frac{r_{D_2} + r_F}{4} + \frac{\tilde{r}_{D_1}}{2}, \text{ and}$$

$$r_{D_2} = \frac{t}{6} + \frac{r_{D_1} + r_F}{4} + \frac{\tilde{r}_{D_2}}{2}.$$

The lowest interest rates that banks can bid are defined by

$$\tilde{r}_F \equiv i_F + \frac{(1-\lambda)(1-\delta_F)(1+i_F)}{\lambda} \text{ and} \quad (5)$$

$$\tilde{r}_D \equiv i_D + \frac{(1-\theta)(1-\lambda)(1-\delta_F)(1+i_D)}{\lambda}. \quad (6)$$

Solving the three reaction functions yields equilibrium interest rates:

$$r_{D_1}^{GR} = r_{D_2}^{GR} = \frac{t}{3} + \frac{4\tilde{r}_D}{5} + \frac{\tilde{r}_F}{5} \text{ and} \quad (7)$$

$$r_F^{GR} = \frac{t}{3} + \frac{2\tilde{r}_D}{5} + \frac{3\tilde{r}_F}{5}. \quad (8)$$

The equilibrium profits are given by

$$\pi_F^{GR} = m\lambda t \left(\frac{1}{3} + \frac{2\Phi}{5t} \right)^2 - C \text{ and}$$

$$\pi_D^{GR} = m\lambda t \left(\frac{1}{3} - \frac{\Phi}{5t} \right)^2$$

with

$$\Phi \equiv \tilde{r}_D - \tilde{r}_F = i_D - i_F + \frac{(1-\theta)(1-\lambda)(1-\delta_D)(1+i_D)}{\lambda} - \frac{(1-\lambda)(1-\delta_F)(1+i_F)}{\lambda}.$$

□

I define Φ as an indicator for the relative efficiency between foreign bank and domestic bank. Technically, from the profit function, Φ is the difference between the lowest interest rates at which foreign bank and domestic bank can bid when efficiency barrier is not taken into consideration. In the profit functions, efficiency barrier results in the reduction in profit margin for foreign bank and increase in the profit margin for domestic banks. The coefficient of relative efficiency is positive for foreign bank. That's because if Φ positive, it means that

foreign bank is more efficient than domestic banks and foreign bank will gain more market share and higher interest margin in the profit function. On the contrary, if Φ is negative, it means that foreign bank is less efficient than domestic banks and will lose some market share and interest margin.

4.2 Joint venture

When foreign bank enters the market via joint venture, efficiency barriers resulted from geographical distance and difference in culture, language, business environment or legal system can be reduced by the assistance of local partner. However, control and profit of the newly-established bank is shared. For simplicity, I assume that entry via joint venture can eliminate part of efficiency barriers. The profits will be reduced by βC , where $0 < \beta < 1$. The share of local partner is lower than 50%. That is, $1 > \alpha > 0.5$, where α is the fraction of profit that foreign bank can get. This assumption allow foreign bank to gain control right after entering the host country. So, when foreign bank enters via joint venture, the equilibrium profits, which are similar to those of Greenfield investment, are given in Lemma 2.

Lemma 2. *If foreign bank enters another market via joint venture, the equilibrium profits for foreign bank and domestic banks are given by*

$$\pi_F^{JV} = \alpha \left[m\lambda t \left(\frac{1}{3} + \frac{2\Phi}{5t} \right)^2 - \beta C \right], \text{ and} \quad (9)$$

$$\pi_D^{JV} = m\lambda t \left(\frac{1}{3} - \frac{\Phi}{5t} \right)^2. \quad (10)$$

Proof. The marginal borrower between domestic bank and foreign bank is give by

$$r_F + t\hat{x} = r_D + t \left(\frac{1}{3} - \hat{x} \right) \Rightarrow \hat{x} = \frac{1}{6} + \frac{r_D - r_F}{2t}$$

So, the market share of both domestic and foreign banks are

$$S_F^{JV} = \frac{1}{3} + \frac{r_{D_1} + r_{D_2} - 2r_F}{2t}, \quad S_{D_1}^{JV} = \frac{1}{3} + \frac{r_F + r_{D_2} - 2r_{D_1}}{2t}, \quad S_{D_2}^{JV} = \frac{1}{3} + \frac{r_F + r_{D_1} - 2r_{D_2}}{2t}.$$

The profit functions are given by

$$\pi_F^{JV} = \alpha \{ m S_F^{JV} [\lambda(r_F - i_F) - (1 - \lambda)(1 - \delta_F)(1 + i_F)] - \beta C \} \text{ and}$$

$$\pi_{D_j}^{JV} = m S_{D_j}^{JV} [\lambda(r_D - i_D) - (1 - \theta)(1 - \lambda)(1 - \delta_D)(1 + i_D)] \quad j = 1, 2.$$

Differentiating the profit functions with respect to interest rates and letting the F.O.C. equal to zero yields respective reaction functions. Solving the three reaction functions yields equilibrium interest rates and profit:

$$r_D^{JV} = \frac{t}{3} + \frac{4\tilde{r}_D}{5} + \frac{\tilde{r}_F}{5}, \quad r_F^{JV} = \frac{t}{3} + \frac{2\tilde{r}_D}{5} + \frac{3\tilde{r}_F}{5}, \quad (11)$$

$$\pi_F^{JV} = \alpha \left[m\lambda t \left(\frac{1}{3} + \frac{2\Phi}{5t} \right)^2 - \beta C \right] \quad \text{and}$$

$$\pi_D^{JV} = m\lambda t \left(\frac{1}{3} - \frac{\Phi}{5t} \right)^2.$$

□

The equilibrium profits for domestic banks when foreign bank enters via joint venture decrease comparing to the profits of Greenfield investment. This implies that a joint venture foreign bank is more competitive than a Greenfield investment foreign bank because joint venture can reduce efficiency barriers. However, from foreign bank's viewpoint, the profit of joint venture is not necessarily higher than that of Greenfield investment because part of the profit is given to the local partner. A fraction $1 - \alpha$ of profits is distributed to local partner while foreign bank gets remaining fraction α of profits.

4.3 Acquisition

If entry via acquisition takes place, a domestic bank is acquired by a foreign bank. I assume that foreign bank can only acquire one domestic bank to rule out the situation for foreign bank to become a monopoly in this market. So, the number of banks competing in the credit market remains the same as the situation of no foreign bank entry. Foreign bank can have access to the soft information held by the acquired bank. Thus, foreign bank can increase its efficiency through acquisition. Moreover, efficiency barriers can also be reduced by the knowledge of the acquired bank. Here, I impose heterogeneity of domestic banks by assuming that Bank 1 and Bank 2 will give foreign bank different level of efficiency barriers when acquisition takes place. If foreign bank acquires Bank 1, the loss from efficiency barriers is $\rho_1 C$. On the other hand, if foreign bank acquires Bank 2, the loss would be $\rho_2 C$. I assume that $\rho_1 < \rho_2$. Bank 1 can provide better knowledge for foreign bank to reduce

efficiency barriers. So, before determining the acquisition price, the profits for both foreign and domestic bank are given by

$$\pi_F^{AC} = m\lambda t \left(\frac{1}{2} + \frac{\Phi + \xi}{3t} \right)^2 - \rho_j C - P^{AC}, \quad j = 1, 2 \quad \text{and} \quad (12)$$

