A Model of Domestic Banking Sector with Foreign Entrants

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This study develops a theoretical framework to examine the short-term impact of foreign entry on domestic banks' operating behavior and performance in emerging markets. Four hypotheses are proposed to show how overhead costs, interest rate margin, and profits may respond to higher level of banking competition caused by foreign entrants. The model shows that the efficiency impact of foreign entry is affected by the pre-existing competitive environment in the host market. Immediate efficiency gains, if any, are only concentrated in more competitive banking sectors. In future empirical studies, the pre-existing competitive condition can be measured by indicators of contestability, intra-industry competition, and inter-industry competition.

1. Introduction

Since the second half of the 1990s, foreign banks have been expanding their presence in many emerging markets. In Latin America and Eastern Europe, foreign-owned banks have accounted for 50 percent or more of total banking assets in many countries (Clarke, Cull, Peria, & Sanchez, 2003). In Asia, the proportion of foreign-owned banks remains relatively low, but it has increased dramatically after the Asian financial crisis due to the need for recapitalization of local banking sectors (Montgomery, 2003). The surge in foreign direct investment (FDI) activities in the banking sector is consistent with the broader market trends of consolidation, integration, privatization, and liberalization started in late 1990s.

However, to what extent the incentives for foreign penetration should be provided remains controversial in emerging markets. The central issue is the comparison of benefits vs. costs yielded by the openness of the banking sector. Arguments in favor of foreign entry mainly build upon the efficiency gains realized by domestic banks due to competitive pressures and spillover effects. Foreign entrants intensify the competition level in a banking system, which forces domestic banks to become more efficient if they wish to survive. Spillover effects refer to the transfer of new technologies, products, and management techniques to local banks (Agénor, 2003; Spencer, 2008). From the economic development perspective, foreign bank presence can also improve allocation of credits and help firms receive easier access to international capital markets (Claessens, Demirgüç-Kunt, & Huizinga, 2001).

However, the positive impact can be offset by foreign banks' alleged "cherry pick" lending practice (Agénor, 2003; Song, 2004), the tendency to take additional risks by domestic banks in dealing with excessive competition (Vivies, 2001), possible increase in the level of concentration due to M&As (Agénor, 2003), and even the failure of infant domestic banks as a result of the "crowding out" effect (Song, 2004).

Given the two sides of arguments, short-term impact of foreign bank entry on local banks' operating efficiency has been widely studied empirically. The cross-country study of Claessens, et al. (2001) detects efficiency gains for local banks. One of the biggest shortcomings of the analysys is that the results only hold "on average" across a large group of countries; but pooling countries with very different financial characteristics is questionable (Agenor, 2003). Some other cross-country studies have derived opposite results by applying the same empirical model to certain subsets of countries. Most notably, by focusing on a sample of emerging markets (Hermes & Lensink, 2001) and

interacting the foreign entry variable with a country's development level (Lensink & Hermes, 2004), the authors find that the positive efficiency effects of foreign entry only applies to developed countries, but not developing countries.

The empirical literature discussed above motivates this study in two ways. First, the follow-up studies after Claessens, et al. (2001) highlight the role of certain economic/financial characteristics (e.g., host nation's economic output or the development stage of its financial sector) in affecting the impact of foreign entry. This study posits that the economic/financial factors matter because they have determined or shaped the competitive environment within which both foreign banks and local banks operate and compete. Therefore, the role of pre-existing competitive condition should be examined in future studies of the FDI implications in banking.

Second, there has been little or no theoretical studies exist to guide empirical research on this topic. Due to the lack of a well-established theoretical paradigm, empirical studies that examine the efficiency impact of banking sector's internationalization are generally ad hoc and limited. Empirical evidence on the issue can only be described as being "mixed" at the best.

The purpose of this paper is to construct a theoretical framework to evaluate the impact of foreign entry on local banks' operating efficiency. More importantly, the model would allow us to evaluate the role of pre-existing competitive environment in affecting such impact. We follow the basic structure of the model of domestic service sector developed by Francois and Wooton (2001a) and make several modifications/extensions. We first derive the market equilibrium earnings for both domestic banks and foreign banks. Then, we discuss how the pre-existing competitiveness in domestic banking sector affects the equilibrium bank earnings. Using the modified and extended model as a theoretical foundation, we propose hypotheses to show possible responses of local banks' overhead costs, net interest margin, and profits to foreign entry.

In this paper, we begin by providing a more detailed survey of the theoretical and empirical motivations underlying the study. Then we lay out the development of the theoretical framework. In the section thereafter, we provide further discussion of the model implications and propose testable hypotheses. Then the paper concludes with a summary, and notes some future research opportunities.

2. Literature Review

2.1. Competition Effects

Standard MNE literature believes that FDI by MNEs can reduce the level of concentration and increase competition in host country/economy industries (Caves, 1982). Competition improves productive, allocative, and dynamic efficiency (Vives, 2001). While the three aspects of efficiency gains induced by increased competition generally apply to the banking industry, studies have suggested that the scale of such gains may be limited. Also, studies have examined the downside of excessive competition in banking.

