The Internationalization of Banking:
A Micro-Macro Approach with a Focus on Romania

Abstract

The purpose of this paper is twofold. On the macro side, we discuss the impact of foreign bank penetration on the financial system by estimating a cross-country panel data for 10 of Central and Eastern European countries (CEECs) between 1997 and 2006. We hypothesize that increased foreign bank concentration could lead to an increased supply of capital for foreign direct investment and a higher credit supply for the domestic economy.

On the micro side, we highlight the relationship between foreign bank penetration, through influencing the local banking market structure, and the performance of the banks operating in this market by measuring a cross-bank panel data for 17 Romanian banks between 1999 and 2006. This estimation intends to give evidence on the structure-conduct-performance paradigm. The value of the paper lies in (1) providing banking sector data for CEECs and specially Romania, (2) estimating the effect of foreign bank penetration on a country and a sector level and (3) providing evidence on the SCP paradigm.

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1 Introduction

In the last years, authorities are increasingly observing the development of the financial markets and are implementing economic and legal measures in order to accelerate financial integration of the European financial markets. According to the vigorous effect of the banking sector on economic growth, the European Union set the integration of this sector as one of the main targets for the next years. A very important factor with regard to integration and the development of the banking systems of the Central and Eastern European countries was obviously the entry of foreign banks via FDI. These banks were not only able to support the transformation of the CEE economies from state-led to market-oriented by introducing more sophisticated financial products and management techniques, but also increased the access to capital for the domestic economy.

Foreign financial intermediaries also showed the capability of increasing the quality and availability of financial services. Other positive effects have been improved domestic financial policy and financial structure (see, among others, Levine (1996), Gray and He (2001), Clarke et al. (2006), Fink et al. (2007), Claessens et al. (1998, 2001)). The change of the banking market structure, mainly caused by foreign bank entry, is characterized by an increasing level of competition and a high level of bank concentration (see, among others, Claessens and Laeven (2003), Barros (2007)). This meaningful development of the banking industry shows deep impacts on the microeconomic level of the credit institutes operating in this market, especially on their performance and efficiency (see Claessens and Glaessner (1999), Okuda and Rungsomboon (2006)). Even though domestic and foreign banks may be positively affected by increased competition, a broad range of literature discusses the negative impact of foreign bank entry on domestic banks' performance measures (see, among others, Stiglitz (1994), Sabi (1995) and Claessens (2001)). Another extension of the competition literature considers decreased bank concentration (e.g. in Romania), which makes the Structure-Conduct-Performance hypothesis very interesting (see,

among others, Bain (1951), Gilbert (1984), Hannan (1991), Lahusen (2004), Hahn (2006). In this case, the decreased level of concentration seems to lead to a decreasing level of performance, as the increased competition lowers the possibility of monopolistic market structures.

Romania's banking market provides a very good example for investigating the relationship between foreign bank entry, market structure and bank performance. Since the beginning of the transition, Romania's banking sector has experienced reforms aimed at modernizing the obsolete financial system and making it more competitive in comparison with Western Europe. An important part of these reforms was the privatization of the major banks, which began at the end of the nineties and still remains incomplete. The past reforms and the EU accession at the beginning of 2007 led to a more stable investment environment in Romania compared to the Commonwealth of Independent States (CIS) countries, despite remaining risks. The concentration in the Romanian bank market has been decreasing steadily and has forced the participants to apply more competitive strategies.

While most of the literature deals with either macro or micro aspects of the impact of foreign bank involvement on the respective countries, we contribute by combining both aspects in our investigation. A lot of current research focuses on risk aspects of foreign banks (see Arvai et. al. (2009), Maechler and Ong (2009)), but we concentrate on performance and efficiency aspects of foreign bank entry and presence. Rooted in the structure-conduct-performance paradigm, we investigate both the impact of foreign banks on macroeconomic performance of the financial sector and on the microeconomic performance of the respective banks. Over the 1996 to 2007 period, we run a cross-country panel regression for 10 New EU Member States (NMS) from Central and Eastern Europe. In applying Levine's (1996) dichotomy of foreign banks influencing macro development via the volume channel (capital accumulation) and/or the efficiency channel, we investigate both the relationship between foreign bank penetration and capital flows (FDI, foreign loans, foreign portfolio investment) and the relationship between foreign bank penetration and efficiency aspects (share of non-performing loans, interest rate spread, and loan availability) on the macro side.

2 Literature Review

2.1 The Structure-Conduct-Performance Paradigm

The performance-aspect in the structure-conduct-performance paradigm can be interpreted in two ways: macroeconomic performance of the financial sector, i.e. its ability to support capital accumulation (volume channel) and to enhance the productivity with which capital and labour are combined to produce goods and services (the efficiency channel); and microeconomic performance of the market participants (in our study: the banks), e.g. according to accountancy based measures. Macro-performance deals with the relationship between finance and growth, and we focus on the special role of foreign banks in this relationship, given certain macroeconomic structures. Micro-performance deals with various return measures of the market participants, i.e. how well they reach their individual goals. Again we focus on the special role of foreign banks related to market microstructures and to the strategies of foreign banks.

Given the significant influence of multinational banks upon their entry into emerging markets, a lot of studies (see Gilbert (1984), Hannan (1991), Lahusen (2004), etc.) focused on the relationship between profitability and the increased level of competition. However, the turnaround effect of a less concentrated market and a change in performance also gained strong support by a broad selection of theories and studies to prove this link. One of the most discussed theories among them seems to be the **Structure-Conduct-Performance Hypothesis** (SCP), which was first applied by Bain (1951). Hannan (1991) developed a model of the SCP-approach, which finally demonstrates the <u>positive relation between market concentration and above-average returns</u>. The model points out that the monopolist is able to vary output and price in order to maximize profit without considering the behaviour of his competitors. The assumption of the supply monopole (structure) determines the market behaviour (conduct) and the performance of the company. This relation between market structure and performance has been extended in the banking literature, allowing an analysis of the connection of market concentration (or market share) and bank performance (e.g. Gilbert (1984), Hahn (2005, 2006)).

A related theory to the SCP approach is the **Relative-Market-Power Hypothesis** (RMP), which asserts that, <u>independent of the market concentration</u>, only companies which possess large <u>market shares and well-differentiated products</u> can exercise market power in pricing and therefore gain above-average profits (see Shepherd, 1982). The **Efficiency-Structure-Paradigm** (ES) mainly has been developed by researchers of the Chicago School like Demsetz (1973), Peltzman (1977) and Brozen (1982) and reflects that not collusion but <u>economies of scope and scale</u> lead to a higher level of profitability and performance. Consequently, market concentration stems from highly efficient companies which are able to increase their market share. Berger (1995) extends the ES Hypothesis through the consideration of X-Efficiency and scale efficiency and establishes the **Efficiency-Structure-X-Efficiency Hypothesis** (ESX). His hypothesis states that firms with predominant management and product technologies have the advantage of below average costs and therefore usually gain higher profit (also see Berger (1995)).

