GLOBAL BUSINESS & FINANCE REVIEW, Volume. 18 Issue. 2 (FALL 2013), 1-16
ISSN 1088-6931 / eISSN 2384-1648 | Http://dx.doi.org/10.17549/gbfr.2013.18.2.01

GLOBAL BUSINESS & FINANCE REVIEW

www.gbfrjournal.org

Foreign Banks in European Transition Countries: A Panel Data Study

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A B S T R A C T

Numerous studies show foreign banks' effect on the economic and financial progress in transition countries, but few investigate the determinant factors that attract foreign bank entry into these emerging countries. The primary objective of this paper is to identify and investigate which factors attract foreign bank entry into transition countries using a panel data study. The study is carried out separately for three groups of European transition countries: CEEB, CIS, and SEE. Although countries that belonged to the former Soviet-bloc are often considered as similar, they differ essentially in their economic and financial system development. Our results show that these differences cause significant differences in factors influencing foreign bank entries into each group of transition states. For the CEEB and CIS countries, the most important factors that influenced foreign bank entry are the number of banks (total and foreign-owned) and non-performing loans. For the SEE countries, the determinant factors of foreign bank entry seem less economically driven than politically motivated.

Keywords: Foreign Banks' Effect, Foreign Bank Entry, European Transition Countires, CEEB, CIS, SEE

Ⅰ. Introduction

Although the transition countries in this study—Central and East Europe and the Baltics (CEEB), South East European (SEE), and Commonwealth of Independent States (CIS)—implemented different policies and reforms at different stages, the characteristics of their financial sector two decades after the break-up of the Soviet Union are basically similar: strong domination by commercial banks which are increasingly foreign-owned lending mainly to the government, a highly illiquid and volatile stock market, inadequate domestic financing, and long-term financing mainly from foreign direct investment. The CEEB and SEE countries achieved further progress than the CIS countries. The average EBRD index for bank reforms indicates that the CEEB countries made further progress than the SEE and CIS countries and improved in all groups (Figure 1). The European Bank for Reconstruction and Development (EBRD) banking sector index ranges from little reform with an index of 1 to comparable western standards with an index of 4+. Although not at western European standards, the CEEB banks today are operating at levels that are more efficient and effective than a decade ago with improved regulation and supervision processes in place. A score of 3 indicates that the CEEB countries established bankruptcy and insolvency procedures for failed banks, subjected the banks to hard budget constraints, and eliminated the easy access to credit from the central bank. The CEEB countries progressed much further in banking reforms (EBRD index between 2.7 and 4.0) than the SEE (EBRD index between 1.0 and 4.0) and CIS (EBRD index between 1.0 and 3.0) countries, particularly in global integration and in banking

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and enterprise reforms. The EBRD index of banking sector reform equals 4.0 for the Czech Republic in years 2001 – 2008 (since 2009 the Czech Rep. has not been classified as a transitional country by EBRD), Estonia in 2004 – 2010, Hungary 1998 – 2009 (in 2010 the index is 3.7), Latvia in 2007 – 2008 (in 2009 and 2010 the index is 3.7), and Croatia in years 2004 – 2010 (Appendix 1). CIS countries rarely obtain a score equal to 3.0 – except for Moldova 2007-2008, Kazakhstan 2003– 2008 and Ukraine 2006 – 2010.

It is crucial that financial development and reforms are sustained to the level of western standards for the transition countries to better withstand external shocks, especially during the recent Euro zone crisis of 2011-2012.

Foreign banks are attracted to potentially profitable markets. The more a country transitions into an economically stable and growing market, the more foreign banks are attracted to the country; and in turn, the greater the foreign bank participation in the transition country, the greater the contribution to that country's development. By developing these characteristic factors, transition countries hope to attract foreign bank entry and foreign direct investment to accelerate economic growth. Therefore, how transition countries evolve and develop their financial systems, implement reform and economic policies to improve per capita income, and lower restrictions to foreign entry are characteristic factors that make their markets attractive to foreign bank entry.

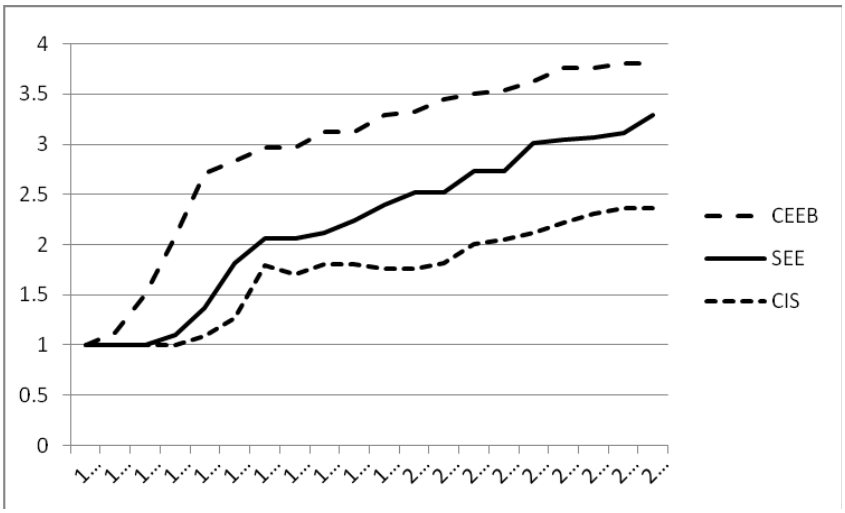
The aim of our study is to identify what determinant factors cause foreign bank entry into transition countries. The analysis is carried out separately for the three groups of CEEB, CIS, and SEE countries applying panel models. Our findings show that CEEB and CIS countries are more similar than SEE countries with respect to the determinant factors that attract foreign bank entry:

number of banks and foreign-owned banks and non-performing loans (NPLs). For SEE countries, banking reform and domestic credit to the private sector are crucial factors. Our study finds that foreign banks are attracted to the CEEB countries that achieved better and further progress in transition reforms than the SEE and CIS countries. The study of transition countries is a new field that helps to provide information on the post-Cold War transformation process, which we hope to add to the field.

Ⅱ. Literature Review

The literature review is divided into two parts: (1) studies that look at the effect of foreign banks' participation on financial market development and economic growth, (2) studies that look at what attracts foreign bank entry into transition markets.

The literature provides numerous studies of the linkages between efficient financial markets, the quality of investments, and an accelerated economic growth (Greenwood & Jovanovic, 1990; Saint-Paul, 1992; Blackburn & Hung, 1998;



Source: European Bank for Reconstruction and Development (2012).

Figure 1. EBRD Index of Banking Sector Reform: Average for CEEB, SEE, and CIS

Harrison et al., 1999; Levine et al., 2000). Some studies look at banking and financial development in transition countries in particular (Berglof & Bolton, 2001; Fries & Taci, 2002; Gomel, 2002). A study of bank performance finds that although bank efficiency improves with recapitalization of big banks, the privatization of the banking sector to private ownership other than to foreign owners has no statistically significant improvements on bank efficiency (Grigorian & Manole, 2002). The authors suggest that further study is needed to see if efficiency gains from foreign ownership are due to management skills or technology transfer, the implication being that foreign bank ownerships help to increase local bank efficiency. Given the strong theoretical and empirical evidences of linkage between financial sector development and economic growth, transition countries must achieve an effective and efficient financial system to attract foreign banks.

