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Acquisition versus greenfield: The impact of the mode of foreign bank entry on information and bank lending rates

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Abstract

Policy makers often decide to liberalize foreign bank entry but at the same time restrict the mode of entry. We study how different entry modes affect the interest rate for loans in a model in which domestic banks possess private information about their incumbent clients but foreign banks have better screening skills. Our model predicts that competition is stronger if market entry occurs through a greenfield investment and therefore domestic banks' interest rates are lower. We find empirical support for our results for a sample of banks from ten Eastern European countries for the period 1995-2003.

Keywords: Banking, Foreign Entry, Mode of Entry, Interest Rate, Asymmetric Information
JEL-Classification: G21, D4, L31

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Empirical evidence shows that, in emerging markets, foreign banks are more profitable and more efficient than domestic banks, but are less profitable in more developed countries. These contrasting findings heat the debate about the extent to which foreign bank entry benefits customers. Traditional industrial organization literature predicts that bank entry leads to more competition which should ultimately help borrowers. Indeed, foreign bank presence in emerging countries does increase access to loans, especially for large and transparent firms. Differences in the distribution of information between domestic and foreign banks may, however, obstruct a comparable impact on lending to small and more opaque firms. These firms are often captured by their domestic bank and barred from borrowing from foreign banks. To date, the impact of the *mode* of foreign bank entry - foreign acquisition versus foreign *de novo* or greenfield investment - on the initial distribution of information and the consequent degree of competition and lending conditions has been largely ignored.

Because governments are often concerned about *cherry picking strategies* of foreign banks in the credit market, they retain (sometimes illegal) barriers to entry. Foreign banks are sometimes not allowed to have majority stakes in private domestic banks. Some domestic policy makers have been reluctant to grant bank licenses that allow foreign investors to start a *de novo* bank. While foreign *de novo* banks are more profitable and efficient than foreign acquired banks, it is unclear whether different modes of entry affect domestic bank lending conditions and competition in the same way. This is especially important for emerging markets where firms are heavily dependent on bank financing.

In this paper we try to fill this void. We provide a theoretical framework that outlines how the distribution of information about potential debtors differs between foreign and domestic banks and how this difference depends on the mode of entry. Consequently, this will influence the degree of competition and the average lending rate for borrowers. The predictions of the model are tested using data on entry modes of foreign banks in ten Eastern European countries. Because Eastern Europe has witnessed a dramatic increase in foreign bank entry over the past decade (foreign bank market shares increased from approximately ten percent in 1995 to almost 70 percent in 2003), it provides a unique laboratory for analyzing the impact of the mode of foreign bank entry on bank interest rates.

The crucial difference between foreign and domestic banks is in their ability to acquire information in the credit market. Domestic banks gain information about their incumbent firms during a previous business relationship. Both the domestic and the foreign bank have the same degree of information about firms that have just entered the credit market. However, in our setting, the screening skills of the foreign banks are better than those of the domestic bank. A foreign bank enters by means of a greenfield investment only if its advantage in screening new applicant firms compensates its disadvantage of having no information about incumbent firms. A foreign acquired bank inherits a credit portfolio that contains information about the quality of incumbent firms. In addition, the acquired bank can generate information by screening applicants. The mode of entry thus determines the distribution of information between foreign and domestic banks and thus affects the degree of competition. Therefore, the mode of entry generates a

differential *competition effect*. Since we empirically analyze the lending rate for borrowers subsequently, we take into account the way a bank's portfolio composition of new applicants and incumbent firms depends on the mode of entry. In contrast to new applicants, successful incumbent firms can signal their type. For these firms, there is perfect competition which drives down the interest rate. Thus, the higher the share of successful incumbent firms, the lower the average lending rate demanded by acquired banks will be. We refer to this effect as the *portfolio composition effect*.

We provide the first analysis of the effects of the mode of foreign bank entry on the credit market of the host country. Our analysis has three main results. First, domestic banks require higher lending rates from new applicants than foreign banks do. Since a foreign bank will enter only if it is better in generating information, it can undercut the domestic bank's lending rate. Second, competition is stronger when a foreign bank enters via a greenfield investment rather than by acquiring an existing bank. The stronger the information advantage of the foreign bank, the weaker the position of the domestic bank, and the higher the domestic bank's lending rate will be. When the domestic bank charges a higher interest rate, the foreign bank can extract rents from borrowers. Thus, the competition effect is more pronounced in the case of entry through a greenfield investment. Third, the average lending rates of foreign and domestic banks depend on the composition of their portfolios. Incumbent firms - about which domestic and acquired banks have *soft* information - face a hold-up problem because they cannot signal their type. However, the higher the share of successful incumbent firms that are able to signal their type, the lower the average lending rate demanded by acquired banks will be.

We use bank balance sheets to derive lending rates for a panel of 236 banks in ten Eastern European countries for the period 1995-2003. We find empirical support for our results by using panel data estimation methods. Consistent with the previous literature, we find that foreign bank presence impacts bank interest rates negatively. On average, foreign banks tend to charge lower lending rates than their domestic counterparts. We also find indications of a differential competition effect: domestic bank lending rates are lower when entry takes place mainly via greenfield investment.

The remainder of this paper is organized as follows. In section I, we review the related literature. A model of bank market entry is presented in section II. We derive the credit contract offered in the case of greenfield investment and in the case of acquisition. We discriminate between the interest rates demanded from new applicants and from incumbent firms. Based on the comparison of the interest rates under different entry mode regimes, we derive testable hypotheses in Section III and investigate the empirical validity of the model for banks operating in ten Eastern European countries. Section IV concludes.

I. Literature

This paper is related to both the theoretical and empirical literatures of foreign bank entry. The theoretical literature has highlighted the problems of asymmetric information in lending faced by new entrants and incumbent banks, which makes it harder for the former to enter the credit markets. Dell'Ariccia et al. (1999) show that when entrant banks are unable to distinguish between good and bad borrowers, foreign bank entry comes to a standstill. They develop a model in which two banks possess private information about the customers they financed in the past. When new firms enter the credit market, neither bank has information about the firms' type. In a first step, the authors demonstrate that the smaller of the two banks makes zero expected profit. This result is used to show that a new entrant would make an expected loss, because it faces a higher share of unprofitable firms that switch from the incumbent bank to the new entrant which has less information.

Dell'Ariccia and Marquez (2004) extend the model and assume that one of the lenders possesses an informational advantage. They study the case where the bank with less information capital has a cost advantage in extending credit. They show that spreads are higher in markets characterized by more severe information asymmetries. As a consequence, it is profitable to finance borrowers whose profitability is lower. If an uninformed lender with lower costs enters, the incumbent bank reacts and finds it more profitable to lend to firms in more opaque sectors. A different set-up is chosen by Detragiache et al. (2006), in which the foreign bank has a cost advantage in processing hard information whereas the domestic bank is better able to use soft information. They show that foreign bank entry may result in *cream-skimming* and ultimately lead to a lower degree of financial intermediation.[1] In contrast to these papers, we assume that all banks have identical cost structures. In addition, foreign banks differ from domestic banks because they are able to screen applicants. Thus, we model the advantage of foreign banks more explicitly.[2] Furthermore, we compare different modes of foreign bank entry by modelling the differences between the information endowment of greenfield and acquired banks in terms of information.

Martinez Peria and Mody (2004) analyze empirically how foreign bank participation and market concentration affected bank spreads in a sample of five Latin American countries during the late 1990s. Their results suggest that foreign banks are able to have lower spreads than domestic banks.[3] Furthermore, they find that acquired banks have relatively higher spreads than foreign *de novo* banks. The authors give two possible explanations for why greenfield banks have lower spreads than acquired banks. First, greenfield banks may be more concerned than foreign acquired banks are with gaining market share, and this leads them to set prices more aggressively, thus benefiting domestic borrowers. Second, due to differences in initial informational conditions, these types of banks might not be able to charge the same spreads. More specifically, as is argued by Dell'Ariccia and Marquez (2004), *de novo* banks will have little information about domestic borrowers and will thus focus on more transparent (and thus more competitive) market segments.[4] We go one step further and distinguish between two types of foreign

bank - greenfield banks that rely on hard information only and acquired banks that rely on both types of information.

Bank market entry in developing countries differs substantially from that in industrialized countries. Eastern Europe is a region with one of the highest shares of foreign participation in the banking sector (Papi and Revoltella (2000)). In 2003, in the new EU member states the share of foreign banks in total banking sector assets amounted to about 55 percent. This was at a time when foreign banks were almost absent in the large EU15 countries (ECB, 2005). This is surprising, because there are no formal restrictions on bank market entry in the EU. Interestingly, foreign-owned banks in developed countries are less profitable than domestic banks (IMF, 2000).[5] However, the opposite situation is found in developing countries. Foreign ownership in these countries increased significantly during the last decade and a majority of assets is now owned by foreign banks. Furthermore, in developing markets foreign banks have a higher profitability than domestic banks (Claessens et al. (2001)).

Some studies focus on the profitability and efficiency of foreign banks in Eastern Europe. Bonin et al. (2005) analyze whether privatization improves bank performance for the 10 largest banks in 6 transition countries in Eastern Europe. Their results indicate that foreign-owned banks are the most efficient (see also Weill (2003)). Majnoni et al. (2003) investigate how foreign ownership affects the cost and profit efficiency of banks in Hungary. They find that, because greenfield banks offer a wider range of financial services, they are more profitable than acquired banks. According to Havrylchyk and Jurzyk (2006) this result is due to a selection effect as foreign banks have acquired less profitable banks.

Using data at both bank and firm level, Giannetti and Ongena (2005) study the impact of foreign bank entry in Eastern Europe on firms' access to credit. They find that firms, especially large domestic firms, benefit from the presence of foreign banks.[6] In contrast, De Haas and Naaborg (2005) document that foreign bank entry in Eastern Europe has not led to a persistent bias of credit supply towards large multinational corporations. Instead, increased competition and the improvement in lending technologies have led to a gradual expansion towards the SME and retail markets. Naturally, foreign bank lending behavior will depend on the legal environment of the host country in which it operates. Haselmann et al. (2005) show that an improvement in the legal protection of creditors in Eastern Europe is positively related to the banks' willingness to lend, especially for foreign banks.

II. A Model of Bank Market Entry

A. Setup of the Model

We study the market entry decision of a bank in a one-period framework. We take as given the bank-firm relationships which have been established in the past. To capture these effects, we use a setup similar to that of Dell'Ariccia et al. (1999). Before starting the analysis, we describe the characteristics of the borrowers and the banking sector.

Firms We distinguish between different groups of borrowers (see Figure 1). First, there are incumbent firms that have established a bank relationship in the past. Second, there are new firms that have just entered the credit market. The total number of firms is normalized to 1; the share of incumbent firms is μ, that of new firms is $(1-\mu)$. The incumbent firms that have already established a bank relationship consist of successful firms and old firms and represent a share of π and $(1-\pi)$. The *successful firms* possess a track record that enables them to signal their type.[7] A share p of *old firms* will be profitable in the future and are referred to as *good firms*.[8] A share $(1-p)$ will fail and they are called *bad firms*. Through the bank relationship, the incumbent bank has perfect information about the profitability of the old firms and knows which firms are good and which are bad. However, the outside bank cannot distinguish between the good and the bad old firms but knows that a fraction p of the old firms is good. Moreover, there are *new firms* that enter the credit market. No bank has information about the type of an individual new firm. It is common knowledge that there is a share of q good firms and a share of $(1-q)$ bad firms among the new firms. All firms that apply for credit to a certain bank for the first time are treated as new applicants unless they can provide a track record.[9]

Three types of firms can invest in new projects, successful, old, and new. However, only the successful, the good old and the good new firms will succeed and generate a payoff of X with certainty. Bad old firms and bad new firms will always fail. In order to carry out the project, firms need to invest an amount I. Since they do not have own liquid funds, the investment has to be credit-financed.

[Figure 1]

Banks We study different scenarios of entry into the banking sector. We assume that, after bank market entry, there is Bertrand competition on the credit market between the domestic and the foreign bank. The cost of raising funds is the same for both domestic and foreign banks and is normalized to 0.[10] The domestic bank is the bank with which the incumbent firms have built a business relation in the past. The domestic bank has perfect information about the incumbent customers. This assumption can be interpreted as the domestic bank having access to soft information that it has accumulated over the years by, for example, maintaining lending relationships.[11] The extent to which a foreign bank

possesses soft information depends on the mode of entry. A *de novo* bank does not have such soft information. Both foreign greenfield and foreign acquired banks do, however, observe - as does the domestic bank - hard information. The foreign bank can, via a superior screening technology, process this hard information better than the domestic bank can. For modelling purposes, we assume that the domestic bank does not possess any screening technology. The foreign bank's screening technology generates a signal about the profitability of the firm, which is correct with probability s ($s > 0.5$).[12] The foreign bank receives the profitability signal without incurring any additional costs. The idea behind this is that the foreign bank uses the screening technology it has built in the home market in order to limit the losses in the market it has just entered. Incorporating screening costs needlessly burdens the calculations and does not change the results. We assume that there is no formal information sharing about borrowers' credit histories.[13] Moreover, we assume that banks have no constraints with regard to lending capacity.

