# Short-Term Effects of Foreign Bank Entry on Bank Performance in Selected CEE Countries

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# Short-Term Effects of Foreign Bank Entry on Bank Performance in Selected CEE Countries

**Janek Uiboupin**

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This paper analyses the short-term impact of foreign bank entry on bank performance in ten Central and Eastern European countries. A panel of 319 banks was analysed over the period 1995–2001. The Arellano-Bond dynamic panel estimation technique was used. The results indicate that foreign bank entry is associated with lower before-tax profits, non-interest income, interest income on interest earning assets and loan loss provisions. Foreign bank entry tends to increase the overhead costs of local banks in the short-run. The results generally indicate that foreign bank entry enhances competition on the market. The role the development of the banking sector plays in regard to the effects of foreign bank entry was analysed. Research results show that in more developed banking markets, foreign bank entry is associated less with decreasing incomes and loan loss provisions than in less developed banking markets. In more developed markets, the overhead costs of banks are less likely to increase. The results show that banks with a higher market share react less to foreign banks entering the market.

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**Introduction**

International banking has grown rapidly since the 1960s due to increasing international capital flows, foreign direct investments and international trade. International banks have been active in transition countries since the beginning of the 1990s after a significant finance market liberalisation and the elimination of entry barriers. Today foreign banks already own more than 50 per cent of the equity capital of banks in CEECs (Central and Eastern European Countries). In many countries foreign banks control over 80% of the banking market.

Growing foreign ownership in the banking sector raises an interesting question about the role of foreign banks in transition economies. In previous studies, the main focus has been on the effects of foreign bank entry on domestic bank performance (profitability, costs and incomes, interest margins and loan loss provisions). In many CEECs, like Estonia, Bulgaria, the Czech Republic and Slovakia, foreign banks control 60–80% of the banking market. Therefore it is reasonable to analyse the effects of foreign bank entry on the total banking market, including both foreign and domestic banks in the sample.

As the time-series for banking activities in transition economies are short, it is difficult to analyse the long-term effects of foreign bank entry. Therefore, all estimations have to be interpreted as short-term effects of foreign bank entry and these may significantly differ from the long-term results.

Transition countries in Central and Eastern Europe differ significantly in terms of foreign bank ownership, banking market development and economic development. Several authors (Lensink and Hermes, 2003; King and Levine, 1993) have concluded that the effects of foreign bank entry depend on the economic and banking sector development of the countries under consideration. In the current paper we will try to estimate whether those effects are different among transition countries with different levels of financial development.

The purpose of this paper is to estimate empirically the short-term effects of foreign bank entry on bank performance in CEECs.

The remainder of the paper is structured as follows: firstly a brief overview of the relevant literature is given, secondly hypotheses are developed based on the previous literature, then a description of the data and methodology is given, then the estimation results are provided and finally conclusions are presented.

## 1. Literature Overview

Banking sectors in the European Union (EU) candidate countries have been subjected to deregulation and liberalisation over the last decade. It has been argued that liberalisation will significantly affect the degree of cross-border competition in the integrated banking sector in terms of performance and efficiency (see Claessens *et al.*, 2001; Gual, 1999; De Brandt and Davis, 2000; Hasan *et al.*, 2000; Berger *et al.*, 2000).

There are a growing number of empirical studies suggesting that the overall economic development of a country is a positive function of the development of its financial sector, in particular the banking system. Recent studies have shown that countries with well-developed financial institutions tend to experience more rapid rates of real GDP per capita growth (Levine, 1997; Levine and Zervos, 1998; Rajan and Zingales, 1998). More importantly, empirical studies have shown that there is a positive correlation between foreign ownership of banks and the stability of the banking system (Caprio and Honahan, 2000; Goldberg *et al.*, 2000).

There is also the experience of the impact of the participation of foreign banks in different countries. For example, Dages *et al.* (2000) examined the lending patterns of domestic and foreign banks and found that foreign banks typically have stronger and less volatile lending growth than their domestic counterparts. They also found that diversity of ownership contributes to greater credit stability during periods of turmoil and weakness for the financial system. Weller (2000) showed that the greater proportion of multinational banks entering the market resulted in lower credit supply among Polish banks during the early phases of transition (1999). The benefits of increased foreign participation in the banking sector are discussed by Gruben *et al.* (1999) and Lardy (2001). Demirgüç-Kunt *et al.* (1998) noticed that over the period 1988–1995 and for a large sample of countries, foreign bank entry was generally associated with a lower incidence of local banking crises.

An important issue for emerging market economies is whether the entry of foreign banks will contribute to the stability of the banking system and function as a stable source of credit, especially during periods of crisis. Mathieson and Roldos (2001) pointed out two related issues: whether the presence of foreign banks makes systemic banking crises more or less likely to occur, and whether there is a tendency for foreign banks to "cut and run" during crisis periods. In general, it has been suggested that foreign banks can provide a more stable source of credit because branches and subsidiaries of large international banks can draw on their parent institutions (which typically hold more diversified portfolios) for additional funding. Large international banks are likely to have better access to global financial markets and the entry of foreign banks can improve the overall stability of the host country's banking system (stronger prudential supervision; better disclosure, accounting and reporting practices, etc.).

The main expected benefits and drawbacks from the entry of foreign banks are clearly defined by Bonin *et al.* (1998) (see also Dages *et al.*, 2000; Doukas *et al.*, 1998). The main expected benefits include:

- The introduction of new banking technology and financial innovations (for foreign banks it is relatively easy to introduce new products and services to the local market).

- The potential for economies of scale and greater scope (foreign banks can help encourage the consolidation of the banking system, they have expertise and experience of other financial activities: insurance, brokerage and portfolio management services).
- Improvement of the conditions for competition (foreign banks represent potential competition for local banks).
- Development of financial markets (foreign banks may help deepen the inter-bank market and attract business from customers that would otherwise have gone to foreign banks in other countries).
- Improvement of the financial system infrastructure (transfer of good banking practice and know-how, accounting, transparency, financial regulation, supervision and supervisory skills).
- The attraction of foreign direct investments (foreign banks may increase the amount of funding available for domestic projects by facilitating capital inflows, diversifying the basis of capital and funding).

The main arguments against the entry of foreign banks are (Anderson and Chantal 1998, p 65):
- Fear of foreign control (control over the allocation of credit implies substantial economic power in any economy).
- Banking is an infant and special industry (this argument is a version of the general infant industry argument and banks are subject to various special protections due to their central role in the economy).
- Foreign banks may have different objectives (foreign banks may be interested only in promoting exports from the home country, or in supporting projects undertaken by home country firms).
- Regulatory differences (supervisors of the host country lose regulatory control and if the home country has weak bank supervision, this may lead to unsound banking in the host country).

Levine (2001) analysed the relationship between financial liberalization and banking efficiency and found that allowing greater foreign bank presence in the market enhances the efficiency of the domestic banking system, decreases both overhead costs and the profits of banks.

The theoretical literature on the impact of FDI stresses the importance of inter-industry and intra-industry spillover effects. The intra-industry spillover effects of FDI on technology transfer depend on the local firm's own ability to innovate and imitate (Glass and Saggi, 1998). It has also been suggested that the spillover effects of foreign entry depend on the differences between the development of the domestic market and that of the foreign bank market – this phenomena is known as the technology gap hypothesis. It suggests that the larger the technology gap between foreign and domestic enterprises the greater the spillover effects.

The most comprehensive empirical study of foreign bank entry was carried out by Claessens *et al.* (2001). They investigated the relationship between foreign bank entry

and the performance of the domestic banking sector in 80 countries. They used panel estimations with 7,900 bank observations over the period 1988–1995. The main results of the study show that foreign banks tend to have higher profits than domestic banks in developing countries, while in developed countries foreign banks are less profitable than domestic banks. Their results also indicated that greater foreign bank presence is related to lower profitability, costs and margins among domestic banks.

Hermes and Lensink (2003) further developed the model used by Claessens *et al.* (2001). They used bank level accounting data from 990 banks in 48 countries for the period 1990–1996. Threshold estimations were used to study how foreign bank entry effects are related to a country's economic development in the shot-term. The results indicate that at lower levels of economic development, foreign bank entry is associated with higher costs and margins for domestic banks. At higher levels of economic development, foreign bank entry has a less significant effect on domestic bank profitability. This result adds some support to the technology gap hypothesis.

Zajc (2002) analysed the effects of foreign bank entry on domestic banks in the Czech Republic, Estonia, Hungary, Poland, Slovakia and Slovenia for the period 1995–2000. The results of this study are somewhat different from those presented by Claessens *et al.* 2001. He found that foreign bank entry is associated with lower non-interest income, but increases overhead expenses.

## 2. Hypotheses

In previous studies of foreign bank participation and bank net interest margins, Hermes and Lensink (2002, 2003) found that foreign bank entry is associated with higher bank interest margins in the short run. Quite often authors find that there is no statistically significant relationship between net interest margin and foreign bank market share (Zajc, 2003). This indicates that net interest margin is probably related to other factors like overall competition on the market, the banks' own market shares, real interest rates, etc. Unite and Sullivan (2003) found that foreign bank entry is associated inversely with the interest rate spreads of domestic banks, but only for those that are affiliated to a family business group. As we expect a rise in competition when the number of foreign banks increases, we propose the following hypothesis:

H1: The net interest margin of a bank in a given country is negatively correlated with foreign bank market share in that country.

