Profitability of foreign banks in Central and Eastern Europe: does the mode of entry matter?[*]

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Abstract

Using data for 419 banks operating in Central and Eastern Europe between 1993-2004, this paper analyzes profitability of domestic, takeover and greenfield banks. The results show that the mode of foreign bank entry is an important determinant of bank performance, as greenfield banks are not affected by domestic conditions but are sensitive to the health of their parent institutions and to the macroeconomic situation in the European Union. We also find that the entry of foreign banks had spillover effects on the performance of domestic banks and that there is convergence in profits and costs between banks with different types of ownership.

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1. Introduction

Factors that determine the performance of financial institutions have long been subject to vigorous debate. Numerous studies document the relationship between banking sector performance and the structure of financial markets (Gilbert, 1984; Berger and Hannan, 1998; Demsetz, 1973), bank's strategy (Berger, 1995; Demirguc-Kunt and Huizinga, 1999; Goddart et al., 2004; Kosmidou et al, 2004; Gonzalez, 2004), or the macroeconomic conditions of countries in which banks operate (Demirguc-Kunt and Huizinga, 1999; Goddart et al., 2004). The majority of papers, however, focus on developed markets with a low presence of foreign banks,[1] implicitly disregarding the importance of ownership information. They ignore a few facts: first, foreign banks might be differently affected by certain factors than domestic banks would, and, second, they could be affected by additional factors, such as home country conditions and strategies of their parent institutions.[2] Moreover, even if ownership and parent bank information is taken into account, most authors treat foreign banks as a homogenous group. In reality, two different types of foreign banks can be distinguished: greenfield banks (or *de novo* banks: foreign banks newly established in a country), and takeover banks (banks initially domestic that were subsequently sold to private foreign investors) (Dell'Ariccia and Marquez, 2004; Claeys and Hainz, 2006; De Haas and Van Lelyveld, 2006; Havrylchyk, 2006). To our knowledge, no study accounts for all these factors simultaneously.

Why is it important to incorporate ownership information in the analysis of banks' performance? To answer this question let us first look at the structure of a bank's balance sheets in its relation to profits. As documented by De Haas & Naaborg (2005), international banks allocate capital between their subsidiaries using either a passive or active approach. In

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[1] The authors investigating this issue generally find that foreign banks operating in developed countries exhibit a lower return on assets than their domestic counterparts (see e.g. Demirguc-Kunt and Huizinga, 2001, for the analysis of the banking sectors in the US, Canada, the UK, Germany, France, and the Netherlands or De Young and Nolle, 1996 for the US), whereas the opposite is true for transition and developing economies (Bonin et al., 2005).

[2] To our knowledge, this issue has only been addressed by Williams in his series of papers analyzing the profitability of banking sector in Australia (Williams, 1998a, 1998b, 2003).

Central and Eastern European countries (CEECs), for example, most parent banks use the passive approach, which means that capital is allocated to subsidiaries that are in need of additional capital to meet the regulatory and supervisory requirements.[3] This suggests that the profitability of foreign banks might be less sensitive to the structure of their own liabilities, such as capitalization and deposits-to-assets ratio, but at the same time could be affected by the health of their parent banks. In addition, superior risk management techniques and higher corporate governance standards of foreign institutions may result in better screening of potential creditors and more effective monitoring after the loan is granted. That, in turn, would lower the ratio of non-performing loans, leading to a higher return from lending activities.

The structure and level of development of financial markets could also have a differential impact on the performance of foreign and domestic banks. In developing countries an increase in foreign bank ownership went hand in hand with a rise in banking market concentration. Foreign banks contributed to the higher concentration through two channels: 1) foreign banks acquired domestic institutions and merged them into one; 2) domestic institutions consolidated because of competitive pressures from their foreign peers. Martinez Peria and Mody (2004), in their study of foreign and domestic banks in Latin America, document that greater market concentration widens spreads more for domestic banks than for foreign ones. The possible reason is that foreign banks charge lower loan rates in order to attract new customers and achieve the desired size, while domestic banks exploit higher concentration by charging higher lending rates and/or lower deposit rates.[4] In addition, as the stock or bond markets develop, profits of foreign banks may be more affected due to the fact

[3] For example, in the Raiffeisen Bank, the subsidiaries set annual targets of credit growth, which are in practice backed up by tier 1 and tier 2 capital from their parent institution in Vienna. Such passive capital reallocation can be denied, only if the capital ratio at the group level comes to the required minimum.

[4] Such situation is possible if foreign banks have better screening and monitoring techniques with respect to hard information, hence serving more transparent groups of customers, while domestic banks serve informationally opaque borrowers.

that they are more likely to service only large enterprises, while profits of domestic banks remain unchanged.

The impact of home country conditions on profitability of foreign banks is ambiguous and cannot be easily predicted. Let us assume, for example, that the home country experiences an economic upswing. In this situation parent banks may have numerous profitable opportunities in their home countries and may decide to allocate less capital to their subsidiaries (substitution effect). At the same time, robust growth in the home country could render parent banks more profitable and better able to develop their subsidiaries abroad (complementary effect). The situation would reverse during an economic slowdown in the home country, as parent banks may decide to either cut their foreign operations – due to low profits at home – or expand abroad in search of new opportunities.[5] Additionally, since foreign banks are likely to have a better access to international markets, they could significantly improve credit supply without having to rely on scarce (and expensive) domestic deposit supply. International experience also indicates that parent banks serve as lenders-of-last-resort if their subsidiaries run into trouble. For example, the Belgian bank KBC recapitalized its Polish subsidiary Kredyt Bank and its Hungarian subsidiary K&H when they encountered problems.

So far, we have discussed the reasons calling for a differential treatment of domestic and foreign banks. As mentioned in the first paragraph, however, foreign banks are not a homogeneous group; hence the mode of entry may have several important implications for banks' performance. First, the decision of whether to buy an existing bank or establish a new one may reflect the strategy of the parent institution (De Haas and Van Lelyveld, 2006). Greenfield banks may be founded when parent banks intend to exercise a high degree of

[5] The empirical literature on the relationship between profitability and home country conditions is scarce, whereas the impact of home country economic environment on loan growth of foreign banks has deserved more attention of researchers, but the evidence that it provides is ambiguous. Peek and Rosengren (1997) and

control over a subsidiary's operations. Consequently, from its inception greenfield banks will be closely integrated with parent institutions, depending on them for capital, and applying approved risk and portfolio management techniques. In contrast, the takeover of an existing bank involves inheriting its personnel, infrastructure and client portfolio. Hence, the modernization of a takeover bank will require time (and money), and its performance may depend on the local factors and the bank's own strategy much more than it would be the case for a greenfield bank.

A foreign bank's decision regarding the mode of entry may also depend on the costs of purchasing and restructuring an existing financial institution. Buying a bank in another country is tantamount to high capital expenditures on the side of parent bank. Furthermore, governments of developing countries often decide to privatize banks in the aftermath of financial crises, hence institutions offered to foreign buyers are illiquid and burdened with non-performing loans. The cost of cleaning up the loan portfolio and restructuring the firm falls on the new owners. Obviously, newly established institutions are free from such considerations (Claeys and Hainz, 2006).

Finally, it is important to note that the mode of entry determines the access of parent institutions to an existing client portfolio. In the case of a takeover, the foreign bank inherits the target bank's database, while a greenfield bank has to build the client portfolio on its own. Consequently, greenfield banks have an incentive to focus on the most transparent clientele. Since it is the most competitive segment of the market, greenfield banks cannot charge high interest rates (Dell'Ariccia and Marquez, 2004, Martinez Peria and Mody, 2006). Meanwhile, takeover banks are able to extend credit to less transparent firms that were served by the bank before the takeover, charging them higher interest rates in the process.