Timing Before the credit market game starts, the incumbent bank learns the type of all old firms in its portfolio. There are two rounds in which the banks offer credit. First, both banks make offers to new applicants. Second, the incumbent bank makes offers to successful and good old firms.[14] New firms apply to both banks in order to increase their chance of receiving a loan. Finally, firms choose which bank to borrow from and invest. Provided both banks offer a loan, firms choose the bank with the lower interest rate. If both banks demand the same repayment, new firms apply in proportion to their share in the population. Old firms stay with their incumbent bank if both the incumbent banks and the outside bank demand the same repayment. Finally, the payoffs are realized and firms repay if they are successful.

The lending rate that we derive in the empirical part is the average rate offered to new applicants and incumbent customers. In the theoretical analysis, we first analyze the terms of the credit contract offered to new applicants. Next, we investigate the lending behavior of banks vis-à-vis the incumbent customers. We show that bank loan portfolios depend on the mode of entry. We refer to this effect as the *portfolio composition effect*. The composition of the loan portfolio determines how sensitive bank repayments are to the *competition effect*. In each step of the analysis, we first discuss entry via a greenfield investment, then entry via acquisition, and finally compare the two modes of entry.

B. Credit Contract Offered to New Applicants

B.1. Market Entry through Greenfield Investment

We first derive the credit contract offered by the domestic bank. The domestic bank has perfect information about all old firms. Therefore, it will only lend to the good old firms and will deny credit to bad old firms since giving them credit would imply making an expected loss. Suppose the domestic bank were to serve all new firms that apply for credit. Since it has no screening skills, the minimal repayment it requires, $\underline{R_D^G}$,

is determined by the break-even condition for serving the whole market, i.e., when the domestic bank undercuts the repayment demanded by the foreign bank. Formally, this condition can be written as:

$$q\underline{R}_D^G - I = 0 \text{ or} \tag{1}$$

$$\underline{R}_D^G = \frac{I}{q}. \tag{2}$$

The minimal repayment of the foreign bank, $\underline{R}_F^G$, is derived by studying the average quality of the firms that applies when the foreign bank serves the whole market. The foreign bank finances all the bad old borrowers that have given a positive signal during the evaluation of the credit proposal. It also finances all new firms with a positive signal. Since the signal is imperfect, a share of $(1-s)(1-p)$ old borrowers and $(1-s)(1-q)$ new borrowers receive credit although they are not creditworthy. The break-even condition is given by:

$$\mu(1-\pi)(1-s)(1-p)(-I) + (1-\mu)\left(qs\left(\underline{R}_F^G - I\right) + (1-q)(1-s)(-I)\right) = 0. \tag{3}$$

This condition determines the minimal repayment as:

$$\underline{R}_F^G = I\frac{\mu(1-\pi)(1-s)(1-p) + (1-\mu)(qs + (1-q)(1-s))}{(1-\mu)sq}. \tag{4}$$

Since the foreign bank has to incur a fixed cost K for entering the market, it will do so only if it makes a positive profit on the credit market. This will be the case if its minimal repayment satisfies $\underline{R}_F^G < \underline{R}_D^G$. This implies that, given $\underline{R}_D^G = \frac{I}{q}$, the foreign bank makes positive profits whenever it serves the whole market.

In equilibrium, banks mix continuously over the range $[\underline{R}, X)$ or do not bid at all. Given these minimal repayments, banks decide about their required repayment R_i^G, $i = D, F$, the cumulative distribution function F_i^G and the probability of denying credit $prob_i^G(D)$. Proposition 1 shows the resulting equilibrium in mixed strategies.

Proposition 1 *If the foreign bank enters through a greenfield investment, there exists an equilibrium in mixed strategies in which repayments received from new applicants are higher for the domestic bank than for the foreign bank:*

- *The domestic bank offers a contract to new applicants with repayment in the range* $\left[\frac{I}{q}, X\right]$*, according to the following cumulative distribution function:*

  $F_D^G(R) = (qR - I)\frac{s}{qsR - 2qsI - I + sI + qI} \;\forall\; R_D^G \in \left[\frac{I}{q}, X\right)$

  and does not make an offer with probability $prob_D^G(D) = I(1-q)\frac{2s-1}{qsX - 2qsI - I + sI + qI}$.

- *The foreign greenfield bank offers a contract to new applicants with repayment in the range* $\left[\frac{I}{q}, X\right]$*, according to the following cumulative distribution function:*

$$F_F^G(R) = (qR - I)\,\frac{1}{qsR - 2qsI - I + sI + qI} \;\forall\; R_F^G \in \left[\frac{I}{q}, X\right)$$

$$\text{and } prob\left(R_F^G = X\right) = \frac{qX(-1+s) - I(2qs - s - q)}{qsX - 2qsI - I + sI + qI}.$$

Proof. See the Appendix. ■

From proposition 1, it is easy to see that the value of the domestic bank's cumulative distribution function is always a fraction, s, of the foreign bank's cumulative distribution function, i.e., $F_D^G(R) = sF_F^G(R)$. Thus, R_D^G first order stochastically dominates R_F^G. This implies that the expected repayment demanded by the domestic bank will be higher than the one demanded by the foreign *de novo* bank.

The domestic bank decides not to offer a credit contract with positive probability because it faces a so-called *winner's curse problem*. Suppose the foreign bank offers a lower repayment, then all the new firms that apply to the domestic bank are those denied credit by the foreign bank after they had given a bad signal. In order to limit the risk of ending up with a loss, the domestic bank will deny credit with a positive probability $prob_D^G(D)$. This probability increases as the screening technology of the foreign bank improves. The intuition is that if the foreign bank has a better screening technology, the average quality of firms that apply to the domestic bank deteriorates. To avoid losses, the domestic bank therefore rations credit with a higher probability.

The foreign bank will only enter the market if it has an absolute advantage in terms of information. When the foreign bank decides to enter, the domestic bank will have an informational disadvantage relative to the foreign bank with respect to the new applicant firms. For each repayment, the foreign bank makes the same expected profit, which is given by:

$$\begin{aligned} & \mu(1-\pi)(1-s)(1-p)(-I) + (1-\mu)\left(qs(\underline{R}_D^G - I) + (1-q)(1-s)(-I)\right) \\ = \;& I\left((1-\mu)(1-q)(2s-1) - \mu(1-\pi)(1-s)(1-p)\right). \end{aligned} \tag{5}$$

Corollary *Foreign banks only enter through greenfield investment if their screening skills are high enough, i.e.,* $s > \widetilde{s} = \frac{\left((1-q+\mu q-\mu p-\mu\pi+\mu\pi p)+\frac{K}{I}\right)}{(2-2q+2\mu q-\mu-\mu p-\mu\pi+\mu\pi p)}$.

Entry through a greenfield investment is attractive only if $I((1-\mu)(1-q)(2s-1) - \mu(1-\pi)(1-s)(1-p)) > K$. Rearranging this condition, we find that the quality of the signal generated by screening must exceed $\widetilde{s}$. Naturally, the higher the fixed cost of market entry, K, the higher $\widetilde{s}$ has to be. The higher I, the amount of credit needed, the lower is $\widetilde{s}$. Comparative statics further show that the higher the share of old firms, the higher the screening quality of the foreign banks must be.

This corollary explains why banks find greenfield investment attractive in emerging markets. In these economies, there are many *de novo* firms that have not yet established a bank relationship. Therefore, the share of applicants whose type is known neither by the foreign nor by domestic banks is high. The threshold $\widetilde{s}$ indicates how much better the foreign bank must be than the domestic bank, which, by assumption, does not receive an informative signal. Consequently, better screening skills of domestic banks increase $\widetilde{s}$. This explains why, in industrialized countries, where domestic banks do have sophisticated screening tools, market entry through greenfield investment is less attractive for foreign banks.

B.2. Market Entry through Acquisition

We assume that initially there are two identical banks. One of the banks is sold to a foreign bank for a price P^A which is exogenously given. When taking over the bank, the foreign bank acquires information about all the customers of the existing bank. Moreover, it can implement its screening technology without any costs, and screening generates the same quality signals as in the case of a greenfield investment. As before, the domestic bank has information about the quality of its old customers. Now, the acquired bank also has information about the stock of customers the domestic bank inherited from the past. This could come from the credit files it receives through the acquisition or the staff it continues to employ. The bank staff possesses soft information about the firms that have already established a bank relationship.

Analogously to the case of greenfield investment, we determine the minimal repayments necessary for the domestic and the foreign bank, respectively. When serving the whole market, the break-even condition for the domestic bank is determined by the quality of the firms that receive credit. Since the domestic bank does not screen, it serves the customers who apply, i.e., all bad old customers that switch banks. The number of bad old firms that apply to the domestic bank is $\mu(1-\pi)0.5\,(1-p)$. Formally, the break-even condition is given by:

$$\mu(1-\pi)0.5\,(1-p)\,(-I)+(1-\mu)\,(q\underline{R}_D^A-I) = 0 \text{ or} \tag{6}$$

$$\underline{R}_D^A = I\frac{1-\frac{1}{2}\mu(1-\pi)\,(1-p)}{(1-\mu)\,q}. \tag{7}$$

Unlike the domestic bank, the foreign bank screens its applicants. Consequently, the foreign bank finances only those firms that generate a positive signal. The break-even condition is given by:

$$\mu(1-\pi)0.5\,(1-s)\,(1-p)\,(-I)+(1-\mu)\,(qs(\underline{R}_F^A-I)+(1-q)\,(1-s)\,(-I))=0. \tag{8}$$

The minimal repayment for the foreign bank is given by:

$$\underline{R}_F^A = I\frac{\frac{1}{2}\mu(1-\pi)\,(1-s)\,(1-p)+(1-\mu)\,((1-q)\,(1-s)+qs)}{(1-\mu)\,sq}.$$

It is easy to show that $\underline{R}_D^A > \underline{R}_F^A$. This implies that the foreign bank has positive profits whenever it demands exactly $\underline{R}_D^A$.[15] Since each repayment has to generate the same expected payoff, the foreign bank makes an expected profit on the credit market. The foreign bank decides to enter the credit market if the expected profit exceeds the acquisition price P^A.

Proposition 2 describes the equilibrium in mixed strategies in more detail:

Proposition 2 *If the foreign bank enters through acquisition, there exists an equilibrium in mixed strategies in which repayments received from new applicants are higher for the domestic bank than for the foreign bank:*

- *The domestic bank offers a contract to new applicants with a repayment in the range* $[I\frac{1-\frac{1}{2}\mu(1-\pi)(1-p)}{(1-\mu)q}, X]$*, according to the following cumulative distribution function:*

  $F_D^A(R) = \frac{1}{2}\frac{s(2qR-2\mu qR-2I+\mu I+\mu pI+\mu\pi I-\mu\pi pI)}{(1-\mu)(qsR-2qsI-I+sI+qI)} \;\forall\; R_D^A \in \left[I\frac{1-\frac{1}{2}\mu(1-\pi)(1-p)}{(1-\mu)q}, X\right)$

  and does not make an offer with probability $prob_D^A(D) = 1 - F_D^A(X)$.

- *The foreign acquired bank offers a contract to new applicants with a repayment in the range* $[I\frac{1-\frac{1}{2}\mu(1-\pi)(1-p)}{(1-\mu)q}, X]$*, according to the following cumulative distribution function:*

  $F_F^A(R) = \frac{1}{2}\frac{(2qR-2\mu qR-2I+\mu I+\mu pI+\mu\pi I-\mu\pi pI)}{(1-\mu)(qsR-2qsI-I+sI+qI)} \;\forall\; R_F^A \in \left[I\frac{1-\frac{1}{2}\mu(1-\pi)(1-p)}{(1-\mu)q}, X\right)$

  and $prob\left(R_F^A = X\right) = 1 - F_F^A(X)$.

Proof. See the Appendix. ■

Again, $F_D^A(R) = sF_F^A(R)$, such that the domestic bank's expected repayment is always higher than the one demanded by the acquired bank.

B.3. Comparison

We compare the credit contracts when a foreign bank enters through either a greenfield investment or acquisition. Since the entry mode determines the degree of competition, we investigate the competition effect here. The results are summarized in proposition 3.

Proposition 3 *Both the domestic bank and the foreign bank receive higher expected repayments from new applicants in the case of acquisition than they do in the case of a greenfield investment.*

Proof. See the Appendix. ■

In order to study expected repayments of the domestic bank, we compare the cumulative distribution functions of repayments for both modes of entry. We can show that both $F_D^A(R) < F_D^G(R)$ and $prob\left(R_D^A = X\right) > prob\left(R_D^G = X\right)$ hold. Thus, higher repayments are assigned a higher probability in the case of acquisition. This is confirmed when we look at the probability that $R = X$ (the probability with which the foreign bank demands the highest repayment). This probability is higher in the case of acquisition and, as a consequence, the repayment is higher in this case. Since the expected repayment demanded by the domestic bank exceeds the repayment asked by the foreign bank, we obtain the same result for foreign banks.

We have shown that competition is stronger in the case of a greenfield investment. The explanation for this result is as follows. The market entry strategy influences how information about old firms is distributed between the two competing banks. Whatever the mode of entry, the domestic bank is always the weaker bank. However, the information disadvantage of the domestic bank with respect to the foreign bank does depend on the entry mode.

In the case of a greenfield investment, the relative position of the domestic bank is determined by the amount of information it has about its old customers compared to the screening skills of the foreign bank. The relative position of the domestic bank is weaker in the case of acquisition than in the case of greenfield investment. Now the foreign bank does not only possess a better screening technology but it also has information about old firms. Consequently, the foreign bank is better able to prevent bad old firms from receiving credit than in the case of greenfield investment. This also implies that the domestic bank receives more applications from bad old firms. Due to the lack of screening techniques, it finances the bad old firms coming from the foreign bank. This means that, in the case of acquisition, the domestic bank needs a higher repayment than the foreign bank in order to make zero expected profits.[16] The degree to which the domestic bank needs a higher repayment determines the scope the foreign bank has for extracting rents from the firms by demanding a higher repayment.