The literature also indicates the reasons and the benefits that transition countries experience when they desire to attract foreign bank participation. Although transition countries are fearful of foreign dominance of their banking sector by foreign banks due to strong nationalistic feelings and the inability of domestic banks to compete (Classens et al., 2001; Keren and Ofer, 2002), the many bank failures leading to the banking and financial crisis in the late 1990s compelled transition countries to lower restrictions to entry and to restructure by allowing the sale of state banks to foreign banks (Bonin & Wachtel, 2003).

Other studies look at transition countries attracting foreign banks' participation because of the benefits to their financial system. Foreign banks enhance the innovation and efficiency of financial services, contribute to stability, increase credit accessibility, and promote the transmission flow of monetary policies (Moreno & Villar, 2005; Bayraktar & Wang, 2005). Bayraktar and Wang (2005) find that the extent of foreign banks' effect depends on the financial liberalization path of a particular country: domestic financial markets first, stock market first, or capital account first. In particular, foreign banks entry increases domestic bank competitiveness if a country liberalizes the stock market first, but the entry does not improve the efficiency of domestic banks if a country liberalizes their domestic financial markets first. The impact is weak in countries that liberalize their capital accounts first.

Besides increasing domestic competition, foreign banks also inject much needed equity capital into insolvent or sick domestic banks heavily burdened with non-performing loans (NPLs) inherited from the pre-transition era created by excessive lending to troubled state-owned enterprises or from misguided state-directed lending policy. However, restrictive foreign bank entry reduces bank sector efficiency which is associated with higher interest rate margins and overhead expenditures (Barth et al., 2001). Foreign banks also bring greater financial stability to the host country, particularly during episodes of financial crisis by not abandoning the host market (Detragiache & Gupta, 2004) or stepping into the breach when domestic banks face financial turmoil: the Argentina and Mexico crises (Goldberg et al., 2000).

On the other hand, while bringing financial stability, foreign banks can transmit external shocks to the host country (Martinez et al., 2002). A large foreign banking presence can also limit information gathering when decision-making and risk management responsibilities rest with the parent bank, increase the vulnerability of the host country to external shocks that affect the parent bank, and expose the host country to foreign exchange risk from foreign currency borrowing to cover local currency business (Moreno & Villar, 2005). Rather than increasing competition, Levy-Yeyati, and Micco (2007) find that foreign bank entry appears to reduce competition in the banking sector in the eight Latin American countries under study. The greater resources, efficiency, higher quality of management, expertise, and better reputation and perceived safety of foreign banks may take customers and profit away from domestic banks (Kim & Lee, 2004).

Despite the benefits of foreign bank participation in emerging markets, the presence and fear of potential foreign banks' dominance have some emerging countries restricting or limiting foreign bank entry: limiting foreign ownership stakes and also imposing artificial requirements like local incorporation requirements ostensibly for better regulatory control. For example, foreign banks in China have to meet a minimum asset size of U$10 billion, have to operate a representative office in China for at least two years, and limit to openings to one branch per year. Foreign ownership of any single domestic bank is limited to 25%, and any single foreign investor is limited to 20%. Despite these difficulties, transitional countries are urged to continue their open policy to foreign bank entry. To minimize financial risks and benefit from foreign bank participation, transitional countries are recommended to diversify their mix of foreign entrants and ownership structures of acquired domestic banks, set clear delineation of regulation between home- and host country, and learn from advanced economies in dealing with challenges posed by foreign entry (Martinez-Diaz, 2007).

The literature is heavy on the effects of foreign bank entry, but few studies look at the causal factors of foreign bank entry in transition countries. Studies like Budzeika (1991) and Fisher and Molyneux (1996) look at determinants of foreign bank entry in United States and United Kingdom. Although the emphasis by Clarke et al. (2001) is the effect

of foreign bank entry, part of their paper attempts to answer the question, "What draws foreign banks to a country?" The authors list various factors: follow domestic clients, pursuit of new market opportunities and foreign direct investment, liberalization of the banking and financial markets, and openness to foreign bank entry. However, the Miller and Parkhe (1998) study of U.S. banks in 32 countries finds that follow-the-customer and foreign direct investment determine foreign bank entry but are not applicable to developing economies. The reason may be that developing economies do not have strong domestic competitors and therefore offer greater profit opportunities to foreign banks.

Profit opportunities are strong incentives for foreign bank entry based on the host country's growing per capita GDP (Yamori 1998, Claessens et al. 2000, Buch 2000). Focarelli and Pozzolo (2000) find foreign bank entry is greater in countries with higher expectations of economic growth with inefficient domestic financial markets, higher average operating costs, and lower net interest margins. The authors surmise that foreign bank entry can contribute to the restructuring of the domestic banks either through mergers or acquisitions to reap potential profits and increase market share, particularly in the developing countries under study (the Czech Republic, Hungary, Republic of Korea, Mexico, Poland, and Turkey) where local banks are likely to be the weakest. The Bol et al. (2002) study of eight European transition countries finds that reform measures toward greater political freedom and openness of a country are important determinants to attract foreign bank entry. Foreign banks respond significantly to reforms that increase efficiency, restructure the financial sector, and stimulate domestic investment.

Hryckiewicz and Kowalewski (2008) examine the determinants of entry into four local banking markets in Central Europe from 1994-2004 that affect entry modes of foreign banks. The study finds that the most important factors are large potential banking markets with a low degree of financial sophistication, the legal origin (common law, French and, German Law) of the home country, the size of economic growth rate differentials between host and home markets, and the distance between host and foreign bank headquarters (mainly European banks). Their study supports the hypothesis that foreign bank entry into developing countries differs in seeking markets with greater profit and market potential rather than in developed economies where entry is to follow their clients to offer banking products and services in an efficient, sophisticated market. Overall, the literature suggests that the determinants for foreign bank entry are somewhat different for developed economies (follow-the-customer) than for developing economies (profit and market opportunities) suggesting that further research is needed.

Ⅲ. Descriptive Analysis of the Transition Banking Sectors

A descriptive analysis based on the EBRD Transition Reports highlights the differences among the transition countries as grouped by EBRD in Table 1. Georgia was excluded from CIS in 2008 so it is only partially considered in our analyses. Ukraine and Turkmenistan signed but did not ratify the CIS Charter so officially they are not CIS members however they participate de facto.

The CEEB countries stand as the most consistent in terms of positive real GDP growth compared to the SEE and CIS countries. By 2007, the transition countries had turned their economy around with Latvia growing at about 9%. The CIS countries experienced the most growth at a 9.02% average rate in 2007. However, most of the growth is from one country, Azerbaijan, with a GDP growth of about 30% due to their huge oil-based economy.

Other CIS countries also experienced GDP growth rates above 8%: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Tajikistan, Turkmenistan, and Uzbekistan. Inflation was also brought down to manageable levels through successful economic stabilization programs by the CEEB and SEE countries averaging 3.8% and 3.75% respectively except for the CIS countries at 9.58% by 2007. This is an economic feat when average hyperinflation of

Table 1. Transition Countries

Central and Eastern European Countries (CEEB)	Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, Slovenia
South East European Countries (SEE)	Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Romania, Serbia and Montenegro
Commonwealth of Independent States (CIS)	Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

417%, 2,014%, and 1,073% plagued the CEEB, SEE, and CIS countries respectively at the start of the market transformation in 1992. The Czech Republic exemplifies how much progress European transition countries have made, graduating from EBRD assistance in 2007.