Jeanneau and Micu (2002) document a complimentary effect, whereas de Haas and Van Lelyveld (2006) find a supplementary effect.

In light of the above discussion, we would like to contribute to the literature by investigating the determinants of banks' profitability, taking into account both the international factors and the possible differential response of domestic, greenfield, and takeover banks to domestic factors. We conduct our analysis using a dataset comprising 419 banks from 11 Central and Eastern European countries, namely Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia, in the period 1993-2004. The sample choice is motivated by the fact that, due to the reforms undertaken after the fall of a communist system, this region has the highest share of foreign investors in the banking sector in the world, rendering it perfect for such a study (in 2004, foreign banks controlled 71 percent of banking assets in CEECs). Moreover, both greenfield and takeover banks operate in all countries.

In order to gain insights into the factors that affect the profitability of banks in CEECs, we first investigate the relationship between banks' profits and a set of domestic and international factors. Since our interest lies in the profitability determinants of banks with different ownership structures, we start by estimating our regressions for the sample of all banks, and proceed by performing separate regressions for the domestic, takeover and greenfield banks. Such strategy allows us to compare the response of three types of banks to common factors, as well as to check whether being part of multinational financial institution matters for the foreign bank performance.

To deepen our understanding of banks' profits, we decompose return on assets into net interest margin, net non-interest income, loan loss provisions and overhead costs, and analyze each component separately. This exercise allows us to examine the sources of the observed higher profitability of the greenfield banks. Finally, to verify whether the performance of banks with different ownership converges over time, we include dynamic variables into our model.

The paper is structured as follows. Section 2 shows sources of data used in this study, as well as descriptive statistics. Sections 3 and 4 present econometric methodology and empirical results, respectively. Section 5 concludes.

2. Data and descriptive statistics

2.1. Data sample and sources

All bank-specific information used in this study comes from Bureau Van Dijk's BankScope database. We extract from it information on banks operating in 11 countries in Central and Eastern Europe between 1993 and 2004. As a result, our panel contains balance sheet and income statement figures on 419 commercial and saving banks in CEECs. We exclude investment banks, micro-finance banks and development banks, and consider merged banks as two entities before and one entity after the merger. For all these banks we use unconsolidated statements whenever possible, relying on consolidated statements otherwise.

Appropriate information on bank ownership is crucial to our analysis. As the BankScope database lacks historical ownership data, for the years 1994-2001 we use information kindly provided by De Haas and Van Lelyveld (2006). For the four remaining years we determine the ownership changes ourselves, on the basis of banks' official publications and central bank reports. We categorize a bank as foreign in a given year if at least 51% of its capital was owned by foreign investors. As a result, we construct two foreign ownership dummies that reflect the mode of entry: *Greenfield* – for a foreign bank that was founded as a *de novo* institution, and *Takeover* – for a bank that became foreign after being purchased by a foreign investor.

The next step in preparing the dataset is identification of the parent banks of all foreign banks operating in CEECs. Due to the lack of historical information, for each foreign bank in CEECs we first identify the largest investor in the BankScope database, and then check other sources (newspapers, banks' annual reports and central banks' publications) for information on past changes in ownership. Since we are interested in the influence that the bank holding can have on its subsidiary, we rely on consolidated balance sheet and income statements.

The data on macroeconomic variables for both home and host countries is taken from the International Financial Statistics of the IMF, and stock market capitalization from the national stock exchanges. A host country is defined as a country where a bank is operating, while a home country is a country of its parent bank. We identify the following home countries: Austria, Belgium, Denmark, Finland, Germany, Greece, Hungary, Japan, Latvia, Italy, the Netherlands, Portugal, Russia, Sweden, the UK and the US. Since many parent banks are large multinational institutions, we also use an alternative definition of the home area and use macroeconomic data for the whole EU instead.

After combining the dataset, we take the necessary steps to ensure its consistency. First, we remove banks for which BankScope does not report any financial information. Second, we eliminate observations with unreasonable values of return on assets, net interest margin and capitalization. As a result, we obtain a database with 1846 bank-year observations. Comparison with data published by the central banks of the respective CEECs reveals that on average our dataset covers 84% of national banking assets.

2.2. Summary statistics

Before performing any econometric estimation, we would like to see whether there are significant differences between domestic, greenfield and takeover banks in the first place. To do this, we compute the following bank performance indicators: return on assets (*ROA*); net interest margin (*NIM*); net non-interest income (*NII*); capitalization (*Capital*); loan loss provisions (*LLP*); ratio of personnel and administrative costs to total assets (*Costs*); shares of loans and deposits to assets (*Loans-to-Assets*, *Deposits-to-Assets*). We present these indicators separately for three types of banks: domestic, takeover and greenfield. In addition, we test the significance of differences in the mean between takeover and greenfield banks with respect to domestic banks.

The results of this exercise are presented in Table 1. We find that greenfield banks are more profitable in terms of *ROA* than domestic banks, whereas there is no difference in profitability between takeover and domestic banks. Results of further tests indicate that the superior performance of greenfield banks comes from better cost efficiency and risk management techniques (resulting in lower *Costs* and *LLP*, respectively), and not from higher margins. In fact, both net interest margin and non-interest income of domestic banks are significantly higher. Combined, these results suggest that greenfield banks may target the most transparent clients, charging them lower rates (Dell'Ariccia and Marquez, 2004). This could also mean that greenfield banks are superior in their cost and risk management, which allows them to charge lower interest rates while still earning higher profits. Greenfield banks also seem to rely on their parents for funding, as their deposit to asset ratio is significantly lower than that of domestic banks.

Differences between domestic and takeover banks are much less pronounced. Return on assets is virtually identical; we do not find significant differences with respect to capitalization or loan loss provisions either. It is interesting to note, however, that both net interest margin and costs of takeover banks are lower, suggesting that foreign ownership increases their efficiency and contributes to higher competition in the banking sector as a whole.

In Table 2 we show the summary statistics for performance indicators of takeover and greenfield banks in CEECs and of matching parent banks in their home countries. The results suggest a motivation for opening a subsidiary in CEECs: simply put, it is very profitable, notwithstanding the mode of entry. This difference between profits in home countries and CEECs comes from higher interest margins and non-interest income, which succeed to offset higher costs. That would suggest that foreign entry might have been a win-win situation: even though foreign banks profit from interest rates and fees that are higher than in their home countries, their entry causes competition in the host banking markets to intensify, benefiting customers. Finally, despite much higher loan loss provisions for takeover banks in CEECs, this difference with parent banks is not statistically significant. Interestingly, greenfield banks have very low loan loss provisions, which are even lower than that of their parent banks, which can be explained by their choice of customers (as noted above).

3. Econometric methodology and a choice of explanatory variables

In order to answer our research questions, we investigate the relationship between banks' return on assets and four groups of variables: 1) bank ownership dummies, 2) individual bank characteristics, 3) host country macroeconomic conditions, 4) indicators of market structure and development of the stock market. In regressions performed on foreign banks, we add a fifth group, namely parent banks' performance indicators and home country macroeconomic conditions.

Consequently, the baseline model takes the following form:

$$ROA_{ijt} = \beta_0 + \beta_1 Takeover_{ijt} + \beta_2 Greenfield_{ijt} + \beta_3\ Bank\quad Characteristics_{ijt} + \qquad (1)$$
$$+ \beta_4 Macro_{jt} + \beta_5\ Market\quad Structure_{jt} + Host_j + \gamma_t + \varepsilon_{ijt}$$

where *i* indicates a bank, *j* – host country, and *t* – year. The exact definitions and data sources of all the variables are presented in Table 3.