It is a common trend in banking markets that incomes from lending activities are falling due to increasing competition. Since an increase in the market share of foreign banks is generally associated with the effects of higher competition, we expect banks to try to increase their non-interest incomes to compensate for the falling interest margins. At the same time, the increased competition associated with foreign bank entry may also decrease the banks' non-interest incomes as they try to offer better conditions and prices for their customers. Therefore, the final effect of foreign bank entry on non-interest income is ambiguous. We propose the following hypothesis:

H2: The non-interest income of a bank in a given country is either positively or negatively correlated with the market share of foreign banks in that country.

Claessens *et al.* (2001) concluded that higher market share among foreign banks is associated with lower overhead costs, which indicates greater efficiency. In transition countries the opposite of this relationship can exist, at least in the short-term. Domestic banks react to foreign bank entry with higher overhead costs because they want to keep up their image and technology base in order to be competitive in the market. The other explanation for these banks increasing their overhead costs would be the adjustment costs that have to be made when a foreign bank takes over a domestic bank. Usually, foreign banks have a more developed technology base that can allow for lower overhead costs in the long run, but the short-term effect can be higher overhead costs. We propose the following hypothesis:

H3: The overhead costs of a bank in a given country are positively correlated with foreign bank market share in that country.

The ratio of bank profits to total assets reflects the overall profitability outcome for the bank. Foreign bank entry is usually expected to have a positive effect on competition in the banking market and therefore is expected to have a negative effect on bank profitability. Several authors have found that foreign bank entry reduces the profits of the domestic banking sector (see Claessens *et al.*, 2001; Hermes and Lenksink, 2003; Zajc 2002; Unite and Sullivan 2003). We propose the following hypothesis:

H4: The ratio of pre-tax profits to the total assets of a bank in a given country is negatively correlated with foreign bank market share in that country.

The effect of foreign bank entry on bank loan loss provisions is still unambiguous because foreign bank entry may have both positive and negative effects on loan quality and therefore the result could even be insignificant. Foreign banks usually have better credit risk management techniques and so then greater foreign ownership is negatively correlated with loan loss provisions. At the same time, increasing competition in the loan market could lead banks to reduce credit quality because they want to keep their market share and increase lending.

H5: Foreign bank market share in a given country has either a positive or negative impact on bank loan loss provisions.

Hermes and Lensink (2003) found that the financial development of a market is a relevant factor of the effect of foreign bank entry. In more developed markets the effect of foreign entry is probably not so strong because the potential for learning from foreign banks is not so great. This is also related to the common assumption that foreign banks are more developed than domestic banks, but that is not always the case. For example, Estonian commercial banks entering the Latvian market are not significantly more advanced than the domestic Latvian banks. We suggest that the way the market share of foreign banks influences bank performance depends on the financial development of the market. It is likely that the development of the banking market is especially important for overhead costs and non-interest activities. In more advanced markets, investments into banking technology have already been made and therefore overhead costs will only rise in less developed markets, while in developed markets the effect is weaker. The same holds for the banks' non-interest income. In developed markets where competition is greater, banks have already shifted to non-

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interest activities and therefore in more developed markets foreign bank entry may even decrease non-interest incomes, because the competition effect is stronger than the adjustment effect. Therefore we basically test the technology gap hypothesis described above.

H6: The effects of foreign bank entry depend on the development of the banking market in the given country.

Banking markets in CEE countries are quite concentrated. In some countries, like Estonia, Lithuania and Slovakia the three biggest banks have more than 60% of the market. Williams (2003) analysed foreign and domestic bank profitability determinants in Australia and found that the market share of competitors significantly decreases bank profits. We suggest that the way local banks react to foreign bank entry may depend on that bank's market share. Bigger banks probably react less to foreign entry, because they are either too big to react quickly to market conditions or foreign bank entry is less important for them compared with smaller banks. We propose the following hypothesis:

H7: A bank's reaction to foreign bank entry depends on the bank's market share.

## 3. Description of Data

In the current study we used different bank-level and macro-level data to investigate the relationship between foreign bank entry and bank performance. A bank is defined to be foreign when it is at least 50 percent foreign owned (i.e. more than 50 percent of its share capital is owned by foreign residents). The study covers data from the period 1995–2001 for 10 countries: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia. Annual data was used in the following subgroups: bank-level accounting data, foreign bank entry data, country specific variables and banking market development data. A detailed description of all variables used in the analysis is given in Appendix 1.

The bank-level accounting data was obtained from the Bankscope database – we used panel data for 319 banks for the period 1995–2001. An important difference compared with previous studies is that both foreign and domestic banks are included in the sample. Several balance sheet variables and profit statement variables are used. First, we used two variables measuring the income of banks: net interest margin (NIM) and non-interest income to total assets (OOITA). Secondly, the profitability of a bank was characterised using before-tax profits to total assets (PTPTA). Thirdly, bank costs were measured using two variables: overhead costs to total assets (OHTA) and loan loss provisions to total assets (LLPTA). These variables were calculated from bank income statements and balance sheets. We used following internationally comparable accounting identity:

$$PTPTA = NIM + OOITA – OHTA – LLPTA \qquad (1)$$

Bank-specific exogenous variables were as follows: short-term and long-term deposits and other funding to total assets (CSTFTA), equity ratio to total assets (ETA) and non-earning assets to total assets (NEATA).

We used two different foreign entry variables: share of foreign bank assets in total banking market assets (FSA) and ratio of foreign banks to total number of banks (FBSN). Since Bankscope covers about 90% of all banks on the market, and the precise ownership structure of any given bank was only described in the last reporting period, it is not possible to calculate foreign ownership by aggregating the data from reporting banks because of the likelihood of overestimating or underestimating foreign ownership on the market. The likelihood of overestimating foreign ownership comes from the fact that foreign banks are more active internationally and also provide data more actively to Bankscope. The likelihood of underestimating foreign ownership in some countries is also quite high because Bankscope does not cover branches of foreign banks, and therefore in countries where the main foreign bank entry mode has been via establishing branches, there is significant underestimation of foreign ownership on the market. Such data problems are more relevant for small countries like Estonia, Latvia and Lithuania, where the number of banks is small, and even if only two or three banks are not present in the database, this may significantly change the foreign ownership data. To overcome these problems, we have used different sources of data. The foreign bank share in total assets (FSA) data is obtained both from Bankscope and national central banks; foreign bank share in total number of banks (FBSN) is obtained from the EBRD Transition Report 2003.

Banking sector development was characterised by domestic private credit to GDP (DCGDP). This is a widely used measure of banking sector development, used also by Hermes and Lensink (2003). Another banking market specific variable used was the concentration index, calculated as the assets of the three biggest banks to total banking market assets in the given country (CONC). Market concentration data was obtained from the database provided by the website of Asly Demirgüç-Kunt from the World Bank. DCGDP data was sourced from the EBRD Transition report 2002.

We used three country specific variables. As Claessens *et al.* (2001), Hermes and Lensink (2003) and Zajc (2002) we also used real GDP growth (GDPG), GDP per capita (INCOME, in logarithm) and the inflation rate (CPI) as indicators of macroeconomic development. All country-specific variables are obtained from the EBRD Transition Report 2002. We have an unbalanced sample because of the lack of data for some banks in some periods. The number of observations varies between 884 and 1041.

Table 1 reflects the main trends displayed by bank specific variables for domestic and foreign banks over the period 1993–2001. Before-tax profits to total assets (PTPTA) declined in both foreign and domestic banks – domestic banks tend to have slightly lower profitability than foreign banks in transition economies. Net interest margins (NIM) have also declined for both foreign and domestic banks – foreign banks are operating with lower average interest margins thereby enhancing competition. Domestic banks show a higher degree of loan loss provisions (LLPTA) except during 1993–1994, which indicates that foreign banks have better credit risk management systems. Foreign banks have a lower equity ratio (ETA) with higher leverage and risk indicating that foreign banks can exploit the reputation of their mother banks and maintain higher risks and profitability than domestic banks.