First of all, so-called "cherry pick" practice of foreign banks in lending can limit the foreign competition to certain market segments. Multinational banks generally have better reputation (prior to the outbreak of financial crisis in 2008 at least), provide more sophisticated products, and adopt better marketing skills. Hence these banks are able to "cherry pick," i.e., to attract the most creditworthy customers in their lending operation. If foreign banks only target specific market niches, their presence will contribute to credit market segmentation. Such presence will not introduce sufficient competitive pressure to improve the overall efficiency level in the banking sector (Agénor, 2003; Song, 2004).

For banks that do experience tougher competition, a more relevant question is whether they are able to meet the challenge. As indicated by Vivies (2001), the social cost of bank failure is huge due to the costs of financial/economic distress.

The first concern is a possible deterioration of asset quality in the local banking system. Hellmann, Murdock, and Stiglitz (2000) indicate that the possible decrease in franchise value

following foreign entry can serve as a risk-taking incentive for domestic banks that seek to survive and compete against foreign rivals. Given banks' limited-liability charters, local banks may take too much risk as a response to increased competition, which is referred to as a moral hazard issue by Vives (2001). In some cases, local banks are "forced" to take extra risk by serving less creditworthy/high risk customers if foreign banks only concentrate on the "best" corporate borrowers (Montgomery, 2003; Crystal, Dages, & Goldberg, 2002).

The second concern is a possible increase of market concentration. Agenor (2003) suggests that domestic banks may also respond to competitive pressures by merging. Merging of domestic banks, as well as the acquisition of local banks by foreign banks, may lead to increased concentration, which can create banks that are too big to fail, reduce the overall efficiency, and increase systemic banking risks.

Both concerns discussed above lead to the worry that foreign entry may result in an increased probability of bank failures. FDI literature has widely studied the crowding out effect, which refers to the phenomenon that less competitive local firms lose market share to more efficient foreign competitions, or even being driven out of business. Studies have found that better-managed MNEs can crowd domestic firms out of product as well as labor markets shortly after the entry (e.g., De Backer & Sleuwaegen, 2003; Kosová, 2010). Empirical evidence specifically targeting the crowding out effect in the banking industry is limited.

To sum up, domestic banks theoretically should enjoy productive, allocative, and dynamic efficiency gains as a result of the competition effects. However, the gains can be limited due to the alleged "cherry-picking" practice of multinational banks. A more serious concern, however, is that competition can be easily excessive in banking. The safety, soundness, and efficiency of the banking practice and banking network might be in danger if local banks respond to increased foreign competition by taking on extra risks and merging with other banks. In a worst-case scenario, local banks can be forced into bankruptcy on a large scale.

2.2. Spillover Effects

In the context of manufacturing FDI, foreign entry leads to higher rates of technology transfer and productivity spillovers (Goldberg, 2004). In Spencer's review (2008), positive productivity spillovers to local firms take place through four mechanisms: demonstration effects, backward and forward linkages, labor turnover, and competition effects. Parallel to the productivity theme in the manufacturing FDI literature, positive spillover is called "efficiency effect" in the banking literature (Goldberg, 2004).

With demonstration effects, local banks can learn to develop new services and products that foreign banks introduced to local market, copy foreign rivals' modern and more efficient banking techniques, especially the risk management techniques, and improve the overall management by learning from foreign managers (Hermes & Lensink, 2004).

Foreign entry can have significant influence on human capital formation for domestic banking sectors. The influence can be achieved in three ways (Konopielko, 1999; Lensink & Hermes, 2004; Mathieson & Roldos, 2000). First, foreign banks become "salary leaders" to attract highly qualified specialists available. Second, foreign banks supplement the staffs with expatriate personnel at the beginning of entry. Third, foreign banks invest in training programs for new employees, including local employees. Improved human capital will reduce operation costs and contribute to more efficient banking practices (Lensink & Hermes, 2004).

Since foreign banks generally outperform local banks in emerging markets (see Claessens et al., 2001; Crystal, et al., 2002; Bosco, 2003; Naaborg, et al., 2004; Coppel & Davies, 2003), the increased level of competition provides incentives for managers to take advantage of the positive spillovers in order to withstand the increasing pressure.

However, positive spillover effects and structural benefits occur over a long run. In the short run, to take advantage of the spillover effects, domestic firms (or banks in our study) must make initial investments or pay for the adjustment costs (Kosová, 2010; Lensink & Hermes, 2004).

Sometimes, local banks are forced to make adjustment just to keep up with foreign rivals.

In sum, local firms/banks should receive efficiency gains due to competition and spillover effects following foreign entry in theory. But spillover effects typically occur gradually. In the short run, excess competition can hurt the efficiency (and even safety and soundness) of local banks.