C. Credit Contract Offered to Incumbent Firms

The population of incumbent customers consists of successful firms and old firms. The incumbent bank can always make an offer that matches the one offered by the outside bank. The incumbent firms will then demand credit from the bank with which they have already established a relationship. Thus, the outside option of the incumbent firms determines the repayment that their incumbent bank can demand.

Successful firms Since the successful firms can prove that they have been successful in the past, there is perfect information about their type and competition for these firms

is perfect. Successful firms will always repay I to whichever bank they demand a loan from.

Old firms The incumbent bank does not provide credit to bad old firms in order to avoid making expected losses. The repayment that the incumbent bank demands from good old firms depends on their outside option which is determined by the entry mode.

We next show that the mode of entry generates a differential portfolio composition effect. Thus, the average lending rate which a bank receives from incumbent firms depends on both the competition and the portfolio competition effect.

C.1. Market Entry through Greenfield Investment

The good old firms that apply to an outside bank face the risk of not receiving an offer. If a good old firm which had a relationship with the domestic bank asks for credit at the foreign *de novo* bank, it is rejected with probability $(1-s)$. This is the probability with which the screening generates an incorrect signal. In this case, the domestic bank is the only bank that is willing to lend. It exerts its market power by demanding $R = X$. If the foreign bank makes an offer, the domestic bank adapts its offer to the outside offer and also demands R_F^G. Note that, because incumbent firms stay with their incumbent banks, a foreign *de novo* bank does not have incumbent customers. Proposition 4 characterizes the average repayment a domestic bank receives from its incumbent firms.

Proposition 4 *If the foreign bank enters through a greenfield investment, the domestic bank receives an average repayment* $E(R_D^G(in))) = \frac{\pi I + (1-\pi)p(sE(R_F^G) + (1-s)X)}{\pi + (1-\pi)p}$ *from successful and good old firms.*

Proof. See the Appendix. ■

C.2. Market Entry through Acquisition

In contrast to the previous case, the foreign bank now has a customer base. Good old firms from the acquired bank have the chance of applying to the domestic bank. However, the domestic bank only offers credit with probability $F_D^A(X)$. With probability $prob_D^A(D)$, the domestic bank does not make an offer at all. In this case, the foreign bank is able to act like a monopolist. Proposition 5 characterizes the average repayment of both the domestic and the acquired bank.

Proposition 5 *If the foreign bank enters through acquisition,*

- *the foreign bank receives an average repayment from successful and good old firms that equals:*
  $E(R_F^A(in))) = \frac{\pi I+(1-\pi)p(F_D^A(X)E(R_D^A)+(1-F_D^A(X))X)}{\pi+(1-\pi)p}$.
- *the domestic bank receives an average repayment from successful and good old firms that equals:*
  $E(R_D^A(in)) = \frac{\pi I+(1-\pi)p(sE(R_F^A)+(1-s)X)}{\pi+(1-\pi)p}$.

Proof. See the Appendix. ■

C.3. Comparison

The average lending rate that we observe in the data depends on the competition effect and the portfolio composition effect. We compare the repayments offered to the new applicants to those offered to the incumbent firms in order to evaluate how the two effects are related to each other.

Domestic bank In Proposition 3, we have shown that a domestic bank demands more from its new applicants if the foreign bank enters through acquisition rather than through a greenfield investment. From propositions 4 and 5, it follows that the domestic bank also demands more from its incumbent customers in the case of acquisition. We therefore obtain the following result about the domestic bank's average repayment.

Proposition 6 *The domestic bank demands lower average repayments if market entry is through greenfield investment rather than through acquisition.*

Proof. See the Appendix. ■

The fact that market entry through greenfield investment reduces the domestic bank's repayments more than with entry via acquisition follows from the competition effect. Since competition is more intense in the case of a greenfield investment, the repayments that the domestic and the foreign bank demand from new applicants are lower. The repayment that the foreign bank offers to new applicants determines the repayment that the domestic bank offers to good old customers. Thus, competition drives down lending rates for new applicants and good old firms. Since the rates for both types of customer are lower in the case of greenfield investment, the different composition of the domestic bank's loan portfolio in the case of greenfield investment and acquisition does not matter for the comparison.

Foreign bank From the previous analysis we know that acquired banks demand higher repayments from new applicants than greenfield banks do. In order to derive

a prediction about the average lending rate (received from incumbent customers and new applicants) we compare the repayment that an acquired bank offers to incumbent firms with the repayment that a greenfield bank offers to new applicants. Proposition 7 describes the result.

Proposition 7 *The competition and portfolio composition effects work in different directions for foreign banks. The competition effect reduces the average repayment of the greenfield bank compared to that of an acquired bank. However, the portfolio composition effect reduces the average repayment of the acquired bank but does not affect the average repayment of the greenfield bank.*

Proof. See the Appendix. ■

Proposition 7 indicates that, depending on the relative share of successful firms, acquired banks, on average, may charge lower lending rates compared to greenfield banks. The result of the comparison depends on the two opposing effects. On the one hand, acquired banks have successful firms that pay low interest rates in their portfolio. On the other hand, competition is less intense than in the case of a greenfield investment. Therefore, the interest rate that an acquired bank offers to good old firms and new applicant firms is higher. The higher the share of successful firms, the more likely it is that the repayment of the greenfield bank is higher than the repayment of the acquired bank.

III. Foreign Entry in Eastern Europe

A. Econometric Specification

We investigate the validity of the theoretical model for a sample of 236 banks in ten Eastern European countries for the period 1995-2003. These countries have been characterized by a large inflow of foreign banks that entered by different modes of entry. We verify empirically two main hypotheses that follow from the theory:

(1) foreign greenfield banks charge lower interest rates than foreign acquired banks[17] and

(2) domestic banks charge relatively lower interest rates following greenfield entry compared to entry via acquisition.

In order to investigate the first hypothesis, we define a number of dummy variables that classify banks according to their mode of entry at each time t. D^{MA} is a dummy variable equal to one from the moment that a foreign bank acquires a domestic bank and obtains a majority ownership share. D^{G} is a dummy variable equal to one from the

moment that a bank enters as a foreign *de novo* bank with a majority foreign ownership share.[18]

For estimation purposes, we need to account for certain data limitations. First, our estimation sample ranges from 1995 to 2003, while we have constructed for each bank a complete ownership history, starting at the date of incorporation. Second, while our theoretical model provides static, one period, predictions, our empirical observation of the mode of entry comprises more than one time period. Therefore, we need to account appropriately for time dynamics in the econometric specification, given the above mentioned sample range limitation. To do this, we distinguish between foreign banks that were already foreign *before* the start of the sample (1995) and banks that became foreign *during* the sample period, either through a greenfield investment or a foreign acquisition. In order to investigate any potential lasting effects of the mode of entry on bank lending rates, we interact the within sample mode of entry dummy variables with the bank's age at each time t. As foreign banks become more acquainted with the market, differences in information asymmetries will gradually disappear. Moreover, domestic banks will benefit from positive spill-over effects following entry and invest in better screening technologies. We therefore expect that lending rates converge as banks grow older.[19]

For each bank i, in country j at time t, we define the real lending rate $r^L_{i,j,t}$ as follows:

$$r^L_{i,j,t} = \frac{RI_{i,j,t}}{\frac{1}{2}(L_{i,j,t-1} + L_{i,j,t})}, \tag{9}$$

with $RI_{i,j,t}$ interest income on customer loans and $L_{i,j,t}$ the volume of loans (net of loan loss reserves) taken from the *Bankscope* database. Because we are dividing a flow variable by a stock variable, we use the average of the stock variable between t and $t-1$. This allows for a better interpretation of our proxy as a bank's average received interest rate in one particular year t (see also Laeven and Majnoni, 2005).

Our econometric specification is:

$$\begin{aligned}
r^L_{i,j,t} &= \alpha_0 + \alpha_1 D^{MA}_{i,j,t} + \alpha_2 D^G_{i,j} + \alpha_3 MS^F_{j,t} + \beta X^k_{i,j,t} + \gamma_j + \lambda_t + \varepsilon_{i,j,t}, \qquad (10)\\
D^{MA}_{i,j,t} &= \text{Dummy for foreign acquired bank,}\\
D^G_{i,j} &= \text{Dummy for foreign greenfield bank,}\\
MS^F_{i,j} &= \text{Market share of foreign banks,}\\
X^k_{i,j,t} &= \text{Bank- and country-specific control variables.}
\end{aligned}$$

A pooled OLS estimation of this equation will be consistent as long as $\varepsilon_{i,j,t}$ is uncorrelated with the explanatory variables. When this condition holds, we are able to obtain consistent estimates of all parameters (including α_2) and make correct inferences when using robustly estimated standard errors.

Because α_2 cannot be estimated using a fixed effects error components model, we include country dummies γ_j and year dummies λ_t in the regression equation to control for a certain amount of unobserved heterogeneity in the data that could bias our results.

To investigate the second hypothesis - whether domestic banks' lending rates are lower with greenfield entry than with entry via foreign acquisition - we investigate how the respective market shares of foreign greenfield banks and foreign acquired banks impact domestic bank lending rates:

$$\begin{aligned} r^L_{i,j,t} &= \delta_0 + \delta_1 MS^{MA}_{j,t} + \delta_2 MS^{G}_{j,t} + \beta X^k_{i,j,t} + \gamma_j + \lambda_t + v_{i,j,t}, \qquad (11) \\ MS^{MA}_{j,t} &= \text{Market share of foreign acquired banks,} \\ MS^{G}_{j,t} &= \text{Market share of foreign greenfield banks.} \end{aligned}$$

From the theory, we expect domestic banks to reduce their interest rates more for both good old firms and new applicants when foreign banks enter through a greenfield investment rather than through acquisition. To test this differential competition effect, we differentiate foreign bank market share for the mode of entry by defining $MS^{MA}_{j,t}$ and $MS^{G}_{j,t}$. We expect a larger negative impact on domestic bank lending rates following entry via greenfield investment, i.e. $|\delta_2| > |\delta_1|$.

Next to variables that capture the mode of entry, we control for k banking sector-specific variables $X^k_{i,j,t}$ that are expected to determine bank lending rates similarly across banks. We include four bank-specific variables: (1) *Liquidity*: High cash holdings represent an opportunity cost of holding higher-yielding assets (e.g. loans) which can increase lending rates; (2) *Deposit rate*: Higher funding costs will lead banks to charge higher lending rates; (3) *Loan loss reserves*: The share of loan loss reserves is intended as a proxy for credit risk. A rise in credit risk will lead banks to increase their lending rates; (4) *Capital*: Banks need to hold regulatory capital as a buffer against credit risk. However, large capital holdings are costly for banks. Consequently, a high capital ratio may consequently lead to high lending rates.

We next include a number of country-specific variables. In order to be able to fully disentangle the impact of foreign greenfield banks on bank lending rates, we include the *Number of banks*. We control for bank market concentration by including the *Top 3 bank market share*. On the one hand, highly concentrated markets may make competition less intense, and this may lead to higher lending rates (Berger, 1995). On the other, highly concentrated markets may be the result of a consolidation process in which banks with superior management or production technologies have lower costs and thus can offer more competitive interest rates on loans, leading to a negative relationship between market concentration and lending rates. We include measures for *GDP growth* and the *Real short term interest rate* to account for country-specific macroeconomic developments. We indirectly control for the share of successful firms in a country by including a *Reform dummy variable* based on the EBRD index for enterprise reform. This index provides a ranking of the liberalization progress and institutional reform in the corporate sector. We

expect that the scope for establishing new businesses will increase as reform progresses, and consequently increase the demand for credit by new firms. We control for the presence of a *Credit registry* by including a dummy variable that equals one from the year of the incorporation of a credit registry onward, zero otherwise (taken from Djankov et al. (2007)). The incorporation of a credit registry induces a downward shift in the overall degree of information asymmetry in the banking market, and this is expected to lead to lower lending rates.

B. Data and Descriptive Statistics

We use annual data from 236 individual banks in ten Eastern European countries, namely Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia for the period 1995-2003, taken from the *Bankscope* database maintained by Fith/IBCA/Bureau Van Dijk. This database offers an extensive coverage of all banks operating in the ten countries that we consider and allows data to be compared across these countries and over time. Bureau Van Dijk issues CD-ROMs that report financial data up to each bank's last 8 available years. To extend the coverage, we merge bank balances and profit and loss accounts from *Bankscope 2002 - update October* and *Bankscope 2005 - update January*, so that we obtain a maximum of ten bank-year observations per bank from 1994 to 2003. This means that we do not exclude information from 1994 and 1995 about banks that are still active in 2003.[20] Due to the construction of our dependent variable in equation (9), we obtain an estimation sample of 9 years (1995-2003).

All data are expressed in common currency (USD) and care is taken that the same reference year is used for the exchange rate in both databases. We complete the data taken from the global format with data contained in the raw format, particularly the data on interest revenues. For all countries, except for Bulgaria, Hungary and Slovakia, we were able to extract interest revenues on customer loans from the raw data.[21]

We supplemented the *Bankscope* data with ownership information taken from central banks and banks' annual reports to classify banks according to their mode of entry. We obtained ownership information for each bank from the day of its incorporation and updated it on a yearly basis.[22] Any ownership changes made within a given bookyear t are recorded in that same year for the construction of the mode of entry variables.