Since we would like to determine whether takeover and greenfield banks are affected by international factors, we augment the above model with variables that capture parent bank characteristics and home country macroeconomic conditions, obtaining the following equation:

$$ROA_{ijt} = \beta_0 + \beta_1 Takeover_{ijt} + \beta_2 Greenfield_{ijt} + \beta_3\ Bank\quad Characteristics_{ijt} + \beta_4 Macro_{jt} + \qquad (2)$$
$$+ \beta_5\ Market\quad Structure_{jt} + \beta_6\ International\quad Factors_{ijt} + Host_j + Home_{ijt} + \gamma_t + \varepsilon_{ijt}$$

Naturally, we run this model only for greenfield and takeover banks.

As noted above, we start the analysis by estimating Equation (1) with *ROA* as a dependent variable. However, *ROA* can be roughly presented in the following way:

$$ROA_{it} = NIM_{it} + NII_{it} - LLP_{it} - Costs_{it} \tag{3}$$

In order to pinpoint the exact sources of profitability, we run Equation (1) using the right-hand-side indicators from Equation (3) as our dependent variables.

In order to test the impact of the mode of entry on a bank's performance, our first group of explanatory variables includes dummies for greenfield and takeover banks. To analyze the spillover effects of foreign ownership on profitability of the banking system, we also include shares of loans granted by takeover and greenfield banks to the total loans in each country (*Share of takeovers* and *Share of greenfields*). Claeys and Hainz (2006) differentiate between spillover effects of foreign ownership on lending rates, depending on the mode of entry, and find that competition is slightly more intense when entry predominantly happens via greenfield investments.

Our choice of the remaining explanatory variables is motivated by the current literature on bank performance (Demirguc-Kunt and Huizinga, 1999; Claeys and Hainz, 2006; Claeys and Vander Vennet, 2004; De Haas and Van Lelyveld, 2006; Martinez Peria and Moody, 2004). The second group, bank specific variables, includes a measure of bank capital adequacy and two bank balance sheet indicators. Bank capital adequacy is captured by *Capital,* a ratio of equity to total assets, and its predicted effect on profits is positive for three reasons. First, the expected bankruptcy hypothesis (Berger, 1995) states that increased capital leads to higher earnings due to reduced interest rates on uninsured funds. This is especially relevant for riskier banks, whose probability of bankruptcy subsequently decreases.[6] Second,

[6] The signaling hypothesis also suggests a positive relationship between capitalization and profits. It assumes that managers have private information about the future cash flows and, therefore, signal about this by their

well capitalized banks may be considered creditworthy by market participants. In this case, banks would be able to offer lower deposit rates, which would lead to higher margins and profits (depositor market discipline hypothesis, Barth et al., 2006). Finally, Kim et al. (2004) suggests that capitalization of banks is important to borrowers, since switching to another bank is costly and, as a result, clients would be prepared to pay higher lending rates to banks which are more likely to extend credit limits or provide new loans in the future (the refinancing hypothesis).

To investigate the impact of bank balance sheet composition on profits we use the ratios of loans and deposits to total assets. Due to the fact that loans are the most risky component of total assets, the first variable, *Loans-to-Assets*, is a measure of a bank's asset risk. The second variable, *Deposits-to-Assets*, is a ratio of demand and savings deposits to total assets (Berlin and Mester, 1999). In developed economies domestic deposits are considered a cheap source of funds; therefore a bank with a wide branch network may be able to achieve high interest margins and higher profits. On the other hand, foreign banks may receive cheaper funds from their parent institutions, rendering this variable insignificant.

Third, we include indicators that capture macroeconomic conditions in the host countries. The *Host interest rate* variable controls for the marginal cost of funds faced by the banks in CEECs. Similar to Demirguc-Kunt and Huizinga (1999) we expect to find a positive relationship between real interest rate and bank profitability. However, this effect should be smaller for foreign banks, which are likely to be less sensitive to domestic interest rate fluctuations due to their access to finance abroad (via their parent banks or direct access to international capital markets). To control for the impact of the business cycle we include GDP growth (*Host GDP*). The sign of this variable is ambiguous. While the literature usually documents that profits are bigger during the economic upswing and are depressed during

capital decisions (Berger, 1995). Berger (1995) and Demirguc-Kunt and Huizinga (1999) provide empirical evidence in support of the expected bankruptcy hypothesis.

downfalls (Goddart et al., 2004), there also studies that fail to pick up this relationship (Demirguc-Kunt and Huizinga, 1999).[7] As CEECs are small open economies, we also include exchange rate volatility.

Fourth, we introduce variables that help us to control for the impact of market structure on profitability. According to the structure-conduct-performance (SCP) hypothesis, higher market concentration leads to imperfect competition. That allows banks to set prices that are less favorable to consumers and results in higher bank profits (see Gilbert, 1984, for a survey). A similar hypothesis of relative market power (RMP) asserts that only firms with large market power and well-differentiated products are able to exercise market power in pricing these products and earn abnormal profits. Additionally, it is hypothesized that managers of large firms could make less effort to maximize efficiency – the so called "quiet life" effect (Berger and Hannan, 1998). An alternative explanation of the positive relationship between high concentration and profitability is offered by Demsetz (1973). He formulates the efficient structure (ES) hypothesis, which suggests that more efficient banks, which are also more profitable, gain large market shares, which may result in high levels of market concentration.[8] To test the above hypotheses we include *Herfindahl Index,*[9] *Market Share* and *X-efficiency* variables in our regression.

Next, we analyze the impact of stock market developments on bank profits by including *Stock market capitalization* variable. Capital markets can serve a complementary or substitution function to the banking sector. On the one hand, the Miller-Modigliani theorem

[7] During macroeconomic upswings borrowers' ability to repay loans tends to increase, and conversely, during downturns, loan defaults are likely to grow. Since loan loss provisioning is usually backward-looking, and is a key contributor to a bank's earnings, we can expect a positive relationship between GDP growth and profitability (Hoggarth and Pein, 2002). At the same time, Martinez Peria and Moody (2004) point out that banks might charge higher interest rates during economic downturns to compensate for the increased risk, which would lead to higher profits, other things being equal.

[8] Berger (1995) attempts to distinguish between the SCP, RMP and the ES hypotheses and, even thought he finds that the superior X-efficiency is associated with higher profits, he does not find proof that this leads to higher concentration of the market. At the same time his results provide support for the RMP hypothesis but run contrary to the SCP paradigm.

[9] We also experiment with other measures of concentration, such as the share of loans held by the top three or five largest banks, but the findings do not change. The results are available upon request.

states that debt and equity finance are pure substitutes in the absence of taxes and bankruptcy costs. Therefore, we could expect a negative impact of deep stock markets on banks' profits, especially for foreign banks which are often accused of cherry-picking the blue-chip clients (substitution effect). On the other hand, as capital markets develop, banks have more information about clients, which makes the tasks of selecting and monitoring clients easier. Therefore, more mature stock markets could help to mitigate problems of adverse selection and moral hazard and increase a bank's profit (complementary effect).

