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Foreign Bank Presence and Its Effect on Firm Entry and Exit in Transition Economies

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Foreign bank presence and its effect on firm entry and exit in transition economies

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May 2010

Foreign bank presence and its effect on firm entry and exit in transition economies[1]

Olena Havrylchyk[2]

Abstract

This study investigates the impact of foreign bank penetration in Central and Eastern Europe on firm entry. We demonstrate that the acquisition of domestic banks by foreign investors has led to reduced firm creation, smaller average size of entrants and increased firm exit in opaque industries compared to transparent ones. At the same time, the entry of greenfield foreign banks spurred firm creation and exit. Unlike previous studies, which use interchangeably the notions of opacity and size, we define opacity in terms of technological process and show that economic significance of foreign bank entry is larger for opaque industries than for industries with large shares of small firms. Our findings can be interpreted as evidence of increased credit constraints and are consistent with theories that argue that foreign bank presence exacerbates informational asymmetries.

JEL: E51, G21, M13

Keywords: Entrepreneurship, Foreign bank entry, Asymmetric information, Credit constraints

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1 Introduction

There is a general consensus among economists that foreign bank entry benefited developing and transition countries by larger supply of credit. This gain has been attributed to foreign banks' higher efficiency that improved the allocation of funds from depositors to creditors, their better access to international credit markets and smaller sensitivity to idiosyncratic shocks (Berger et al., 2000; Bonin et al., 2005; De Haas and Lelyveld, 2006; Claeys and Hainz, 2007). Despite this large literature, the issue of whether all borrowers benefit from better credit access has not been resolved. Some studies reveal that foreign banks are less likely to grant credit to small enterprises and instead increase lending to large firms (Degryse et al., 2009). Such a lending policy is motivated by a comparative advantage of foreign banks to use hard information and disadvantage in collecting and processing soft information. From the public policy perspective, it would not be important whether foreign banks lend to small and medium enterprises (SMEs), as long as domestic banks continue to serve these clients, but foreign banks preferred to enter emerging markets via acquisition of domestic banks, reducing their number and consequently their ability to service SMEs.

The consequences could be particularly dire for start-ups, which are the most opaque clients and face credit constraints even in the presence of well developed financial markets.[3] Previous studies have shown that the process of creative destruction contributes more to productivity growth in transition economies than in industrial or developing countries (Bartelsman et al., 2004). It has been also documented that entry of new firms is a major source of new jobs and contributes to lower inequality (Berkowitz and Jackson, 2006). Therefore, it is crucial to locate potential barriers to firm entry and survival.

In this paper, we analyze the impact of foreign bank presence in Central and Eastern European countries (CEECs) on the rate of firm entry and exit, size of entrants and their survival probability in the initial years. This region is particularly well suited for our study, because bank credit is the main source of finance for enterprises, and shallow capital markets cannot provide a substitute for bank loans. At the same time, the banking sector in CEECs experiences the highest level of foreign bank presence in the world. Despite numerous

[3] Banking credit is the main source of non-equity financing for "infant" enterprises that are less than 2 years old (Berger and Udell, 1998). Those firms that borrow from banks tend to concentrate their borrowing at a single institution, with which they form a long-term relationship which enables banks to collect private information on creditworthiness of these firms (Petersen and Rajan, 1994).

greenfield banks set up by foreign investors, the preferred mode of foreign entry was via acquisition of existing domestic banks. This has led to virtual disappearance of domestic private banks in such countries as Estonia, Czech and Slovak Republics. Moreover, firm turnover (entry plus exit) is a particularly sizable in transition economies, reaching 20.5 percent of total number of firms (compared to 3-10 percent in developed economies). Notwithstanding the high rate of new firm creation, the firm number per capita remains below the Western European level and this gap is not closing.

Our paper contributes to the literature that analyses the impact of foreign bank presence on the supply of credit to small and medium enterprises. Numerous empirical studies provide strong evidence that foreign-owned banks are less likely to lend to small firms (i.e. informationally opaque firm) than domestically-owned banks (Berger et al., 2001; Clarke et al., 2006; Mian, 2006; Berger et al., 2008). In response to foreign bank entry, some domestic banks shift their loan allocation towards small borrowers (Degryse et al., 2009), which leads to mixed results about the total effect of foreign bank entry. Beck and Martinez Peria (2010) and Gormley (2010) find that foreign bank entry had negative effects on the outreach of the banking sector and access to credit in Mexico and India, respectively. At the same time, Giannetti and Ongena (2007), analyzing firm level data for CEEC, find that existing firms of all sizes benefited, even though the effects were larger for big firms. None of these studies, however, investigate the impact of foreign bank presence on firm entry and exit, as well as size of entrants. Moreover, they interpret informational opacity as firm size, and disregard other aspects of informational asymmetries.

This study is also an important addition to the literature that investigates credit constraints as a barrier to firm entry. A number of papers demonstrates that financial development is crucial for firm entry and post-entry growth (Guiso and Sapienza, 2004; Klapper et al., 2006; Aghion et al., 2007). Moreover, theoretical and empirical papers show that credit constraints diminish the size of start-ups as they cannot enter with their optimal size (Evans and Jovanovic, 1989; Holtz-Eakin et al., 1994; Colombo and Grilli, 2005). Other papers look at more specific aspects of financial development, such as bank competition (Bonaccorsi di Patti and Dell'Ariccia, 2004; Cetorelli and Strahan, 2006) or deregulation of bank branching restrictions in the US (Black and Strahan, 2002; Kerr and Nanda, 2009; Kerr and Nanda, 2010). To our knowledge, ours is the first paper to explore the impact of foreign bank presence on the firm entry and exit (extensive margin), as well as the size of startups (intensive margin of entry).

We provide consistent evidence that foreign bank penetration has led to lower rate of firm entry and a higher rate of firm exit in informationally opaque industries compared to transparent ones. Moreover, we find that the mode of foreign bank entry is crucial, because the negative impact is driven by virtual disappearance of domestic banks due to their acquisition by foreign investors. Interestingly, the entry of greenfield foreign banks has spurred firm creation in more opaque industries, which is consistent with market segmentation theories. Unlike previous studies that use interchangeably notions of opacity and size, we define opacity in terms of technological process at the industry level. Firm opacity is not always correlated with firm size. In fact, many small firms can be rather transparent because they have fixed assets that can be used as collateral, whereas creditworthiness of many large firms can be more difficult to evaluate due to their technological sophistication. We show that the economic significance of foreign bank entry is larger for opaque industries than for industries with large share of small firms. Finally, we show that the negative effect of foreign bank acquisitions is not experiences by sole entrepreneurs, which means that the average size of new entrants diminishes, in line with the hypothesis of credit constraints.

Our results have important policy consequences because we find that acquisition of domestic banks by foreign investors can discourage the entry of firms and diminish the size of new entrants, which calls for the discussion of measures to lessen credit constraints for newly established firms. This is also relevant to the discussion about different modes of foreign bank entry. Moreover, our definition of opacity implies that industries that are the most negatively affected are those that possess high levels of knowledge and skill intensity and, therefore, are crucial for future growth.

The paper proceeds as follows. In Section 2 we present theoretical considerations. Section 3 describes our chosen empirical strategy and data. In Sections 4-5 we document our empirical findings and report robustness tests. Finally, Section 6 concludes with policy suggestions.