We restrict our analysis to commercial banks and use consolidated statements only, each bank therefore appears only once in our sample. Our final dataset consists of an unbalanced panel of 1207 observations. Table I presents summary statistics of the variables used for estimation. About 40% of the observations in our sample are from foreign banks, of which 20% are from foreign acquired banks and 19% are from foreign greenfield banks. Although 16% of bank years are from banks that were already foreign owned before 1995, their average market share is less than 8%. Domestic banks acquired by a foreign bank within the sample encompass 17% of observations (with an average

market share of 23%), while within sample foreign *de novo* establishment amounts to 5% (with an average market share of 5%). The summary statistics indicate that, at the start of the 1990s, foreign entry mainly occurred via establishing a foreign *de novo* bank. Foreign acquired bank market shares, however, dominate greenfield bank market shares from 1997. With a wave of foreign acquisitions, bank markets became more and more concentrated. On average, the market share of the top 3 banks per country amounts to almost 60 percent.

[Table I]

C. Results

Table II presents the estimation results for equation (10). First, from column I it follows that foreign greenfield banks charge, on average, about 1.23% lower lending rates than domestic banks. Second, foreign acquired banks do not charge significantly less on average than either domestic (column I) or greenfield (column II) banks. When distinguishing between banks that were foreign owned before 1995 and those that entered later, older foreign banks do not demand significantly lower rates, on average (column III). However, our results indicate that banks that entered before 1995 as a foreign greenfield bank do charge significantly lower rates (column IV). We include age interactions in columns V and VI to control for bank-specific time dynamics. Linear age effects are never significant. The nonlinear age effects indicate that, while foreign greenfield banks charge about 7.72% less in the first year after entry, they gradually reduce the gap between them and domestic banks a few years after entry. The age dynamics for acquired banks show a different pattern, with initial higher rates that are gradually reduced in the years after entry. Third, a higher foreign bank share in loans has a significantly downward impact on the average lending rate, which supports the competition effect. This finding corroborates previous empirical literature (Martinez Peria and Mody (2004), Claessens et al. (2001)). The bank-specific control variables are significant and have the expected sign. Highly liquid banks, banks with higher deposit costs, a high share of loan loss reserves and capital tend to have higher lending rates. A large number of banks and the presence of a credit registry lead to lower rates, while a more concentrated market leads to lower lending rates.[23]

[Table II]

In Table III, we investigate whether there is a differential competition effect on domestic bank lending rates, depending on the mode of entry. We present separate regression results for the group of domestic banks. First, from column I, it follows that foreign entry has had a negative impact on domestic bank lending rates in our sample. Second, foreign greenfield bank market share has a positive impact on domestic bank lending rates, while foreign acquired bank market share has a negative impact (column II). This result indicates a positive impact on competition following foreign acquisition. From the theory, we expect that immediately after entry, competition will be more intense

following greenfield entry. The results in columns II and IV corroborate this prediction. Relatively younger foreign banks' market share (since 1995) has a significantly downward impact on domestic bank lending rates, while the opposite is true for older foreign banks (before 1995). When distinguishing between the mode of entry for within sample foreign entry, the results indicate that a one percent increase in foreign *de novo* market share leads to a reduction in domestic bank average lending rates of 0.23% compared to a reduction of 0.11% following a one percent increase in foreign acquired market share. These results indicate that competition is more intense when entry mainly occurs via a greenfield investment, although the two coefficients differ only marginally significantly. Within the framework of the theoretical model, these results can be interpreted as follows. Immediately after entry, foreign banks can impose more competition on domestic banks because of their superior screening skills. What domestic banks can demand will then depend on their weakness relative to the foreign bank. Because the greenfield bank has no access to soft information, its information advantage is small relative to that of a foreign acquired bank. Therefore, competition will be more intense. Over time, both domestic and foreign banks can get stronger by improving their screening capacity and acquiring more soft information. The results in column III suggest that, in our sample, domestic banks have become even weaker relative to foreign banks over time, because they need higher interest rates. This may be due either to a relatively slow adoption of new technologies or to foreign banks' aptitude to acquire *soft* information. The latter prediction, however, falls outside the theoretical model of section 3.

[Table III]

D. Robustness

We look into two robustness checks. First, one of the main assumptions underlying our empirical estimation strategy is that all explanatory variables are exogenous. However, including foreign bank market share might lead to a potential endogeneity problem. Second, we assume that there is no unobserved heterogeneity left in the data, i.e. we are not estimating an error components model. We implicitly assumed that our greenfield dummy captures all bank-specific time-constant heterogeneity across banks and that it is the only source of such time-constant heterogeneity across banks.

Endogeneity Observing a positive correlation between foreign bank market share - by either mode of entry - and lending rates does not provide a conclusive answer about the direction of causality. To alleviate doubts on causality, we instrument the market share of foreign banks, $MS^F_{j,t}$, as well as the market shares by mode of entry, $MS^{MA}_{j,t}$ and $MS^G_{j,t}$, with a number of preset, country-specific regulatory features that facilitated foreign bank entry in Eastern Europe.

The countries under analysis had shown widely different policies towards (the mode of) foreign bank entry (see Bonin et al. (1998)). Even though foreign bank entry was

sometimes allowed already early in transition - with changing restrictions to the mode of entry - there was a continuing reduction to the barriers of (the mode of) entry during the years we consider. After abolishing formal restrictions to entry, other obstacles gradually vanished: creditor right enforcement improved and credit registries - either private or public - were introduced to alleviate asymmetric information problems in lending (Djankov et al. (2007)). We assume that it is unlikely that foreign bank presence has systematically impacted all changes in regulation and those therefore provide legitimate candidates to instrument and exogenously determine foreign bank market shares.

The instruments that we use for foreign bank market share are the following. First, we use the *Creditor Rights Index* taken from Djankov et al., 2007. An improvement in the legal protection of creditors has been shown to be positively related to banks' willingness to lend, especially for foreign banks (Haselman et al., 2005; Giannetti and Ongena, 2005). Second, we include the *Number of domestic banks* to control for a country's remaining takeover potential. We expect this to be positively (negatively) correlated with the market share of foreign acquired banks (greenfield banks). Third, we include factors of the *Index of Economic Freedom* taken from the Heritage Foundation (2005) that capture a country's institutional aptitude for foreign bank entry.[24] The higher the score on a factor, the greater the level of government interference in the economy and the less economic freedom a country enjoys. It is therefore expected that foreign bank entry will be lower for countries that score high on these factors.

In Tables IV and V, we replicate the results of Tables II and III using an instrumental variable estimator. Tables A1 and A2 in the appendix show the estimation output for the first stage regressions. The results for foreign bank market share are largely corroborated for both the whole sample and the sample of domestic banks. For the sample of foreign banks, the market share becomes also significant. The J-statistics in Table IV however indicate that the null of the validity of the instruments can be rejected at the 1% level, casting doubt on the strength of our instruments. The results for the whole sample in Table IV may therefore be inconsistent because of a weak instrument problem. The J-statistics can, however, not be rejected for the sample of foreign or domestic banks. The results in Table V therefore strengthen our previous results with respect to the competition effect: in the first years after entry, foreign banks increase competition so that domestic banks reduce their lending rates. The impact of competition is, however, more pronounced following greenfield entry. This is in line with our theoretical prediction.

[Tables IV and V]

Error Components Our empirical specification in equation (10) implicitly assumes that there is no unobserved heterogeneity left in our data. When we relax this assumption, our estimation method can be adapted to allow for an unobserved fixed effect in the error term. Because we are interested in the estimation of α_2, our estimation method is restricted to a random effects estimator. Hausman specification tests, however, rejected the validity of the random effects (GLS) estimator in favor of the fixed-effects (within group) estimator that does not provide an estimate for α_2. Using a random-effects estimator

will therefore produce inconsistent parameter estimates. The Hausman specification test, moreover, does not allow us to draw any conclusions about the validity of the assumption of fixed unobserved heterogeneity (Wooldridge, 2002, p. 289). We therefore choose to use the pooled OLS estimator and estimate robust standard errors that are clustered on banks. This allows for both arbitrary heteroscedasticity and intra-bank correlation in the estimation of the standard errors.

IV. Summary

Foreign bank entry receives a great deal of attention in politics and the media. In this paper, we investigate the impact of the mode of foreign bank entry on the costs of financing. In a theoretical model we have shown that the mode of entry determines the distribution of information between foreign and domestic banks and that thus affects the degree of competition. Therefore, the mode of entry generates a differential competition effect. The predictions of the theoretical model reveal that the competition effect reduces the lending rate of the domestic bank more strongly if entry occurs through greenfield investment. The empirical evidence from ten Eastern European countries is in line with the predictions of the theoretical model and previous findings for foreign banks in emerging markets. On average foreign bank entry lowers interest rates. We also show that increased competition has a stronger impact on domestic banks after foreign *de novo* entry.

Our analysis does not explicitly address the question of what entry mode is optimal from the point of view of the foreign bank. However, our model does suggest that the optimal entry mode crucially depends on the characteristics of the host market and the costs of entry. Market entry by greenfield investment is unlikely to be attractive in established market economies where only few firms are new entrants in the credit market. Market entry by acquiring an existing bank is subject to considerably higher uncertainty in emerging markets, since there it is more difficult to determine the quality of the target bank's credit portfolio. These arguments already show that the optimal mode of entry depends on whether the host country is an established market economy or an emerging market.

Appendix: Omitted Proofs

A. Proof of Proposition 1

Step 1: We show that old customers stay with their incumbent bank.

- Bad old customers are denied credit by their incumbent bank because they generate a payoff of $0 < I$.
- Due to the sequential nature of offers, the foreign bank marginally underbids the domestic bank (and vice versa) and keeps its good old firms, i.e. $R_F^G = R_D^G$, because the old firms have a slight preference for the incumbent bank.

Step 2: We show that no equilibrium in pure strategies exists.

$\underline{R}_D^G$ denotes the repayment that the domestic bank needs to make zero expected profit.

Suppose there exists a symmetric equilibrium with $R_F^G = R_D^G > \underline{R}_D^G$. The foreign bank has an incentive to marginally undercut R_D^G and still make a positive expected profit. Suppose that $R_F^G = R_D^G = \underline{R}_D^G$. The foreign bank has an incentive to undercut the domestic bank and still make a positive expected profit. In this case, the domestic bank would make an expected loss and, thus, it would be better for it to make no offer at all.

Suppose there exists an asymmetric equilibrium in pure strategies. Suppose that $R_F^G > R_D^G > \underline{R}_D^G$. The foreign bank has an incentive to marginally undercut the domestic bank and make a positive expected profit. Suppose that $R_F^G > R_D^G = \underline{R}_D^G$. The foreign bank has an incentive to undercut the domestic bank and still make a positive expected profit. In this case, the domestic bank would make an expected loss and, thus, it would be better for it to make no offer at all. Suppose that $R_D^G > R_F^G \geq \underline{R}_D^G$. The domestic bank has an incentive to demand a marginally lower repayment than the foreign bank and make a non-negative profit.

Step 3: We show that $F_D^G(R)$ and $F_F^G(R)$ are continuous and strictly monotonously increasing in an interval $\left(\underline{R}_D^G, X\right)$.

Suppose that F_j^G, $j = D, F$, is discontinuous at R^*, i.e. there exists an atom in F_j^G, then bank i's action of playing $R^* - \epsilon$ strictly dominates playing $R^* + \epsilon$, $\epsilon > 0$. Therefore, bank i, $i \neq j$, $i = D, F$, will not bid a free-market repayment $[R^*, R^* + \epsilon)$. But then bank j can raise its repayment without losing customers, so R^* cannot be an optimal action for bank j. Hence, F_j^G must be continuous.

Suppose that F_j^G is non-increasing over some interval, i.e. there exists an interval $(R_a, R_b) \subseteq (\underline{R}, X)$ for which $f_i(R) = 0 \ \forall \ R\epsilon(R_a, R_b)$. But then $prob(R_i < R_j \mid R_i = R_a) = prob(R_i < R_j \mid R_i \epsilon (R_a, R_b))$, but profits are strictly higher for $R_i > R_a$ (conditional on winning), so that bank i maximizes its payoff by playing $R_i = R_b$ and hence would never offer a repayment in the interval. But then bank j can increase its profits by playing $R_j = R_b - \epsilon$ with positive probability, where $\epsilon < R_b - R_a$, since this will lead to strictly higher profits than any interest rate offer in a neighborhood of R_a. However, this contradicts the assumption that $f_i(R) = 0 \ \forall \ R\epsilon(R_a, R_b)$.

Step 4: We determine the equilibrium in mixed strategies as described in the proposition.

Consider the profit function of the domestic bank conditional on the offer of the foreign bank:

$$\Pi_D^G(R) = (1-\mu)\left(\left(1-F_F^G\right)(qR-I) + F_F^G\left((1-s)\,q\,(R-I) - s\,(1-q)\,I\right)\right) \forall R\epsilon\left[\underline{R}_D^G, X\right).$$

The domestic bank will participate only if $\Pi_D^G(R) \geq 0$ or

$$\lim_{R_D^G \to X}\left(1-F_F^G\right) \geq \frac{qsR - qR - 2qsI + Is + Iq}{qsR - 2qsI - I + Is + Iq}$$

There are two ways of getting $\lim_{R_D^G \to X}\left(1-F_F^G\right) > 0$:

- There is an atom at X in F_F^G. However, there cannot exist an atom in both F_F^G and F_D^G since then neither $F_F^G = X$ nor $F_D^G = X$ would be optimal.
- Either the domestic bank or the foreign bank does not always bid on the free market. As shown below, this has to be the domestic bank. This implies that its expected profit is zero because each offer generates the same profit.