**Table 1. Average values of bank specific variables according to ownership (percentage)**

| Variable | Ownership | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|---|---|---|---|
| PTPTA | Foreign | 2.9 | 1.5 | 0.7 | 1.9 | 2.3 | 0.9 | 0.8 | 1.5 | 1.2 |
| | Domestic | 4.5 | 1.2 | 1.3 | 1.1 | 1.4 | -0.2 | 1.1 | 1.0 | 0.6 |
| NIM | Foreign | 10.1 | 5.2 | 5.9 | 5.7 | 5.3 | 5.1 | 4.7 | 4.9 | 4.2 |
| | Domestic | 12.2 | 5.3 | 5.9 | 5.9 | 5.0 | 6.0 | 5.1 | 5.1 | 4.6 |
| OHTA | Foreign | 6.6 | 5.2 | 4.6 | 5.0 | 4.4 | 4.7 | 4.6 | 4.4 | 3.9 |
| | Domestic | 5.3 | 4.8 | 5.0 | 5.3 | 5.7 | 6.3 | 5.4 | 5.0 | 4.8 |
| LLPTA | Foreign | 4.0 | 1.6 | 1.6 | 1.0 | 1.0 | 1.0 | 1.2 | 0.7 | 0.5 |
| | Domestic | 1.2 | 1.4 | 1.7 | 1.7 | 1.8 | 2.1 | 1.3 | 1.1 | 1.9 |
| OOITA | Foreign | 5.2 | 4.2 | 2.8 | 3.9 | 4.3 | 2.4 | 2.8 | 2.6 | 2.4 |
| | Domestic | 5.4 | 3.4 | 3.6 | 4.1 | 5.0 | 2.9 | 3.5 | 2.9 | 3.6 |
| ETA | Foreign | 12.4 | 10.8 | 10.7 | 13.9 | 15.1 | 15.4 | 14.8 | 13.0 | 11.8 |
| | Domestic | 18.8 | 18.6 | 17.8 | 17.9 | 15.5 | 17.6 | 17.2 | 15.8 | 15.1 |
| CSTFTA | Foreign | 77.7 | 80.8 | 81.0 | 77.6 | 75.9 | 74.9 | 77.2 | 78.7 | 79.3 |
| | Domestic | 73.3 | 73.3 | 71.8 | 73.8 | 76.0 | 71.7 | 72.0 | 74.0 | 77.8 |

*Source: Bankscope, author's calculations*

Figure 1 shows that the average foreign bank market share has increased significantly in CEE countries during the period 1993–2001. Average foreign bank market share in total assets is almost 80%. Foreign bank market share in assets is significantly higher than the share in total number. Therefore it can be concluded that foreign banks have high market shares in transition countries. In most cases the biggest banks in CEE countries are at least partly and often fully foreign owned (see Appendix 4).
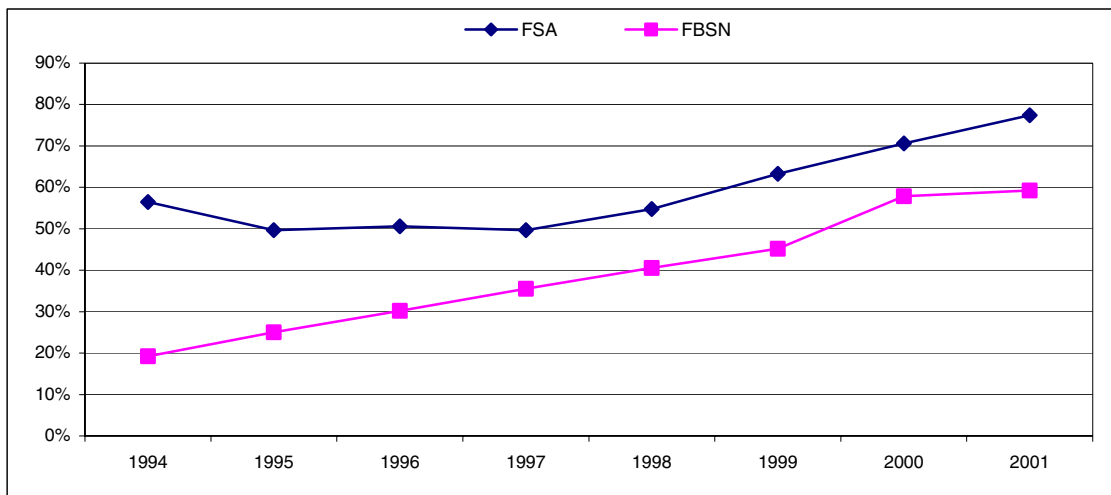


**Figure 1. Average foreign bank market share in CEE markets**
*Source: author's calculations*

The proportion of foreign banks to total number of banks in each country is given in Figure 2. A more detailed overview of the number of foreign banks to total number of banks is given in Appendix 2. The number of foreign banks has increased over time in almost all CEE countries. By the end of 2001, numbers of foreign banks have fallen

compared to 2000 in Lithuania and Latvia. The reason for this is market concentration via bank mergers.
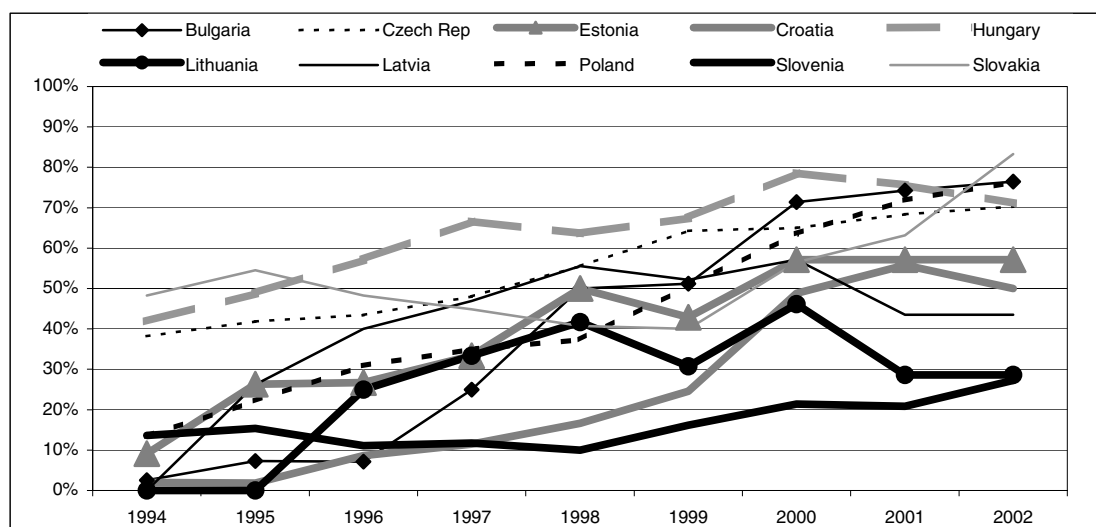


**Figure 2. Number of foreign banks to total number of banks (percentage)**
*Source: EBRD, 2003; author's figures*

In empirical estimations, we used domestic private credit to GDP (DCGDP) as a proxy for banking sector development in a given country. Figure 3 shows that DCGDP suits quite well in characterizing the development of the banking market. First, the private credit to GDP in almost all countries has risen constantly in connection with the development of the banking sector. Secondly, except for Bulgaria and the Czech Republic, there are no significant drawbacks in credit supply that could lead to the situation where, for example, in the beginning of 1990s there was a high credit supply, then after the banking crisis the DCGDP falls and in 2002 the DCGDP ratio is the same as it had been in 1995, suggesting that the banking market has not developed in 5 years, but significant development has actually occurred.



**Figure 3. Private credit to GDP (DCGDP) 1994–2002**
*Source: IFS, 2003*

Figure 4 demonstrates the EBRD (European Bank for Reconstruction and Development) banking sector development indices for CEE countries. According to the EBRD, b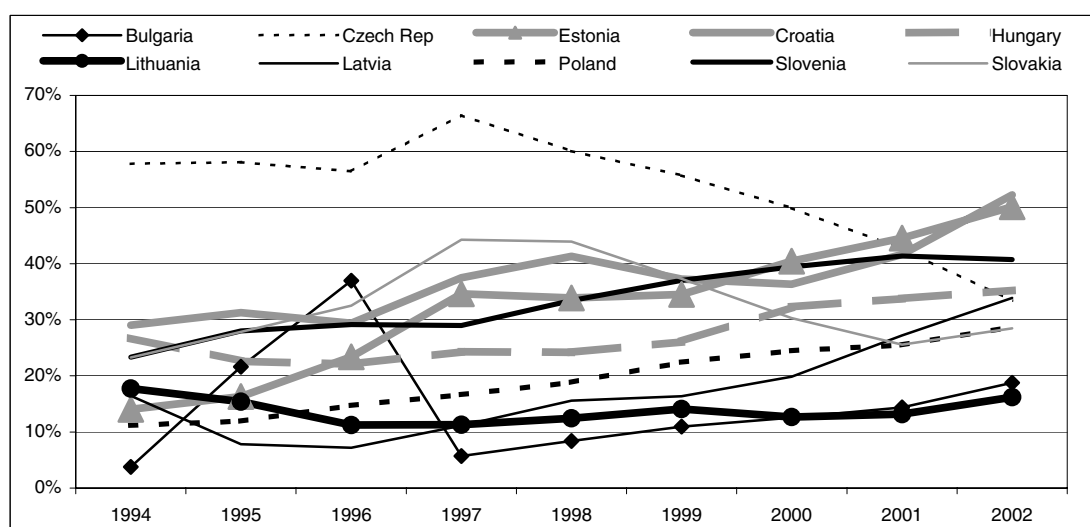anking sector development in the Czech Republic has been significant although private credit is falling because of the recession of the whole economy at the end of 1990s and the stricter credit policy. According to the EBRD Transition report 2002, the most developed banking sector among CEE countries is in Hungary, while significantly less developed banking markets exist in Lithuania and Bulgaria. Compared with 1993, banking sector development has been most rapid in Latvia and Croatia.
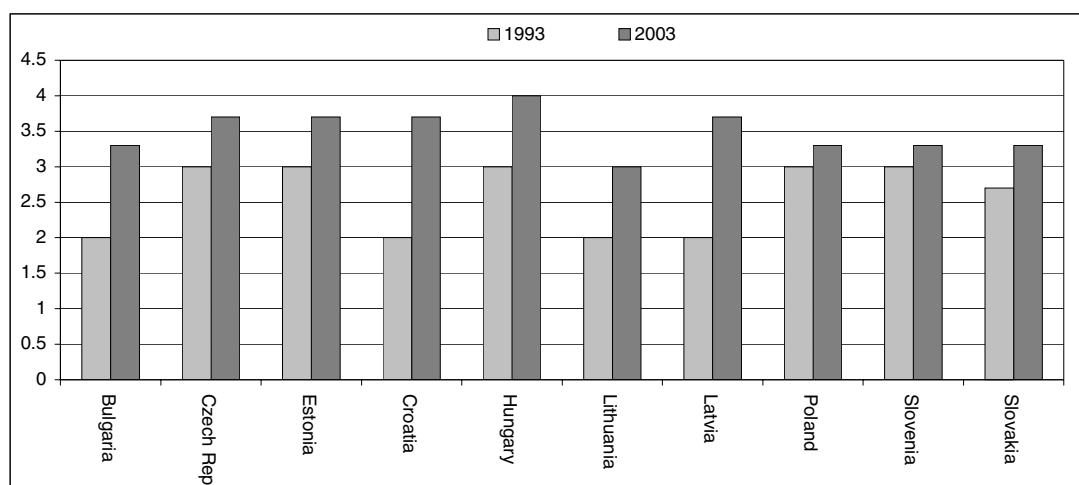