2 Theoretical considerations

Information based theories argue that foreign banks have a comparative advantage in lending based on hard information, such as long credit history and detailed financial statement information, whereas domestic banks are better placed to lend to firms based on soft information.[4] Dell'Ariccia and Marquez (2004) present a model where domestic banks,

[4] Hard and soft information differ with respect to the degree of transferability. Hard information, on the one hand, refers to credible and publicly verifiable data, such as firms' balance sheets, credit history, collateral and

possessing an information advantage, compete for borrowers with foreign banks that have a cost advantage in extending a loan. This leads to the segmentation of lending markets, because foreign banks are more effective at competing away from local banks borrowers for whom informational disadvantages are smaller. The model predicts, however, that small borrowers benefit as well, because domestic banks shift their credit allocation towards sectors where their competitors face greater adverse selection problems.

The model has different implications depending on the mode of foreign banks entry, which is not explicitly stated in the model. If banks enter via greenfield institutions, the model predicts segmentation of the market, but SMEs can benefit because domestic banks would step up their supply of loans to them. However, if foreign banks enter via acquisition of domestic institutions, as is mostly the case of many transition economies, this would lead to decreased number of domestic banks (virtual disappearance in some countries) and SMEs would be faced with increased credit constraints.

The departure of Detragiache et al. (2008) model is the same: domestic banks have a cost advantage in gathering and processing soft information, whereas foreign bank have an advantage in dealing with hard information. In this setup, they consider different outcomes depending on the cost of monitoring soft information and cost of adverse selection. When the cost of monitoring soft information is relatively low, entry by foreign banks causes the economy to move to the separating equilibrium, where foreign banks finance transparent borrowers and domestic banks – opaque ones. However, when cost of monitoring and cost of adverse selection are high, the economy moves to the credit-constrained equilibrium where borrowers with soft information are excluded from the market. This is related to the notion of cream skimming. Similar to model of Dell'Ariccia and Marquez (2004), this model also implies that a separating equilibrium will only work if foreign banks enter via greenfield institutions, while credit-constrained equilibrium is more likely when foreign banks enter via acquisition of domestic institutions because foreign ownership increases the cost of monitoring soft information.

While none of these models considers the impact on firms' entry and exit, their implications are clear. The choice of the mode of foreign bank entry is a crucial determinant. Acquisition of domestic banks by foreign investors is likely to be detrimental to the entry of

guarantees. On the other hand, soft information cannot be verified by a third person and is gained a result of the relationship between a bank and a borrower. For example, through repeated interviews with an owner of a young firm, a bank manager might be convinced that the firm's owner is a smart, honest and hard working entrepreneur with a high probability of success. However, this soft information cannot be transferred to other potential lenders (Petersen, 2004).

new firms due to reduced supply of loans to opaque clients, while the entry of foreign banks via greenfield investment does not lead to clear-cut conclusions (separating or credit constrained equilibrium). Thus, we can formulate Hypothesis 1:

Hypothesis 1: The acquisition of domestic banks by foreign investors has a negative effect on firm creation in opaque sectors compared to transparent sectors.

As to firm exit, let us consider an opaque firm that has a relationship with a domestic bank and this bank is acquired by a foreign investor. In this case, a new investor acquires hard and soft information about the client that proves its creditworthiness. If foreign banks have not just a disadvantage in collecting soft information, but also more difficulties to communicate it, the loan to such a client would not be renewed. This idea is derived from Stein (2002) who argues that organizations with more hierarchical structures are more likely to rely on hard information as opposed to organizations with flatter structures. The reason is that flatter organizations have better control and information on their managers, and thus can afford to give them more discretion, which allows them to use soft information. This modeling has been extended to large banks by Berger et al. (2005) and can further be extended to foreign banks, which are usually part of large multinational banking groups, and where communication of soft information is obstructed not only by the hierarchy, but also by cultural and linguistic barriers. Moreover, discretion given to loan officers can be inductive to connected lending, a common problem in many developing countries (e.g. Khwaja and Mian, 2005). Such reasoning allows us to formulate the following hypothesis.

Hypothesis 2: The acquisition of domestic banks by foreign investors has a positive effect on firm exit in opaque sectors compared to transparent sectors.

3 Estimation strategy and data

If foreign banks suffer more from informational asymmetries than domestic banks, information based theoretical models imply that their presence should have a differential effect on firm entry and exit depending on the firm opacity. Therefore, we rely on a difference-in-difference approach, inspired by Rajan and Zingales (1998), and estimate the impact of foreign bank presence on firm demographics, depending on the degree of opaqueness of industry in which these firms operate.

Our chosen methodology has a number of advantages that have been widely recognized by researchers that investigate the impact of financial development on economic growth and, more precisely, the effect of banking sector development on the firm creation (Aghion et al., 2007; Bonaccorsi di Patti and Dell'Ariccia, 2004; Cetorelli and Strahan, 2006). This identification strategy substantially minimizes the risk that our results are driven by reverse causality (foreign banks enter markets with high firm entry rates) because it is unlikely that banks would be attracted to a particular market just because one specific industry experienced a relatively higher rate of firm birth. Moreover, the use of interactions reduces the problem of omitted variable, such as legal environment, that drives both firm demographics and entry of foreign banks.

The key variable in our empirical set-up is a measure of opacity. Following Bonaccorsi di Patti and Dell'Ariccia (2004), we construct opacity measure as ratio of total assets to fixed assets at the industry level ($Opacity\ (fixed\ assets)_i$). The underlying idea is that a bank can evaluate more easily the quality of a business plan when it is based on a simple technology with a large predictable component and where the unobservable quality of human capital or effort is less important in determining the outcome. Moreover, moral hazard can be reduced because certain technologies with substantial share of fixed assets imply the availability of collateral. Indeed, Sengupta (2007) presents a model where foreign banks are more likely to rely on collateral as a screening device to contest the incumbent banks' informational advantage. The research on rating agencies also shows that there is less uncertainty in rating firms that have higher share of fixed assets. The above ratio is calculated at the industry level, based on the individual firm data contained in the AMADEUS database for the period between 2000 and 2005.[5] To minimize measurement errors, we first dropped companies falling in the 5 percent and 95 percent percentiles of the distribution of our ratios.

[5] Following Bonaccorsi di Patti and Dell'Ariccia (2004), we calculate opaqueness indicators relying on the local data for CEECs. This approach is different from that of Rajan and Zingales (1998), who rely on the measure of financial dependence based on the US data. One can argue that the measure of financial dependence is correlated with financial constraints and therefore a neutral measure of financial dependence requires data from the market with no credit constraints, such as the US. In our case, share of fixed assets is not endogenous and, therefore, we need to measure opaqueness in the countries of interest. We test robustness of our results by relying on the UK data, and we find that opaqueness of industries is highly correlated between countries and our estimations yield similar results. We additionally find that our results hold even if we rely on financial dependence, instead of opacity.