$$\pi_D^{AC} = m\lambda t \left(\frac{1}{2} - \frac{\Phi + \xi}{3t} \right)^2, \quad (13)$$

with

$$\xi \equiv \frac{\theta(1-\lambda)(1-\delta_F)(1+i_F)}{\lambda}.$$

In order to get equilibrium profits for foreign and domestic bank under acquisition, the price of acquiring a domestic bank must be determined. The equilibrium price of acquisition will equal π_D^{AC} , which is the profit that domestic bank will get after acquisition entry. When faced with foreign bank entry via acquisition, domestic banks seek optimal strategy to maximize their profits. Here, I assume that domestic banks doesn't care about other entry modes which foreign bank might take. If foreign bank offers acquisition price $P^{AC} > \pi_D^{AC}$, two domestic banks will accept the offer because the profit of acquired bank is bigger than that of the remaining bank. So, the optimal strategy in this game would be accepting the offer. However, when both domestic banks tend to accept the offer, the acquisition price decreases since foreign bank possesses more bargaining power. On the other hand, if foreign bank offers acquisition price $P^{AC} < \pi_D^{AC}$, then two domestic banks will reject the offer because rejecting the offer and earning π_D^{AC} is better than accepting the price P^{AC} . As the result, domestic banks will be indifferent between accepting and rejecting the offer when $P^{AC} = \pi_D^{AC}$. The acquisition price for two domestic banks are the same since they are identical in cost of fund, screening technology and soft information. However, the benefit of reducing efficiency barriers differs. Foreign bank can make more profit if choosing Bank 1 because $\rho_1 C < \rho_2 C$. Therefore, the equilibrium profit of acquisition is given in Lemma 3.

Lemma 3. *The equilibrium profit when foreign bank enters the market via acquisition is*

$$\pi_F^{AC} = 2m\lambda \left(\frac{\Phi + \xi}{3} \right) - \rho_1 C. \quad (14)$$

Proof. Only one domestic and one foreign bank operate in the market. The market shares both increase compared to previous entry modes. In addition, foreign bank can have

access to soft information from acquired bank. The profit function of foreign bank changes because of the information benefits, whereas the profit function of domestic bank remain unchanged. The costs from efficiency barriers when foreign bank acquires Bank 1 is $\rho_1 C$. The acquisition profit function and market shares are given by

$$\pi_F^{AC} = mS_F^{AC}[\lambda(r_F - i_F) - (1 - \theta)(1 - \lambda)(1 - \delta_F)(1 + i_F)] - \rho_j C - P^{AC} \quad j = 1, 2$$

$$S_F^{AC} = \frac{1}{2} + \frac{r_D - r_F}{t}, \quad \text{and} \quad S_D^{AC} = \frac{1}{2} + \frac{r_F - r_D}{t}.$$

The equilibrium interest rates for domestic and foreign bank are

$$r_D^{AC} = \frac{t}{2} + \frac{\tilde{r}_F}{3} + \frac{2\tilde{r}_D}{3} - \frac{\xi}{3} \quad \text{and} \quad (15)$$

$$r_F^{AC} = \frac{t}{2} + \frac{\tilde{r}_D}{3} + \frac{2\tilde{r}_F}{3} - \frac{2\xi}{3}. \quad (16)$$

Similar to Proof of Lemma 1, the equilibrium profit for domestic bank is

$$\pi_D^{AC} = m\lambda t \left(\frac{1}{2} - \frac{\Phi + \xi}{3t} \right)^2 - \rho_j C - P^{AC} \quad j = 1, 2$$

with

$$\xi = \frac{\theta(1 - \lambda)(1 - \delta_F)(1 + i_F)}{\lambda}.$$

Since Bank 1 can give lower costs from efficiency barriers, foreign bank will always choose to acquire Bank 1. The equilibrium acquisition price is the profit that a domestic bank can earn under acquisition entry mode. So, the equilibrium profit for foreign bank is given by

$$\pi_F^{AC} = m\lambda t \left(\frac{1}{2} + \frac{\Phi + \xi}{3t} \right)^2 - m\lambda t \left(\frac{1}{2} - \frac{\Phi + \xi}{3t} \right)^2 - \rho_1 C = 2m\lambda \left(\frac{\Phi + \xi}{3} \right) - \rho_1 C$$

□

According to the above result, the benefit of soft information $\xi \geq 0$, has a positive effect on the profit for foreign bank via acquisition. Foreign bank with $\Phi \geq -\xi$ always makes positive profit via acquisition. So, the minimum efficiency for foreign bank to acquire a domestic bank is $-\xi$. Note that $\frac{d\xi}{d\lambda} < 0$. The benefit of soft information decreases with better credit quality in the host market and requires higher efficiency level to enter the host market via acquisition. Obtaining more information of local customers in less transparent markets

prevents foreign bank from incurring great loss due to information asymmetry. Thus, foreign bank tend to acquire a domestic bank in banking markets with bad credit qualities. Also acquisition will be easier since requirement of efficiency level is lower in less transparent markets. As a result, markets suffering from more bad credit qualities may witness more bank acquisitions from foreign banks.

4.4 Summary

Here, I will explain how the equilibrium profits for three entry modes differ from one another. Equilibrium profits for three different entry modes are given by

$$\begin{aligned}\pi_F^{GR} &= m\lambda t \left(\frac{1}{3} + \frac{2\Phi}{5t} \right)^2 - C, \\ \pi_F^{JV} &= \alpha \left[m\lambda t \left(\frac{1}{3} + \frac{2\Phi}{5t} \right)^2 - \beta C \right], \text{ and} \\ \pi_F^{AC} &= m\lambda t \left(\frac{1}{2} + \frac{\Phi + \xi}{3t} \right)^2 - \rho_j C - P^{AC} = 2m\lambda \left(\frac{\Phi + \xi}{3} \right) - \rho_1 C.\end{aligned}$$

First, consider the profits for Greenfield investment and joint venture. π_F^{GR} and π_F^{JV} are generally the same except two parameters, α and β , where $0.5 < \alpha < 1$ and $0 < \beta < 1$, in joint venture. βC represents remaining costs from efficiency barriers with the help of local partner. In other words, local partner can save $(1 - \beta)C$ for foreign bank. As β decreases, foreign bank can save more costs from efficiency barriers and makes higher profits. However, a fraction $1 - \alpha$ of profits are given to local partner. Foreign bank can retain a fraction α of profits. So, although joint venture can save some costs from efficiency barriers, part of profits are given to local partner. As α increases, foreign bank can keep more profits for itself. Foreign bank must evaluate the gain and loss of joint venture comparing to other two entry modes while making entry mode decision.

Entry via acquisition can also save costs from efficiency barriers by acquiring domestic bank's resources and knowledge. So, costs from efficiency barriers C is discounted by ρ_j , where $j = 1, 2$. Acquiring different domestic bank discounts the costs from efficiency barriers differently. However, it's always more beneficial to acquire a domestic bank which can save more costs from efficiency barriers. So, by assuming $\rho_1 < \rho_2$, foreign bank always acquires Bank 1. If not considering acquisition price P^{AC} , foreign bank can gain large market

share than entries via Greenfield investment and joint venture since fewer banks competing in the market.¹⁰ However, after deducting the acquisition price P^{AC} and costs from efficiency barriers $\rho_1 C$, foreign bank may not make more profits than Greenfield investment and joint venture. In the next section, I will compare profits for three different entry modes and find out how foreign bank makes entry mode choices.