Step 5: We determine the minimum repayment $\underline{R}_D^G$. $\underline{R}_D^G$ is determined by the condition that the domestic bank wins the free market with certainty:

$$\Pi_D^G\left(\underline{R}_D^G\right) = (1-\mu)\left(q\underline{R}_D^G - I\right) = 0$$

$$\underline{R}_D^G = \frac{1}{q}I$$

Step 6: We determine the expected profit of the foreign bank.

The return of the foreign bank for $\underline{R}_D^G$ is:

$$\begin{aligned}\Pi_F^G(\underline{R}_D^G) &= (1-s)\,\mu(1-\pi)\,((1-p)\,(-I)) + (1-\mu)\,(qs(\frac{I}{q}-I) + (1-q)\,(1-s)\,(-I)) \\ &= I\,((1-\mu)\,(1-q)\,(2s-1) - \mu(1-\pi)\,(1-s)\,(1-p)) \\ &\equiv \overline{\Pi}_F^G > 0\end{aligned}$$

Unless $\overline{\Pi}_F^G > 0$, the foreign bank would not enter because it has to cover the fixed cost of market entry K. Thus, it is shown that the domestic bank does not always bid on the free market and therefore makes zero expected profit.

Step 7: We determine the mixing probabilities.

Let us use the fact that $\Pi_F^G(R) = \overline{\Pi}_F^G$ and $\Pi_D^G(R) = 0$ for each repayment.

- For the foreign bank we determine $F_F^G(R)$ by setting

  $$\Pi_D^G(R) = (1-\mu)\left(\left(1-F_F^G\right)(qR-I) + F_F^G\left((1-s)\,q\,(R-I) - s\,(1-q)\,I\right)\right) = 0$$

  Accordingly, $F_F^G(R) = (qR-I)\,\frac{1}{qsR-2qsI-I+sI+qI} \forall R_F^G \,\epsilon\, \left[\frac{I}{q}, X\right)$
  and $prob\left(R_F^G = X\right) = \frac{qX(-1+s)-I(2qs-s-q)}{qsX-2qsI-I+sI+qI}$.

- For the domestic bank we determine $F_D^G(R_D^G)$ by setting

  $$\begin{aligned}\Pi_F^G(R) &= (1-s)\,\mu(1-\pi)\,((1-p)\,(-I)) + (1-\mu)\left(1-F_D^G\right)\cdot \\ &\quad (qs\,(R-I) + (1-q)\,(1-s)\,(-I)) \\ &= I\,((1-\mu)\,(1-q)\,(2s-1) - \mu(1-\pi)\,(1-s)\,(1-p)) \\ &\equiv \overline{\Pi}_F^G\end{aligned}$$

  Accordingly, $F_D^G(R) = (qR-I)\,\frac{s}{qsR-2qsI-I+sI+qI} \forall R_D^G \,\epsilon\, \left[\frac{I}{q}, X\right)$. With probability $prob_D^G(D) = I\,(1-q)\,\frac{2s-1}{qsX-2qsI-I+sI+qI}$ the domestic bank makes no offer at all.

Step 8: We determine the expected repayments the banks realize.

- For the domestic bank the expected repayment is

  $$\begin{aligned}E_D^G(R) &= \int_{\underline{R}_D^G}^{X} \left[(1-\mu)\left(\left(1-F_F^G\right)qR + F_F^G\,(1-s)\,qR\right)\right] dR \\ &= \int_{\underline{R}_D^G}^{X} [(1-\mu)(1-sF_F^G)qR]dR\end{aligned}$$

- For the foreign bank the expected repayment is

$$E_F^G(R) = \int_{\underline{R}_D^G}^{X} [(1-\mu)(1-F_D^G)sqR]dR$$

- We show that $E_D^G(R) - E_F^G(R) > 0$:
  Since $F_D^G = sF_F^G$, we can rewrite

$$\begin{aligned} E_F^G(R) &= \int_{\underline{R}_D^G}^{X} [(1-\mu)\left(1-sF_F^G\right)sqR]dR \\ &= sE_D^G(R). \end{aligned}$$

Q.E.D.

B. Proof of Proposition 2

The first three steps are analogous to the Proof of Proposition 1.

Step 4: We determine the equilibrium in mixed strategies as described in the proposition.

Consider the profit function of the domestic bank conditional on the offer of the foreign bank:

$$\Pi_D^G(R) = (1-\mu)\left(\left(1-F_F^G\right)(qR-I) + F_F^G\left((1-s)\,q\,(R-I) - s\,(1-q)\,I\right)\right)$$

$$\forall R \epsilon \left[\underline{R}_D^G, X\right).$$

The domestic bank will participate only if $\Pi_D^A(R) \geq 0$ or

$$\lim_{R_D^A \to X}\left(1-F_F^A\right) \geq \left(1-\left(\frac{1}{2}\frac{(\mu I + \mu I p - 2I + 2qR - 2\mu qR + \mu\pi I - \mu\pi pI)}{((1-\mu)\,(-I + Iq + qsR - 2qsI + Is))}\right)\right)$$

There are two ways for getting $\lim_{R_D^A \to X}\left(1-F_F^A\right) > 0$:

- There is an atom at X in F_F^A. However, there cannot exist an atom in both F_F^A and F_D^A since then neither $F_F^A = X$ nor $F_D^A = X$ would be optimal.
- Either the domestic bank or the foreign bank does not always bid on the free market. As shown below, this has to be the domestic bank. This implies that its expected profit is zero because each offer generates the same profit.

Step 5: We determine the minimum repayment $\underline{R}_D^A$. $\underline{R}_D^A$ is determined by the condition that the domestic bank wins the free market with certainty:

$$\Pi_D^A(R) = \mu(1-\pi)\frac{1}{2}(1-p)(-I) + (1-\mu)(qR-I) = 0$$

$$\underline{R}_D^A = I\frac{1-\frac{1}{2}\mu(1-\pi)(1-p)}{q(1-\mu)}$$

Step 6: We determine the expected profit of the foreign bank.

The return of the foreign bank for $\underline{R}_D^A$ is:

$$\begin{aligned}
\Pi_F^A(\underline{R}_D^A) &= (1-s)\mu(1-\pi)\left(\frac{1}{2}(1-p)(-I)\right) + (1-\mu)\cdot \\
&\quad \left(qsI\frac{\left(1-\frac{1}{2}\mu\right)(1-\pi)(1-p)}{q(1-\mu)} - I\right) + (1-q)(1-s)(-I) \\
&= \frac{1}{2}\left(\mu + \mu p + \mu\pi s(1-p) - 2(1-s)(q\mu+1-q) + 2(1-q)s(1-\mu)\right)I \\
&\equiv \overline{\Pi}_F^A > 0
\end{aligned}$$

Thus, it is shown that the domestic bank does not always bid on the free market and therefore makes zero expected profit. The foreign bank makes positive expected profits since it enters the credit market only if the expected profit exceeds the acquisition price P^A.

Step 7: We determine the mixing probabilities.

Let us use the fact that $\Pi_F^A(R_F^A) = \overline{\Pi}_F^A$ and $\Pi_D^A(R_D^A) = 0$ for each repayment.

- For the foreign bank we determine $F_F^A(R)$ by setting

$$\begin{aligned}
\Pi_D^A(R) &= \mu(1-\pi)\left(\frac{1}{2}(1-p)(-I)\right) + (1-\mu)\cdot \\
&\quad \left(\left(1-F_F^A\right)(qR-I) + F_F^A\left((1-s)q(R-I) - s(1-q)I\right)\right) \\
&= 0
\end{aligned}$$

  Accordingly, $F_F^A(R) = \frac{1}{2}\frac{(2qR-2\mu qR-2I+\mu I+\mu pI+\mu\pi I-\mu\pi pI)}{(1-\mu)(qsR-2qsI-I+sI+qI)} \forall R_F^A \in \left[I\frac{1-\frac{1}{2}\mu(1-\pi)(1-p)}{(1-\mu)q}, X\right)$ and $prob\left(R_F^A = X\right) = 1 - F_F^A(X)$.

- For the domestic bank we determine $F_D^A(R_D^A)$ by setting

$$\begin{aligned}\Pi_F^A(R) &= (1-s)\,\mu(1-\pi)\left(\frac{1}{2}(1-p)(-I)\right)\\ &\quad +(1-\mu)\left(1-F_D^A\right)(qs(R-I)+(1-q)(1-s)(-I))\\ &= \frac{1}{2}\left(\mu+\mu p+\mu\pi s(1-p)-2(1-s)(q\mu+1-q)+2(1-q)s(1-\mu)\right)I\\ &\equiv \overline{\Pi}_F^A\end{aligned}$$

  Accordingly, $F_D^A(R)=\frac{1}{2}\frac{s(2qR-2\mu qR-2I+\mu I+\mu pI+\mu\pi I-\mu\pi pI)}{(1-\mu)(qsR-2qsI-I+sI+qI)}\forall R_D^A\,\epsilon\left[I\frac{1-\frac{1}{2}\mu(1-\pi)(1-p)}{(1-\mu)q},X\right)$.
  With probability $prob_D^A(D)=1-F_D^A(X)$ the domestic bank makes no offer at all.

Step 8: We determine the expected repayments the bank realize.

- For the domestic bank the expected repayment is:

$$\begin{aligned}E_D^A(R) &= \int_{\underline{R}_D^A}^{X}\left[(1-\mu)\left(\left(1-F_F^A\right)qR+F_F^A(1-s)qR\right)\right]dR\\ &= \int_{\underline{R}_D^A}^{X}\left[(1-\mu)\left(1-sF_F^A\right)qR\right]dR\end{aligned}$$

- For the foreign bank the expected repayment is:

$$E_F^A(R)=\int_{\underline{R}_D^A}^{X}\left[(1-\mu)\left(1-F_D^A\right)sqR\right]dR$$

- We show that $E_D^A(R)-E_F^A(R)>0$:
  Since $F_D^A=sF_F^A$, we can rewrite

$$\begin{aligned}E_F^A(R) &= \int_{\underline{R}_D^A}^{X}\left[(1-\mu)\left(1-sF_F^A\right)sqR\right]dR\\ &= sE_D^A(R).\end{aligned}$$

Q.E.D.

C. Proof of Proposition 3

(1) We show that

$$E_D^G(R) - E_D^A(R) = \int_{\underline{R}_D^G}^{X} (1-\mu)\left(1 - sF_F^G\right) qRdR - \int_{\underline{R}_D^A}^{X} (1-\mu)\left(1 - sF_F^A\right) qRdR < 0$$

since for a given $\underline{R}$

$$(1-\mu)\left(1 - sF_F^G\right) qR - (1-\mu)\left(1 - sF_F^A\right) qR = \\ sqR\left(-F_F^G + F_F^A\right)(1-\mu) < 0$$

This term is negative because $F_F^G > F_F^A$ and $\underline{R}_D^G < \underline{R}_D^A$ as we will show.

If $F_F^A(R) < F_F^G(R)$ holds, then $prob\left(R_F^A = X\right) > prob\left(R_F^G = X\right)$. This relationship implies that the cumulative distribution function of repayments sets higher probability mass on higher repayments when the bank enter through acquisition instead of greenfield investment.

We show that $prob\left(R_F^A = X\right) > prob\left(R_F^G = X\right)$:

$prob\left(R_F^A = X\right) - prob\left(R_F^G = X\right) =$

$\left(\frac{1}{2}\frac{(-2qsX-2Iq+4qsI-2sI+2qsX\mu-I\mu+2I\mu q-4\mu qsI+2\mu sI+I\mu p+2qX-2qX\mu-I\mu\pi+I\mu\pi p)}{((-1+\mu)(qsX-I+Iq-2qsI+sI))}\right)$
$-\left(\frac{(Is+Iq+qsX-2qsI-qX)}{(qsX-I+Iq-2qsI+Is)}\right)$
$= \left(\frac{1}{2}I\mu\left(1+\pi\right)\frac{(1-p)}{((1-\mu)(qsX-I+Iq-2qsI+sI))}\right) > 0$

as $(qsX - I + Iq - 2qsI + Is) > 0$
(which can be seen from $prob_D^G(D) = I(1-q)\left(\frac{(2s-1)}{(qsX-2qsI-I+sI+qI)}\right) > 0$)

We also show that $\underline{R}_D^G < \underline{R}_D^A$:

$$\underline{R}_D^G - \underline{R}_D^A = \frac{1}{q}I - I\frac{1 - \frac{1}{2}\mu(1-\pi)(1-p)}{(1-\mu)q} = \frac{1}{2}I\mu\frac{-1-p-\pi(1-p)}{(1-\mu)q} < 0$$

(2) The same argument can be made for the expected repayments of the foreign bank.

The comparison of repayments between the two modes of entry is the same as for the domestic bank because the cumulative distribution function of the domestic bank is always a fraction s of the foreign bank's cumulative distribution function (see propositions 1 and 2). Q.E.D.