When we run regressions on foreign banks, we augment our model with international factors, such as parent bank NIM (*Parent NIM*), capitalization (*Parent capital*), home market GDP growth (*Parent GDP*) and interest rates (*Parent interest rate*). The choice of most of the variables is motivated by recent studies on transmission of international shocks and the role of international factors on performance of banks (Jeanneau, S. and M. Micu, 2002; Peek, J., and Rosengren, E., 1997 ; De Haas and Van Lelyveld, 2006; Williams, 1998a, 1998b, 2003). We add to the literature by including a variable capturing the capitalization of parent banks. It appears to us to be the most important international factor, since managers of international banks state that the supply of capital to their subsidiaries can only be constrained if capitalization of the whole group reaches a critical level (Haas & Naaborg, 2005).

We estimate all of our models using a random effects panel data methodology, with robust standard errors adjusted for intra-group correlation. In addition, we include host country fixed effects, and, in regressions on the samples of takeover and greenfield banks, parent banks' home countries fixed effects. In order to capture the time dynamics for which we cannot control with our macroeconomic and market structure variables, we include year dummies.

4. Empirical results

4.1. Determinants of bank profitability

Table 4 presents estimation results for our main profitability model described in Equation (1). The first column reports the results for all banks (domestic and foreign), the second only for domestic banks, and the four remaining columns for takeover and greenfield banks with different foreign macroeconomic variables.

Bank Specific Characteristics

Our results allow us make some interesting conclusions. First of all, we find that greenfield banks, on average, earn *ROA* that is 0.95 percentage points higher than *ROA* of domestic banks. These results contrast with the findings for mature banking markets where greenfield banks start with low profitability and only after nine years achieve the level of profits of older banks of similar size (DeYoung and Hasan, 1998). At the same time, we show that the impact of foreign ownership on banks taken over by foreign investors is not statistically significant. Hence, our hypothesis about the importance of the mode of entry for banks' profitability is confirmed.[10]

The analysis of other bank specific factors also corroborates our expectations. First, we find that profits of domestic and takeover banks are positively influenced by capitalization and deposits-to-assets ratio. One standard deviation increase in bank capitalization adds 1.24 and 0.70 percentage points to the *ROA* of domestic and takeover banks, respectively. The effect of the deposit ratio is smaller (around 0.34 percentage points for both banks), but still economically significant. These results reflect the higher margins, due to the following reasons. First, better capitalized banks can offer lower interest rates on all types of funding (the expected bankruptcy and deposit discipline hypotheses) and can charge higher lending

[10] We also run regressions separately for each country. The findings for Poland show that takeover banks are even less profitable than domestic institutions, whereas in other countries profitability of takeover banks is not

rates at the same time (the refinancing hypothesis). Second, deposits are the cheapest source of funding, which explains why a higher *Deposits-to-Assets* ratio has a positive impact on profits.

Capitalization and *Deposits-to-Assets* ratio are more important for domestic banks who, contrary to foreign institutions, cannot count on back-up from abroad in the event they encounter trouble. The fact that greenfield banks are not affected either by capitalization or liabilities structure can be explained by their very close ties with parent institutions, which facilitate access to capital and funding. Moreover, for them, deposits are not the cheapest source of funding since unlike domestic and takeover banks, greenfield banks have limited branch networks.

If we turn to the asset side of banks' balance sheets, we again see important differences between domestic, takeover and greenfield banks. The loans-to-assets ratio has a negative impact on profits of domestic banks: an increase of one standard deviation reduces profits by 0.50 percentage points. This may reflect three facts. First, domestic banks may use inferior screening and monitoring techniques, thus granting loans to unreliable clients. Additionally, after the entry of foreign banks, they may be forced to compete for the least transparent (and hence more risky) borrowers (Dell'Ariccia and Marquez, 2004), exacerbating the problem stemming from bad risk assessment methods. Finally, domestic banks may invest their funds in government bonds, which offer higher effective interest rates than loans due to the low level of reimbursement of the loans. Interestingly, the same variable has a positive impact on the profitability of takeover banks, which suggests that new risk management techniques introduced by the parent banks lead to a better screening of potential borrowers and better monitoring of their activities after the loan is granted. Again, greenfield banks are unaffected by the structure of their assets.

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significantly different from domestic banks or marginally higher. If we exclude Polish banks from our sample, the takeover dummy is still insignificant. The results are available upon request.

Domestic Macroeconomic Conditions

Let us turn our attention to variables that capture macroeconomic conditions in the host countries. In this case, we also see a striking contrast between domestic and foreign banks. As hypothesized above, domestic banks are sensitive to domestic GDP growth and interest rates, whereas both takeover and greenfield banks do not respond to changes in local economic conditions. This has important implications for the banking sector stability, as profits of domestic banks appear to be procyclical, i.e. growing during economic expansions and declining during downturns. In this respect, foreign banks contribute to banking stability notwithstanding their mode of entry. Greenfield banks, on the other hand, are affected by exchange rate volatility. This might be related to their propensity to give loans to international corporations and export-oriented local enterprises. Interestingly, this relationship is positive, which means that higher exchange rate volatility leads to higher profits.

In addition to high sensitivity to local business cycles, domestic banks are also very sensitive to domestic interest rates. As short-term interest rates increase by one standard deviation, profitability of domestic banks decreases by 0.47 percentage points. As expected, foreign banks are not influenced by domestic costs of funds and this result holds for both modes of entry. This should reflect an easy access of these institutions to sources of finance outside of countries of their operations, such as parent banks loans and direct borrowing from international capital markets. If spikes in interest rates in domestic countries are caused by the increased level of risk, foreign banks can additionally benefit from the “flight to quality”, as depositors withdraw funds from domestic institutions and transfer them to the foreign ones.

Market structure

Among variables that control for the market structure, the most consistent and statistically significant one is banks’ market share. As predicted by the relative market power hypothesis, large banks seem to be able to gain abnormal profits. The economic effect is the highest for takeover banks: one standard deviation increase in market share raises *ROA* by 0.82 percentage points. Domestic and greenfield banks benefit less: for both the economic effect is around 0.40 percentage points. Another plausible explanation for the positive relationship between market power and profitability is economies of scale, which allow large banks to have lower costs than their smaller rivals.[11] We will come back to this question later in our paper.

Market concentration has an impact only on takeover banks, and the relationship is negative. In other words, takeover banks operating in more concentrated banking markets are less profitable. The effect is economically important: an increase of one standard deviation in Herfindahl index results in a drop of *ROA* by 1.82 percentage points. This stands in sharp contrast to the structure-conduct-performance paradigm, which predicts collusion in more concentrated markets, and consequently higher profits. However, more recent literature shows that the relationship between market concentration and competition is more complex. Claessens and Laeven (2004) estimate the degree of competition in 50 developed and developing countries and demonstrate that more concentrated banking markets actually face more competition than less concentrated markets.[12] Our results indirectly suggest that higher concentration of banking markets in CEECs also reflects higher competition.

As we mentioned earlier, concentration in the CEE banking markets increased simultaneously with foreign ownership. Therefore, a higher concentration of banking markets is the result of banking market consolidation, and the negative relationship between profitability and concentration could come from the enhanced competition after the entry of foreign banks (Claeys and Hainz, 2006). However, in our specification we control for the share of takeover and greenfield banks, and inclusion of these variables does not influence

[11] We also experiment with another variable that captures banks' size, namely log of banks' total assets. Consistently, this variable also has a positive impact on profits. We include market share in our specification since it is in percentage point and is therefore easier to interpret.

either the magnitude or significance of the concentration measure. Our results show that the presence of takeover banks squeezes profits in the local markets, whereas the presence of greenfield banks has no significant impact. We will also come back to these variables later.