3. The Role of the Competitive Environment in Banking

3.1. Empirical Evidence

Empirical studies examined the efficiency impact of foreign entry on domestic banking industry. The seminal work of Claessens, et al. (2001) is a comprehensive cross-country study on the issue. Based on bank-level data for 80 developed and developing countries during the 1988-1995 period, the authors find that increased penetration of foreign banks is related to a reduction in profitability, non-interest income, and operating expenses of domestic banks, after bank-specific and country-specific factors are controlled. The impact of foreign entry on net interest margins is found to be insignificant. The study also finds that efficiency effects of foreign banks are felt immediately upon entry, and do not depend on gaining a substantial market share.

Many follow-up studies, however, indicate that how foreign bank entry affects the performance of domestic banks largely depends on environmental factors specific to the development level of a host country. This study posits that the factors discussed in the literature, including the existing foreign ownership (Montinola & Moreno, 2001; Hermes & Lensink, 2001), the development level of the financial sector (Hermes & Lensink, 2004), and the sequence of financial liberalization took place in the recipient country (Bayraktar & Wang, 2004), etc., have determined or shaped the competitive environment within which both foreign banks and local banks operate.

3.2. Characters of Uncompetitive Banking Environment

According to Laeven and Claessens (2004), the competitive environment for banking can be determined by the following three factors: intra-industry competition determined by the market structure, inter-industry competition from non-bank financial institutions, and contestability that is largely associated to government regulation. Banking sectors of many emerging markets can be viewed as less competitive from these three perspectives.

First, many emerging market economies were formerly centrally planned economies, or, transition economies. Before transition, banking sectors in these countries/economies were usually highly concentrated and functionally segmented (Bonin, Hasan, & Wachtel, 2005).[1] A highly concentrated and segmented market structure leads to market distortions and hinders local banks' capability to compete effectively.

Second, in the hope to balance competition and safety and/or to meet the need of development priorities, governments in many emerging market economies adopt financial repression policies such as interest rate controls and directed credit policies, impose various barriers against foreign entry, and apply restrictions on the scope of foreign banks' business activities. Entry and activity restrictions may have negative impact on bank efficiency by reducing competition and limiting economies of scope (Barth, Caprio, & Levine, 2001). When an originally highly regulated banking sector opens up to foreign entry, domestic banks may suffer due to their inefficiencies and weaknesses. If a banking sector still maintains heavy restrictions against the activities of foreign banks, the increase of competition level would be very limited and the expected efficiency gains due to financial liberalization cannot be realized.

Third, capital markets are generally less developed in emerging market economies. Again, the

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[1] For instance, in China, the banking system has been dominated by the "Big Four" commercial banks. The Industrial & Commerce Bank of Chia (ICBC) used to be the major supplier of funds to China's urban areas and manufacturing sector; the Bank of China (BOC) specializes in foreign-exchange transactions and trade finance; the China Construction Bank (CCB) specializes in funding infrastructure projects and urban housing development; the Agriculture Bank of China (ABC) specializes in providing financing to China's agricultural sector.

lack of competition from the competing industry (i.e., non-banking financial sector) makes domestic banks less efficient and more vulnerable to foreign rivals.

In sum, concentrated and/or segmented market structure, insufficient inter-industry competition, and limited contestability are the major indicators of an uncompetitive banking environment. Banking sectors with one or several of these characteristics are either less efficient and/or relatively more closed. Such "noncompetitive banking environment" tends to allow inefficient banks to survive and contain the capability of banks to compete effectively. Under normal circumstances, I assume that the three aspects of a certain banking sector are highly correlated: a closed market is usually more concentrated and faces less inter-industry competition; banks operating in the market are less efficient and less competitive. On the contrary, a banking market with fewer restrictions on bank entry/activities typically has a less concentrated/segmented market structure and experiences more intense competition from non-banking sectors. Banks are more efficient and more competitive in these markets.

3.3. Competitive Structure as a Key Driver behind FDI Implications

Literature has shown the competitive structure of an industry as a key driver behind FDI implications. Viewing international trade and trade through local establishments as two broad modes of trade, the trade theory has focused on the interaction of international trade/FDI with market structure and public regulation, especially the implications of liberalization for profits, trade volumes, and national gains from trade (see, for example, Markusen, 1995; Francois & Wooton, 2001a, 2001b; Sampson & Snape, 1985). One basic conclusion is that trade liberalization without some form of domestic deregulation in a specific industry will not result in the increase of benefits expected (Francois & Wooton, 2001b).

Francois and Wooton (2001a) further develop a model that focuses on the impact of improved domestic market access for a foreign service provider on a domestic service market. One aspect of their analytical results is that in an imperfectly competitive industry, less market access results in a higher domestic market price and the domestic service providers may therefore become more profitable.

Motivated by the mixed empirical results and the work of Francois and Wooton (2001a), we are developing a theoretical framework to further study the role of competitive environment in affecting the efficiency impact of foreign entry on local banks in the following section.

4. A Model of Domestic Banking Sector

This section illustrates a model that focuses on the banking sector of an emerging market economy. The banking sector, as it is in a developing economy, is assumed to be imperfectly competitive due to a history of high market concentration/segmentation, a lack of competition from other financial sectors, and/or the presence of regulatory restrictions that intend to protect the domestic banks from foreign competition. The model will first determine the market equilibrium price and quantity when there is a foreign entry. Then the model discusses the changes of the equilibriums when the domestic banking environment becomes more competitive.