2.2 The Relationship between Finance and Growth

King and Levine (1993a) were among the first who provided an endogenous theoretical framework, linking financial development with the process of economic growth. They argue that financial systems "evaluate prospective entrepreneurs and fund the most promising ones". Pagano (1993) similarly mentions the positive impact of financial intermediation on economic growth, whereby he alludes to the generic character of the term "financial development.. Therefore, the term <u>financial development</u> in this thesis always refers to an <u>increase of physical capital accumulation</u> and <u>efficiency</u>, as explained by Levine (1996). On the one hand, high-quality financial services can enhance growth by an increase in the physical capital accumulation, which could result from a higher national saving rate or from an increased inflow of foreign capital. On the other hand, financial systems can alter the productivity and efficiency with which capital and labour are combined in order to produce goods and services. Regarding the efficient allocation of capital, Wachtel (2001) lists four ways in which the financial industry improves allocations. First and as mentioned earlier, the financial sector enhances <u>screening</u> and monitoring of fund

seekers. Second, <u>mobilization of savings</u> may be encouraged due to innovative attractive instruments and saving vehicles. Third, financial institutions can take advantage of economies of scale and therefore reduce costs of project evaluation and origination. Finally, financial intermediaries provide opportunities for risk management and liquidity and develop instruments for risk sharing. (also see Blum et al. (2002) and Haiss and Fink (2007)). Levine (2005) states that the improvement of financial instruments, markets, and intermediaries enhances the provision of the basic functions of financial markets, and ultimately affects long-term economic development through the capital accumulation or the efficiency channel. Merton and Bodie (1995) focus in their conceptual framework rather on the <u>functional perspective</u> than on the institutional aspect. They mention that over time financial functions are assumed to be more stable and that "competition and innovation among institutions ultimately result in greater efficiency in the performance of financial system functions". In the World Economic Forum's Financial Development Report 2008, Roubini and Bilodeau (2008) holistically define financial development as "the factors, policies, and institutions that lead to effective financial intermediation and markets, and deep and broad access to capital and financial services". Levine (2008) specifies that countries with large and privately-owned banks that funnel credit to enterprises and liquid stock exchanges tend to grow faster than countries with lower levels of financial development (also see Barisitz (2005), Eller et. al (2006), Hagmayr and Haiss (2007)).

Concurrently Rajan (2006) mentions that a new deregulated and highly competitive financial environment leads to an investment return sensitive compensation system for bank managers, especially returns relative to their competitors. Managers therefore have greater incentive to take risks and induce superior performance. Kregel (2007) states that the deregulation wave that started in 1980 led to a banking system that no longer serviced only business lending but also emphasised more risky investment opportunities (also see Winkler (2009))

2.3 The Special Role of Foreign Banks

Levine (1996) developed a theoretical framework which highlights the role of foreign banks in financial and economic development. He states that if financial systems stimulate capital formation and enhance economic efficiency, foreign banks play an essential role. He discusses the following benefits from foreign banks' market entries, on the one hand, and potential costs deriving from the liberalization of foreign bank entry, on the other.

Levine (1996) comes to the following conclusion. First, a relaxation of restrictions on foreign banks entry may increase the capital inflow. Second, economic growth can be promoted by foreign banks since they contribute positively to the improvement of the domestic banking system. The effect capital formation is twofold as foreign banks are considered to facilitate international capital inflows, and this capital may spur economic development. Claessens et al. (1995) distinguish between short-term and long-term capital flows while "the former are deemed as unstable hot money and the latter are deemed as stable cold money" (also see, Razin et al. (1998)). Daude and Fratzscher (2008) extend the study on international capital flows and mention four categories of capital inflows deducted from the financial account. These are FDI, foreign portfolio investment (FPI), divided also into equity and debt investment, and foreign loans (FL). They demonstrate empirically that countries which are characterized by higher levels of corruption and a lower protection of property rights receive more FDI and FL than foreign portfolio investments (also see Gray and He (2001), Clarke et al. (2006), Fink et al. (2007)).

Regarding Levine (1996), foreign banks enjoy the reputation of contributing directly to the domestic market by providing new and better skills, management techniques, training procedures, technology, and products. Moreover, they may increase the level of competition in and contestability of the domestic market, which will result in a downward pressure on other domestic financial institutions to enhance the quality of their offered financial services (also see Claessens and Glaessner (1998), Claessens et al. (2001), Goldberg (2004), Bonin et al. (2005), Mehl et al. (2006), Moshirian (2006) Beck and Martinez Peria (2008)).

Levine (1996) states that financial arrangements rely strongly on the legal framework provided by the government, which dictates the rules regarding property rights, information disclosure, transparency and availability of financial statements, and the

supervisory and regulatory systems observing the financial system. When all of the mentioned factors are governed in order to support the financial market, the financial system itself will provide better financial services. (also Fries et al. (2002), Passera (2004), Sensarma (2006), Mihaljek (2006), Fink et al. (2007), Staikouras et al. (2009)).

2.4   Performance related to Market structure and Foreign Competitors

The <u>consequences of foreign bank penetration</u> on the individual banks themselves, <u>whether domestic or foreign</u>, and on the banking market in general is important to consider. Several theories approach the performance measurement of banks in a certain market in different ways. Some studies (see Claessens and Glaessner (1998), Okuda and Rungsomboon (2006), Yildirim and Philippatos (2007), Staikouras et al. (2008a)) argue that the level of foreign bank participation is of significant influence due to the competition pressure from more efficient and experienced financial institutions. Other works (see Stiglitz (1994), Sabi's (1995), Claessens et al. (2001), Staikouras et al. (2008b)) imply that the changing market structure seems to be the main driver for performance of the financial intermediaries. This chapter intends to give an overview of the existing studies on the linkage between the competitive environment, or the market structure, and the performance of banks.

Kantzenbach (1967) developed a competition approach which explains the market structure conditions for a functional competitive environment. In general, he defines <u>competitive intensity</u> as the time which a market needs to eliminate innovative advances by imitating competitors, and mentions the important functions of competition. He concludes in his approach that the deep impact of the entry of foreign banks, especially into a less developed banking market, may occur in the form of a changed environment, which can be a higher level of competition between the operating banks. At the same time, the banking industry of a slightly developed country like Romania moves from a government-led into a market-driven financial market, which will witness an essential downward trend of industry concentration (also see Classens and Laeven (2003), Barros et al. (2007), Yeyati and Micco (2007).