¹⁰ $S_F^{GR} = S_F^{JV} = \frac{1}{3} + \frac{2\Phi}{5t}$ and $S_F^{AC} = \frac{1}{2} + \frac{\Phi + \xi}{3t}$. $S_F^{AC} - S_F^{GR} = \frac{\xi}{3t} + \frac{1}{6} - \frac{\Phi}{15t}$. Since $\xi > 0$ and $-\frac{5}{6t} \leq \Phi \leq \frac{5}{6t}$, $S_F^{AC} - S_F^{GR} > 0$.

5 Choices of Entry Modes

In this section, I will show how foreign bank choose from three different entry modes. First, consider only Greenfield investment and joint venture. Foreign bank must compare the equilibrium profits for two different entry modes and find out the entry mode which yields higher profits. The result is given in Proposition 1.

Proposition 1. *Consider only Greenfield investment and joint venture. Foreign bank enters the domestic credit market based on the relative efficiency level Φ . Foreign bank with lower efficiency won't enter the market. Foreign bank with intermediate efficiency chooses joint venture investment. Foreign bank with higher efficiency enters the host country via Greenfield investment. If $\Phi < \Phi^{JV}$, foreign bank won't enter the market. If $\Phi^{JV} \leq \Phi \leq \Phi^{J-G}$, foreign bank enters the host market via joint venture. If $\Phi \geq \Phi^{J-G}$, foreign bank enters the host market via Greenfield investment. The separating efficiency levels are given by*

$$\Phi^{JV} \equiv -\frac{5t}{6} + \frac{5}{2} \sqrt{\frac{\beta Ct}{m\lambda}}, \text{ and} \quad (17)$$

$$\Phi^{J-G} \equiv -\frac{5t}{6} + \frac{5}{2} \sqrt{\frac{(1-\alpha\beta)Ct}{(1-\alpha)m\lambda}}. \quad (18)$$

Proof. Foreign bank can make a choice of entry modes by comparing the equilibrium profits of different entry modes. Now, consider only two entry modes: Greenfield investment and joint venture. If $\pi_F^{GR} - \pi_F^{JV} \leq 0$ and $\pi_F^{JV} > 0$, foreign bank is making positive profit and the profit of joint venture investment is higher than that of Greenfield investment. So, foreign bank prefers joint venture to Greenfield investment. On the other hand, if the situation reverses. When $\pi_F^{GR} - \pi_F^{JV} \geq 0$ and $\pi_F^{GR} > 0$, foreign bank then opt to enter via Greenfield investment. Solving $\pi_F^{GR} - \pi_F^{JV} = 0$, $\pi_F^{GR} = 0$ and $\pi_F^{JV} = 0$, with respect to Φ , yields conditions for entry mode choices.

$$\pi_F^{GR} - \pi_F^{JV} \geq 0, \text{ if}$$

$$\Phi \geq -\frac{5t}{6} + \frac{5}{2} \sqrt{\frac{(1-\alpha\beta)Ct}{(1-\alpha)m\lambda}}, \text{ or}$$

$$\Phi \leq -\frac{5t}{6} - \frac{5}{2} \sqrt{\frac{(1-\alpha\beta)Ct}{(1-\alpha)m\lambda}}.$$

$\pi_F^{GR} > 0$, if

$$\Phi > -\frac{5t}{6} + \frac{5}{2}\sqrt{\frac{Ct}{m\lambda}}, \quad \Phi^{GR} \equiv -\frac{5t}{6} + \frac{5}{2}\sqrt{\frac{Ct}{m\lambda}}.$$

Combining the above two conditions yields the condition that foreign bank chooses Greenfield investment as its entry mode. The condition for $\pi_F^{GR} - \pi_F^{JV} \geq 0$ and $\pi_F^{GR} \geq 0$ is

$$\Phi \geq \Phi^{J-G} \equiv -\frac{5t}{6} + \frac{5}{2}\sqrt{\frac{(1-\alpha\beta)Ct}{(1-\alpha)m\lambda}}.$$

Besides, due to the symmetric location along a circular city, the market share of each bank can't exceed $\frac{2}{3}$ and that is equivalent to $-\frac{5}{6t} \leq \Phi \leq \frac{5}{6t}$. So, I will refer $-\frac{5}{6t} \leq \Phi \leq \frac{5}{6t}$ as *Condition (1)* thereafter. On the other hand, if

$$\Phi \geq \Phi^{JV} \equiv -\frac{5t}{6} + \frac{5}{2}\sqrt{\frac{\beta Ct}{m\lambda}},$$

$\pi_F^{JV} \geq 0$. Combining the condition for $\pi_F^{GR} - \pi_F^{JV} \leq 0$ yields the condition for foreign bank to choose joint venture as entry mode. The condition is given by

$$\Phi^{JV} \equiv -\frac{5t}{6} + \frac{5}{2}\sqrt{\frac{\beta Ct}{m\lambda}} \leq \Phi \leq \Phi^{J-G} \equiv -\frac{5t}{6} + \frac{5}{2}\sqrt{\frac{(1-\alpha\beta)Ct}{(1-\alpha)m\lambda}}.$$

□

According to the above results, entry is not profitable for foreign bank with relatively low efficiency comparing to the domestic banks. With the increasing efficiency, foreign bank finds joint venture more profitable than Greenfield investment because efficiency level is not high enough to overcome costs from efficiency barriers C . Entering via joint venture can reduce efficiency barriers and only requires lower efficiency level. So, joint venture is chosen by foreign banks with intermediate efficiency level. With higher level of efficiency, efficiency can cover both fixed cost and efficiency barrier. The profit of Greenfield investment catches up with that of joint venture. It's more profitable not sharing profits with a local partner. When $\Phi = \Phi^{J-G}$, profits of two entry modes are the same. Foreign bank is indifferent with joint venture and Greenfield investment because two entry modes yield same amount of profit. With higher efficiency level, Greenfield investment makes more profit than joint venture does. So, for $\Phi > \Phi^{J-G}$, foreign bank will choose Greenfield investment instead.

Figure 1 illustrates the results of Proposition 1.¹¹

¹¹In Figure 1, I conduct a numerical simulation by assuming $m = 80$, $\lambda = 0.9$, $t = 1$, $C = 3$, $\beta = 0.8$ and $\alpha = 0.8$. Negative profits are not considered. The profits of two entry modes increase with efficiency.