As previously indicated, the basic structure of the model is adopted from the model of domestic service sector developed by Francois and Wooton (2001a). This study modifies and extends the model in several ways. First, we modify some assumptions so that the model applies specifically to the banking sector, and is more relevant to the specific issues examined in this study. Second, we modify the cost functions of both domestic banks and foreign banks to reflect the operating responses of two types of banks under competition. Third, we extend the discussion and provide interpretation for the modified model, which incorporates two parameters that were not originally included.

4.1. Basic Structure

Suppose in an emerging market economy *h*, a homogeneous service *S* is provided by *n* identical

domestic banks (*d*) and a single foreign bank (*f*).

Several assumptions have been made regarding the market *h*. First, domestic banking market is highly regulated and non-competitive. Second, service *S* is interest related intermediary service, that is, the bank accepts deposits and lends funds from these deposits. Interest spread is the only source of a bank's profits. Third, funding costs for domestic banks and foreign banks are assumed to be the same and remain constant. This assumption simplifies the presentation of the model. Relaxing this assumption does not change the interpretation of the results.

Due to the inverse relationship between the lending rate and the demand for bank credit, the demand function of banks' lending service, assumed to be linear, can be written as:

$$p = x - y(nq_d + q_f) \tag{1}$$

where *p* is the market lending rate; q_d and q_f are the quantities of credit output of each domestic bank and the foreign bank respectively; *x* and *y* are the intercept and slope parameters that determine the position and steepness of the linear and inverse relationship between price and quantity of the banking service in the market. Parameters *x* and *y* are assumed to be constant.

The revenues of the two types of banks can be derived from (1), which is

$$R_i = \left[x - y(nq_d + q_f) \right] q_i \tag{2}$$

for *i=d, f*.

The model assumes that domestic banks face a constant marginal cost *c*, which includes funding costs and the original level of overhead costs. Additionally, the non-competitive assumption of the banking environment implies that domestic banks are less efficient than foreign banks. Therefore, domestic banks would pay adjustment costs *A* to take advantage of the positive spillover effects and keep up with foreign rivals. The major component of *A* is the investment domestic banks make to upgrade their services, technologies, banking skills, and management. It may also include the extra costs incurred to stay in the competition, for example, the costs needed to keep and train specialized personnel, or to serve less credit-worthy customers. Adjustment costs *A* is a result of the "transmission effect" as proposed by Uiboupin (2004), and is a decreasing function of the competitiveness (*Z*) of the banking sector.

Meanwhile, in addition to the same marginal cost *c* (as their borrowing costs are assumed to be the same), the foreign bank has to pay an additional cost *T* in serving the host country consumers. *T* represents the additional costs needed for the foreign bank to overcome the regulatory restrictions. *T* is also a decreasing function of *Z*, an indicator of the banking competitiveness. Therefore, marginal costs *MC* and total costs *C* of the two types of banks can be written as:

$$MC_d = c + A \Rightarrow C_d = (c + A)q_d \tag{3}$$

where $A \sim f(Z)$.

$$MC_f = c + T \Rightarrow C_f = (c + T)q_f \tag{4}$$

where $T \sim g(Z)$.

The marginal revenue of the foreign bank is determined by the partial differentiation of equation (2) for *i=f*. According to Francois & Wooton (2001a), two assumptions have to be made: (1) firms set quantity strategically (Cournot assumption); (2) domestic banks do not react by adjusting quantities subsequently ($\frac{\partial q_d}{\partial q_f} = 0$). Then the foreign bank's marginal revenue would be:

$$MR_f = \frac{\partial R_f}{\partial q_f} = x - y(nq_d + 2q_f) \tag{5}$$

We come up with the quantity reaction function of the foreign bank by equating marginal revenue (5) to marginal cost (4):

$$q_f(q_d) = \frac{x - (c + T) - ynq_d}{2y} \tag{6}$$

According to Francois and Wooton (2001a), the marginal revenues of the domestic banks depend on the assumed structure of the home market. If the home market is highly regulated as assumed in this case, each bank would act in collaboration with other domestic banks by adjusting output quantity by the same anticipated amount. The marginal revenue of each domestic bank can be determined by the partial differentiation of equation (2) for *i=d*:

$$MR_{dn} = \frac{\partial R_d}{\partial q_d} = x - y(2nq_d + q_f) \tag{7}$$

We derive the reaction function for domestic banks by equalizing marginal revenue (7) to marginal cost (3):

$$q_d(q_f) = \frac{x - c - A - yq_f}{2ny} \tag{8}$$

4.2. Market Equilibrium

By interacting the foreign bank's reaction function (6) with the reaction function of domestic banks (8), market equilibrium can be solved:

$$q_d^* = \frac{x - c - 2A + T}{3ny} \tag{9}$$

$$q_f^* = \frac{x - c + A - 2T}{3y} \tag{10}$$

Substituting expressions (9) and (10) into the demand function (1), we derive the equilibrium price (or the equilibrium lending rate) in the market:

$$p^* = \frac{x + 2c + A + T}{3} \tag{11}$$

Profits π equals to the difference between a bank's revenue and its cost:

$$\pi_d^* = p^* q_d^* - C_d \tag{12}$$

$$\pi_f^* = p^* q_f^* - C_f \tag{13}$$

Substituting expressions (3), (9), and (11) into equation (12), and inserting expressions (4), (10), and (11) into equation (13), the total profits for each domestic bank and the foreign bank can be expressed as follows:

$$\pi_d^* = \frac{(x - c - 2A + T)^2}{9ny} \tag{14}$$

$$\pi_f^* = \frac{(x - c + A - 2T)^2}{9y} \tag{15}$$

The implications of the above results will be fully discussed in the following section. Testable hypotheses are also developed based on the discussions.

5. Model Discussions and Hypotheses Development

5.1. Management Efficiency: Model Assumptions

A low level of market competition may lead to cost and labor inefficiency, which results in high overhead costs. It is argued that foreign penetration introduces competitive pressures to domestic banking sectors. In order to keep up with foreign rivals and survive, domestic banks would try to reduce their operating expenses. In addition to adopting a tightfisted approach, banks also typically merge and/or adopt new technologies to help reduce overhead costs. Following the convention,

lower operating/noninterest expenses is used as an indicator of the improvement in management efficiency.

However, for banks that have been operating in less competitive banking environment, the capability to improve cost efficiency and labor productivity are limited. Meanwhile, foreign banks come in with much more advanced banking techniques and skills needed for more efficient operation. In order to keep up with the rivals and take advantage of the positive spillover effects in the long run, less competitive banking industries have to invest heavily in the upgrade/modernization of technology, management, and personnel training. The magnitude of the presumed operating cost decline can be partially offset initially by the adjustment costs/investments. The operating costs can even rise if heavy adjustment costs/investments are needed in less competitive banking sectors.

For economies with a more competitive banking environment, the initial investments in modern bank techniques and practices have already been made. So there would be no immediate increase in adjustment costs and investments. On the contrary, those investments start to generate its return and spillovers take effect. For example, local banks may have benefited from their exposure to more advanced risk management and internal control practices, better corporate governance, and more advanced banking services and skilled banking personnel. Banks that are used to more intensive competition are able to further improve cost efficiency to withstand tough competition, although the decline in operating costs would possibly be marginal.

Based on the above discussions, we propose the following hypothesis to show the impact of foreign entry on local banks' management efficiency (as measured by operating expenses) under different competitive environments:

Hypothesis 1. *In the short run, foreign entry leads to a decline in the operating expenses of domestic banks under a competitive banking environment; under a less competitive banking environment, foreign entry leads to rising operating expenses for domestic banks. The average impact is ambiguous.*

According to H1, we expect to find the competitiveness of the pre-existing banking environment to have a downward impact on the operating expenses of domestic banks upon foreign entry. The domestic-banking-sector model illustrated in this paper uses the rising adjustment costs assumption under a noncompetitive banking environment setting.

5.2. Earnings and Profits

5.2.1. Market Share

In the numerator of expression (9), $q_d^* = \dfrac{x - c - 2A + T}{3ny}$, there is a negative sign in front of *A*

and a positive sign for *T*. Therefore, domestic banking sector that pays a smaller amount of adjustment costs would gain a larger market share than those who have to pay a large amount to deal with foreign entry, when other things are equal. In other words, with the improvement of banking efficiency (due to more intense intra-industry competition, inter-industry competition, and/or simply more exposure to foreign competition), the loss of market share by domestic banks is mitigated.

Meanwhile, the positive sign of *T* in the numerator of expression (9) indicates that in countries where foreign banks face more entry and activity restrictions, domestic banks tend to gain more market share. The implication is that, with the improvement of market contestability, domestic banks should lose some market share immediately upon entry.

On the contrary, expression (10), $q_f^* = \dfrac{x - c + A - 2T}{3y}$, shows that foreign banks' market share

is positively related to the adjustment costs (*A*) that domestic banks pay, and negatively related to the regulatory barriers against their activities and entry (*T*).

Suppose *Z* is a single indictor for the competitiveness of a banking sector, then the relationship between Z and domestic banks' market share should be ambiguous. Specifically, the relationship is determined by the comparison of the sensitivity of *A* and *T* to the change of *Z*. A detailed illustration of the ambiguous relationship between competitiveness indicator and equilibrium outputs of two types of banks is provided in Appendix A. In general, expression (9) shows that foreign entry drives down the market share of local banks if contestability is not seriously limited. Competitive domestic banks tend to suffer lower losses (in terms of market share) than uncompetitive local banks upon foreign entry. However, a significant lack of contestability can even lead to higher market shares of domestic banks.