Furthermore, foreign banks tend to have a significant influence on the host banking markets through the increased level of competition conduct, which has a significant impact on the banking market's profitability performance (see Claessens and Glaessner (1998), Okuda and Rungsomboon (2006)). Contrarily, Yildirim and Philippatos (2007) conclude in their study of eleven Latin American countries that bank returns are negatively linked to the increased degree of foreign bank participation which stimulates the degree of competition in national banking markets (also see Staikouras et al. (2008a)).

Apart from the already discussed performance impact on the local financial market, ownership of the operating financial institutions may play an important role, since domestic banks and their foreign competitors will be affected in different ways. Stiglitz (1994) discusses the additional costs to domestic banks due to higher competition with large international banks which enjoy a better reputation. Consequently, profitability and margins may slow down and entrepreneurs could receive less access to loans (also see Sabi (1995), Claessens et al. (2001), Staikouras et al. (2008b)).

Gilbert (1984), describes the results of 44 studies which test the SCP relation, and demonstrates that only 32 of these studies report some evidence of significant association between market structure and measures of bank performance. In seven of those 32 studies, the coefficients on measures of market structure are not statistically significant in most of the equations (also see Lahusen (2004). Hahn (2006) supports the SCP Hypothesis by the analysis of the Austrian banking market, where the local banks seem to possess market power due to a concentrated banking market. The significance of the concentration variables with the dependent profitability indicators shows the relevance of the SCP model and neglect the RMP and the ES hypotheses (also seeKosmidou and Pasiouras (2006), Goldberg and Rai (1995), Fu and Heffernan (2006), Samad (2008), Clayes and Vander Vennet (2008)).

3 Macroeconomic Empirical Evidence

3.1 Data

To investigate how foreign bank participation affects the local financial system, a data set is used which comprises data of 10 different Eastern European countries (all of them are members of the European Union) from 1997 – 2007, which include the Czech Republic (CZ), Slovakia (SK), Hungary (HU), Slovenia (SI), Poland (PL), Estonia (EE), Latvia (LV) and Lithuania (LT), which entered the European Union in 2005, and Romania (RO) and Bulgaria (BG), which entered the EU in the year 2007. Data stems mainly from the database of the European Bank for Reconstruction and Development (2008), the Vienna Institute for International Economic (WIIW) studies and the Economist Intelligence Unit (EIU) Country Database.

3.2 Methodology and Variables

In order to investigate the role of foreign banks in an economy, the relationship between the levels of foreign bank penetration is executed through the following model, which is applied to Levine's (1996) hypotheses by adjusting the model, using different dependent variables for each hypothesis. For the regressions, the following model specification is used:

$$\Pi_{i,\,t} = a_0 + a_1 \, FOR_{i\,,t} + \sum_{j\,=\,6} a_j \, Z_{ij,\,t} + \varepsilon_{i,\,t}$$

where $\Pi_{i,t-1}$ denotes one of the dependent variables, which will be in detail explained in the following paragraphs. Since this thesis aims at examining the impact of foreign bank entry, $FOR_{i,t}$ represents the explanatory variable, which reflects a ratio that measures foreign bank penetration ratio in country i at time t. Following the research of Claessens et al. (2001) the degree of foreign bank penetration is explained by the share of **foreign banks in the total number of banks** and the share of **foreign bank assets of total bank assets**, which are both ratios provided by the European Bank for Reconstruction and Development. The asset share presence measure may be

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appropriate if foreign banks have an impact on the pricing and profitability of domestic banks only after gaining market share, while the second measure is more appropriate when the number of foreign banks indicates competitive conditions. Z describes a vector of additional control variables of country i at time t, which could significantly influence the dependent variable. Subscript i stands for cross-section units, i.e. countries (i = 1…10), while t denotes time, i.e. years (t = 1997…2007) and j describes a variable, i.e. control variables (j = 1…6). $\varepsilon_{i,t}$ is the error term, and a_0, a_1 and a_j are parameters to be estimated. The explanatory variable of this thesis possibly may induce international cross-country externalities, which are hardly measurable, persistent over time and different across countries. In order to include these externalities in this panel regression, country-specific effects are included. Due to the focus of this thesis on differences between specific CEE economies and not on a randomly sampled pool of countries, the estimation procedure takes fixed effects into account.

Gray and He (2001) assume in their developed hypothesis that a higher presence of foreign financial intermediaries can enhance the quality of the local financial market and consequently promote inward FDI. Therefore, the rate of inward FDI as percentage of GDP could be used as a dependent variable (Π). But since the **stock of inward FDI in percentage of GDP** is considered to give more stable evidence about the assumed coherence, it represents the first dependent variable (also see Eller et al. (2008)) The second dependent variable is foreign portfolio investment, which is deducted from a country's financial account under the heading **"portfolio investments, liabilities"** expressed in percent of GDP. Another source of international capital flows is the flow of foreign loans which in this thesis are considered the third and last type of capital flows. Therefore, the **foreign liabilities of banks in percent of GDP** will be used to reflect the inflow of foreign loans. The latter two indicators were also applied by Daude and Fratzscher (2008) in their investigation of the pecking order of international investment capital flows.

In accordance with the theoretical framework, the link between the degree of internationalization and the development of domestic financial services will be analyzed as follows. In this case Π measures the degree of the <u>quality, pricing and availability of domestic financial services</u>. In accordance with the investigation of

Mehl et al. (2006) the availability of domestic financial services, or financial depth, will be measured by the **monetization** and the **intermediation ratio** (broad money ratio, domestic private credit to private sector as percentage of GDP will be used as a proxy for the intermediation ratio). They argue that these two variables measure the financial system's capacity to perform its main functions and conclusively give evidence about the promotion of capital accumulation and the pace of productivity growth. Pissarides (2001) also uses the two mentioned variables in her study on financial intermediation in South Eastern European countries. Moreover, the **credit to households** as percentage of GDP could give empirical evidence about the development of the retail banking sector on its own (also see Mihaljek (2006)).

To measure the quality of financial services, the author follows Barajas et al. (2000), who use the **Non-Performing-Loan (NPL) ratio** as indicator in their studies, intending a significant proof that foreign banks may worsen loan quality of domestic banks. They argue that the NPL-ratio among domestic banks increased, which seems to reflect a fluctuation of higher quality clients to the entering foreign financial institutions (also see Mihaljek (2006), Podpiera and Weill (2008)). In addition, Barajas et al. (2000) state that concerning pricing, the entry of foreign financial intermediaries into a banking market lowered the **intermediation spread**[1] (also see Claessens et al. (2001) and Clayes and Vander Vennet (2008)).