**Figure 4. EBRD banking index of banking sector reform**
*Source: EBRD, 2002; author's figure*

In empirical estimations, a proxy for banking market concentration is often used to describe the market situation. According to the database composed by Asly Demirgüç-Kunt, there has been quite a remarkable de-concentration of banking markets in CEE countries (see Table 2). The author suggests that this trend could be somewhat misleading, because it is based on the Bankscope database, where at the beginning of the 1990s many banks were not reported, and therefore it could be that calculations give higher concentration rates. Therefore, it might be that the estimation results about banking concentration are not significant or signify something other than expected.

**Table 2.Concentration index showing the assets of the three biggest banks to total banking market assets (percentage)**

| Country | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|---|---|
| Bulgaria | 87.3 | 70.9 | 78.1 | 69.2 | 55.3 | 56.1 | 52.6 | 51.6 |
| Czech | 55.3 | 46.7 | 43.1 | 43.3 | 37.7 | 43.7 | 52.7 | 47.6 |
| Estonia | 84.3 | 57.9 | 53.0 | 50.5 | 75.8 | 77.0 | 78.0 | 80.5 |
| Croatia | 72.9 | 67.3 | 60.9 | 53.3 | 58.8 | 52.4 | 51.5 | 50.7 |
| Hungary | 56.8 | 43.5 | 44.0 | 49.4 | 38.5 | 36.3 | 33.3 | 36.0 |
| Lithuania | 92.1 | 69.4 | 51.0 | 50.8 | 58.9 | 70.9 | 69.4 | 67.2 |
| Latvia | 61.6 | 44.1 | 41.9 | 41.6 | 49.8 | 46.3 | 39.3 | 35.3 |
| Poland | 48.0 | 42.7 | 45.4 | 39.6 | 38.4 | 39.0 | 33.3 | 36.9 |
| Slovenia | 68.7 | 53.8 | 47.6 | 48.2 | 48.2 | 43.6 | 47.4 | 56.2 |
| Slovakia | 83.5 | 78.4 | 69.0 | 59.0 | 49.4 | 57.5 | 56.4 | 60.6 |
| Average | 71.1 | 57.5 | 53.4 | 50.5 | 51.1 | 52.3 | 51.4 | 52.3 |

*Sources: Asly Demirgüç-Kunt, Financial Structure and Economic Development Database, World Bank,*
*[http://www.worldbank.org/research/projects/Finstructure/database.htm]*

## 4. Empirical Model

First we present a theoretical model for foreign bank entry. We used a single-period model as we are interested in the short-term effects of foreign entry. Suppose, that foreign bank share on the market at time $t_0$ is $FS_0$, so that $0 \leq FS_0 < 1$. We assume, that in the beginning of the period foreign bank share is less than 100%. At time $t_0$ banks have set their strategies to maximize their profits $\pi_0$ given that market conditions from previous times that are provided exogenously. Bank profit depends on costs and incomes:

$$\pi_i = nii + ooi - oh - llp$$

where  $nii$ – net interest income;
$ooi$ – non-interest income;
$oh$ – overhead costs;
$llp$ – loan loss provisions.

Now suppose that foreign bank(s) enter the market. This is defined as the difference between $FS_1$ and $FS_0$. Foreign bank entry motives are taken from previous periods (*market seeking* or *customer following* motives). Foreign bank entry affects the market conditions. Local banks (both foreign and domestically owned) may react to foreign bank entry. If local banks are reacting to foreign entry, then their profit at period $t_1$ components differ from those at time $t_0$, because banks change their cost structure and prices in order to be competitive and maximize their profits. It is assumed, that the period between $t_0$ and $t_1$ is long enough so that banks are able to react to foreign entry if they find it beneficial. Bank profit is also affected by macroeconomic factors, but it is assumed that those effects are the same for all banks operating on the market. *Ex post* it can be said that local banks have reacted to foreign entry if at least one component from the profit equation has changed.

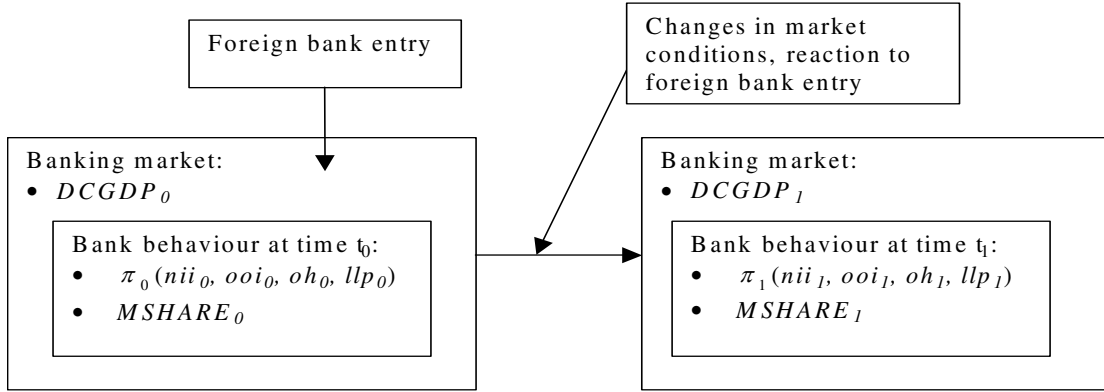The conception of the model is illustrated in Figure 5.

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**Figure 5. Theoretical effect of foreign bank entry**
*Source: author's figures*

At $t_1$ the model may restart, new foreign banks enter and the banks reorganize their activities again to maximise profits.

Next, the empirical short-term relationship between foreign bank entry and bank performance will be analysed. We start with an empirical model, which is similar to that used by Claessens *et al.* (2001):

$$\Delta I_{ijt} = \alpha_0 + \beta_j \Delta FS_{jt} + \delta_{ij} \Delta B_{ijt} + \gamma_j \Delta X_{jt} + \varepsilon_{ijt} \qquad (2)$$

where $I_{ijt}$ is a vector or the dependent variables for bank $i$ in country $j$ at time $t$, $FS_{jt}$ is a measure of foreign bank penetration in country $j$ at time $t$, $B_{ijt}$ is a set of bank specific variables for bank $i$ in country $j$ at time $t$. $B_{ijt}$ is included into the equation as a set of control variables. $X_{jt}$ is a vector of the country variables in country $j$ at time $t$.

Then we further develop the initial empirical model characterised by equation 2 by adding banking market development variables and an interactive term for foreign bank entry and banking market development, the same methodology was also used by Hermes and Lensink (2003). The model with banking sector development and the interactive term is as follows:

$$\Delta I_{ijt} = \alpha_0 + \beta_j \Delta FS_{jt} + \gamma_j \Delta FS_{jt} \times DCGDP_{jt} + \delta_{ij} \Delta B_{ijt} + \varphi_j BMD_{jt} + \varepsilon_j \Delta X_{jt} + \varepsilon_{ijt} \quad (3)$$

$DCGDP_{jt}$ is a proxy for banking market development in country $j$ at time $t$, $FS*DCGDP$ is a variable that has been created by interacting the foreign bank entry variable with the banking market development variable. The interactive term is included to test whether foreign entry effects in a particular country depend on the level of banking market development in that country. We expect that foreign bank entry has a more relevant impact in the early stages of internationalisation and has less impact when the banking market in the target country is well developed. It may even be the case that the sign of the coefficient of $FS$ changes from negative to positive or vice versa. Banking market development variables are expected to have a negative effect on the costs and incomes of a bank.