International factors

In the augmented models for takeover and greenfield banks (specified in Equation 2) we find that only greenfield banks are influenced by international factors. Specifically, we observe that greenfield banks in CEECs improve their profitability when their parent banks' NIM goes up. However, the most significant and economically important international factor proves to be the capitalization of parent banks. While a one standard deviation increase in the parent NIM raises *ROA* by 0.51 percentage points, a similar increase in parent capitalization increases *ROA* by 0.75 percentage points, or 50 percent more. The second effect is similar in magnitude to the effect of own capitalization for takeover banks, and significantly smaller than for domestic banks, again signifying the importance of adequate capitalization for economic performance. Our findings are in line with the results of Williams (2003) and De Haas and Van Lelyveld (2006), who also find that the health of the parent institution is crucial for the performance of foreign banks. However, our results additionally show that the support of parent institutions is only significantly important for greenfield banks. This may reflect the fact that greenfield banks are "embedded" in the multinational structure of their parent banks, while takeover banks enjoy more independence due to the long transformation process after ownership change.

Our findings show that foreign banks operating in CEECs are not sensitive to economic conditions in their home countries. Since the majority of foreign banks present in CEECs belong to multinational institutions that operate beyond their home countries, it would be better to include macroeconomic variables for the entire EU, rather than for individual

[12] Berger et al. (2004) offer a good review of the current stance of the theoretical and empirical research on the

countries. We perform this robustness check and our results are presented in the two last columns of Table 4. In this case we see that interest rates have a significant negative impact on greenfield banks' performance, which means that higher borrowing costs on the EU market lead to lower profits of greenfield banks in CEECs. The economic significance is slightly higher than the impact of domestic interest rates on profitability of domestic banks: a one standard deviation increase in the EU interest rate decreases *ROA* by 0.55 percentage points. Such high sensitivity of greenfield banks to the EU interest rates can be worrisome, since theoretically they can transmit external shocks to their host countries. However, in practice, EU interest rates are lower than those of CEE, and even though an increase in international interest rates diminishes the profits of greenfield banks, they still benefit from low funding costs thanks to easier access to international financial markets.

To summarize the results obtained so far, we find that the mode of entry is an important determinant of banks' profitability. First of all, greenfield banks, on average, earn a *ROA* that is 0.95 percentage points higher than the *ROA* of domestic banks. Second, greenfield banks are not affected by bank specific characteristics and local macroeconomic conditions, whereas they are sensitive to the health of their parent institutions and economic environment in the EU. Third, takeover banks appear to be independent from the impact of international factors, but are also not influenced by changes in the local macro conditions.

4.2. Decomposition of ROA

Return on assets is the final measure of bank performance, and is calculated by adding net interest and non-interest income and subtracting loan loss provisions and overhead costs. Thus, to better understand factors causing differences in profitability between domestic, greenfield and takeover banks, in this sub-section we look at the determinants of each of these four components of *ROA*. Our results are presented in Table 5.

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relationship between bank concentration and competition.

We find that higher profitability of greenfield banks documented earlier can be explained by differences in loan loss provisions and overhead costs: a greenfield bank on average has loan loss provisions and costs lower than a domestic bank by 6.43 and 1.23 percentage points, respectively. This finding suggests that greenfield banks are better able to manage their costs and risks.[13] Another plausible explanation for this result is a different loan portfolio of greenfield banks: if they predominantly serve larger enterprises, their loan risk is significantly reduced. Unfortunately, the BankScope database does not allow us to control for the loan structure of banks, and we cannot make a final conclusion on this issue.

Another interesting result coming from the analysis of profitability components is the lack of statistically significant differences for net interest and non-interest income charged by greenfield and domestic banks.[14] To further investigate the impact of foreign ownership on the net interest margin we add to our analysis regressions on determinants of lending and deposit rates. Our results, presented in the last two columns of Table 5, show that greenfield banks are able to offer lower deposit rates to their customers, probably due to their superior reputation.[15] In theory, this should widen their *NIM*. However, greenfield banks have smaller branch networks than both domestic and takeover banks and their *Deposits-to-Assets* ratio is only 60% (for comparison deposit ratios of domestic and takeover banks amount to 80% and 77%, respectively). So even though greenfield banks offer lower deposit interest rates to their customers, they still have to rely on other more expensive sources of funds, which at the end equalize the *NIM* of all three types of banks.

[13] The lower overhead cost ratio of greenfield banks comes from much higher productivity of their employees rather than lower salaries. In fact, the average salary in greenfield and takeover banks is, respectively, 70% and 40% higher than in domestic banks. While part of this is driven by higher remuneration of foreign managers, the anecdotal evidence suggests that foreign banks try to attract the most professional employees at all levels by offering them a higher salary.

[14] When presenting an earlier version of the paper, several times we received comments that higher profitability of greenfield banks might stem from their higher non-interest income.

[15] Very often takeover banks do not change the official names of their acquired institutions and there is evidence that they are still perceived to be domestic by their customers. This could explain why they cannot benefit from better reputation associated with foreign ownership and cannot offer lower interest rates to their depositors.

While analyzing the impact of bank specific variables, we documented that higher capitalization raises profits, but we could not make a conclusion at that stage whether this was due to lower cost of funds (the expected bankruptcy and depositor market discipline hypotheses) or high lending rates (the refinancing hypothesis). After the decomposition of *ROA*, we find that the deposit rate are unaffected by bank capitalization, whereas the relationship with the lending rate is positive and significant. These results are in line with the refinancing hypothesis formulated by Kim et al. (2004) which states that borrowers are ready to pay higher interest rates to a bank which will be more able to stand behind its borrowers and grant them loans in the future.

Another question that arose in our earlier discussion concerned the positive effect of market power on profitability. Theoretically, market power can allow banks to charge higher interest margins, or lead to lower costs due to the scale effects. Now we can state that the positive relationship between market power and profitability arises from lower costs of large banks, whereas we do not observe banks using their market power to influence interest rates.

4.3. Spillover effects

In addition to examining the impact of foreign ownership on performance of banks, we would also like to know whether foreign banks have a spillover effect on domestic banks. We can test this possibility by including the shares of loans held by greenfield and takeover banks as additional factors and estimating the regressions on the sample of domestic institutions. Since foreign bank participation has been steadily increasing over time, we include year dummies in all our regressions to ensure that our variables do not pick up time trends but speak directly about spillovers. The results are presented in Table 6.

We notice that a higher share of foreign banks leads to increased costs for domestic banks. At first, this effect may seem counterintuitive, as foreign bank ownership is usually associated with higher competition and, thus, lower costs.[16] Our findings, however, can be viewed in light of the work of Lensink and Hermes (2003), who find that foreign banks' entry to less developed countries leads to a short-term increase in costs. Even though foreign ownership should produce positive spillovers in the long-term, initially domestic banks need to invest in new techniques and practices, as well as in human capital. In addition, Pruteanu-Podpiera et al. (2006) formulate the "banking specificities" hypothesis, according to which competition may increase banks' monitoring costs by reducing the length of customer relationships. The positive relationship between costs and foreign bank entry that we find seems to also be in line with this hypothesis.

Despite their rising costs, domestic banks did not make an attempt to compensate for this by raising their interest or non-interest income, which would be possible due to their superior market power. Moreover, we observe a decreasing *NII*[17] in response to greenfield banks' entry. In the end, the profits of domestic banks remain unchanged thanks to decreased loan loss provisions.[18]

4.4. Structural shifts

Our analysis is based on the period of 12 years, between 1993 and 2004. Starting from 2000, more than 50% of the banking assets in CEECs were owned by foreign investors,[19] and in Hungary, Estonia and Latvia foreign banks entered even earlier. Therefore, it is possible that foreign and domestic banks might have had time to converge with respect to their

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[16] In general, overhead costs of banks in the CEECs have an inverted U-shaped relationship as they have risen at the beginning of the analyzed period and have fallen in the second half. A simple correlation coefficient between costs and greenfield and takeover bank shares is negative, but its magnitude is small and it is only significant in case of takeover bank share.