This thesis also adapts a set of **control variables** that capture several basic country characteristics and then conducts extensive sensitivity analysis to verify the robustness of the panel analysis. The first control variable is the market size measured through **real GDP**, according to Campos and Kinoshita (2008), who state that generally countries with larger market sizes draw more capital flows, whereas there might be exceptions. They also mention that investors could also seek monopoly power instead of domestic market size, as in Latin America for example. Second, they also proved the relationship between capital flows and a low **inflation rate**, where the latter reflects a stable macroeconomic environment and is assumed to be a positive signal of credibility to foreign investors (also see Claessens et al. (2001)). To examine the determinants of financial depth the **GDP growth rate** is the third control variable,

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[1] The author found several relationships between FSFDI and the intermediation spread, as well as the et interest margin. Due to the similar reflections of the two variables, the author decided to use both to investigate the effect of foreign banks on the price signal.

as applied by Detragiache et al. (2006)**,** Lensink et al. (2004) and Koivu (2002) (also see Unite et al. (2003) Barajas et al. (2000)). The fourth control variable is the **Corruption Perceptions Index (CPI)** documented by Transparency International. Since corruption can cause a slowdown for financial development, as it causes instability, increased costs and insecure property rights (see Detragiache et al. (2006)). According to Wachtel (2001), important factors such as human capital investment and government consumption may play a role for the development of financial markets. Eller et al. (2006) also use **government consumption in percent of GDP** as a control variable reflecting the size of the public sector in the CEE region. Regarding **educational attainment**, this variable reflects the level of human capital investment, and also is considered a positive signal to attract potential investors, which is why it is added as the sixth control variable (see Barro (2000)). With respect to Levine's (1996) hypothesis, which reflects the influence of foreign banks on the degree of financial regulation, the estimation of any coherence pursuing the relationship between foreign bank entry and financial regulation remains a broad topic of qualitative and descriptive research.

3.3   Estimation results

The relationships between the different variables are discussed after the analysis with generalized least square regression taking into account fixed effects. This regression method is used due to the results of tests for heteroscedasticity, which shows the necessity to take account of the country-specific residuals of the model and forces a gls-based regression in order to avoid heteroscedastic effects. Through stepwise regression all insignificant control variables are removed one by one.

We first discuss the volume sight and then move on to efficiency. Regarding the link between foreign bank penetration and FDI, the regression variables, including all control variables, behave as expected: independently of using the amount of foreign banks or the asset share of foreign banks as the explanatory variable, foreign bank penetration is related positively and highly significant to the inward stock of FDI. This finding does not only undermine the theoretical approach of Levine (1996), but

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is also in line with the empirical results of Grey and He (2001) and the study of Haiss and Roessl (2008a).

Regarding the relationship between FPI and the level of foreign bank penetration, no significant link could be found, which is also in line with findings of Haiss and Roessl (2008b). The analysis of the linkage between foreign bank penetration and the flow of foreign loans shows at the asset share level and the competition level different results. When using the asset share of foreign banks as the explanatory variable, no significant relationship can be found, however using the number of foreign banks reflects a strong correlation with the foreign liabilities of banks in the NMS, but only at the low significance level. The absence of a strong significant correlation also supports Mihaljek's findings (2006), who also could not find any relationship that banks, whether foreign or domestic, have an influence on the flow of foreign loans. The differences in the results come from the fact that foreign banks with minor activities in the host country (i.e. small in terms of assets and equity in the host economy) may prefer providing loans to host country clients directly from their home country headquarters. Moving to the measurement of the **quality of financial services**, as hypothesized in Levine's (2006) second assumption, the relationship between foreign bank penetration and the rate of non-performing loans is significant. Using the foreign asset share ratio as the independent variable, the negative and strong significant correlation supports Mihaljek's (2006) findings that foreign bank entry improves the efficiency of the local banking market through an increased level of competition, which results in a decreasing level of non-performing loans. The other explanatory variable supports this result with a higher coefficient but with a lower rate of significance. The intermediation spread appeared to correlate significantly with both of the explanatory variables, while the significance of the number of foreign banks ratio was lower at the five percent level. This underlines the empirical results of Barajas (2000), who "argue foreign entry was found to be unambiguously beneficial for loan quality as well as for competition and operative efficiency". According to them, newly entered banks had to charge lower spreads in order to gain market share from their already established competitors. Concerning the influence of foreign bank penetration on the monetization ratio, both explanatory indicators demonstrate exactly the same results. The positive link is significant at the ten percent

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level and proves the hypothesis that foreign bank entry can improve the transfer of financial resources from households and the corporate sector to the financial sector. This proves the positive impact of foreign intermediaries on the financial system's ability to perform its main functions. Analyzing the intermediation ratio only, FSFDI wields a significant impact at the five percent level. This complies with Mihaljek's argument (2006) that foreign banks do not support the local banking market with more loans but have a positive influence on its efficiency. According to Pissarides (2001) low levels of bank credit to the private sector are caused by a shortage of funds, lack of credit skills and unavailability of good lending opportunities. Therefore, through the entry of foreign banks the mentioned domestic financing obstacles can be reduced and can, after a certain time period, lead to increased financial intermediation. It seems that foreign banks entered the NMS markets in the first years of transformation but did not extend their loan ratios. Due to a lack of data on the household variable, Romania and Poland had to be excluded from estimations. Regarding the results, the two explanatory variables give different evidence. While the asset share indicator demonstrates no significant correlation with the amount of households in percent of GDP, the number variable shows a positive and strong significant relationship. It appears clear that before the entry of foreign banks, the retail sector of the new member states hardly existed and that the former introduced this business field to the CEE economies.

4 Microeconomic Empirical Evidence

4.1 Data

In order to examine the effect of the market structure on the banks operating in the Romanian banking market, data for 17 commercial banks operating in Romania was obtained. The used data includes information for the period **1999 – 2006** and was drawn from Bankscope Database of Bureau van Dijk's company, the Database of the European Bank for Reconstruction and Development, the National Bank of Romania and the Financial Structure Dataset of the World Bank. Nine of the banks were foreign owned, five owned by domestic shareholders and three of the banks in the dataset were acquired by foreign shareholders during the period. This dataset

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comprises the information of between fifty and sixty percent of the Romanian banking market assets. As result, the author has to mention that the used panel data may not be representative. Moreover, since Citibank, the Romanian International Bank, OTP Bank and Volksbank Romania lack data for the year 1999, the panel data analysis is considered unbalanced.