Finally, an interactive term for foreign bank entry and bank market share is included in the equation. It may be the case that banks with different market shares react differently to foreign bank entry. We suggest that smaller banks react more to foreign entry, because they are more flexible to changes in market conditions and have to adjust more to remain competitive. The model is:

$$\Delta I_{ijt} = \alpha_0 + \beta_j \Delta FS_{jt} + \gamma_j \Delta FS_{jt} \times MSHARE_{jt} + \delta_{ij} \Delta B_{ijt} + \varphi_j BMD_{jt} + \varepsilon_j \Delta X_{jt} + \varepsilon_{ijt} \quad (4)$$

where *FS\*MSHARE* is a variable that has been created by interacting the foreign bank entry variable with the banking market development variable.

## 5. Estimation Results and Discussion

Two variables are used to measure foreign bank presence: number of foreign banks as a percentage of the total number of banks (FBSN) and foreign bank assets as a percentage of total banking market assets (FSA). An interactive term with private credit to GDP (DCGDP) and bank market share (MSHARE) is included. Five bank performance measures are used (ALINT (interest income on interest earning assets), PTPTA, OOITA, OHTA and LLPTA) as dependent variables. Stata SE 8 is used to generate the estimations.

Compared with previous studies, a somewhat different methodology is used to estimate regression coefficients compared with Claessens *et al.* (2001), who used a fixed effects model. Instead the Arellano-Bond linear, dynamic panel data estimation is used. The Arellano-Bond estimation enables the use of a lagged term of a dependent variable as an exogenous variable, and instrumental variables (Arellano and Bond, 1991) to reduce the endogeneity problem and get more consistent estimates. To reduce the heteroskedasticity that is often a problem in micro-level panels, robust standard errors are reported (see Stata, 2003). Robust standard errors are higher and therefore relationships are less statistically significant.

It is generally assumed that foreign bank entry at time *t* is exogenous, that is, FBSN or FSA do not depend on bank-specific variables at time *t* (Zajc, 2002). In practice, foreign bank entry may be associated with timing and the bank enters the market at year *t* because of market conditions at period *t*. It may be the case that foreign banks are entering via acquisition at time *t* because of a period of crisis for a single bank or the whole banking market in order to acquire banks at a low price. It can be argued that this makes foreign bank entry partly endogenous. The endogeneity problem here is not very strong, because in most cases the bank name changes after the merger, and the bank that was acquired, for example because of negative profit and low price, drops out of the period *t* estimation as we use first differences. Nevertheless some endogeneity may remain because sometimes foreign banks consider the average performance of the whole market in period *t* while making entry decisions.

To reduce possible endogeneity problems in the estimations, it is suggested that level lag operators be used (Stata, 2003). Level lag operators for foreign bank entry variables (1 period lag of FBSN and FSA) are used as instrumental variables.

An important difference between this and previous studies is that the effect of the entry of foreign banks on both foreign and domestic bank performance is analysed. First differences of variables ensure that the observations of a foreign bank that enters into the market at time $t$ are not included. The short-term reaction to the entry of a foreign bank among banks operating in CEEC markets is also analysed. Yearly time dummies (1996–2001) are included in the estimations, but the regression coefficients of these time dummies are not reported. The Arellano-Bond estimations also include tests for autocorrelations AR(1) and AR(2) that are not reported. Autocorrelation was not significantly present in the regressions except in the case of ALINT.

Estimation results with FBSN as the foreign bank entry variable are given in Table 3. The foreign bank entry variable FBSN has a statistically significant and negative effect on the average bank interest rate on earning assets and loan loss provisions (LLPTA). The foreign bank entry effect on net interest margin was also tested, but no statistically significant correlations were found. Therefore, ALINT was used to analyse the effect on interest revenues. It seems that foreign bank entry has a significant effect only on interest income on interest earning assets and not on interest expenses. Hermes and Lensink (2003) found that the effect of FBSN on non-interest income was positive and significant, while Zajc (2002) found similar results. A negative relationship with the profitability measures indicates that foreign bank entry enhances the level of competition in the banking sector.

**Table 3. Effect of foreign bank entry (FBSN) on bank performance**

| Variable | D(ALINT) | D(PTPTA) | D(OOITA) | D(OHTA) | D(LLPTA) |
|---|---|---|---|---|---|
| LD(DEP) | 0.0185 (0.0238) | 0.1898 (0.1304) | 0.0217 (0.0961) | 0.3240 (0.2795) | 0.2061* (0.1096) |
| D(FBSN) | -0.1277*** (0.0387) | -0.0252 (0.0408) | -0.0583 (0.0713) | -0.0024 (0.0503) | -0.0700* (0.0409) |
| D(NEATA) | 0.1109* (0.0603) | 0.0355 (0.0414) | 0.4998* (0.2979) | 0.4282 (0.3328) | -0.0251 (0.0773) |
| D(ETA) | -0.1535 (0.1027) | 0.3968*** (0.1310) | -0.0244 (0.3568) | -0.2211 (0.3459) | 0.0100 (0.0964) |
| D(CSTFTA) | -0.0242 (0.0345) | 0.0543 (0.0369) | 0.1437 (0.0886) | 0.0100 (0.0767) | 0.0498 (0.0416) |
| D(MSHARE) | 0.1722 (0.1698) | 0.2006* (0.1089) | -0.6116** (0.3001) | -0.6354* (0.3334) | -0.1750* (0.1032) |
| FD | 0.0119 (0.0147) | -0.0347 (0.0295) | 0.0086 (0.0579) | 0.0347 (0.0677) | 0.0249 (0.0226) |
| D(DCGDP) | -0.0247** (0.0295) | 0.0574 (0.0505) | 0.5085*** (0.1736) | 0.5294* (0.3165) | 0.1648*** (0.0610) |
| D(GGDP) | -0.4700*** (0.1669) | -0.0125 (0.1186) | -0.3006** (0.1462) | -0.4822* (0.2508) | -0.0464 (0.1218) |
| D(LNINCOME) | 0.0039 (0.0440) | -0.0072 (0.0488) | -0.2695** (0.1293) | -0.2694* (0.1454) | -0.0651 (0.0519) |
| D(CPI) | -0.0036 (0.0033) | 0.0051 (0.0043) | 0.0344 (0.0266) | 0.0103 (0.0259) | 0.0026 (0.0018) |
| D(MMR) | 0.0322 (0.0480) | - | - | - | - |
| Nr. Obs | 1036 | 1041 | 1035 | 2021 | 895 |
| F-Statistic | 4.13 | 2.91 | 2.08 | 1.29 | 2.60 |

*Source: author's calculations*
*Note: * significant at 10% level, ** significant at 5% level, *** significant at 1% level.*

As foreign bank entry is negatively related to the average loan interest rate, we can conclude that the empirical results support hypothesis 1.

The negative relationship between FBSN and LLPTA shows that foreign bank entry leads to stricter lending policies among local banks. No cherry-picking behaviour was found among foreign banks compared with domestic banks, as FD is not significant.

FBSN is not statistically associated with profits, overhead costs or non-interest income. Therefore, hypotheses 2, 3 and 4 did not find support using this regression estimation. The banking market concentration index was excluded from the estimation equations because there was no significant effect on any of the dependent variables.

FSA has a somewhat different effect on bank performance. Estimation results in Table 4 show that FSA has a negative effect on the average loan interest rate and a positive effect on loan loss provisions. As proposed by hypothesis 2 and 5, foreign bank entry may have both a positive and negative effect on non-interest incomes and loan loss provisions. FSA reflects the relative size of foreign banks versus domestic banks.

**Table 4. Effect of foreign bank entry (FSA) on bank performance**

| Variable | D(ALINT) | D(PTPTA) | D(OOITA) | D(OHTA) | D(LLPTA) |
|---|---|---|---|---|---|
| LD(DEP) | 0.0167 (0.0223) | 0.1809 (0.1274) | 0.0537 (0.1099) | 0.3541 (0.2848) | 0.2162** (0.1112) |
| D(FSA) | -0.0417** (0.0168) | -0.0203 (0.0145) | 0.0512 (0.0340) | 0.0617 (0.0478) | 0.0251** (0.0117) |
| D(NEATA) | 0.1116* (0.0594) | 0.0379 (0.0425) | 0.5076* (0.3065) | 0.4375 (0.3451) | -0.0253 (0.0791) |
| D(ETA) | -0.1648 (0.1036) | 0.3966*** (0.1315) | -0.0321 (0.3647) | -0.2304 80.3555) | 0.0101 (0.0957) |
| D(CSTFTA) | -0.0285 (0.0316) | 0.0495 (0.0370) | 0.1345 (0.0889) | -0.0029 80.0796) | 0.0469 (0.0403) |
| D(MSHARE) | 0.2048 (0.1695) | 0.2166 (0.1135) | -0.6168** (0.3141) | -0.6512* (0.3422) | -0.1766* (0.0963) |
| FD | 0.0125 (0.0193) | -0.0284 (0.0308) | -0.0067 (0.0539) | 0.0227 (0.0648) | 0.0140 (0.0187) |
| D(DCGDP) | 0.0088 (0.0340) | 0.0598 (0.0472) | 0.5347*** (0.1814) | 0.5350 (0.3362) | 0.1897*** (0.0641) |
| D(GGDP) | -0.4745*** (0.1681) | -0.0120 (0.1133) | -0.3154** (0.1453) | -0.4654** (0.2470) | -0.0700 (0.1092) |
| D(LNINCOME) | 0.0280 (0.0447) | 0.0018 (0.0503) | -0.2905** (0.1367) | -0.2909** (0.1591) | -0.0675 (0.0523) |
| D(CPI) | -0.0028 (0.0031) | 0.0054 (0.0043) | 0.0347 (0.0261) | 0.0104 (0.0264) | 0.0037* (0.0020) |
| D(MMR) | 0.0703 (0.0463) | - | - | - | - |
| Nr. Obs | 1023 | 1028 | 1022 | 1009 | 884 |
| F-Statistic | 3.63 | 3.57 | 1.75 | 1.26 | 2.88 |

*Source: author's calculations*
*Note: * significant at 10% level, ** significant at 5% level, *** significant at 1% level.*

Estimation results indicate that if the foreign banks entering the market are large compared with local banks then, due to increased competition on the loan market, banks will offer better loan conditions to firms and this could result in increased loan losses. From the other explanatory variables, MSHARE is negatively associated with

overhead costs and non-interest income and is positively associated with profits. These results indicate that bigger banks are able to achieve some economies of scale.