To test for the robustness of our results, we propose an alternative measure of opaqueness – skills or knowledge intensity of industries ($Opacity\ (skill\ dependence)_i$)[6]. The idea behind is similar to the previous argument that it is more difficult for a bank to evaluate firms that operate in industries where there is a relatively greater knowledge component to their value-added process. Brewer et al. (1996) argue that knowledge assets and R&D-intensive physical assets are highly firm- and industry- specific, thus lowering liquidity value and recovery rates for a bank. Moreover, availability of knowledge assets increases moral hazard because it allows more managerial discretion to shift to riskier projects. These theoretical considerations are supported by empirical evidence of higher financial constraints for firms in knowledge intensive industries (Gellatly et al., 2004). According to these arguments, we compute an alternative measure of opaqueness as a ratio of skilled labor to total labor at the industry level, where skilled employee is defined as one that has completed at least a few years of college. The data comes from the US Bureau of Labor Statistics.[7]

Most of previous studies that analyze the effect of foreign bank entry on firms, define opacity in terms of size. Our study is different in this respect because we define opacity in terms of technological content of specific industries. While we have information on size of new entrants, we cannot rely on it to compute opacity because it is justified only for existing firms that become more transparent with size, as auditing and disclosure requirements tend to be tighter. However, we can compute a share of small firms in a total number of firms ($Small\ firms_i$)[8] to test whether foreign bank entry had a disproportional effect on industries that have higher share of small enterprises due to technological process. This approach was employed by Beck et al. (2008) in their study of the impact of financial deepening on small firms. Contrary to common assumption, industries that have high share of small firms are not necessarily opaque. For example, firms that are engaged in repair of goods are often small but they are very transparent because they do not have high share of skilled employees and posses fixed assets, which can be used as collateral. At the same time, production of computers is

[6] This measure has been inspired by Carlin and Mayer (2003), who look at the relationship between financial development and growth of industries with high level of skilled labor. They use skill dependence as a proxy for dependence of industries on investment by other stakeholders.

[7] Similar to opacity measure in terms of fixed assets, we would like to compute skill dependence relying on the CEEC data, but to our knowledge, such data is not collected. However, Carlin and Mayer (2003) show that skill dependence of industries is highly correlated across countries (correlation coefficient of 0.83), which justifies our use of the US data.

[8] A firm is considered small if its sales are below 10 percentile of firms' total sales. A robustness check was performed with firms' assets, but the results do not change.

done by large firms, but they are rather opaque because their workforce is highly educated and the share of non-tangible assets is very high.

Formally, the estimated model can be presented as follows:

$$Demo_{i,j,t} = a_1 Initial\ share_{i,j} + a_2 Opacity_i * Foreign_{j,t-1} + a_3 Small\ firms_i * Foreign_{j,t-1} + a_4 Industry_i + a_5 Country_j + a_6 Year_t + \varepsilon_{i,j,t}$$

$Demo_{i,j,t}$ includes the following firm demographic statistics: entry, exit, net entry and survival rates. Entry/exit rates refer to a number of firms that entered/exited industry i in country j and in year t divided by total firms in this industry, country and year. Net entry rate is computed as a difference between entry and exit. Survival rate is computed as a number of firms that have been created in year $t-2$ and have survived till time t as a percentage share of firms in year $t-2$.[9] The data on firms' demographics is taken from the Business Demography Statistic that is provided by Eurostat. Our data allows us to calculate firms' demographic indicators with respect to different firm sizes. Thus, we compute entry, exit, net entry and survival rates for the firms with 1) no employees, 2) between one and four employees; 3) between five and nine employees and 4) more than nine employees. All variable definitions are provided in Table 1.

The initial share ($Initial\ share_{i,j}$) of each industry i in the local market j at the beginning of the analyzed period accounts for the fact that firm demographics depend on the stage of industry development (new, mature, declining, etc) and is computed with AMADEUS data. The interaction term is the product of opacity in industry i and a measure for the degree of foreign bank presence in country j and in year $t-1$. Foreign bank presence is measured as a share of foreign banks in the total bank capital in country j and in year t ($Foreign_{j,t}$). The data is taken from BankScope and augmented by information provided by central banks, our own research of banks web-pages and newspapers. In addition, we include industry, country and year dummies to control for industry, country and time respectively. We also add size-specific effects when we incorporate firm size dimension into the model.

We perform our analysis based on a dataset that includes 52 industries in 9 Central and Eastern European countries (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania,

[9] For robustness purposes, we also compute survival rates after three, four and five years since firm creation. The findings remain generally unchanged but we prefer to report the results of survival after two years due to higher number of observations for this measure. The same is true for the measure of churning.

Romania, Slovakia and Slovenia) for the period 2000-2005. Creation of new firms and exit of old ones is a very sizable phenomenon in CEE. Table 2 shows that on average 12 percent of all firms are new entrants, whereas 8 percent are likely to exit in a given year. This figure is larger than the firm turnover in developed countries, where the entry rate is below 6 percent (Aghion et al., 2007). The average density of firms, measured by a number of enterprises divided by the population (in 10,000) is still lower in CEE than in Western Europe, but there is great variation inside the region. Czech Republic has the highest enterprise density in Europe, while Bulgaria, Latvia, Lithuania, and Romania have the lowest (Figure 1). At the same time, if we compute the density of firm entry (a number of new enterprises divided by the population in 10,000), the difference between developed and emerging Europe is not statistically significant (Figure 2), which suggests that the current rate of new firm creation in CEECs is not sufficient for caching-up with Western Europe.

Given our empirical methodology that investigates the variation of entry rates between industries, we present average entry rates with respect to different industries (Figure 3). As expected, new industries, such as computer and related activities, experience the fastest entry rates, whereas manufacturing – the lowest. In Figures 4 we present a scatter plot of our opacity measures: 1) total assets divided by fixed assets 2) share of skilled employees to total employees. Our results demonstrate that industries in which the quality of human capital or effort plays the decisive role, such as software, hardware, data processing, architectural, research and development, and advertising, are some of the most informationally opaque sectors. Despite this, the correlation between these two measures is not very high (38 percent), and some industries appear to be opaque according to the first measure (cleaning, construction), but completely transparent according to the second one. Small correlation between our measures of opacity implies that these indicators describe different aspects of informational asymmetries.[10] Finally, we present a scatter plot of the average firm entry and the share of domestic banks acquired by foreign investors (Figure 5). The strong negative correlation between these variables provides us with further motivation to investigate the causality of this relationship.

4 Empirical findings

We report the finding of the baseline model in Table 3. Our variable of interest is the interaction between foreign bank share and opacity, which is negative in all models with the

[10] The share of small firms is correlated with skill dependence (correlation coefficient of 0.30) but is not correlated with the ratio of total assets to fixed assets.

entry rate as dependant variable, notwithstanding the definition of opacity. Foreign bank presence is associated with slower firm creation in informationally opaque industries than in transparent ones. At the same time we find no significant effect of foreign bank penetration on firm entry in industries that depend more on small firms. These results are robust if we control for the exit rate that should account for the "administrative turnover" of firms that change their legal status (Bonaccorsi di Patti and Dell'Ariccia, 2004). The coefficient for exit variable is significant and positive, indicating that higher entry rate is correlated with higher exit rates. Our main results are confirmed by the model with net-entry as a dependant variable.

We also find that foreign bank presence leads to higher exit rates for firms in opaque industries compared to transparent ones. These results are likely to be associated with incumbent firms because no effect on the survival of newly established firms is observed (column 6 of Table 3). We interpret these finding by smaller willingness of foreign banks to engage in relationship lending because lending officers in these banks have more difficulties to communicate soft information to banks' headquarters that are located abroad. Alternatively, if connected lending is more likely to happen in opaque industries (because lending officers are given more discretion), our results might signal that foreign banks are less susceptible to political pressure and are less likely to lend to connected parties (Detragiache et al., 2006; Giannetti and Ongena, 2007).