The improved financial environment attracts more foreign banks into the CEEB countries. Transition countries have bank-based rather than financial-based systems. The average EBRD index for Banking Reforms shows that the CEEB countries are consistent in improving their banking reforms from 1993-2007 with an average index of 3.8; although by 2005, the SEE countries also show significant progress while the CIS countries still lag behind. The index for the Czech Republic, Estonia, Hungary, Latvia and Croatia is as high as a 4 in 2007, which indicates their banking sector is comparable to western standards. This is not surprising given that some of these countries have a strong presence of foreign banks: 75.6% (2007), 85.7% (2006), and 70% (2006) of total banks for the Czech Republic, Estonia, and Hungary respectively.

The amount of non-performing loans (NPLs) as a percent of total loans in the transition countries is dropping and improving with an average of 3.2%, 5.23%, and 4.34% for the CEEB, SEE, and CIS countries respectively in 2006. The transition countries resolve the NPLs either through consolidation or purchase by the foreign banks. The NPLs are the highest in the SEE countries where foreign bank presence is less. The average domestic credit to the private sector as a percentage of GDP between 1991-2006 is growing from over 25% to over 54% in the CEEB countries, which is consistent with the large number of foreign banks providing most of the financing for the private sector. This is in sharp contrast to the CIS countries with an average of only 24.8% of domestic credit going to the private sector in 2006. This is not surprising since the CIS countries have the smallest number of foreign banks. The implication here is that the high GDP growth is financed primarily through the public sector by the government rather than through the private sector.

The most striking progress made by the CEEB countries is in the liberalization of foreign exchange and trade: From 1994 onwards, the foreign exchange and trade sectors are comparable to western standards (above an index of 4+) unlike the SEE (which achieved a 4+ only by 2003), and CIS countries with the highest index of 3.45 in 2007. Foreign banks are global in operations, and their presence may spur the transition countries to boost trade and foreign exchange liberalization further.

The larger presence of foreign banks in the CEEB countries seems to be related to better transition performance indicators. Whether the causality is that the improving economic and financial environment attracts more foreign banks into the more advanced reformed countries or that the larger presence of the foreign banks contributes to improving the economic and financial conditions of the transition countries can be determined by empirical analysis. However, the descriptive analysis indicates that the transition countries that have crossed the *great divide* and have consistent and progressive reforms, economic growth, and financial development seem to be associated with the greater presence of foreign banks.

Ⅳ. European Transition Countries and Financial Development

The literature review shows that in the last decade, reforms and market potentials have attracted foreign bank entry into transition countries. Transition countries have carried out financial reforms and achieved economic growth. This section looks in particular at the European transition countries to understand the development of their banking and financial sector.

The desire to accede to the EU zone is a strong incentive for the ten European transition countries to maintain sustained progress in transition. Consequently, eight countries attained EU membership in May 2004: the Czech Republic, Estonia, Hungary, Poland, Slovenia, Latvia, Lithuania, and Slovak Republic. Bulgaria and Romania attained membership in January 2007.

Allowing foreign bank participation in the banking sector can bring the many benefits described by the literature. Foreign banks respond to Eastern European markets that have progressive reforms which particularly boost financial sector efficiency and provide greater political freedom (Lensink & De Hann, 2002). The study also finds that foreign bank entry has a positive impact on domestic investments. Berglof and Bolton (2001) find that domestic financing is inadequate in transition countries. Therefore, foreign financing can be the alternative source of financing for the transition countries.

A study of the Czech Republic transformation of their banking sector over 15 years suggests that political factors played a significant role in the inefficiency and losses incurred by the banking sector which could have been avoided and shifted to the private sector rather than being borne by the public (Barta & Miroslav, 2006). The slowing of reforms due to political considerations caused underperformance and

higher costs in the banking sector. Hence, transition countries are vulnerable to financial crisis, which is observed in countries like Hungary and Lithuania in the contagion of the 2009 global financial crisis. The denomination of local loans in euro rates increases the external vulnerability of financial problems for the transition countries.

Grigorian and Manole (2002) argue that due to the lack of institutional development, transition countries are better off with a higher concentration of banks and less competition in the initial stages of transition. They argue that banks in transition countries would better compete when their economic development is sufficiently stronger and able to respond more efficiently. However, this argument dooms the transition countries to a vicious trap of lack of institutional development, inefficient banks, and a lack of economic development. The authors also find that banks with controlling foreign ownership tend to be more efficient than domestically owned state and private banks, which argues for foreign participation to break the cycle. The results are not surprising given the better expertise, risk management, and access to outside foreign capital. The better-capitalized foreign banks have stronger capital-asset ratios and better performing loan portfolios because they attract higher quality domestic and foreign borrowers.

Transition countries would like to attract foreign banks due to the perception that foreign banks have less risk because of their parent or international connections and financial support in the event of a bailout. In addition, unless newly established and privatized banks have a controlling foreign ownership, privatization of banks does not improve efficiency significantly (Grigorian & Manole, 2002; Bonin & Wachtel, 2002; Keren & Ofer, 2002). This suggests that foreign ownership is important for transition countries to succeed. Countries with more progress in legal and regulatory institution building have lower entry and transaction costs to foreign banks and less state interference. Foreign banks also bring with them accounting transparency and good governance.

Transition countries view foreign banks as better equipped than local banks to modernize and develop their banking system and integrate the local financial system into global financial markets. In the late 1990s, foreign banks like Citibank, Allied Irish Banks, Internationale Nederlanden Group (ING), Credit Suisse First Boston, ABN-Amro, and Bayerische Hype-Bereinsbank to name a few, increased their entry into the transition markets, more in some transition countries than others. It was not until foreign banks gain significant stakes in the banking sectors that bank privatization takes off (Berglof & Bolton, 2001). Hungary is the first to invite extensive foreign ownership with 12 foreign banks in 1992 increasing to 27 foreign banks in 2005, which is 71% of the total number of banks. For example, in order to resolve NPLs, one of Hungary's major banks, Magyar Hitel Bank (MHB), was sold to a Dutch bank, ABN Amro. By the end of 1997, Hungary sold four of its large state-owned banks to foreign banks. In 2005, the estimated percentage of foreign ownerships was surpassed by Poland with 82% of the total number of banks, followed by the Czech Republic, Estonia, Slovak Republic, and Romania with about 70%. The smallest foreign bank penetration is Russia with about 4% of the total number of banks.

Bonin and Wachtel (2003) argue that foreign ownership is instrumental in privatizing Poland's banking sector. For example, Wielkopolski Bank Kredytowy and Bank Zachodni were privatized and later merged into the majority ownership of Allied Irish Bank in 2000. In the same year, Citibank Poland and Bank Handlowy were merged to form the fourth largest bank in Poland. The early policy of foreign bank entry of the Polish government is the sale of weak domestic banks to foreign owners rather than was granting new licenses to foreign banks with the objective of restructuring the troubled local banks through foreign capital infusion. In 1999, the Polish government began opening the banking sector without restrictions to foreign banks and selling majority stakes of state-owned banks to foreign ownerships. Romania and the Czech Republic similarly resolved insolvent banks and non-performing loans through the sale of state-owned banks to foreign owners.