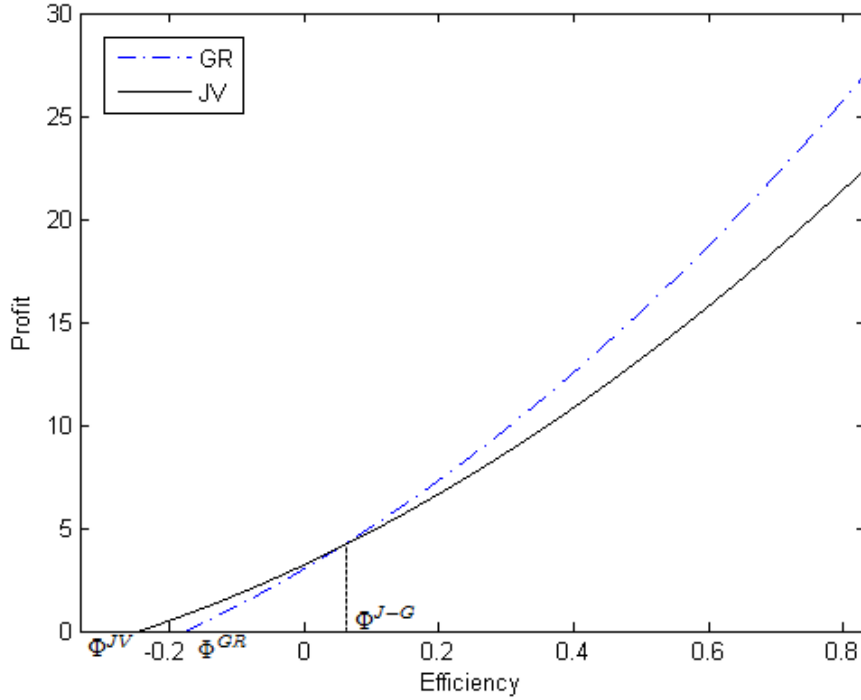


Figure 1: Profits for Greenfield investment and joint venture

Foreign bank with efficiency level higher than Φ^{JV} can earn positive profit via joint venture. On the other hand, the minimum efficiency level for foreign bank to earn positive profit via Greenfield investment is Φ^{GR} , where $\Phi^{JV} < \Phi^{GR}$. The profits of two entry modes intercept at Φ^{J-G} . If there is no efficiency barriers, the value of Φ^{JV} and Φ^{J-G} become the same. The profit of Greenfield investment is higher than that of joint venture from the efficiency level Φ^{JV} . However, foreign banks will always choose Greenfield investment over joint venture because foreign banks don't need joint venture to reduce the efficiency barrier. In reality, efficiency barriers always exist between two different countries. So, foreign bank always takes joint venture into consideration while making entry modes decision. As the level of efficiency barriers is higher than a particular value, joint venture will always be more profitable than Greenfield investment. The following proposition provides condition for existence of the separating efficiency Φ^{J-G} .

Proposition 2. *Separating efficiency level Φ^{J-G} , which is characterized by equation (18), exists if $0 \leq C \leq \bar{C}$, where*

$$\bar{C} \equiv \frac{4m\lambda t(1-\alpha)}{9(1-\alpha\beta)}. \quad (19)$$

Proof. $\Phi^{J-G} \in [\Phi^{JV}, \frac{5t}{6}]$ because when $C = 0$, $\Phi^{J-G} = \Phi^{JV}$ and Φ^{J-G} can't exceed $\frac{5t}{6}$. So,

$$\begin{aligned} \frac{5t}{6} &\geq -\frac{5t}{6} + \frac{5}{2} \sqrt{\frac{(1-\alpha\beta)Ct}{(1-\alpha)m\lambda}} \\ \Rightarrow C &\leq \frac{2m\lambda t(1-\alpha)}{3(1-\alpha\beta)}. \end{aligned}$$

The above value is always bigger than 0. So, if

$$0 \leq C \leq \bar{C} \equiv \frac{4m\lambda t(1-\alpha)}{9(1-\alpha\beta)}, \quad (20)$$

$\Phi^{J-G} \in [\Phi^{JV}, \frac{5t}{6}]$ always exists. □

Intuitively, when foreign bank is faced with a relatively high level of efficiency barriers and larger costs C , the profit of Greenfield investment is undermined by efficiency barriers more severe than joint venture because joint venture can reduce part of the loss. So, that makes joint venture more profitable than Greenfield investment. Foreign bank never consider Greenfield investment when $C > \bar{C}$. However, when $0 \leq C \leq \bar{C}$, foreign bank will choose between Greenfield investment and joint venture according to its relative efficiency.

The entry mode choice between Greenfield investment and joint venture is characterized C . Higher level of efficiency barriers decreases the profit of Greenfield investment and affects Φ^{J-G} . Proposition 3 states how these this parameter C affects the choice of Greenfield investment and joint venture.

Proposition 3. *Increase in cost of efficiency barriers increases the efficiency range for joint venture. The separating efficiency level Φ^{J-G} increases. Technically,*

$$0 < \frac{d\Phi^{JV}}{dC} < \frac{d\Phi^{J-G}}{dC}. \quad (21)$$

Proof. Differentiating Φ^{JV} and Φ^{J-G} with respect to C yields

$$\frac{d\Phi^{JV}}{dC} = \frac{5}{4} \sqrt{\frac{\beta t}{m\lambda C}} > 0, \quad (22)$$

$$\frac{d\Phi^{J-G}}{dC} = \frac{5}{4} \sqrt{\frac{(1-\alpha\beta)t}{(1-\alpha)m\lambda C}} > 0. \quad (23)$$

Because

$$\frac{\frac{1}{\beta} - \alpha}{1 - \alpha} > 1,$$

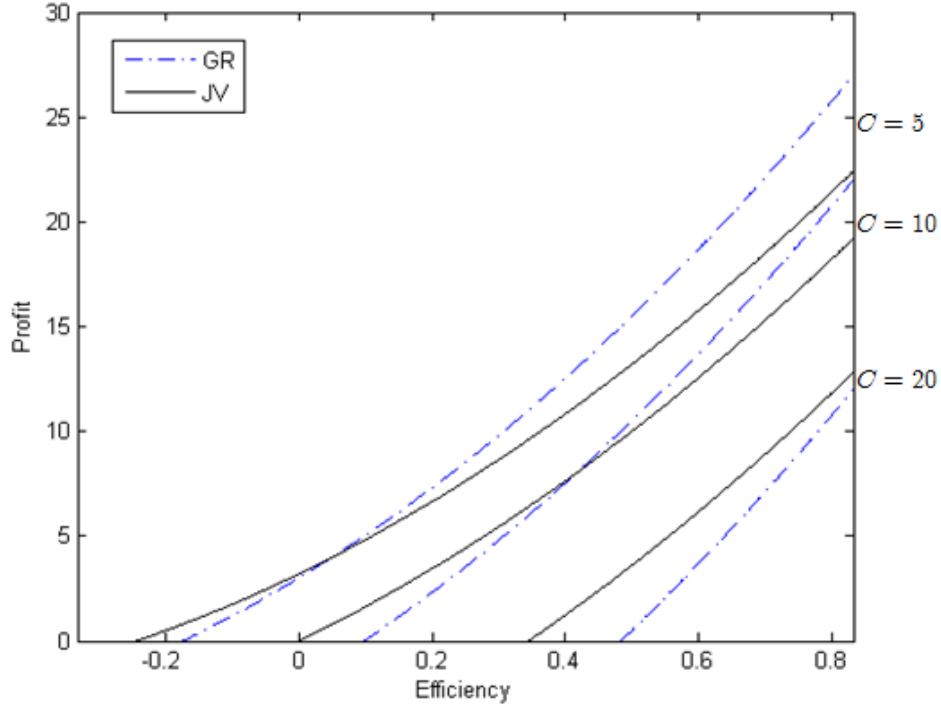


Figure 2: Changes in C

$$\frac{d\Phi^{JV}}{dC} = \frac{5}{4} \sqrt{\frac{\beta t}{m\lambda C}} < \frac{d\Phi^{J-G}}{dC} = \frac{5}{4} \sqrt{\frac{(\frac{1}{\beta} - \alpha)\beta t}{(1-\alpha)m\lambda C}} \quad (24)$$

□

In Figure 2, profits for Greenfield investment and joint venture both decrease as C increases. The profit lines shift to the right. It requires foreign banks to have higher level of efficiency to earn positive profits. Both Φ^{JV} and Φ^{GR} increase. The separating efficiency level Φ^{J-G} increase as costs from efficiency barriers C increases. When $C = 20$, the profit of joint venture is always higher than that of Greenfield investment in any efficiency level.¹² Φ^{J-G} doesn't exist. Moreover, since $0 < \frac{d\Phi^{JV}}{dC} < \frac{d\Phi^{J-G}}{dC}$, the range of joint venture expands as C increases. Additional foreign banks choose joint venture instead of Greenfield investment when the level of efficiency barriers increase.