Our findings contrast with the work of Giannetti and Ongena (2007), who find that foreign bank entry spurs both entry and exit in CEE. This difference is likely to be due to data issues, because their study relied on AMADEUS firm level data to calculate entry and exit of firms, whereas we have actual data on firm demographics. This also explains why we have similar results for exit of incumbent firms (present both in AMADEUS and in our database), while our results differ with respect to new entrants (not present in AMADEUS but covered by our database).

Section 2 argued that the effect of foreign bank entry is different depending on the mode of entry. In Table 4, we present results separately for foreign investors that entered via acquisition of domestic banks and those that established greenfield banks. The negative effect of foreign bank presence on firm entry in opaque industries compared to transparent ones is observed only when foreign banks prefer to enter via acquisition of domestic banks, which is in line with Hypothesis 1. There is no impact of the entry of greenfield institutions. Therefore, it is not the entry of foreign banks, but the disappearance of domestic banks that exacerbates

informational asymmetries and leads to credit constraints for start-ups. The impact of both modes of entry on firm exit is positive but not consistently significant anymore.

In the following specifications we relax the assumption of common coefficient of the interaction term and allow it to vary according to the firm size. The results, presented in Table 5, confirm our previous findings that the mode of foreign bank entry is important because only the acquisition of domestic banks leads to lower rates of firm creation in opaque industries. The impact is similar across all size categories, except individual entrepreneurs[11], which means a decrease in the average size of startups in more opaque industries in the wake of foreign bank entry. Following hypothesis of Evan and Jovanovic (1989), we interpret this result as evidence of increasing credit constraints because new firms cannot enter at their optimal size. We also find that the entry of foreign greenfield banks increases firm creation. It should be stressed that this effect is not due to higher supply of loans to start-ups by greenfield banks but rather due to competitive pressure that they put on domestic banks. Degryse et al. (2009) provide empirical evidence that greenfield banks attract the most transparent borrowers, and that their entry has a positive effect on loan supply by domestic banks to more opaque and riskier borrowers. This result is consistent with the theory of loan market segmentation of Dell'Ariccia and Marquez (2004).

As to firm exit, we find that foreign bank presence has a positive effect on the exit of smaller firms in opaque industries compared to transparent ones, notwithstanding the mode of entry. Our finding that acquisition of domestic banks by foreign investors has positive effect on firm exit in opaque sectors is in line with Hypothesis 2. Note that we do not observe disproportionately negative effects on survival of these firms, which implies that this finding refers to the exit of incumbent firms and not of start-ups. As it was mentioned earlier, size can be used as a measure of opacity for existing firms. Therefore, higher exit rate of smaller firms in opaque industries in countries with deeper foreign bank penetration signals tighter credit constraints for these firms. Finally, we observe that the entry of greenfield banks increases not just firm entry but firm exit as well. Despite such an increased turnover, the net effect on firm entry rate is not significant.

[11] The lack of impact on individual entrepreneurs that have no employees could be due to new lending technologies, such as credit score lending, that are well suited for funding small firms (Mester, 1997; Petersen and Rajan, 2002). This is especially true when credit scores are based on the owner's personal consumer data obtained from consumer credit bureaus, which is combined with data on the SME collected by financial institutions.

Since we rely on a difference-in-difference estimation, it is worth pointing out what the coefficients mean in terms of economic significance. Take an electricity industry which is at the 25th percentile of opacity and database activities, which are at 75th percentile, according to the definition of opacity in terms of fixed assets. The coefficient suggests that the difference in entry rates between electricity and database industries in Czech Republic (which is at the 75th percentile in terms of foreign bank presence which amounted to 73 percent of total banking assets in 2002) is 0.6 percentage points higher than the difference in entry rates between these same industries in Latvia (which is at the 25th percentile in terms of foreign bank presence). In other words, moving from Czech Republic to Latvia would benefit an opaque industry, like database activities, relatively more than a transparent one. As a comparison, this observed change amounts to 4 percent of the mean difference in entry rates between these industries across all countries, which reaches 15 percent. This effect can be considered quite negligible, but it is driven by the fact that there is no significant effect on the creation of individual entrepreneurs. If we look at the creation of firms with more than 9 employees, the observed change amounts to 48 percent of the mean difference. Economic significance is very similar when industry opacity is measured in terms of skill dependence.

5 Additional robustness tests

Our measure of opacity as a ratio of total assets to fixed assets can cause an identification problem, because it could be the case that industries characterized by a high share of fixed assets are also those that have high fixed start-up costs (Bonaccorsi di Patti and Dell'Ariccia, 2004). These firms might benefit as foreign banks prefer to extend loans to larger firms or they might suffer if for diversification purposes these banks decide to issue many smaller loans rather than to fund a small number of large borrowers. If we do not control for this, the negative or positive sign of the interaction term would capture these developments. Therefore, we introduce a control variable for start-up costs that equals to the average volume of fixed assets of young firms (less than five years) in the industry ($Entry\ costs_i$). In addition, we also constructed the opaqueness indicator employing only young firms, defined as firms younger than 5 years($Opacity\ (fixed\ assets\ for\ young\ firms)_i$). The results are presented in Table 6. The coefficient of the interaction with entry costs almost never achieves significance level and its inclusion does not modify our baseline results. Therefore, we can rule out an explanation that foreign bank entry led to changes in entry rates of firms in industries, depending on the size of their entry costs.

The entry of foreign banks in CEECs happened only when authorities have liberalized entry rules for foreign institutions. It could be hypothesizes that all types of entry regulation could have been liberalized at the same time. To control for this, we include additional interaction variable between an indicator that measures the ease of starting a new business and a natural rate of entry in absence of all entry barriers. Results, reported in Panel A of Table 7, are robust to the inclusion of this variable.

Finally, the entry of foreign banks has been accompanied by the fast growth of the financial sector due to their better access to international capital markets or via loans from parent banks. To control for this, we include an interaction term between financial depth and opacity (Panel B, Table 7), but the inclusion of this variable does not change our baseline results. While our findings confirm previous results that associate deeper financial markets with smaller credit constraints for start-ups (Guiso and Sapienza, 2004; Klapper et al., 2006; Aghion et al., 2007), the economic significance of this effect is very small in our study. From the point of view of entrepreneurs, the increased supply of credit in the wake of foreign bank entry mattered less than the increased informational asymmetries that made foreign banks less suitable to lend to them.

6 Conclusions

While foreign banks have contributed to the increased loan supply in CEE economies, there is little evidence about whether all borrowers benefited equally. A number of theoretical papers argue that foreign banks have a comparative advantage in lending to transparent firms, whereas domestic banks are better suited to engage in "relationship lending" and lend to opaque borrowers. Given that start-ups are the most opaque clients, we are interested to investigate whether they gained or lost from the presence of foreign banks.

Our analysis provides a few interesting conclusions. The presence of foreign banks is robustly associated with a lower entry rate of firms and smaller size of entrants in industries characterized by higher informational asymmetries compared to more transparent ones. We also find that foreign bank entry has a positive effect on exit rate in more opaque industries. These impacts are economically significant and are consistent with theories that emphasize the role of domestic banks in servicing opaque firms such as start-ups.