Foreign bank entry into Eastern Europe negatively affected the domestic revenues of both interest- and non-interest income and profitability of domestic banks from increased competition (Uiboupin, 2004). On the other hand, foreign bank entry increased competition and improved credit lending to small- and medium-sized enterprises and retail markets; but how credit is allocated depends very much on the parent bank (De Hass & Naaborg, 2005). A study of foreign bank entry in Eastern Europe shows that the increased competition of foreign entry has reduced domestic interest rates benefiting the domestic firms in lowering the cost of funds (Claeys & Hainz, 2006). However, the study finds that despite the overall lower interest rates, *de novo* foreign banks tend to charge higher interest rates than foreign acquired banks. The implication is that competition is more intense if the transition countries allow foreign banks to enter as *de novo* banks which forces domestic banks to compete by lowering their interest rates. *De nova* foreign banks in Eastern Europe tend to do better than foreign acquired banks in profitability due to lower costs of new foreign direct investment, higher quality borrowers with better risk management skills, and the targeting of different segments

of larger and more transparent enterprises leaving riskier customers to domestic banks (Havrylchyk, 2006). Specifically, foreign banks in Eastern Europe tend to target mortgage lending and lending to subsidiaries of foreign enterprises rather than to large domestic enterprises (De Haas et al., 2007).

In contrast, most of the CIS and SEE countries allowed little entry of foreign banks while at the same time foreign banks are reluctant to enter a market with weak institutions. For its size, Russia has the smallest foreign bank participation in its banking sector. The inefficient supervisory structure and extensive political interference in Russia and other CIS countries engender high incidences of corruption and fraud, which undermines public confidence in the banking institutions. The banks are weak and usually become insolvent very quickly requiring government bailouts. Banks have been involved in pyramid schemes in a number of countries: Albania, Russia, Romania, and smaller schemes in Bulgaria and the Czech Republic (Gomel, 2002). The pyramid scheme in Albania from 1996-1977 was so extensive and severe that at its peak, it was nominally valued at about half the country's GDP. The collapse of the pyramid scheme in 1997 lowered Albania's domestic credit to the private sector as a percent of GDP from 3.8% to 0.6%. The liberal policies of some of the transition countries like Hungary and Poland to foreign bank entry speak to these countries' acknowledgement of the benefits of foreign bank participation. The EU membership mandate requires the new members to accelerate the convergence and harmonization of their banking sector. Today, foreign banks dominate the credit markets in many of the Eastern European countries and provide most of the credit lending to the private sector in the more liberalized countries. There is also evidence that foreign and domestic bank performance tends to converge (Naaborg et al., 2003).

Ⅴ. Methodology

In our study, we want to determine what factors x_{it} (i =1, 2,⋯, 8, 10, 11) influence foreign participation in the banking system for each group of countries: CEEB (8 countries with 88 observations), CIS (7 countries with 77 observations), and SEE (11 countries with 121 observations). We construct a panel data for the three groups of countries using observations from 1998-2008 obtained from the EBRD Transition Reports. Later EBRD data no longer include the Czech Republic. Since later EBRD data did not include the Czech Republic, to capture the contribution of foreign banks for all transition countries including the Czech Republic, our study looks at data from 1998-2008. There are no missing observations for all considered variables over these years. Average and variability measures for all variables are presented in Appendix 4.

In our empirical investigation, we use eleven explanatory variables: $x1$ - $x11$ and a dependent variable y to describe foreign participation in the banking system (Table 2).

We measure the participation of foreign-owned banks by the percentage asset share of foreign-owned banks for all three groups of countries applying the same variable sets (and periods). Eleven variables are chosen due to data availability from EBRD to generate indicators employing the

Table 2. List of Variables

Variable Symbol	Variable Description
$x1$	EBRD index of large-scale privatization
$x2$	EBRD index of enterprise reform
$x3$	EBRD index of forex and trade liberalization
$x4$	Number of banks
$x5$	Non-performing loans (in per cent of total loans)
$x6$	Domestic credit to private sector (in per cent of GDP)
$x7$	EBRD index of banking sector reform
$x8$	EBRD index of reform of non-bank financial institutions
$x9$	Number of foreign-owned banks
$x10$	Inflation (average) year over year as percentage change in CPI
$x11$	Real GDP Growth
y	Asset share of foreign-owned banks (in per cent)

Average for the year, not end of previous year.

same methodology for all analyzed countries and periods.

Panel data is a two-dimensional study application which combines time-series with cross-sections data where each country in a particular group is considered as a unit. Panel data creates more variability by combining variation across units with variation over time. The panel data analysis provides our regression analysis with both a spatial and temporal dimension. The spatial dimension pertains to the set of cross-sectional units of observations for the 26-transition countries under study, and the temporal dimension pertains to the periodic observations of the set of variables characterizing these cross-sectional units over the 11 annual observations' time span.

The regression model for the panel data is defined as follows:

$$y_{it} = \alpha_i + \boldsymbol{\beta}^T \mathbf{x_{it}} + \varepsilon_{it} \quad (1)$$

where for i = 1, 2,⋯, N and t = 1, 2,⋯, T:

- y_{it} - dependent variable observed for i-th unit (country) in t-th period of time,
- α_i - individual effect, which is taken to be constant over time t and specific to the individual cross-sectional units i,
- $\mathbf{x_{it}}$ - vector of k regressors not including constant term,
- $\boldsymbol{\beta}^T$ - vector of structural parameters,
- ε_{it} - random disturbance.

There are two types of panel data models. The fixed effects approach takes α_i to be a group specific constant term in the regression model. The random effects approach specifies that α_i is a group specific disturbance similar to ε_{it} except that for each group, there is but a single draw that enters the regression identically in each period. When $\alpha_1 = \alpha_2 = ... = \alpha_N$ is constant, then ordinary least squares estimation provides consistent and efficient estimates for all parameters α and β. The above hypothesis is tested using the Breusch−Pagan test about individual effects. This is the null hypothesis:

$$H_0 : \sigma_\alpha^2 = 0 \quad (2)$$

and the test statistics are as follows:

$$\lambda = \frac{NT}{2(T-1)} \cdot \left(\frac{S_1}{S_2} - 1 \right)^2 \quad (3)$$

$$S_1 = \sum_{i=1}^{N} \left(\sum_{t=}^{T} e_{it} \right)^2 \text{ and } S_2 = \sum_{i=1}^{N} \sum_{t=}^{T} e_{it}^2 \quad (4)$$

where *eit* are residuals of the model (1) and the critical value of λ statistics comes from χ2 distribution with one degree of freedom.

If hypothesis (2) is rejected, the individual effects characteristic for each unit exists; and to employ OLS, it is necessary to introduce binary variables for each unit of least squares with dummy variables (LSDV) or fixed effects estimator (Kennedy, 2003).