Estimation results using an interactive term with foreign ownership (FBSN) and banking sector development are given in Table 5. The results indicate that banking sector development has some impact on the short-term effects of foreign bank entry. As concluded above, the entry of foreign banks is generally associated with decreasing interest incomes. Estimations using the interactive term FBSN*DCGDP, show that in more developed banking markets this fall in interest revenues is lower because interest rates have already converged more with developed markets.

**Table 5. Effects of foreign bank entry (FBSN): the significance of the development of the banking market**

| Variable | D(ALINT) | D(PTPTA) | D(OOITA) | D(OHTA) | D(LLPTA) |
|---|---|---|---|---|---|
| LD(DEP) | 0.0165 (0.0220) | 0.1916 (0.1302) | 0.0450 (0.1183) | 0.3229 (0.2899) | 0.2013* (0.1095) |
| D(FBSN) | -0.2293*** (0.0820) | 0.0617 (0.0790) | 0.3104 (0.2312) | 0.3382* (0.2036) | -0.0388 (0.0845) |
| D(FBSN*DCGDP) | 0.3620** (0.1768) | -0.2922* (0.1644) | -1.2258** (0.5979) | -1.1266* (0.6814) | -0.1072 (0.1862) |
| D(NEATA) | 0.1008* (0.0609) | 0.0408 (0.0413) | 0.5233* (0.3022) | 0.4417 (0.3260) | -0.0251 (0.0786) |
| D(ETA) | -0.1497 (0.1008) | 0.3929*** (0.1316) | -0.0455 (0.3722) | -0.2406 (0.3540) | 0.0091 (0.0972) |
| D(CSTFTA) | -0.0233 (0.0341) | 0.0535 (0.0371) | 0.1394 (0.0892) | 0.0075 (0.0757) | 0.0491 (0.0414) |
| D(MSHARE) | 0.1581 (0.1731) | 0.2099** (0.1043) | -0.5791** (0.2922) | -0.6052* (0.3291) | -0.1727* (0.1021) |
| FD | 0.0083 (0.0146) | -0.0345 (0.0291) | 0.0094 (0.0609) | 0.0362 (0.0699) | 0.0253 (0.0225) |
| D(DCGDP) | -0.1552** (0.0751) | 0.1395 (0.0858) | 0.8693*** (0.3375) | 0.8543* (0.5093) | 0.1952* (0.0925) |
| D(GGDP) | -0.4254*** (0.1514) | -0.0146 (0.1196) | -0.3061** (0.1466) | -0.4932** (0.2479) | -0.0561 (0.1268) |
| D(LNINCOME) | 0.0191 (0.0463) | -0.0013 (0.0468) | -0.2621** (0.1269) | -0.2606* (0.1431) | -0.0610 (0.0518) |
| D(CPI) | -0.0063 (0.0041) | 0.0067 (0.0042) | 0.0404 (0.0287) | 0.0164 (0.0277) | 0.0033* (0.0018) |
| D(MMR) | 0.0702* (0.0402) | - | - | - | - |
| Nr. Obs | 1036 | 1041 | 1035 | 1021 | 895 |
| F-Statistic | 4.02 | 2.97 | 1.85 | 1.2 | 2.63 |

*Source: author's calculations*
*Note: * significant at 10% level, ** significant at 5% level, *** significant at 1% level.*

FSA*DCGDP has a significant effect on average loan interest rates, pre-tax profits and non-interest incomes (see Table 6). Foreign bank entry reduces the profitability of local banks, but in more developed markets this fall is lower because the entering bank does not have such a high competitive advantage as those in less developed countries.

The development of the banking market also has some effect on bank overhead costs. Our results indicate that in countries with a less developed financial sector, foreign entry is more related to higher overhead costs, but for countries with a more

developed financial sector, foreign entry causes less and less extra costs for banks because the banking system is already developed and less additional investments are needed to upgrade banking equipment.

Results show that foreign bank entry reduces the non-interest incomes of local banks, but the coefficient may turn positive in more developed markets where competition is greater. We found only limited support for hypothesis 6. One reason for the apparently limited role that banking sector development plays in the effects of foreign entry could be the homogenous nature of the countries in the sample.

Lags of difference of dependent variables do not generally have statistically significant coefficients. From another explanatory variable bank equity to total assets is positively correlated with bank profits.

**Table 6. Effects of foreign bank entry (FSA): the role of banking sector development**

| Variable | D(ALINT) | D(PTPTA) | D(OOITA) | D(OHTA) | D(LLPTA) |
|---|---|---|---|---|---|
| LD(DEP) | 0.0160 (0.0220) | 0.1805 (0.1264) | 0.1391 (0.1446) | 0.4027 (0.3073) | 0.2184** (0.1117) |
| D(FSA) | 0.0651* (0.0347) | -0.1366*** (0.0387) | -0.3075** (0.1248) | -0.2444 (0.1864) | -0.0235 (0.0409) |
| D(FSA*DCGDP) | -0.3371*** (0.1066) | 0.3512*** (0.1135) | 1.0882** (0.4342) | 0.9311 (0.6640) | 0.1476 (0.1287) |
| D(NEATA) | 0.1103* (0.0588) | 0.0382 (0.0414) | 0.5074 (0.3104) | 0.4342 (0.3474) | -0.0266 (0.0779) |
| D(ETA) | -0.1665 (0.1036) | 0.3948*** (0.1309) | -0.0314 (0.3819) | -0.2306 (0.3653) | 0.0114 (0.0960) |
| D(CSTFTA) | -0.0282 (0.0314) | 0.0492 (0.0368) | 0.1318 (0.0914) | -0.0064 (0.0820) | 0.0469 (0.0402) |
| D(MSHARE) | 0.2130 (0.1696) | 0.2043* (0.1106) | -0.6698** (0.3350) | -0.6962* (0.3746) | -0.1838* (0.0989) |
| FD | 0.0109 (0.0167) | -0.0286 (0.0376) | 0.0019 (0.0389) | 0.0301 (0.0564) | 0.0144 (0.0166) |
| D(DCGDP) | 0.1894*** (0.0738) | -0.1690*** (0.0569) | -0.1452** (0.1361) | -0.0507 (0.1324) | 0.0989 (0.0539) |
| D(GGDP) | -0.4151*** (0.1570) | -0.0095 (0.1121) | -0.3574 (0.1718) | -0.4927** (0.2740) | -0.0690 (0.1094) |
| D(LNINCOME) | -0.0017 (0.0450) | 0.0530 (0.0491) | -0.1173 (0.0771) | -0.1498* (0.0752) | -0.0476 (0.0459) |
| D(CPI) | -0.0057* (0.0034) | 0.0071* (0.0043) | 0.0376 (0.0280) | 0.0136 (0.0288) | 0.0044** (0.0022) |
| D(MMR) | 0.1173*** (0.0433) | - | - | - | - |
| Nr. Obs | 1023 | 1028 | 1022 | 1009 | 884 |
| F-Statistic | 4.53 | 3.93 | 1.32 | 1.36 | 3.00 |

*Source: author's calculations*
*Note: * significant at 10% level, ** significant at 5% level, *** significant at 1% level.*

Next the interactive term with the foreign bank entry variable and bank market share is introduced. It could be expected that small banks react to foreign bank entry somewhat differently from large banks. It could also be expected that banks with a larger market share react less to foreign bank entry. This could be because firstly, they are too big to react so quickly and secondly, banks with a high market share may care less about foreign entry because it affects them less than smaller banks.

Estimation results in Table 7 show that the role that bank market share plays in regard to the effects of foreign entry is very limited. The interactive term FBSN*MSHARE has a statistically significant negative effect on non-interest income and loan loss provisions. Bigger banks tend to have lower loss provisions, indicating that they have comparably more creditworthy clients and/or a better credit risk policy. No significant coefficients for FSA*MSHARE were found and therefore those results were not reported.