Intuitively, a larger country attracts more foreign banks to its market. According to the profit functions under different entry modes, operating in a larger market is more profitable than operating in a small market for both foreign and domestic banks. However, the impacts

¹²Given the same values of parameters in Figure 1, $\bar{C} = 17.7778$. So, when $C > \bar{C}$, joint venture is more profitable than Greenfield investment.

of market size on entry modes may not be the same. Proposition 8 states the impact of market size on the entry mode choice for foreign bank.

Proposition 4. *With a larger market size, the range of efficiency for Greenfield investment become wider and the range for joint venture contracts. Foreign bank tend to choose Greenfield investment while entering a large market. Technically,*

$$\frac{d\Phi^{J-G}}{dm} < \frac{d\Phi^{JV}}{dm} < 0. \quad (25)$$

Proof. Since all the profit functions are positively related to market size, I will differentiate the cut-off efficiency values with respect to market size m to see how these values respond to change in market size m . First, take a look at Φ^{JV} and Φ^{J-G} . The results of differentiation are

$$\frac{d\Phi^{J-G}}{dm} = -\frac{5}{4m} \sqrt{\frac{(1-\alpha\beta)Ct}{(1-\alpha)m\lambda}} < \frac{d\Phi^{JV}}{dm} = -\frac{5}{4m} \sqrt{\frac{\beta Ct}{m\lambda}} < 0. \quad (26)$$

□

Large market size increases profits no matter which entry mode foreign bank selects. However, foreign bank entry via joint venture need to share part of the increased profit with its partner. On the other hand, Greenfield investment can retain all the increased profit thanks to bigger market size. So, the range for Greenfield investment expands. Foreign bank tends to choose Greenfield investment over joint venture in a large market. Here, I didn't assume that cost from efficiency barriers increases with market size. In reality, it's possible that the cost of efficiency barriers would be higher as the market size grows.

Next, I will include acquisition into the entry mode analysis. Compared to Greenfield investment and joint venture, basically, acquisition is more advantageous to foreign bank. Entry via acquisition encounters less competitors and larger market share. Moreover, foreign bank can access soft information and use it to screen out borrowers with bad projects. Efficiency for foreign bank increases if acquisition is taken. So, foreign bank may consider acquisition its optimal entry mode under some particular circumstances. The result is given in Proposition 5 .

Proposition 5. *If*

$$\Phi^{AC} \equiv -\xi + \frac{3\rho_1 C}{2m\lambda} < \Phi^{JV} \quad (27)$$

foreign bank always enter the market via acquisition.

Proof. If $\Phi^{JV} > -\xi + \frac{3\rho_1 C}{2m\lambda}$, letting $\Phi = \Phi^{JV}$, then

$$\pi_F^{AC} = 2m\lambda \left(\frac{\Phi^{JV} + \xi}{3} \right) - \rho_1 C > 0 = \pi_F^{JV} = \alpha \left[m\lambda t \left(\frac{1}{3} + \frac{2\Phi^{JV}}{5t} \right)^2 - C \right].$$

Foreign bank won't choose joint venture if $\Phi < \Phi^{JV}$ because acquisition can make positive profit while joint venture can't. Only acquisition is available and profitable if $-\left(\xi + \frac{3\rho_1 C}{2m\lambda}\right) < \Phi < \Phi^{JV}$. Compare $\frac{d\pi_F^{AC}}{d\Phi}$ and $\frac{d\pi_F^{JV}}{d\Phi}$.

$$\frac{d\pi_F^{AC}}{d\Phi} = 2m\lambda, \text{ and} \quad (28)$$

$$\frac{d\pi_F^{JV}}{d\Phi} = m\lambda \left(\frac{4\alpha}{15} + \frac{8\alpha\Phi}{25t} \right). \quad (29)$$

Because of *Condition (1)*, $-\frac{5t}{6} \leq \Phi \leq \frac{5t}{6}$. So,

$$\frac{d\pi_F^{AC}}{d\Phi} - \frac{d\pi_F^{JV}}{d\Phi} = m\lambda \left(2 - \frac{4\alpha}{15} + \frac{8\alpha\Phi}{25t} \right) > 0. \quad (30)$$

Therefore, $\pi_F^{AC} - \pi_F^{JV} > 0$ if $\Phi^{JV} > -\xi + \frac{3\rho_1 C}{2m\lambda}$. Similarly, $\pi_F^{AC} - \pi_F^{GR} > 0$ given $\Phi = \Phi^{GR}$. Comparing $\frac{d\pi_F^{AC}}{d\Phi}$ and $\frac{d\pi_F^{GR}}{d\Phi}$ yields

$$\frac{d\pi_F^{AC}}{d\Phi} - \frac{d\pi_F^{GR}}{d\Phi} = 2m\lambda - m\lambda \left(\frac{4}{15} + \frac{8\Phi}{25t} \right) = m\lambda \left(2 - \frac{4}{15} + \frac{8\Phi}{25t} \right) > 0. \quad (31)$$

□

This proposition is similar to the result of van Tassel and Vishwasrao (2007). They show that foreign always prefers acquisition to Greenfield investment assuming a zero acquisition price. However, with the existence of acquisition price, the result still holds when $\Phi^{JV} > \Phi^{AC}$.

By using the same parameter values in Figure 1, the profit of acquisition shifts leftward as the benefit of soft information increases.¹³ In Figure 3, Φ^{AC} and Φ^{JV} are the intercept of x-axis and the profit of acquisition and joint venture. When $\Phi^{AC} < \Phi^{JV}$, acquisition dominates

¹³Here, I use $\alpha = \rho_1 = 0.8$ in Figure 3. I don't assume particular relationship between α and ρ_1 . As ρ_1 decreases, Φ^{AC} becomes smaller. This means acquisition can reduce the loss of profit more.