In our research, we construct five different models for different sets of explanatory variables, reducing the number of EBRD indexes since these indexes are closely correlated. In fact, the number of banks x_4 and number of foreign banks x_9 are also correlated; however, this relation is different for each group of countries: For CEEB the Pearson coefficient equals 0.91, for CIS - 0.76, and for SEE - 0.20. On the other hand, the relation between the share in the number of foreign-owned banks, x_4 / x_9, and asset share of foreign-owned banks is not very close (Appendix 2) since correlation between these measures is equal to 0.67 for CEEB, 0.48 for CIS, and 0.53 for SEE states.

The first model (m1) contains all explanatory variables:

$$y_{it} = f(x_{1it}, x_{2it}, x_{3it}, x_{4it}, x_{5it}, x_{6it}, x_{7it}, x_{8it}, x_{9it}, x_{10it}, x_{11it}) \quad \text{(m1)}$$

The second model contains a reduced number of explanatory variables since the EBRD indexes of large-scale privatization, enterprise reform, and reform of non-bank financial institutions are omitted; and only two EBRD indexes, x_3 and x_7, are left. Therefore, the models are as follows:

$$y_{it} = f(x_{3it}, x_{4it}, x_{5it}, x_{6it}, x_{7it}, x_{9it}, x_{10it}, x_{11it}) \quad \text{(m2)}$$

The next model contains only one EBRD index, i.e. the index of banking sector reform x_7:

$$y_{it} = f(x_{4it}, x_{5it}, x_{6it}, x_{7it}, x_{9it}, x_{10it}, x_{11it}) \quad \text{(m3)}$$

Model (m4) includes no EBRD indexes in the set of explanatory variables, and variables describing the number of banks are excluded. In other words, in this model the asset share of foreign-owned banks is described by non-

performing loans, domestic credit to private sector, inflation, and real GDP growth:

$$y_{it} = f(x_{5it}, x_{6it}, x_{10it}, x_{11it}) \quad \text{(m4)}$$

The last model contains all variables but two which describe the number of banks and number of foreign owned banks operating in each country (i.e. variables x_4, and x_9):

$$y_{it} = f(x_{1it}, x_{2it}, x_{3it}, x_{5it}, x_{6it}, x_{7it}, x_{8it}, x_{10it}, x_{11it}) \quad \text{(m5)}$$

Each of the models is estimated separately for the three groups of countries CEEB, SEE and CIS, as panel data models.

VI. Empirical Results

The results of the Breusch-Pagan test (see Appendix 3) justify application of LSDV in estimating the models since for all models except (m1) (estimated for the CIS countries), the null hypotheses (2) are rejected. The detailed results for each model are presented in Appendices 4 - 9. The summarized results of the country fixed effect model estimations are shown in Table 3.

Taking into account the fit of the model in terms of adjusted determination coefficient, the best description of the asset share of foreign-owned banks is given by model (m1) which contains all explanatory variables, although the quality of models (m2) and (m3) do not differ much from the first model. However, model (m4) which contains only 4 variables shows a substantial difference. On the other hand, model (m5) is not as robust in describing the dependent variable as the first three models. The determination coefficients are highest for CEEB countries—more than 82% for models (m1) - (m3)— than for CIS and SEE countries (more than 71%). This means that the random components in the CIS and SEE countries are the biggest— 24% (or more) of the variability is explained by variables that are not included in our models. The implication may be that other factors like political connections and cronyism with high incidences of corruption and fraud not included in our models play a more important role in how business is conducted. The adjusted *R*2 here provides a measure of how well real outcomes are likely to be predicted by the model regardless of the number of explanatory variables. We also considered Akaike's, Hannan-Quinn, Schwarz information criteria that are measures of the goodness of fit in estimating a model and they are often used as a guide in model selection.

The aim of our study is to determine the significant factors that cause different levels of foreign bank investments in the banking sector for the three groups of states. Considering each group of countries, we notice that the sets of significant variables are similar for CEEB and CIS

countries while different for SEE states. Among all the explanatory variables, only one— the number of foreign-owned banks (*x9*)— appears in models (m1) – (m3) estimated for all three groups of countries. Other important variables are the NPL (*x*5), EBRD index of large scale privatization (*x*1), and the number of banks (*x*4) which are significant in all models estimated for the CEEB and CIS states but are insignificant for the SEE countries. The resolution of NPLs by the transition countries and the privatization of state-owned banks are attractive to foreign bank entry. The EBRD index of banking reform (*x*7) is also

Table 3. Determination Coefficients and Explanatory Variables at the Significance Level a≤0.05

Model	Variable Set	CEEB		CIS		SEE	
		R^2 Adjusted	Significant Variables	R^2 Adjusted	Significant Variables	R^2 Adjusted	Significant Variables
m1	*x*1, *x*2, *x*3, *x*4, *x*5, *x*6, *x*7, *x*8, *x*9, *x*10, *x*11	0.844	*x*1, *x*4, *x*5, *x*9	0.761	*x*1, *x*4, *x*5, *x*7, *x*9	0.721	*x*2, *x*9, *x*10, *x*11
m2	*x*3, *x*4, *x*5, *x*6, *x*7, *x*9, *x*10, *x*11	0.834	*x*3, *x*4, *x*5, *x*9	0.749	*x*4, *x*5, *x*6, *x*7, *x*9	0.709	*x*6, *x*7, *x*9, *x*10, *x*11
m3	*x*4, *x*5, *x*6, *x*7, *x*9, *x*10, *x*11	0.823	*x*4, *x*5, *x*9	0.752	*x*4, *x*5, *x*6, *x*7, *x*9	0.712	*x*6, *x*7, *x*9, *x*10, *x*11
m4	*x*5, *x*6, *x*10, *x*11	0.787	*x*5, *x*10	0.636	*x*5	0.524	*x*6, *x*11
m5	*x*1, *x*2, *x*3, *x*5, *x*6, *x*7, *x*8, *x*10, *x*11	0.807	*x*1, *x*2, *x*5	0.642	*x*1 ,*x*3, *x*5, *x*7	0.605	*x*11

significant in all models (m1) – (m3) and (m5) that include this variable estimated for the CIS states. On the other hand, for SEE states, the most important factors are represented by real GDP growth (*x*11) which is significant in all models as well as inflation (*x*10) in models (m1) – (m3) and domestic credit to private sector (*x*6) in models (m2) - (m4). For the SEE countries, the need to establish basic economic factors of real GDP growth and to control inflation seems to be essential to attract foreign banks investment.

For the CEEB countries, the asset share of foreign-owned banks is mostly influenced by *x4*- total number of banks, *x5* - non-performing loans, and *x9* - number of foreign-owned banks in the models (m1) – (m3). The lessening of restrictions by CEEB countries to foreign bank entry is important in attracting foreign bank investment. For the models estimated for the CIS countries, the variables *x4*, *x5*, *x7*, and x*9* are the most significant for the models (m1) – (m3). The number of banks and foreign-owned banks, NPLs resolution, and progress in banking reforms are important factors for the CIS countries to attract foreign bank entry. Model (m3) seems to have a better fit than model (m2) since the EBRD index of forex and trade liberalization is not significant in both models and can be omitted. Models (m2) and (m3) estimated for the CIS countries contain the same set of significant variables while this set (i.e. significant variables) for model (m1) differs only by one variable since *x6* - domestic credit to private sector is replaced by EBRD index of large-scale privatization - *x1.* The reform effort of large scale privatization is an important factor for CIS countries which are behind in this effort relative to the CEEB countries.