5.2.2. Interest Rate Spread

Conventional borrowing and lending operations are at the center of the commercial banking business. Interest spreads are the major source of bank earnings and profits. Greater net interest margins reflect either operational inefficiency or market power.

In general, competition increases deposit taking and lending. Thus lending rate drops and deposit rate rises, which eventually reduce margins. However, if the banking environment is highly concentrated or segmented, or if there is a significant lack of contestability, then the entry of foreign banks *per se* would not introduce effective competition immediately. Specifically, multinational banks may only concentrate on specific market niches, typically a small number of large clients. Domestic markets are then forced to concentrate their resources to the market segments they have a comparative advantage in and explore lending and borrowing opportunities there. Thus the decline in interest margin may not be as significant as it would be otherwise. Moreover, if regulatory protection and restrictions still exist, local banks can remain attractive to deposits without raising the rates significantly due to inefficient competition, particularly because of protection, preferred treatment, and network, etc. There also can be moral hazard problem when local banks take on high-risk high-return activities to compete. Therefore, interest spreads might even rise for domestic banks with strong market position and those supported by regulatory authorization to compensate for the increased overhead costs.

The domestic banking sector model previously presented supports the arguments. Interest margin equals lending rate minus borrowing rate. Based on expression (11), ($p^* = \dfrac{x + 2c + A + T}{3}$),

we derive the equilibrium interest spread upon foreign entry:

$$S^* = \frac{x - c + A + T}{3} \tag{16}$$

Expression (16) shows that the equilibrium interest spread upon foreign entry is positively related to adjustment costs of domestic banks (*A*) and additional costs paid by foreign banks to overcome regulatory restrictions (*T*). Although interest margins should generally decline as a result of increased competition, expression (16) implies that in an uncompetitive banking environment, banks are motivated to reduce the decline and even charge higher interest rate spreads to cover their extra costs—adjustment costs for domestic banks and costs paid to overcome regulatory barriers and restrictions in the case of foreign banks. As previously discussed, moderated decline or even an increase in interest margin can be achieved when there is obvious market segmentation and/or lack of market contestability.

We thus propose the following hypothesis on the impact of foreign entry on local banks' interest rate spread:

Hypothesis 2. *In the short run, foreign entry has downward pressure on local banks' interest rate spread on average; the magnitude of the (presumed) decline is positively related to the pre-existing banking competitiveness in the host market.*

We expect that under a competitive banking environment, interest rate spread of local banks declines immediately upon foreign entry. Under a less competitive banking environment, the

magnitude of the decline is smaller. Interest spread can even increase in banking sectors that are highly segmented, protected, or regulated.

5.2.3. Profitability

Because of the spillover effects of foreign entry, local banks are able to provide a wider variety of products and services, improve cost efficiency, and operate with stronger corporate governance over time. As a result, foreign entry will lead to higher and more stable bank earnings and profits in the long run (Crystal, et al., 2002). Immediately upon foreign entry, however, increased competition can eliminate excess profits or drive down the average profitability level of all the banks in theory.[2]

However, the anticipated decline in profits might not occur if the pre-existing banking environment in a host country/economy is highly uncompetitive. The domestic bank model previously specified suggests that the relationship between foreign entry and local banks' profitability under a less competitive banking environment is ambiguous. Expressions (14),

$\pi_d^* = \dfrac{(x - c - 2A + T)^2}{9ny}$, and (15), $\pi_f^* = \dfrac{(x - c + A - 2T)^2}{9y}$, indicate that the relative magnitudes of A

and T affect the profits of two types of banks.

Focusing on the profits of local banks (expression (14)), when both A and T exist, it is not clear whether an improvement in the competitiveness of the banking environment would help or hurt domestic banks' profits.[3] Specifically, if there is a single indicator of banking competitiveness Z, the impact of Z on banks' equilibrium profits should be determined by the sign of (x-c) in expression (14), as well as the relative "competitiveness elasticity" of A and T. Appendix B provides a detailed illustration of the ambiguous relationship between competitiveness indicator and the equilibrium profits of two types of banks.

The ambiguous relationship under the "A>0 and T>0" situation can be explained conceptually. According to the following accounting identity, banks' profits are determined by four factors reported in the income statement, including net interest margins (*NIM*), non-interest income (*NII*), overhead costs (*OVERHEAD*), and loan loss provisioning costs (*LLP*) (Claessens, et al., 2001):

$$PROFIT \,/\, TA = NIM + NII \,/\, TA - OVERHEAD \,/\, TA - LLP \,/\, TA \qquad (17)$$

TA refers to total assets in (17). In an uncompetitive banking environment, when inefficient domestic banks lose market share to foreign entrants (especially when contestability is not significantly restricted as illustrated in expression (9)), both interest and non-interest income would decline. As discussed previously, overhead costs are assumed to increase due to the need to pay for the adjustment costs/investments, which also contributes to a decline in the profits. Additionally, if local banks continually charge high provisions to account for deteriorating asset quality, banks' earnings and profits would dampen further. However, domestic banks can use other ways to improve their profitability, especially when they have superior market positions and/or are highly protected.