4.2   Methodology and Variables

The theoretical foundation for the estimation of the SCP-Modell in its easiest form is defined as followed:

$$\Pi_{i,t} = a_0 + a_1 X_{i,t} + \sum_{J=4} a_j Z_{ij,t} + \varepsilon_{i,t}$$

Since this thesis aims at examining the impact of the existing market structure and foreign bank entry, X represents the explanatory variable, which reflects a ratio that measures the competition in the market or a foreign bank penetration ratio. Regarding the measurement of the market structure, a **Concentration ratio** which is composed of the asset share of the five largest financial intermediaries is used, as following the empirical surveys by Samad (2008) and Berger (1995). Another often used market structure variable is the **Herfindahl Index** (HERF), which also gives evidence about the level of concentration in a banking industry. For a perfectly competitive market the index is greater than 0 and 100 for a monopoly. Therefore, a low value of HERF reflects a high amount of banks in the market. Moreover, the HERF takes into account the number of banks and the inequality of market shares. Various studies proved the relevance of this indicator in the measurement of market concentration, such as Smirlock (1985), Berger (1995), Goldberg and Rai (1996), Hahn (2006).
 According to Claessens et al. (2001), the degree of foreign bank penetration should be explained through the **share of number of foreign banks** and the share of **foreign bank assets of total bank assets**, where we use the respective ratios provided by the EBRD. While the first one can be appropriate when the number of foreign banks indicates competitive conditions, the asset share presence measure may be appropriate if foreign banks have an impact on the pricing and profitability of

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domestic banks only after gaining market share also adopts these measures in order to investigate whether market penetration or the presence of foreign banks could be the reason for changes in bank performance (also see Barajas (2000)). Similar to various studies (see Berger (1995), Goldberg and Rai (1996) and Samad (2008)) this thesis uses usual profitability indicators for measuring bank performance, since profitability is a consolidated figure which takes into account all products and services regarding profits and losses. This thesis uses three measures of profits, which were also applied by Berger (1995), Goldberg and Rai (1996) and Samad (2008). These variables are firstly the **Return on Assets**, which is computed by the division of the total net profits through the bank's total assets, and secondly the **Return on Equity,** which is calculated by dividing the bank's total profits by the bank's total equity. Thirdly, the **Net Interest Margin**, relative to total assets, should serve to show the pricing ability of a bank. Z describes a vector of additional control variables of country i at time t, which could significantly influence the dependent variable. Subscript i stands for cross-section units, i.e. banks (i = 1…17), while t denotes time, i.e. years (t = 1999…2006) and j describes a variable, i.e. control variables (j = 1…4). $\varepsilon_{i,t}$ is the error term, and a_0, a_1 and a_j are parameters to be estimated. Because most of the previous studies, such as Kosmidou and Pasiouras (2006) and Hahn (2006), apply the fix effects as the more robust estimation method, this study also uses the fixed effects estimator as the more appropriate choice.

We also apply a set of **control variables** in order to underline the robustness of the adopted model. Following the study of Pasiouras and Kosmidou (2006), this thesis uses microeconomic variables to show the impact of bank specific influences and also provides proof of the macroeconomic impact on the banks' profitability. The first applied microeconomic control variable should be the **total assets** of the bank ass applied by Goldberg and Rai (1996) and Pasiouras and Kosmidou (2006), who argue that it reflects the cost difference regarding the bank's size and its ability to diversify (also see Bonin et al. (2005). Secondly, the **cost/income ratio** demonstrates the efficiency of expense management, which, according to to Pasiouras and Kosmidou (2006) is one of the main drivers of bank's performance and negatively related to it.

With view on the macroeconomic impacts, the **real GDP** growth measures the total economic activity within an economy and as a result should prove a positive

influence on the applied profitability variables, even if Pasiouras and Kosmidou (2006) found different results for domestic and foreign banks. Moreover, **inflation** tends to be related to banks' performance since through an anticipated inflation rate banks can timely adjust interest rates so that revenues increase faster than costs and profitability raises (see Staikouras et al. (2008a)).

4.3   Estimation results

The relationships between the different variables are discussed after the analysis with generalized least square regression taking into account fixed effects. This regression method is used in order to avoid any heteroscedastic tendencies in the results and to take account of the bank-specific residuals of the model. The effect of the explanatory variables is measured for both foreign and domestic banks separately. This should help to investigate the effect of concentration and foreign bank penetration on the profitability of each type of bank. To each variable which is used to measure foreign bank characteristics, the sign d0 is added. In addition, each indicator for domestic bank issues is marked by d1. Table 10 summarizes the correlations between the level of banking concentration and the three different measures of bank performance used in this study.

The results suggest that neither the Return on Assets, nor the Return of Equity is affected through level of concentration in the banking sector. The results are the same for foreign as well as for domestic banks. The author can only find a significant positive relationship between the market structure and the net interest margins of foreign banks at the 5 percent significance level. These findings confirm the study of Kosmidou and Pasiouras (2006) Goldberg and Rai (1995), which found no significant negative relation between market concentration and domestic banks' performance, but demonstrated a significant relationship between concentration and foreign bank net interest margins.

Regarding the first microeconomic **control variable**, it gives the impression that only domestic banks are able to take advantage of economies of scale in order to increase diversification and improve the Return ratio and the net interest margin. This may come due to the fact that foreign banks rather lend to big customers (at least initially)

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and avoid any risk in newly entered developing countries, while domestic banks have to expand more rapidly in order to compensate any competitive measures. These findings rather would support the RMP hypothesis than the SCP-paradigmIt is important to point out that the cost to income ratio mirrors only the cost efficiency of a firm, while the efficiency of management and risk monitoring skills can not be reflected by this simple ratio. Surprisingly, and not in line with the study of Pasiouras and Kosmidou (2006), the correlations are of positive nature, a fact which would reflect that high cost efficiency leads to higher profits. This may be caused by the fast growth of the Romanian banking market, as characterized in the descriptive element of the microeconomic part. The fast growing banking sector combined with a more competitive environment may force banks to accept higher management expenses and costs in order to raise the level of profits. Moreover, it looks like they focus rather on economies of scale than on the improvement of cost efficiency. To sum up, the significant relationship between cost efficiency and a bank's performance is given, although the direction of the relation depends on the level of sector development and saturation. Considering the macroeconomic control variables, only foreign banks seem to take advantage of a growing economy particularly by improving their net interest margin. Using inflation as an indicator of market development, in times of high inflation and adverse market conditions foreign banks seem to be able to improve their Return on Assets. In contrast, in circumstances with lower inflation or better market conditions the net interest margin seems to be raised due to the ability of foreign banks to price their financial products more anti-competitively.

The estimation results of the relationship between the Herfindahl index, used as a proxy for the concentration ratio, and the performance measures of banks in the Romanian financial market are given. The result disagrees with the above mentioned hypothesis and shows a significant but negative correlation of the index with the net interest margin of foreign banks. This induces that concentration would hamper foreign banks in taking advantage of their market power and pricing their financial products anti-competitively. Since the two different concentration ratios show different outcomes, the robustness of the relation should be doubted. The relationships between banks' size, cost efficiency and the applied performance measures appear to be significant and also are positive. Since the estimations seem

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robust, the same explanation of the matter can be drawn, which leads the author to the conclusion supporting the RMP and the ESX hypothesis.