A similar result is observed for the models (m2) and (m3) estimated for the SEE states. Both models contain the same set of significant variables: *x6*, *x7*, *x9*, *x10*, *x11* and the adjusted *R*2 is higher for the model (m3) than (m2). For SEE countries, *x11* - real GDP growth is significant in all models; also *x9* - number of foreign-owned banks and *x10* - inflation change in average CPI appear in the models (m1) - (m3). Among the EBRD indexes, only the ones that include the banking sector reform *x7* and enterprise reform *x2* are significant in the models (m2), (m3), and (m1), respectively. Banking and enterprise reform efforts make the transition countries attractive as potential markets to the foreign banks.

It is worth mentioning that two models (m4) and (m5) which do not contain variables *x4* – number of banks and x*9* – number of foreign-owned banks have relatively weak adjustment to the empirical data in comparison to other models, and the lack of these variables enables other variables to become significant in models estimated for CEEB and CIS states.

Looking at the EBRD indexes we notice six phenomena:

- The index of large-scale privatization - *x1* appearing only in the model (m1) and (m5) is significant and positive for CEEB and CIS states. Large scale privatization causes more foreign investments in the banking system but only in the CIS and CEEB states. This factor is not significant for SEE where little privatization has taken place.

- The index of enterprise reform - *x2* which is present only in the model (m1) and (m5) is significant and positive for SEE (m1) and CEEB (m5) states. Enterprise reform is an important factor in attracting more foreign bank investment only in the SEE and CEEB states and not for the CIS countries where corruption is more prevalent.

- The index of forex and trade liberalization - *x3* in models (m1), (m2), and (m5) significantly and positively influences foreign presence in the banking sector only in CEEB countries in the model (m2). This factor is not significant for the CIS and SEE countries where there is less capital and market development with mostly unconvertible domestic currencies.

- The index of banking sector reform - *x7* that is absent only in the model (m4) is an essential factor that influences the asset share of foreign-owned banks in CIS and SEE countries in models (m2) and (m3). The continued progress made by the SEE countries in banking reforms encourages greater investment by foreign banks in the SEE than in the CIS states.

- The index of reform of non-bank financial institutions - *x8* appears only in the models (m1) and (m5), and it is not significant for any group of countries. This factor does not seem to be important in attracting foreign bank participation in the CEEB, CIS, SEE countries since these countries are primarily bank dominated; and the depth of the financial market is still undeveloped.

- The non-performing loans *(x5*) plays an important but negative role on foreign bank participation in the banking sector for CEEB and CIS countries while *x6* - domestic credit to private sector is significant and positive only in SEE countries in models (m2) – (m4). Foreign bank participation is greater in countries with fewer NPLs problems while SEE countries with less

foreign bank investment depends more on domestic credit to finance the private sector.

Macroeconomic variables describing inflation (*x10*) and real GDP growth (*x11*) are significant only for SEE countries, the former in the models (m1) – (m3) and the latter in all models. However, the parameter estimates for the CPI are positive (from 0.49 to 0.75) while the ones for the GDP growth are negative (≈ -2.0). These two variables are important to SEE countries lagging behind in transition relative to the CEEB and CIS countries but with unexpected signs. The participation of foreign banks in the SEE countries may be due to other factors like politics which are not captured in our models rather than economic factors. Another reason may be that foreign banks see future potential markets in the SEE countries and want to establish a foothold in these countries despite the poor economic growth and high inflation. For example, Bulgaria and Romania, although behind in transition, made sufficient progress to become EU members in 2007; and Croatia became a member on July 1, 2013.

In summary of our panel study, in all groups of countries, the asset share of foreign banks (*y*) depends significantly and positively on the number of foreign-owned banks (*x9*). It is the only variable that is common for all groups of states and models (m1) – (m3). However, an increase in the number of banks by one causes the increase in the asset share of foreign-owned banks by 1.31% and 1.11% for CEEB and CIS countries but for SEE states by 4.31% on average. The influence is evaluated as an average of parameter estimates obtained for all considered models. For the CEEB and CIS countries, the total number of banks (*x4*) and non-performing loans (*x5*) also influence the asset share of foreign-owned banks. For CEEB countries, the influence of both variables is negative while for the CIS countries the influence of *x4* is positive. Obtained results show that an increase in non-performing loans by 1 percent of total loans causes the decrease of asset share of foreign-owned banks by 1.35% for CEEB states and by 0.48% for CIS states on average (in models m1 – m3). An increase in the total number of banks by one decreases the asset share of foreign-owned banks by about 1 % for CEEB states and increases approximately by 0.16 – 0.17% for CIS countries.

Ⅶ. Conclusion

Our study shows that although the banking systems in CEEB countries seem to be more similar to the SEE than to CIS states (Figure 1), the CEEB and CIS have more similar factors that significantly influence foreign presence compared to factors which are different for the SEE states (Table 3).

For both groups of countries, CEEB and CIS, the most important factors that influence foreign presence in the banking sector are number of banks (total and foreign-owned) as well as non-performing loans. For the CIS countries with less developed banking systems, the EBRD index of banking sector reform seems to be a crucial factor. This factor together with the number of foreign-owned banks plays an important role in some models estimated for SEE countries as well as domestic credit to private sector, inflation, and GDP growth. However, parameter estimates for macroeconomic factors are characterized by unexpected signs. There is greater variability of the asset share of foreign-owned banks observed in years 2007 and 2008 for the SEE countries (13.47% and 14.28% respectively). Political rather than economic factors may play a more important role in the SEE states in attracting foreign bank investment. Foreign banks are entering the transition countries, particularly CEEB countries, with the best characteristics for potential future profits.