It should be stressed that the effect of foreign bank penetration depends on their mode of entry. The observed negative effects are due to virtual disappearance of domestic banks,

which have been acquired by foreign investors. In contrast, the entry of foreign banks via greenfield investment is associated with higher rate of firm creation in more opaque industries, which we interpret as a sign of market segmentation where greenfield foreign banks attract transparent borrowers and, thus, increase competitive pressure on domestic banks to increase their supply of loans to SMEs.

Our results should be viewed in the context of the literature on loan supply by foreign banks in CEE. While foreign bank entry increased the average loan supply and its stability (De Haas and Lelyveld, 2006), not all borrowers have benefited equally. Incumbent large firms and, to a smaller degree, medium and relatively small firms have seen their access to credit improve (Giannetti and Ongena, 2007). At the same time, our study shows that foreign bank entry could have tightened credit constraints for SMEs, forcing their exit and reducing the entry of new firms.

Our results provide important policy implications because they show that foreign bank entry can be harmful for the creation of new firms in industries with higher informational asymmetries. We argue that firm opacity is not necessarily correlated with its size. Moreover, we document that economic significance of foreign bank entry is larger for opaque industries than for industries with large share of small firms. By definition, opaque industries possess high levels of knowledge and skill intensity, such as new information technologies and, therefore, are crucial for future growth. This negative aspect should be considered along positive consequences of foreign bank entry, such as the increased and more stable supply of lending to larger firms. If foreign banks have a massive presence in the country and no domestic banks are left, different ways to support entrepreneurship should be explored, such as venture-capital funds or state funds, to assist start-ups and SMEs in more opaque industries.

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Figure 1. Firm density

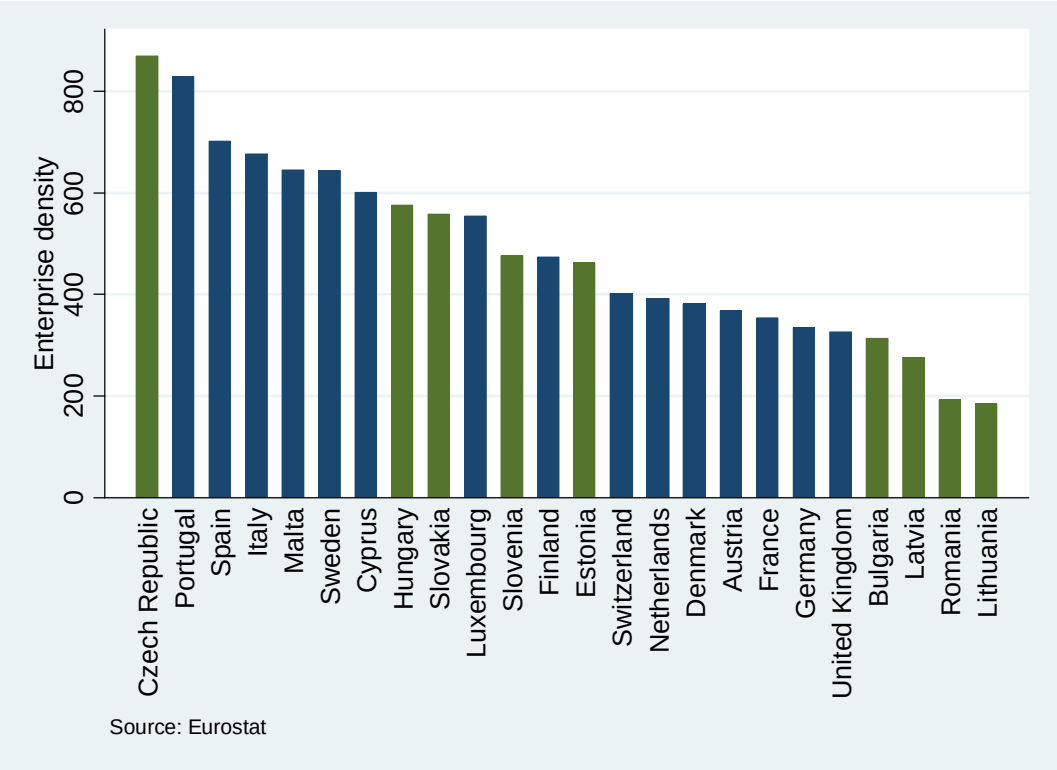


Figure 2. Firm entry density.