Turning towards the relationship between foreign bank penetration and the profitability of banks operating in the Romanian banking sector, the only significant relationship which can be derived is the positive correlation between FSFDI and the net interest margin of foreign banks. This finding is in line with the study of Claessens et al. (2001), which states that foreign banks operating in developing countries have higher interest margins and profitability than domestic competitors. This gives the impression that foreign banks can price their financial products better than their domestic competitors.

Changing the foreign bank asset ratio for the number of foreign bank ratio does support the positive correlation mentioned above, but with lower significance at the 5 percent level. No essential change in the correlations of the control variables can be addressed, only that the inflation rate does not seem to have any significant influences on the performance of the financial intermediaries operating the local banking sector. Additionally, economic growth does not only spur the net interest margin of foreign banks, but also the Return on Asset ratio is positively related at the 10 percent significance level.

5 Conclusion

This thesis discusses the possible effects of foreign bank penetration on developing countries in two ways. First, it assesses important influences of foreign bank entry on international capital flows and the improvement of the quality and availability of financial services. Methodically, it applies descriptive data and panel regression analyses in order to measure the impacts of foreign bank presence in the New Member States (NMS) from Central and Eastern Europe (CEE) over the 1999 – 2007 period. Second, it examines the essential competition pressures of foreign banks on the profitability level of banks operating in the Romanian banking market. Therefore it gives a detailed descriptive overview on the history of the Romanian banking market and utilizes panel regression analyses with the purpose of evaluating the impact of foreign banks on 17 large Romanian banks.

The literature review proposes that financial development enhances economic development by raising physical capital accumulation and efficiency. The improvement of financial instruments, markets and intermediaries enhances the provision of the basic functions of financial markets and therefore the appropriate allocation of investment. In this thesis the focus lies on the role of financial intermediaries, more specifically on the special role of foreign banks. On the one hand, the main benefit of foreign bank entry is the improvement of access to international capital, which can flow in the form of foreign direct investment, foreign portfolio investment or foreign loans. On the other hand, foreign bank penetration can improve the quality, price and availability of financial services offered by banks. Previous research on this topic found that more foreign capital is channelled to transition countries which enjoy a higher degree of foreign bank presence (See Gray and He (2001), Clarke (2006), Fink (2007)). Addressing this issue, the literature suggests foreign banks as an important factor raising the level of competition in the domestic financial sector. This significantly influences the accomplishment of market functions through the behaviour of market participants and finally ends in an optimal competitive environment which is characterized by a certain market structure. This development has been demonstrated in previous studies, which argue that a larger presence of foreign banks leads to a more competitive banking system (See Claessens and Laeven (2003), Barros et al. (2007)). Furthermore, this increased level of competition influences the financial companies operating in this environment significantly by pressuring their performance. Several past theses stress this relationship and found empirical evidence for it (See. Claessens and Glaessner (1998), Okuda and Rungsomboon (2006)). The literature also highlights that this may affect foreign and domestic banks in different ways. Domestic banks may suffer from this new circumstance and their profitability and margins may slow down (See Stiglitz (1994), Sabi (1995),Claessens et al. (2001), Staikouras et al. (2008b)). The Structure-Conduct-Performance Hypothesis discusses the same subject from the point of banking concentration, stating a positive relation between market concentration and above-average returns. Related but contrary theories are the Relative-Market-Power Hypothesis, which assert large market shares are the reason for above-average profits, and the Efficiency-Structure-Paradigm, which argues that rather efficiency is

the answer for increasing profits. These theories are discussed and empirically tested by different researchers with varying results (See Gilbert (1984), Berger (1995), Lahusen (2004), Hahn (2006), Kosmidou and Pasiouras (2006), Goldberg and Rai (1995), etc.).

In the macroeconomic empirical section, the thesis presents descriptive presentations of the data and panel regressions with fixed-effects and generalized least square-regressions. The panel analysis focuses on the New EU Member States covering the years between 1997 and 2007. Based on the Levine (1996) framework that foreign banks can stimulate financial development via capital accumulation or via raising the efficiency of the financial sector, we start with the volume channel.

- Regarding the <u>link between FSFDI</u> (measured by the asset share of foreign-owned banks and the number of foreign banks) <u>and FDI</u>, the estimation demonstrates a <u>positive and significant relation</u> between the two indicators, inducing that a more attractive economic environment to foreign investors due to an advanced banking market with a certain amount of foreign competitors attracts FDI.

- <u>No significant association between foreign bank presence and foreign portfolio investment and foreign loans</u> could be found. Following Levine (1996), we investigate the impact of foreign banks on the efficiency of the financial sector by approximating efficiency with non-performing loans, the interest rate spread and availability measures. Also, concerning the impact of foreign financial intermediaries on the amount of non-performing loans, it seems that foreign bank entry significantly improves the efficiency of the local banking market through an increased level of competition. The intermediation spread appeared to correlate significantly with foreign bank entry and gives conclusive evidence of the benefits for loan quality as well as for competition and operative efficiency.

- A positive and significant relationship with the monetization ratio is given and proves the ability of foreign banks to perform its main functions and to transfer of financial resources from households and from the corporate sector to the financial sector. (Seventhly,) the correlation with private credit to the domestic private sector appears weak and therefore undermines the argument that foreign financial intermediaries do not support the local economy with more loans but have a

positive influence on its efficiency. Finally, there seems to be a significant relationship between the household ratio and the number of foreign banks, confirming that retail banking in CEE nearly did not exist before the entry of foreign banks.

In the microeconomic empirical section, the thesis presents panel regressions with fixed-effects and generalized least square-regressions. The panel analysis focuses on 17 Romanian banks covering the years between 1999 and 2006 and will be carried out separately on domestic and foreign banks. Due to a lack of data, the panel analysis is carried out **unbalanced** and the sample might be considered as not representative.

- Regarding the relationship between banking market concentration and the two ratios Return on Assets and Return on Equity, no significant relation can be found in this thesis.
- Using net interest margin as the independent variable, a positive significant association reflects that foreign banks can set their prices anti-competitively. Moreover, the significance of the correlation between bank concentration and the microeconomic variables bank size and cost efficiency demonstrates the acceptance of the RMP and ESX hypothesis rather than the proof of the SCP-paradigm.
- Proving the impact of foreign bank presence on the local banking market, the only positive correlation observed was between foreign bank presence and net interest margin. This result also proves that foreign banks can price their financial products better than their domestic competitors.

To sum up, the preliminary macroeconomic empirical results prove that the presence of foreign banks can influence the banking market of a transition country in a very positive way by allocating more international capital to the local economy and also by enhancing the efficiency of the financial sector in several ways. The tentative microeconomic results declare only little support for the SCP paradigm, when foreign banks only influence competition and not profitability.