[17] This can probably be explained by abnormal returns that banks earned at the beginning of the analyzed period, when high inflation and volatility of exchange rates allowed them to earn high trading income. Therefore, stabilization of exchange rates and decreased inflation that happened at the time of greenfield bank entry has led to these results.

[18] In our regressions we include year dummies in order to capture only spillover effects. Their omission can lead to biased conclusions. For example, without controlling for annual effects we fail to notice any impact of foreign participation on bank costs and see a highly significant negative impact on *NIM* as a response to foreign bank entry by takeover. Therefore, by omitting annual effects, we attribute such trend developments as declining NIM to spillover effects from foreign bank ownership.

[19] If we exclude Slovenia, we can say that starting from 1999 the majority of assets were in foreign ownership.

structure and behavior and that differences in profitability and its sources can disappear over time. In order to test this hypothesis, we interact our *Greenfield* and *Takeover* dummies with a time trend. The results are presented in Table 7.

As expected, we see that higher profitability of greenfield banks disappears over time (each year by 0.13 percentage points), and this result seems to be caused by increasing overhead costs (0.13 percentage points per year as well).[20] In the case of takeover banks, we observe that they charge lower interest margins than domestic banks, but this effect also diminishes with time.

Our finding that domestic and foreign banks converge in their performance can be an indirect sign of spillover effects, as domestic banks become more competitive and greenfield banks cannot gain abnormal profits. This also reflects the findings of Lensink and Hermes (2004) that at lower levels of economic development foreign bank entry increases costs and margins of domestic banks. Since during the analyzed period the banking markets have significantly developed (thanks to foreign bank entry, but also due to improved banking regulation and supervision), we observe less differences between domestic and foreign banks.

5. Conclusions

In this paper we investigate factors influencing the performance of commercial banks operating in Central and Eastern Europe. The focal point of our study is the impact of ownership structure, and more specifically the mode of entry of foreign institutions, on bank performance. We differentiate between two types of foreign banks: newly established (greenfield) banks and banks that were initially domestic, but were subsequently sold to foreign investors (takeover). Our findings allow us to make some very interesting conclusions.

[20] We have also tried to interact the greenfield dummy with a banks' age. In this case we find that greenfield banks have lower costs and higher ROA, but the effect diminishes for older banks. The results are available upon request.

First, our results clearly show that the mode of foreign bank entry is an important determinant of bank performance. Takeover banks do not exhibit profitability (or its components) different from domestic banks, whereas greenfield banks earn a higher return on assets than other banks. This higher profitability stems from the lower costs of greenfield banks, rather than from higher interest or non-interest margins. We also find evidence of better portfolio quality of greenfield banks, which is likely due to their superior skills in screening potential borrowers and their subsequent monitoring. Our findings can also be interpreted as reflecting the fact that greenfield banks target different market segments, namely the largest and most transparent enterprises, leaving riskier clients to domestic banks.

Second, we document that the mode of entry determines foreign banks' vulnerability to local and international conditions. Greenfield banks are not sensitive to domestic factors such as the structure of their balance sheets or local macroeconomic environment. At the same time, they are affected by the health of their parent institutions and interest rate changes in the EU. This reflects very tight links between greenfield institutions and their parent banks. Since profits of greenfield banks are positively related to capitalization and net interest margins of their parent banks, we find evidence that parent banks support their subsidiaries operating in CEECs. Interestingly, we also discover that profitability of takeover banks depends on their own level of capital, and is not sensitive to either local macroeconomic developments or international factors.

Third, we find that the entry of foreign banks (both greenfield and takeover) has important spillover effects on the performance of domestic banks in CEECs. Specifically, we document that as the participation of foreign banks increases, the banks' costs rise as well. This finding can be viewed as a "negative" spillover effect, but it is consistent with the idea that in countries with a low level of economic development, costs of domestic banks rise in response to competition from foreign banks because domestic institutions have to invest in new technology and better human resources. At the same time, our results show a certain level of convergence between banks of different types of ownership: profitability of greenfield banks decreases over time due to rising costs. This is a sign of positive spillover effects, as domestic banks become more competitive and greenfield banks cannot earn abnormal profits.

To conclude, we find that there are important differences between greenfield and takeover banks; thus treating them as a homogeneous group is not appropriate. We show that the performance of greenfields banks is superior, and attribute this result to their modern management and lending technologies, superior reputation and support from their parent institutions. However, these factors do not appear to improve the performance of takeover banks, which could be due to the short time that has elapsed from the change of ownership and the significant burden of bad loans that these banks have inherited. In terms of banking sector stability, we document a positive impact of foreign banks entry, since foreign banks are less sensitive to domestic economic conditions than domestic ones, and in addition, greenfield banks enjoy the support of their parent institutions.

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Table 1. Descriptive statistics for domestic, takeover and greenfield banks

		Obs.	Mean	S.E.
ROA	Domestic	1617	0.862	0.088
	Takeover	367	0.875	0.108
	Greenfield	536	1.450	0.096***
NIM	Domestic	1617	4.671	0.080
	Takeover	367	4.119	0.113***
	Greenfield	536	3.943	0.129***
Non-interest income	Domestic	692	2.217	0.069
	Takeover	216	2.313	0.128
	Greenfield	280	1.940	0.113**
Capital	Domestic	1617	14.451	0.294
	Takeover	367	14.196	0.542
	Greenfield	536	14.438	0.477
Loan loss provisions	Domestic	1485	15.519	1.397
	Takeover	331	15.438	7.573
	Greenfield	409	5.486	0.706***
Costs/Assets	Domestic	1226	4.771	0.101
	Takeover	292	4.280	0.174**
	Greenfield	378	3.424	0.225***
Loans-to-Assets	Domestic	1617	46.488	0.444
	Takeover	367	51.959	0.907***
	Greenfield	536	45.875	0.830
Deposits-to-Assets	Domestic	1608	79.693	0.523
	Takeover	367	76.600	1.175**
	Greenfield	530	60.541	1.128 ***

***, **, and * correspond to 1%, 5% and 10% significance level that the difference with domestic banks is different from zero.

Table 2. Descriptive statistics for takeover, greenfield and their parent banks

		Obs.	Mean	S.E.
ROA	Takeover	282	1.035	0.113
	Parent	282	0.733	0.072^{**}
	Greenfield	491	1.402	0.097
	Parent	491	0.487	0.037^{***}
NIM	Takeover	258	3.964	0.141
	Parent	258	2.109	0.100^{***}
	Greenfield	480	3.819	0.133
	Parent	480	1.712	0.066^{***}
NII	Takeover	44	2.553	0.241
	Parent	44	1.526	0.039^{***}
	Greenfield	26	2.088	0.378
	Parent	26	1.533	0.068^{***}
LLP	Takeover	267	17.064	9.380
	Parent	267	7.160	0.584
	Greenfield	301	4.182	0.613
	Parent	301	8.219	0.346^{***}
Capital	Takeover	116	5.439	0.849
	Parent	116	2.792	0.287^{***}
	Greenfield	218	4.030	0.385
	Parent	218	2.924	0.140^{***}
Costs	Takeover	211	4.117	0.210
	Parent	211	1.894	0.130^{***}
	Greenfield	292	3.106	0.146
	Parent	292	1.381	0.056^{***}

***, **, and * correspond to 1%, 5% and 10% significance level that the difference with domestic banks is different from zero.