D. Proof of Proposition 4

If the foreign bank enters through greenfield investment, the domestic bank finances $\mu\pi$ successful firms from which it gets a repayment I. It also grants loans to $\mu(1-\pi)p$ good old firms. Their repayment depends on their outside option, i.e., on whether they receive an offer from the foreign bank. Provided they receive an offer, which happens with probability s, they repay R_F^G, otherwise they repay X. The total number of incumbent firms financed by the domestic bank is $\mu\pi+\mu(1-\pi)p$. Thus, the expected repayment from incumbent firms is $E(R_D^G(in)) = \frac{\pi I+(1-\pi)p(sE(R_F^G)+(1-s)X)}{\pi+(1-\pi)p}$. Note that the repayment of the incumbent firms depends on the repayments *offered* by the competing banks and not on the repayment *realized* by the competing bank. Therefore, we denote the incumbent firm's expected repayment by $E(R_D^G(in))$ in contrast to the bank's realized expected repayment which is denoted by $E_D^G(R)$. Q.E.D.

E. Proof of Proposition 5

In the case of acquisition, successful firms repay I, good old firms that do not get an outside offer X. If a good old firm receives an outside offer, the incumbent bank demands the same repayment as the outside bank: the acquired bank demands R_D^A, the domestic bank R_F^A.

The foreign bank finances 0.5μ successful firms and $0.5\mu(1-\pi)p$ good old firms. Thus, the foreign banks expected repayment from incumbent firms is $E(R_F^A(in)) = \frac{\pi I+(1-\pi)p(F_D^A(X)E(R_D^A)+(1-F_D^A(X))X)}{\pi+(1-\pi)p}$.

The domestic bank finances 0.5μ successful firms and $0.5\mu(1-\pi)p$ good old firms. Thus, the foreign banks expected repayment from incumbent firms is $E(R_D^A(in)) = \frac{\pi I+(1-\pi)p(sE(R_F^A)+(1-s)X)}{\pi+(1-\pi)p}$. Q.E.D.

F. Proof of Proposition 6

$$
\begin{aligned}
&E(R_D^G(in)) - E(R_D^A(in)) \\
&= \frac{(\pi I+(1-\pi)p(sE(R_F^G)+(1-s)X)))}{\pi+(1-\pi)p} - \frac{(\pi I+(1-\pi)p(sE(R_F^A)+(1-s)X)))}{\pi+(1-\pi)p} \\
&= \frac{(1-\pi)ps(E(R_F^G)-E(R_F^A))}{\pi+(1-\pi)p} < 0
\end{aligned}
$$

following from Proposition 3 where we have shown that $E(R_F^G) - E(R_F^A) < 0$.

Q.E.D.

G. Proof of Proposition 7

We compare the repayment the acquired bank demands from its incumbent firms with the repayment of the greenfield bank.

$E(R_F^A(in)) - E(R_F^G)$
$= \frac{\pi(I-E(R_F^G))+(1-\pi)p(F_D^A(X)(E(R_D^A)-E(R_F^G))+(1-F_D^A)(X-E(R_F^G)))}{\pi+(1-\pi)p}$

with

- $I - E(R_F^G) < 0$,
- $E(R_D^A) - E(R_F^G) > 0$,
- $X - E(R_F^G) > 0$

Q.E.D.

Appendix: The role of information sharing

Two sources are responsible for the superior information of incumbent banks. First, the incumbent bank has lent to firms in the past and can thus observe their type. Second, the incumbent bank obtains soft information by having a business relationship, for example, keeping a firm's account.

So far, we have assumed that there is no information sharing about the credit history of old firms, i.e., credit registries do not exist. How are our results affected when a credit registry is incorporated? Information sharing implies that there is no asymmetric information about the old firms' credit history. Old firms that have borrowed in the past can be identified as old firms and therefore are no longer pooled with new firms. As a result, bad old firms will not be financed, since all banks have the information that they are not credit-worthy. Good old firms can show their type to the outside bank. Therefore, there is perfect competition for good old firms and they no longer face a hold-up problem. As a result, interest rates for good old firms will decline to the rate demanded from successful firms. Competition for new applicant firms, which now are only new firms, does not change. For new firms, the foreign bank has the advantage of possessing a screening technology, and therefore remains the "stronger" bank. The information advantage of the domestic bank and the acquired bank with respect to old firms is, however, significantly reduced. As a result, the different entry modes converge in terms of information distribution because the information about old firms' credit history is now publicly available. With respect to soft information, the incumbent bank keeps its information advantage on firms' credit-worthiness.

Overall, the incorporation of a credit registry reduces asymmetric information and impacts negatively on average lending rates for all banks. Moreover, the average quality of loans granted increases because some of the bad old firms are no longer financed.

References

[1] Berger, Allen N., 1995, The Profit-structure Relationship in Banking: Tests of Market-power and Efficient-structure Hypotheses, *Journal of Money, Credit and Banking* 27(2), 404-431.

[2] Berger, Allen N., DeYoung, Robert, Genay, Hesna, and Udell, Gregory F., 2000, Globalization of financial institutions: Evidence from cross-border banking performance, in: *Brookings-Wharton Papers on Financial Activity* 3, 23-158.

[3] Besanko, David, and Thakor, Anjan V., 1987, Collateral and Rationing: Sorting Equilibria in Monopolistic and Competitive Credit Markets, *International Economic Review* 28(3), 671-689.

[4] Bonin, John P., Kalman Miszei, István P. Székely, and Wachtel, Paul, 1998, *Banking in Transition Economies: Developing Market-oriented Banking Sectors in Eastern Europe* (Edward Elgar Publishing: Cheltenham and Northampton).

[5] Bonin, John P., Hasan, Iftekhar, and Wachtel, Paul, 2005, Privatization Matters: Bank Efficiency in Transition Countries, *Journal of Banking and Finance* 29(1), 31-53.

[6] Claessens, Stijn, Demirgüç-Kunt, Aslí, and Huizinga, Harry, 2001, How Does Foreign Entry Affect Domestic Banking Markets, *Journal of Banking and Finance* 25, 891-911.

[7] Clarke, George R. G., Cull, Robert, and Martinez Peria, Maria Soledad, 2001, Does Foreign Bank Penetration Reduce Access to Credit in Developing Countries?, *World Bank Policy Research Working Paper* No. 2716.

[8] de Haas, Ralph, and Naaborg, Ilko, 2005, Does Foreign Bank Entry Reduce Small Firms' Access to Credit? Evidence from European Transition Economies, *De Nederlandsche Bank Working Paper* No. 50/August 2005.

[9] Dell'Ariccia, Giovanni, Friedman, Ezra, and Marquez, Robert, 1999, Adverse selection as a Barrier to Entry in the Banking Industry, *RAND Journal of Economics* 30(3), 515-534.

[10] Dell'Arricia, Giovanni, and Marquez, Robert, 2004, Information and Bank Credit Allocation, *Journal of Financial Economics*, 72 (1), 185-214.

[11] Detragiache, Enrica, Tressel, Thierry, and Gupta, Poonam, 2006, Foreign Banks in Poor Countries: Theory and Evidence, *IMF Working Paper* WP/06/08, January 2006.

[12] Djankov, Simeon, McLiesh, Caralee, and Shleifer, Andrei, 2007, Private Credit in 129 Countries, *Journal of Financial Economics*, forthcoming.

[13] DeYoung, Robert, and Nolle, Daniel, 1996, Foreign-owned banks in the US: Earning market share or buying it? *Journal of Money, Credit, and Banking* 28(4), 622-636.

[14] Dittus, Peter, and Prowse, Stephen, 1996, Corporate Control in Central Europe and Russia. Should Banks Own Shares?, in Roman Frydman, Cheryl W. Gray, and Andrzej Rapaczynski (eds.): *Corporate Governance in Central and Eastern Europe and Russia, Vol. 2., Insiders and the State* (Central European University Press, Budapest, 1996, 20-67).

[15] ECB, 2005, *EU Banking Structures* (European Central Bank, October 2005).

[16] Giannetti, Mariassunta, and Ongena, Steven, 2005, Financial Integration and Entrepre-neurial Activity: Evidence from Foreign Bank Entry in Emerging Markets, mimeo, Stockholm School of Economics.

[17] Gormley, Todd, 2006a, Banking Competition in Developing Countries: Does Foreign Bank Entry Improve Credit Access?, May 2006, available at http://ssrn.com/abstract=879244.

[18] Gormley, Todd, 2006b, Open Capital Markets in Emerging Economies: The Social Costs and Benefits of Cream-Skimming, May 2006, available at http://ssrn.com/abstract=896000.

[19] Haselmann, Rainer, Pistor, Katharina, and Vikrant, Vig, 2005, How Law Affects Lending, *Columbia Law and Economics Working Paper* No. 285, October 2005.

[20] Havrylchyk, Olena, and Jurzyk, Emilia, 2006, Profitability of Foreign Banks in Central and Eastern Europe: Does the Mode of Entry Matter?, mimeo, LICOS Leuven, February 2006.

[21] Heritage Foundation, 2005, Explaining the Factors of the Index of Economic Freedom, available at http://www.hermitage.com/research/features/index/downloads.cfm.

[22] IMF, 2000, International Capital Markets. Developments, Prospects, and Key Policy Issues, Chapter VI, International Monetary Fund, Washington DC, September 2000, 152 - 182, available at http://www.imf.org/external/pubs/ft/icm/2000/01/eng/.

[23] Laeven, Luc, and Majnoni, Giovanni, 2005, Does Judicial Efficiency Lower the Cost of Credit?, *Journal of Banking and Finance* 29(7), 1791-1812.

[24] Lehner, Maria, and Schnitzer, Monika, 2006, Entry of Foreign Banks and their Impact on Host Countries, SFB/TR 15 Discussion Paper No. 152, University of Munich, June 2006.

[25] Levine, Ross, 2004, Denying Foreign Bank Entry: Implications for Bank Interest Margins, in Luis Antonio Ahumada and J. Rodrigo Fuentes (eds.): *Bank Market Structure and Monetary Policy* (Santiago, Chile: Banco Central de Chile, 271-292).

[26] Majnoni, Giovanni, Shankar, Rashmi, and Vàrhegyi, Eva, 2003, The Dynamics of Foreign Bank Ownership: Evidence from Hungary, *World Bank Policy Research Working Paper* No. 3114, August 2003.

[27] Martinez Peria, Maria Soledad, and Mody, Ashoka, 2004, How Foreign Participation and Market Concentration Impact Bank Spreads: Evidence from Latin America, *Journal of Money Credit and Banking* 36(3), 511-537.

[28] Mian, Atif, 2006, Distance Constraints: The Limits of Foreign Lending in Poor Economies, *Journal of Finance*, 61(3), 1465-1505.

[29] Mester, Loretta, 1997, What's the Point in Credit Scoring? *Federal Reserve Bank of Philadelphia Business Review*, September/ October, 3-16.

[30] Papi, Luca, and Revoltella, Debora, 2000, Foreign Direct Investment in the Banking Sector: A Transitional Economy Perspective, in Claessens, Stijn and Jansen, Marion (eds.): *The Internationalization of Financial Services – Issues and Lessons for Developing Countries* (Kluwer Law International, The Hague, November 2000, 437-457).

[31] Sengupta, Rajdeep, 2006, Foreign Entry and Bank Competition, *Journal of Financial Intermediation*, forthcoming.

[32] Stein, Jeremy C., 2002, Information Production and Capital Allocation: Decentralized versus Hierarchical Firms, *Journal of Finance* 57(5), 1891-1921.

[33] Weill, Laurent, 2003, Banking Efficiency in Transition Economies. The Role of Foreign Ownership, *Economics of Transition* 11(3), 569-592.

[34] Wooldridge, Jeffrey M., 2002, *Econometric Analysis of Cross Section and Panel Data* (MIT Press, Cambridge, Massachussetts, London, England).

Notes

[1]A similar result is obtained by Gormley (2006a) who assumes that foreign banks have access to cheaper funds but their screening costs are higher. A study on India shows that foreign bank entry may reduce financial intermediation (Gormley, 2006b).

[2]In Sengupta (2006) the new entrant has lower costs and offers collateralized credit contracts to match the incumbent's information advantage.

[3]Equivalently, it is shown that restricting foreign bank entry increases the net interest margin (Levine, 2004).

[4]A similar argument is made by Stein (2002) who argues that banks with more hierarchical structures - here foreign banks - are more likely to rely on *hard information* rather than on *soft information*.

[5]See also De Young and Nolle (1996) and Berger et al. (2000) who find that foreign banks are less efficient than domestic banks in developed markets.

[6]This finding is in line with Mian (2006) and Clarke et al. (2001).

[7]We do not explicitly study collateralization. However, successful firms could be considered as firms that provide collateral in order to signal their type.

[8]The differentiation between old and new firms is independent of the activity of the firm in the product market. The distinction between old and new firms is only important with respect to the information that is revealed to the bank through the previous bank relationship, irrespective of whether the old firm has already applied for credit in the past.

[9]This assumption implies that the foreign bank does not distinguish between new firms and old firms - i.e. firms that already have a bank relationship - that apply for credit at a particular bank for the first time.

[10]Competition for primary deposits could play a role in the structure of the credit market (Besanko and Thakor (1987)). In many transition economies, however, credit-granting banks do not compete for primary deposits. Often, former savings banks are still the most important collectors of deposits, which they transfer to the credit-granting banks through the money market (Dittus and Prowse (1996)). For ease of theoretical exposition, we assume that all banks have the same funding costs. In the empirical analysis we control for differences in deposit funding costs.

[11]More generally, we can think of this information advantage as the result of maintaining a business relationship: "Small businesses are likely to have deposit accounts at the small bank in town,[...] and the information the bank can gain by observing the firms' cash flows can give the bank an information advantage in lending to these businesses" (Mester, 1997 p. 12).