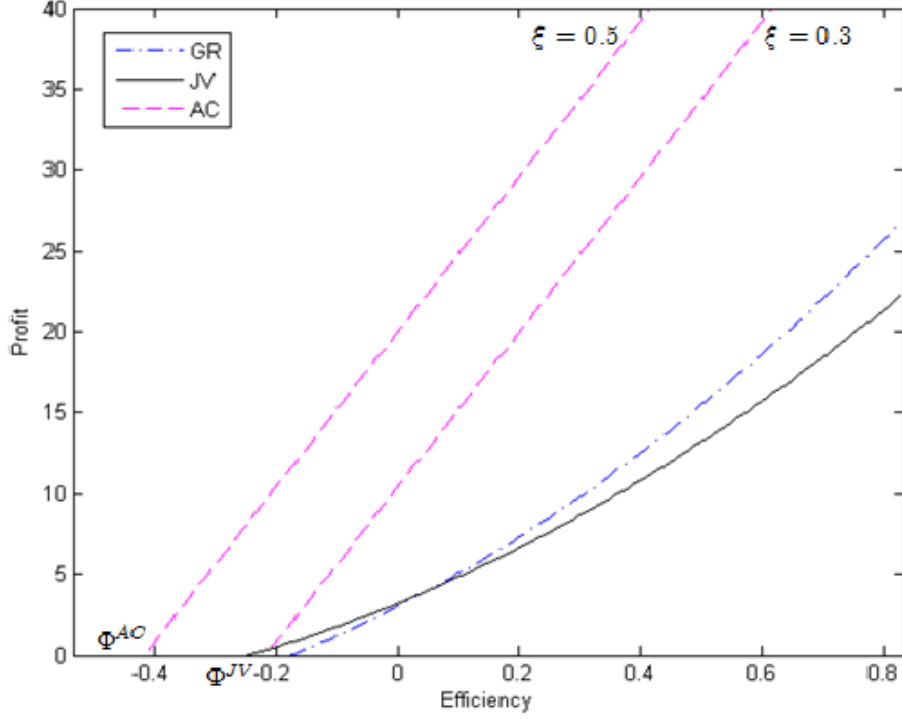


Figure 3: Profits for acquisition, joint venture and Greenfield investment

other entry modes. However, if the benefits of soft information is lower, for lower efficiency levels joint venture will be more profitable than acquisition. This situation will be discussed next.

Φ^{AC} and Φ^{JV} represent the minimum efficiency level which yields non-negative profits for joint venture and acquisition. So, when joint venture and Greenfield require higher minimum efficiency levels than acquisition does, acquisition becomes more profitable than any other entry modes. In previous section, $\Phi^{JV} \leq \Phi^{GR}$. So, if $\Phi^{AC} < \Phi^{JV}$, $\Phi^{AC} < \Phi^{JV} \leq \Phi^{GR}$. That mean if joint venture entry requires higher efficiency than acquisition does, Greenfield investment also requires higher efficiency than acquisition does. Intuitively, acquisition generally yields higher profits for foreign bank thanks to higher market share, soft information and local knowledge. If acquisition doesn't require higher level of efficiency, foreign will always tend to choose acquisition.

The condition in Proposition 5 can also be written as

$$\xi > \frac{5t}{6} - \frac{5}{2} \sqrt{\frac{\beta Ct}{m\lambda}} + \frac{3\rho_1 C}{2m\lambda}. \quad (32)$$

This implies that if the benefit of soft information is high enough to make the required

efficiency level lower than that joint venture requires, acquisition would be more profitable than other two entry modes.

Here, I focus on the situation that acquisition doesn't dominate other entry modes to see how foreign bank makes its entry mode choice between acquisition, joint venture and Greenfield investment. First, consider an interesting situation when the profits of three entry modes are the same.

Lemma 4. *The profits of three entry modes become the same $\pi_F^{GR} = \pi_F^{JV} = \pi_F^{AC}$, if $\xi = \xi^*$, where*

$$\xi^* \equiv \frac{5t}{6} - \frac{5}{2} \sqrt{\frac{(1-\alpha\beta)Ct}{(1-\alpha)m\lambda}} - \frac{3C}{2m\lambda} \left(1 - \rho_1 - \frac{1-\alpha\beta}{1-\alpha}\right). \quad (33)$$

Proof. Previously, $\pi_F^{GR} = \pi_F^{JV}$ when $\Phi = \Phi^{J-G}$. Substituting Φ by Φ^{J-G} in π_F^{GR} and π_F^{AC} can solve for ξ^* .

$$2m\lambda \left(\frac{\Phi^{J-G} + \xi}{3} \right) - \rho_1 C = m\lambda t \left(\frac{1}{3} + \frac{2\Phi}{5t} \right)^2 - C$$

$$\Rightarrow \xi^* = \frac{5t}{6} - \frac{5}{2} \sqrt{\frac{(1-\alpha\beta)Ct}{(1-\alpha)m\lambda}} - \frac{3C}{2m\lambda} \left(1 - \rho_1 - \frac{1-\alpha\beta}{1-\alpha}\right).$$

□

Lemma 4 states that when $\xi = \xi^*$, profit lines of three different entry modes intercept at a point, $\Phi = \Phi^{J-G}$. Also, this point will separate two different entry mode patterns. Proposition 6 and Proposition 7 state the results.

Proposition 6. *With higher benefits from soft information, foreign bank never choose Greenfield investment. Foreign bank chooses joint venture when its efficiency level is lower. With increasing efficiency, foreign bank chooses acquisition.*

Proposition 6 states that foreign bank doesn't consider Greenfield investment when the benefit of soft information is higher than ξ^* . Only joint venture and acquisition is taken into consideration. As the benefit of soft information increases, profit line for acquisition keeps shifting leftward. Acquisition may dominate joint venture and becomes only choice left for foreign bank like the result of Proposition 5. In Figure 4, when $\xi = 0.3$, the profit line of Greenfield investment is always under those of joint venture and acquisition.

Proposition 7. *With lower benefits from soft information, foreign bank choose from joint venture, Greenfield investment and then acquisition. Foreign bank with low efficiency level chooses joint venture. With intermediate efficiency, foreign bank chooses Greenfield investment. Foreign bank chooses acquisition when its efficiency is higher. In this situation, joint venture substitutes Greenfield investment by giving less efficient foreign bank alternative choice to make higher profit.*

Proof. Previously, in Proof of Proposition 4, the slope of π_F^{AC} is higher than those of π_F^{GR} and π_F^{JV} . If π_F^{AC} intercept with π_F^{GR} and π_F^{JV} at Φ^{G-A} and Φ^{J-A} , $\pi_F^{AC} > \pi_F^{GR}$ and $\pi_F^{AC} > \pi_F^{JV}$ when $\Phi > \Phi^{G-A}$ and $\Phi > \Phi^{J-A}$. On the other hand, when $\Phi < \Phi^{G-A}$ and $\Phi < \Phi^{J-A}$, $\pi_F^{AC} < \pi_F^{GR}$ and $\pi_F^{AC} < \pi_F^{JV}$. If $\xi < \xi^*$, Φ^{G-A} and Φ^{J-A} is smaller than Φ^{J-G} . When $\Phi < \Phi^{J-G}$, $\pi_F^{JV} > \pi_F^{GR}$. In this range, $\Phi < \Phi^{J-G}$, Greenfield investment is not considered. $\pi_F^{AC} > \pi_F^{JV}$ when $\Phi > \Phi^{J-A}$. So, π_F^{GR} is lower than π_F^{AC} and π_F^{JV} in this situation. Foreign bank chooses joint venture when $\Phi < \Phi^{J-A}$ and acquisition when $\Phi > \Phi^{J-A}$. If $\xi > \xi^*$, Φ^{G-A} and Φ^{J-A} is larger than Φ^{J-G} . When $\Phi > \Phi^{J-G}$, $\pi_F^{JV} < \pi_F^{GR}$. In this range, $\Phi > \Phi^{J-G}$, joint venture is not considered. So, when $\Phi > \Phi^{G-A} > \Phi^{J-G}$, foreign bank chooses acquisition. When $\Phi^{J-G} < \Phi < \Phi^{G-A}$, foreign bank chooses Greenfield investment. When $\Phi < \Phi^{J-G}$, foreign bank chooses joint venture.