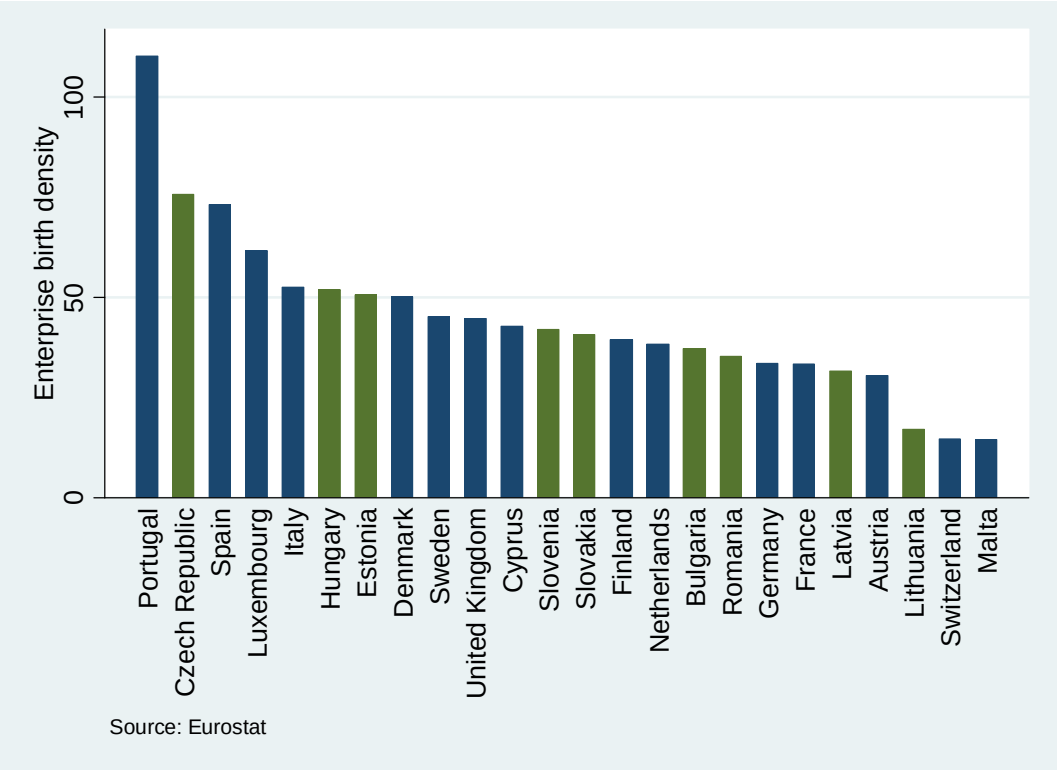
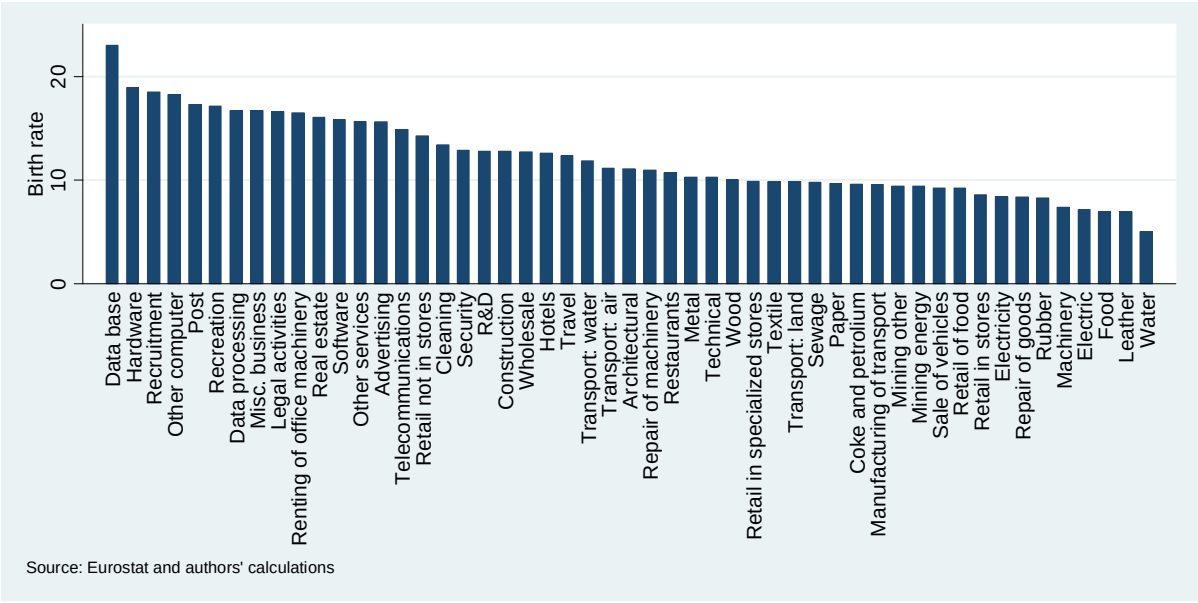
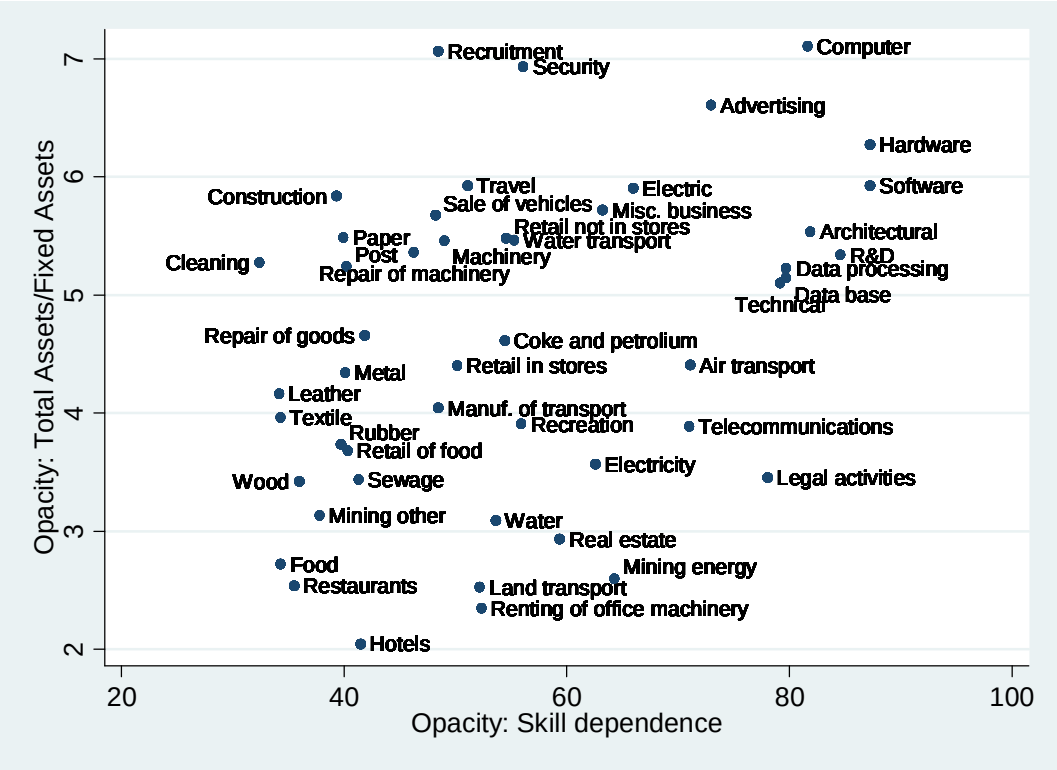


Figure 3. Firm entry rates with respect to different industries



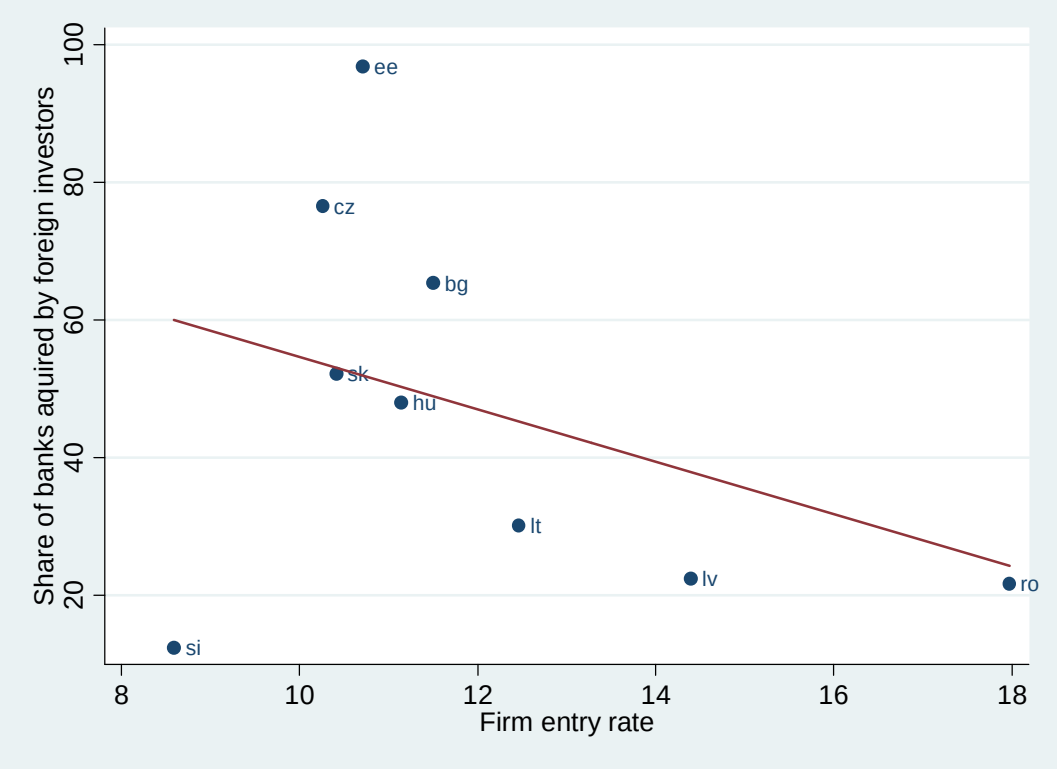
Source: Eurostat and authors' calculations