First, as indicated in the discussion about interest rate spread, it is possible for domestic banks to charge higher interest spreads in some market segments if they have strong market position and/or such position is supported and strengthened by regulatory authorization.

The second way is to diversify bank income by increasing fee-income products. Although the ability of less efficient banks to diversify their income is limited, regulations that restrict foreign banks' participation in fee-based activities would benefit local banks and moderate the drop in their profits.

Finally, banks are likely to take on high- return but high-risk activities, both in their

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[2] If local banks are able to find ways to reduce their operating costs, the decrease in the average profitability level will be marginal.

[3] There can be special circumstances where $A≈0$ and T>0, or A>0 and $T≈0$. Expression (14) can be further discussed based on these two special cases. This study assumes that A>0 and T>0 and A and T are positively correlated (since Z is a decreasing function of both A and T).

interest-based or fee-based products, to meet the imminent need to improve profitability and stay in the competition. In some cases, it can easily become a moral hazard problem if (1) banks use this strategy just to take advantage of the highly protective government regulation and/or (2) necessary risk analysis is not performed and loan loss provisions are not sufficiently provided.

In sum, the natural reaction to rival foreign competition is to reduce costs and increase/diversify incomes. Banks that have been operating in an uncompetitive environment may not be able to effectively reduce their operating expenses; overhead costs can even increase due to the need to deal with the transmission effect and make adjustment investments. Profits drop further if asset quality deteriorates. On the other hand, however, the decline in profits can be reduced if domestic banks charge higher interest spreads, explore fee-based activities, and/or take on additional risks to compete (with or without making adjustments to LLPs). Local banks tend to adopt these strategies to moderate the short-term profit decline if they hold superior market position and/or are highly protected by the government regulation.

As a result, in a less competitive banking environment, the impact of foreign entry on local banks' profitability is ambiguous because the "uncompetitiveness" has an upward impact on each of the four determinants identified in expression (17). As indicated by expression (14) under the model's framework, a key factor is the relative magnitudes of the adjustment investments/costs paid by domestic banks and their capability to improve their profitability under the regulatory protection against foreign rivals.

In conclusion, when all the determinants of bank profits are taken into consideration, it is hard to predict the exact relationship between the magnitude of the presumed decline in profits upon foreign entry and the pre-existing banking competitiveness. Assuming that a bank's profits are mainly determined by its net interest margin, we propose the following two hypotheses to account for the impact of foreign entry on bank profits:

Hypothesis 3. In the short run, foreign entry has downward pressure on local banks' profits on average; the relationship between the magnitude of the (presumed) decline in profits and the pre-existing competitiveness of the banking environment in the host market is ambiguous.

Hypothesis 4. Based on the assumption that banks' profits are primarily determined by their net interest margins, the magnitude of the (presumed) decline in local banks' profits upon foreign entry is positively related to the pre-existing banking competitiveness in the host market.

To sum up, under a less competitive banking environment, overhead costs of domestic banks are assumed to rise immediately upon foreign entry due to the need to pay for the adjustment costs. The presumed decline in interest rate spreads would be partly mitigated because local banks tend to increase the margins to cover the adjustment costs needed to keep up with the foreign rivals. Their ability to raise the interest rate spreads is negatively related to the banking sector competitiveness (especially the contestability and market concentration dimensions). Similarly, the presumed decline in local banks' profits upon foreign entry is smaller if local bank are able to charge higher interest spreads, explore fee-based activities, and/or take on additional risks to compete under a less competitive banking environment, especially if their market positions are authorized by regulatory protections. Both theoretical illustration and conceptual arguments lend support to the hypotheses developed in this section.

6. Concluding Remarks

A large and growing body of empirical research finds that cross-country differences in various institutional factors influence the impact of foreign bank entry (e.g., Hermes & Lensink, 2001, 2004; Lensink & Hermes, 2004; Bayraktar & Wang, 2004). Well-developed theoretical models are needed to guide the empirical investigation of the role of institutional factors in affecting the FDI implications.

This article develops a theoretical framework to examine how competitive environment may affect the short-term impact of foreign entry on domestic banks' operating efficiency in emerging markets. Based on the model specifications, four testable hypotheses are proposed to show how overhead costs, interest rate margin, and profits may respond to increased banking competition

caused by foreign entrants. The model suggests that foreign entry *per se* may not be associated with immediate improvement of intermediation and cost efficiency in domestic banks, largely due to the need to pay for the adjustment costs.   Moreover, interest rate spreads may also rise in order to cover the adjustment costs needed to keep up with the foreign rivals. The increase in spread can be achieved without significant loss of market share/business volume only when there is substantial protection/market segmentation due to regulations. The overall impact of foreign entry on domestic banks' profitability would be ambiguous and depend on relative magnitude of various factors. Generally, immediate efficiency gains, if any, are only concentrated in more competitive banking sectors, especially those with higher level of banking freedom.