$$\Phi^{G-A} \equiv \frac{5t}{4} - \frac{5}{2} \sqrt{\frac{5t^2}{36} + \frac{2t\xi}{3} + \frac{(1-\rho_1)Ct}{m\lambda}}, \text{ and} \quad (34)$$

$$\Phi^{J-A} \equiv \frac{25t - 10at}{12\alpha} - \frac{5}{2} \sqrt{\frac{25t^2}{36\alpha^2} - \frac{5t^2}{9\alpha} + \frac{2t\xi}{3\alpha} - \frac{\rho_1 Ct}{m\lambda\alpha} + \frac{\beta Ct}{m\lambda}}. \quad (35)$$

□

On the other hand, when the benefit of soft information is small.¹⁴ Profit line of acquisition shifts rightward. Acquisition requires higher efficiency level to make positive profits. In this situation, a efficiency range of Greenfield investment appears. Foreign bank first select joint venture when efficiency level is low. With increasing efficiency level, the entry mode is Greenfield investment and then acquisition. In Figure 4, when $\xi = 0.05$, joint venture, Greenfield investment and acquisition yield highest profits as efficiency level increases.

¹⁴The quality of credit market, soft information held by acquired bank, screening technology and cost of fund affect the benefit of soft information. Better credit credit, lower soft information of old borrowers, mediocre screening technology and high cost of fund all result in smaller benefit of soft information.

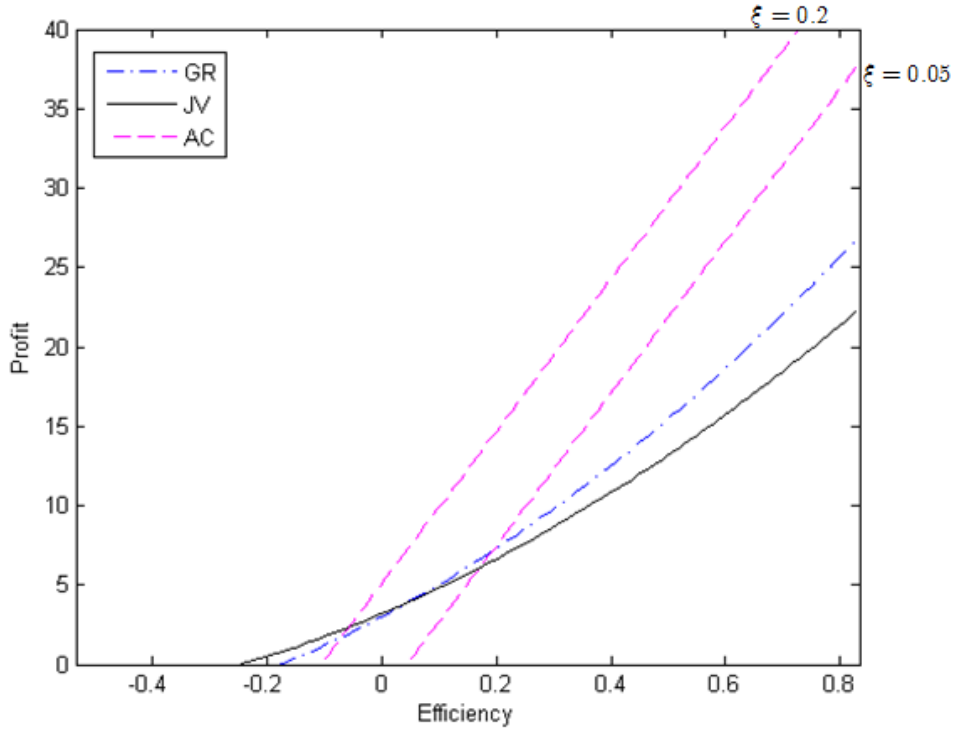


Figure 4: Proposition 6 and 7

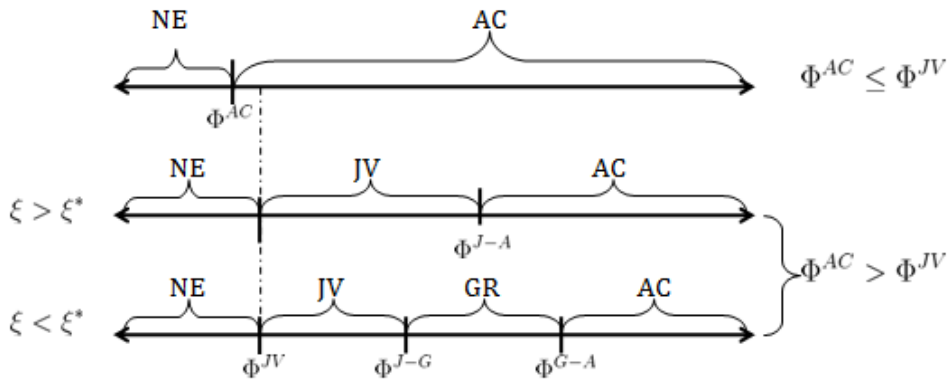


Figure 5: Entry mode patterns

Figure 5 compares the results of Proposition 5, 6 and 7. With sufficient benefit of soft information, foreign bank always choose acquisition. However, with lower benefit of soft information, joint venture and acquisition edge out Greenfield investment. Foreign bank only consider acquisition and joint venture in this situation. On the other hand, when the benefit of soft information is even lower, foreign bank consider all three entry modes according to its efficiency level.

The results of entry mode choice are similar to the studies of Beermann (2007) and

Lehner (2009) although these studies differ in measurement of efficiency. However, Beermann (2007) and Lehner (2009) don't consider joint venture as one of the entry modes. Also, they don't as consider efficiency barriers and benefits of acquiring domestic as factors which affects different entry mode choices. Beermann (2007) uses fixed cost and Lehner (2009) considers screening technology to measure the efficiency of foreign banks. Their results generally show that more efficient foreign banks, those with lower fixed cost or better screening technology, expand abroad via acquisition whereas less efficient foreign banks choose Greenfield investment. Here, in my model, I compare the lowest interest rates that foreign and domestic banks can bid as a measurement of efficiency for foreign banks. This is a composite approach that includes cost of funds, screening technologies and soft information. Moreover, this approach compares the competitiveness between domestic banks and foreign banks. A foreign bank can be relatively efficient in a developing country and relatively inefficient in a more developed host country. Therefore, it might choose entry modes differently in two host countries. In a same country, more efficient foreign banks tend to choose acquisition while less efficient foreign banks choose Greenfield investment or joint venture.

Here, I will focus on how the developments of host country and market size affect the choice of entry mode. In my model, I regard travel cost t as an indicator of development of the host country. In a more developed country, borrowers incur lower travel cost when applying for loans probably because of convenient business environments or better transparency in credit market. On the contrary, borrowers may incur additional travel cost in a less developed country. Proposition 8 states the impact of development in host country on the entry mode choice for foreign bank.