**Table 7. Foreign bank entry  (FBSN) and bank performance: the role of bank (market share)**

| Variable | D(ALINT) | D(PTPTA) | D(OOITA) | D(OHTA) | D(LLPTA) |
|---|---|---|---|---|---|
| LD(DEP) | 0.0184 (0.0238) | 0.1876 (0.1299) | 0.0307 (0.0989) | 0.3429 (0.2916) | 0.2015* (0.1079) |
| D(FBSN) | -0.1171*** (0.0415) | -0.0103 (0.0419) | -0.1275** (0.0642) | -0.0816 (0.0822) | -0.1008** (0.0426) |
| D(FBSN*MSHARE) | -0.1664 (0.2358) | -0.2505 (0.1551) | 1.1796* (0.6216) | 1.3582 (0.9280) | 0.4665*** (0.1414) |
| D(NEATA) | 0.1103* (0.0601) | 0.0348 (0.0413) | 0.5029* (0.2977) | 0.4302 (0.3335) | -0.0236 (0.0760) |
| D(ETA) | -0.1542 (0.1026) | 0.3968*** (0.1310) | -0.0243 (0.3582) | -0.2209 (0.3504) | 0.0103 (0.0961) |
| D(CSTFTA) | -0.0253 (0.0346) | 0.0534 (0.0371) | 0.1482* (0.0885) | 0.0148 (0.0760) | 0.0517 (0.0413) |
| D(MSHARE) | 0.2071 (0.2053) | 0.2526** (0.1083) | -0.8549** (0.4245) | -0.9185* (0.5143) | -0.2989** (0.1204) |
| FD | 0.0162 (0.0110) | -0.0246 (0.0262) | -0.0401 (0.0380) | -0.0245 (0.0315) | 0.0084 (0.0134) |
| D(DCGDP) | -0.0259 (0.0290) | 0.0561 (0.0506) | 0.5178*** (0.1736) | 0.5461* (0.3270) | 0.1717*** (0.0606) |
| D(GGDP) | -0.4653*** (0.1693) | -0.0080 (0.1194) | -0.3201** (0.1529) | -0.5040* (0.2648) | -0.0542 (0.1203) |
| D(LNINCOME) | 0.0051 (0.0447) | -0.0054 (0.0488) | -0.2790** (0.1318) | -0.2819* (0.1527) | -0.0721 (0.0521) |
| D(CPI) | -0.0036 (0.0033) | 0.0052 (0.0043) | 0.0339 (0.0265) | 0.0096 (0.0258) | 0.0024 (0.0018) |
| D(MMR) | 0.0335 (0.0484) | - | - | - | - |
| Nr. Obs | 1036 | 1041 | 1035 | 1021 | 895 |
| F-Statistic | 4.27 | 3.87 | 2.1 | 1.24 | 2.59 |

*Source: author's calculations*

*Note: * significant at 10% level, ** significant at 5% level, *** significant at 1% level.*

A summary of the results and a comparison with other studies is given in Table 8. The results are consistent with earlier studies with some differences. It can be generalized that foreign bank entry is negatively correlated with income variables (ALINT, PTPTA and OOITA) and foreign bank entry is also negatively associated with loan loss provisions. Overhead costs are positively correlated with FBSN, but the increase is less important for countries with higher DCGDP, therefore the technology gap hypothesis found some support according to these results. Hermes and Lensink (2002, 2003) and Zajc (2002) have also found a positive and significant effect of foreign bank entry on overhead costs. In most studies, foreign bank entry is negatively correlated with non-interest income. Hermes and Lensink (2003) found a positive and significant correlation between foreign bank entry and non-interest income.

The regression equations were also estimated using the fixed effects OLS model. A summary of the results is reported in Appendix 3. There are some minor differences between the Arellano-Bond estimation results and the fixed effects results. Generally, we can say that the Arellano-Bond and the OLS fixed effects models give quite similar results. Therefore, parameter estimates are generally robust against different estimation methodologies.

**Table 8. Summary of results and comparison with earlier studies**

| | Model | Net int. margin; ALINT | Non-interest income | Before-tax profit | Overhead expenses | Loan loss provisions |
|---|---|---|---|---|---|---|
| Results | FBSN | - | NS | NS | NS | - |
| | FSA | - | NS | NS | NS | + |
| | FBSN FBSN*DCGDP | - + | NS | NS | + - | NS |
| | FSA FSA*DCGDP | + - | - + | - + | NS | NS |
| | FBSN FBSN*MSHARE | NS | - + | NS | NS | - + |
| | FSA FSA*MSHARE | NS | NS | NS | NS | NS |
| Claessens *et al.* (2001) | FBSN | NS | - | - | - | NS |
| | FSA | NS | NS | NS | NS | NS |
| Hermes and Lensink (2003a) | FBSN FBSN*DCGDP | + - | + - | - + | + - | + - |
| Hermes and Lensink (2003b) | FBSN FBSN*GDPPC FSA FSA*GDPPC | + - + - | + - + - | - + - NS | + - + NS | + - + - |
| Zajc (2002) | FBSN | NS | - | - | + | NS |
| | FSA | - | - | - | + | NS |

*Note:*    *+ indicates a significant positive correlation*
       *- indicates a significant negative correlation*
       *NS indicates a relationship that is not statistically significant*
*Sources: author, Claessens et al. (2001), Hermes and Lensink (2003 a,b), Zajc (2002)*

**Conclusions**

This paper has demonstrated the impact of foreign bank entry on bank performance in CEE countries. Bank-level micro data was combined with macroeconomic and banking sector development indicators to estimate the effects of foreign bank entry. The main methodological difference with previous studies was that both domestic and foreign banks were included in the study and Arellano-Bond estimations were used instead of the fixed effects. In previous studies, only domestic banks were observed. The reason for including all banks in this sample was to analyse the effects of foreign bank entry on the whole banking market, and also because in many countries foreign banks are clearly dominating the market.

The results indicated that foreign bank entry is associated with lower before-tax profits, non-interest income, average loan interest rate and loan loss provisions. We found limited evidence that foreign entry increases bank overhead costs in the short run. Results generally indicate that foreign bank entry enhances competition in the market. The role of banking sector development was also analysed. Estimation results

indicate that in more developed banking markets foreign bank entry is less associated with decreasing incomes and loan loss provisions than in less developed banking markets. In more developed markets, bank overhead costs are less likely to increase. The results show that banks with a greater market share react less to foreign bank entry in terms of non-interest income and loan loss provisions.

The results support hypotheses 1, 2, 5 and 6. The support for hypotheses 3, 4 and 7 was limited. These research results are consistent with previous studies with some exceptions indicating that transition economies are a somewhat special case in terms of foreign bank entry effects.

The general conclusion of the paper is that foreign bank entry is likely to increase the level of competition in Central and Eastern European countries. In further research it would be interesting and useful to study the effects of foreign bank entry on the stability of the banking markets in CEE countries.

**References**

Arellano, M., Bond, S., 1991. Some Tests of Specification for Panel Data: Monte-Carlo Evidence and an Application to Employment Equations. *The Review of Economic Studies*, 58(2), 277–297.

Berger, A. N., DeYoung, R., Genay, H., Udell, G. F., 2000. Globalization of financial institutions: evidence from cross-border banking performance. *Brookings-Rochester Economic Series*, 3.

Bonin, J., Miszei, K., Szekely, I. and Wachtel, P., 1998. Banking in Transition Economies: Developing Market Oriented Banking Sectors in Eastern Europe. *Edward Elgar*, Brookfield, Vermont.

Caprio, G. and Honohan, P., 2000. Finance for Growth: Policy Choices in a Volatile World. The World Bank, Washington DC.

Claessens, S., Demirgüç-Kunt, A. and Huizinga, H., 2001. How Does Foreign Entry Affect Domestic Banking Markets? *Journal of Banking and Finance,* 25(5), 891–911.

Dages, B. G., Goldberg, L. and Kinney, D., 2000. Foreign and Domestic Bank Participation in Emerging Markets: Lessons from Mexico and Argentina. *Federal Reserve Bank of New York Economic Policy Review,* 6(3), 17–35.

De Brandt, O. and Davis, P., 2000. Competition, Contestability, and Market Structure in European Banking Sectors on the Eve of EMU. *Journal of Banking and Finance,* 24, 6/7.

Demirgüç-Kunt, A., Levine, R. and Min, H.-C., 1998. Opening to Foreign Banks' Issues of Stability, Efficiency, and Growth. In: Seongtae Lee (ed.), The Implications of Globalization of World Financial Markets. Bank of Korea, Seoul.

Doukas, J., Murinde, V. and Wihlborg, C., 1998. Main Issues in Financial Sector Reform and Privatisation in Transition economies. In: J. Doukas, V. Murinde and C. Wihlborg (eds.), Financial sector Reform and Privatisation in Transition Economies. *Elsevier* Science B. V., Amsterdam, 1–18.

European Central Bank, 2002. Financial Sectors in EU Accession Countries. Ed. Christian Thimann, 234 pp.

European Bank for Reconstruction and Development, 2003. Integration and regional cooperation. *Transition Report.*

European Bank for Reconstruction and Development, 2002. Agriculture and rural development. *Transition Report.*

Glass, A. J., Saggi, K., 1998. International technology transfer and the technology gap. *Journal of Development Economics*, 55, 369–398

Goldberg, L. B., Dages, G. and Kinney, D., 2000. Foreign and Domestic Bank Participation: Lessons from Argentina and Mexico. Federal Reserve Bank of New York, *Working Paper*.