Longitudinal studies can be conducted to test the four hypotheses proposed in this paper. Attention should be paid to the construction of the key variable of the "competitive environment." As indicated, banking competition can be approached from three perspectives (Laeven and Claessens, 2004). "Intra-industry Competition" may be measured by market structure indicators such as Herfindahl-Hirschman Index. "Market Contestability" is more about the regulatory dimension and therefore could be based on survey data on banking regulation. "Inter-industry Competition" focuses on the competition from non-bank financial sectors. Indicators of the development level of stock market in the host nation may be used as a proxy.

The issue of foreign penetration is particularly important for banking regulators and policy makers in emerging markets, where the financial sectors are mostly bank- dominated and relatively fragile. Theoretical model developed in this paper shows that it takes time for domestic banks to truly benefit from competition effects and spillover effects caused by foreign entry. Host nation's institutional endowments, competitive environment more specifically, may be the key driver behind FDI implication. With additional evidence from empirical studies, better decisions can be made to address controversial policy issues related to regulatory stringency, the degree of market access, and the speed at which a banking sector should be opened to foreign competition.

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Appendix A. Competitiveness and Equilibrium Outputs

Assume $A=\alpha-\beta Z$, $T=\gamma-\delta Z$, where $\alpha>0$, $\beta>0$, $\gamma>0$, and $\delta>0$; Z is an indicator of the real conduct of banking competition.

Substituting A and T into expression (9) and (10), the equilibrium output of each domestic bank and foreign bank can be written as:

$$q_d^* = \frac{(x+\gamma-2\alpha-c)+(2\beta-\delta)Z}{3ny}$$

(A.1)

$$q_f^* = \frac{x+\alpha-c-2\gamma+(2\delta-\beta)Z}{3y}$$
(A.2)

Since $n>0$ and $y>0$, q_d^* would be an increasing function of Z for a domestic bank if $\beta > \frac{1}{2}\delta$. That is, when the "competitiveness elasticity" of adjustment costs is more than half of that of the extra costs paid by foreign banks to overcome the regulatory restrictions, the improvement in the competitiveness of the banking environment would increase the equilibrium market share of domestic banks. When $\beta < \frac{1}{2}\delta$, the opposite is true.

For the foreign bank, q_f^* would be an increasing function of Z if $\delta > \frac{1}{2}\beta$. That is, when the "competitiveness elasticity" of extra costs for regulatory restrictions is more than half of that of domestic banks' adjustment costs, the improvement in the banking competitiveness would increase the equilibrium market share of foreign banks. When $\delta < \frac{1}{2}\beta$, the opposite is true.

Appendix B. Competitiveness and Equilibrium Profits

Assume $A=\alpha-\beta Z$, $T=\gamma-\delta Z$, where $\alpha>0$, $\beta>0$, $\gamma>0$, and $\delta>0$; Z is an indicator of the real conduct of banking competition.

Substituting A and T into expression (14) and (15), the equilibrium profits of each domestic bank and foreign bank can be written as:

$$\pi_d^* = \frac{[x+\gamma-2\alpha-c+(2\beta-\delta)Z]^2}{9ny}$$
(B.1)

$$\pi_f^* = \frac{[x+\alpha-c-2\gamma+(2\delta-\beta)Z]^2}{9y}$$
(B.2)

Expression (B.1) can be written as

$$\pi_d^* = \frac{(x+\gamma-2\alpha-c)^2 + (2\beta-\delta)^2 Z^2 + 2(x+\gamma-2\alpha-c)(2\beta-\delta)Z}{9ny}$$
(B.3)

Since $n>0$, and $y>0$, π_d^* would be an increasing function of Z for a domestic bank if one of the following two conditions is satisfied:

(1) $x + \gamma > 2\alpha + c$ and $\beta > \frac{1}{2}\delta$;

(2) $x + \gamma < 2\alpha + c$ and $\beta < \frac{1}{2}\delta$.

Likewise, π_d^* would be a decreasing function of Z for a domestic bank if one of the following two conditions is satisfied:

(1) $x + \gamma > 2\alpha + c$ and $\beta < \frac{1}{2}\delta$;

(2) $x + \gamma < 2\alpha + c$ and $\beta > \frac{1}{2}\delta$.

For the foreign bank, expression (B.2) can be written as

$$\pi_f^* = \frac{(x + \alpha - c - 2\gamma)^2 + (2\delta - \beta)^2 Z^2 + 2(x + \alpha - c - 2\gamma)(2\delta - \beta)Z}{9y} \tag{B.4}$$

Therefore, π_f^* would be an increasing function of Z for a foreign bank if one of the following two conditions is satisfied:

(1) $x + \alpha > c + 2\gamma$ and $\delta > \frac{1}{2}\beta$;

(2) $x + \alpha < c + 2\gamma$ and $\delta < \frac{1}{2}\beta$.

π_f^* would be a decreasing function of Z for a foreign bank if one of the following two conditions is satisfied:

(1) $x + \alpha > c + 2\gamma$ and $\delta < \frac{1}{2}\beta$;

(2) $x + \alpha < c + 2\gamma$ and $\delta > \frac{1}{2}\beta$.