[12]One could argue that bad old firms will be recognized more easily than bad new firms. One extension of the model could incorporate this notion by introducing differences in the technology precision between old and new firms. The results would, however, remain qualitatively unaltered.

[13]For the countries that we include in our empirical analysis, this is a valid assumption in the first years under consideration. We discuss the role of information sharing in the Appendix and control for the incorporation of credit registries in the empirical analysis.

[14]Bad old firms are no longer financed by their incumbent bank. In the presence of soft budget constraints, a fraction of bad old firms may continue to borrow from their incumbent bank. However, while soft budget constraints may be especially relevant for state-owned banks, we focus here on commercial banking.

[15]This result is obtained as long as screening produces an informative signal, i.e., $s > 0.5$. Only then will the screening capability make the foreign bank stronger relative to the domestic bank. One might argue that the acquired bank's relative information advantage in soft information may not be used to its full potential. Stein (2002) argues that soft information becomes more difficult to communicate within more hierarchical structures (here the acquired bank). This argument does not change our results qualitatively as the foreign bank is always the stronger competitor as otherwise it would not enter the market.

[16]Along the same line of argument, the domestic bank rations credit with a higher probability since it wants to avoid making losses.

[17]Under the assumption that the share of successful firms is relatively low.

[18]Foreign greenfield banks that are acquired by - or acquire - another foreign bank are always absorbed by the latter in our data, such that D^G is constant over time. Including extra dummies that control for foreign acquisitions of foreign banks had do significant impact on our results and was never in itself significant.

[19]This expectation is in line with Lehner and Schnitzer (2006) who show that, if a foreign bank with strong screening skills enters, the domestic bank's incentive to improve its screening capabilities should increase.

[20]Omitting this information may otherwise bias our market share and concentration variables.

[21]In some countries, a different term is used for this variable under the raw format, but all refer to loans made to individuals or firms. For Bulgaria, Hungary and Slovakia we use total interest revenues.

[22]A detailed listing of foreign *de novo* entry, foreign and domestic mergers, and acquisitions between 1990 and 2003 in Central and Eastern Europe is available from the authors upon request.

[23]The coefficients for the country dummies on Bulgaria, Hungary and Slovakia are

always positive and significant (omitted from the estimation output). The country dummies thus effectively control for the upward bias in the measure of the lending rate for these countries, given our data limitations.

[24]Specifically, the factors included are related to: Trade Policy; Fiscal Burden of Government; Monetary Policy; Banking and Finance; Overall Regulation.

Figure 1
Composition of the population of firms

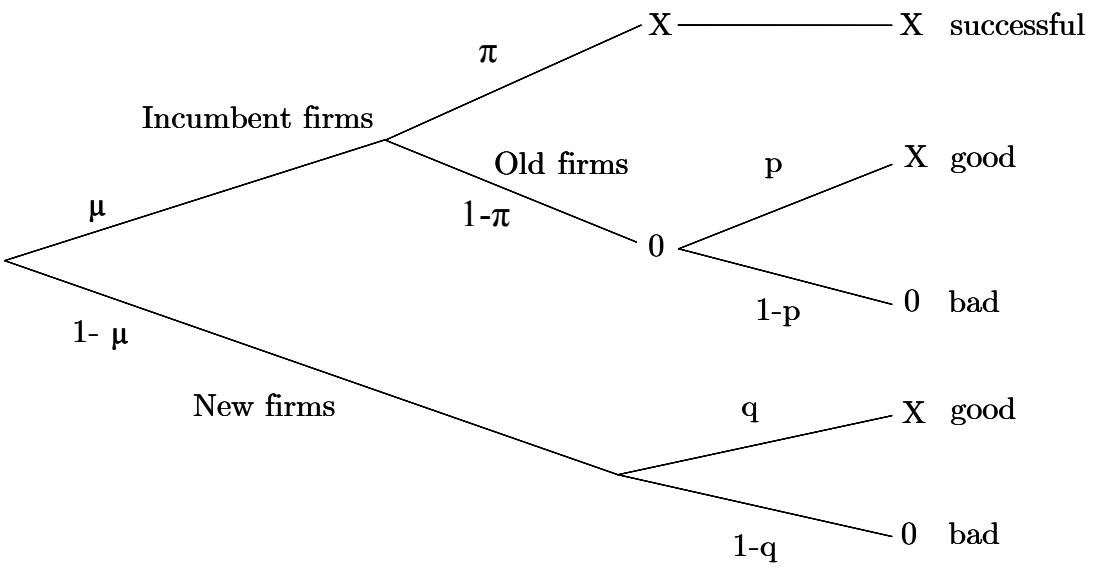

Table I
Variable Definitions and Descriptive Statistics (1207 Observations)

Sources: Own calculations based on *Bankscope 2002 – October update*, *Bankscope 2005 – January update*, bank and central banks' annual reports. The number of banks, GDP growth and enterprise reform are based on *EBRD Transition Reports*; the real short term interest rate is taken from the *IMF International Financial Statistics*; the credit registry dummy is taken from Djankov et al. (2007).

Note: For banks with negative equity, *capital* is computed as if the bank had 1 percent equity to assets in order to avoid misleading interpretation (as in Berger, 1995).

Dependent Variable		Mean	Min	Max
Lending rate (%)	Interest income on customer loans/Average loans.	16.15	0.14	49.59
Bank-specific Mode of Entry Variables				
Foreign MA (D^{MA})	=1 if foreign acquired, 0 otherwise.	0.20	0	1
Foreign Greenfield (D^{G})	=1 if foreign greenfield, 0 otherwise.	0.19	0	1
Foreign (already before 1995)	=1 if foreign before 1995, 0 otherwise.	0.16	0	1
Foreign MA (already before 1995)	=1 if foreign acquired before 1995, 0 otherwise.	0.02	0	1
Foreign Greenfield (already before 1995)	=1 if foreign greenfield before 1995, 0 otherwise.	0.14	0	1
Foreign MA (since 1995 or after)	=1 if foreign acquired in 1995 or after, 0 otherwise.	0.17	0	1
Foreign Greenfield (since 1995 or after)	=1 if foreign greenfield in 1995 or after, 0 otherwise.	0.05	0	1
(Foreign MA)*(Age)	Age is the age of the bank since the acquisition or establishment. Age is only defined for within sample mode of entry (in 1995 or after).	3.09	0	8
(Foreign MA)*(Age2)		13.03	0	64
(Foreign Greenfield)*(Age)		4.78	1	9
(Foreign Greenfield)*(Age2)		26.38	1	81
Country-specific Mode of Entry Variables				
Foreign bank share	Market share of foreign banks' loans.	35.81	0	99.39
Bank share of Foreign MA (MS^{MA})	Market share of foreign acquired banks' loans.	23.94	0	99.39
Bank share of Foreign Greenfield (MS^{G})	Market share of foreign greenfield banks' loans.	11.87	0	30.07
Foreign bank share (before 1995)	Market share of banks that were already foreign before 1995.	7.68	0	27.43
Bank share of Foreign MA (before 1995)	Market share of banks that were already acquired before 1995.	0.82	0	5.49
Bank share of Foreign Greenfield (before 1995)	Market share of banks that were already established before 1995.	6.87	0	23.00

Foreign bank share (since 1995)	Market share of banks that became foreign in or after 1995.	28.13	0	99.39
Bank share of Foreign MA (since 1995)	Market share of banks that became acquired in or after 1995.	23.12	0	99.39
Bank share of Foreign Greenfield (since 1995)	Market share of banks that became established in or after 1995.	5.00	0	26.92
Bank-specific Control Variables				
Liquidity (%)	Liquid assets (cash, bank and central bank deposits)/Assets.	29.69	0.53	94.71
Deposit rate (%)	Interest expenditures/Average assets	6.02	0	17.86
Log(loan loss reserves)	Log(Loan loss reserves/Average gross loans)	1.51	-4.61	6.71
Capital (%)	Equity/Assets	12.96	0	90.34
Country-specific Control Variables				
Log(banks per capita)	Log(Number of banks per 1 million inhabitants)	3.56	1.79	4.42
Credit Registry	=1 if public or private credit registry, 0 otherwise	0.47	0	1
Top 3 bank share (%)	Market share of top 3 banks' loans.	58.48	40.63	100
GDP growth (%)	Real GDP growth.	4.06	-9.40	9.80
Real interest rate (%)	Real short term interest rate.	4.10	-68.64	25.13
Enterprise reform	=1 if EBRD enterprise reform index>=3, 0 otherwise.	0.47	0	1

Table II
Pooled OLS Regressions of Bank Lending Rates

Coefficient estimates are based on pooled OLS. Standard errors are robust and clustered on banks. All regressions include country and year dummies. The sample in (II) is restricted to foreign banks. Variable definitions are provided in Table I. * significant at 10%; ** significant at 5%; *** significant at 1%.

	I	II	III	IV	V	VI
Foreign MA	-0.14					
	[0.84]					
Foreign Greenfield	-1.23*	-1.39				
	[0.73]	[1.01]				
Foreign (already before 1995)			-1.42		-1.45	-1.5
			[0.92]		[0.93]	[0.92]
Foreign MA (already before 1995)				-0.76		
				[2.93]		
Foreign Greenfield (already before 1995)				-1.52*		
				[0.89]		
Foreign MA (since 1995 or after)			-0.09	-0.08	0.55	-1.03
			[0.83]	[0.83]	[1.15]	[1.32]
(Foreign MA)*(Age)					-0.21	1.06
					[0.30]	[0.66]
(Foreign MA)*(Age2)						-0.18**
						[0.08]
Foreign Greenfield (since 1995 or after)			-0.69	-0.67	-2.98	-11.89***
			[1.13]	[1.13]	[1.95]	[3.35]
(Foreign Greenfield)*(Age)					0.48	4.57***
					[0.35]	[1.61]
(Foreign Greenfield)*(Age2)						-0.40**
						[0.16]
Foreign bank share in total bank loans	-0.04*	-0.02	-0.04*	-0.04*	-0.04*	-0.04**
	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]
Liquidity	0.15***	0.16***	0.15***	0.15***	0.15***	0.15***
	[0.02]	[0.04]	[0.02]	[0.02]	[0.02]	[0.02]
Deposit rate	0.88***	1.26***	0.88***	0.88***	0.87***	0.85***
	[0.14]	[0.18]	[0.14]	[0.14]	[0.14]	[0.14]
Log(loan loss reserves)	0.57**	0.79**	0.57**	0.57**	0.57**	0.55**
	[0.24]	[0.40]	[0.25]	[0.24]	[0.25]	[0.25]
Capital	0.06*	0.01	0.06*	0.06*	0.06*	0.06*
	[0.03]	[0.06]	[0.03]	[0.03]	[0.03]	[0.03]
Log(banks per capita)	-4.91**	-6.41	-4.96**	-4.96**	-4.91**	-5.06**
	[2.26]	[4.11]	[2.25]	[2.25]	[2.25]	[2.27]
Credit Registry	-1.45*	1.72	-1.47*	-1.46*	-1.45*	-1.27
	[0.84]	[1.18]	[0.84]	[0.84]	[0.84]	[0.85]
Top 3 bank share	-0.18***	-0.09	-0.18***	-0.18***	-0.18***	-0.17***
	[0.05]	[0.08]	[0.05]	[0.05]	[0.05]	[0.05]
GDP growth	-0.29**	0.07	-0.29**	-0.29**	-0.29**	-0.30**
	[0.12]	[0.14]	[0.12]	[0.12]	[0.12]	[0.12]
Real interest rate	0.14***	0.07	0.14***	0.14***	0.14***	0.14***
	[0.04]	[0.05]	[0.04]	[0.04]	[0.04]	[0.04]
Enterprise reform	2.00**	0.74	1.99**	1.99**	1.95**	1.99**
	[0.78]	[1.19]	[0.78]	[0.78]	[0.77]	[0.78]
Constant	30.59***	16.02	30.71***	30.69***	30.75***	30.71***
	[7.98]	[13.73]	[7.96]	[7.95]	[8.03]	[8.08]
Observations	1207	466	1207	1207	1207	1207
R-squared	0.52	0.67	0.52	0.52	0.52	0.52
N banks	236	113	236	236	236	236

Table III
Pooled OLS Regressions of Domestic Bank Lending Rates

Coefficient estimates are based on pooled OLS. Standard errors are robust and clustered on banks. All regressions include country and year dummies. The sample is restricted to domestic banks. Variable definitions are provided in Table I. * significant at 10%; ** significant at 5%; *** significant at 1%.