Table 3. Definitions of variables and data sources

Symbol	Description	Source of data
ROA	Return on assets of bank, calculated as ratio of profit after taxes to the average total assets in years t and t-1	BankScope
NIM	Net interest margin, calculated as ratio of net interest income to the average total assets in years t and t-1.	BankScope
NII	Net non interest income, calculated as ratio of net commission and trading income to the average total assets in years t and t-1.	BankScope
LLP	Loan loss provisions, calculated as ratio of loan loss provisions to interest income.	BankScope
Costs	Costs, calculated as ratio of personnel and other operating expenses to the average total assets in years t and t-1.	BankScope
Capital	Capitalization of bank , calculated as a ratio of registered capital to the average total assets in years t and t-1.	BankScope
Loans-to-Assets	The share of loans in total assets	BankScope
Deposits-to-Assets	The share of deposits in total assets	BankScope
X-efficiency	X-efficiency, calculated with stochastic frontier methodology, with loans, securities, and deposits as outputs and labor and capital as inputs.	BankScope and own calculations
Market Share	Share of loans of a bank in the total loans of banking sector in host country	BankScope
Herfindahl	Herfindahl index in host country, calculated as the sum of squared shares of loans	BankScope
Share of greenfields	Share of loans of greenfield banks in the total country's loans	BankScope and own calculations
Share of takeovers	Share of loans of takeover banks in the total country's loans	BankScope and own calculations
Stock market capitalization	Ratio of stock market capitalization to GDP	National stock exchanges
Exchange rate volatility	Standard deviation of the real effective exchange rate	IFS
Host GDP	Real rate of growth of GDP in host country	IFS
Host interest rate	Real short-term interest rate in host country	IFS
Takeover	Dummy variable taking the value 1 in year t and consecutive years if bank i was acquired by foreign investor in year t	De Haas and Van Lelyveld (2006) and own research
Greenfield	Dummy variable taking the value 1 in year t and consecutive years if bank i was established by foreign investor in year t	De Haas and Van Lelyveld (2006) and own research
Parent_NIM	Net interest margin of parent bank, calculated as a ratio of the difference between interest income and interest expenses to the average total assets in years t and t-1	BankScope
Parent capital	Capitalization of parent bank calculated as a ratio of registered capital to total assets	BankScope
Parent GDP	Real rate of growth of GDP in home country of the bank	IFS
Parent interest rate	Real short-term interest rate in home country of the bank	IFS
$Host_j$	A vector of dummy variables taking the value 1 for each host country j	
γ_t	Dummy variable taking the value 1 for each time period t	
Home	A vector of dummy variables taking the value of 1 if parent banks comes from country home, which includes Austria, Belgium, Denmark, Finland, Germany, Greece, Hungary, Japan, Latvia, Italy, the Netherlands, Portugal, Russia, Sweden, the UK, and the US	BankScope and own research

Table 4. Estimations of profitability.

	All banks	Domestic	Takeover	Greenfield	Takeover	Greenfield
Capital	0.081^{***}	0.1058^{***}	0.067^{**}	0.016	0.066^{**}	0.019
	[0.014]	[0.021]	[0.031]	[0.013]	[0.031]	[0.013]
Loans-to-Assets	-0.018^{**}	-0.028^{***}	0.023^{*}	0.00043	0.023^{*}	0.0027
	[0.007]	[0.010]	[0.012]	[0.0089]	[0.012]	[0.0082]
Deposits-to-Assets	0.015^{**}	0.023^{**}	0.018^{*}	0.0048	0.018^{*}	0.0051
	[0.007]	[0.01]	[0.009]	[0.0074]	[0.0098]	[0.0073]
X-efficiency	0.002	0.0024	0.007	0.007	0.007	0.008
	[0.003]	[0.0045]	[0.004]	[0.0066]	[0.0043]	[0.007]
Herfindahl Index	2.795	0.704	-20.145^{***}	3.181	-20.15^{***}	2.996
	[2.378]	[3.181]	[6.254]	[5.723]	[6.169]	[5.604]
Market share	0.047^{***}	0.050^{**}	0.083^{***}	0.138^{***}	0.082^{***}	0.134^{**}
	[0.013]	[0.020]	[0.018]	[0.048]	[0.017]	[0.054]
Share of greenfields	0.0056	-0.02	0.034	0.044	0.034	0.0399
	[0.017]	[0.027]	[0.034]	[0.029]	[0.035]	[0.030]
Share of takeovers	-0.012^{*}	-0.016	0.022	-0.008	0.0214	-0.011
	[0.007]	[0.010]	[0.025]	[0.011]	[0.025]	[0.011]
Stock market capitalization	-0.024	-0.018	-0.020	-0.028	-0.021	-0.036
	[0.019]	[0.022]	[0.027]	[0.030]	[0.027]	[0.029]
Exchange rate volatility	0.068	0.050	-0.011	0.255^{***}	-0.0099	0.227^{**}
	[0.055]	[0.074]	[0.082]	[0.097]	[0.082]	[0.091]
Host GDP	0.086^{*}	0.101^{*}	0.161	-0.037	0.1652	-0.0303
	[0.048]	[0.058]	[0.129]	[0.078]	[0.128]	[0.084]
Host interest rate	-0.042^{**}	-0.035^{**}	0.049	0.048	0.0499	0.0491
	[0.017]	[0.017]	[0.057]	[0.038]	[0.058]	[0.038]
Greenfield	0.950^{***}					
	[0.302]					
Takeover	0.202					
	[0.239]					
Parent NIM			-0.165	0.433^{*}	-0.169	0.417
			[0.236]	[0.241]	[0.235]	[0.282]
Parent capital			0.035	0.313^{***}	0.0299	0.297^{***}
			[0.083]	[0.092]	[0.083]	[0.096]
Home GDP			-0.081	-0.0075		
			[0.075]	[0.118]		
Home interest rate			-0.014	-0.307		
			[0.018]	[0.202]		
EU GDP					-0.077	0.0098
					[0.078]	[0.254]
EU interest rate					-0.012	-0.29^{***}
					[0.018]	[0.079]
R2	0.1246	0.1430	0.5228	0.3278	0.5224	0.2951
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Host country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Home country dummies	No	No	Yes	Yes	Yes	Yes
Number of obs.	1846	1185	186	269	186	269
Number of banks	419	293	62	76	62	76

The dependent variable is *ROA*.
Robust standard errors in parentheses
***, **, and * correspond to 1%, 5% and 10% significance level