Proposition 8. *In a less developed country, the country will witness more foreign bank entry and foreign banks will tend to enter via joint venture and Greenfield investment. Technically,*

$$\frac{d\pi_F^{AC}}{dt} = 0, \quad \frac{d\pi_F^{GR}}{dt} > 0, \quad \frac{d\pi_F^{JV}}{dt} > 0 \quad \text{and} \quad \frac{d\Phi^{JV}}{dt} < 0. \quad (36)$$

Proof. Differentiating the profit function of three entry modes with respect to t yields

$$\frac{d\pi_F^{AC}}{dt} = 0, \quad (37)$$

$$\frac{d\pi_F^{GR}}{dt} = m\lambda \left[\left(\frac{1}{3} + \frac{2\Phi}{5t} \right) \left(\frac{1}{3} - \frac{2\Phi}{5t} \right) \right], \text{ and} \quad (38)$$

$$\frac{d\pi_F^{JV}}{dt} = \alpha \left[m\lambda \left(\frac{1}{3} + \frac{2\Phi}{5t} \right) \left(\frac{1}{3} - \frac{2\Phi}{5t} \right) \right]. \quad (39)$$

Because of *Condition (1)*, $\frac{d\pi_F^{GR}}{dt} > \frac{d\pi_F^{JV}}{dt} > 0$. Also,

$$\frac{d\Phi^{JV}}{dt} = -\frac{5}{6} + \frac{5}{4} \sqrt{\frac{\beta C}{m\lambda t}}, \text{ and} \quad (40)$$

$$\frac{d\Phi^{J-G}}{dt} = -\frac{5}{6} + \frac{5}{4} \sqrt{\frac{(1-\alpha\beta)C}{(1-\alpha)m\lambda t}}. \quad (41)$$

Because in Proof of Proposition 3,

$$\frac{5}{4} \sqrt{\frac{\beta t}{m\lambda C}} < \frac{5}{4} \sqrt{\frac{(1-\alpha\beta)t}{(1-\alpha)m\lambda C}},$$

$$\frac{d\Phi^{J-G}}{dt} < \frac{d\Phi^{JV}}{dt}. \quad (42)$$

The range of joint venture expands. So, foreign bank tends to choose joint venture.

$$\frac{d\Phi^{JV}}{dt} = -\frac{5}{6} + \frac{5}{4} \sqrt{\frac{\beta C}{m\lambda t}} < 0$$

because $C < \frac{4m\lambda t}{9\beta}$ must be satisfied. The maximum profit which foreign bank can get via joint venture is

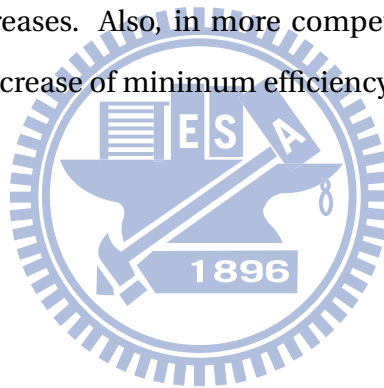
$$\frac{4m\lambda t}{9} - \beta C,$$

when $\Phi = \frac{5t}{6}$ and market share is $\frac{2}{3}$. If $C > \frac{4m\lambda t}{9\beta}$, foreign bank never makes positive profit via joint venture. So, I assume that $C < \frac{4m\lambda t}{9\beta}$ and that makes $\frac{d\Phi^{JV}}{dt} < 0$. \square

Travel costs occurred during the application process will be undertaken by borrowers. Besides, in a less developed country, bad business environment can't provide sufficient information to borrowers. Borrowers can't find another bank to apply for loans easily. So, both foreign and domestic banks make more profit from exploiting the travel cost t . However, the profits of entry via acquisition remain unchanged. Since acquisition price is equivalent to the profit of domestic bank and this profit increases with travel cost t , the marginal profit caused by travel cost t will be offset by increase of acquisition price. Therefore, foreign bank would tend to choose Greenfield investment and joint venture in less developed country.

The entry threshold Φ^{JV} decreases in a less developed country. That is, foreign bank entry requires a lower level of efficiency. The entry becomes profitable for some inefficient foreign bank and less developed countries will see more foreign bank entries than developed countries do. The result of Proposition 8 is generally inconsistent with Sengupta (2007). Sengupta (2007) shows that better legal protections will facilitate foreign bank entry. Better legal protection may imply better development of host country. Here, better development of the host country generally deters foreign bank entry via Greenfield investment and joint venture.

Dell’Ariccia (2001), Mueller (2007) and Lehner (2009) look at travel cost t from a different viewpoint. They consider travel cost a measure of competitive intensity for banks.¹⁵ Lower travel cost implies more intensive competition among banks. From this viewpoint, in a more competitive market, foreign bank tends to choose acquisition because the number of banks competing in the market decreases. Also, in more competitive market, less foreign bank entries take place due to the increase of minimum efficiency level Φ^{JV} .



¹⁵If travel cost becomes zero, the competition turns into a price competition.

6 Conclusion

In this thesis, I have demonstrated that the conditions of host country is the major reason why foreign banks choose entry modes differently. I analyze three different entry modes, including joint venture, Greenfield investment and acquisition with a new model which contributes to explain entry mode choice. In the model, I identified that the benefit of soft information, efficiency barriers and the relative efficiency are three major determinants to the entry mode choice for foreign bank. Acquisition dominates joint venture and Greenfield investment when the benefit of soft information is high. Two entry mode patterns are separated by the amount of benefits of soft information. With high benefits, foreign bank only considers joint venture and acquisition according to efficiency level. With low benefits, as the efficiency level increases, foreign bank choose not to enter, joint venture, Greenfield investment and then acquisition.

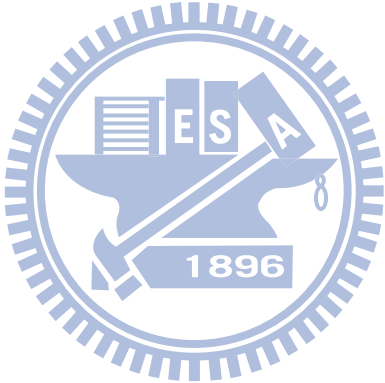
Moreover, it is found that costs due to efficiency barriers, market development and size of the credit market also affect the entry mode choice. Higher costs due to efficiency barriers encourage foreign bank to select joint venture. Better market development discourages foreign bank entry and decreases the profits of Greenfield investment and joint venture. However, the level of host country development doesn't affect entry and profit of acquisition. With larger market size, the profits of joint venture and Greenfield investment both rise. However, foreign bank tends to choose Greenfield investment in larger market.

This thesis first contributes to analyze joint venture as an entry mode for foreign bank in a theoretical model. In my model, joint venture not only expands the range for entry but also substitutes Greenfield investment when entering a country with high efficiency barriers. Less efficient foreign bank can enter a host country and make positive profits via joint venture. However, joint venture as an entry mode doesn't receive much attention in the literature of foreign bank entry. So, there is plenty of room for future studies.

The model also contributes to the literature by incorporating conditions of host countries. Efficiency barriers, efficiency of domestic banks, information asymmetry, development and market size determines the entry mode choice for a foreign bank. Because of these factors, a foreign bank may make different entry mode choices in different host

countries. As in a same host country, the choices of foreign banks differs according to their efficiency levels.

More studies can be done by considering more banks in a model. For example, I limit the number of domestic banks to only two and only one foreign bank is making entry to the market. Besides, the conditions of host countries, the entry mode choices of other competitors entering the market may also affect the choice of foreign banks. Also, heterogeneity of domestic banks can also apply to cost of fund, screening technology and soft information.



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