	I	II	III	IV
Foreign bank share in total bank loans	-0.06**			
	[0.03]			
Bank share of Foreign MA		-0.06*		
		[0.03]		
Bank share of Foreign Greenfield		0.17*		
		[0.09]		
Foreign bank share (before 1995)			0.39***	
			[0.13]	
Bank share of Foreign MA (before 1995)				3.72***
				[0.91]
Bank share of Foreign Greenfield (before 1995)				0.22*
				[0.13]
Foreign bank share (since 1995)			-0.07**	
			[0.03]	
Bank share of Foreign MA (since 1995)				-0.11***
				[0.03]
Bank share of Foreign Greenfield (since 1995)				-0.23*
				[0.14]
Liquidity	0.13***	0.13***	0.12***	0.12***
	[0.03]	[0.03]	[0.03]	[0.03]
Deposit rate	0.63***	0.62***	0.63***	0.62***
	[0.19]	[0.18]	[0.18]	[0.18]
Log(loan loss reserves)	0.4	0.41	0.34	0.34
	[0.30]	[0.30]	[0.30]	[0.30]
Capital	0.07**	0.08**	0.07**	0.07**
	[0.04]	[0.04]	[0.04]	[0.03]
Log(banks per capita)	-6.13**	-5.46*	-5.02*	-5.88**
	[2.78]	[2.87]	[2.80]	[2.77]
Credit Registry	-1.99*	-1.97*	-1.63	-2.29**
	[1.13]	[1.11]	[1.13]	[1.13]
Top 3 bank share	-0.20***	-0.21***	-0.12*	-0.07
	[0.06]	[0.06]	[0.06]	[0.07]
GDP growth	-0.39**	-0.40**	-0.37**	-0.31*
	[0.17]	[0.16]	[0.16]	[0.16]
Real interest rate	0.15***	0.14***	0.13**	0.14***
	[0.05]	[0.05]	[0.05]	[0.05]
Enterprise reform	2.06**	2.61***	2.63***	2.81***
	[0.97]	[0.97]	[0.98]	[0.96]
Constant	49.58***	46.19***	37.79**	38.93***
	[15.20]	[15.23]	[15.12]	[12.00]
Observations	741	741	741	741
R-squared	0.48	0.49	0.50	0.51
N banks	164	164	164	164

Table IV
2SLS Regressions of Bank Lending Rates

Coefficient estimates are based on 2SLS. Standard errors are robust and clustered on banks. All regressions include country and year dummies. The sample in (II) is restricted to foreign banks. Variable definitions are provided in Table I. Under the null of the validity of the overidentifying restrictions, Hansen's J statistic is distributed as chi-squared (P-value reported). * significant at 10%; ** significant at 5%; *** significant at 1%.

	I	II	III	IV	V	VI
Foreign MA	0.07					
	[0.83]					
Foreign Greenfield	-1.20*	-1.51				
	[0.71]	[0.97]				
Foreign (already before 1995)			-1.4		-1.43	-1.48
			[0.91]		[0.91]	[0.90]
Foreign MA (already before 1995)				-0.75		
				[2.89]		
Foreign Greenfield (already before 1995)				-1.49*		
				[0.87]		
Foreign MA (since 1995 or after)			0.14	0.15	0.74	-0.94
			[0.82]	[0.82]	[1.14]	[1.33]
(Foreign MA)*(Age)					-0.19	1.15*
					[0.30]	[0.68]
(Foreign MA)*(Age2)						-0.19**
						[0.08]
Foreign Greenfield (since 1995 or after)			-0.69	-0.67	-2.91	-11.93***
			[1.10]	[1.10]	[1.89]	[3.45]
(Foreign Greenfield)*(Age)					0.46	4.61***
					[0.33]	[1.58]
(Foreign Greenfield)*(Age2)						-0.41***
						[0.15]
Foreign bank share in total bank loans	-0.06**	-0.06*	-0.06**	-0.06**	-0.06**	-0.06**
	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]
Liquidity	0.15***	0.16***	0.15***	0.15***	0.15***	0.15***
	[0.02]	[0.04]	[0.02]	[0.02]	[0.02]	[0.02]
Deposit rate	0.92***	1.24***	0.92***	0.91***	0.91***	0.89***
	[0.14]	[0.18]	[0.14]	[0.14]	[0.14]	[0.14]
Log(loan loss reserves)	0.55**	0.79**	0.55**	0.55**	0.55**	0.52**
	[0.24]	[0.40]	[0.24]	[0.24]	[0.24]	[0.24]
Capital	0.07**	0.01	0.07**	0.07**	0.07**	0.07**
	[0.03]	[0.06]	[0.03]	[0.03]	[0.03]	[0.03]
Log(banks per capita)	-7.26***	-8.73*	-7.34***	-7.34***	-7.26***	-7.45***
	[2.49]	[4.57]	[2.49]	[2.49]	[2.48]	[2.50]
Credit Registry	-0.68	2.14*	-0.7	-0.69	-0.7	-0.5
	[0.80]	[1.19]	[0.80]	[0.80]	[0.80]	[0.81]
Top 3 bank share	-0.15***	-0.07	-0.15***	-0.15***	-0.15***	-0.14***
	[0.05]	[0.07]	[0.05]	[0.05]	[0.05]	[0.05]
GDP growth	-0.13	0.15	-0.13	-0.12	-0.13	-0.14
	[0.11]	[0.14]	[0.11]	[0.11]	[0.11]	[0.11]
Real interest rate	0.12***	0.07	0.12***	0.12***	0.12***	0.12***
	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]
Enterprise reform	2.33***	1.15	2.33***	2.33***	2.28***	2.32***
	[0.75]	[1.09]	[0.75]	[0.75]	[0.75]	[0.75]
Constant	31.93***	43.37**	38.88***	38.88***	38.75***	39.68***
	[8.31]	[22.03]	[12.08]	[12.09]	[12.12]	[12.23]
Observations	1170	465	1170	1170	1170	1170
R-squared	0.54	0.66	0.54	0.54	0.54	0.54
N banks	235	113	235	235	235	235
J-statistic	17.24	7.07	16.92	17	17.41	16.6
P Value	0.01	0.22	0.01	0.01	0.01	0.01

Table V
2SLS Regressions for Domestic Bank Lending Rates

Coefficient estimates are based on 2SLS. Standard errors are robust and clustered on banks. All regressions include country and year dummies. The sample is restricted to domestic banks. Variable definitions are provided in Table 1. Under the null of the validity of the overidentifying restrictions, Hansen's J statistic is distributed as chi-squared in the number of overidentifying restrictions (P-value reported). * significant at 10%; ** significant at 5%; *** significant at 1%.

	I	II	III	IV
Foreign bank share in total bank loans	-0.09**			
	[0.04]			
Bank share of Foreign MA		-0.09**		
		[0.04]		
Bank share of Foreign Greenfield		-0.17		
		[0.15]		
Foreign bank share (before 1995)			0.27	
			[0.26]	
Bank share of Foreign MA (before 1995)				3.35
				[2.28]
Bank share of Foreign Greenfield (before 1995)				0.34
				[0.25]
Foreign bank share (since 1995)			-0.10**	
			[0.04]	
Bank share of Foreign MA (since 1995)				-0.17***
				[0.06]
Bank share of Foreign Greenfield (since 1995)				-0.55**
				[0.23]
Liquidity	0.13***	0.14***	0.13***	0.12***
	[0.03]	[0.03]	[0.03]	[0.03]
Deposit rate	0.69***	0.70***	0.69***	0.69***
	[0.18]	[0.18]	[0.17]	[0.17]
Log(loan loss reserves)	0.36	0.35	0.31	0.24
	[0.28]	[0.28]	[0.27]	[0.27]
Capital	0.09**	0.09**	0.09**	0.08**
	[0.04]	[0.04]	[0.04]	[0.03]
Log(banks per capita)	-8.82***	-9.16***	-8.05***	-9.37***
	[2.98]	[3.11]	[3.11]	[3.11]
Credit Registry	-1.41	-1.44	-0.92	-0.82
	[1.06]	[1.05]	[1.04]	[1.05]
Top 3 bank share	-0.17***	-0.17***	-0.1	0.05
	[0.06]	[0.06]	[0.07]	[0.10]
GDP growth	-0.18	-0.17	-0.18	-0.08
	[0.15]	[0.16]	[0.15]	[0.15]
Real interest rate	0.12**	0.13**	0.11**	0.11**
	[0.05]	[0.05]	[0.05]	[0.05]
Enterprise reform	2.62***	2.45**	2.99***	3.11***
	[0.95]	[1.00]	[1.04]	[1.03]
Constant	57.79***	59.46***	48.95***	45.93***
	[15.54]	[16.30]	[17.48]	[16.32]
Observations	705	705	705	705
R-squared	0.51	0.51	0.52	0.53
N banks	163	163	163	163
J-statistic	8.49	8.37	6.13	2.95
P Value	0.2	0.14	0.29	0.4

Table A.1.
First Stage Regressions for Bank Lending Rates (2SLS Results Table IV)

We only report estimates of the excluded instruments. Coefficient estimates are based on pooled ordinary least squares regressions. Standard errors are robust and clustered on banks. All regressions include country and year dummies. The sample in (II) is restricted to foreign banks. *Creditor Rights* is an index aggregating creditor rights, taken from Djankov et al. (2007). The index ranges from 0 (weak creditor rights) to 4 (strong creditor rights). We include 4 Factors of Economic Freedom. The factors related to: Trade Policy; Fiscal Burden of Government; Monetary Policy; Banking and Finance; Regulation. Each factor ranges from 1 (free) to 5 (repressed). * significant at 10%; ** significant at 5%; *** significant at 1%

	I	II	III	IV	V	VI
Creditor Rights	0.81***	-0.37	0.80***	0.80***	0.80***	0.79***
	[0.16]	[0.32]	[0.16]	[0.16]	[0.16]	[0.16]
Number of Domestic Banks	-0.32***	-0.76***	-0.32***	-0.32***	-0.31***	-0.31***
	[0.06]	[0.14]	[0.06]	[0.06]	[0.06]	[0.06]
Trade Policy	-1.84***	0.21	-1.86***	-1.86***	-1.87***	-1.91***
	[0.56]	[1.29]	[0.55]	[0.55]	[0.55]	[0.54]
Fiscal Burden of Government	-10.49***	-10.31***	-10.43***	-10.43***	-10.35***	-10.23***
	[0.55]	[1.13]	[0.55]	[0.55]	[0.55]	[0.56]
Monetary Policy	9.12***	10.80***	9.13***	9.13***	9.09***	9.11***
	[0.57]	[0.74]	[0.57]	[0.57]	[0.58]	[0.58]
Banking and Finance	-8.62***	-1.58	-8.61***	-8.61***	-8.85***	-8.82***
	[1.14]	[2.31]	[1.14]	[1.14]	[1.14]	[1.14]
Regulation	12.72***	12.66***	12.70***	12.70***	12.73***	12.64***
	[0.56]	[1.71]	[0.57]	[0.57]	[0.56]	[0.57]
Observations	1170	465	1170	1170	1170	1170
R-squared	0.92	0.93	0.92	0.92	0.92	0.92
N banks	235	113	235	235	235	235

Table A.2.
First Stage Regressions Results for Domestic Bank Lending Rates (2SLS Results in Table V)

We only report estimates of the excluded instruments. Coefficient estimates are based on pooled ordinary least squares regressions. Standard errors are robust and clustered on banks. All regressions include country and year dummies. The sample is restricted to domestic banks. *Creditor Rights* is an index aggregating creditor rights, taken from Djankov et al. (2007). The index ranges from 0 (weak creditor rights) to 4 (strong creditor rights). We include 4 Factors of Economic Freedom taken from Heritage Foundation. The factors related to: Trade Policy; Fiscal Burden of Government; Monetary Policy; Banking and Finance; Regulation. Each factor ranges from 1 (free) to 5 (repressed). * significant at 10%; ** significant at 5%; *** significant at 1%.

Dependent Variable	Foreign bank share in total bank loans	Bank share of Foreign MA	Bank share of Foreign Greenfiel d	Foreign bank share (before 1995)	Bank share of Foreign MA (before 1995)	Bank share of Foreign Greenfiel d (before 1995)	Foreign bank share (since 1995)	Bank share of Foreign MA (since 1995)	Bank share of Foreign Greenfiel d (since 1995)
	I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**
Creditor Rights	0.51*	0.88***	-0.37***	0.02	0.49*	0	0.02	0.88***	-0.39***
	[0.26]	[0.29]	[0.05]	[0.03]	[0.27]	[0.00]	[0.03]	[0.29]	[0.03]
Number of Domestic Banks	-0.21***	-0.04	-0.17***	-0.16***	-0.05	0.01***	-0.18***	-0.05	0.01
	[0.06]	[0.08]	[0.04]	[0.03]	[0.07]	[0.00]	[0.03]	[0.08]	[0.01]
Trade Policy	-3.05***	-3.23***	0.18	0.97***	-4.02***	0.03	0.94***	-3.26***	-0.75***
	[0.78]	[0.93]	[0.33]	[0.27]	[0.90]	[0.02]	[0.26]	[0.94]	[0.13]
Fiscal Burden of Government	-10.77***	-11.95***	1.18***	-0.81**	-9.96***	-0.01	-0.80***	-11.94***	1.98***
	[0.94]	[1.01]	[0.38]	[0.32]	[0.96]	[0.05]	[0.29]	[1.00]	[0.18]
Monetary Policy	8.31***	7.97***	0.34	0.52*	7.78***	0.15***	0.38	7.82***	-0.04
	[0.88]	[1.05]	[0.30]	[0.29]	[0.98]	[0.05]	[0.27]	[1.05]	[0.13]
Banking and Finance	-12.87***	-13.38***	0.51	0.89	-13.76***	-0.59***	1.48**	-12.79***	-0.97**
	[1.73]	[1.51]	[0.99]	[0.84]	[1.62]	[0.13]	[0.72]	[1.53]	[0.45]
Regulation	10.83***	6.92***	3.91***	1.1	9.73***	0.21***	0.89	6.71***	3.02***
	[1.36]	[2.01]	[0.92]	[0.75]	[1.92]	[0.05]	[0.72]	[2.03]	[0.30]
Observations	705	705	705	705	705	705	705	705	705
R-squared	0.91	0.83	0.91	0.91	0.89	0.93	0.90	0.83	0.96
N banks	163	163	163	163	163	163	163	163	163