Table 5. Estimations of profitability components

	NIM	NII	LLP	Costs	Lending rate	Deposit rate
Capital	0.084***	0.023	-0.521*	0.028*	0.231*	-0.026
	[0.0112]	[0.016]	[0.266]	[0.017]	[0.122]	[0.049]
Loans-to-Assets	0.029***	-0.00067	0.16435	-0.01022	-0.17126***	0.03198
	[0.0058]	[0.0068]	[0.156]	[0.011]	[0.045]	[0.025]
Deposits-to-Assets	0.0164***	0.0046	-0.146	-0.011	-0.0155	-0.092**
	[0.0046]	[0.0059]	[0.163]	[0.015]	[0.024]	[0.036]
X-efficiency	-0.011***	0.007**	0.091		0.0044	0.018*
	[0.004]	[0.003]	[0.07]		[0.014]	[0.01]
Herfindahl Index	0.823	3.786	-35.875*	0.903	-13.919	20.612***
	[2.2768]	[2.789]	[19.409]	[2.650]	[13.819]	[6.140]
Market share	0.013	-0.0035	-0.280	-0.086***	-0.038	-0.063
	[0.016]	[0.0142]	[0.193]	[0.022]	[0.056]	[0.054]
Share of greenfields	0.061***	-0.075***	-0.598*	0.053**	-0.057	0.029
	[0.014]	[0.018]	[0.315]	[0.022]	[0.074]	[0.047]
Share of takeovers	0.0062	0.0189***	-0.0013	0.027***	-0.126**	0.0016
	[0.00512]	[0.007]	[0.14067]	[0.00662]	[0.05237]	[0.028]
Stock market capitalization	-0.025**	0.017	0.558	0.0074	0.092*	-0.053
	[0.01]	[0.013]	[0.368]	[0.014]	[0.055]	[0.043]
Exchange rate volatility	0.042	-0.083	0.482	-0.049	-0.209	0.256**
	[0.037]	[0.052]	[0.558]	[0.045]	[0.168]	[0.106]
Host GDP	-0.1398***	-0.072*	-0.389	-0.190***	-0.416***	-0.284***
	[0.035]	[0.0384]	[0.643]	[0.031]	[0.144]	[0.062]
Host interest rate	-0.0027	0.0099	0.282	0.024	0.041	-0.00073
	[0.0199]	[0.0178]	[0.217]	[0.017]	[0.065]	[0.048]
Greenfield	0.43	-0.3004	-6.428*	-1.226***	-0.255	-3.951**
	[0.348]	[0.352]	[3.365]	[0.336]	[1.250]	[1.967]
Takeover	-0.084	-0.114	10.102	0.148	-0.6	-0.772
	[0.246]	[0.251]	[12.882]	[0.344]	[0.96]	[0.718]
R2	0.3563	0.1961	0.0274	0.2718	0.4135	0.1741
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Host country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Home country dummies	No	No	No	No	No	No
Number of obs	1846	897	1711	1846	1082	1844
Number of banks	419	230	395	419	278	419

The dependent variables are *NIM, NII, LLP, Costs, Lending rate, Deposit rate*
Robust standard errors in parentheses
***, **, and * correspond to 1%, 5% and 10% significance level

Table 6. Estimation of spillover effects on the sample of domestic banks.

	NIM	NII	LLR	Costs
Capital	0.08***	0.014	-0.58***	0.020
	[0.015]	[0.013]	[0.177]	[0.018]
Loans-to-Assets	0.035***	0.0024	0.50422***	-0.002
	[0.0078]	[0.009]	[0.15479]	[0.012]
Deposits-to-Assets	0.023***	0.011	0.045	0.0012
	[0.006]	[0.0089]	[0.164]	[0.0085]
X-efficiency	-0.00775*	0.012***	0.153	
	[0.00434]	[0.00494]	[0.120]	
Herfindahl Index	-3.235	10.44***	-19.556	2.483
	[2.604]	[3.739]	[29.059]	[2.839]
Market share	0.020	-0.012	-0.329	-0.135***
	[0.023]	[0.017]	[0.399]	[0.042]
Share of greenfields	0.027	-0.109***	-0.77*	0.049**
	[0.022]	[0.028]	[0.424]	[0.021]
Share of takeovers	0.0008	0.020	0.026	0.035***
	[0.007]	[0.013]	[0.101]	[0.008]
Stock market capitalization	-0.002	-0.0129	0.268	-0.005
	[0.013]	[0.017]	[0.282]	[0.013]
Exchange rate volatility	0.0048	-0.071	0.883	-0.014
	[0.049]	[0.087]	[0.78]	[0.052]
Host GDP	-0.168***	-0.044	-0.830	-0.197***
	[0.040]	[0.04]	[0.537]	[0.029]
Host interest rate	0.015	-0.083***	0.128	0.027
	[0.020]	[0.030]	[0.14]	[0.023]
R2	0.3714	0.2817	0.0508	0.3218
Year dummies	Yes	Yes	Yes	Yes
Host country dummies	Yes	Yes	Yes	Yes
Home country dummies	No	No	No	No
Observations	1185	548	1137	1185
Number of banks	293	147	278	293

The dependent variables are *NIM, NII, LLP, Costs*
Robust standard errors in parentheses
***, **, and * correspond to 1%, 5% and 10% significance level

Table 7. Estimations allowing for structural shifts

	ROA	NIM	NII	LLP	Costs
Capital	0.081***	0.084***	0.024	-0.527*	0.03*
	[0.014]	[0.011]	[0.017]	[0.269]	[0.017]
Loans-to-Assets	-0.018**	0.027***	-0.0009	0.167	-0.011
	[0.007]	[0.006]	[0.007]	[0.156]	[0.011]
Deposits-to-Assets	0.014**	0.016**	0.0047	-0.139	-0.010
	[0.007]	[0.004]	[0.0059]	[0.157]	[0.015]
X-efficiency	0.0025	-0.01**	0.00741**	0.091	
	[0.0033]	[0.004]	[0.0037]	[0.071]	
Herfindahl Index	2.748	0.971	3.798	-37.759*	1.109
	[2.383]	[2.28]	[2.789]	[19.40]	[2.638]
Market share	0.048***	0.011	-0.0038	-0.274	-0.089***
	[0.013]	[0.016]	[0.014]	[0.193]	[0.022]
Share of greenfields	0.0096	0.064***	-0.074***	-0.636*	0.051**
	[0.017]	[0.013]	[0.019]	[0.342]	[0.023]
Share of takeovers	-0.010	0.006	0.019***	-0.002	0.025***
	[0.007]	[0.0054]	[0.007]	[0.145]	[0.007]
Stock market capitalization	-0.024	-0.021**	0.018	0.51545	0.011
	[0.02]	[0.011]	[0.013]	[0.374]	[0.014]
Exchange rate volatility	0.073	0.044	-0.083	0.475	-0.053
	[0.055]	[0.037]	[0.052]	[0.561]	[0.044]
Host GDP	0.08716*	-0.13964***	-0.07309*	-0.39162	-0.191***
	[0.048]	[0.035]	[0.039]	[0.641]	[0.031]
Host interest rate	-0.043**	-0.003	0.01	0.288	0.025
	[0.017]	[0.02]	[0.018]	[0.223]	[0.01734]
Greenfield	1.972***	0.537	-0.384	-9.596	-2.253***
	[0.619]	[0.580]	[0.655]	[8.659]	[0.636]
Greenfield*trend	-0.127**	-0.011	0.01	0.388	0.128*
	[0.063]	[0.06]	[0.071]	[0.869]	[0.072]
Takeover	-1.386	-2.121**	-0.342	31.254	-0.551
	[1.014]	[0.962]	[0.898]	[32.634]	[1.213]
Takeover*trend	0.157	0.215**	0.025	-2.204	0.084
	[0.098]	[0.102]	[0.104]	[2.189]	[0.114]
R2	0.1294	0.3566	0.1964	0.0275	0.2730
Year dummies	Yes	Yes	Yes	Yes	Yes
Host country dummies	Yes	Yes	Yes	Yes	Yes
Home country dummies	No	No	No	No	No
Number of obs.	1846	1846	897	1711	1846
Number of banks	419	419	230	395	419

The dependent variables are *ROA, NIM, NII, LLP, Costs*
Robust standard errors in parentheses
***, **, and * correspond to 1%, 5% and 10% significance level