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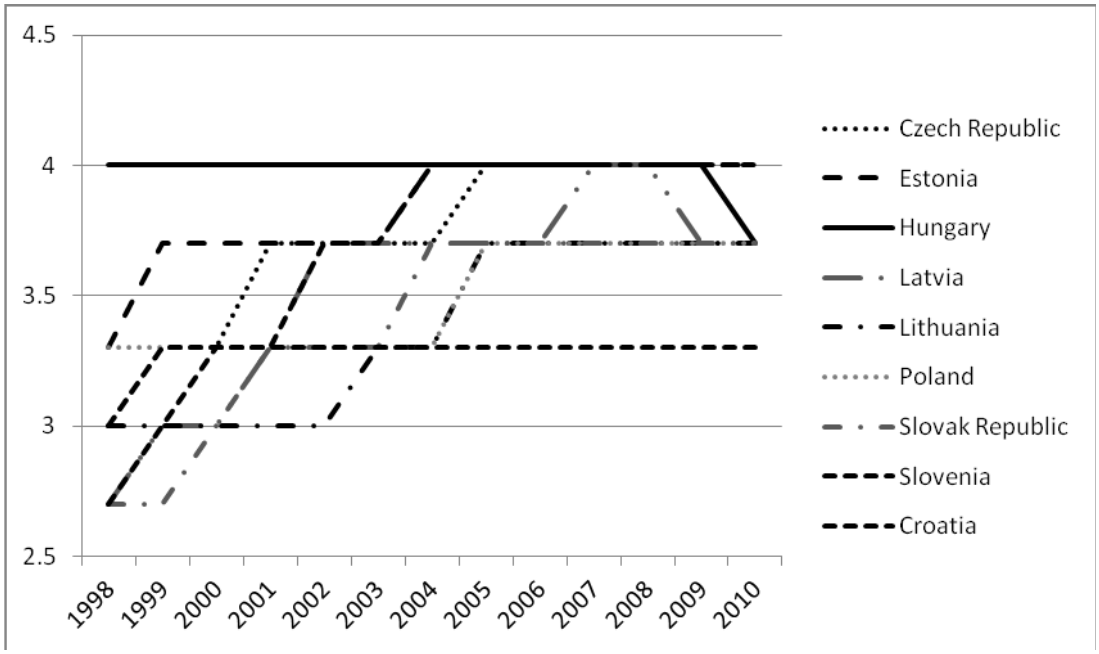
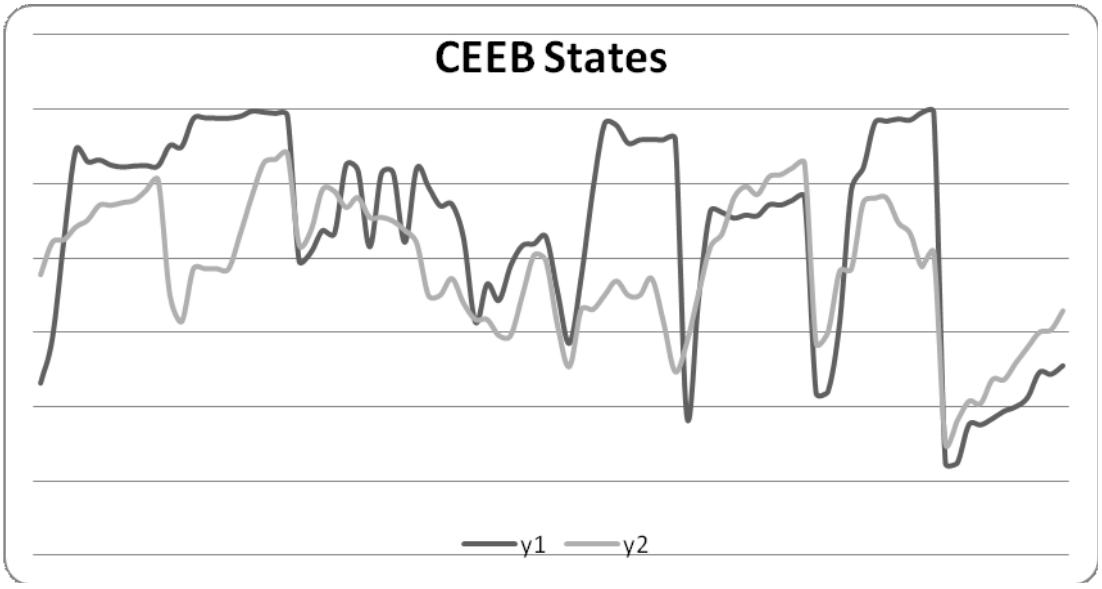
Appendices

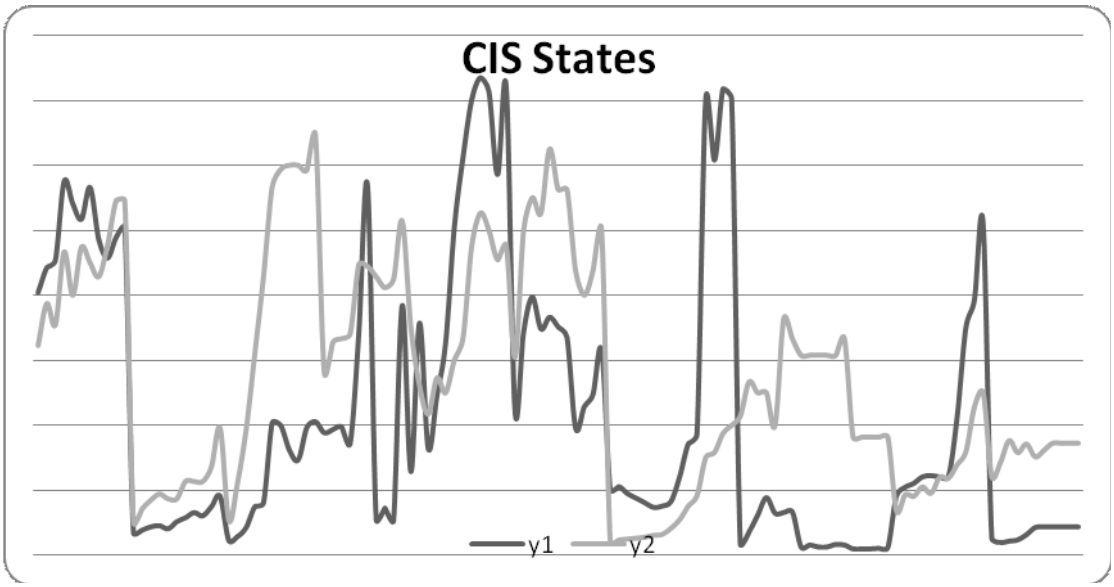
Appendix 1. Transitional states with the most developed banking sector measured by the EBRD banking reform index.



Appendix 2. Relation between share of assets (y1) and share in number of foreign-owned banks (y2) for CEEB, CIS and SEE countries.



Appendix 2. Relation between share of assets (y1) and share in number of foreign-owned banks (y2) for CEEB, CIS and SEE countries. (continued)



Appendix 3. Results of Breusch-Pagan test

		Model 1	Model 2	Model 3	Model 4	Model 5
CEEB	λ	14.1885	38.4266	34.9501	194.8173	439.9681
	p-value	0.0002	0.0000	0.0000	0.0000	0.0000
CIS	λ	0.7620	11.8427	86.9330	173.7536	604.9733
	p-value	0.3827	0.0006	0.0000	0.0000	0.0000
SEE	λ	158.6763	173.2599	172.1760	233.6604	38.4935
	p-value	0.0000	0.0000	0.0000	0.0000	0.0000

Appendix 4. Average and dispersion measures for variables

		x1	*x2*	*x3*	*x4*	*x5*	*x6*	*x7*	*x8*	*x9*	*x10*	*x11*	*y*
SEE	average	2.99	2.22	3.92	30.77	13.76	26.75	2.79	1.97	15.57	10.25	4.70	61.67
	stand. deviation	0.62	0.46	0.67	11.30	17.07	19.30	0.62	0.51	6.85	15.62	3.52	31.41
	variability coef.	0.21	0.21	0.17	0.37	1.24	0.72	0.22	0.26	0.44	1.52	0.75	0.51
CIS	average	2.53	1.80	3.10	153.93	9.38	16.72	2.05	1.88	13.18	17.93	7.98	21.42
	stand. deviation	0.80	0.39	1.08	360.27	11.97	13.16	0.58	0.49	15.27	31.78	5.28	21.05
	variability coef.	0.32	0.22	0.35	2.34	1.28	0.79	0.29	0.26	1.16	1.77	0.66	0.98
CEEB	average	3.66	3.17	4.28	30.08	8.20	40.96	3.54	3.12	18.49	5.06	5.07	68.28
	stand. deviation	0.41	0.32	0.08	17.39	9.04	19.48	0.37	0.48	13.88	3.43	3.04	26.92
	variability coef.	0.11	0.10	0.02	0.58	1.10	0.48	0.10	0.15	0.75	0.68	0.60	0.39