Figure 4. Scatter plot of two measures of opacity



Source: Amadeus, US Bureau of Labor statistics and authors' calculations

Figure 5. Scatter plot of firm entry vs. share of foreign acquired banks for the period 2000-2005



Source: Eurorostat, BancScope and authors' calculations

Table 1. Description of variables

Variable	Definition	Data source
Demographic variables		
$Entry_{ijt}$	Number of firms that entered industry i in country j and in year t divided by total firms in this industry, country and year.	Business Demography Statistic (BDS) of Eurostat
$Exit_{ijt}$	Number of firms that exited industry i in country j and in year t divided by total firms in this industry, country and year.	BDS of Eurostat
Net $entry_{ijt}$	Difference between entry and exit.	BDS of Eurostat
$Survival_{ijt}$	Number of firms that have been created in year $t-3$ and have survived till time t as a percentage share of firms in year $t-3$.	BDS of Eurostat
Firm density	Number of enterprises divided by the population (in 10,000).	BDS of Eurostat
Firm entry density	Number of new enterprises divided by the population (in 10,000).	BDS of Eurostat
Industry level variables		
Opacity(fixed $assets)_i$	An average ratio of total assets to fixed assets for an industry *i*.	Amadeus
Opacity(fixed assets of young $firms)_i$	An average ratio of total assets to fixed assets for an industry *i*, computed only for firms that are less than 5 years old.	Amadeus
Opacity(skill $dependence)_i$	Ratio of skilled labor to total labor, where skilled employee is defined as one that has completed at least a few years of college.	US Bureau of Labor Statistics.
Opacity (small $firms)_i$	Share of small firms in a total number of firms. A firm is considered small if its sales are below 10 percentile of firms' total sales.	Amadeus
Entry $costs_i$	Average volume of fixed assets of young firms (less than five years) in the industry.	Amadeus
Initial $share_i$	The initial share of each industry i in the local market j at the beginning of the analyzed period	Amadeus
$Natural_i$	Entry rate in industry *i* in the UK.	BDS of Eurostat
Country level variables		
$Foreign_{jt}$	Foreign bank presence is measured as a share of foreign banks in the total bank capital in country j and in year t	BankScope and own research
$Greenfield_{it}$	Greenfield mode of foreign bank entry is measured as a share of foreign banks that entered via greenfield investment in the total bank capital in country j and in year t	Own research
$Acquired_{it}$	Acquired mode of foreign bank entry is measured as a share of foreign banks that entered via acquisition of incumbent domestic banks in the total bank capital in country j and in year t	Own research
$Credit_{jt}$	A ratio of total credit to GDP in in country j and in year t	IFS
Start-up $costs_{jt}$	An indicator that evaluates the freedom (time and costs) of starting a new business, where indicator ranges from 0 (the least free) to 10 (the most free).	Fraser Institute

Table 2. Summary statistics for the period 2000-2005

	Obs	Mean	St.dev.
Entry rate (in percent)			
Total	2503	12.00	7.57
No employees	2400	20.28	17.14
1 – 4 employees	2455	12.07	9.77
5 – 9 employees	2393	6.09	8.36
More than 9 employees	2391	3.08	4.46
Exit rate (in percent)			
Total	2236	8.49	4.38
No employees	2146	17.20	14.12
1 – 4 employees	2195	8.05	7.32
5 – 9 employees	2142	3.20	5.06
More than 9 employees	2155	1.78	2.60
Net entry rate (in percent)			
Total	2229	3.85	7.73
No employees	2129	4.05	20.70
1 – 4 employees	2176	4.28	11.55
5 – 9 employees	2111	3.07	9.87
More than 9 employees	2109	1.33	4.53
Survival rate (in percent)			
Total	1508	75.75	14.15
No employees	1372	67.76	20.14
1 – 4 employees	1457	82.49	14.80
5 – 9 employees	1190	88.33	16.35
More than 9 employees	1163	87.24	19.06

Entry/exit rates refer to a number of firms that entered/exited industry i in country j and in year t divided by total firms in this industry, country and year. Net entry is computed as a difference between entry and exit. Survival is computed as a number of firms that have been created in year $t-2$ and have survived till time t as a percentage share of firms in year $t-2$.

Table 3. The impact of foreign bank presence on firm demographics depending on industry opacity

	Entry	Entry	Exit	Net entry	Survival
Panel A					
Initial industry share	-0.013	-0.063**	0.084*	-0.134*	0.287*
	(0.704)	(0.045)	(0.056)	(0.096)	(0.066)
Foreign*opacity (fixed assets)	-0.292**	-0.248**	0.504***	-0.661***	-0.709
	(0.013)	(0.025)	(0.000)	(0.000)	(0.289)
Foreign*Share of small firms	0.018	0.022	0.141*	-0.125	-0.898
	(0.817)	(0.774)	(0.095)	(0.361)	(0.018)
Exit		0.185***			
		(0.000)			
Constant	11.58***	14.45***	6.121**	8.030***	58.55***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	4399	4300	4063	3999	2368
R-squared	0.539	0.571	0.601	0.146	0.364
Panel B					
Initial industry share	-0.003	-0.055*	0.068	-0.114	0.329**
	(0.908)	(0.080)	(0.118)	(0.147)	(0.033)
Foreign*opacity (skill dependence)	0.138	0.147	0.075	0.114	-1.082**
	(0.183)	(0.153)	(0.462)	(0.506)	(0.016)
Foreign*Share of small firms	-0.043***	-0.042***	0.042***	-0.098***	0.064
	(0.000)	(0.000)	(0.000)	(0.000)	(0.431)
Exit		0.184***			
		(0.000)			
Constant	12.15***	11.29***	6.657***	7.181***	45.72***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	4318	4224	3996	3933	2320
R-squared	0.537	0.568	0.599	0.150	0.364

Robust p values in parentheses; year, industry and country dummies are included; clustered by country/industry.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4. The impact of foreign bank presence on firm demographics depending on industry opacity and share of small firms