Appendix

Table 1: Summarized estimation results with FSFDI

	fdi	fpi	fl	npl	ispr	m2	pcre	hcre
fsfdi	0.3704608***	-0.0029443	-0.0053536	-0.1521401***	-0.0138749***	0.0292665*	-0.0699459**	-0.0081998
	13.4	-0.39	-0.23	-5.4	-2.83	1.7	-2.16	-0.54
ngdp				-0.0000599**	-0.0000201***	0.0000702***		0.0001753***
				-2.06	-3.98	6.13		5.17
pgdp	-0.3436651*	-0.0926107*		-1.126579***	-0.1554834***			
	-1.74	-1.9		-5.47	-4.29			
infl				-0.0131665***				
				-3.93				
cor			6.231192***		-0.4420207***	3.570757***	6.024835***	2.045823***
			5.01		-2.03	4.68	4.26	2.13
ea	0.6260717***	0.062486**	0.4210083***		-0.0409647***		0.6834324***	0.2048138***
	6.84	2.47	4.94		-2.33		5.46	2.92
gc	-2.458227***		-3.76127***		0.2626464***	-1.515249***	-5.236613***	-2.348197***
	-8.66		-10.44		5.16	-10.3	-10.64	-8.6
_cons	-60.1192***	-10.70658*	-57.25363***	23.94785***	15.88595***	46.14386***	-84.84607***	7.951086
	-2.9	-1.88	-3.06	8.29	4.52	6.08	-3.49	0.44
Nr.of obs	110	110	110	110	110	110	110	88
Nr. of groups	10	10	10	10	10	10	10	8
Time periods	11	11	11	11	11	11	11	11
Wald chi2(16)	939.35	41.56	699.81	242.08	978.1	1649.87	674.22	483.58
Log likelihood	-355.6482	-199.5273	-344.8126	-320.6572	-148.2028	-287.9116	-367.3988	-221.8027
Prob>chi2	0.000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table 2: Summarized estimation results with NRFB

	fdi	fpi	fl	npl	ispr	m2	pcre	hcre
nrfb	29.04821***	-0.1896227	6.702872*	-8.363318*	-1.511662**	5.193936*	-3.962045	0.0039999***
	5.13	-0.13	1.76	-1.78	-2	1.92	-0.88	10.84
ngdp	0.0001853***		-0.0000427***	-0.000098***	-0.0000216***	0.0000671***		-0.00000278***
	5.38		-3.2	-3.95	-4.88	6.01		-3.73
pgdp		-0.1017769**	-0.2820528*	-1.22282***	-0.138156***			
		-2.07	-1.95	-5.07	-3.82			
infl				-0.0129009***				-0.0002172***
				-3.63				-5.33
cor			6.280529***	-2.110172*		3.597964***	6.298106***	
			5.96	-1.89		4.75	5.77	
ea		0.061479**	0.4978941***		-0.0323948*		0.6453416***	0.0055441***
		2.19	4.91		-1.89		5.95	4.39
gc	-2.448835***		-3.788952***		0.2988078***	-1.438073***	-5.326897***	-0.9514765***
	-8.29		-11.71		6.45	-9.09	-11.62	-2.97
_cons	91.29411***	-11.02535*	-42.18298	25.9173***	8.425507**	43.85806***	-78.80189***	-0.7656659***
	11.45	-1.81	-1.61	6.27	2.1	5.43	-4.16	-2.65
Nr.of obs	110	110	110	110	110	110	110	88
Nr. of groups	10	10	10	10	10	10	10	8
Time periods	11	11	11	11	11	11	11	11
Wald chi2(16)	648.81	39.25	765.67	186.01	855.62	1661.48	834.29	1019.65
Log likelihood	-371.0021	-199.8393	-337.2969	-328.8834	-147.1425	-287.8445	-360.5631	128.4336
Prob>chi2	0.000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table 3: Banks included in panel analysis

Name of bank	Dataset available	Reporting Strd.	Ownership
ABN Amro	1999 – 2006	IFRS unqual.	Foreign
Alpha Bank	1999 – 2006	IFRS unqual.	Foreign
Banca Romaneasca	1999 – 2006	IFRS gen. unqual.	Foreign since 2003
Bancpost	1999 – 2006	IFRS unqual.	Foreign since 2002
Banca Comerciala Romana	1999 – 2006	IFRS gen. unqual.	Foreign since 2005
BRD	1999 – 2006	IFRS gen. unqual.	Foreign
CEC	1999 – 2006	IFRS mixed	Domestic
Emporiki Bank	1999 – 2006	IFRS gen. unqual.	Domestic
Export-Import Bank	1999 – 2006	IFRS unqual.	Domestic
Firenze Romania	1999 – 2006	IFRS gen. unqual.	Foreign
Libra Bank	1999 – 2006	IFRS gen. unqual.	Foreign
Piraeus Bank	1999 – 2006	IFRS gen. unqual.	Domestic
Tiriac Bank	1999 – 2006	IFRS mixed	Foreign
Citibank Romania	2000 – 2006	IFRS mixed	Foreign
Romanian International Bank	2000 – 2006	IFRS mixed	Domestic
OTP Bank Romania	2000 – 2006	IFRS unqual.	Foreign
Volksbank Romania	2000 – 2006	Local GAAP	Foreign

Source: Bankscope Database Bureau van Dijk Company

Table 4: Summarized estimation results with bank concentration ration

	road0	road1	roed0	roed1	nimd0	nimd1
bcon	0.0228974	0.0028739	0.2695502	0.0034577	0.0769831**	0.0181405
	1.04	0.42	1.93	0.18	2.56	1
tad0	-0.0001151	-0.00000819	-0.0003038	0.0000163***	0.000133	-0.0000744
	-1.34	-0.15	-0.37	0.1	0.7	-0.73
tad1	-0.0002246	0.0003542***	-0.0004329	0.0024672	0.0001754	0.0013236***
	-1.59	2.86	-0.41	5.16	0.74	5.19
costd0	0.0141494	-0.0000503	0.0604201**	-0.0003007	0.0143658**	-0.0048162
	2.35	-0.05	2.2	-0.1	2.34	-1.13
costd1	-0.0033888	0.0105163***	-0.0125257	0.0601687**	0.0304942***	0.0198447*
	-0.46	2.73	-0.31	2.34	-4.94	1.69
pgdp	0.0212157	0.0016797	-0.0818308	-0.0032098	0.3594895***	0.0316785
	0.58	0.12	-0.32	-0.09	6.53	0.96
infl	0.6113178**	0.0025618	1.440632	0.0419515	-0.6783267*	-0.1488998
	2.43	0.03	0.82	0.18	-1.83	-0.68
_cons	-1.552061	-0.1802467	-8.440997	-1.178743	5.055474*	0.2745412
	-0.85	-0.21	-0.66	-0.42	1.83	0.14
Nr.of obs	132	132	132	132	132	132
Nr. of groups	17	17	17	17	17	17
Obs per group:						
Min	7	7	7	7	7	7
Avg	7.764706	7.764706	7.764706	7.764706	7.764706	7.764706
Max	8	8	8	8	8	8
Wald chi2(16)	266.09	116.33	191.9	257.58	374.38	432.91
Log likelihood	-244.567	-743.942	-476.3094	-2.427.771	-272.1359	-202.7278
Prob>chi2	0.000	0.000	0.000	0.000	0.000	0.000