Gruben, W., Koo, J. and Moore, R., 1999. When Does Financial Liberalization Make Banks Risky? An Empirical Examination of Argentina, Canada and Mexico. Federal Reserve Bank of Dallas, Center for Latin American Economics *Working Paper*, 0399.

Gual, J., 1999. Deregulation, Integration and Market Structure in European Banking. *Journal of the Japanese and International Economy,* 13, 372–396.

Hasan, I., Lozano-Vivas, A. and Pastor, J. T., 2000. Cross-Border Performance in European Banking. Bank of Finland *Discussion Papers*, 24/2000. Bank of Finland, Helsinki.

Hermes, N., Lensink, R., 2002. The impact of foreign bank entry on domestic banks in less developed countries: an econometric analysis. In: Foreign Banks and

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Economic Transition, Poznań University of Economics, *Working Papers,* 20, 129–147.

Hermes, N., Lensink, R., 2003. Foreign bank presence, domestic bank performance and financial development. Paper for SUERF colloquium, 2003, 23 pp.

King, R. G., Levine, R., 1993. Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics*, 108, 717–737.

Lensink, R., Hermes, N., 2003. The short-term effects of foreign bank entry on domestic bank behaviour: Does economic development matter? *Journal of Banking and Finance*, in print.

Lardy, N. R., 2001. Foreign Financial Firms in Asia. Paper presented at the World Bank, IMF, and Brookings Institution 3rd Annual Financial Markets and Development Conference, 19–21 April 2001, New York.

Levine, R., 1997. Financial Development and Economic Growth: Views and Agenda. *Journal of Economic Literature,* 33, 688–726.

Levine, R. and Zervos, S., 1998. Stock Markets, Banks, and Economic Growth. *American Economic Review,* 88, 537–558.

Levine, R., 2001. International financial liberalization and economic growth. *Review of International Economics*, 9(4), 688–702.

Mathieson, D. J. and Roldos, J., 2001. The Role of Foreign Banks in Emerging Markets. Paper presented at the World Bank, IMF, and Brookings Institution 3rd Annual Financial Markets and Development Conference.

Rajan, R. G. and Zingales, L., 1998. Financial Dependence and Growth. *American Economic Review,* 88, 559–586.

Stata Cross-Sectional Time-Series, 2003. Reference Manual. Release 8, *A Stata Pess Publication*, 242 pp.

Unite, A. A., Sullivan, M. J., 2003. The effect of foreign entry and ownership structure on the Philippine domestic banking market. *Journal of banking and Finance*, 27, 2323–2345.

Weller, C. E., 2000. Financial Liberalization, Multinational Banks and Credit Supply: The Case of Poland. *International Review of Applied Economics,* 14(2), 193–211.

Williams, B., 2003. Domestic and international determinants of bank profits: foreign banks in Australia. *Journal of Banking and Finance,* 27, 1185–1210.

Williams, B., 1997. Positive theories of multinational banking: eclectic theory versus internalisation theory. *Journal of Economic Surveys*, 11(1), 71–100.

Zajc, P., 2002. The effect of foreign bank entry on domestic banks in Central and Eastern Europe. Paper for SUERF colloquium, 2003, 19 p.

## Appendix 1. Description of variables

| Variable | Source | Description |
|---|---|---|
| FBSN | Central banks, EBRD | Number of foreign banks as a percentage of all banks in a given country and year |
| FSA | BankScope | Share of foreign banks' assets in total banking market assets in a given country and year |
| NIM | BankScope | Net interest income (interest income minus interest expense) over total assets |
| ALINT | BankScope | Interest income to interest earning assets |
| PTPTA | BankScope | Before-tax profit over total assets |
| OOITA | BankScope | Non-interest income over total assets |
| OHTA | BankScope | Total operating expense (all but interest expenses) over total assets |
| LLPTA | BankScope | Loan loss provisions over total assets |
| ETA | BankScope | Equity over total assets |
| NEATA | BankScope | Non-interest earning assets over total assets |
| CSTFTA | BankScope | Short and long term deposits, and other non-deposit short term funding over total assets |
| MSHARE | BankScope | Bank assets to total banking market assets in a given year |
| GGDP | EBRD | Real GDP annual growth rate |
| INCOME | EBRD | GDP per capita in US dollars |
| CPI | EBRD | Annual CPI change |
| MMR | IFS | End of year money market interest rate |
| DCGDP | IFS | Private credit to GDP in a given country and year |

*Note: all variables are in percentages except GDP per capita (in US dollars (th), 1995 prices)*
*Sources: Central banks' home pages, EBRD Transition Report 2002, Fitch IBCA's BankScope database, Asly Demirgüç–Kunt, Financial Structure and Economic Development Database, Worldbank, [http://www.worldbank.org/research/projects/Finstructure/database .htm]; International Monetary Fund. International Financial Statistics Yearbook 2002.*

**Appendix 2. Foreign bank share in total number of banks (percentage)**

| Country | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|---|---|---|---|
| Bulgaria | 2.5 | 7.3 | 7.1 | 25.0 | 50.0 | 51.2 | 71.4 | 74.3 | 76.5 |
| Czech | 38.2 | 41.8 | 43.4 | 48.0 | 55.6 | 64.3 | 65.0 | 68.4 | 70.3 |
| Estonia | 9.1 | 26.3 | 26.7 | 33.3 | 50.0 | 42.9 | 57.1 | 57.1 | 57.1 |
| Croatia | 2.0 | 1.9 | 8.6 | 11.5 | 16.7 | 24.5 | 48.8 | 55.8 | 50.0 |
| Hungary | 41.9 | 48.8 | 57.1 | 66.7 | 63.6 | 67.4 | 78.6 | 75.6 | 71.1 |
| Lithuania | 0.0 | 0.0 | 25.0 | 33.3 | 41.7 | 30.8 | 46.2 | 28.6 | 28.6 |
| Latvia | 0.0 | 26.2 | 40.0 | 46.9 | 55.6 | 52.2 | 57.1 | 43.5 | 43.5 |
| Poland | 13.4 | 22.2 | 30.9 | 34.9 | 37.3 | 50.6 | 63.5 | 71.9 | 76.3 |
| Slovenia | 13.6 | 15.4 | 11.1 | 11.8 | 10.0 | 16.1 | 21.4 | 20.8 | 27.3 |
| Slovakia | 48.3 | 54.5 | 48.3 | 44.8 | 40.7 | 40.0 | 56.5 | 63.2 | 83.3 |
| Average | 16.9 | 24.4 | 29.8 | 35.6 | 42.1 | 44.0 | 56.6 | 55.9 | 58.4 |

*Source: Transition Report 2002, author's calculations*

## Appendix 3. Summary of estimations with fixed effects

| | Model | ALINT | Non-interest income | Before-tax profit | Overhead expenses | Loan loss provisions |
|---|---|---|---|---|---|---|
| Results | FBSN | - | - | - | NS | NS |
| | FBSN FBSN*DCGDP | NS | + - | NS | + - | NS |
| | FBSN FBSN*MSHARE | NS | - + | NS | NS | - + |
| | FSA | NS | NS | - | NS | + |
| | FSA FSA*DCGDP | NS | - + | - + | NS | NS |
| | FSA FSA*MSHARE | NS | NS | NS | NS | NS |

*Source: author's calculations*

*Note:      + indicates a significant positive correlation*
*          - indicates a significant negative correlation*
*          NS indicates a relationship that is not statistically significant*

## Appendix 4. Largest banks in CEE countries and their ownership

| Country | Three largest banks | Major owner (country of origin) |
|---|---|---|
| Bulgaria | Bulbank A. D.<br>United Bulgarian Bank<br>DSK Bank | Unicredito (IT)<br>National Bank of Greece (GR)<br>Public |
| Czech Republic | CSOB<br>Ceska Sporitelna<br>Komercni Banka | KBC (BE)<br>Erste Bank (AT)<br>Société Generale (FR) |
| Estonia | Hansapank<br>Ühispank<br>Sampo Pank | Swedbank (SE)<br>SEB (SE)<br>Sampo (FI) |
| Hungary | Parekss Banka<br>Kereskedelmi és Hitelbank<br>Central-Europ. Intern. Bank | Dispersed private owenership<br>KBC (BE)<br>Bayeriche Landesbank (DE) |
| Latvia | Pareks Banka<br>Latvijas Unibanka<br>Aizkraukles | Europe Holding (GB)<br>SEB (SE)<br>Board of directors |
| Lithuania | Vilniaus Banka<br>Lietuvos Taupomasis<br>Bank Snoras | SEB (SE)<br>Swedbank (SE)<br>Incorion Investments (LT) |
| Poland | Bank Pekao<br>Bank Handlowy<br>PKO BP | Unicredito (IT)<br>Citibank (US)<br>Public |
| Slovakia | VUB<br>Slovenska Sporitelna<br>Tatra Banka | Intesa (IT)<br>Erste Bank (AT)<br>RZB (AT) |
| Slovenia | NLB<br>NKBM<br>SKB banka | KBC (BE)<br>Public (65% privatised in 2001/2002) Société Generale (FR) |

*Source: ECB, 2002*