	Entry	Entry	Exit	Net entry	Survival
Panel A					
Initial industry share	-0.030	-0.0973***	0.0685	-0.135*	0.336*
	(0.560)	(0.000)	(0.347)	(0.096)	(0.066)
Acquired*opacity (fixed assets)	-0.527***	-0.435***	0.322	-0.674***	-0.447
	(0.000)	(0.000)	(0.146)	(0.000)	(0.558)
Greenfield*opacity (fixed assets)	0.612	0.215	1.286*	-0.693	-0.480
	(0.252)	(0.596)	(0.050)	(0.337)	(0.760)
Foreign*Share of small firms	-0.003	0.0347	0.0604	-0.131	-0.726*
	(0.978)	(0.698)	(0.621)	(0.346)	(0.072)
Exit		0.603***			
		(0.000)			
Constant	5.891***	6.602***	-2.578	7.027***	56.19***
	(0.000)	(0.000)	(0.340)	(0.000)	(0.000)
Observations	4399	4300	4063	3999	2368
R-squared	0.083	0.451	0.085	0.130	0.270
Panel B					
Initial industry share	-0.028	-0.089**	0.042	-0.117	0.349*
	(0.592)	(0.011)	(0.552)	(0.135)	(0.055)
Acquired*opacity (skill dependence)	-0.049**	-0.056***	0.037	-0.105***	0.0361
	(0.019)	(0.000)	(0.108)	(0.000)	(0.690)
Greenfield*opacity (skill dependence)	-0.0244	-0.056	0.074	-0.029	0.342**
	(0.630)	(0.166)	(0.259)	(0.684)	(0.042)
Foreign*Share of small firms	0.107	0.185	-0.019	0.106	-0.893*
	(0.434)	(0.107)	(0.895)	(0.543)	(0.060)
Exit		0.601***			
		(0.000)			
Constant	6.544***	4.197***	3.779*	7.907***	30.48**
	(0.000)	(0.000)	(0.086)	(0.000)	(0.019)
Observations	4318	4224	3996	3933	2320
R-squared	0.082	0.448	0.085	0.134	0.274

Robust p values in parentheses; year, industry and country dummies are included; clustered by country/industry.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5. The impact of foreign bank presence on firm demographics by size depending on industry opacity

	Entry	Entry	Exit	Net entry	Survival
Initial industry share	0.004	-0.0467	0.107**	-0.134*	0.265*
	(0.897)	(0.143)	(0.015)	(0.097)	(0.098)
Acquired*opacity (fixed assets) 0	-0.204	-0.155	0.511***	-0.538*	-0.064
	(0.276)	(0.380)	(0.007)	(0.092)	(0.937)
Acquired*opacity (fixed assets) 1-4	-2.992**	-2.685**	-1.406	0.149	-0.104
	(0.019)	(0.034)	(0.162)	(0.926)	(0.988)
Acquired*opacity (fixed assets) 4-9	-0.642***	-0.552***	0.440***	-1.065***	-0.172
	(0.000)	(0.000)	(0.000)	(0.000)	(0.817)
Acquired*opacity (fixed assets) >9	-0.307**	-0.211*	0.377***	-0.582**	-1.212
	(0.017)	(0.087)	(0.000)	(0.011)	(0.199)
Greenfield*opacity (fixed assets) 0	1.389***	1.128**	2.151***	-0.707	1.374
	(0.000)	(0.012)	(0.000)	(0.374)	(0.428)
Greenfield*opacity (fixed assets) 1-4	9.622**	10.41***	8.550**	-5.588	11.44
	(0.011)	(0.000)	(0.013)	(0.301)	(0.476)
Greenfield*opacity (fixed assets) 4-9	0.613	0.499	1.481***	-0.676	-3.685**
	(0.125)	(0.200)	(0.000)	(0.374)	(0.034)
Greenfield*opacity (fixed assets) >9	1.656***	1.359***	2.366***	-0.581	-1.939
	(0.000)	(0.000)	(0.000)	(0.455)	(0.317)
Exit		0.182***			
		(0.000)			
Constant	10.08***	12.91***	2.572	6.603***	51.68***
	(0.000)	(0.000)	(0.320)	(0.000)	(0.000)
Observations	4399	4300	4063	3999	2368
R-squared	0.544	0.575	0.603	0.147	0.368

Robust p values in parentheses; year, industry, size and country dummies are included; clustered by country/industry.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6. Robustness test: Fixed assets for young firms and entry costs

	Entry	Entry	Exit	Net entry	Survival
Initial industry share	-0.031	-0.095***	0.071	-0.135*	0.344*
	(0.554)	(0.009)	(0.327)	(0.097)	(0.063)
Acquired*opacity (fixed assets of young firms)	-0.492***	-0.390***	0.307	-0.553**	-0.343
	(0.008)	(0.002)	(0.147)	(0.016)	(0.643)
Greenfield*opacity (fixed assets of young firms)	0.532	0.165	1.384**	-0.976	-0.202
	(0.305)	(0.671)	(0.031)	(0.155)	(0.893)
Entry costs	0.000	0.000	0.000	0.000	0.000
	(0.949)	(0.443)	(0.566)	(0.391)	(0.868)
Foreign*Share of small firms	-0.025	-0.002	0.093	-0.209	-0.761*
	(0.821)	(0.981)	(0.447)	(0.130)	(0.070)
Exit		0.603***			
		(0.000)			
Constant	5.993***	6.800***	-3.268	7.804***	55.81***
	(0.000)	(0.000)	(0.237)	(0.000)	(0.000)
Observations	4399	4300	4063	3999	2368
R-squared	0.083	0.451	0.085	0.130	0.270

Robust p values in parentheses; year, industry and country dummies are included; clustered by country/industry.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7. Robustness test: Controlling for start-up costs and financial development

	Entry	Entry	Exit	Net entry	Survival
Panel A					
Initial industry share	-0.030	-0.096***	0.069	-0.136*	0.326*
	(0.572)	(0.008)	(0.338)	(0.093)	(0.075)
Acquired*opacity (fixed assets)	-0.503**	-0.416***	0.346	-0.707***	-0.530
	(0.011)	(0.003)	(0.120)	(0.004)	(0.488)
Greenfield*opacity (fixed assets)	0.640	0.235	1.339**	-0.766	-0.903
	(0.232)	(0.563)	(0.040)	(0.293)	(0.568)
Start-up costs*Natural	-0.005	-0.004	-0.007	0.010	0.0441*
	(0.342)	(0.411)	(0.350)	(0.310)	(0.063)
Foreign*Share of small firms	0.006	0.0425	0.071	-0.147	-0.808**
	(0.957)	(0.640)	(0.557)	(0.297)	(0.0473)
Exit		0.602***			
		(0.000)			
Constant	6.002***	6.655***	-2.312	6.754***	55.35***
	(0.000)	(0.000)	(0.397)	(0.000)	(0.000)
Observations	4399	4300	4063	3999	2368
R-squared	0.083	0.451	0.085	0.130	0.272
Panel B					
Initial industry share	-0.041	-0.100***	0.0574	-0.123	0.283
	(0.442)	(0.006)	(0.426)	(0.128)	(0.127)
Acquired*opacity (fixed assets)	-0.408**	-0.405***	0.420*	-0.782***	-0.543
	(0.047)	(0.004)	(0.066)	(0.002)	(0.481)
Greenfield*opacity (fixed assets)	0.333	0.142	1.267*	-0.670	-0.843
	(0.545)	(0.731)	(0.0543)	(0.355)	(0.595)
Credit*opacity (fixed assets)	0.010***	0.002	0.011**	-0.011**	0.025*
	(0.005)	(0.328)	(0.0181)	(0.0145)	(0.0573)
Foreign*Share of small firms	0.038	0.046	0.111	-0.187	-0.704*
	(0.729)	(0.612)	(0.374)	(0.190)	(0.082)
Exit		0.602***			
		(0.000)			
Constant	3.236	6.200***	-5.227*	8.822***	48.90***
	(0.132)	(0.000)	(0.0817)	(0.000)	(0.000)
Observations	4399	4300	4063	3999	2368
R-squared	0.084	0.451	0.086	0.131	0.272

Robust p values in parentheses; year, industry and country dummies are included; clustered by country/industry.
* significant at 10%; ** significant at 5%; *** significant at 1%