Appendix 5. Parameter estimates for model describing asset share of foreign-owned banks for Model 1

	CEEB	*No. Obs. 88*		CIS	*No. Obs. 121*		SEE	No. Obs. 77	
Variables	*Parameter Estimates*	*t-Student Statistics*		*Parameter Estimates*	*t-Student Statistics*		*Parameter Estimates*	*t-Student Statistics*	
const	-112.7300	-1.3468		12.8118	0.4981		-140.5490	-2.1974	**
*x*1	22.6202	2.0727	**	16.3530	2.7753		-3.7609	-0.2683	
*x*2	16.4638	1.6407		-8.1059	-1.008	***	33.3372	2.0442	**
*x*3	28.0436	1.2919		-0.6122	-0.1478		-0.4541	-0.0400	
*x*4	-0.9967	-2.6613	***	0.1387	2.3959		-0.0491	-0.0804	
*x*5	-1.3184	-4.4247	***	-0.4539	-4.5182	**	0.1849	0.9825	
*x*6	-0.1984	-1.7200	*	0.2543	1.4740	***	0.2828	1.0475	
*x*7	-15.5927	-1.7391	*	-29.6124	-5.7931		20.1228	1.7222	*
*x*8	2.2147	0.3079		5.0682	0.5976	***	4.9755	0.3277	
*x*9	1.3963	3.1096	***	1.0579	4.6192		4.4175	5.1956	***
*x*10	-0.2136	-0.3829		-0.0551	-1.3382	***	0.7475	2.7444	***
*x*11	-0.3015	-0.6123		0.07688	0.2759		-2.0761	-2.9767	***

* - significance level $\alpha = 0.1$ ** - significance level $\alpha = 0.05$ *** - significance level $\alpha = 0.01$

Appendix 6. Parameter estimates for model describing asset share of foreign-owned banks for Model 2

	CEEB	*No. Obs. 88*		CIS	*No. Obs. 121*		SEE	No. Obs. 77	
Variables	*Parameter Estimates*	*t-Student Statistics*		*Parameter Estimates*	*t-Student Statistics*		*Parameter Estimates*	*t-Student Statistics*	
const	-93.1324	-1.1298		34.0651	1.9844	**	-95.4777	-1.8382	*
*x*3	49.7263	2.4679	**	-0.1256	-0.0305		3.8479	0.3918	
*x*4	-1.1996	-3.2319	***	0.1768	3.4052	***	-0.05566	-0.1040	
*x*5	-1.4324	-5.096	***	-0.4928	-4.8741	***	0.1603	0.8886	
*x*6	-0.0292	-0.3113		0.2895	1.8552	*	0.5418	2.3702	**
*x*7	-6.8989	-0.8209		-27.3000	-5.3187	***	23.6352	2.2415	**
*x*9	1.29694	3.1505	***	1.1391	4.9485	***	4.2014	4.9271	***
*x*10	-0.2086	-0.4365		-0.0395	-0.9490		0.5068	2.2078	**
*x*11	-0.1681	-0.3385		0.2513	0.9110		-2.0092	-2.8450	***

* - significance level $\alpha = 0.1$ ** - significance level $\alpha = 0.05$ *** - significance level $\alpha = 0.01$

Appendix 7. Parameter estimates for model describing asset share of foreign-owned banks for Model 3

	CEEB	*No. Obs. 88*		CIS	*No. Obs. 121*		SEE	No. Obs. 77	
Variables	*Parameter Estimates*	*t-Student Statistics*		*Parameter Estimates*	*t-Student Statistics*		*Parameter Estimates*	*t-Student Statistics*	
const	93.4398	2.7492	***	33.7848	2.3425	**	-80.9285	-2.2434	**
*x*4	-1.0872	-2.8537	***	0.1767	3.4262	***	-0.1702	-0.3824	
*x*5	-1.3010	-4.5577	***	-0.4927	-4.8984	***	0.1837	1.0870	
*x*6	0.0056	0.0587		0.2890	1.8738	*	0.5469	2.4126	**
*x*7	-1.0009	-0.1201		-27.3300	-5.4511	***	24.3992	2.3706	**
*x*9	1.2274	2.8895	***	1.1378	5.0623	***	4.3113	5.3906	***
*x*10	-0.3648	-0.7449		-0.0392	-0.9838		0.4868	2.1899	**
*x*11	0.1341	0.2693		0.2497	0.9267		-2.0206	-2.8830	***

* - significance level $\alpha = 0.1$ ** - significance level $\alpha = 0.05$ *** - significance level $\alpha = 0.01$

Appendix 8. Parameter estimates for model describing asset share of foreign-owned banks for Model 4

	CEEB	*No. Obs. 88*		CIS	*No. Obs. 121*		SEE	No. Obs. 77	
Variables	*Parameter Estimates*	*t-Student Statistics*		*Parameter Estimates*	*t-Student Statistics*		*Parameter Estimates*	*t-Student Statistics*	
const	84.9385	15.2227	***	26.5109	6.6292	***	43.7885	5.0193	***
*x*5	-1.4755	-7.2441	***	-0.4887	-4.0142	***	-0.2044	-1.0383	
*x*6	0.0730	0.9827		0.0819	0.6512		1.1997	6.2783	***
*x*10	-1.3262	-2.8278	***	-0.0008	-0.0174		-0.2554	-1.0739	
*x*11	-0.1667	-0.3110		-0.2327	-0.7593		-1.8648	-2.0804	**

* - significance level $\alpha = 0.1$ ** - significance level $\alpha = 0.05$ *** - significance level $\alpha = 0.01$

Appendix 9. Parameter estimates for model describing asset share of foreign-owned banks for Model 5

	CEEB	*No. Obs. 88*		CIS	*No. Obs. 121*		SEE	No. Obs. 77	
Variables	*Parameter Estimates*	*t-Student Statistics*		*Parameter Estimates*	*t-Student Statistics*		*Parameter Estimates*	*t-Student Statistics*	
const	-103.8690	-1.1003		-3.7919	-0.3607		-117.3980	-2.5246	***
*x*1	18.8212	1.6859	**	13.3507	2.8216	***	3.2552	0.1992	
*x*2	26.7455	2.5082	***	-8.1744	-0.8578		29.0635	1.5536	
*x*3	18.5854	0.7853		19.1115	6.1984	***	16.5118	1.6332	*
*x*5	-1.2846	-3.8645	***	-0.5070	-4.2655	***	-0.2367	-1.1921	
*x*6	-0.1669	-1.3709		0.07748	0.4562		0.3117	0.9714	
*x*7	-9.9550	-1.0011		-23.4257	-3.9089	***	21.2484	1.5543	
*x*8	0.4942	0.0616		0.6515	0.0933		-1.5748	-0.1004	
*x*10	-0.8882	-1.5917	*	-0.0121	-0.2631		0.4581	1.4771	
*x*11	-0.4711	-0.8572		-0.1312	-0.4535		-2.0788	-2.5049	***

* - significance level $\alpha = 0.1$ ** - significance level $\alpha = 0.05$ *** - significance level $\alpha = 0.01$