Table 5: Summarized estimation results with Herfindahl Index

	road0	road1	roed0	roed1	nimd0	nimd1
herf	-0.311547	0.0630109	-1.396472	0.1363109	-3.934179***	-0.3289753
	-0.3	0.18	-0.2	0.14	-2.92	-0.44
tad0	-0.0000678	0.00000546	0.0003738	0.0000426	0.0002734	-0.0000333
	-0.87	0.11	0.48	0.26	1.58	-0.31
tad1	-0.0002024	0.0003641***	-0.0000558	0.00248***	0.0002553	0.0013355***
	-1.43	2.88	-0.05	4.93	1.14	4.92
costd0	0.014047**	-0.0000366	0.0565672**	-0.0003336	0.0151856***	-0.0032689
	2.33	-0.03	2.05	-0.11	2.77	-0.91
costd1	-0.0033642	0.0103844***	-0.016456	0.0613677**	0.0255253***	0.0209899*
	-0.44	2.78	-0.39	2.37	-3.68	1.73
pgdp	0.0175987	0.0028702	-0.0974992	-0.0014342	0.3069192***	0.0193234
	0.45	0.19	-0.35	-0.03	6.06	0.64
infl	0.6901064***	0.0110468	2.331674	0.0500267	-0.6015362*	-0.0398403
	2.8	0.13	1.33	0.21	-1.91	-0.22
_cons	-12.25705***	-8.53245***	-40.6168***	-32.60751***	21.50717***	10.42603***
	-4.59	-5	-2.86	-5.25	8.02	3.75
Nr.of obs	132	132	132	132	132	132
Nr. of groups	17	17	17	17	17	17
Obs per group:						
Min	7	7	7	7	7	7
Avg	7.764706	7.764706	7.764706	7.764706	7.764706	7.764706
Max	8	8	8	8	8	8
Wald chi2(16	258.14	113.58	189.11	235.81	417.24	395.97
Log likelihood	-244.9476	-78.13675	-478.0148	-247.5914	-269.8629	-190.2756
Prob>chi2	0.000	0.000	0.000	0.000	0.000	0.000

Table 6: Summarized estimation results with FSFDI

	road0	road1	roed0	roed1	nimd0	nimd1
fsfdi	-0.0031423	-0.0000353	0.0834971	-0.0008067	0.058192***	0.014403
	-0.21	-0.01	0.95	-0.07	3.09	1.24
tad0	-0.0000478	0.00000192	0.0000625	0.0000386	0.0000754	-0.0000992
	-0.51	0.03	0.08	0.21	0.36	-1.01
tad1	-0.000195	0.0003592***	-0.0002335	0.0024805***	0.0001711	0.0013129***
	-1.42	2.86	-0.23	5.02	0.69	5.28
costd0	0.0138588**	-0.0000459	0.0562045**	-0.0002497	0.0128062*	-0.0055891
	2.33	-0.04	2.04	-0.1	1.94	-1.31
costd1	-0.004107	0.0105114***	-0.0121619	0.060395**	0.0271514***	0.0197115*
	-0.55	2.75	-0.3	2.31	-4.42	1.69
pgdp	0.0278752	0.0023341	-0.2834183	-0.0012343	0.2259765***	-0.0032588
	0.56	0.13	-0.83	-0.03	3.23	-0.08
infl	0.6897015***	0.0136642	2.583935	0.047099	-0.4546517	-0.0780351
	2.88	0.16	1.49	0.22	-1.28	-0.39
_cons	10.40754***	-8.482213***	-48.38757***	-32.23208***	13.35504***	10.09891***
	5.2	-4.95	-3.35	-5.23	4.48	3.63
Nr.of obs	132	132	132	132	132	132
Nr. of groups	17	17	17	17	17	17
Obs per group:						
Min	7	7	7	7	7	7
Avg	7.764706	7.764706	7.764706	7.764706	7.764706	7.764706
Max	8	8	8	8	8	8
Wald chi2(16	262	113.76	192.1	246.42	369.62	452.37
Log likelihood	-245.0278	-79.26537	-477.4539	-240.9585	-272.4137	-202.7499
Prob>chi2	0.000	0.000	0.000	0.000	0.000	0.000

Table 7: Summarized estimation results with number of foreign banks ratio

	road0	road1	roed0	roed1	nimd0	nimd1
fsfdi	-3.173057	-0.1233543	2.204946	-0.2126158	7.839564**	1.466192
	-1.04	-0.12	0.11	-0.08	2.13	0.56
tad0	-0.0000124	0.00000436	0.0004836	0.0000363	0.0002219	-0.0000404
	-0.16	0.08	0.66	0.23	1.17	-0.38
tad1	-0.0001829	0.0003607***	0.0000178	0.0024824***	0.0002287	0.0013212***
	-1.44	2.98	0.02	5.19	0.92	4.86
costd0	0.0139752**	-0.0000242	0.0560746**	-0.0002451	0.0135082**	-0.0038212
	2.35	-0.02	2	-0.09	2.54	-0.93
costd1	-0.0032947	0.0105397***	-0.0191955	0.0597247**	0.0318579***	0.0236429**
	-0.45	2.72	-0.48	2.3	-6.9	2.01
pgdp	0.0990092*	0.0046925	-0.1145231	0.0010518	0.2028507**	0.0002391
	1.41	0.19	-0.24	0.02	2.24	0
infl	0.5424177	0.0068502	2.592875	0.0383968	0.0705673	0.0079799
	1.84	0.07	1.28	0.15	0.19	0.03
_cons	-9.883691***	-8.374319***	-44.95179**	-31.97974***	8.640594**	8.436471**
	-2.6	-4.35	-1.96	-4.89	2.1	2.28
Nr.of obs	132	132	132	132	132	132
Nr. of groups	17	17	17	17	17	17
Obs per group:						
Min	7	7	7	7	7	7
Avg	7.764706	7.764706	7.764706	7.764706	7.764706	7.764706
Max	8	8	8	8	8	8
Wald chi2(16	260.08	118.41	196.39	257.27	483.6	390.72
Log likelihood	-244.5222	-77.70162	-477.6893	-240.045	-268.4026	-201.7168
Prob>chi2	0.000	0.000	0.000	0.000	0.000	0.000

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